

JAVA SPARROW

Padda oryzivora

Critical —

Endangered —

Vulnerable A1a,c,d; A2c,d; C1



The popularity of this finch as a cagebird has resulted (and unless stringent action is taken, will continue to result) in a rapid decline in its population and range as a consequence of intense trapping activity, such that it qualifies as Vulnerable.

DISTRIBUTION The Java Sparrow was originally native to Java and Bali, Indonesia (Rensch 1931a, Chasen 1935), and almost certainly also Madura, where no collections were made until the 1970s (SvB). Sumatra (Robinson in Kuroda 1933–1936) and Bawean (Clement *et al.* 1993) have been included in its native range, but the species was undoubtedly introduced to Sumatra, and, apparently in 1802, to Bawean (Alting Siberg 1846, Vorderman 1892a, Hoogerwerf 1966–1967, van Marle and Voous 1988). Rensch (1931a) regarded the rarity of the species of Lombok and Sumbawa as a sign that it had been introduced there, although the fact that its closest relative and only congener, the Timor Sparrow *Padda fuscata* (see relevant account), inhabits Timor raises the question of whether the Java Sparrow at one time possessed a natural range in certain western islands in the Lesser Sundas. Coates and Bishop (1997) rejected a report of the species from the Moluccas.

The Java Sparrow is one of very few globally threatened species which has actually expanded its range, and probably the only one which has *greatly* expanded its range, since it is now established in many parts of the world. It has become naturalised in (*Asia*) China (mainland, Hong Kong, Taiwan), Japan, Vietnam, Peninsular Malaysia including Penang island, Singapore, Borneo (Malaysia, Indonesia, Brunei; more details below), Sumatra (more details below), Sulawesi (more details below), the Moluccas and Lesser Sundas (Indonesia), Christmas and Cocos-Keeling Islands (Australia), Philippines (at least nine islands: Collar *et al.* 1999: 501), Thailand, Myanmar and Sri Lanka; (*Africa*) Tanzania including Zanzibar and Pemba islands; (*Atlantic*) St Helena; (*North America*) Florida (USA), Puerto Rico; (*Pacific*) Fiji, Hawaiian Islands (Long 1981, Lever 1987). It was introduced around 1750 to Mauritius, and became a pest there, but was eventually exterminated by mass onslaught, a diminution in the food supply, and the cyclone of 1892; other places where it was introduced but died out include the Comoro Islands, Seychelles, India, Australia and possibly New Zealand (Long 1981, Lever 1987). In addition to these records, there are specimens of birds from Senegal (in IRSNB), Egypt (in AMNH, BMNH), South Africa (in MCZ) and Venezuela (in BMNH).

In the following account, information is included on the non-native range within the Indonesian archipelago plus Borneo, but it remains divided up by native and non-native ranges. Only localities in the original natural (“native”) range have been mapped, and its conservation status has been assessed on the basis of this native range only, irrespective of its range or abundance elsewhere (in accordance with the rules in IUCN SSC 1994).

■ **INDONESIA** (*native range*) The species is known from the islands of Java, Madura and Bali, with records as follows:

Java ■ **West Java** **Pulau Jaga Utara** (=Noordwachter Island), Jakarta Bay, undated (Vorderman 1895a); **Pulau Payung**, Seribu Island, undated (Bartels 1908); **Ujung Kulon National Park** on the Cigenter pasture, July 1955 (Hoogerwerf 1969–1971); **Labuan**, undated (Hoogerwerf 1948a); **Lebak Gede**, Bandung, April 1920 (eggs in RMNH); **Ujungtebu**, 300 m, Gunung Karang, Serang, April 1920 (Robinson and Kloss 1924b; male in BMNH); **Pulau**

