Status, distribution and conservation perspectives of Lesser Florican in the North-Western India

A SURVEY REPORT

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

March 2011

Photo Credit: G.S. Bhardwaj

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Dedicated to
Late Dr. Ravi Sankaran

JAGDISH KISHWAN
Additional Director General of Forests (Wildlife)

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Foreword

Sypheotides indica, the lesser florican inhabiting western India is an indicator of the health of the grassland ecosystems. The bird is specifically noticeable in the monsoon season due to its characteristic flight display. Ever-increasing human pressure, and conversion of grasslands to other landuses, are slowly pushing this graceful species towards extinction. Invasion of plantations into grasslands, pesticide related pollution, spread of invasive species and uncontrolled grazing are other factors resulting in its habitat degradation, consequently leading to the decline of the unique species.

Last systematic survey of this species was conducted by late Dr Ravi Sankaran, an eminent ornithologist, in the year 1999. This study has been undertaken with an aim to update the status of lesser florican and its habitat in north-western India as recorded earlier by Dr Sankaran. The finding of the present study suggests that apart from local extinction in some of the areas, its population, in general, has declined sharply across its entire distribution range reported by Dr Sankaran a decade back.

The study underlines the need for launching of a 'Recovery Plan' for this rare species in its distribution range, without losing time. I compliment Shri G. S. Bhardwaj, Scientist-F, Wildlife Institute of India for undertaking this eye-opening survey, and bringing to fore the need for immediate action for recovery of this beautiful bird. I hope the bird lovers would find this survey, and findings flowing therefrom, useful and interesting. I am sure his continuing efforts will be able to save this bird and bring it back from the brink of extinction.

(Jagdish Kishwan)
New Delhi, 26th April 2011

जहाँ है हरियाली।
वहाँ है खुशहाली।।

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Acknowledgement

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The survey was possible because of the support of the forest officials of the states of Rajasthan, Madhya Pradesh and Gujarat and some NGOs at the field level.

We are grateful to Sh RN Mehrotra, PCCF Rajasthan, Sh HM Bhatia CWLW Rajasthan, Sh AK Upadhyay CCF Udaipur, Dr NC Jain CCF (WL) Udaipur, Sh Shafaat Husain CCF, Ajmer, Sh P. Kathirvel, DFO Ajmer, Sh Nanak Chand ACF, Bhilwara, Sh Shatrujeet Singh Rathore of Shapura. We are thankful to Sh KC Meena, DFO Pratapgarh and Sh Virpal Singh Rana ACF, Pratapgarh.

We are very thankful to Sh Harkirat Singh Sangha and Sh Devender Mistry of Pratapgarh, a keen birder of the area who helped us a lot in conducting the survey.

We are thankful to the officials of the State Forest Department of Madhya Pradesh especially Sh HS Pabla, Chief Wildlife Warden, Sh Manoj Argal, DFO Ratlam, Sh DS Chauhan, ACF Ratlam, Sh Pradeep Kachchawa, Range Officer Sailana WLS, Sh RP Dadoriya, ACF Sardarpura WLS, Sh RP Dwivedi, Range Officer Sardarpura WLS, Sh AS Ohriya, Range Officer Petlawad, Sh BS Devda Deputy Range Officer, Petlawad and all the frontline staff who extended their cooperation in conducting the survey. We are thankful to Sh P M Laad CCF (retd) for his valuable information.

We convey our thanks to the officials of the Gujarat Forest Department especially Sh RV Asari,CWLW; Sh RK Sugur, DFO Rampura; Sh RT Bhuria, Range Officer, Rampura; Sh JS Solanki, Wildlife Warden, Velavadar National Park; Sh Vijay A Rathod, Range Officer Velavadar National Park; Sh RL Meena, CCF (WL) Junagarh; Sh LJ Parmar, DFO Rajkot; Sh VK Madariya, Range Officer Gondal; Ms Anita Garg, DFO Junagarh; Sh Sandeep Kumar, DFO Sasangir; Sh DK Sharma, CCF Kacch; Sh DT Vasavada, DFO Buj; Sh CK Arvadia, Range Officer Naliya for their help in conducting the survey.

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We appreciate the whole hearted cooperation and support of our faculty colleagues especially Dr. K. Vasudevan. We appreciate the help and support of Ms Bitapi Sinha for designing and printing of this report. We are thankful to Shri Qamar Qureshi, Nodal Officer GIS Cell and staff for providing relevant maps. We extend our thanks to Sh Kuldeep Chauhan for taking a keen interest in designing the report. We are thankful to Dr Pranab Pal for sparing a good condition vehicle for the survey.

This survey covering more than 8000 kilometres in just 25 days could not have been possible without the active support of Sh Vinod Bisht, driver who continuously remained with us during the entire survey.

Authors

Summary

The Lesser Florican *Sypheotides indica*, a species endemic to the Indian subcontinent, is largely seen during the monsoon season in north-western India, where it breeds. Its population and range is believed to be decreasing at an alarming rate due to breeding habitat loss and threats in the non-breeding habitats, believed to be in south and south-east India. In this connection, to understand the present status and distribution of Lesser florican in the north-western India *i.e.* in Gujarat, Madhya Pradesh and Rajasthan, a survey following an established protocol (Sankaran 2000) was carried out in the month of August 2010, which is a part of breeding season of this species, when most of males display in the grasslands.

A total of 84 individual Lesser Floricans (83 male and 1 female) were sighted in three states of north-western India, which is 65% less than the sightings reported in 1999 by Dr. Sankaran. It was found significantly fewer sightings than reported in 1999 in all grasslands surveyed ($t=2.81$, $df=14$, $p<0.05$). Of the 169 potential grasslands available for floricans in the north-western India, 91 grasslands were surveyed, which include grasslands surveyed during 1999. Of the surveyed grasslands, Lesser Floricans were found in 24 grasslands as against 37 grasslands in 1999.

Among the three states, more sightings of Lesser Florican were reported in the state of Gujarat (N=54) followed by Rajasthan (N=18) and Madhya Pradesh (N=12). But in 1999, more sightings of florican were reported in Gujarat (N=141) followed by Madhya Pradesh (N=63) and Rajasthan (N=34). More than 55% of grasslands in Gujarat that were reported with florican in 1999 (Sankaran 2000) were observed without florican in 2010. More or less similar situation was in Madhya Pradesh also. Population and habitat of Lesser Florican in the north-western India was observed to be continuously declining at an alarming rate.

Lack of a National Policy on grassland management, habitat degradation, plantations, poor landuse planning, pesticide pollution, invasive species, inadequate coverage of florican habitats in the Wildlife Protected Area Network and lack of knowledge on the non-breeding habitats of this species are observed to be major threats to this species.

1.1. Introduction

Six species of bustards (Otididae) occur in the Indian subcontinent. The Great Indian Bustard *Ardeotis nigriceps*, Lesser Florican *Sypheotides indica* and Bengal Florican *Houbaropsis bengalensis* breed in India, while the Great Bustard *Otis tarda,* the Little Bustard *Tetrax tetrax* and Houbara *Chlamydotis undulata* are occasional or common winter migrants (Grimmett *et al*., 1998). The Lesser Florican and the Great Indian Bustard are endemic to the Indian subcontinent, while a sub species of the Bengal Florican is found in Cambodia, and Vietnam as well (Osborne *et al.,* 1984).

The Lesser Florican is amongst the smallest bustards of the world with 510-740 gm of adult body weight. It occurs largely in grasslands and is an endangered species. It breeds during the southwest monsoon, which normally begins by the end of June (Jerdon 1864, Baker 1921, Dharmakumarsinhji 1950, Ali and Ripley 1969, Sankaran *et al*. 1992, Sankaran 1997a). During this period, a distinct movement into Gujarat, eastern Rajasthan and western Madhya Pradesh, where it congregates in areas of good rainfall, has been documented (Jerdon 1864, Sankaran *et al*. 1992). Its primary breeding habitat are grasslands where sufficient grass cover is available during the breeding season. In western India, these grasslands are fragmented and patchily distributed and the majority of habitat available to the Lesser Florican is now a mosaic of grassland and cropland (Sankaran 1997).

The most recent surveys in 1999, have an estimated population of 3530 birds (Sankaran 2000). The breeding success of the Lesser Florican depends on the quantum and distribution of monsoon, which is highly uncertain across all its breeding range (Sankaran 1994) and availability of sufficient grass cover (Ali and Ripley 1983). Undisturbed grasslands with mixed vegetation cover appears to be of the greatest importance in habitat

A florican in its habitat

A florican in cropfields

Trampling of nests and eggs by livestock is a serious threats to Lesser florican

selection during the breeding season of the Lesser Florican (Sankaran 1997a).

Several studies (Jerdon 1864, Baker 1921, Dharmakumarsinhji 1950, Ali and Ripley 1969, Sankaran et al. 1992, Sankaran 1997a&b, Sankaran 2000) have been carried out and gathered information on habitat use, population status and breeding behaviour of this species during the breeding season.

Loss of breeding sites is believed to be a major cause for the declining population of this endangered species. More than 620 sites have been brought under protected area network in India but grasslands are very poorly represented (Rahmani and Manakadan 1988; Rodgers and Panwar 1988). There has been a considerable loss of private owned grasslands, and also grass patches in between crop fields (Rahmani 1987, Shankaran 1994). In addition, most of the grasslands, either pure or mosaic are under excessive pressure of grazing due to livestock. Unlike the breeding areas, there is hardly any information about the non-breeding habitat of this species, which is crucial for their comprehensive conservation plan preparation.

1.2. Historical Distribution

The Lesser Florican is virtually endemic to India, although there were some records from Pakistan, Nepal and one unconfirmed historical report from Myanmar (Birdlife International 2001). The scatter of historical records shows a fairly even distribution across all of modern-day lowland India, with the exception of the Brahmaputra valley in the north-east; thus the species appears once to have occurred from Gujarat and central Rajasthan east to West Bengal and Orissa and from Saharanpur in north-west Uttar Pradesh south to Trivandrum in southern Kerala (Baker 1922–1930, Ali *et al.* 1986, Sankaran 1995b, Birdlife Internation 2001). There was one record from Punjab (Birdlife International, 2001). The main breeding areas were apparently in the districts of Nasik, Ahmednagar and Sholapur of Maharastra, eastern Haryana and the Kathiawar Peninsula (south-central and south Gujarat) (Goriup and Karpowicz 1985), but are now in southern Rajasthan, southern and eastern Gujarat, and western Madhya Pradesh (Sankaran 1991, 1994b). The species is believed to be wintering in dry, grassy areas throughout much of India, mainly east of the Western Ghats, and south and east of the Godavari river (Ali *et al.* 1986, Sankaran 1995b), however, in the recent past their sightings in India other than during breeding season have become rare.

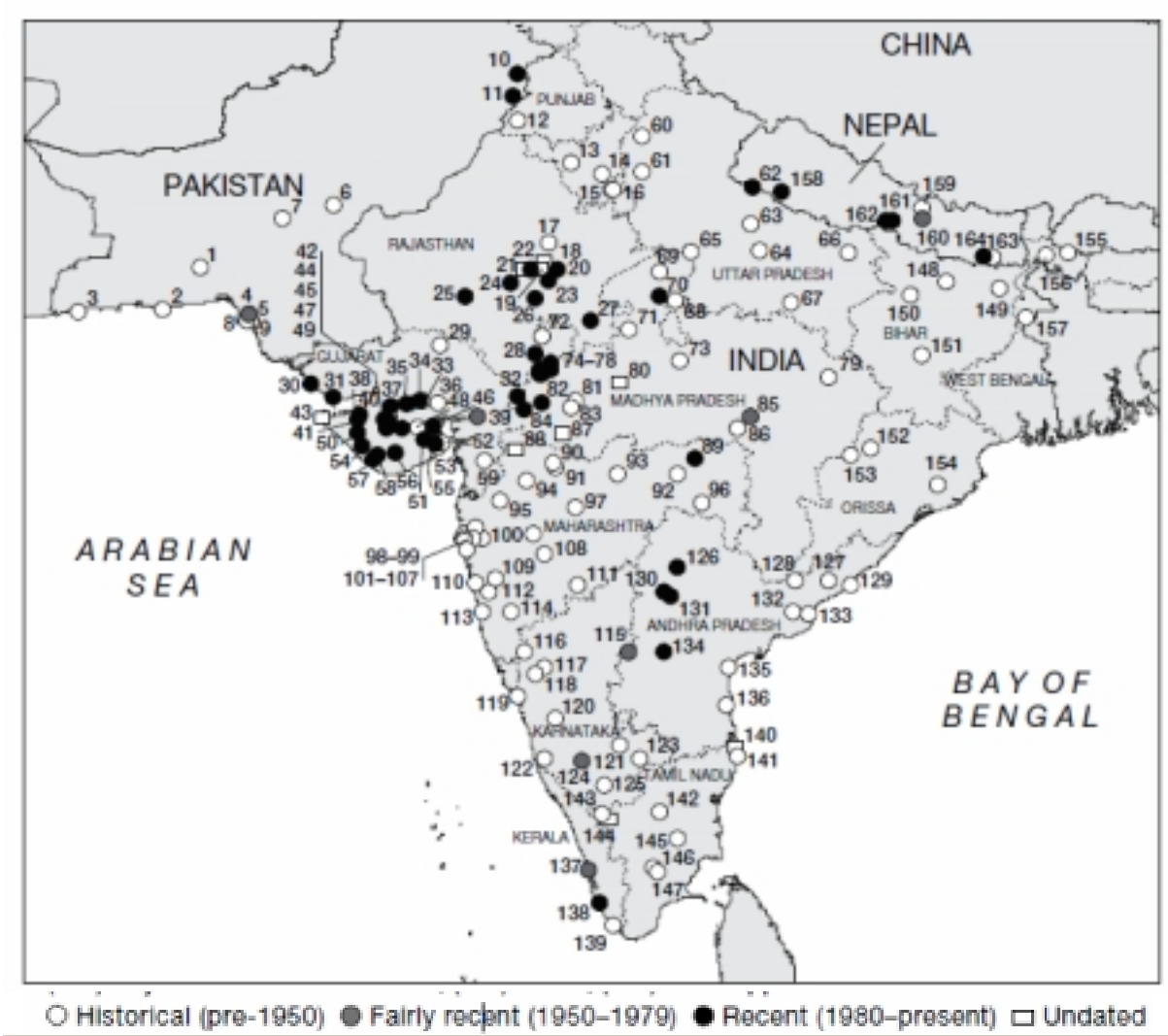


Fig1: Present and historical distribution of Lesser florican

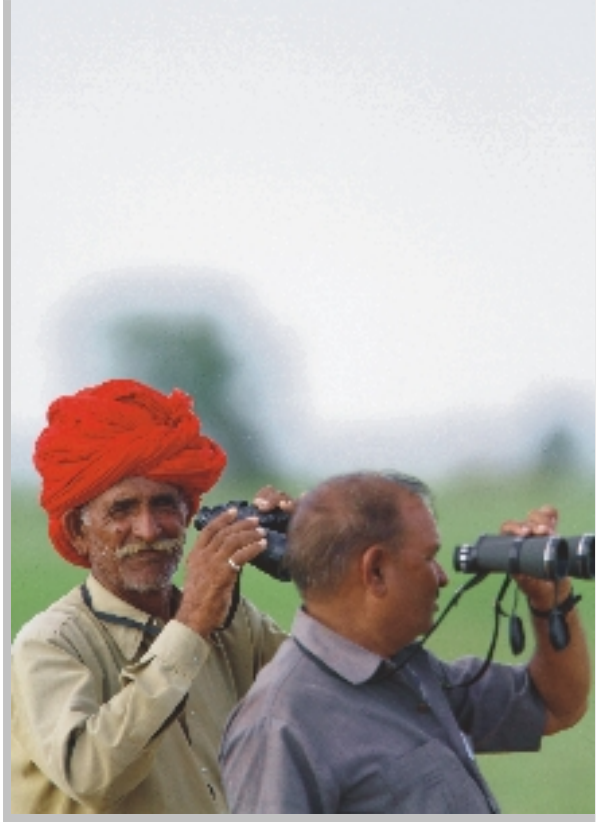
(Source: Birdlife International, 2001)

Early in the twentieth century, breeding florican were also sighted in southern Sind and the grassy plains of Lasbela district, Baluchistan and Pakistan. These birds might be the spill over of breeding dispersal from the adjacent Gujarat in India (Ticehurst 1922–1924, Roberts 1991–1992). The Lesser Florican was also reported in the eastern part of Coastal Mekran (Ticehurst. 1926–1927).

