

Threatened Birds of Asia:

The BirdLife International Red Data Book

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Recommended citation

BirdLife International (2001) *Threatened birds of Asia: the BirdLife International Red Data Book*. Cambridge, UK: BirdLife International.

© 2001 BirdLife International

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Internet: www.birdlife.net

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ISBN 0 946888 42 6 (Part A)

ISBN 0 946888 43 4 (Part B)

ISBN 0 946888 44 2 (Set)

British Library-in-Publication Data

A catalogue record for this book is available from the British Library

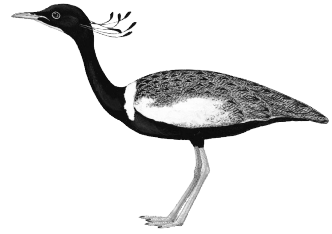
First published 2001 by BirdLife International

Designed and produced by the **Nature**Bureau, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire RG14 5SJ, United Kingdom

Available from the Natural History Book Service Ltd, 2–3 Wills Road, Totnes, Devon TQ9 5XN, UK. Tel: +44 1803 865913 Fax: +44 1803 865280 Email nhbs@nhbs.co.uk
Internet: www.nhbs.com/services/birdlife.html

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LESSER FLORICAN
Sypheotides indica



Critical —

Endangered **A2b,c; C1**

Vulnerable **A1a,b,c**

This species qualifies as Endangered because it has a very small, declining population, primarily a result of loss and degradation of its dry grassland habitat. The rate of decline is predicted to increase in the near future as pressure on the remaining grasslands intensifies.

DISTRIBUTION The Lesser Florican is virtually endemic to India, although there are persistent records from Nepal and one unconfirmed historical report from Myanmar (see Remarks 1). 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 Sahranpur in north-west Uttar Pradesh south to Trivandrum in southern Kerala (Baker 1922–1930, Ali *et al.* 1986, Sankaran 1995b). There is apparently one record from Punjab (see below). The main breeding areas were apparently in the districts of Nashik, Ahmednagar and Sholapur of Maharashtra, 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 winters in dry, grassy areas throughout much of India, mainly east of the Western Ghats (although there is a record from the west side, at about 1,000 m), and south and east of the Godaverri river (Ali *et al.* 1986, Sankaran 1995b).

■ **PAKISTAN** Early in the twentieth century, monsoon breeding dispersal into Gujarat, India, resulted in a certain amount of overspill into southern Sind (particularly the south-western corner when the rains were heavy) and the grassy plains of Lasbela district, Baluchistan (Ticehurst 1922–1924, Roberts 1991–1992). The Lesser Florican occurred “in the eastern part of Coastal Mekran in some years” according to Ticehurst (1926–1927), while other birds apparently used to “hang about” the cultivation in northern [Upper] Sind in the cold weather (Ticehurst 1922–1924). The species still occurs sporadically in tiny numbers (Roberts 1991–1992). Records are from: ■ **Baluchistan Gili**, Hingol river, September, year unspecified (Ticehurst 1926–1927); **Ormara**, two, undated (Ticehurst 1926–1927); **Gwadar**, undated (Symons 1909b); **Band Murad Khan**, Lasbela district, near the Hab river, three males, September 1937, one male in the same area beyond Mangho Pir, September 1958, and one female there, 1964 (Roberts 1991–1992); **Hubb or Hab river**, 18 on the Baluchi side (all in brown plumage), one of which was “nearly fully fledged”, October in around 1875 (Le Messurier 1875; also Ticehurst 1922–1924, 1926–1927), with an egg found on the Hab plains, August 1882 (*Stray Feathers* 10 [1883]: 420); ■ **Sind Bindi**, Larkana, February, year unspecified (Ticehurst 1922–1924); **Larkana district** specifically at Philipota, several, January, year unspecified (Ticehurst 1922–1924) and Rodham, February, year unspecified (Ticehurst 1922–1924); **Moach plains**, west of the Karachi monsoon records, undated (Ticehurst 1922–1924); around **Karachi**, 10–30 “couples” shot in good monsoons (August or September), undated (Hume 1872–1873), also at Gadap, 24–32 km north-east of Karachi, monsoon records, undated (Ticehurst 1922–1924); **Abad** (Tel Kandario) (untraced), three, February, year unspecified (Ticehurst 1922–1924); **Sapora** (untraced), up to eight shot in a day (“all except one in black plumage”), August in around 1872 (Le Messurier 1875); ■ **Punjab** 32 km north-east of **Lahore**, several, July 1986 (Roberts 1991–1992); “Alloo”, **Kasur district**, several, July

1986, and to the west on the old bed of the Sukh Beas river, several, July 1987 (Roberts 1991–1992).

■ **INDIA** The great majority of records have been collated in Ali *et al.* (1986) and Ganguli Lachungpa and Rahmani (1990) and mostly refer to one or two birds. It is important to note that a great deal more anecdotal but reliable evidence was assembled in the course of surveys in the 1980s, and any fresh attempts at identifying population levels and critical areas should refer back to Ali *et al.* (1986), Sankaran and Rahmani (1986, 1990a) and Sankaran *et al.* (1990). Records are from:

■ **Punjab** Urneewalla, here assumed to be **Arniwala**, August 1871 (female in BMNH);

■ **Haryana** **Hisar**, displaying in July 1913, also seen August 1923, September 1924 (Whistler 1915a), July 1914 (male in BMNH); **Rohtak**, common in monsoon, undated (Hume and Marshall 1879–1881); **Sultanpur**, Gurgaon district, undated (Hume and Marshall 1879–1881), and many specimens collected including in May, July, August 1876 (three males in BMNH), August 1878 (two males in AMNH, BMNH), July 1879 (16 specimens in BMNH), June 1880 (male in BMNH), July 1880 (14 specimens in AMNH, BMNH), August 1880 (nine males in BMNH), records from the last sites suggesting that the species was once common in monsoon in Gurgaon (Hume and Marshall 1879–1881); **Farrukhnagar**, Gurgaon district, July 1881 (23 specimens in BMNH and MCZ), September 1881 (male in BMNH), August 1881 (male in BMNH), April 1887 (male in BMNH);

■ **Rajasthan** unspecified localities in “Rajputana” (a term denoting a large region mostly encompassed by Rajasthan, centred just north of Jodhpur although the records were not necessarily from there, and were perhaps more likely to refer to the Ajmer region to the east), breeding in July–September of unspecified years (Jerdon 1862–1864), in September–October of unspecified years (Barnes 1888–1891), and being “very common” in unspecified years (Barnes 1888–1891); **Sambhar**, start of rains (July) in 1873 (Adam 1873, 1874); **Arain**, Ajmer district, monsoon/breeding (Saxena and Meena 1985); **Ramsar**, Ajmer district, monsoon/breeding (Saxena and Meena 1985); Dinghara and Rampur (Rampara) area, **Malpura**, Tonk district, a few birds reported (Sankaran *et al.* 1992), two males seen in 1999 (Sankaran 2000); **Mangliawas** (Mangaliyawas), Ajmer district, monsoon/breeding (Saxena and Meena 1985); Athun Ganeshpur, Nasirabad–Kekri road, **Ajmer district**, three in August 1983, and at Bandar, Goyal, Ratakot and Gagwana in the monsoon/breeding season (Saxena and Meena 1985), also records pre-1985 (Vardhan 1985), with an estimated 15–20 males around 1996 (Sankaran 1997b) and 2–3 females reported at Gagwana, 1999 (Sankaran 2000); **Sonkhaliya** (Shokaliya Bustard Closed Area) (including Kekri, Bagera, Basu and Tora villages), Ajmer district, a few every monsoon (Sankaran and Rahmani 1990a, Sankaran *et al.* 1992), four males seen plus another 11 reported, 1999 (Sankaran 2000); **Kalalia** (Kalaliya), with three birds at Jhalwa in 1982, and four reported in 1986 (Sankaran *et al.* 1992), four seen in 1989 (Sankaran *et al.* 1992), two males, “near Polytechnic”, 1999 (Sankaran 2000); **Pali**, Boya and associated localities (Bali, Perawa, Danda, Kurna and Dari), Bali tehsil, estimated 30–50 males, year unspecified (Sankaran 1997b), a few at Omkali every monsoon, and at Pinwada Seroi in the monsoon/breeding season (Sankaran *et al.* 1992); **Bhilwara district**, Sangamer, at Kalsane I, seven in 1984, and Kalsane II, regularly seen in monsoon of an unspecified year (Sankaran *et al.* 1992), also at Shahpura (Shivpura), two in 1986 (Sankaran *et al.* 1992), two males and a female at Loolas/Kalsas, 14 males reported at Baldharka and a pair reported at Jamoli, 1999 (Sankaran 2000); Sorsan buld, **Sangod**, Baran district, reportedly a few every year (Sankaran *et al.* 1992); Bated and associated localities (Bajrangadh, Akaypur, Gandher, Silarpura, Belara, Kultana and Bileshri) near **Pratapgarh**, Chittaurghadh district, estimated 25–30 males, year unspecified (Sankaran 1997b), eight seen there in 1994, seven males and one female in 1999, and also 10 males and a female at Kadiawath in 1999, six males and a female at Sidpura and two males at Mohwdikheda in 1999 (Sankaran 2000);