Dua (or at least in adjacent land), Serang, undated (Hoogerwerf 1948a, Milton and Marhadi 1985); **Cikepuh**, Sukabumi, April 1986 (SvB); **Cimaja**, 1913 (two females in RMNH); **Pelabuhanratu** (including Wijnkooops Bay), Sukabumi, from 1880s well into the twentieth century (Vorderman 1887, Bartels 1902, 1906, Robinson and Kloss 1924b, Hoogerwerf 1948a); **Cidadap**, Cimandiri estuary, March 1927 (eggs in RMNH; also Bartels 1915–1930); **Gobang**, 1946–1949 (Mees 1946–1949); **Gunung Masigit**, 1920, 1922 (two specimens in RMNH); **Pasir Gaok**, 10 km west-north-west of Bogor, 1924 (female in RMNH); **Jampang**, Sukabumi, c.1900 (Bartels 1902, 1906); **Gadog**, Bogor, undated (Bernstein 1860–1861); **Ciomas**, northern slopes of Gunung Salak, where common, undated (Hoogerwerf 1948a); **Sukamaju**, July 1922 (eggs in RMNH); **Bogor**, throughout the twentieth century (van Oort 1910, Snouckaert von Schauburg 1926, Sody 1927, Rensch 1931a, Kuroda 1933–1936, Berlioz 1935, Hoogerwerf and Siccama 1937–1938, Hoogerwerf 1948a, 1950, Mees 1946–1949, Diamond *et al.* 1987, SvB), but see Population; **Cijeruk**, Bogor, August 1928 (two females in MZB); **Cicurug**, Sukabumi county, undated (Vorderman 1886), March 1910 (female in MZB); **Jakarta**, from around 1880 to around 1950, possibly later (Nicholson 1881, Vorderman 1882–1885, van Oort 1910, Hoogerwerf and Siccama 1937–1938, Mees 1946–1949); **Pasir Kananga**, 1906 (male in RMNH); **Depok** (see Remarks 1), July 1909 (specimen in MCZ); **Caringin**, 1901 (six specimens in RMNH); **Cibening**, 1911 (male in RMNH); **Sukabumi**, May 1929 (Kuroda 1933–1936); **Cimungkat** surroundings, Gunung Pangrango, Sukabumi, 1905–1908 and later (nine specimens in RMNH; Hoogerwerf 1948a); **Muara Bungin**, Karawang, 1927 (male in RMNH); **Cibarusa**, 1946–1949 (Mees 1946–1949); **Cianjur**, 1946–1949 (Mees 1946–1949); **Batujaya**, 1946–1949 (Mees 1946–1949); **Kedunggede**, 1946–1949 (Mees 1946–1949); **Cihea**, 1923 (three specimens in RMNH); **Cibungur**, May 1898 (eggs in RMNH); **Ciheulang**, Sukabumi, 1900s (Bartels 1902, 1906); **Cikalong**, near Banjaran, undated (specimens in RMNH); **Curug Cijalu**, Subang, October 1998 (YPAL *in litt.* 1999); **Banjaran**, 1910 (specimens in RMNH); **Bandung**, 750 m, 1921 (eggs in RMNH), 1955 (specimen in RMNH), but not found during a nine-month bird study in 1977–1978 around Bandung (van Helvoort 1981); **Gunung Papandayan**, 1,500 m, undated (Stresemann 1930a, Hoogerwerf 1948a); **Cikajang**, July 1918 (eggs in RMNH); **Garut**, Gunung Guntur, October 1900 (two specimens in AMNH), 700 m, 1929–1931 (four specimens and June eggs in RMNH; also Berlioz 1935); **Ngamplang**, Garut, May 1929 (Kuroda 1930, 1933a); **Tanjung**, Banyuresmi, Gunung Guntur, November 1998 and June 1999 (YPAL *in litt.* 1999); Tasik Malaya (“**Marai**”), Garut county, May 1929 (Kuroda 1930); **Carui**, 1946–1949 (Mees 1946–1949); **Banjar**, Ciamis, 1905 (male, female in RMNH); **Cirebon**, 1925 (five specimens in RMNH); **Pangandaran**, June 1921 (eggs in RMNH); ■ **Central Java Brebes**, Tegal county, 1910 (three specimens in RMNH, ZMA); **Karangbolong**, Kebumen, 30 m, February 1920 (Robinson and Kloss 1924b, three specimens in NRM, ZRCNUS); **Kutoarjo** town, Purworejo, June 1979 (SvB); **Purworejo**, 1925 (eggs in RMNH); **Godean** at Sidoarum and Sendang Sari, 1999 (Aji *et al.* 1999); **Yogyakarta** city, 1930s (Berlioz 1935), and at the Palace of the Sultan, July 1979 (SvB); **Depok** including Babarsari, Nologaten and Catur Tunggal, January and February 1999 (Aji *et al.* 1999); **Semarang**, Semarang, 1938–1939 (50 specimens in MZB, two in FMNH); **Gedangan**, 1930–1932 (11 specimens, eggs in MZB, RMNH); **Kalasan Temple** (Candi Kalasan) and Sari Temple, 1999 (Aji *et al.* 1999); **Prambanan** (temple complex, including Roro Jonggrang, Ijo and Barong temples) near Yogyakarta, around 1930 (Kuroda 1933–1936), July 1988 (Richards and Richards 1988), 68 birds in 1998 (Aji 1998, Aji *et al.* 1999), October 1999 (YPAL *in litt.* 1999); **Jepara**, Kudus, undated (Kuroda 1933–1936); **Gunung Kidul** at Ngungap, Rongkop, 1997, and at Slawu Cave (Melikan), Song Banyu and Pulau Gelatik (Jepitu), 1999 (Aji *et al.* 1999); **Cilegong**, Jepara, Kudus, December 1928 (two specimens in MZB); **Paliyan** at Kanogoro village, Yogyakarta, 1999 (Aji *et al.* 1999); **Panggung** at Giri Karto village, Yogyakarta, 1999 (Aji *et al.* 1999); **Tepus** at Purwodadi village, Yogyakarta, 1999 (Aji *et al.* 1999); **Solo**, Solo county, November 1886 (Whitehead 1893), September and October 1939 (59 specimens in MZB);

Gajah Mungkur reservoir, Wonosobo, one of the commonest birds in 1982 (Whitten *et al.* 1996); ■ **East Java Padangan**, April 1926 (male in MZB); **Kediri** county, 1900s (Bartels 1902, 1906); **Wonosalem**, undated (see Remarks 2), Jombang, undated (Vorderman 1892b); **Gunung Arjuno** at Prigen, April 1890 (male in NHMW); **Manyar**, April 1931 (eggs in RMNH); **Malang**, former agricultural academy campus woodland, several years up to 1999 (*Suara Satwa* 3 [4]: 14–15), regency offices, August 1999 (YPAL *in litt.* 1999); **Gondang Legi**, 20 km south of Malang, flocks of 50+, 1996 (Nursahid *per* YPAL *in litt.* 1999); **Gresik** town, Surabaya county, including “Karkglotten”, June 1929 (Kuroda 1933–1936; see Remarks 3); **Surabaya**, Surabaya, most recently including the zoo, from 1890s down to at least 1991 (59 specimens in MZB, RMNH; Bartels 1902, 1906, Koningsberger 1901–1909, Kuroda 1930, Heath 1991); **Bangil**, Pasuruan, June 1929 (Kuroda 1933–1936); **Dampar**, undated (eggs in RMNH); **Meru Betiri National Park** at Rajewesi, Banyuwangi, April 1981 and August 1986 (SvB); **Klatakan**, 1941 (female in RMNH); **Gunung Raung** at Sumberwringin, Besuki county, 1917 (five specimens in RMNH); **Baluran National Park**, Banyuwangi, 1980–1999 (SvB, Richards and Richards 1988, Heath 1991, Tobias and Phelps 1994, N. Bostock *in litt.* 1999), formerly common, including flocks of over 100 around 1990, but now very easy to miss there (JAT, B. F. King verbally 1998); **Bajulmati**, Banyuwangi, 30 m, January 1920 (Robinson and Kloss 1924b, four specimens in BMNH, ZRCNUS);