2.1. Objective of the study

The reports of decline in the population and possible extinction of Lesser Florican in next 50 years was even mentioned in the late 19th (Hume and Marshall 1879-1881) and in first quarter of 20th (Baker 1921-1930) centauries. It was observed that there was a drastic reduction in its population by 60% from an estimated number of 4374 individuals in 1982 to 1672 in 1989 (Sankaran et al. 1992; Sankaran 1990, Sankaran and

Rahmani 1990a). The most recent surveys in 1999, have estimated a population of 3530 birds (Sankaran 2000) which shows a population increase of 62%. For last 10 years there was no systematic study for assessing the status and distribution of this species. Due to ever increasing anthropogenic pressures, continuous change in the land use pattern especially in grassland areas, natural resource management practices by different agencies, other developmental activities and possible climate change might have dragged the dwindling population of Lesser Florican to minimum level. Being an indicator of high grass productivity (Magrath et al. 1985, Sankaran 1997c), the jumping display of Lesser Florican is like the pulse of the grassland ecosystem. With this background a rapid survey aimed to assess the present status of Lesser florican and their habitat in north-western India was carried out. It was also aimed to train the local staff and bird watchers towards florican count and also create awareness among locals.



Frontline staff doing survey in Ajmer

Local staff is a great help for conducting such survey

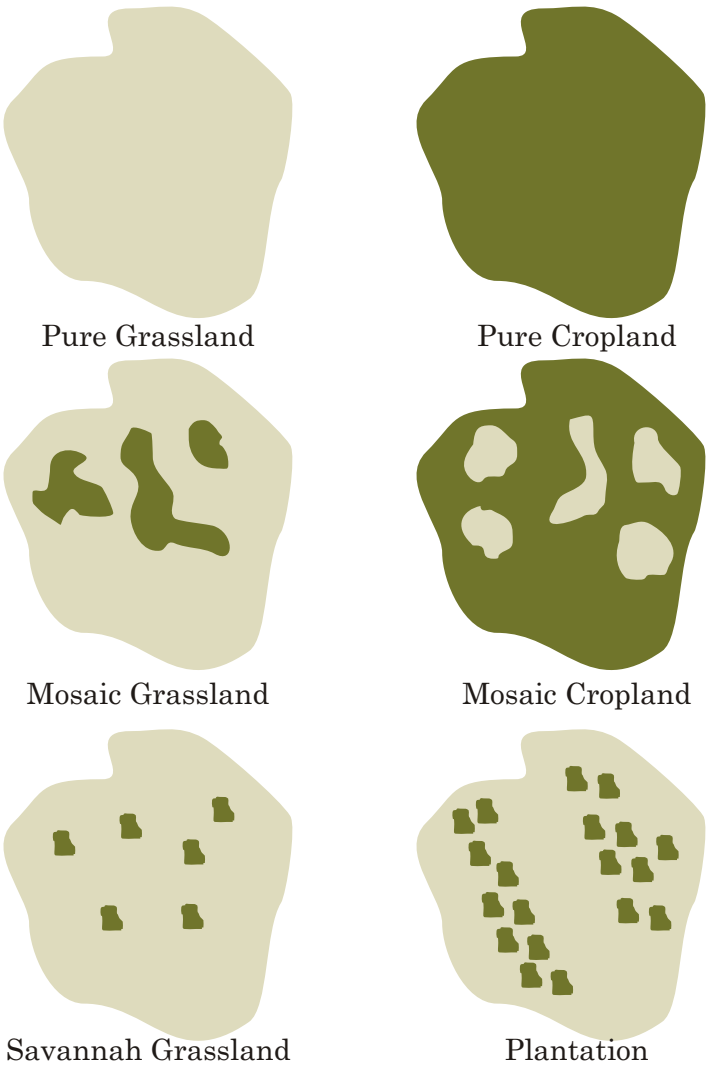
3.1. Methods

Field survey was conducted in the month of August, 2010 in all potential habitats of Lesser Florican covering mostly Malwa and Kathiawad peninsulas of Rajasthan, Madhya Pradesh and Gujarat. Based on previous experience with Dr. R. Sankaran, and past surveys (Sankaran 1991 and 2000), grasslands distributed across known breeding range had been identified in these three states. These sites were visited and extensively covered on foot, by two to seven observers, and a total count of the males present were made. As males are territorial and very conspicuous during the breeding season due to their aerial display, a fairly accurate count of the number of males present in grasslands can be made (Sankaran 2000). A total distance of 8416 kilometres was covered on vehicle to reach all 91 grasslands surveyed. During the survey, 91 sites in 65 villages were surveyed including both grasslands belonging to state forest departments, revenue department and private individuals and agricultural fields. Efforts were made to use and compare the previous status survey report of Sankaran (2000) as baseline data. We did not attempt to estimate the total population of Lesser florican in the north-western India as done during earlier surveys (Sankaran 2000), instead we compared the number of sightings with previous surveys to understand the population trend in time.

Interaction with villagers

Sensitization of field staff

Local informers



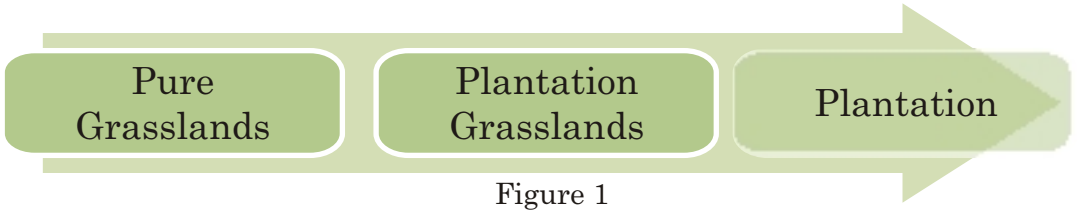


Figure 1

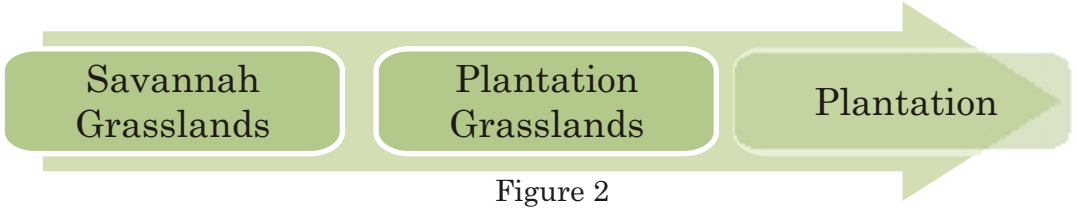


Figure 2

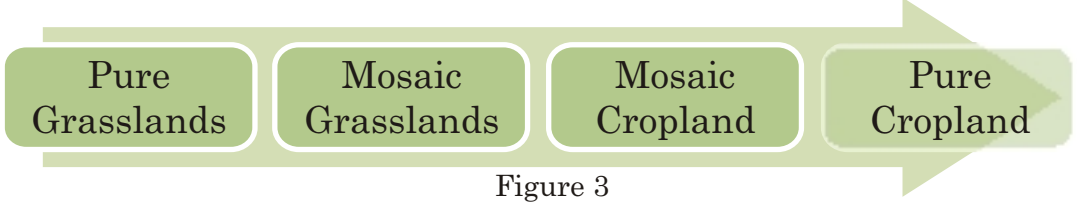


Figure 3

Figures 1, 2 and 3 showing the human induced change. Figure 1 and 2 are the conversion of natural grasslands to man-made forests called plantations.

Most of the observations were made in morning (sunrise till 1000hrs) and evening hours (1600 hrs till sunset) when the activity of the cocks especially their jumping behaviour remained maximum. Observations were based on the basis of direct sightings or with the help of binoculars or SLR cameras with telephoto lenses.

Photographic evidences of some of the observations of birds as well as of habitats including different management practices were also recorded. To avoid trampling of nests and eggs, no special efforts were made for the search of females or the nests of this bird. Surveyed grasslands were classified into 7 categories namely pure grassland, pure cropland, savannah grassland, mosaic grassland, plantation, plantation grassland and mosaic cropland to study the habitat preference of floricans. This classification was done on the basis of relative dominance of certain vegetation types and landscape. Savannah grasslands are the areas where grasslands are interspersed with scattered trees. If such grasslands also had agriculture fields were categorised as mosaic grasslands. If the agriculture sites had patches of grasslands amidst then they were categorised as mosaic croplands. Planted forests are the areas where the areas have totally been converted into woodland by reforestation activities.

Mosaic cropland

Mosaic grassland

Plantation in grasslands

Florican seeking refuge in jowar *Sorghum Vulgare* crop

Survey in Naliya Grassland

Pure grassland patch in Velavadar National Park

4.1. Survey Team

Along with Principal Investigators, officials from state forest departments of Rajasthan, Madhya Pradesh and Gujarat participated in this survey of Lesser Florican in 2010. In addition, many of the local wildlife enthusiasts and NGOs also joined for the survey of this endangered species. Survey team also included P Kathirvel DFO Ajmer, Rajender Singh (Forester), Goga Kumhar, Shatrujeet Singh Rathore of Shahpura, Nanak Chand (ACF of Shahpura), Noor Mohammad (Shahpura), KC Meena (DFO Pratapgarh), Prahlad Singh, Driver; VPS Rana (ACF Pratapgarh), Devender Mistry (a keen birder), Manoj Argal (DFO Ratlam), DS Chauhan (ACF Ratlam), Pradeep Kacchawa (RO Sailana WLS), Kheema Bhil (Chowkidar Sailana WLS), Dadoriya (ACF Dhar), Dwivedi (RO Sardarpura WLS), Lal Singh (Chowkidar Sardarpura WLS), AS Ohriya (RO Petlawad), BS Dewda (Deputy RO Petlawad), Mohan Singh Singhad (FG Petlawad), JS Solanki (SDO Velavadar National Park), Vijay A Rathod (RO Velavadar National Park), Allah Rakha (Chowkidar Velavadar National Park), LJ Parmar (DFO Rajkot), Hitesh Dave and Gorang Joshi, both NGOs from Gondal, VK Madariya (RO Gondal), Anita Garg (DFO Junagarh), Sandeep (DFO Sasangir), Sisodia (Forester Maliya), Hazi Ahmad (Chowkidar Junagarh), CK Arwadia (RO Nalia), Jugal Kishor Tiwari, Ashwani Jadeja (Forest Guard, Nallya) and Nane Mammad (Chowkidar Naliya). Apart from these there were a number of officials from the frontline staff who contributed a lot for the successful survey of the species.

Survey in Sailana WLS

5.0. Results and Discussion

5.1. Status of Lesser Florican and its habitat in north-western India

A total of 84 individual Lesser Floricans (83 male and 1 female) were sighted in three states of north-western India such as Gujarat, Madhya Pradesh and Rajasthan, during the breeding season of 2010, which is less than 65% of sightings reported in 1999. We found significantly fewer sightings of florican this year than reported in 1999 ($t=2.81$, $df=14$, $p<0.05$). Of the 169 potential grasslands for florican in the north-western India, 91 grasslands were surveyed, which include grasslands surveyed during 1999 (Sankaran 1999). Of the surveyed grasslands, Lesser Floricans were found in 24 grasslands as against 37 grasslands in 1999 (Graph 1).

A startled cock hiding in *Sorghum vulgare* crop

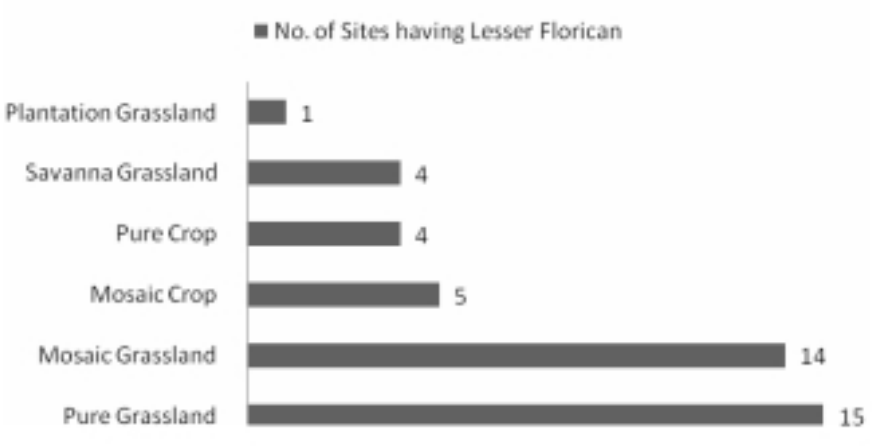
Some of grasslands were grouped as one to compare the present data with previous surveys, for example, all grasslands in Naliya always considered as one by Sankaran (2000) although 18 different grasslands were there (these grasslands might have fragmented into several patches due to encroachment which took place in last two decades). We also followed the same method in this report. During the entire survey only one female was observed while flushing out from a stunted growth of *Butea monosperma* in Tajpuriya-Damnod grassland of Sailana Wildlife Sanctuary. Detail of all sightings of floricans provided in the Table 1.

