

Threatened Birds of Asia:

The BirdLife International Red Data Book

Editors

N. J. COLLAR (Editor-in-chief),
A. V. ANDREEV, S. CHAN, M. J. CROSBY, S. SUBRAMANYA and J. A. TOBIAS

Maps by

RUDYANTO and M. J. CROSBY

Principal compilers and data contributors

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With contributions from: S. H. M. Butchart, D. S. Butler (maps), P. Davidson, J. C. Lowen, G. C. L. Dutson, N. B. Peet, T. Vetta (maps), J. M. Villasper (maps), M. G. Wilson

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Wellbrook Court, Girton Road, Cambridge, CB3 0NA, United Kingdom

Tel: +44 1223 277318 Fax: +44 1223 277200 Email: birdlife@birdlife.org.uk

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LARGE GREEN-PIGEON

Treron capellei

Critical —

Endangered —

Vulnerable **A1c; A2c**



This species qualifies as Vulnerable because it is restricted to low-lying forest in a region in which this habitat-type is being cleared and degraded at such a rate that rapid and continuing population declines are inferred.

DISTRIBUTION The Large Green-pigeon is endemic to the Greater Sunda region of Asia, being present in the lowland forests of Thai-Malay Peninsula, Sumatra and Borneo, and possibly still at one site on Java (see Remarks 1). Robinson and Chasen (1936) observed that it did not occur in Singapore or any of the small islands around the Peninsula, but there are records from the Riau archipelago, from the West Sumatran islands and from Pulau Matasiri off south-east Borneo. Records are from:

■ **MYANMAR** **Thayawthadangi** (Elphinstone Island), Mergui archipelago, March 1882 (J. Anderson 1887, Smythies 1986);

■ **THAILAND** **Khun Tan**, April 1914 (Gyldenstolpe 1916), here regarded as provisional since far too far north and with other records also suspect (see Distribution: Thailand under Malaysian Peacock-pheasant *Polyplectron malacense* and Plain-pouched Hornbill *Aceros subruficollis*); **Surat Thani** (Bandon), January 1927 (two males in USNM; see Remarks 2); **Thale** (Lay) **Song Hong**, interior of Trang, October and November 1896 (Riley 1938), January 1910 (Robinson and Kloss 1910–1911), with a male from Trang, November 1896 (in USNM); **Mabek** (untraced), this evidently (*vide* D. R. Wells *in litt.* 2000) being near **Ban Yaha**, Patani, July 1901 (male in BMNH); **Chalerm Prakiat Wildlife Sanctuary** (=Pa Phru, Pru To Daeng), Narathiwat, June 1992 (Wells 1999); **Hala-Bala Wildlife Sanctuary**, April–May 1997 (*Bird Conserv. Soc. Thailand Bull.* 14[9]: 15);

■ **MALAYSIA** ■ **Peninsular Malaysia** **Langkawi**, up to c.200 m, undated (Wells 1999); **Penang**, around 1850 (Moore 1859) but no longer (Wells 1999); **Temengor Forest Reserve**, August 1993 and March 1994 (Davison *et al.* 1995); **Kenering** lake (Tasak Kenering), northern Perak, undated (Wells 1999); **Selama**, northern Perak, undated (Robinson and Kloss 1910–1911); **Pondok Tanjong Forest Reserve** (Pondok Tanjong), near Jaiping, Perak, August 1918 (two males in ZRCNUS); **Aring**, Kelantan, September 1899 (Bonhote 1901); **Taman Negara National Park** at Kuala Tahan, Pahang, August 1920 (male in ZRCNUS), and present there in January 1990 (*Enggang* 3,1: 4), at Sungai Tembeling towards Kuala Tahan, February 1959 (Madoc ms), at Kuala Koh, June 1996 (*Enggang* 4,2/3: 26), at Kuala Juram, October 1996 (*Enggang* December 1996–January 1997: 19), indeed present in many areas, currently (many observers *in litt.* 1999–2000); **Changkat**, Mentri, Perak, September 1918 (five specimens in AMNH, BMNH, ZRCNUS); **Parit**, Perak, September 1911 (female in ZRCNUS); **Bernam**, Selangor, July 1879 (male in BMNH); **Semangko pass**, near Fraser's hill, February 1908 (Robinson 1909; see Remarks 3); **Fraser's Hill** (Bukit Fraser), July 1968 (Medway and Wells 1970), September 1971 (Wells 1974); **Kuala Lompat**, near the Kerau Wildlife Reserve, between March 1984 and October 1986 (Lambert 1989a,d); **Bentong**, Pahang, April 1891 (male in ZRCNUS); below **Pekan Sebrang**, lowest reaches of Pahang river, mid-twentieth century (Madoc ms); **Templer Park**, December 1980 (N. Gardner *in litt.* 1995); **Triang**, Pahang, September 1912 (male in BMNH); **Dusun Tua** (Tura), Selangor, October 1906 (male in ZRCNUS); **Klang**, Selangor,