Madura Batang-Batang, April 1970 (male in MZB);

Bali generally throughout the fields of the island below 600 m, with specific records from **Bali Barat National Park** at Makam Jayaprana, Teluk Terima, Banyuwedang, north-west and north-east Prapat Agung, 1979–1994 (SvB; also Ash 1982, 1984); **Candikusuma**, April 1932 (Dupond 1942); coastal west Bali in park-like primary forest in **Negara** county, May 1925 (von Plessen 1926b); **Tanahlot**, Tabanan, April 1981 (SvB); **Ulu Watu**, Badung, March 1982 (Ash 1982); **Buleleng**, February 1911 (Stresemann 1913), May 1929 (Kuroda 1930, 1932), and (flock of 40), February 1999 (I. Mauro *in litt.* 1999); **Wangaya Gede**, April and June 1982 (Ash 1982); **Gitgit**, 500 m, August 1927 (Rensch 1930, 1931a); **Petitenget**, April 1982 (Ash 1982); **Kerobokan**, Badung, July 1999 (YPAL *in litt.* 1999); **Suwung**, Badung, April–October 1982 (Ash 1982); **Abian Base**, Badung, July 1999 (YPAL *in litt.* 1999); **Kuta**, March 1938 (four specimens in RMNH); **Denpasar** at the Bali Beach Hotel (flock of 60), September 1982 (NJC) and in Jalan Cokroaminoto, August 1999 (YPAL *in litt.* 1999); Temple Merun (untraced), March 1997, 20–25 birds breeding in the temple buildings (D. R. Dann *in litt.* 1999); **Pesanggaran**, Badung, small colony in mangroves with new fledged juvenile in June 1982 (Ash 1982); **Nusa Dua**, Badung, August 1982 (Ash 1982); **Ubud**, Gianyar, into 1980s (Mason 1985); **Sukawati**, Gianyar, August 1999 (YPAL *in litt.* 1999); **Padangbai**, Karangasem, June 1982 (Ash 1982); **Amed**, at sea-level, Karangasem, October 1982 (Ash 1982).

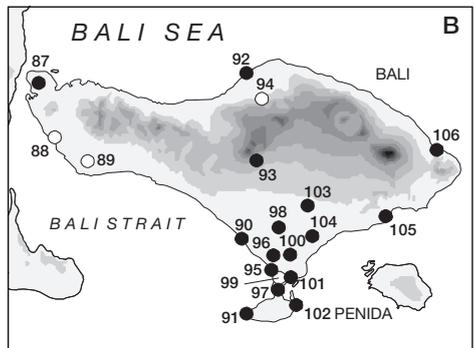
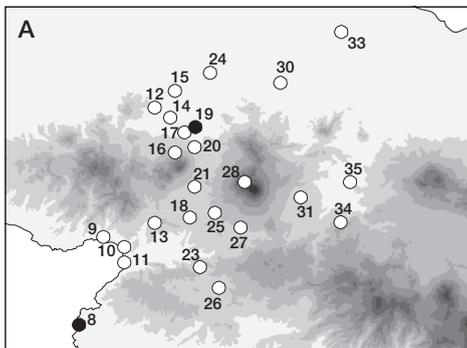
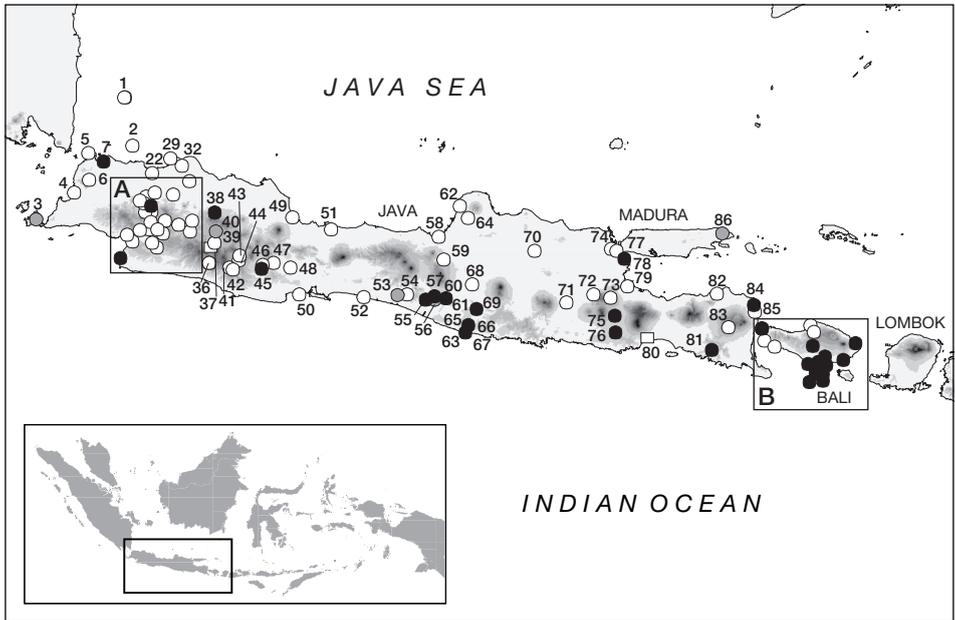
Untraced records on Java include: **Bantar Gadung**, Sungai Mandiri, October 1909 (female in MCZ); **Candibaru**, Semarang, where very common around 1930 (Kuroda 1930, 1933a); **Cibogoh**, 1905 (seven specimens in RMNH); **Ciburial**, south of Cikepuh, July 1999 (YPAL *in litt.* 1999); **Pondoktisuk**, 1925 (female in RMNH).