Among the three states, was maximum sightings of Lesser Florican were reported in the state of Gujarat (N=54) followed by Rajasthan (N=18) and Madhya Pradesh (N=12) (Graph 1, Table 2). But in 1999, more sightings of Florican were reported in Gujarat (N=141) followed by Madhya Pradesh (N=63) and Rajasthan (N=34). Although more number of Floricans sighted in Gujarat during the breeding season of 2010 (Graph 2), there was a drastic decline of grasslands with Florican. More than 55% of grasslands in Gujarat that reported with Florican in 1999 (Sankaran 2000) were observed without florican in 2010. Populations and habitats of Lesser florican in the western Indian have been continuously declining at an alarming rate (Table 2).

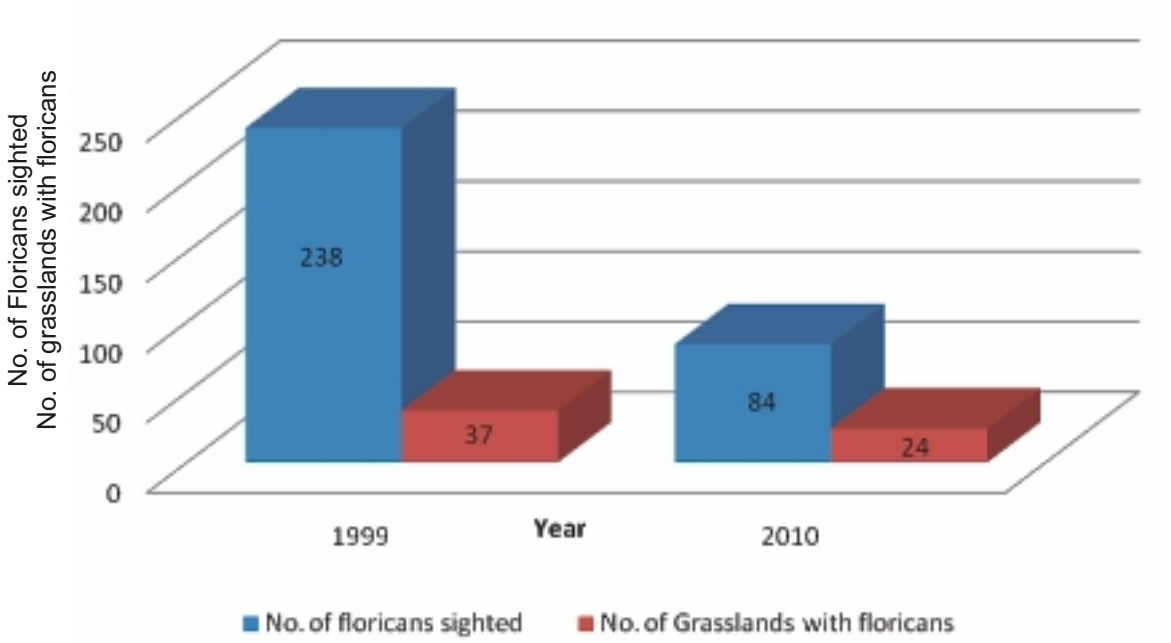
Most of sightings of the Lesser florican remained confined in sites representing pure grasslands (35%), followed by mosaic grasslands (33%), savannah areas (12%), mosaic crop (9%), pure cropland (9 %) and least in grasslands with plantations (2%) and there were no sightings in plantations. However, several grasslands in the western India were either degraded due to grazing or planted with tree species which made them unfit for Lesser Florican to use.

5.2. Status and distribution of Lesser Floricans in Gujarat

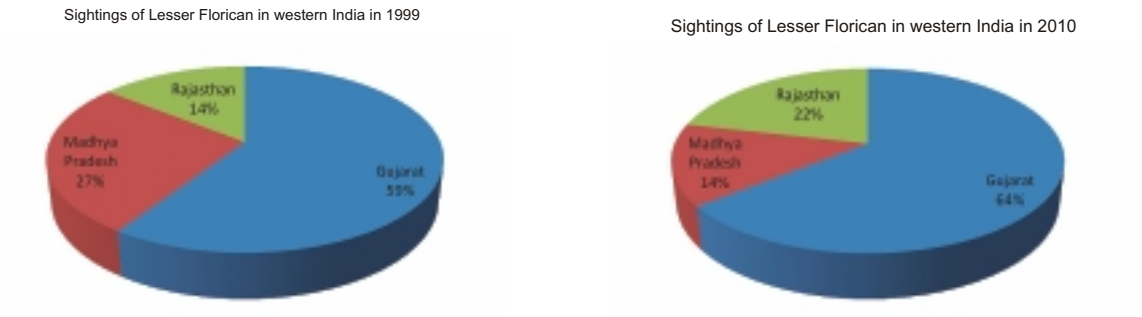
A total of 54 individuals of Lesser Florican were sighted in three districts of Gujarat during the breeding season of 2010, which is less than 62% of the sightings reported in 1999. Of the 54 individuals, 26 Floricans were found in Velavadar National Park alone. However, Forest Department could count more than 50 Floricans this year. Because of Florican



Number of sites having Lesser Florican



Graph 1. Number of Lesser Floricans sighted and number of grasslands with Florican in the three states of western India during the breeding season of 1999 and 2010



Graph 2. Sightings of Lesser Florican in north-western India during the breeding season of 1999 and 2010.

Table 1. Details of Lesser Florican sightings in 2010 in the western India.

No.	State	Range	Village	Place	Obs	No.	Observer
1	Raj	Ajmer	Saunkhaliya	Block 1	Nil	0	GSB
2	Raj	Ajmer	Saunkhaliya	Block 1	Nil	0	GSB
3	Raj	Ajmer	Bolihardi	Block 1	Seen	3	GSB
4	Raj	Ajmer	Saunkhaliya	Block 2	Nil	0	GSB
5	Raj	Ajmer	Bhatiyami	Block 3	Nil	0	GSB
6	Raj	Malpura	Kurar	Kurar bir	Seen	2	R*
7	Raj	Malpura	Lamba harisingh	Lamba	Seen	2	R*
8	Raj	Shahpura	Shopura	Shopura	Seen	2	GSB
9	Raj	Shahpura	Arnia Ghoda	Mewada	Seen	1	GSB
10	Raj	Shahpura	Baldarkha	Baldarkha	Nil	0	GSB
11	Raj	Shahpura	Khamor	Khamor bir	Call	1	GSB
12	Raj	Shahpura	Mataji ka khera	Mataji ka Khera	Seen	1	NM
13	Raj	Devgarh	Kariabad	Kariabad	Nil	0	GSB
14	Raj	Pratapgarh	Malwala ka mal	Malwala ka mal	Call	1	GSB
15	Raj	Pratapgarh	Nayakhera	Navlakha bir	Seen	2	DM
16	Raj	Devgarh	Ratniyakheri	Ratniyakheri	Seen	1	GSB
17	Raj	Devgarh	Bori	Bori bir	Nil	0	GSB
18	Raj	Devgarh	Chicklad	Chicklad bir	Seen	2	DM
19	MP	Sailana	Sailana	Shikarwadi	Seen	1	GSB
20	MP	Sailana	Khariya	Khariya bir	Seen	1	GSB
21	MP	Sailana	Tajpuriya	Tajpuriya-Damnod	Seen	3	GSB
22	MP	Sailana	Amba	P 170	Call	1	K
23	MP	Sailana	Sherpur	Sherpur bir	Nil	0	GSB
24	MP	Sailana	Amba	Bhadlakhali	Seen	1	K
25	MP	Sailana	Nankia	Nankia bir	Call	1	GSB
26	MP	Sardarpur	Panpura	Panpura comptt 422	Nil	0	GSB
27	MP	Sardarpur	Panpura	Panpura comptt 423	Seen	1	LS* 5 Aug 5
28	MP	Sardarpur	Panpura	Panpura comptt 423b	Seen	1	LS* July 27
29	MP	Petlawad	Morjhina	Bani Beat	Nil	0	GSB
30	MP	Petlawad	Morjhina	Tarkhedi Beat c 205	Seen	1	GSB
31	MP	Petlawad	Kana Kua	Tarkhedi Beat c 208	Seen	1	GSB
32	MP	Thandala	Semalpada	Semalpada bir	Nil	0	GSB
33	Guj	Rampur	Neemaliya	Neemaliya Bir	Seen	2	GSB
34	Guj	Rampur	Muwaliya	Muwaliya Bir	Seen	3	GSB
35	Guj	Dahod	Kharoda	Kharoda	Nil	0	GSB
36	Guj	Jhalod	Tatagolla	Tatagolla	Nil	0	GSB
37	Guj	Jhalod	Sharda	Sharda	Nil	0	GSB
38	Guj	Gothra	Samli	Samli	Nil	0	GSB
39	Guj	Velavadar	Velavadar	Police chowki area	Seen	6	GSB
40	Guj	Velavadar	Velavadar	Central Portion	Seen	1	GSB
41	Guj	Velavadar	Velavadar	Lakarkot	Nil	0	GSB
42	Guj	Velavadar	Velavadar	Territorial ground	Nil	0	GSB
43	Guj	Velavadar	Velavadar	Fire affected area	Seen	2	GSB
44	Guj	Velavadar	Velavadar	Peelu wala area	Call	1	GSB
45	Guj	Velavadar	Velavadar	Salt affected area	Nil	0	GSB
46	Guj	Velavadar	Velavadar	Lakarkot	Seen	6	GSB
47	Guj	Velavadar	Velavadar	Rollerwalla-Lakarkot	Seen	5	GSB
48	Guj	Velavadar	Meethapur	Meethapur Bir	Seen	3	GSB
49	Guj	Velavadar	Velavadar	Salt affected area	Seen	1	GSB

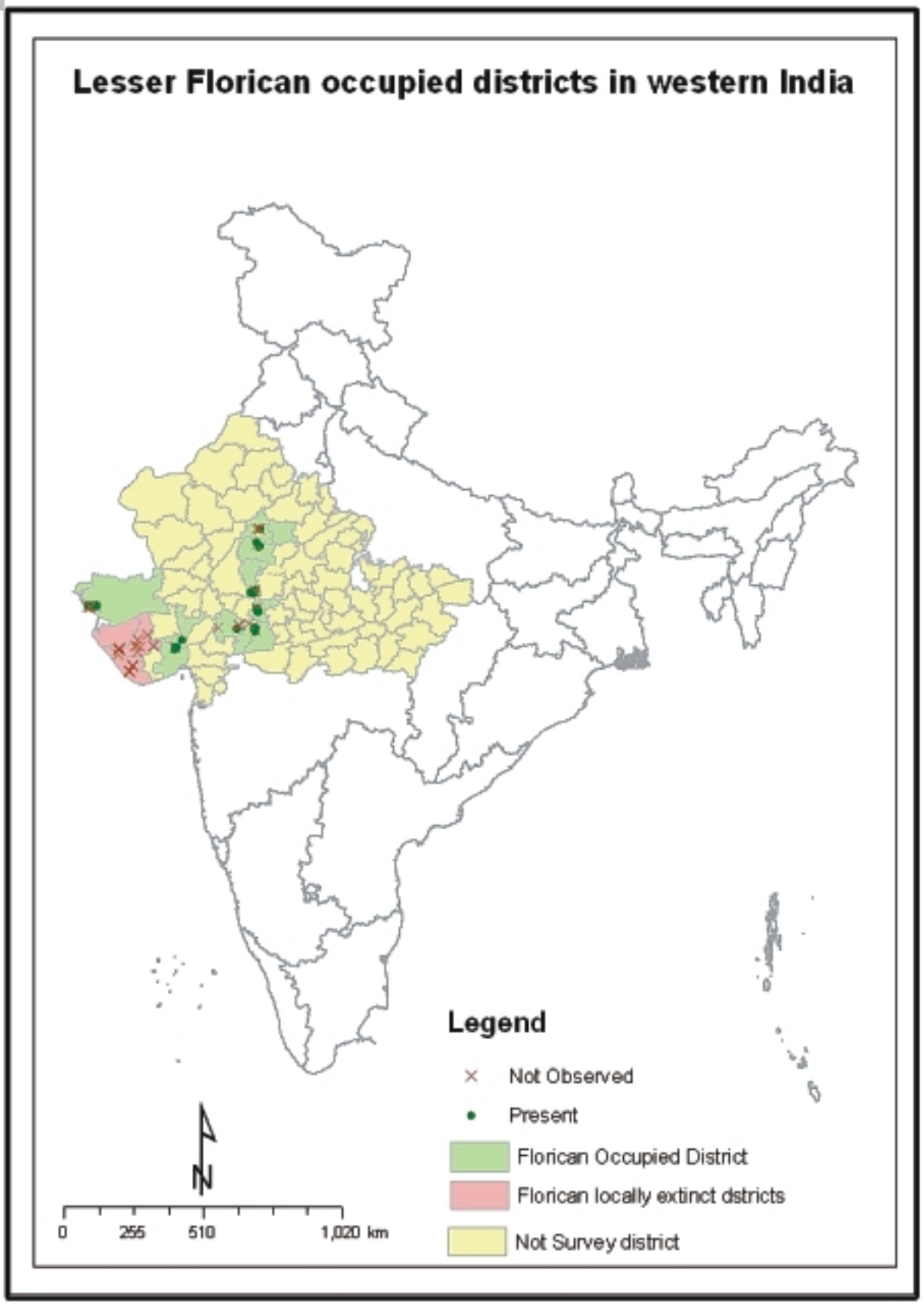
No.	State	Range	Village	Place	Obs	No.	Observer
50	Guj	Bagodra	Lothal	Near Lothal	Seen	1	KS
51	Guj	Velavadar	Mewasa	Mewasa	Seen	1	GSBKS
52	Guj	Gondal	Jastan	Jastan 1	Nil	0	GSBKS
53	Guj	Gondal	Jastan	Jastan 2	Nil	0	GSBKS
54	Guj	Gondal	Betawar	Vanthali	Nil	0	GSBKS
55	Guj	Gondal	Ambadi	Ambadi	Nil	0	GSBKS
56	Guj	Gondal	Gondal	Umbada	Nil	0	GSBKS
57	Guj	Gondal	Bandaria	Bandaria	Nil	0	GSBKS
58	Guj	Malya	Sarkari Umrapur	Lakada	Nil	0	GSBKS
59	Guj	Sasan	Jalandar	Jalandar/Amrapur/ Virdi	Nil	0	GSBKS
60	Guj	Sasan	Babra	Mota Babra	Nil	0	GSBKS
61	Guj	Sasan	Babra	Nana Babra	Nil	0	GSBKS
62	Guj	Sasan	Lilya	Lilya	Nil	0	GSBKS
63	Guj	Sasan	Itari	Itari	Nil	0	GSBKS
64	Guj	Sasan	Jamka	Jamka	Nil	0	GSBKS
65	Guj	Sasan	Kodia	Kodia	Nil	0	GSBKS
66	Guj	Kuthiyana	Saran	Saran	Nil	0	GSBKS
67	Guj	Jam Jodhpur	Patan	Patan	Nil	0	GSBKS
68	Guj	Jam Jodhpur	Patan	Patan 1	Nil	0	GSBKS
69	Guj	Jam Jodhpur	Moti	Near Moti	Nil	0	GSBKS
70	Guj	Jam Jodhpur	Moti	Moti	Nil	0	GSBKS
71	Guj	Jam Jodhpur	Mahiki	Mahiki	Nil	0	GSBKS
72	Guj	Rajkot	Kirasana	Kirasana	Nil	0	GSBKS
73	Guj	Rajkot	Rampura	Nani Harisar	Nil	0	GSBKS
74	Guj	Nalliya	Prajau	Anamat	Nil	0	GSBKS
75	Guj	Nalliya	Prajau	Anamat 2	Seen	3	FD
76	Guj	Nalliya	Prajau	Anamat 3	Nil	0	GSBKS
77	Guj	Nalliya	Lala	GIB WLS	Nil	0	GSBKS
78	Guj	Nalliya	Banada	Banada	Nil	0	GSBKS
79	Guj	Nalliya	Nalia	Udejawad	Nil	0	GSBKS
80	Guj	Nalliya	Nalia	Udejawad 2	Seen	3	FD
81	Guj	Nalliya	Prajan	Near Prajau	Seen	1	GSBKS
82	Guj	Nalliya	Jakhab	Jakhab	Seen	1	GSBKS
83	Guj	Nalliya	Gadwada	Gadwada	Nil	0	GSBKS
84	Guj	Nalliya	Kalotia	Kalotia	Seen	7	FD
85	Guj	Nalliya	Kalotia	Kalotia 1	Seen	2	GSBKS
86	Guj	Nalliya	Bachunda	Bachunda	Nil	0	GSBKS
87	Guj	Nalliya	Bita	Bita	Seen	2	GSBKS
88	Guj	Nalliya	Bita	Bita-Dhupi	Seen	1	GSBKS
89	Guj	Nalliya	Bannada	Bannada	Call	1	GSBKS
90	Guj	Nalliya	Nalia	Anamat-Nalia	Seen	1	GSBKS
91	Guj	Nalliya	Prajau	Prajau	Nil	0	GSBKS