■ **Gujarat Deesa** (Disa), 7–8 birds during rains, unspecified year (Butler 1875–1877), “fairly numerous at the beginning of the rains”, c.1889 (Nurse 1900); **Jakhau**, Nalliya, Kutch district, three nests, 4–5 males in 1989 (Sankaran *et al.* 1992), 33 in 1994 (Sankaran 1994b) and 64 males, three females in 1999 (Sankaran 2000); **Mandvi**, Kutch, July 1940 (two males in FMNH), at Layja/Bayat grassland, three in 1994 (Sankaran 1994b); Panchmahal, one, before 1912 (Baker 1921–1930), and more recently in this district around **Dahod**, with six birds in 1982 (Yahya 1990), and (strictly at Rampura–Movalia–Kalitalai grasslands), with 15–20 birds at Rampura in 1989 (Sankaran 1990, Sankaran *et al.* 1992), five in 1994 (Sankaran 1994b), nine males and two females in 1999 (Sankaran 2000), also Jekot in Dahod taluk, one in 1994 (Sankaran 1994b); **Wadhwan**, one female with three juveniles in November 1908 (Khengarji 1909); **Surendranagar**, two at Sangadra grassland, Thanghad, 1994 (Sankaran 1994b); **Rampur** (Rampar), Dhoraji taluk, Jamnagar district, three birds in 1982 (Sankaran *et al.* 1992); **Mithapur** (Bhal), Bhavnagar, singles in July 1943 and July 1945, five in July 1946, four in August 1947 (Dharmakumarsinhji 1955); Tithwa, **Wankaner**, Rajkot district, two in 1982 (Magrath *et al.* 1985, Sankaran *et al.* 1992), two in 1994 (Sankaran 1994b); **Pipartoda** (Pipartora), 1981 and 1982 and August 1989 (Goriup and Karpowicz 1985, Magrath *et al.* 1985, Sankaran *et al.* 1992); **Vadodara** (Baroda), where four nests with eggs and chicks were found in August–September at Bakral (10 km from Vadodara), 1885–1886 (Littledale 1886), July 1950 (Dharmakumarsinhji 1955); **Rajkot**, Kathiawar, July 1871 (male in BMNH), breeding in rains, unspecified year (Hume and Marshall 1879–1881), two eggs collected around 1921 (*J. Bombay Nat. Hist. Soc.* 28 [1921]: 646), recorded at Halar district, 13 km east of Rajkot, July 1947 (Dharmakumarsinhji 1955); **Jamnagar district**, Harshadpur (near Ranjitsagar), nine birds in September 1981 and 1982 (Goriup and Karpowicz 1985, Magrath *et al.* 1985), 11 birds seen in 1982 (Ridley *et al.* 1985, Yahya 1990), at Sapa, 1981, and ten birds at Kengarpur in 1982, two in July 1989 (Sankaran *et al.* 1992), also a male reported at Sapa in 1999 (Sankaran 2000); **Pal**, Rajkot district, four in 1982 (Yahya 1990) and one in 1982 (Sankaran *et al.* 1992); **Dwarka**, undated, mapped by Ganguli Lachungpa and Rahmani (1990); **Vadali**, 1982 (Magrath *et al.* 1985) and Vadali/Lothad/Mahajan, Rajkot taluk, Rajkot district, 1982 (Sankaran *et al.* 1992); **Kotdasangani**, Rajkot district, one male at Khokri grassland, four males at a grassland and three males at Rajabheda grassland, 1999 (Sankaran 2000) and Kirasara, Rajkot district, two in 1994 (Sankaran 1994b) and five males in 1999 (Sankaran 2000); **Velavadar National Park** (Blackbuck National Park, Velavadar Blackbuck National Park), Bhal, Bhavnagar, July 1946 (Dharmakumarsinhji 1955), small numbers each year (Sankaran and Rahmani 1990, Sankaran *et al.* 1992, Srivastav and Rana 1998), including over 20 males in 1997 (Sankaran 1997b), and 19 in 1999 (Sankaran 2000); **Jasdan**, Rajkot district, Jasdan taluk, six birds at Maika I and three at Maika II in 1982 (Sankaran *et al.* 1992); **Gadhada**, September 1944, and in this area at Sathara, August 1945 (Dharmakumarsinhji 1955); **Gondal**, four birds at Umbawara and one at Wadadhari (Vadhadhari) in 1982 (Sankaran *et al.* 1992), two at Umwada in 1994 (Sankaran 1994b) and 13 males and two females there in 1999 (Sankaran 2000), six at Vanthali in 1994 (Sankaran 1994b) and two males seen (five more reported) in 1999 (Sankaran 2000), one at Ambadi in 1994 (Sankaran 1994b) and four males there in 1999 (Sankaran 2000), plus two at Virpur Jallaram in 1994 (Sankaran 1994b); **Jam Jodhpur**, Jamnagar district, Mahiki, two birds in 1981 and three in 1982 (Goriup and Karpowicz 1985, Magrath *et al.* 1985), Sadodad, seven birds in 1981, three in 1982, two in 1988 (Sankaran *et al.* 1992), Moti, four birds in 1981, five in 1982 (Sankaran *et al.* 1992), with two males and a further two reported in 1999 (Sankaran 2000), also at Devria, two birds in 1982 (Sankaran *et al.* 1992); **Bhavnagar district**, where seen at Badhada, August 1943, at Badudi, Bhal (Gohilwad), July 1944, at Bhal, four birds in August 1947, at Malankun (Gohilwad), August 1943, and Palania vid (Gohilwad), July, August 1947 (Dharmakumarsinhji 1955), also Ranigado/Hipavali, Mahuwa, unspecified year (Sankaran *et al.* 1992), Dolthi (Gir west), 1982 (Yahya 1990), Gebar, Mahuwa, unspecified

year (Sankaran *et al.* 1992), Jhinhura, 17 birds in 1982 (Yahya 1982), Mithiala, Mahuwa, unspecified year (Sankaran *et al.* 1992), Manpura, 1982 (Yahya 1990), and Piparla, three birds in 1982 (Yahya 1990), and 10 km on Ghoga road from Bhavnagar, 1982 (Yahya 1990); Allapur near **Hathab** (Gohilwad), Bhavnagar, 1946–1947 (Dharmakumarsinhji 1955), more recently two in 1994 (Sankaran 1997b) but none in 1999 (Sankaran 2000); **Bhandaria**, Gondal (or Jasdan) taluk, Rajkot district, three birds in 1982 (Sankaran *et al.* 1992), and four there in 1994 (Sankaran 1994b); Junagadh district, **Manavadar** (Manavadhar), two each at Sadarghad and Dadamdhar, 1982, also Dadwa, possibly one bird in August 1989 (Sankaran *et al.* 1992); **Trapaj**, September 1944 (Dharmakumarsinhji 1955); Chathadia, **Dhari**, Amreli district, 1987 (Sankaran *et al.* 1992); around **Gir National Park**, 1997 (Sankaran 1997b); **Sasan**, Junagadh district, at Mota Babra/Amaridhar/Motabatgadh grasslands, three birds in 1982, two at Lakada grassland in 1982, also at Malanka/Zinzudar/Nataliya/Kodia, 12 birds in 1982 (Sankaran *et al.* 1992), but none in the latter areas in 1999 (Sankaran 2000), two at Nana Babra and one at Manpur in 1994 (Sankaran 1994b); near **Kapura** (Kapurna), north-west of Dhule, common, undated (Davidson 1882); Labhpara (untraced), four birds in September 1981 (Goriup and Karpowicz 1985); Sapt (untraced), 1981 (Goriup and Karpowicz 1985, Magrath *et al.* 1985);