Indonesian records (*non-native range*) (arranged alphabetically within islands) include:

Kalimantan “only... very local... confined to the south (Amuntai, Binuang and Lupak Dalam), and... no reports of large flocks” (Holmes and Burton 1987); **Banjarmasin**, 1850s in thousands (Mottley and Sclater 1863, Everett 1889, Smythies 1981); **Barabai**, at “Kamp. Pagat”, June 1882 (Kutter 1885); **Sungai Negara** at Lampihong, January 1989 (van Balen and Prentice 1997, Holmes 1997);

Riau Archipelago Pulau Bulan, April 1924 (Gibson-Hill 1952b);

Sumatra Deli, 1880s, where fairly common (Hagen 1890, Hartert 1902a), including the Polonia Estate (specimens in AMNH); **Galang**, June 1938 (four males in ZRCNUS); near **Kotaagung**, 1976 but not 1992–1994 (Holmes 1996); **Labuhanmaringgai**, 1976 but not 1992–



The distribution of Java Sparrow *Padda oryzivora*: (1) Pulau Jaga Utara; (2) Pulau Payung; (3) Ujung Kulon National Park; (4) Labuan; (5) Lebak Gede; (6) Ujungtebu; (7) Pulau Dua; (8) Cikepuh; (9) Cimaja; (10) Pelabuhanratu; (11) Cidadap; (12) Gobang; (13) Gunung Masigit; (14) Pasir Gaok; (15) Jampang; (16) Gadog; (17) Ciomas; (18) Sukamaju; (19) Bogor; (20) Cijeruk; (21) Cicurug; (22) Jakarta; (23) Pasir Kananga; (24) Depok; (25) Caringin; (26) Cibening; (27) Sukabumi; (28) Cimungkat; (29) Muara Bungin; (30) Cibarusia; (31) Cianjur; (32) Batujaya; (33) Kedunggede; (34) Cihea; (35) Cibungur; (36) Ciheulang; (37) Cikalong; (38) Curug Cijalu; (39) Banjaran; (40) Bandung; (41) Gunung Papandayan; (42) Cikajang; (43) Garut; (44) Ngamplang; (45) Tanjung; (46) Marai; (47) Carui; (48) Banjar; (49) Cirebon; (50) Pangandaran; (51) Brebes; (52) Karangbolong; (53) Kutoarjo; (54) Purworejo; (55) Godean; (56) Yogyakarta; (57) Depok; (58) Semarang; (59) Gedangan; (60) Kalasan Temple; (61) Prambanan; (62) Jepara; (63) Gunung Kidul; (64) Cilegong; (65) Paliyan; (66) Panggang; (67) Tepus; (68) Solo; (69) Gajah Mungkur reservoir; (70) Padangan; (71) Kediri; (72) Wonosalem; (73) Gunung Arjuno; (74) Manyar; (75) Malang; (76) Gondang Legi; (77) Gresik; (78) Surabaya; (79) Bangil; (80) Dampar; (81) Meru Betiri National Park; (82) Klatakan; (83) Gunung Raung; (84) Baluran National Park; (85) Bajulmati; (86) Batang Batang; (87) Bali Barat National Park; (88) Candikusuma; (89) Negara; (90) Tanahlot; (91) Ulu Watu; (92) Buleleng; (93) Wangaya Gede; (94) Gitgit; (95) Petitenget; (96) Kerobokan; (97) Suwung; (98) Abian Base; (99) Kuta; (100) Denpasar; (101) Pesanggaran; (102) Nusa Dua; (103) Ubud; (104) Sukawati; (105) Padangbai; (106) Amed.

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

1994 (Holmes 1996); Medan, 1907 (male in SMNS); around Padang, since nineteenth century and still present in 1981 (van Marle and Voous 1988); Payakumbuh, Padang Highlands, February 1979 (van Marle and Voous 1988); Tanjungmorawa, Serdang, June 1917 (Robinson and Kloss 1919b); Way Lima (Wai Limau), undated (Kloss 1931); unspecified locality in Bengkulu, 1910s (Robinson and Kloss 1924a); several unspecified sites in the floodplains of South Sumatra, 1989 (Verheugt *et al.* 1993, Holmes 1996);

Bawean Batulintang, 200–500 m, June 1954 (female in MZB; Hoogerwerf 1966–1967); Muara, June 1954 (Hoogerwerf 1966–1967); only on the south coast in 1954 (Hoogerwerf 1966–1967) at Tanjung Alang-alang, sea-level, 1954 (four specimens in MZB);

Belitung recorded with no precise locality, mid-1930s (Chasen 1937);

Kangean Arjasa, May 1892 (specimen in MZB; also Vorderman 1893), along with the islands of Sapudi and Sepeken, May 1892 (Vorderman 1892b, 1893);