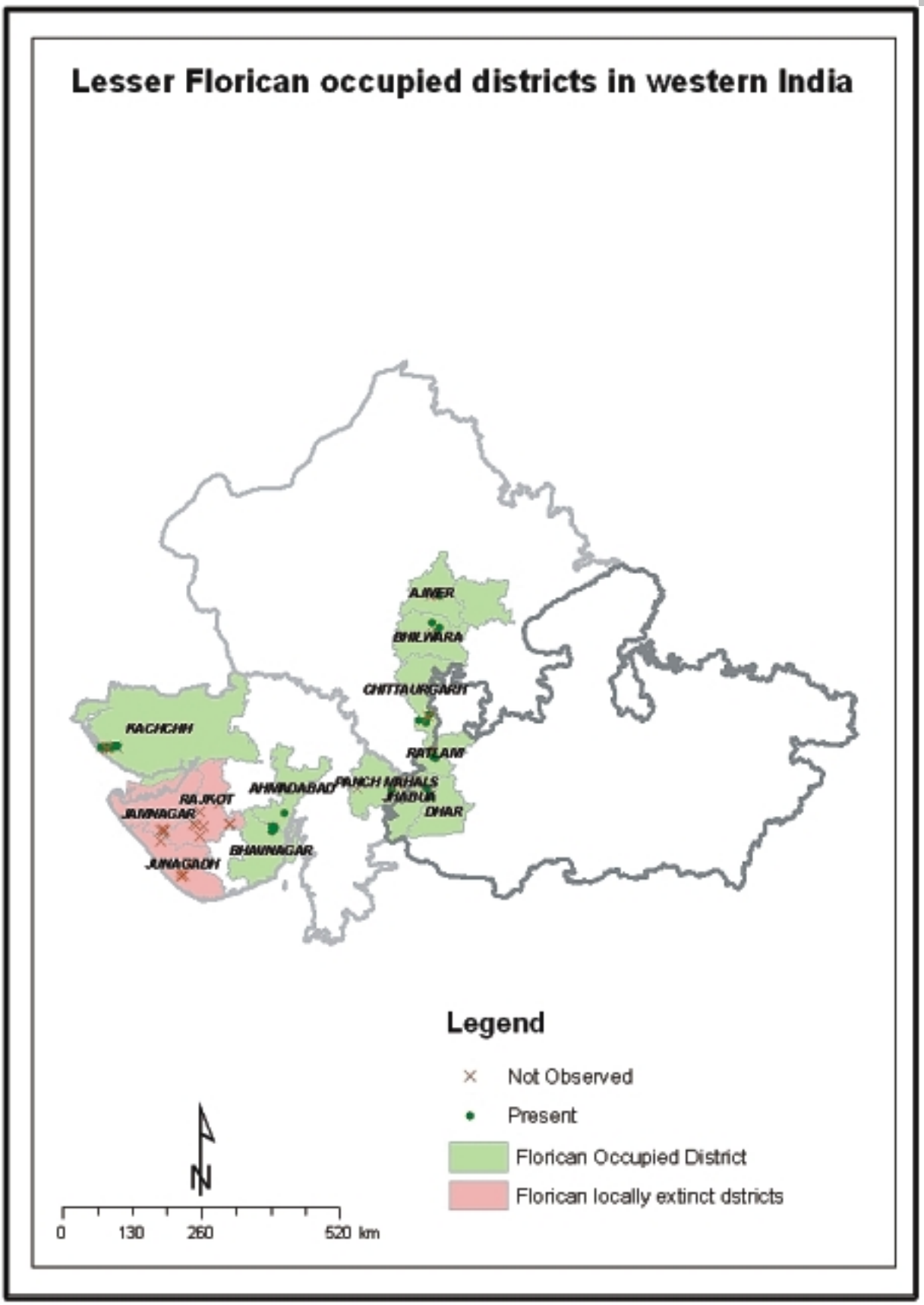
Whereas
R* - Rajender Singh
LS* - Lal Singh
GSB - Gobind Sagar Bhardwaj
KS - K. Sivakumar
GSBKS - Gobind Sagar Bhardwaj and K. Sivakumar
FD - Forest Department
K - Kheem Bheel, Cattle Guard

Table 2. Summary of the survey on Lesser Florican during the last three decades. Florican populations and their distribution range have been continuously declining in the western India.

State	District	No. of Taluk/ Village	No. of Grasslands under monitoring	Area of grasslands (ha)	1982		1989		1994		1999		2010	
					No. of Floricans sighted	No. of Grasslands with Floricans	No. of Floricans sighted	No. of Grasslands with Floricans	No. of Floricans sighted	No. of Grasslands with Floricans	No. of Floricans sighted	No. of Grasslands with Floricans	No. of Floricans sighted	No. of Grasslands with Floricans
GUJRAT	Bhavnagar	5	13	6000	0	0	2	1	35	2	19	1	27	3
	Amerli	2	4	2000	0	0	NV	NA	0	0	0	0	0	0
	Junagadh	2	22	3000	21	8	NV	NA	4	3	0	0	0	0
	Jamnagar	7	15	3200	34	9	NV	NA	1	1	2	1	0	0
	Rajkot	5	30	6000	21	9	NV	NA	27	11	42	9	0	0
	Surendranagar	3	4	3000	NV	NA	NV	NA	2	1	NV	NA	NV	NA
	Kuch	3	6	13000	NV	NA	8	1	36	2	67	1	22	1
	Panchmahal	2	9	8000	NV	NA	20	1	6	2	11	0	5	1
Total		**29**	**103**	**44200**	**76**	**26**	**30**	**3**	**111**	**22**	**141**	**12**	**54**	**5**
MADHYA PRADESH	Mandsaur	2	5	1500	NV	NA	NV	NA	0	0	0	0	0	0
	Ratkam	5	29	4500	36	5	28	5	25	8	55	15	8	6
	Jhabua	2	2	500	5	1	9	1	3	1	1	1	2	1
	Dhar	1	10	4000	14	4	11	3	13	2	7	2	2	2
Total		**10**	**46**	**10500**	**55**	**10**	**48**	**9**	**41**	**11**	**63**	**18**	**12**	**9**
RAJASTHAN	Baran	1	1	1000	NV	NA	NV	NA	NV	NA	NV	NA	NV	NA
	Kota	1	2	200	NV	NA	NV	NA	NV	NA	NV	NA	NA	NA
	Bhilwara	2	8	1200	NV	NA	NV	NA	NV	NA	3	1	5	4
	Tonk	1	1	500	NV	NA	NV	NA	NV	NA	2	1	2	1
	Ajmer	2	3	300	NV	NA	NV	NA	NV	NA	4	1	3	1
	Chittaurgadh	1	5	400	NV	NA	NV	NA	8	1	25	4	8	4
Total		**8**	**20**	**3600**	**0**	**0**	**0**	**0**	**8**	**1**	**34**	**7**	**18**	**10**

(Data Source: Sankaran (2000)


Lesser Florican occupied districts in western India
Legend
Not Observed
Present
Florican Occupied District
Florican locally extinct dstricts
Not Survey district
N
0
255
510
1,020 km


Lesser Florican occupied districts in western India
AJMER
BHILWARA
CHITTAURGARH
KACHCHH
RATLAM
PANCH MAHALS
AHMADABAD
DAHOD
RAJKOT
DHAR
JAMNAGAR
BHAVNAGAR
JUNAGADH
Legend
Not Observed
Present
Florican Occupied District
Florican locally extinct dstricts
N
0
130
260
520 km

A jumping Florican in pure grasslands of Velavadar National Park

friendly grassland management being practised in this National Park, the population trend of Florican seemed to be increasing here when compared to previous surveys (Sankaran 2000). The second largest population of Florican (22 birds) was found in Naliya grasslands in the district of Bhuj and remaining five sightings were in the Rampur area of the district Dahod.

Of the 103 potential grasslands for Florican in Gujarat, 59 grasslands were surveyed, which include grasslands surveyed during 1999 (Sankaran, 2000). Of the surveyed grasslands, Lesser Floricans were found only in 5 grasslands as against 12 grasslands in 1999.

Principal Investigator recording information

Shockingly, there was no sighting of Florican in the districts of Junagadh, Jamnagar and Rajkot where Floricans were reported in previous surveys. Local birdwatchers of these regions have also confirmed the absence of Floricans in past few years largely due to degradation and disturbances in the grasslands. A drastic decline in the population as well as the extent of the distribution of Lesser Florican was observed in the state of Gujarat. Gujarat is still known to be an important state for the Lesser Florican conservation, which may change soon if the current practice of grasslands management continued.

Five individuals were seen in the grasslands of Rampur range of Dahod district. One was seen jumping in an agricultural field in Lothal area of Bhavnagar district. So the Florican occupied districts are restricted to Dahod, Bhavnagar and Bhuj. The Florican occupied habitats in Rampur area of Dahod are dominated by savannah and pure grasslands where as in Velavadar National Park, pure grasslands support a good population of Florican. Although the adjoining agricultural fields around 10 kms radius of the Sanctuary also had

Grazing in potential habitats of florican is a serious threat to population

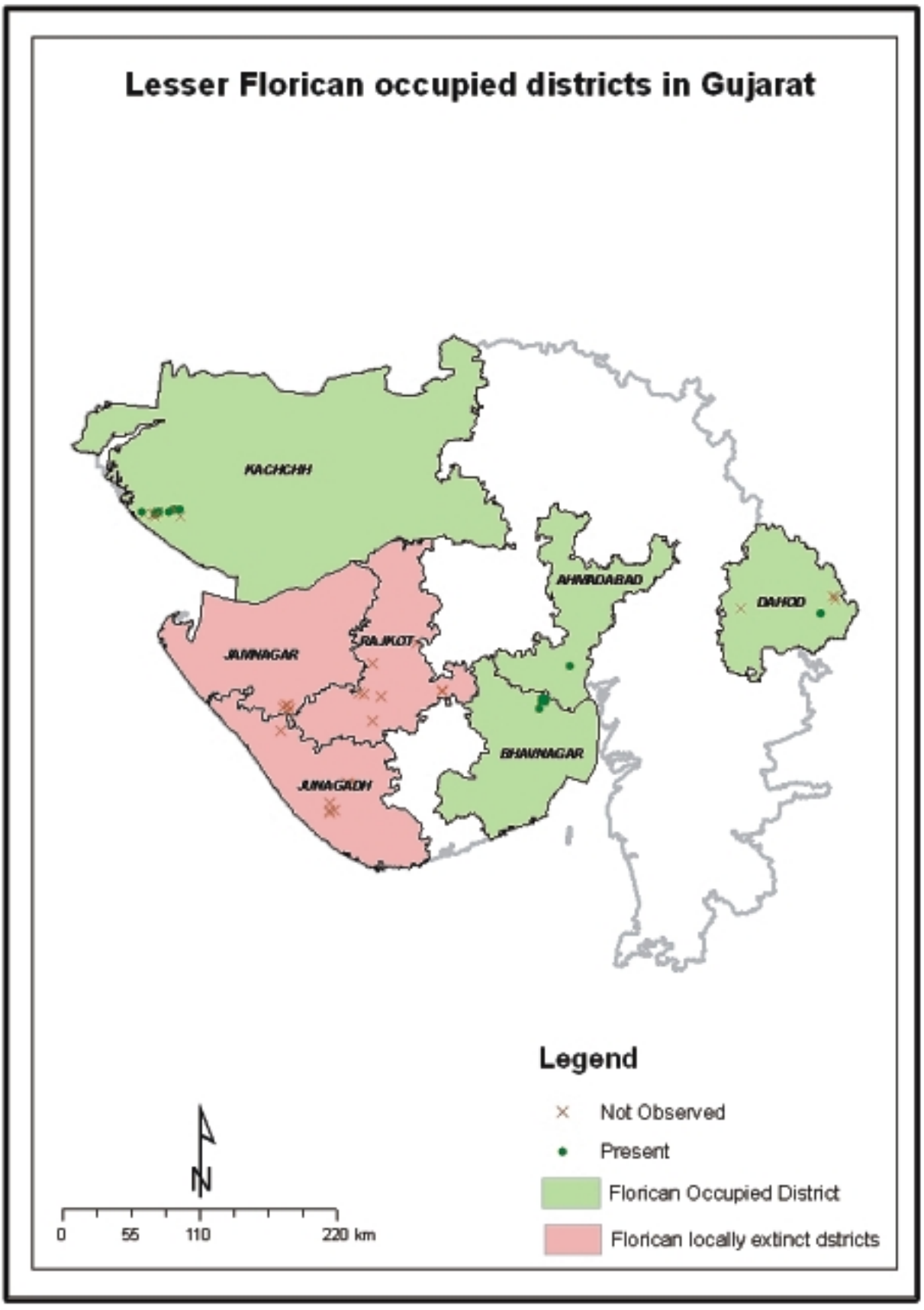
Information gathering from graziers

Floricans but the main population was confined in the grasslands of Velavadar National park.