■ **Uttar Pradesh Saharanpur** (Sahranpur), at Koomarheira, 1872 (F. W. Butler 1881, specimen in BMNH); **Meerut district**, undated (Hume and Marshall 1879–1881); **Dudwa National Park** (Tiger Reserve), one, 1981 (Inskipp and Inskipp 1983), one female, June 1988 (Rahmani *et al.* 1988, Javed and Rahmani 1998), listed (BNHS 1990); **Sitapur**, June 1860 (Irby 1861; also Hume and Marshall 1879–1881); **Lucknow**, undated (Hume and Marshall 1879–1881); **Etawah**, August 1869 (male in BMNH; also Hume and Marshall 1879–1881); **Gorakhpur**, small numbers early in the rains (Osmaston 1913); **Allahabad**, July 1881 (Markham 1881); **Jhansi**, common, undated (Hume and Marshall 1879–1881); Jagannathpur (“Juggernathpore, United Provinces”) (untraced), July 1866 (male in BMNH) (see Remarks 2); bank of the Ganges (unspecified locality), April–May before 1864 (Jerdon 1862–1864);

■ **Madhya Pradesh Gwalior**, 1938 (Abdulali 1968–1996); **Karera Bustard Sanctuary**, January, June, July and August of an unspecified year (Haribal *et al.* 1986), although June 1982 and June and July 1985 have also been noted, when the birds in question were regarded as in transit to the breeding grounds (Sankaran and Rahmani 1986, Rahmani 1988b); **Guna** (Goon), March–December 1867 (King 1868); **Nimach** (Neemuch), August 1879 (male in BMNH), September–October of an unspecified year (Barnes 1886); **Sagar** (Saugor), a few in hot weather of an unspecified year (Jerdon 1862–1864), pre-1880 (specimen in BMNH); Jaora, Ratlam district, at **Ringnod**, three birds in 1982, four in 1986 (Sankaran *et al.* 1992), three in 1994 (Sankaran 1994b); **Ratlam** (Malwa), rains of an unspecified year (Jerdon 1862–1864), in Ratlam district, around 1980 (*Newsletter for Birdwatchers* 21, 8 [1980]: 2), and more recently at Aamlipada, 13 males, plus two males at Ghoshala and two males and one female at Karamdi Mali, 1999 (Sankaran 2000); **Nawabganj**, Ratlam district, one male in 1999 (Sankaran 2000); **Sailana**, Ratlam district, including the Sailana Kharmor Sanctuary (e.g. Naulakha), 18 birds in August–October 1984 (Ali *et al.* 1984, Ganguli-Lachungpa 1985), including five at Ambha/Daulatpura/Sheopur in 1984, 12 in 1986, nine in 1989 (Sankaran *et al.* 1992, Sankaran 1997d), seven in 1994, five males and one female in 1999 (Sankaran 2000), four at Badshah ki bheed in 1984 and six there in 1986 (Sankaran *et al.* 1992), two in 1994 (Sankaran 2000), two beyond Badshah ki bheed in 1986 (Sankaran *et al.* 1992), one at Hamirpada/Tajpuria in 1986 (Sankaran *et al.* 1992), 4–5 birds at Hazariya in 1986, 2–3 there in 1989 (Sankaran *et al.* 1992, Sankaran 1994a), two in 1994 and one male in 1999 (Sankaran 2000), three at Nancha bheed in 1986 (Sankaran *et al.* 1992), one there in 1989 and three males in 1999 (Anon. 1990a, Sankaran 2000), Davaikheda, three in 1999 (Sankaran 2000), Pallia, two in 1986 (Sankaran *et al.* 1992), Vijay Ramjiki, 1986 (Sankaran *et al.* 1992), Naulakha, nine birds in 1982, 15 in 1984, 12 in 1986 and 11 in 1989 (Sankaran *et al.* 1992, Sankaran 1994a), one in 1994 (Sankaran

1994b) and six males in 1999 (Sankaran 2000), five at Khariya in 1994 and one male there in 1999 (Sankaran 2000), and four at Besa Dabar, 1994 (Sankaran 2000); **Dhamnodbhed**, two in 1986 (Sankaran *et al.* 1992), four males in 1999 (Sankaran 2000); near **Jhilmili**, Surguja district, January of an unspecified year (Ball 1874); near **Sehore**, “scarce”, undated (Whitehead 1911), rains/breeding (Sankaran *et al.* 1992); **Indore**, rains (Jerdon 1862–1864), and at “Bijasan Ramna”, August 1938 (Ali and Whistler 1939–1940); **Sardarpur** (Sardarpore), Dhar district, including records from Sardarpur Florican Sanctuary, three birds in April 1910 (Tyrrell 1910), two males in 1938 (D’Abreu 1935), on “Jhabua road”, near Rajgarh, September 1938 (Ali and Whistler 1939–1940), Chadawat, nine birds each in 1982, 1984 and seven birds in 1989 (Sankaran *et al.* 1992), 10 in 1994 and two in 1999 (Sankaran 2000), also in Panpura, reported in 1989 (Sankaran *et al.* 1992), three in 1994 and one male (plus 10 reported) in 1999 (Sankaran 2000), and 17 km from Sardarpur on the Ratlam road, two in 1989 (Sankaran *et al.* 1992), four males reported at Morpipli in 1999 (Sankaran 2000); **Mhow**, Indore district, pre-1885 and 1894 (four specimens in BMNH), six individuals shot there, 1921–1922 (Grieve 1923), a rains visitor 1927–1929 in “varying” but sometimes large numbers (Briggs 1931); Thakur Sajjan, at Tarkhedi, **Jhabua district**, five birds in 1982, four in 1984, 11 reported in 1986 (Sankaran *et al.* 1992), three in 1994 and one in 1999 (Sankaran 2000); **Kanha National Park**, June 1969 (Ranjitsinh 1984); **Balaghat district**, undated (E. A. D’Abreu in Whistler ms); **Nimar district**, undated (Hewetson 1856);

■ **Maharashtra Nandurbar**, occasionally in cold weather of an unspecified year (Abdulali 1968–1996); **Nagpur**, October of an unspecified year (Vagrant [McMaster] 1868), breeding, August–September of an unspecified year (D’Abreu 1935), one captured in January 1982 in Darwha range of West Yavatmal division (Kandey 1982; also Sankaran *et al.* 1992); **Dharangoan** (Dharamgaon), common and breeding in rains, undated (Hume and Marshall 1879–1881); **Erandol** (Erandole), undated (Davidson 1882); **Wardha**, rare, undated (Blanford 1871); **Akola**, August of an unspecified year (Vagrant 1871); **Malegaon**, Nashik district, September 1886 (male in BMNH); **Nashik**, common before 1879 (Hume and Marshall 1879–1881); **Chandrapur** (=Chanda), rare, undated (Blanford 1871); **Jalna**, Aurangabad, August and in the cold season (Jerdon 1839–1840, 1864); **Kalyan**, Bombay (=Mumbai), December 1912 (*J. Bombay Nat. Hist. Soc.* 22 [1913]: 631); **Andheri**–Malad, Bombay, December 1912 (Suter 1913); **Ahmednagar**, common before 1879 (Hume and Marshall 1879–1881); **Parel**, Bombay, September 1918 (Marryat 1918); **Mahalaxmi**, Bombay, one individual, c.1899 (Symons 1909b); **Panvel** (Panwel), one female, January 1909 (Symons 1909b); **Bombay** (=Mumbai), c.24 km from Salsette, one, 1938 (Ali and Abdulali 1936–1939, Abdulali 1968–1996); **Chinchavli**, near Neral, November 1908 (Suter 1913); **Churchgate Street** (Churchgate Station), Bombay, June 1913 (*J. Bombay Nat. Hist. Soc.* 22 [1913]: 631); between Madhwa and **Alibag**, December 1912 (Kinneer 1913), and Chondi, Alibag taluka, May 1938 (Ali and Abdulali 1936–1939); **Karjat**, at the foot of Bhor ghat, January 1935 (Prater 1935); **Mahabaleshwar** (Mahabaleshwar hills), April 1915 (Fellowes 1918); **Dapoli** (Dapuli), undated (Vidal 1880); **Solapur** (Sholapur), May, June and September 1874 (three specimens in BMNH), birds common in September–October of an unspecified year (Davidson and Wenden 1878), “many” breeding in rains before 1879 (Hume and Marshall 1879–1881, E. A. Butler 1881); Lavel and **Chiplun** (Chiplin), year unspecified (Vidal 1880), and at the latter, February 1913 (Kinneer 1913); **Ratnagiri**, rare, unspecified years (Vidal 1880, Barnes 1888–1891); **Satara**, November 1908 (Khengarji 1909);