Sulawesi a “feral population” between Jeneponto and Parepare, 1976–1979 (Andrew and Holmes 1990; see Remarks 4); Makassar (Ujung Pandang), October 1871 (Meyer 1879), June 1895 (Meyer and Wigglesworth 1896), 1940s (Coomans de Ruiter and Maurenbrecher 1948); Menado, March 1871 (Meyer 1879, Meyer and Wigglesworth 1898), and currently (Coates and Bishop 1997, C. Donald *in litt.* 1999); Palu valley, 1981–1992, but none found in July–August 1999 (K. D. Bishop *in litt.* 2000); Parepare, 1940s (Coomans de Ruiter and Maurenbrecher 1948, Coomans de Ruiter 1951), and now evidently well established in the area (Coates and Bishop 1997); Segeri, September 1871 (Meyer 1879, Meyer and Wigglesworth 1898); head of Teluk Bone currently (Coates and Bishop 1997);

Lombok Ekas, sea-level, 1927 (Rensch 1931a); Narmada, sea-level, March 1927 (Rensch 1931a); Sewela (Swela), 400 m, 1927 (Rensch 1931a);

Sumbawa Batu Tering, May 1988 (Johnstone *et al.* 1996); Bima, sea-level, June 1927 (Rensch 1931a); Sumbawa Besar, sea-level, April 1927 (Rensch 1931a), May 1988 (Johnstone *et al.* 1996);

Flores liberated in 1926 but apparently unsuccessfully (Rensch 1931a).

A record from Bangka is regarded as probably in error (van Marle and Voous 1988). A report from the Moluccas is judged to have related to Ambon (White and Bruce 1986).

Outside of Indonesia but within the Indonesian archipelago (*non-native range*) the species occurs in various parts of Borneo, thus:

Malaysia *Sabah* Labuan, where introduced to the island apparently in the 1860s or early 1870s and by the end of the 1870s “in prodigious numbers” (Sharpe 1879b) such that it was seriously damaging local rice-crops (Sharpe and Whitehead 1889–1890); Jesselton and Tuaran, 1960s (Gore 1968); seven on Kota Kinabalu race course, March 1984 (Smith 1984); Tanjung Aru at the Beach Hotel, outside Kota Kinabalu, July 1987 (N. J. Redman *in litt.* 2000);

Sarawak Baram district, May 1896 and May 1897 (two specimens in BMNH); Kuching, where birds were liberated at various times, including 200 in 1940, the species multiplying in numbers in 1949 (Harrisson 1950) but not continuing to do so (Harrisson 1951), but breeding in December 1964 and January–February 1965 (Fogden 1965);

Brunei Bandar Seri Begawan, 1950s–1970s at least (Smythies 1955, 1981); Berakas, Lumapas and Mentiri, undated (Mann *in prep.*); Binturan, June 1984 (Counsell 1986); Jerudong, March 1974 (Smith 1977), June 1984 (Counsell 1986); Seria, June 1984 (Counsell 1986); Sinaut, October 1973 (Smith 1977); widespread (Mann 1987) and likely to be found “in any padi-growing or scrub area” (Kidd 1978); Wasan, ricefields, 1989 and 1994 (M. J. Seal Coon *in litt.* 1999).

POPULATION The Java Sparrow has undergone a cataclysmic collapse in numbers within its native range. Irrespective of how numerous it may be elsewhere in its introduced populations, it is now an extremely rare bird within its original range.

Native Indonesian range Java (historical evidence) In the nineteenth century, Vorderman (1887) observed it everywhere at Pelabuhanratu and along the sea coast (where no Tree Sparrows *Passer montanus* were yet present). The species used to gather to roost in thickly foliated trees of certain towns, forming “flocks of thousands” (Sharpe and Whitehead 1889–1890); immense flocks used to roost every night in some large trees close to the hotel in Solo, Central Java (Whitehead 1893). Kuroda (1930, 1933a) reported that it was less numerous in West than in Central and East Java, where it was often seen in flocks of considerable size. However, it used to be abundant on the outskirts of Jakarta (Hoogerwerf and Siccama 1937–1938). It was very common at Jampang and Ciheulang (Bartels 1902, 1906) and Ngemplang (Kuroda 1930, 1933a). In 1919 one collector reported it scarce in Bogor but extremely abundant in Banten (ZMA label data). On a visit to Java, apparently in the early 1930s, one observer found the species abundant at every locality visited, in farms, gardens and settlements, at times surpassing the Tree Sparrow in numbers (Berlioz 1935). Hoogerwerf (1969–1971) described it as “one of the most common species in the cultivated parts of Java, up to at least 1,500 m”, although also noting that local populations show “great fluctuations” apparently related to the raiding of standing crops and storage yards. It was probably fluctuations of this sort that led Bartels (1915–1930) to record its disappearance from a number of ricefields in West Java in the years before 1929. The large flocks found between March and August consist mainly of juvenile birds (Hoogerwerf and Siccama 1937–1938). **Java (modern evidence)** The species has now disappeared from around Jakarta, and there are no recent reports of very large roosts; inquiries of local people throughout the island (also Madura and Bali) have revealed that the species used to be common or very common, but that it is hardly seen nowadays (SvB). Similar complaints are heard from visiting birdwatchers, who only find it, if at all, in Baluran and/or Bali Barat National Parks (e.g. Richards and Richards 1988, Tobias and Phelps 1994, B. F. King verbally 1998), but even in Baluran the flocks of 50–100, which were a regular feature of dry acacia woodland and waterholes near the park headquarters in the period 1981–1995, are no longer to be seen and indeed the species appeared to be missing entirely in July 1999 (K. D. Bishop *in litt.* 2000). Similarly it used to be predictable on visits to or near the Bogor Botanic Gardens, 1980–1994, but since then none has been seen (K. D. Bishop *in litt.* 2000). **Bali** Formerly it was very common on Bali, often in flocks of several hundreds (Stresemann 1913, von Plessen 1926b), but it has greatly declined, and by the start of the 1980s it was uncommon in the north-west, locally common in the south-east, still with as many as 300 on ricefields at Suwung in October 1982 (Ash 1982). More recent investigations have revealed a further reduction in abundance (see above under Java: Modern evidence), and one observer who found it sufficiently common, 1981–1995, to keep no detailed records was unable to find a single bird in 1998 or 1999 (K. D. Bishop *in litt.* 2000).