The population of the species, which is quiet fragmented in Naliya, might be due to fragmented grasslands that belong to many agencies like Gujarat Forest Department, Revenue department and also the private owners. Most of the potential Florican grasslands in the region are converted into cotton crops, where large quantity of pesticides are being used, a greatest threat to Floricans here.

Table 3. Survey details of Lesser florican in the state of Gujarat in 2010.

No.	Range	Place	Owner	Vegetation Type	Associated Vegetation	Male	AP
1	Rampur	Neemaliya Bir	FD	Pure Grassland	Butea, Salar, Teak, Goyakhair	2	Nil
2	Rampur	Muwaliya Bir	FD	Savanna Grassland	Butea, Khair	3	Nil
3	Velavadar	Police chowki wala area	FD	Pure Grassland	Nil	6	Nil
4	Velavadar	Central Portion	FD	Pure Grassland	Nil	1	Nil
5	Velavadar	Fire affected area	FD	Pure Grassland	Kikar	2	Nil
6	Velavadar	Peelu wala area	FD	Pure Grassland	Salvadora, juliflora	1	Nil
7	Velavadar	Lakarkot	FD	Pure Grassland	Nil	6	Nil
8	Velavadar	Rollerwalla-Lakarkot	FD	Pure Grassland	Nil	5	Nil
9	Velavadar	Meethapur Bir	FD	Pure Crop	Juliflora	3	Farming
10	Velavadar	Salt affected area	FD	Savanna Grassland	Juliflora, Sueda	1	Nil
11	Bagodra	Near Lothal	Pvt	Savanna Grassland	Nil	1	Farming
12	Velavadar	Mewasa	RL	Mosaic Grassland	Juliflora	1	Farming
13	Nalliya	Anamat 2	FD	Pure Grassland	Nil	3	Nil
14	Nalliya	Udejawad 2	RL	Pure Grassland	Nil	3	Nil
15	Nalliya	Near Prajau	RL	Mosaic Grassland	Jharber, juliflora	1	Grazing
16	Nalliya	Jakhab	Pvt	Mosaic Grassland	Jharber, juliflora	1	Wind mills
17	Nalliya	Kalotia	FD	Mosaic Grassland	Kikar, Kumtha	7	Grazing
18	Nalliya	Kalotia 1	FD	Mosaic Grassland	Kikar, Juliflora	2	Nil
19	Nalliya	Bita	RL	Mosaic Grassland	Kikar, karil, jharber, goyakhair	2	Nil
20	Nalliya	Bita-Dhupi	RL	Mosaic Grassland	Kikar, jharber	1	Nil
21	Nalliya	Bannada	FD	Plantation Grassland	Kikar, juliflora, tortilis, harber	1	Grazing
22	Nalliya	Anamat-Nalia	RL	Pure Grassland	Nil	1	Nil


Lesser Florican occupied districts in Gujarat
KACHCHH
AHMADABAD
DAHOD
JAMNAGAR
RAJKOT
BHAVNAGAR
JUNAGADH
Legend
Not Observed
Present
Florican Occupied District
Florican locally extinct dstricts
N
0
55
110
220 km

5.3. Status and distribution of Lesser Floricans in Rajasthan

A total of 18 individuals of Lesser Florican were sighted in four districts of Rajasthan during the breeding season of 2010, which is less than 47% of the sightings reported in 1999. Of the 18 individuals, maximum number of birds were seen in Pratapgarh (earlier part of Chittaurgarh) (n=6) followed by 4 in Malpura area of Tonk district, Shahpura area of Bhilwara (n=5) and Saunkhalya areas of Ajmer (n=3).

Out of the 20 potential grasslands for Florican in Rajasthan, 18 grasslands were surveyed, which include grasslands surveyed during 1999 (Sankaran 1999). Of the surveyed grasslands, Lesser Floricans were found in 10 grasslands as against 7 grasslands in 1999. Floricans were sighted in all four surveyed districts viz Bhilwara, Tonk, Ajmer and Pratapgarh of the state. Although, the population of Floricans in Rajasthan had continuously declined in the last three decades but the distribution range of Florican was almost same. Most of grasslands in the state have now been invaded with *Prosopis juliflora* and *Capparis decidua* especially in Ajmer and Bhilwara districts which is seen as a major threat and should be viewed seriously.

More than 80% of the surveyed grasslands in the state were owned by private owners and these lands were under great pressures of farming. Most of these private *birs* (grasslands) have been converted into agricultural fields, thus subjected to high human disturbances. Non existence of any policy and guidelines related to the grasslands in the country, the massive planting activities by the State Forest Department in the grasslands especially in Saunkhlia areas of Ajmer and Shahpura areas of Bhilwara have resulted into scrublands of different

Table 4. Survey details of Lesser Florican in the state of Rajasthan during 2010.

No.	Range	Place	Owner	Vegetation Type	Associated Vegetation	Male	AP
1	Ajmer	Block 1	Pvt	Mosaic Crop	Juliflora, kikar, karil	3	Farming
2	Malpura	Kurar bir	Pvt	Mosaic Crop	Juliflora, kikar, karil	2	Farming
3	Malpura	Lamba	Pvt	Pure Crop	Juliflora, kikar, karil	2	Farming
4	Shahpura	Shopura	Pvt	Pure Crop	Juliflora, kikar, karil	2	Farming
5	Shahpura	Mewada	RL	Mosaic Grassland	Juliflora, kikar	1	Farming
6	Shahpura	Khamor bir	Pvt	Mosaic Crop	Juliflora, kikar, raunj	1	Farming
7	Shahpura	Mataji ka Khera	Pvt	Pure Crop	Juliflora, kikar, karil	1	Farming
8	Pratapgarh	Malwala ka mal	Pvt	Mosaic Grassland	Butea, kikar	1	Nil
9	Pratapgarh	Navlakha bir	Pvt	Pure Grassland	Ratanjot, butea	2	Grazing
10	Devgarh	Ratniyakheri	Pvt	Mosaic Grassland	Butea, kikar, lantana	1	Farming
11	Devgarh	Chicklad bir	FD	Savanna Grassland	Butea, teak	2	Grazing

stages of degradation. In Pratapgarh district, a drastic reduction in numbers of Lesser Florican reported even during 2008 (Bhardwaj 2010) as compared to 1999 (Sankaran 2000) that might be due to the changes in the land use pattern. The remaining land having grasslands belong to private owners largely look like small islands in middle of the crop lands. Navlakha bir was the only pure grassland observed belonging to a private person. In this grassland, two male Floricans were sighted in August 2010 (pers. comm. Devender Mistry).

5.4. Status and distribution of Lesser Floricans in Madhya Pradesh

A total of 12 individuals of Lesser Florican were sighted in three districts of Madhya Pradesh during the breeding season of 2010, which is less than 80% of the sightings reported in 1999. Compared to other states in the north-western India, the Madhya Pradesh had lost the maximum number of Floricans in last 10 years period. Of the 12 individuals sighted, maximum number of Floricans were found in Ratlam district (N=8) followed by Dhar district. Eight Floricans were sighted in and around Sailana WLS. According to the forest officials there were about 25 birds in the Sanctuary. In Sardarpura Wildlife Sanctuary, two Floricans were sighted (pers. comm.. Lal Singh Chowkidar). Similarly in Petlawad range of Jhabua district two Floricans were sighted. Ratlam is traditionally known for Florican in ages due to vast grasslands habitat all over the district, however, due to poor grassland management and landuse pattern the population of Florican continuously declined in this district.

Of the 46 potential grasslands for Florican in Madhya Pradesh, 14 grasslands were surveyed, which include grasslands reported with Florican in 1999 (Sankaran 1999). Of the surveyed grasslands, Lesser Floricans were found in 9 grasslands. Floricans were sighted in all districts surveyed but in Mandsaur. Maximum number of grasslands reported with Florican found in the district of Ratlam followed by Dhar.

Most of the grasslands belonging to state forest department in the area were either pure grasslands or in the first category of transformation that is mosaic grasslands, especially in Sailana areas. Though the grasslands of Sardarpura are legally protected as Sanctuary but the grazing pressure in the area was considerably higher as compared to Sailana and Petlawad areas. Otherwise half of the areas were devoid of any human pressure. Among the associated vegetation, stunted growth of Dhak *Butea monosperma* remained dominant in most of the grasslands.

5.5. Reports of Lesser Florican in other parts of India

Birdwatchers from all over country were approached through several online e-groups for information regarding sightings of Lesser Florican in India. A detailed literature and news papers review was also carried out for the same.


Lesser Florican occupied districts in Madhya Pradesh
RATLAM
JHABUA
DHAR
Legend
Not Observed
Present
Florican Occupied District
N
0
75
150
300 km

More than 20 birdwatchers responded with some interesting observations of Lesser Floricans. Based on their information, it was confirmed that the presence of Lesser Florican in Rollapadu Wildlife Sanctuary, Andhra Pradesh during month of February-March 2010 (pers. comm.. Murali Krishna C). In Rollpadu WS, one bird was sighted between February-March 2010 and a male was sighted during November-December 2009 (pers.comm. Murali Krishna C). It was presumed that the population of lesser Florican may not be more than five individuals in Rollapadu WS.

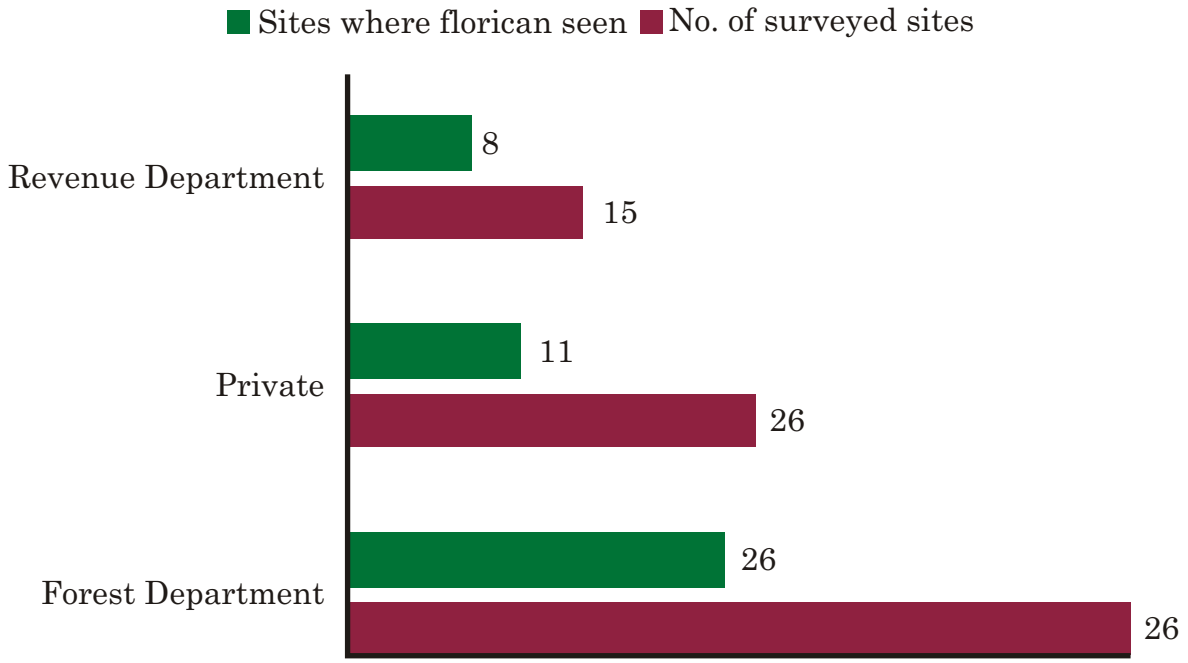
A Lesser Florican was sighted in the forest area near Sisa-Masa villages in Akola, Maharashtra during the month of June 2010 by Prashant Gahale, a naturalist and wildlife photographer (source: Times of India, July 26, 2010). Although, Akola is known for Lesser Florican but this solitary male was sighted after a gap of 12 years here.

6.1. Status of florican habitat in the north-western India

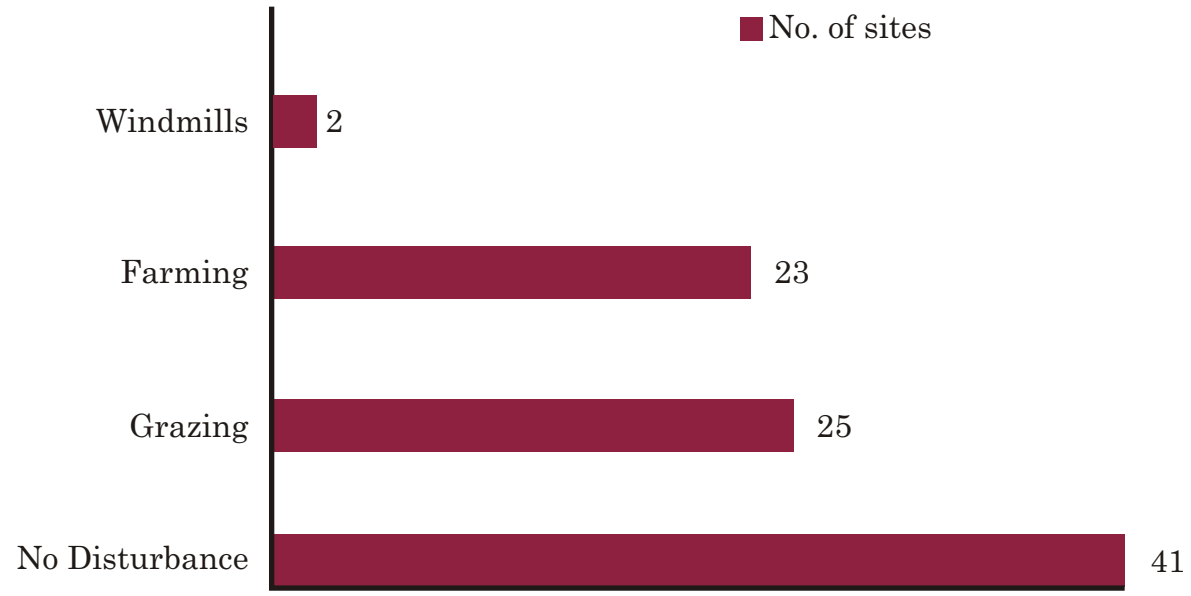
Among 91 surveyed grasslands, 55% of grasslands were owned by the State Forest Departments followed by private owners (26 %), revenue departments (15%) and others.