■ **Karnataka Tungabhadra**, at Tungabhadra Wildlife Sanctuary (untraced), pre-1956 (Goriup and Karpowicz 1985); **Belgaum**, few birds, year unspecified (E. A. Butler 1881), January 1880 (male in BMNH); **Dharwad** (Dharwar), common, year unspecified (E. A. Butler 1881); **Haliyal** (Halyal), North Kanara, April of an unspecified year (Davidson 1898a); **Belikeri** (Kanara), undated (Abdulali 1968–1996), and at unspecified localities in Kanara, rare, undated (Barnes 1888–1891); north **Shimoga district** (probably south of Ranibennur), a “good many”

in hot weather (March–May), pre-1883 (Anderson 1883); **Tumkur**, before 1912 (Baker 1921–1930); **South Kanara**, October–February/March of an unspecified year (Jerdon 1862–1864); **Bangalore**, numerous in rains (June–September) and cold weather (October–February), pre-1883 (Anderson 1883), one, December 1911 (Betham 1912); at the “101 mile post” on the Bangalore–Mangalore road, **Hassan district**, May 1952 (Worth 1953); east Mysore (referring to the defunct administrative unit), “numerous” pre-1879 (McInroy 1879), but only one in 15 years (around 1930s), c.48 km north of **Mysore** city (Ali and Whistler 1942–1943);

■ **Andhra Pradesh Dubak Mandal**, Medak district, February 1997 (Pittie *et al.* 1998); unspecified locality, **Northern Circars**, undated (Jerdon 1839–1840, 1862–1864); unspecified locality, **Godavari district**, undated (Cox 1899), June, unspecified year (Ali and Whistler 1935–1937); **Waltair** (at Razan), undated (Cox 1899); **Patancheru**, where seen near Medak, November 1984 (Sankaran *et al.* 1992; possibly the “Medak district” record of Taher 1984), also at the ICRISAT Asia Centre (specifically at 17°30'N 78°15'E), March–April 1997 (Pittie *et al.* 1998); **Hyderabad**, November 1986 (Sankaran *et al.* 1990, 1992, also Pittie *et al.* 1998); **Rajamandri** (Rajamundhry), June 1881, December–January of an unspecified year (Tostems 1881); Samulkotta, c.10 km from **Coconada**, 4–5, undated (McInroy 1879); **Rollapadu Sanctuary**, Kurnool district (Karnool), winter/summer/rains and breeding, e.g. 11 nests in October 1987–February 1988, further records of up to nine males (but not breeding annually) until 1994 at least (Manakadan and Rahmani 1989, 1993, 1999, Sankaran and Manakadan 1990, K. J. Rao 1992, Rao 1995a); **Ongole**, “plenty”, year unspecified (Tostems 1881); **Nellore**, one of the “most celebrated florican hunting grounds” in southern India (Jerdon 1862–1864);

■ **Kerala** unspecified localities on the “Malabar coast”, a few in July–November, year unspecified (Jerdon 1862–1864); between **Cochin** (Kochi) and Palghat, late-1970s (A. Vergheese verbally 1996); **Karunagapaly**, Quilon district, January 1989 (Krishnan 1991); **Trivandrum**, 1876 (Ferguson and Bourdillon 1903–1904);

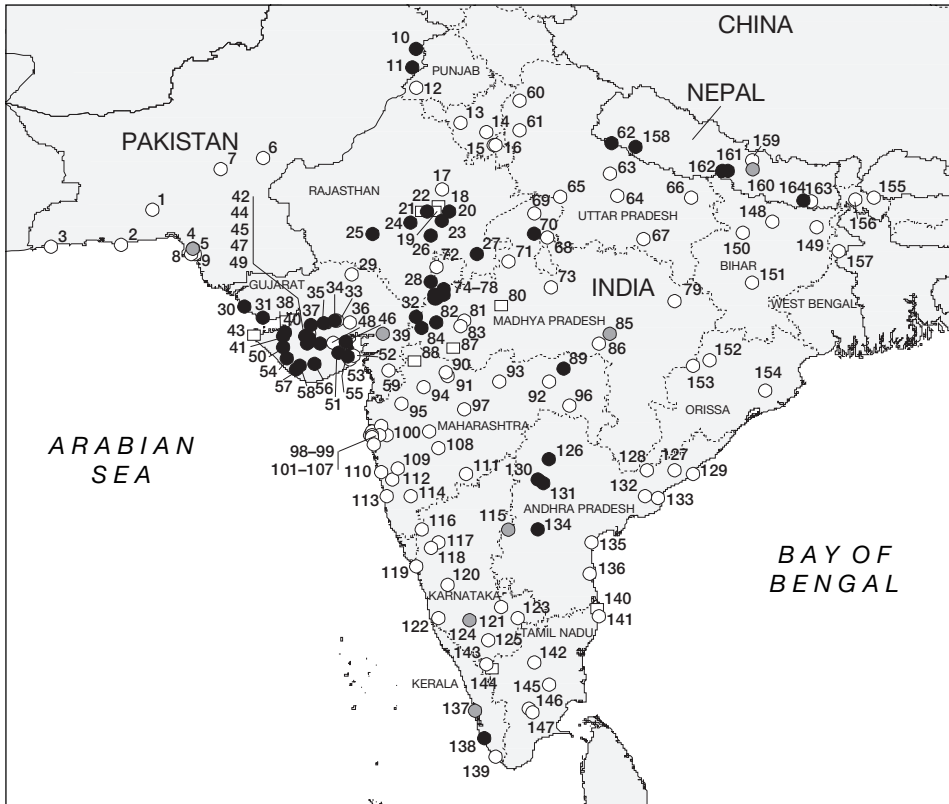
■ **Tamil Nadu** unspecified locality, Carnatic, October to February/March, year unspecified (Jerdon 1862–1864); **Ponneri**, pre-1969 (specimen in BMNH); **Madras** (=Chennai), 1871 (specimens in BMNH), 1876 (specimens in BMNH), and year unspecified (Aflalo 1904, Whistler and Kinneer 1931–1937); **Mallur** (Malur), 30 birds shot in one day, pre-1879 (McInroy 1879); Nilgiri slopes, between **Naduvattam** and Pykara, c.1,000 m, year unspecified (Davison 1883); **Coonoor**, no data (specimen in ANSP); **Tiruchchinappalli** (previously Trichinopoly, “Trichi”), October, year unspecified (Jerdon 1839–1840), one nest in October 1935 (Whistler and Kinneer 1931–1937); **Sholavandan**, Madura district, March 1904 (Nichols 1943–1945); **Madura**, undated (Jerdon 1839–1840);

■ **Bihar Darbhanga district**, at Ramawli (Ramowli), c.25 km from Darbhanga), April 1909 (female in YPM), and Hatauri, June 1912 (male in YPM); **Purnea**, occasional in May–June (Jerdon 1862–1864), and Purnea and Nuddeah, stragglers in April–May, year unspecified (Baker 1921–1930); **Dinapur** (Dinapore), Patna district, pre-1907 (specimen in BMNH); **Hazaribagh**, one female seen on the Chatra road (km 20), around 1945 (Baillie 1946);

■ **Orissa Sambalpur**, several birds, undated (Ball 1876), and at Gainslot, one, December 1876 (Ball 1877); **Sohela**, Sambalpur district, January 1907 (female in BMNH); **Cuttack**, undated (Blanford 1895–1898, also Symons 1909b), and unspecified localities south of the Mahanadi river, undated (Ball 1878);

■ **West Bengal Hasimara**, June 1911 (O'Donel 1913); **Neora Nadi**, at “Neora Nuddy tea garden”, not far from Baradighi, two shot, unspecified year (Inglis *et al.* 1920); **Maldah**, undated (Baker 1921–1930).