February–March 1879 and February 1880 (13 specimens in AMNH, BMNH, one qualified as “Demansara”); near **Langat**, Selangor, April 1879 (specimen in BMNH); **Melaka** (“Malacca”), 1880s (three specimens in BMNH, ZRCNUS; also Kelham 1881–1882), including Cape Rachado (Tanjong Taun), April 1920 (male in BMNH); foot of **Gunong Pulai**, Johor, March 1880 (eight specimens in BMNH; also Wells 1999), and “Pulai”, November 1904 (two specimens in ZRCNUS); and unspecified locality in the lowlands of Pahang, 1900s (specimen in AMNH; also Hartert 1902b);

■ **Sabah Benkoka river**, November 1885 (Sharpe and Whitehead 1889–1890); **Poring hot springs**, March 1884 (Smith 1884); Kinabalu, presumably in what is today **Kinabalu Park**, June/July 1903 (specimen in AMNH); **Ranau**, undated (Sheldon *et al.* in press); **Kabili-Sepilok Forest Reserve**, May 1987 (Lomosse and Lomosse 1987), September/October 1991 (Verbelen 1991); **Ensuan**, undated (Sheldon *et al.* in press); **Betotan**, near Sandakan, August 1927 (four specimens in ZRCNUS; also Chasen and Kloss 1930); **Ulu Meliau**, c.15 km above the Meliau/Labuk confluence, 1,500 m, May 1956 (two specimens in BMNH) and Meliau River, 1.5 km above confluence with Labuk River, c.60 m, April 1956 (three specimens in BMNH) and Meliau river, undated (Sheldon *et al.* in press); **Sandakan**, undated (Everett 1889); **Tampias**, undated (Sheldon *et al.* in press); **Kinabatangan river**, recently (Smythies and Davison 1999), hence presumably in the Kinabatangan Wildlife Sanctuary (see Measures Taken); **Abai**, undated (Everett 1889); **Sukau**, August 1996 (C. F. Brooks *in litt.* 1999); **Mawau**, undated (Sheldon *et al.* in press); **Segama river**, undated (Sheldon *et al.* in press); **Lambidan**, c.1875 (Sharpe 1876–1879, Everett 1889); **Klias**, undated (Sheldon *et al.* in press); **Saliwangan**, undated (Sheldon *et al.* in press); **Labuan**, before 1876 (specimen in BMNH; also Everett 1889); **Lumerau**, undated (Sheldon *et al.* in press); **Tabin Wildlife Reserve**, September/October 1988 (Goh *et al.* 1989), August 1996 (C. F. Brooks *in litt.* 1999); **Ulu Melian**, undated (Sheldon *et al.* in press); **Mengalong river**, May and June 1899 (Blasius 1901); **Silam**, undated (Sheldon *et al.* in press); **Danum Valley Conservation Area**, July 1986 (Smith 1986), June 1998 (I. Mauro *in litt.* 1999), including Ulu Segama Forest Reserve and the Bole river, between May 1989 and October 1990 (Lambert 1992), and mid-1990s (Zakaria and Nordin 1998); **Kalabakan Forest Reserve**, May–July 1982 (Mitra and Sheldon 1993); **Gunung Magdalena**, 40 km north of Tawau, June 1956 (female in BMNH); near **Kalabakan**, large flock, February 1962 (Gore 1968); **Brumas**, undated (Sheldon *et al.* in press);