Non-native Indonesian range Sumatra The species does not appear ever to have been abundant on Sumatra: Berlioz (1935) seemed to miss it on his 1930s visit, and this and other evidence suggests that it can never have been anywhere near as common as it once was on Java. Nevertheless, in a recent review it was noted that a “drastic decline” had occurred in the introduced populations, “possibly because of excessive capture for the bird trade” (Holmes 1996). **Sulawesi** Andrew and Holmes (1990) referred to the island’s introduced population being extant in South Sulawesi, seeming to imply that it was formerly more widespread. Meyer (1879) found it “plentiful” in South Sulawesi but rare at Menado. Most recently it has been described as generally uncommon and local, but locally common, in the South (Coates and Bishop 1997). **Lombok** Rensch (1931a) found birds only singly or in pairs in cultivated areas in 1927, and judged them rather rare. Recently the species has been described as uncommon and local on the island (Coates and Bishop 1997). **Sumbawa** Rensch (1931a) found birds only singly or in pairs in cultivated areas in 1927, and judged them rather rare. The species was “uncommon” on the island in 1988, when the only three records involved

groups of six, four and “several” (Johnstone *et al.* 1996). Recently the species has been described as uncommon and local on the island (Coates and Bishop 1997). *Kalimantan* In south-east Borneo, around Banjarmasin, the species was “rather common” in the 1850s, descending on ricefields “in vast flocks” and taken “in thousands” for food (Mottley and Selater 1863). It was, however, noted that after a century it had “failed to overrun the rest of Borneo as might have been expected” (Smythies 1955), and “nowhere else does it seem to have become abundant” (Smythies 1981).

ECOLOGY *Habitat Within natural range* The Java Sparrow is a lowland species (Whitehead 1893, Bartels 1915–1930), chiefly found at 0–500 m (Rensch 1931a) but occasionally reaching 1,500 m in West Java (Stresemann 1930a). It is perhaps best characterised as a bird of woodland edge where it borders open cultivated areas (Mughtar and Nurwatha 1999, YPAL *in litt.* 1999). It occupies open woodlands especially in rice-growing areas (SvB) and commonly in cultivated land (Bernstein 1860–1861), but also grassy areas with no rice, sometimes remote from human activity, when birds prove to be much shier (Bartels 1915–1930), sometimes near fishponds and even, in very small numbers, in mangroves (Hoogerwerf and Siccama 1937–1938). Specimens from Padangan and Gedangan, Central Java, were collected in teak forest (RMNH label data). On Bali the species similarly uses open woodland (park-like primary forest) and tree savanna, mangroves, beach forest, secondary growth in farmland, occasionally to mid-altitudes at 830 m (Stresemann 1913, Ash 1982, B. van Helvoort verbally 1987, Mughtar and Nurwatha 1999). *Outside natural range* Birds seem to occupy the same type of man-modified landscapes as on Java and Bali, but have been found in rubber and fruit plantations, Negara river basin, Kalimantan, 1989 (van Balen and Prentice 1989). In Wallacea birds are often found near human habitations, and in cultivation, gardens, ricefields, areas of scrub with scattered trees, and mangroves, often associating with foraging flocks of munias, to 100 m on Sulawesi and to 400 m on Lombok (Coates and Bishop 1997). *Roosting* Communal roosts of many hundreds of birds (such that outer branches bend under their collective weight) have been observed in “alang-alang woodlands” (Vorderman 1882–1885), large *Ficus benjamina* fig trees (Koningsberger 1901–1909, Hivernon 1920, Sody 1955), tamarind *Tamarindus indica* trees in Surabaya (Bartels 1915–1930) and other large, densely leaved trees (Hoogerwerf and Siccama 1938) in suburban Jakarta. Largest concentrations of roosts are observed in Jakarta between breeding seasons, i.e. July–August and March–April (Hoogerwerf and Siccama 1937–1938). The largest flocks are at roosts, usually in tall trees, cultivated palms in towns, shrubs, reeds or sugarcane in the country, and it is these that are targeted by birdcatchers (Hoogerwerf 1969–1971). Roosting apparently involves very close physical contact by groups of birds (see Smythies 1981).

Food The extensive farming of rice on Java and Bali has resulted in the predominance of this food in the Java Sparrow’s diet—*oryzivora* means “rice-eater”—and hence in the mass movement of flocks over considerable areas in search of the resource, such that the species once had pest status (Bernstein 1860–1861, Hivernon 1920). Nevertheless, the species is adapted to taking various small seeds of grasses and flowering plants, with records of *Andropogon sorghum*, *Bambusa blumeana*, *Lantana camara* and *Passiflora*, plus some insects (Sody 1953, Becking 1989; also Hoogerwerf 1966–1967). Indeed, in areas where rice is harvested only once a year, the species has to survive on other seeds for many months, and it even appears that certain seeds, although far less predominant, are actually preferred to rice; bamboo can be temporarily important (Bartels 1915–1930). Insects, bamboo seeds, and the seeds and fruits from bushes and wasteland areas are taken during the rainy season, in riceless areas or after the rice harvest (Bernstein 1860–1861, Bartels 1915–1930).