■ **NEPAL** Records (none of them known to concern breeding, although most are from the breeding season of birds in the country, including the Bengal Florican *Houbaropsis bengalensis*) are as follows: **Royal Bardia National Park**, Bheri Zone, Bardia district, and in upper Baghaura, one in February 1980, one male in May 1982 (Inskipp and Inskipp 1983), and one



The distribution of Lesser Florican *Sypheotides indica*: (1) Gili; (2) Ormara; (3) Gwadar; (4) Band Murad Khan; (5) Hab river; (6) Bindi; (7) Larkana district; (8) Moach plains; (9) Karachi; (10) Lahore; (11) Kasur district; (12) Arniwala; (13) Hisar; (14) Rohtak; (15) Sultanpur; (16) Farrukhnagar; (17) Sambhar; (18) Arain; (19) Ramsar; (20) Malpura; (21) Mangliawas; (22) Ajmer district; (23) Sonkhaliya; (24) Kalalia; (25) Pali; (26) Bhilwara district; (27) Sangod; (28) Pratapgarh; (29) Deesa; (30) Jakhau; (31) Mandvi; (32) Dahod; (33) Wadhwan; (34) Surendranagar; (35) Rampur; (36) Mithapur; (37) Wankaner; (38) Pipartora; (39) Vadodara; (40) Rajkot; (41) Jamnagar district; (42) Pal; (43) Dwarka; (44) Vadali; (45) Kotdasangani; (46) Velavadar National Park; (47) Jasdian; (48) Gadhada; (49) Gondal; (50) Jam Jodhpur; (51) Bhavnagar district; (52) Hathab; (53) Bhandaria; (54) Manavadar; (55) Trapaj; (56) Dhari; (57) Gir National Park; (58) Sasan; (59) Kapura; (60) Saharanpur; (61) Meerut district; (62) Dudwa National Park; (63) Sitapur; (64) Lucknow; (65) Etawah; (66) Gorakhpur; (67) Allahabad; (68) Jhansi; (69) Gwalior; (70) Karera Bustard Sanctuary; (71) Guna; (72) Nimach; (73) Sagar; (74) Ringnod; (75) Ratlam; (76) Nawabganj; (77) Sailana; (78) Dhamnod; (79) Jhilmili; (80) Sehore; (81) Indore; (82) Sardarpur; (83) Mhow; (84) Jhabua district; (85) Kanha National Park; (86) Balaghat district; (87) Nimar district; (88) Nandurbar; (89) Nagpur; (90) Dharangoan; (91) Erandol; (92) Wardha; (93) Akola; (94) Malegaon; (95) Nashik; (96) Chandrapur; (97) Jalna; (98) Kalyan; (99) Andheri; (100) Ahmednagar; (101) Parel; (102) Mahalaxmi; (103) Panvel; (104) Bombay; (105) Chinchavli; (106) Churcgate Street; (107) Alibag; (108) Karjat; (109) Mahabaleshwar; (110) Dapoli; (111) Solapur; (112) Chiplun; (113) Ratnagiri; (114) Satara; (115) Tungbhadra; (116) Belgaum; (117) Dharwad; (118) Haliyal; (119) Belikeri; (120) Shimoga district; (121) Tumkur; (122) South Kanara; (123) Bangalore; (124) Hassan district; (125) Mysore; (126) Dubak Mandal; (127) Northern Circars; (128) Godavari district; (129) Waltair; (130) Patancheru; (131) Hyderabad; (132) Rajamandri; (133) Coconada; (134) Rollapadu Sanctuary; (135) Ongole; (136) Nellore; (137) Cochin; (138) Karunagapaly; (139) Trivandrum; (140) Ponneri; (141) Madras; (142) Mallur; (143) Naduvattam; (144) Coonoor; (145) Tiruchinappalli; (146) Sholavandan; (147) Madura; (148) Darbhanga district; (149) Purnea; (150) Dinapur; (151) Hazaribagh; (152) Sambalpur; (153) Sohela; (154) Cuttack; (155) Hasimara; (156) Neora Nadi; (157) Maldah; (158) Royal Bardia National Park; (160) Patan; (161) Rapti Dun; (162) Royal Chitwan National Park; (163) Itahari; (164) Kosi Tappu Wildlife Reserve.

○ Historical (pre-1950) ● Fairly recent (1950–1979) ● Recent (1980–present) □ Undated

in June 1988 (Suwal and Shrestha 1988b), but no recent reports (Baral *et al.* 2000); **Kathmandu valley**, collected in the nineteenth century, in May and June of year(s) unknown (Hodgson 1829a, 1844, Inskipp and Inskipp 1991); south-east of **Patan** (Lalitpur), Kathmandu valley, three in monsoon, unspecified year (Fleming *et al.* 1979); **Rapti Dun**, one female in May 1987 (Halberg 1987); **Royal Chitwan National Park**, two males in April 1996 (White and White 1994; also *Danphe* 5, 4 [1996]: 2), and specifically at Chitwan Jungle Lodge, Narayani Zone, Chitwan District, 200 m, one female in March 1986 (Couronne and Kovacs 1986), Meghauli, one bird between March and April 1962 (Diesselhorst 1968), and Kachhuwani, one male in May 1982 (Inskipp and Inskipp 1983); west of **Itahari**, Morang, not uncommon in winter (Hodgson 1829a); **Kosi Tappu Wildlife Reserve**, c.500 m south of Kushaha, one female, June 1995 (*Danphe* 5, 4 [1996]: 2, Cox 1998).

POPULATION The Lesser Florican has been recorded as in decline since the end of the nineteenth century (Baker 1921–1930); Hume and Marshall (1879–1881) had even expressed their fear of the species going extinct within 50 years of their writing (i.e. by the 1930s). Early reports suggest that it was abundant in the nineteenth century. Fulljames (1837) stated that in Gujarat birds were “so plentiful sometimes” that they could be bought alive from the locals for next to nothing. In Kathiawar, the species was “abundant in the rains” (Lloyd 1873). Its numbers have been declining for many decades, and in the process it has become much rarer and/or disappeared from many parts of its range (Sankaran 1990, 1993). Thus for example tribal communities in Andhra Pradesh and Karnataka reported that it was frequently seen and trapped in suitable areas up to the mid- or late 1970s, but in the late 1980s it was much less common (Sankaran *et al.* 1990). In Kutch, Gujarat, it was “very abundant during the rains” in the nineteenth century (Stoliczka 1872) while in the 1990s it was thinly distributed (Sankaran *et al.* 1992). Before 1975 it was possible to see 30–40 individuals in a day in Kutch during the rains, but numbers dramatically dropped around this time with few birds arriving despite good rains, probably as a result of being “persecuted mercilessly” (Madansinhji of Kutch 1976). It was always apparently “rare” in Orissa (Ball 1877) and in the Madras region where very few were shot each season (Dewar 1905), and only “a very occasional visitor” as far south as southern Kerala (Ferguson and Bourdillon 1903–1904). It clearly arrived in large numbers in some parts of Kerala, however, as 30 birds were shot in a day not far from Bangalore (*Stray Feathers* 8 [1879]: 491).

Its population declined by nearly 60% from an estimated 4,374 birds in 1982 to about 1,672 in 1989 (although initially only 750 were estimated in the latter year: Sankaran *et al.* 1992; also Sankaran 1990, Sankaran and Rahmani 1990a), mainly owing to a failure of monsoon rains between 1985 and 1987 (Sankaran 1993, 1995c). However, a survey in 1994 showed a population of 2,206, an increase of 32% on the 1989 figure, attributed to the fairly good rainfall that western India had enjoyed in the ensuing five years (Sankaran 1994b, 1995c). A further survey in 1999 (after another series of good rains) encountered 240 floricans (223 males and 17 females) resulting in a population estimate of 3,530 birds (Sankaran 2000), a population increase of a further 62%. However, caution is urged in interpreting these figures as it is now postulated that these increases may have reflected a greater concentration of floricans in known sites, and thus falling habitat availability rather than rising numbers of birds (Sankaran 2000; see Threats). Population densities at a single site are known to change depending on the rainfall patterns (Sankaran 1991, 1994b).

In Pakistan the species once occurred regularly in several areas, particularly when the rains were good, at which times breeding was recorded. By the 1940s, it had become a scarce rainy-season visitor, very erratic in occurrence, and by the latter half of the twentieth century it was a “vagrant” to the country (Roberts 1991–1992). The situation of the species in Nepal is unclear, but it is presumably also the case that numbers will have been declining proportionately to India.

ECOLOGY Habitat The Lesser Florican is a bird of grasslands and open fields, preferring drier ungrazed plains with grass 0.5–1 m tall, generally avoiding tall grasslands in well-watered tracts, and occupying grasslands of varying shrub densities from more open formations to fairly dense *Acacia* forest, but being more commonly found on grasslands with a shrub density of fewer than 50 per hectare (mostly *Acacia*, *Butea*, *Ziziphus* and *Calatropis*) (Magrath *et al.* 1985). High grass productivity, an indicator of low grazing pressure, is a good predictor of florican presence (Magrath *et al.* 1985, Sankaran 1997c), with breeding areas generally coinciding with those in which grass grows tall in the monsoon (Sankaran 2000). The principal grasslands in north-west India are of the *Sehima nervosum*–*Chrysopogon fulvus* type (Sankaran 1995b). The species often confines itself to small patches of “bheed” or “vidi” (undeveloped grassland, mostly of the *Sehima*–*Chrysopogon* type) and grassy bunds within such areas (Sankaran and Rahmani 1986). These grasslands are left ungrazed through the monsoon so that grass grows for fodder to be harvested after the rains (around October), after which time they are virtually devoid of cover until the next monsoon and thus seasonally abandoned by floricans (Sankaran 2000). The majority of Lesser Florican are thought to breed in these production grasslands (Sankaran 2000). In Rollapattu Wildlife Sanctuary it prefers areas of a mosaic of medium (50 cm) and tall (100–150 cm) grassland, the former consisting of a *Heteropogon contortus*–*Eremopogon foveolatus*–*Chrysopogon fulvus* grass community, the latter involving *Sehima nervosum* or *Cymbopogon caesius* (Manakadan and Rahmani 1999). The grasslands frequented by the species have been found to range from 2 ha to 3,000 ha in size (Sankaran *et al.* 1992, Sankaran 2000). The species can breed even in small grass patches (<0.8 ha) isolated in cultivation (Sankaran 2000). In Nepal it has been recorded in tall elephant grasses comprising various species of *Saccharum*, *Phragmites karka* and *Typha elephantina*, as at Royal Chitwan National Park and Royal Bardia National Park; near Koshi Tappu a female was observed crossing from a closely grazed patch of grass to slightly flooded littoral grassland (Cox 1998). Birds roost in an open space, a little way from bushes (Sankaran and Rahmani 1986).