Irrespective of ownership, the Floricans were sighted in all categories of grasslands provided the grasslands were undisturbed and conducive for birds to breed. Although, maximum number of Floricans were sighted in the grasslands maintained and owned by the state Forest Departments but there was no significant differences in the preference of grasslands by the Florican with respect to ownership

Florican occupancy in surveyed sites

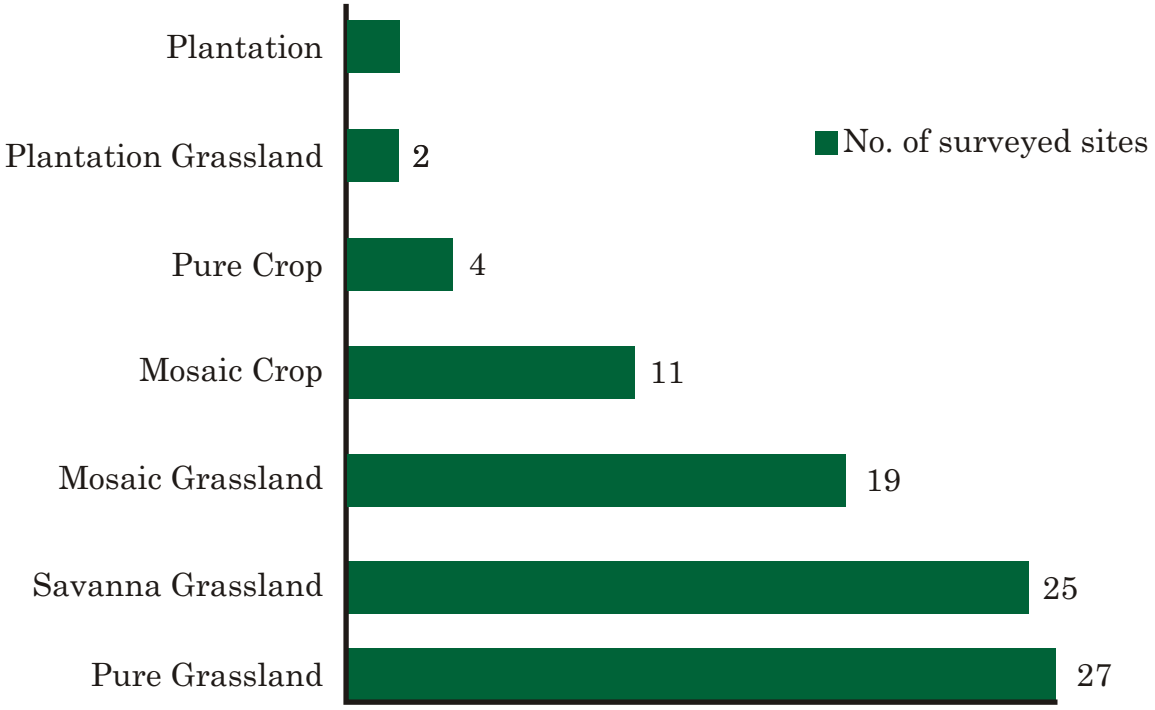


Human Disturbances



while considering the number of grasslands available with different owners. For example, maximum number of grasslands belong to the Forest Department were sighted with Florican, similarly the maximum number of grasslands of the Forest Department also reported without Florican in 2010. Among the surveyed grasslands more than 50% grasslands were subjected to

Types of grasslands surveyed



intense anthropogenic pressures including grazing from livestock (28% sites), agriculture (23% sites) and wind mills (2% sites). Although, remaining grasslands were comparatively undisturbed during our survey period but most of these grasslands were surrounded by agriculture fields and protected exclusively for fodder.

Most of the surveyed erstwhile grass *birs* are in different stages of succession due to various anthropogenic pressures leading to such transformations (Fig 1, 2 and 3). Pure grasslands constituted 30% of all different categories of surveyed sites. It is followed by savannah grasslands (29%), mosaic grasslands (21%), mosaic cropland (12%), pure agriculture fields (4%), grasslands with plantation and plantations.

In all surveyed grasslands, there were some woody species, which remained associated with the grasslands. Out of 32 observed species of associated vegetation, *Acacia nilotica* remained the dominant species followed by *Butea monosperma*, *Prosopis juliflora*, *Capparis decidua*, *Zizyphus nummularia* and other species. Most of the surveyed grasslands in the Malwa Plateau (areas of Pratapgarh, Ratlam, Dhar, Jhabua and Dahod) were devoid of *Prosopis juliflora* and were having stunted growth or bushes of *Butea monosperma* and also some growth of *Acacia nilotica*.

7.1. Associated fauna species of Lesser Florican

During the survey the presence of other associated bird species of Lesser Florican were also taken into record. These include Rain Quail *Coturnix coromandelica*, *Zitting cisticola*, Painted francolin *Francolinus pictus*, Grey Francolin *Francolinus pondicerianus*, Black francolin *Francolinus francolinus*, Sykes's Lark *Galerida deva*, Singing Bush lark *Mirafra cantillans* and Great Indian Bustard *Ardeotis nigriceps*. In most of the grasslands, Painted Francolin remained as one of the most prominent bird followed by *Zitting cisticola*, but in Naliya area of Bhuj there was dominance of Black Francolin. Rain Quail, Painted Francolin and Grey Francolin remained dominant in all kinds of grassland whereas Black Francolin remained restricted only to the grasslands of Naliya. It was also observed that *Zitting cisticola* largely preferred tall and undisturbed grasslands. Among birds of prey Bonellies eagle, Short-toed Snake Eagle, a pair of Red-necked Falcon, Black-shouldred Kite and a Shikra were sighted in the surveyed grasslands.

During the entire survey of 23 days covering more than 8000 kilometres, not even a single vulture was sighted in entire journey. But during 1999 survey, one of the investigator (Sivakumar) accompanied Dr. Ravi Sankaran and observed more than 500 vultures investing the almost similar sampling effort. Similarly, sightings of

Black Francolin

Great Indian Bustard

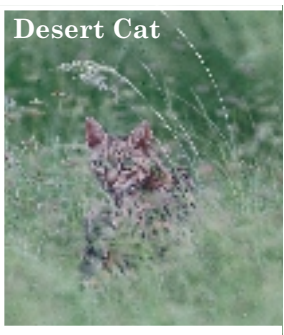
Shikra

Rain Quail

Black Buck

Jackal

Indian Fox



Desert Cat

A herd of Blue Bull

Black-shouldered kites were also significantly reduced than reported in 1999.

Among mammals a number of Blue Bull (N>200), Black bucks (N>300), Indian Fox (N<10), Indian Jackal (N<30), Wolves (N=6), a jungle cat and a desert cat were sighted in different grasslands.

8.0. Threats

8.1. Lack of National Policy on Grassland Management in India

Due to inadequate grassland conservation policy and management practices or a mindset that assumes grasslands are wastelands, many of the state owned grasslands and village pasture lands have been planted extensively with tree species including *Prosopis juliflora*. Several grasslands in the regions have been converted into either woodlands or crop lands. In addition, due to excess of grazing most of remaining grasslands were also degraded to the extent of erosion of the top soil. Many of the grasslands belonging to state forests departments commonly known as grass *birs* were auctioned every year. Instead of harvesting the grass manually after the monsoon season, the contractors, many times lease out these areas to the local graziers due to non-availability of man power to cut grasses. Herds of cattle throng these grasslands and render great disturbance to the breeding floricans, even trampling their nests and eggs. Complete removal of grasses from grassland is also not conducive for florican to breed in the next year, but most of private and government owned grasslands were observed harvesting the entire grasses leaving no habitat for wildlife.

Wind mill near Naliya WLS

A florican seen jumping in savannah grassland in Rampur Vir (Gujarat)

8.2. Habitat Loss

Of the 169 potential grasslands of Florican available in the north-western India, 91 grasslands still believed to be conducive for Florican were surveyed, which include grasslands surveyed during 1999 (Sankaran 1999). Of the surveyed grasslands, Lesser Floricans were found only in 24 grasslands as against 37 grasslands in 1999. This was largely due to degradation of grasslands, which have failed to attract Floricans. Floricans like pure but undisturbed grass patches with mosaic characteristics to settle down at the beginning of breeding season. Changes in land-use pattern over the decades have resulted in a drastic decline of grassland habitat in the north-western India. Many of these grasslands were reclaimed for agriculture to meet the demands of the growing population. Ever growing cattle population in the region has also caused overgrazing in the grassland habitats (Sankaran 2000). In many areas, most of protected grasslands were lost to agriculture, leased to graziers or ploughed up, a situation that was particularly alarming in privately owned grassland (Sankaran 1995). Grasslands in the Naliya area of Kutch, which were known to be an important region for Florican conservation have been encroached dramatically. Encroachers are ploughing up Florican habitats for cotton cultivation, causing a huge loss of habitat for both bustards and local herdsmen. Moreover, degradation of grasslands in Gondal, Rajkot, Jamnagar, Ratlam, and Dhar districts in the north western India either completely failed to attract Florican or attracted few individuals.

Degradation of grasslands due to uncontrolled grazing in Shahpura area

8.3. Plantations

It was observed that grasslands have wrongly been considered as waste land and hence large scale planting activity was carried out in many grasslands in the north western India. Grasslands with plantation were avoided by the Florican as these birds prefer pure grasslands with few trees here and there. Because of plantation. Presently, several potential grasslands of Florican failed to attract these birds.

Plantation in grasslands

8.4. Invasive Species

Invasion of alien *Prosopis juliflora* was reported in several grasslands in the north western India. Apart from *Prosopis juliflora*, several other tree species were also observed invading the grasslands largely due to grazing. Grazing of cattle

A florican roosting in a grassland just adjacent to *P. juliflora* shrubs

expedites the spreading of these invasive species in the grasslands.

8.5. Pesticide pollution

Lesser Florican is an omnivorous species. Foods of Florican include many types of invertebrates, and various plant parts. It includes: grasshoppers, beetles, flying ants, hairy caterpillars, centipedes, worms, frogs, small lizards, crop shoots, leaves, herbs and berries. Insect form the large part of diet of the Lesser Florican. Crop fields in semi-arid and arid zones are known to be excellent breeding ground for insects. Most of Florican sightings during this survey were at the fringes of grasslands which were adjoined with crop fields. It shows that the Florican prefer this area largely due to better availability of insects in the region. Use of pesticides in the adjoining agriculture fields around the Florican grasslands is drastically reducing the food availability. Moreover, insect with pesticide may also threaten the Floricans health.

Intensive cultivation using rampant pesticides is a challenge to remaining population of florican

8.6. Indiscriminate developmental activities

Windmills in or around the Florican habitat also seemed to be threatening bustard in general and Floricans in particular. Once the Great Indian Bustard Sanctuary (Lala village) that used to attract several Floricans had failed to have single Florican this year might be due to mushrooming of windmills around this sanctuary. Apart from windmills, urban expansion, expansion of agricultural activities, road etc in the grasslands are also posing threat to this species.

Uncontrolled development activities in grasslands

8.7. Hunting

Displaying male Floricans are easy victims of hunting. Severe hunting pressure in the last century could eradicate most of male population (Hume and Marshall 1879–1881, Baker 1921–1930, Birdlife International, 2001), appears to have affected the species drastically (Sankaran 1993). Because of

its delicate flesh and excellent taste florican became a best sport-birds of both native people and colonial sportsmen (Jerdon 1839–1840). Sporadic incidences of hunting of this species reported during our survey. However, hunting does not seems to be a major threat as most of villagers were sympathetic to the floricans.

8.8. Inadequate Protected Area Coverage

Less than five protected areas (grasslands) are existing exclusively for the conservation of Florican/Bustards in the north western India. These include Sailana Kahrmor Sanctuary and Sadarpur Florican Sanctuary both in Madhya Pradesh and the third is Velavadar WLS. Former two are exclusively notified for Lesser Florican while the third one is for Black Buck in Gujarat. There is also one sanctuary called Great Indian Bustard WLS which is chiefly for GIB but it is also a habitat of Lesser Florican. In Madhya Pradesh, the Sailana Kharmor Sanctuary (Sankaran 1990) and in Gujarat, the Velavadar Blackbuck National Park were the only two wildlife protected areas reported with Floricans during this survey. Velavadar NP is the only grassland in north western India observed with increase in the population of Lesser Florican in the three decades was largely due to better grassland management and protection. Some of the protected grasslands in the region were also unfit for Florican largely because of these grasslands being managed only for fodder. Currently, less than 5% of Lesser Florican habitat is protected by Wildlife (Protection) Act, 1972 is crossly inadequate to save this species.

9.0 Existing Conservation and Management Practices

The Lesser Florican *Sypheotides indica* is placed in Schedule I of the Wildlife (Protection) Act, 1972, and hence its hunting, trapping or shooting is prohibited. In addition, the habitat of this species is accorded protection in five areas by declaring them as wildlife sanctuaries. These include Sailana Kahrmor Sanctuary and Sadarpur Florican Sanctuary both in Madhya Pradesh and the third is Velavadar WLS. Former two are exclusively notified for Lesser Florican while the third one is for Black Buck in Gujarat. There is also one sanctuary called Nalia WLS which is chiefly for GIB but it is also a habitat of Lesser Florican. Keeping them as flagship species, for the conservation of Lesser Floricans and its habitat, past and current management practices vary from state to state and are site specific.

9.1. Rajasthan State

Saunkhlya closed area is the only area which is set aside for Great Indian Bustards and Lesser Florican. The revenue areas of more than 43 villages constitutes an area of more than 54 square kilometres which is a combination of village pasture lands, revenue land, agricultural land and also some grass *birs* belonging to state forest department. Most of the grasslands and *birs* have been converted into scrublands with *Prosopis juliflora* and other thorny plants like *Acacia nilotica.* The remaining pasturelands, because of overgrazing have

Local intervention by the staff in cultivating soyabean in the grasslands, a measure to check the floricans going out in agricultural fields

resulted into degraded areas. Only two staff, Rajender Singh Forester and one chowkidar, Goga Kumhar is well aware of the Lesser Florican. All the Floricans which were observed here, were in the agricultural fields.

The Shahpura area of Bhilwara also represent the same scenario. Even the concerned staff was unaware about the bird. Shatrujeet Singh Rathore of Shahpura was a great help in florican site location and awareness generating among the staff. Even the local forest officers had not seen the bird in their lifetime. The excitement and joy among the staff could be felt when they were watching the jumping florican through the spotting scope of Shatrujeet Singh Rathore.

There is need for awareness generation for Lesser Florican

There are no special managerial inputs for its conservation in Pratapgarh. Till 2006 it was only late Thakur Digvijay Singh of Dhamotar who as a keen bird watcher was spreading awareness among the local people in Kariabad area when local DFO got interested in the bird and started monitoring it and came out with its status report (Bhardwaj 2010). At present there are no managerial inputs for the conservation of florican and its habitat as most of the potential habitats are belonging to private individuals. The sighting of two floricans in savannah grasslands belonging to state forest department in Chiklad area may help in developing local conservation program for the Pratapgarh district.