Breeding Within natural range Breeding extends from February to August, with the main focus in April and May, nest records conflating to give the following monthly totals: (West Java) March 2, April 16, May 16, June 9, July 5, August 2; (Central Java) April 2; (East

Java) April 21, May 9, June 5, July 4 (Sody 1930, 1936, Rensch 1931a, Bouma 1936, Hoogerwerf 1949, Hellebrekers and Hoogerwerf 1967, Muchtar and Nurwatha 1999). On Bali eggs have been found in April (Stresemann 1913) and July (Muchtar and Nurwatha 1999), and fledglings in June (Kuroda 1933–1936, Ash 1982) and August (Muchtar and Nurwatha 1999). The nest resembles the untidy, loosely built construction of Eurasian House Sparrow *Passer domesticus*, and is likewise made of dried grass and placed under roofs and eaves and in other niches in buildings in towns and villages, often in loose colonies with 2–4 m between nests (Stresemann 1913, Kuroda 1933–1936, Hoogerwerf 1969–1971, Aji 1998, Muchtar and Nurwatha 1999), at least in areas where Tree Sparrows are scarce or absent (Koningsberger 1901–1909). In remoter areas they are placed in bushes and treetops, especially in palms in the leaf-folds in palm-crowns and amongst epiphytes on the stems of *Arenga* palms (Bernstein 1860–1861, Hoogerwerf 1949). In recent years Javan birds have been found breeding in holes in *Artocarpus* and *Samanea* trees, in slots between temple stones and on coastal cliffs, while birds in Bali have nested under the roofs of offices (Aji 1998, Aji *et al.* 1999, Muchtar and Nurwatha 1999, YPAL *in litt.* 1999). Nests are also sometimes placed in presumed old woodpecker (Ash 1982) and barbet holes (Bartels 1915–1930), and apparently in crevices within limestone caves (Kuroda 1933–1936, SvB). Most clutches on Java were of 3–4, sometimes 5–6, eggs; once even 15 eggs, apparently from two females, were found (Hoogerwerf and Siccama 1937–1938), but 4–7 eggs appeared to be standard in Bogor Botanic Gardens (Hoogerwerf 1949). *Outside natural range* A bird on Lombok, March, and two on Sumbawa, April, had developed gonads, and a juvenile was collected on Sumbawa in June (Rensch 1931a). On Bawean breeding in 1954 had evidently taken place in April/May (Hoogerwerf 1966–1967). On Sulawesi breeding activity has been recorded in May, June, July, August and October, with fledged young in November; most nests were open, but some were in holes in *Samanea saman* trees (“Regenboom”) (Coomans de Ruiter 1948; also Coomans de Ruiter and Maurenbrecher 1948). A “furious battle” between two pairs in the eaves of a bungalow in September, Brunei or Sarawak (Smythies 1955), was presumably over a nest site. A nest built into the bottom of an eagle eyrie contained two fresh eggs in mid-June, Borneo (Kutter 1885). In Kuching the species nests in the eaves of buildings such as the Law Courts and the Brooke Memorial (Smythies 1981), with records of breeding from January–February and September–October (Mann in prep.). In Brunei nest-building was observed in August (C. F. Mann in Mann in prep.).

There is an extensive review of breeding in captivity in Restall (1996).

Migration There are no concerted movements in this species, but there appear to be substantial short-distance displacements by post-breeding flocks in search of local food supplies (see Food).

THREATS The precipitous decline in the Java Sparrow can be attributed primarily to one factor, human exploitation as a cagebird; however, the role of pesticides may be and have been much greater than is known and requires further exploration.

Trade Java is well known for its cultural attachment to birds in captivity—in Javanese tradition, every man was expected to possess five things: a job, a house, a horse or carriage, a wife and a bird (Whitten *et al.* 1996). For what must be hundreds of years, Java Sparrows have been caught in considerable numbers for sale at local bird markets (e.g. van Helvoort 1981, Basuni and Setiyani 1989, SvB) and for the international trade (Nash 1993a). The birds are attractive, easy to keep and rapidly tamed, so that sometimes escaped or released birds will return to their cages (Bartels 1915–1930). *Internal consumption* Vorderman (1882–1885) reported hundreds of birds of this species being sold throughout the year by street vendors. Apart from ending up in cages and aviaries, hundreds are hunted at their roosts (Hivernon 1920), and also traded, for culinary purposes, especially by ethnic Chinese (Hoogerwerf and Siccama 1937–1938). Birdcatchers target roosting flocks, which is when