Floricans are known to return to particular grasslands in successive years and at several sites birds have occurred every year for at least 20–30 years, suggesting that there may be a strong site-fidelity among males (Magrath *et al.* 1985). However, Dharmakumarsinhji (1955) found that the same individuals do not necessarily visit the same grassland or locality every year. The species is regularly found in cultivation such as grain (including millet), cotton *Gossypium* and dholl close to grasslands, and in grassland habitats within forest plantations (Ali and Ripley 1968–1998, Goriup and Karpowicz 1985, Saxena and Meena 1985, Sankaran 1995b, 1997c). In Andhra Pradesh it has been recorded in fields of bajra *Pennisetum glaucum*, jowar *Sorghum bicolor*, groundnut *Arachis hypogea* and chickpea *Cicer arietinum* (Pittie *et al.* 1998). Breeding in cultivation is not frequent, but does occur, having usually been recorded in soyabean *Glycine max* and groundnut, and less frequently in cotton, sorghum *Sorghum vulgare*, maize *Zea mays*, sugarcane *Saccharum*, rice *Oryza sativa*, mustard *Brassica campestris*, lentils and wheat *Triticum vulgare* (Sankaran 2000). In areas where grasslands are grazed, or croplands are irrigated during drought, the species tends to be found more frequently in cropland (Sankaran 1997c). In years of good rainfall grasslands sometimes grow too tall and individuals shift to shorter vegetation, such as soyabean fields (Sankaran 1997c). When not breeding, the species sometimes uses lightly wooded country, grazed lands and scrubland dominated by *Ziziphus* (Sankaran 2000).

Food Although initially thought to have a diet composed “almost exclusively of grasshoppers” (Sykes 1832), the Lesser Florican is in fact omnivorous, eating many types of invertebrate, plus various plant parts: grasshoppers (including Acrididae), beetles (including Cantharidae), flying ants, hairy caterpillars, centipedes, worms, frogs, small lizards (e.g. *Agama*), crop shoots, leaves (e.g. soyabean), herbs and berries (Baker 1921–1930, Ali and Ripley 1968–1998, Dharmakumarsinhji and Lavkumar 1972, Ali *et al.* 1986, Sankaran and Rahmani 1986, Roberts 1991–1992). Decomposed parts of green leaf and small pieces of stones were recorded from the

stomachs of a dead bird (Yahya 1990). Birds typically walk 5–10 m before pausing and scanning the grass for prey and checking for danger; then they either dash at and snap up a prey item or creep-stalk it in the manner of an egret (Ali *et al.* 1986). The area covered may be considerable; in the pre-breeding period, one bird walked over 2 km in seven hours (Ali *et al.* 1986). Birds will pause to take swarming black ants as they emerge, one being seen to take 129 pecks—presumably 129 ants—in a five-minute period; they also focus on caterpillar outbreaks on *Butea* bushes, leaping to snatch insects off leaves just out of standing reach (Ali *et al.* 1986).

Breeding The main studies are by Sankaran and Rahmani (1986), Sankaran (1991, 1997c). **System** The species operates a lekking mating system in which no pair-bond is formed (Magrath *et al.* 1985, Sankaran 1994a). Males establish territories measuring 1–2 ha in size, clumped together in an exploded lek, with an inter-territorial distance of 200–500 m (Sankaran 1994a, 1995b); they display from a particular spot within the territory (Sankaran and Rahmani 1986). On average 4.7 territories were found in an area of about 1 km² (Sankaran 1994a). Sankaran (1994a) found that large areas of grassland (e.g. 1 km² or more) allowed late-arriving males to establish territories rapidly instead of competing with already established males; as females nest outside male territories, large areas were necessary to accommodate all the nesting females. **Period** Males moult out of their female-like non-breeding dress in the course of June and July (Sankaran and Rahmani 1986). They display from the onset of the monsoon rains, usually in July, till the end of September, often selecting an elevated patch of ground or small ridge for their performances (Sankaran 1991, 1993, 1994a). In north-west India nests with eggs have been found in September, and a fairly close synchronisation seems to exist between the peak of male display and female fertilisation (Ali *et al.* 1986, Sankaran and Rahmani 1986). However, the height of grass appears to dictate the timing of territorial establishment since, although in one study area males arrived back at the same time, those in totally protected grasslands established territories earliest, those in seasonally protected grasslands somewhat later, and those in partially protected grasslands 4–6 weeks later (Sankaran 1990; for an explanation of grassland types see Measures Taken: Grass production). Orthopteran abundance, a crucial factor in relation to food supply for females and young, peaks with grass seeding at the end of September (Sankaran 1991), which would coincide with a period of high consumption by females with growing broods (this also being when most male display ceases in the north-west; see above). In Andhra Pradesh a nest with three eggs was found in December in a groundnut crop, and subsequently nests were found in January and February (K. J. Rao 1992). Sankaran and Manakadan (1990) found seven nests/chicks in Andhra Pradesh between late December 1987 and early February 1988 (hatching in January and February), a time when the usual breeding grounds in north-west India were in “severe drought”. The grasslands in southern India are therefore apparently used when unfavourable conditions affect the usual breeding range (Sankaran and Manakadan 1990). **Nest-site** The females invariably nested in long grass outside the male’s territory (Sankaran 1994), although one nest was reported inside a male territory (Ali *et al.* 1986); in 1986 four nests were in grassland and one (later predated, probably by a crow) was in a stunted weeded maize crop (Sankaran and Rahmani 1986). The nest site may be in part determined by the cover afforded to the female, not only for the nest to escape detection but also for her to avoid further harassment by displaying males (Sankaran and Rahmani 1986). **Clutch size and incubation period** Clutches consist of 3–4 eggs (Ali *et al.* 1986, Sankaran and Rahmani 1986). A pair with eight eggs was found in September (BMNH label data), which cannot be correct unless two females had laid in the same scrape (A. R. Rahmani *in litt.* 2000). A nest with two eggs on 28 August contained four on 30th, indicating a laying interval of 24 hours; hatching occurred on 22nd day of incubation (Sankaran and Rahmani 1986). **Care of young** The female alone leads the chicks; limited observations suggesting that family parties may remain on the breeding grounds for at least a month longer than males (Sankaran and Rahmani 1986). **Other data** Life-span is uncertain; one ringing recovery involved an adult retrapped after four years (Dharmakumarsinhji 1950).

Migration The Lesser Florican undertakes movements which appear to be governed largely by rainfall, but which remain poorly understood. The sexes are cryptically coloured during the non-breeding season (Sankaran 1993), and this has always made a good understanding of the species's movements and spatial requirements very difficult to follow. It breeds chiefly in the north-western sector of its range (Gujarat, western Madhya Pradesh, north-western Maharashtra and south-eastern Rajasthan), moving there at the start of the monsoon period (June–July) and subsequently (October–November) appearing to disperse south and east into the breadth of the Indian subcontinent, where there is little clear evidence of its precise status, distribution or habitat requirements (Sankaran and Rahmani 1986, Sankaran 1990, 1993, 1997d, Sankaran *et al.* 1992). That movements do occur is revealed by records such as the one from Hyderabad city, November 1986, involving a male that fell wounded into a house after colliding with an overhead wire (Sankaran *et al.* 1990). However, movements may only be partial and opportunistic, with the species tending to concentrate in those regions where rainfall has been good, and with sporadic occurrences outside this range in both breeding and non-breeding seasons (Goriup and Karpowicz 1985). This assessment is supported by the discovery that birds which usually spend part of the non-breeding period in Rollapadu Bustard Sanctuary, Andhra Pradesh, breed there when rains are poor further north (Sankaran and Manakadan 1990, K. J. Rao 1992); and indeed tribal communities in Andhra Pradesh and Karnataka reported that the species could be seen year-round in appropriate areas in these states but was most often seen in winter, from November and December (Sankaran *et al.* 1990). Ringing recoveries involving 18 of 489 birds suggested that birds were moderately site-faithful, with 10 being in the same area as ringed and the remainder mostly well within a 50 km radius of their ringing site (Dharmakumarsinhji 1950); this however would be expected in years when rainfall was consistent. Although Kinnear (1913) called the species an “uncommon cold weather visitor” to the Bombay area, Ali and Abdulali (1936–1939) listed scattered records from throughout the year. At Velavadar National Park, it tends to arrive “with the first showers”, generally fairly punctually around mid-June (Srivastav and Rana 1998).