9.2. Madhya Pradesh

Managerial inputs in three important areas in Madhya Pradesh including Sailana grasslands, Sardarpur grasslands in Dhar district and Petlabad grasslands in Jhabua reflect the commitment of state government towards the conservation of this species. *Kharmor Batao Inam Pao* remains the most impressive program where a villager will get the reward for showing a Lesser Florican in his

The scheme of rewarding informers about the florican should be replicated in other areas

agricultural field. Besides this he will be further rewarded for providing protection till the end of the season.

Many of the grasslands are well protected with chain linked fencing. Some of the places in Saradarpur WLS have too much grazing pressure resulting in the breach of fences. Thus such areas are exposed to over grazing which ultimately reduces sighting of Lesser Floricans. In another observation in the same sanctuary, one of the *chowkidar* had come up with an innovative idea of cultivating small patches of the area with soyabean *Glycine max* with an objective to prevent Lesser Floricans going out in agricultural field which are full of insecticides.

9.3. Gujarat

Despite too much grazing pressure, the excellent protection measures taken by the local forest officials have resulted in some patches of undisturbed grasslands showing the presence of Lesser Florican in the Rampura grasslands of Dahod district. Owing to grazing pressure and due to invasion of *Prosopis juliflora* many of the grasslands of Kharoda, Tatagolla and Sharda are on the way of becoming scrubland.

Most of the grasslands of Gondal in Rajkot are under immense pressure of grazing. The Kirasana grassland is still intact and is a possible habitat for the florican. But it is slowly being surrounded by concrete jungle of Rajkot.

The only place of pure and undisturbed grasslands is Velavadar National Park where maximum number of floricans were sighted in a small area. In Naliya, a rapid change in land use pattern has been observed. Many of the grasslands belonging to private owners or revenue department which were earlier the habitats of florican had been converted into agriculture lands. Intensive agricultural practices including cultivation of cash crops like cotton using enormous insecticides all around in last couple of years may be viewed as serious threat not only to Lesser Florican but also to other members of the bustard family.

Mushrooming concrete jungle all around the Kirasana grassland

A jumping Florican in pure grasslands of Velavadar

10.0. Recommendations

10.1. National Policy on Grasslands Management

It is important to have a National Policy on Grasslands Management in India appreciating the ecological services being provided by these ecosystems. Currently, grasslands are by and large considered as waste lands due to lack of knowledge about their ecological services. Under the umbrella of Joint Forest Management/ Eco-development or social forestry schemes tree plantations were carried out in a major scale which is harmful to floricans and their habitats as well as associated species in the grasslands. The practice of tree plantation by the forest department or by other agencies in grasslands or grass *birs* should be avoided. Moreover, current practise of looking grasslands as source of only fodder for cattle needs to be reconsidered. Sustainable use of grassland resources without harming their ecological services needs to be emphasised in the National Policy. The Policy is also required to be suggesting the wildlife especially bustards friendly grassland management in India.

10.2. Inclusion of more florican habitats in the existing Wildlife Protected Area Network

Less than five protected areas (grasslands) are existing exclusively for the conservation of Florican/Bustards in the north western India. These include Sailana Kahrmor Sanctuary and Sadarpur Florican Sanctuary both in Madhya Pradesh and the third is Velavadar National Park. Former two are exclusively notified for Lesser Florican while the third one is for Black Buck in Gujarat. There is also one sanctuary, the Great Indian Bustard WLS, which is chiefly for GIB but it is also a habitat of Lesser Florican. Less than 5% of globally endangered Lesser Florican habitat is protected by Wildlife (Protection) Act, 1972. Since the protected Florican habitats are comparatively better than non-protected grasslands, it would be better to bring more grasslands under the Protected Area Network of India by declaring more grasslands as 'Conservation or Community Reserves'. It is urgently required to bring some of the grasslands in Naliya region in the protected area network. Similarly, some grasslands in Gonda and Rajkot districts as well as in Ratlam and Dhar districts.

Grasslands around Sailana are also needed to be declared as 'Community/Conservation Reserve' with the consensus of local communities. And then the grasslands in the protected areas are needed to be managed to fulfil the habitat requirement of bustard in general and Lesser Florican in particular.

10.3. Management of Invasive Species

Eradication of *Prosopis juliflora* and other invaded tree species from the selected grasslands in the north-western India should be taken up immediately. Eradication and monitoring of invasive species in the grasslands should be a continuous programme following the guidelines of IUCN-Invasive Species Specialist Group.

10.4. Florican friendly landuse pattern

Floricans prefer pure but undisturbed grass patches with mosaic of last year grasses to settle down at the beginning of breeding season. Therefore, it is recommended to leave mosaic of old grasses during harvesting for floricans as well as other grassland wildlife. Instead of leasing out grasslands for grazing it would be better if the grasses are manually cut after the monsoon season that will prevent trampling of cattles on florican nests as well as spreading of invasive tree species in the grasslands. Pesticides use in adjoining agricultural fields found to be detrimental for the survival of floricans, therefore, local communities need to be advised the ill effects of pesticide use and they should be compensated if they incur any loss due to non-use of pesticides around florican habitats.

10.5. Florican watch and community involvement in florican conservation

The financial incentive scheme of Madhya Pradesh Forest Department for rewarding the villagers for giving the information of the presence of bird in their agricultural land needs to be thoroughly appreciated and it may be started in others states of Rajasthan and Gujarat, if it is found to be

There is a need to involve local people in conservation of florican and its habitat

worth. An awareness and sensitisation programme for the conservation of Lesser Florican and its habitat should be initiated by all the state forest departments in the states of Rajasthan, Madhya Pradesh and Gujarat. This should be further supplemented with eco-tourism and sensitive Florican watch activities. Local communities need to be involved in the management of grasslands and they need to be told the reason behind the decline of Florican as well as deterioration of their grasslands. There was an initiative in Naliya, where grasslands grazing/harvesting was regulated with the help of local communities. Because of this some grasslands in Naliya region were not disturbed during the breeding season of Florican. This initiative was implemented in collaboration with Forest Department, Revenue Department and Local community. If this model works successfully then the same may be tried elsewhere in the country.

10.6. Florican friendly grasslands management

Apart from declaring some of important grasslands as conservation/community reserves, it would also be required to modify the current use of grasslands in the north-western India. Instead of allowing livestock grazing all over grasslands, certain portion of grasslands need to be protected at least for a year period. Next year, these protected grass patches may be used as fodder but protecting other parts of grasslands for another year use. This kind of practice would help the Floricans to settle down and to breed.

10.7. Research and Monitoring

The Lesser Florican *Sypheotides indica*, a species endemic to the Indian subcontinent, is largely seen during the monsoon season in north-western India, where it breeds. Its population and range is decreasing at an alarming rate due to breeding habitat loss and threats in the non-breeding habitats, believed to be in south and south-east India. Their breeding habitats have sharply declined in north-western India, which is believed to be a major cause for the decline of this endangered species, and there is hardly any information on its non-breeding habitat which is supposed to be in Central and South India. A number of studies have been carried on its population status, habitat-use and behavior in the breeding grounds, but there is practically no information about their habitats, ecology and behavior in non-breeding habitats, the knowledge of which is crucial for their comprehensive conservation plan preparation. It is important to know the status of non-breeding habitat of florican using satellite tracking techniques, understand the migration pattern/movements, and investigate its current status and distribution in north-western India, which could lead to data on the species in other areas. There is also need of continous monitoring of Lesser Florican and its habitat in the states of Rajasthan, Madhya Pradesh, Gujarat and Maharashtra. Studies on impact assessment of mega and even so called eco-friendly projects like wind mills on the Lesser Florican should be initiated. A study on the effects of pesticides and

insecticides on Lesser Florican is still lacking. There should be a study on this issue.

10.8. Species Recovery Plan

Lesser Florican, as well as grasslands, already included in the Species Recovery Plan under the centrally sponsored scheme 'Integrated Development of Wildlife Habitats (IDWH). Under this scheme there are three major components viz. Assistance to Protected Areas, Assistance to Outside PAs and Assistance for initiating Recovery Plans for the species. State governments should immediately initiate recovery plan for the species under this scheme.

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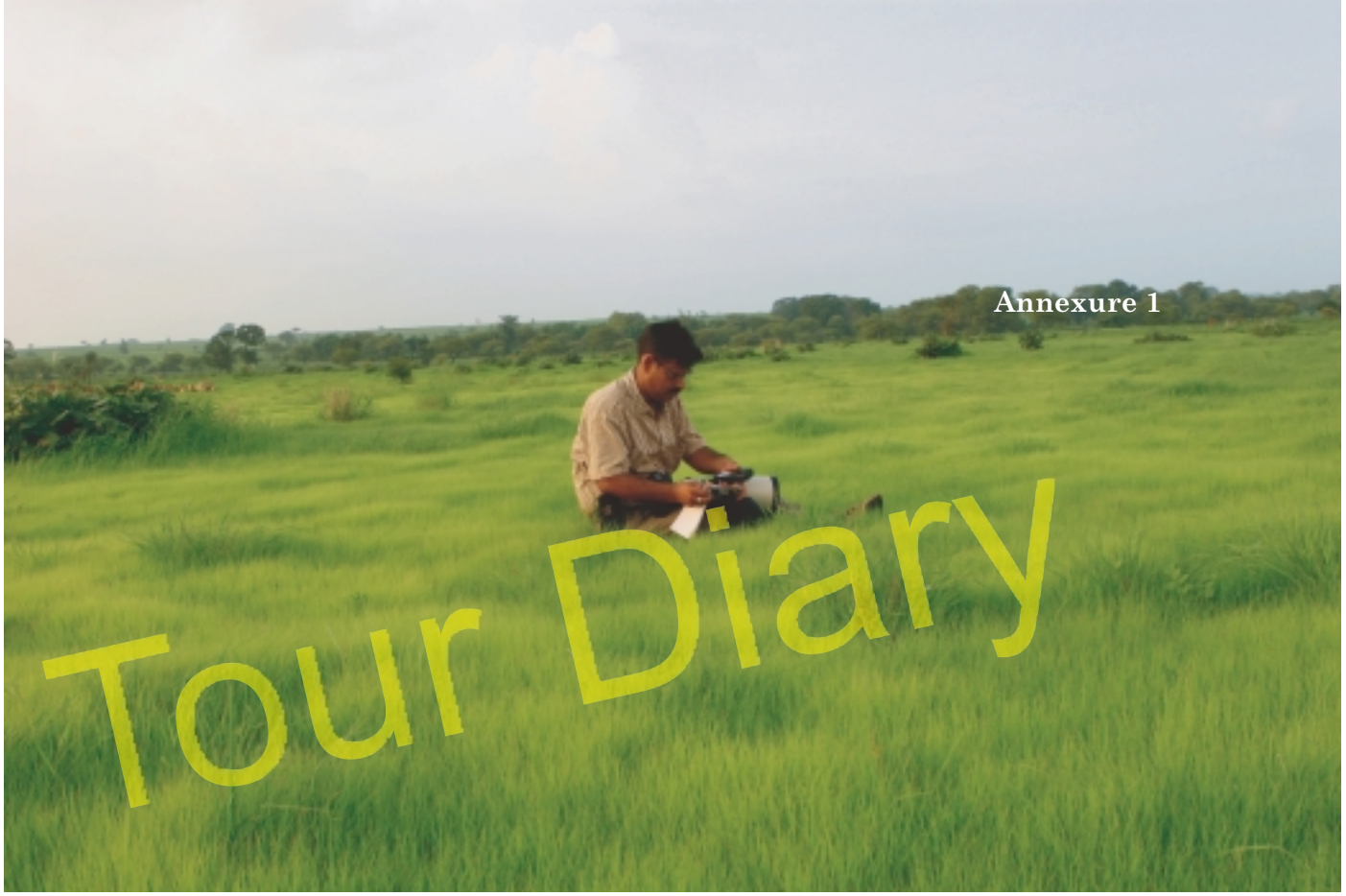

Annexure 1

Tour Diary

Day 1 August 6, 2010
From Dehradun to New Delhi. Halt at IIC.

Day 2 August 7, 2010
New Delhi to Ajmer. Met DFO Ajmer, P Kathirvel. Halt at Circuit House. Dinner with IGP Rajesh Nirwan.

Day 3 August 8, 2010
At 7:00AM along with DFO Kathirvel, from Circuit House to Veer Naka (Nasirabad Range) and held discussion with the front line staff. Then to Saunkhalia Chauraha. Visited some of the charagah areas and agricultural fields in this closed area. The area is spread over in 43 revenue villages and has been divided into three blocks. Six cocks were seen in the block 1. At 11:00PM back to Ajmer and had lunch with DFO Ajmer. During evening hrs along with Goga Kumhar and Rajender Singh went to block 1. Tea at Goga Kumhar house in Madhopur.

Day 4 August 9, 2010
Breakfast at Kathirvel house. Met CCF Sh. Shafaat Hussain and collector Sh. Rajesh Yadav. Went to office and had meeting with DFO and ACF. At 11:00AM from Ajmer to Shahpura *bagh* in Bhilwara. Met Shatrujeet Singh of Shahpura and along with him went to Shopura charagah area. Two floricans were seen, jumping in crop of *Moong (Vigna radiata)* and *Jowar (Sorghum vulgare)*. Raghu Bheel was well versed about the area. Then to Mewada

Principal Investigator with Shatrujeet Singh Rathod, waiting for florican to jump in Shahpura area

area of village Arnia Ghoda. For reaching their we had to travel around 1 km on foot along with Sat Singh, Noor Mohammad, ACF Nanak Chand and concerned staff. Surprisingly it was for the first time that the staff saw this bird. One cock was seen jumping continuously in a small patch of grassland surrounded by crop of *jowar* and *moong*. Height of the grass being around less than a feet. The presence of so many people, a dozen around 100 meters away, made the cock alert, and he was jumping after every minute which continued till sun set viz. 7:30PM. And we came back. Dinner with His Highness Shahpura Rajadhiraj Indrajitdeo. Discussed about Lesser Florican during state time. It was told that during early time "florican pie" was a recipe whose taste diminished the moment the bird started eating blister flies. As per their belief people who eat floricans that consumed blister flies will be unable to urinate!!!

Day 5 August 10, 2010

Morning at 7:00AM to Baldarkha, around 15 kms from Shahpura. Charagah area of not less than 100 hectares, totally infested with *Prosopis juliflora* and *Capparis decidua* bushes and was full of cattle population. When interviewed some of the villagers suggested that Hari Singh of *Mataji ka sthan* (Temple area) could be the resource person. Went to the temple area and met Hari Singh. It was revealed that Hari Singh once served in the forest department and was having considerable knowledge about the bird. A very interesting story was told by Hari Singh. He told that *bheels* (local community) use to kill females as bush meat hunting and once a female was killed leaving behind a live nest. Then the male was seen hatching the eggs afterwards. Then we visited to a *bir* called *Khamor ka bir* which is actually a degraded area full of bushes and some scattered trees of raunj (*A. leucophlrea*), *desi babul (Acacia nilotica)* and *P. juliflora*. A male was observed calling from a distance of more than 500 meters in *jowar/moong* field. Despite continuous efforts we could not locate the bird, but its repeated peculiar call confirmed its presence.