the largest concentrations of birds occur (Hoogerwerf 1969–1971), or else net birds at breeding sites (Muchtart and Nurwatha 1999). In the temples around Yogyakarta the greatest problem may be temple-cleaning (for tourists), which results in nests being destroyed and the young being taken for sale (Aji 1998). The demand for birds is sufficiently great within Java and Bali that some birds for sale in bird markets there come from other parts of Indonesia to which the species was long before introduced (Muchtart and Nurwatha 1999, YPAL *in litt.* 1999). *External consumption* External trade in the Java Sparrow has been extensive probably for centuries. In the period 1961–1965 (data for 1963 lacking), when the total number of Hill Mynas *Gracula religiosa* exported was only 313, the total number of Java Sparrows exported was 445,102 (Somadikarta 1967). Oesman (1979) reported that total bird exports from Indonesia were over two million in the period 1970–1975, that in 1970 83% of the birds involved were Java Sparrows, and that in 1975 55% of them were this species, concluding that “this is probably indicative of the decline in numbers of the once very numerous *Padda oryzivora*”; he questioned whether this decline had been caused by pesticides. Holmes (1995) remarked as follows: “Ironic is the wholesale introduction of the Java Sparrow by the trade, not just into Indonesian islands but SE Asia generally, to be succeeded by an equally wholesale decimation of the same feral populations, until its current virtual extinction.” In Brunei in the mid-1970s the species was “regularly offered for sale in Bandar Seri Begawan market, usually groups of birds in small chicken-netting baskets” (Kidd 1978). Vorderman (1882–1885) reported that albino birds were particularly prized in China, but these would clearly only come from captive breeding management. Restall (1996) recounted a newspaper report of a Chinese businessman releasing 6,000 Java Sparrows on Singapore on the occasion of his daughter’s wedding in 1993; the birds had apparently been wild-caught on Java.

Pesticides Excessive use of pesticides on ricefields commenced in the 1960s and coincided with a decline in several bird species associated with this habitat (see, e.g., van Balen *et al.* 1993). Whitten *et al.* (1996) observed that “insecticides have had a major destabilising effect on overall yields, causing losses of millions of tons of rice, wasting billions of dollars in hard currency, and degrading the health and well-being of farmers and their environment”. It must be borne in mind that the Java Sparrow is a bird of agricultural land and was formerly abundant, probably with populations maintained at unnaturally high levels owing to the pervasive cultivation of rice on Java and Bali; this would have made it vulnerable to changes in agricultural practice, in particular increased pesticide use but also perhaps through the use of different rice varieties, timing of planting and harvesting, and mechanisation.

Persecution With Indonesia becoming a net importer of rice since 1993, there has been intense pressure to increase yields, and on both Java and Bali Java Sparrows are heavily persecuted, with adult birds being shot with air-rifles and nests and nestlings being destroyed by children instigated by farmers (Restall 1996).

Competition from the Tree Sparrow Many sources mention the ecological similarity between Java Sparrow and Eurasian Tree Sparrow. The latter is a relatively recent arrival within the range of the former, and where its appearance has coincided with the disappearance of the Java Sparrow (e.g. at Pelabuhanratu) it is possible that some competitive exclusion is in play.

Habitat loss It has been noted that seed-rich areas have been invaded by alang-alang grass, whose seeds are useless to the sparrow (Bartels 1915–1930), and the extent of this phenomenon may have been sufficient to reduce alternative (i.e. non-rice) food supplies for the species. There is a proposal to convert woodland on the former Malang agricultural academy campus to luxury housing: this is widely opposed by local people, who are using the Java Sparrow, which breeds there, as a symbol of resistance (*Suara Satwa* 3 [4]: 14–15).

MEASURES TAKEN *Trade* The species was added to Appendix II of CITES in 1997, and there are currently no annual quotas (R. F. A. Grimmett *in litt.* 2000). Apparently using

birds originally imported from the Netherlands, captive breeding is increasingly supplying birds for sale in markets in Java (R. Saryanthi *in litt.* 2000).

Protected areas The species occurs in only very few protected areas: apart from Cikepuh, which is a small wildlife reserve (see Measures Taken under Green Peafowl *Pavo muticus*), the species has been recorded in Ujung Kulon, Meru Betiri, Baluran and Bali Barat National Parks.

MEASURES PROPOSED The internal trade in wild birds must be curtailed, and the entire market demand now needs to be met by captive breeding (see Measures Taken). Extension programmes to protect the birds around houses are needed; at the temples in Yogyakarta bird houses of some sort are needed which will allow the birds to breed successfully, or else awareness campaigns to alter the views of temple managers towards the species and possibly make the birds part of the tourist attraction rather than a problem to combat (Kutilang-IBC *in litt.* 1999). A long-term awareness campaign seems inevitably necessary, to shift people's knowledge steadily into an appreciation of the Java Sparrow as something more significant than a mere article of home decoration. Field studies should investigate the biology and ecology of the species, which has never been scientifically documented in the wild, and from this some calculations should be possible of the rate of recovery of populations under careful management regimes. Moreover, the relative importance of the causes of the species's decline (excessive trade, persecution, pesticides, competition) require evaluation, and studies could be made of the varying benefits of different agricultural practices. The remaining concentrations of birds within their natural range need to be identified and locally based protection programmes established as appropriate. Suwung on Bali holds Java Sparrow and is a coastal area with mudflats, mangroves and adjacent ricefields; there are plans to preserve the area as it forms an important foraging and roosting for waders and waterbirds (V. Mason *in litt.* 1997).

REMARKS (1) There are two Depoks in Java, one near Jakarta and one near Yogyakarta; the former has been chosen here. (2) Four specimens in NHMW appear to be labelled from either Cipandok, Wonosalem or Garut (F. Steinheimer *in litt.* 1996). (3) The untraced locality Karkglotten appears to be derived (via a common mispronunciation) from the Dutch *kalkgrotten*, meaning limestone caves. (4) The word "feral" strictly applies to free-living descendants of *domesticated* animals, so it is probably mostly misused in respect of the Java Sparrow; although it has been bred in sufficient generations to produce mutations, it hardly seems to warrant being considered domesticated.