Records of it occurring all year round in several areas in the past presumably indicate that sufficiently large areas of habitat then permitted at least some birds to remain in several parts of India, and suggest that with the loss of its grassland habitat its movements to western India may have become more pronounced over the last century. Nevertheless, A. O. Hume (footnote to Butler 1875–1877) indicated that the species spent the “rainy season” in Gujarat and other parts of western India, but past the “cold and dry seasons” in the “central tablelands of the peninsula”. Anderson (1883) recorded its absence during “hot weather” from Bangalore when it was common in north Shimoga district nearly 270 km north-west. Sykes (1832) mentioned that it appeared “in hundreds” in the Deccan seasonally and Stoliczka (1872) reported large numbers arriving in Kutch during the rains.

In Nepal it is considered to be a rare summer visitor, found in the early monsoon between March and July (Inskipp and Inskipp 1983, Couronne and Kovacs 1986, Halberg 1987, White and White 1994, Cox 1998).

THREATS Habitat loss, hunting and failure of monsoon rains appear to have contributed to the large-scale, persistent decline of the species over the past 125 years.

Grassland destruction Changes in land-use pattern over the decades have resulted in a drastic decline in grassland habitat (e.g. in Jamnagar district, Gujarat) (Goriup and Karpowicz 1985). Subdivision, fragmentation and shrinking of the vast expanse of grasslands in north-western India became serious with the change in land act (the Land Ceiling Act) in the early 1970s, when the grasslands held under ownership by landlords and farmers were acquired by government and redistributed among small agrarians (Sankaran 1993). Many of these areas were reclaimed for agriculture to meet the demands of the growing population, and an increase in the number of cattle in the region caused overgrazing of the grassland habitats (Sankaran

1993). In many areas between 40–70% of protected grasslands were lost to agriculture, leased to graziers or ploughed up, a situation that was particularly alarming in privately owned grassland (Sankaran 1995c). Grassland in the Nalliya area of Kutch (one of the most important breeding areas for the species) has been encroached dramatically and illegally by immigrants from Haryana, who are ploughing up “vast tracts of land, in exactly those sites where the floricans were displaying”, causing a huge loss of habitat for both bustards and local herdsmen (Sankaran 2000). In the 1980s Magrath *et al.* (1985) found that the rapid spread of exotic *Prosopis juliflora* posed a serious threat to florican habitat. This problem continues, rendering grasslands poor for both birds and fodder production (Sankaran 2000). Studies of cattle-supporting grasslands in western India showed that rainfall is crucial to breeding success: in good monsoon years grass regrows strongly after grazing, but in drought years it does not, resulting in habitat inadequate for Lesser Floricans to breed (Sankaran 1990, 1991). “Horrendous overgrazing” (B. F. King verbally 1998) is thus blamed as a major factor in eliminating suitable grasslands from much of the historical range of the species. Given its predilection for longer grass varieties, burning of grass “whether by accident, vandalism or as a management tool” is detrimental to Lesser Florican populations (Manakadan and Rahmani 1999). While state-owned grasslands survive relatively intact, privately owned grasslands may have declined in extent by around 50% (presumably since Magrath *et al.* 1985) and grasslands between crops by an even greater margin (Sankaran 2000). This is postulated to have concentrated birds in better protected sites: for example, the Panpura grasslands near Sardarpur traditionally held 2–3 male floricans in a large area because the habitat was suboptimal, but in 1999 the site held up to 15 male floricans, presumably representing an influx from nearby the Chadawad and Dhulat grassland which lost 15–20 males when 70% of suitable “protected” habitat was destroyed (Sankaran 2000). Over 50% of protected grasslands were lost to agriculture, ploughed up or leased to graziers at the Naulakha grasslands within Sailanor Kharmor Sanctuary between 1989 and 1999, and the same rate of loss was recorded in other areas such as Ringnod, Daulatpura and Shikarwadi in western Madhya Pradesh, with further conversion planned (Sankaran 2000). Hazariya has been sold to agriculturists and is therefore expected to disappear in the near future (Sankaran 2000). Alarmingly, on the Malwa plateau (one of the most important breeding areas for the species as it is the least drought-prone) c.50% of privately owned grasslands have been converted to agriculture or leased to grazing in a decade (1989–1999), this being particularly relevant as most grassland habitat on the plateau is privately owned (Sankaran 2000).

Hunting Severe hunting pressure in the last century, in which often the male population could be almost eradicated during a single morning shoot (Hume and Marshall 1879–1881, Anon. 1908, Baker 1921–1930), appears to have affected the species drastically (Sankaran 1993). Because of its delicate flesh and excellent flavour it was the “most esteemed of Indian game-birds” and its pursuit was a “favourite sport” of both native people and colonial sportsmen (Jerdon 1839–1840). Local people in Gujarat commonly trapped the species when it arrived in the monsoon early in the nineteenth century (Fulljames 1837). In 1879, A. O. Hume in Hume and Marshall (1879–1881) wrote that “owing to the un-sportsmanlike manner in which these beautiful birds are massacred during the breeding season, they are everywhere diminishing perceptibly in numbers, and will, in another half century, be, I fear, almost extinct”. This view was later echoed by Barnes (1888–1891), who stated that these birds were “getting scarcer every year, owing to the merciless manner in which they are shot”. The prominence of males during their jumping display leads to the greatest persecution being imposed in the breeding season, a time at which other game-birds enjoy statutory protection (Ali 1954–1955). Baker (1922–1930) remarked that at this time birds were “constantly shot and harassed”. In 1986 it was reported that tribal people in western Madhya Pradesh continue to catch incubating females by throwing a basket or net over them (Sankaran and Rahmani 1986). Hunting with guns and snares continues to be widespread; hunting by local villagers

was encountered in two areas in 1999, and “sport-hunting” by city-dwellers also occurs (Sankaran 2000). The impact of this pressure is unknown.

Drought Unreliable monsoon rains have significantly contributed to the decline in preferred areas (Sankaran 1993, 1994b). For example, severe drought between 1985 and 1987 in north-western India resulted in the species’s low breeding success in most of the areas (Sankaran 1993, 1994b). Although better florican habitat is known to occur in western Madhya Pradesh than in western Gujarat, owing to inadequate rainfall the birds are thought to migrate into the latter area (Sankaran 1993). However, the rapid recovery of the Indian population after a severe reduction in numbers during drought years in the 1980s reveals that the species is capable of building up numbers very quickly as long as sufficient area of habitat is available (A. R. Rahmani *in litt.* 1999).

Pollution Being primarily insectivorous, the species is presumably susceptible to the large quantities of pesticides that are liberally applied to cultivation in the Indian subcontinent, but the extent or effects of this threat are unknown (Sankaran 2000).

Collision with overhead wires A female seen in Andhra Pradesh flew into overhead wires, scattering feathers, and another fell into a garden in Hyderabad city after a similar mishap (Pittie *et al.* 1998). It is possible that the proliferation of electrical wires over the Indian countryside has played a role in reducing populations of this species.

Natural predators Lesser Floricans are wary of falcons, kites and harriers, with reports of predation by Bonelli’s Eagle *Hieraaetus fasciatus* and, possibly, Eagle Owl *Bubo bubo* (Sankaran and Rahmani 1986).

MEASURES TAKEN The Lesser Florican has been the subject of conservation attention for almost 20 years.

Statutory protection The species is protected under Schedule I of the Wildlife (Protection) Act 1972, and its hunting or trapping is prohibited in India (Sankaran 1990). Florican chowkidars (watchers) were appointed by paying a stipend between July and September in western Madhya Pradesh to prevent hunting of the species and to keep track of immigrating birds (Sankaran 1994b).