Came back to Shahpura Bagh at 11:00AM and had breakfast with Satsingh and started to Pratapgarh. By evening, I reached Kariabad area of Pratapgarh, my favorite point for Lesser Florican, a place where late Sh Digvijay Singh of Dhamotor showed me this beautiful bird for the first time in 2006. Unfortunately for last one year this bird is not visiting this area. More area of the grassland has been converted into agricultural field. The area was full of Sykes's Lark and *Zitting cisticolas*. I remained there for around half an hour and then reached Pratapgarh circuit house. Dinner at the residence of DFO Sh. KC Meena. Collector, Pratapgarh was also present at this occasion.

Day 6 August 11, 2010

From circuit house of Pratapgarh to "*Malawala ka maal* area" just adjacent to Police lines. This grass *bir*, having an area of around 10 hectares is surrounded all around by agricultural fields having crop of *Jowar* and *soyabean*. The

MP Forest officials and staff doing survey in Sardarpura WLS

associated vegetation includes the stunted growth of *B. monosperma* and *A. nilotica*. There was continuous call of *Z. citsicola*, Painted Francolin, Sykes's lark and Rain quails. A Eurasian Eagle Owl was seen perching on a side branch of a *A. nilotica* tree. This is the area where Devendra Mistry discovered this bird for the first time in 2009. This year he had already seen two birds in the area. We remained there for about an hour and could hear only the sound of the bird confirming its presence. Perhaps the presence of owl around 50 meters away was the reason preventing the bird from jumping display. I was already told about the adverse situation of Navlakha bir due to excess grazing. Being a private bir belonging to His highness Pratapgarh, it is now being neglected and highly subjected to grazing and encroachment. In the year 2009, in the month of September two males were seen jumping in the area when the grass height was around 4 feet. The present situation revealed the signs of rampant grazing and the grass height was less than even 2 inches. The area is already been treated with contour trenches and the mounds have been planted with the *Jatropha curcus* plants on the rows making a sort of visual barriers between the jumping floricans after around every 70-100 meters distance.

By 10:30AM we were in Ratniyakheri area which is again a grass *bir* of around 7-8 hectares surrounded all around by agricultural fields currently cropped with maize and Soyabean. The grass land again represents a kind of undulating landscape with mild slopes having height of grass around 3 feet and studded with stunted vegetation of *B. monosperma* and *A. nilotica*. For the first 15 minutes we could not see the target bird except the frequent calls of rain quails, cisticolas, Sykes's larks and painted francolin. At one side of the landscape the farmers were busy in weeding their crops. It was Devendra Mistry who spotted the bird with his

binoculars around 700 meters away from us. The bird was preening and jumping intermittently. At 11:30AM came back to circuit house and held discussions with DFO, Sh KC Meena and ACF Sh VPS Rana during the lunch at DFO's residence.

We spent our evening hours in *Bori grass bir* having an area of around 5 hectares and is completely devoid of any anthropogenic pressure except a cow was seen grazing in the periphery. Grass height was around 3 feet and the area was studded with stunted growth of B. monosperma and A. nilotica species. Among the birds Z. cisticola and Sykes's lark were seen but no Lesser Florican sign was visible. Back to Pratapgarh and had dinner with collector Pratapgarh.

Day 7 August 12, 2010

At 07:00AM, again went to Ratniyakheri. Reached at the same point with an objective to have a close look of the Florican. On the way I found a Rain Quail calling from top of a boulder. I literally crawled to reach in vicinity of cock which was a tough job and made me completely exhausted and soaked in sweat. I was hardly 20 meters away from the bird when he guessed my presence and made my job impossible. I got up on the knees, took a breath and stood up. I could feel trembling of my legs due to complete exhaustion and perhaps accumulation of lactic acid and I came back towards my vehicle where Devendra was waiting for me.

It was during the close proximity with the bird when I observed that the bird was having some white patches on the head region; probably a change in the breeding plumage. Even the pupil of the eye was a bit smaller as compared to the normal individuals. By noon we came back to the division and after having lunch I started my journey towards Sailana area.

Sailana is located in Ratlam district and it is in this area where there is a sanctuary dedicated to Lesser Florican, and notified in the name of Kharmor WLS, Sailana. Along with DFO Sh Manoj Argal and Range Officer Pradeep Kacchawa we went to Shikarwadi area of Sailana WLS and saw one Lesser Florican jumping in the grassland with more than 3 feet grass. Legally it is revenue land but as a part of sanctuary, Shikarwadi is having an area of 355 hectares which is a mosaic of grasslands and agricultural areas. By evening we came back to forest campus and had night halt at FRH, Ratlam.

Day 8 August 13, 2010

At 7:00AM from Ratlam FRH to Sailana and went to Kariya grass *bir,* legal status of which is revenue land, that is a mosaic of grass patches surrounded by agricultural land masses. One cock was seen jumping in the grass area. It was in Tajpuriya, which is part of Sailana WLS where a female florican was seen which immediately flushed from a bush of *B. monosperma* and two males were seen around 200 meters away from the site of female. In P170 compartment which is a grass *bir* under forest department in vicinity of Amba village a male was seen jumping in the grassland. Area was fully infested with *P. juliflora* bushes, which

might be the result of planting activities by the forest department. Another grass bir in revenue area was checked.

Day 9 August 14, 2010

Remained in Ratlam FRH till 11:00AM making notes of the observations and then proceeded towards Sardarpura WLS. After having lunch at Sardarpura FRH we went to Sardarpura WLS and surveyed some of the grasslands. But we could not locate floricans. Though extensive work has been done in the protection of these grasslands by the department, but the pressure of grazing is so high that only signs of grazing were visible. I was quite impressed with a *chowkidar* named Lal Singh who was having considerable knowledge about the bird. According to him the bird use to visit adjacent agricultural fields having *jowar* and *soyabean* for feeding inspite of having good habitat of grassland. Interestingly he had made at least 9 agricultural plots of *moong, urd* and *soyabean* pulses inside the grassland to prevent the birds going in the pesticide affected areas. Then we went from Sardarpura to Jhabua. Dinner at DFO residence in Jhabua. Night halt in a hotel in Jhabua.

Day 10 August 15, 2010

From Jhabua to grasslands of range Petlawad. Two floricans were seen jumping in the grasslands separated by a distance of around 2 kms. After survey of Petlawad we went to Semalpada grass bir in Range Thandla. Along with Forest Guard Rakesh Parmar saw the grass land but no record of floricans. By noon we entered Gujarat & reached FRH Rampur, Dahod at 3:00PM. This FRH is located on the Dahod-Ahemdabad highway. Along with the range officer, visited Neemnaliya and Muwaliya grass birs which are under the control of forest department and saw 5 floricans. Excellently managed grass birs with good quality of protection. Though the grass was high upto 4 feet but the cocks were displaying in a patch of grass having a height of less than a foot.

Day 11 August 16, 2010

At 7:00AM we started from Rampur FRH to Kharonda, Tadagola and Sarda grasslands which were around 30 kms from Rampura. The area seemed to be degraded and looked a bit arid as compared to the grasslands of Rampura. All grasslands were in bad condition with vegetation of P. juliflora and devoid of this bird. One local person Gaindal Bilwa, Chowkidar confirmed that he had not seen this bird for last 10 years. Reached Rampura FRH at 11:00AM and after having lunch with DFO Dahod went to Ahemdabad. On the way Samli area in Godhra district was seen for floricans. Night halt at Ahmedabad.

Principal Investigator Dr. K. Sivakumar interviewing local NGOs in Gujarat

Day 12 August 17, 2010
From Ahemdabad to Velavadar NP. On the way visited Lothal prehistoric sight. Reached Velavadar at 2:30PM. FRH is just on the periphery of the national park. Excellent grassland. By evening visited some of the prime grasslands of the Park including police chowki wala area, central portion, Lakarkot, territorial ground and other areas and just in 3 hours (from 4:30PM to 7:30PM) saw 10 male floricans. Halt at Velavadar National Park.

Day 13 August 18, 2010
Along with Range Officer Vijay A. Rathod and *Chaukidar* Allah Rakha, went to central portion and Lakarkot area of the park and could spot 6 floricans and six in other areas. There after we visited Meethapur village area adjacent to central portion of the National Park. Allah Rakha told me that the birds often visit adjoining agricultural fields for feeding. Three floricans were seen jumping in the *jowar* crop which was less than a foot in hight and the cocks were separated by more than 150 meters.

By evening we went towards wetland side where we saw 4 wolves across the other wetland area. It is also a salt affected area and the growth of grass was very less and halophytes grew luxuriantly. It was raining and one cock was silently roosting on the ground just near the *Sueda sp. clump*. Two male black bucks passed by the bird by very close distance. But the bird was least bothered. We thought that perhaps it was the rain showers that prevented the bird from jumping. Surprisingly just 1 km away from this place other bird was found jumping despite the rain showers.

Day 14 August 19, 2010
Early in the morning, along with Allah Rakha went to the lake area for wolf sighting and came back and then along with SDO Velavadar, Mr J.S. Solanki visited the Mewasa village and then to the grass *birs* which were actually charagah areas of Mewasa village. After travelling around two kilometers on foot where the scanty grass had attained a height of only few inches and we could easily sight some larks, Indian courser, planticoles etc. It was near the *Jowar* crop we saw a florican jumping in the grass patch around 70 meters away from us.

Came from the area and held meeting with the local villagers and the concerned staff in the Panchayat Bhawan. Up-Sarpanch of Mewasa, Daya Makwana was himself present in the meeting. When we came back, Dr K Siva was already in the FRH waiting for us. After having lunch we started our journey towards Gondal area of Rajkot district. On the way just near the Jastan town we visited two gresslands, Jastan 1 and Jastan 2. We were advised by DFO Rajkot to stay in a FRH in Jastan WLS but the conditions of the room seemed so unhygienic that we were compelled to move towards Gondal area and stayed in guesthouse of Swamy Narayan Temple Trust. Then we met Hitesh bhai and Gorang Joshi, both NGOs working for the cause of conservation for a considerable period of time.

Day 15 August 20, 2010

During morning hours we surveyed some of the grasslands along with Hitesh bhai and Mr Joshi and the concerned range officer. One of the grassland included Khad Vanthali bir belonging to the state forest department where in the year 2008 in the month of November a lioness along with her three cubs strayed in the area. As usual the calls of rain quails, zitting cisticolas, larks and painted quails were indicating the good quality of grassland. Though we could not locate even a single florican, but some of the staff insisted that they had seen one individual in the adjoining agricultural field. After visiting Ambadi *bir* we went to the Umbada *bir* belonging to a private individual, HH Jyotindra Singh of Gondal. Having an area of more than 150 hectares this area has been handed over to a group of graziers and there was rampant grazing negating the very possibilities of the existence of Lesser Florican. And actually we could not locate even a single bird. After visiting Bandaria bir reached Junagarh and met Anita Garg, DCF Junagarh.

From Junagarh to Sasangir. On the way visited Lakardhar Annamat *bir* belonging to forest department. It was forester Sh Sisodia who accompanied us. Reached Sasan gir by evening. Stayed at FRH Sasan.

Day 16 August 21, 2010

Early in the morning went to some of the grasslands including Jallandhar, Devaliya, Babra, Nana Babra. We met a local Chowkidar at Nana Babra, Hazi Ahmad of Porbander who confirmed the presence of this bird two years ago. Came back to Sasan and after breakfast, along with trekker Ibrahim went to other grasslands including Lilya, Itari, Jamka and Kodiar and came back at Sasan. Met DCF Sh. Sandeep Kumar and checked out from the FRH and headed towards Porbander. On the way went to Somnath temple. Night halt at Hotel Kaveri International, Porbander.

Day 17 August 22, 2010

Along with Bharat Rughani, local naturalist Porbander, went to some of the wetlands near Porbander and then checked out from Hotel Kaveri at 9:00AM and started our journey towards the grasslands in Jam Jodhpur of Jamnagar areas. On the way we had our breakfast locally called *gathia* in *Kutiyani* and then visited some of the grasslands like Saran, Kageshwari, Patan, Moti and Mahiki birs mostly in Jam Jodhpur area of Jamnagar district. We could not locate even a single Florican in such grasslands. From here we went to Rajkot via Upleta and then by evening we visited much talked Kirasana *bir* which was under the control of Rajkot

Interaction with graziers

Forest Division. Having an area of more than 450 hectares this patch of grassland is surrounded by mushrooming concrete development of Rajkot. It is due the efforts of the forest department especially forest guards like Narender Singh this patch is still well maintained. Unfortunately there were no floricans in the area.

On the way from Rajkot to Morbi we randomly checked another grass bir namely Nani Harisar which is also under the control of forest department adjacent to the highway. Reached Morbi by evening. Night halt at a hotel.

Day 18 August 23, 2010
Early in the morning we started from Morbi to Bhuj. In Bhuj the vehicle was serviced and reached Naliya FRH at 3:30PM. Along with young enthusiastic forest guard Aswani Jadeja, we went to Anamat grasslands and sighted 2 GIBs, some chinkaras, many black francolins and Indian coursers. Night halt at FRH Naliya.

Day 19 August 24, 2010
Went to Nalia WLS. It is grassland having an area of around few hectares, completely fenced and is surrounded all around by agricultural fields doing intensive farming for cash crops including cotton and til. It was told that using intensive pesticides to achieve maximum yield from the area was a very recent practice. From the watch tower I could count around 88 wind mills all around the Sanctuary.

After seeing a couple of grasslands we reached near the Parjau area and here we could locate a Lesser Florican, jumping at a distance of not less than 100 meters from a pair of GIB. Few cattle were also seen grazing in vicinity of the florican. There after florican was also seen in Jakhab area just adjacent to wind mill.

Then to Gadwada and Kalotia grasslands and back to FRH.

Day 20 August 25, 2010
Along with FG Ashwani Jadeja and Nane Mamad went to Kalotia, Bitaand, Bannada and Annamat-Nalia grasslands and sighted four floricans.

During evening hours again to Prajau area and sighted desert cat.

Day 21 August 26, 2010
From Naliya to Bhuj, Palanpur, Abu Road and finally at Udaipur. Night halt at Hotel Royal Retreat. Dinner with Chief Conservator Forest. Sh. AK Upadhyay and APCCF. Sh A.C. Choubey.

Day 22 August 27, 2010
Udaipur to Delhi. Night halt at Home 37, East Kailash

Day 23 August 28, 2010
Delhi to Dehradun

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