Conservation-oriented research A symposium arranged by TWSI in 1980 brought together a wide range of Indian biologists and conservationists to present evidence on the modern status and needs of bustards in India (Goriup and Vardhan 1983). Fieldwork on the ecology and distribution of the Lesser Florican was undertaken by the Bombay Natural History Society in the 1980s (see references at the head of Distribution: India). The Florican Watch initiative has helped gather data on the local movements and numbers of the species (Sankaran 1994b).

Protected areas Rajasthan In 1983, the state government declared an area at Gagwana bounded by Ajmer, Narwar, Salemabad and Kisangarh to protect the breeding of the species and banned hunting for the next ten years (Vardhan 1985). The Lesser Florican also occurs in the Sonkhaliya Bustard Closed Area (see Distribution). **Madhya Pradesh** The state government declared an area near Mandsaur as the Sardarpur Florican Sanctuary and offered a reward of Rs.250 for any farmer reporting the occurrence of the species in his cropfields (Vardhan 1985). The species also occurs in Sailana Kharmor Sanctuary (Sankaran 1990). **Gujarat** Velavadar Blackbuck National Park regularly hosts a few birds every year (Sankaran and Rahmani 1990a) and indeed up to 40 males were observed on occasion in the late 1990s (A. R. Rahmani *in litt.* 1999). **Andhra Pradesh** Rollapadu Bustard Sanctuary (6.14 km²) hosts the species and, apparently when rains are poor in the north-west of the subcontinent, it breeds there (Sankaran and Manakadan 1990, K. J. Rao 1992, Manakadan and Rahmani 1999).

Habitat management Grass production Natural grasslands in western India are managed in varying ways to produce fodder for cattle: partially grazed grasslands (PGG) are grazed in the 4–6 weeks after the onset of the monsoon, then protected for 12–16 weeks to produce hay and then are further grazed; seasonally protected grasslands (SPG) are grazed between the

grass harvest and the start of the next monsoon; and totally protected grasslands (TPG) are not allowed to be grazed at all (Sankaran 1990). The Indian Forest Department has recently begun eradication programmes for *Prosopis juliflora* in Rajasthan, an action likely to raise both local florican numbers and the fodder output of production grasslands (Sankaran 2000a). *Species-specific* In December 1994, a workshop was held in Baroda, Gujarat, and a conservation strategy was drawn up including management recommendations for fodder-producing grasslands, to encourage government to increase the area of protected grasslands, and to involve NGOs and individuals in florican protection on privately owned lands through the “Florican Watch” project (Sankaran 1995c). Creation of a cattle camp in Ratlam district (near Sailana Kharmor Sanctuary), Madhya Pradesh, by the Forest Department, wherein more than 600 head of cattle were stall-fed, resulted in a decreased grazing pressure on the grassland habitat and also helped in a significant rejuvenation of vegetation in florican habitat (Sankaran 1994b).

Local action groups and awareness campaigning “Florican Watch” groups were proposed with a mandate to conserve the Lesser Florican and educate people by: identifying areas important for the species and making an inventory of protected grasslands in each area (district), identifying and motivating individuals at village level for protecting the species locally, and educating people on conservation and sustainable use of grasslands (Anon. undated). The recommended structure of Florican Watch was to have an advisory committee, a programme coordinator, district-level Florican Watch group (8–10 members) and a village-level Florican Watch group (1–2 members) (Anon. undated). This initiative, established in the early 1990s as a network of local enthusiasts and supporters, has been instrumental in creating a widespread awareness programme (Sankaran 1995c). A poster in local languages heralding the need for florican conservation has been widely circulated and a series of articles has appeared in newspapers local languages (Sankaran 1995c).

MEASURES PROPOSED *Site protection* Owing to the erratic distribution of rainfall, it is necessary to protect many grasslands within the species’s breeding range, so that the birds can migrate to grassland areas which have received optimum rainfall (Sankaran 1993). As a part of a long-term action plan it was recommended that overgrazed and unprotected land be identified and a network of grasslands established (Sankaran 1993). Following a workshop in July 1996 in Kota, Rajasthan, several sites in Rajasthan were identified for intensive conservation action (Sankaran 1997b).

Control of hunting “Stringent game laws, rigidly and impartially enforced” (Barnes 1888–1891) and “rigid protection” (Baker 1922–1930) were deemed necessary to stem declines in this species caused by excessive hunting, particularly during the breeding season. These recommendations, though even more desperately relevant at the outset of the twenty-first century, have never been properly implemented. Hunting of the species must be strictly banned at all times, and especially during the breeding season (Ali 1954–1955), and heavy penalties enforced for violators.

Creation and management of “ecologically viable grasslands” The conservation of the Lesser Florican is by no means an issue in which a single species is in conflict with modern human land use –quite the reverse: as Sankaran (1995b) wrote, “without a long-term development policy to restore degraded grasslands to fodder-producing lands, the future of animal husbandry, and of the species of fauna and flora that depend on this habitat in western India, is bleak... What makes the Lesser Florican so special, and a symbol of this need for long-term planning, is that its conservation needs coincide with human needs”. To be viable for both human and wildlife needs, grasslands must be managed according to clear principles, as follows: (1) grazing should be prevented throughout the year, or where this is impossible it should be limited to between 15 June and the hay harvest; (2) the hay harvest should begin at the start of November, and never before 15 October, and should be undertaken in a patchwork manner to allow adequate cover (Sankaran and Rahmani 1990b). To oversee

these practices, and to extend the cover under such a regime, a special division (“Grassland Corporation”) of the Forest Department should be established (Sankaran and Rahmani 1990b). Non-reserved or unprotected grasslands under public ownership should be upgraded to reserved status and protected for its hay produce, and overgrazed land—particularly areas over 100 ha—should be brought into this scheme; current (in 1980s) emphasis on use of public land for plantations should be reversed and fodder-generating grasslands reinstated as the most economically *and* ecologically viable land use; cattle camps, used largely as a relief measure during droughts, should be expanded as a mandatory feature of rural development, reducing indiscriminate grazing pressure; fodder development schemes that employ pesticides, fertilisers, planting and seeding should be strictly avoided; a target of 8,000–10,000 ha of fodder-producing areas per district should be set aside as a means of making western India self-sufficient in fodder (Sankaran and Rahmani 1990b). A fuller review of the targets involved in this initiative was published as an action plan (Anon. undated).

Policy and practice changes Since grass is a valuable source of fodder to cattle, it is recommended to adopt stall-fed cattle-rearing rather than free-grazing of grasslands for an efficient and sustainable way of utilising grassland habitats (Sankaran 1993). Anon. (undated) recommended the following as a part of the action plan: formulation and imposition of a National Grazing Plan to ensure sustainable use of grasslands; a total ban on planting *P. juliflora* in all grassland habitats, the Revenue Department and *gram panchayats* to bear responsibility in the development of fodder-producing grasslands; development of grass-growers’ cooperatives on lines similar to the existing tree-growers’ associations; and encouragement of the Department of Animal Husbandry to implement schemes that promote the concept of fewer but better-quality livestock, particularly in areas which have protected grasslands, to reduce grazing pressure.

Local management involvement So that villagers can benefit from fodder resources present in their areas, greater participation of people in grassland management is needed, along with steps to prevent encroachment of community-grazing lands (Anon. undated). With a view to promoting the participation of people in grassland restoration, conservation and management, it is recommended that cooperative societies should be formed in each village (a) to manage surrounding grassland, handing over waste land to village cooperatives for fodder-producing grasslands, giving the responsibility of grass production to local people and offering suitable remuneration for doing so, and (b) to ensure that the large grassland areas that come under private ownership are not fragmented (Anon. undated).

Awareness campaigns Anon. (undated) also called for creating awareness among villagers in areas where the species occurs through: screening audio-visuals (films and video programmes) on grassland management and florican conservation, especially in areas where grasslands exist or where grasslands are being developed; and implementing special education programmes on similar themes in schools for both students and teachers.

Research It is essential to establish as clearly as possible where the species spends the non-breeding period (Ali *et al.* 1986). It is possible that satellite transmitters will soon be small enough to be fitted to breeding birds in north-west India, and their movements followed over one or more non-breeding cycles. Moreover, it is important to survey many more areas of Rajasthan, Maharashtra, Madhya Pradesh, Andhra Pradesh and Karnataka.

REMARKS (1) One specimen is on record as shot at Sandoway, Arakan, Myanmar (*Bengal Sporting Magazine* September 1835: 151; and thereafter Anon. 1850, Symons 1909b), a fact that seems highly unlikely, but given that the locals had never “seen a bird of the kind before” it might just have been a vagrant (and was presumably either this species or Bengal Florican *Houbaropsis bengalensis*, a species that also lacks a confirmed record for Myanmar). (2) Several towns of this name exist in West Bengal and Orissa but apparently none in the area once covered by the United Provinces.