■ **Sarawak Lawas river**, c.1870s (Sharpe 1876–1879), April 1886 (Sharpe and Whitehead 1889–1890) and also Lawas river, before 1883 (specimen in BMNH) and Lawas, April 1886 (female in AMNH); **Baram river**, August 1894 (two specimens in SMF); middle **Limbang river**, 150 m, between December 1962 and March 1963 (Harrisson 1963); **Gunung Mulu National Park**, April–May 1978 (Wells *et al.* 1978), including at Batu Pala (Croxall 1978); **Sungai Melinau**, June 1983 (Duckett 1985); **Batu Niah estate**, undated (Duckett 1985); **Kubaaan river**, Tutoh, 400–600 m, February 1965 (Fogden 1976); **Baram district**, 1890s (Hose 1893); **Gunung Dulit**, 300 m, December 1898 (male in BMNH); **Kabulu**, c.1875 (Sharpe 1876–1879); **Bintulu**, c.1875 (Sharpe 1876–1879); **Lio Matu**, Baram district, October 1920 (three specimens in ZRCNUS); **Rajang river**, May 1987 (Lomosse and Lomosse 1987); **Samunsam Wildlife Sanctuary**, undated (MacKenzie 1981); **Lundu**, August 1866 (Salvadori 1874); **Lanjak Entimau Wildlife Sanctuary**, September 1981 (Kavanagh 1981); **Semengo Forest Reserve**, 20 km north of Kuching, October 1964–November 1965 (Fogden 1976); **Batang Ai National Park**, 1992 (Meredith 1995); south **Paku**, Seribas, March 1917 (male in BMNH) and Ulu Anyut, Paku, Seribas, August 1915 (male in ZRCNUS);

■ **BRUNEI Jerudong**, June 1984 (Counsell 1986); road from **Tutong** to Seria, June 1988 (Sparks undated); **Lamunin**, June 1984 (Counsell 1986), July 1988–June 1990 (Mann 1991); Andulau, presumably in the **Andalau Forest Reserve**, July 1988–June 1990 (Mann 1991); **Benutan river**, July 1988–June 1990 (Mann 1991); **Ulu Temburong National Park** (see Measures

Taken), September/November 1978 (Brown 1979), May–June 1984 (Counsell 1986), July 1988 (Blair *et al.* 1988);

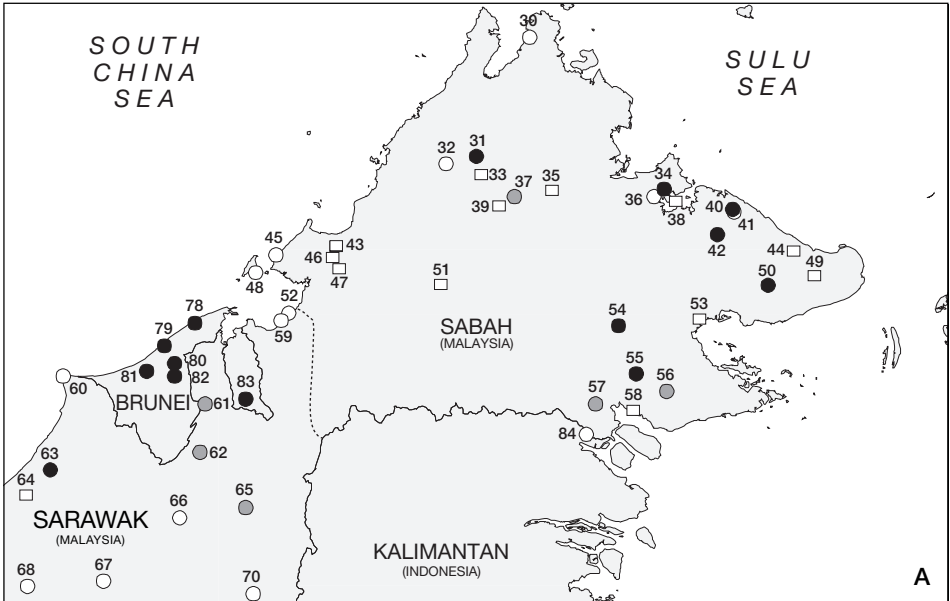
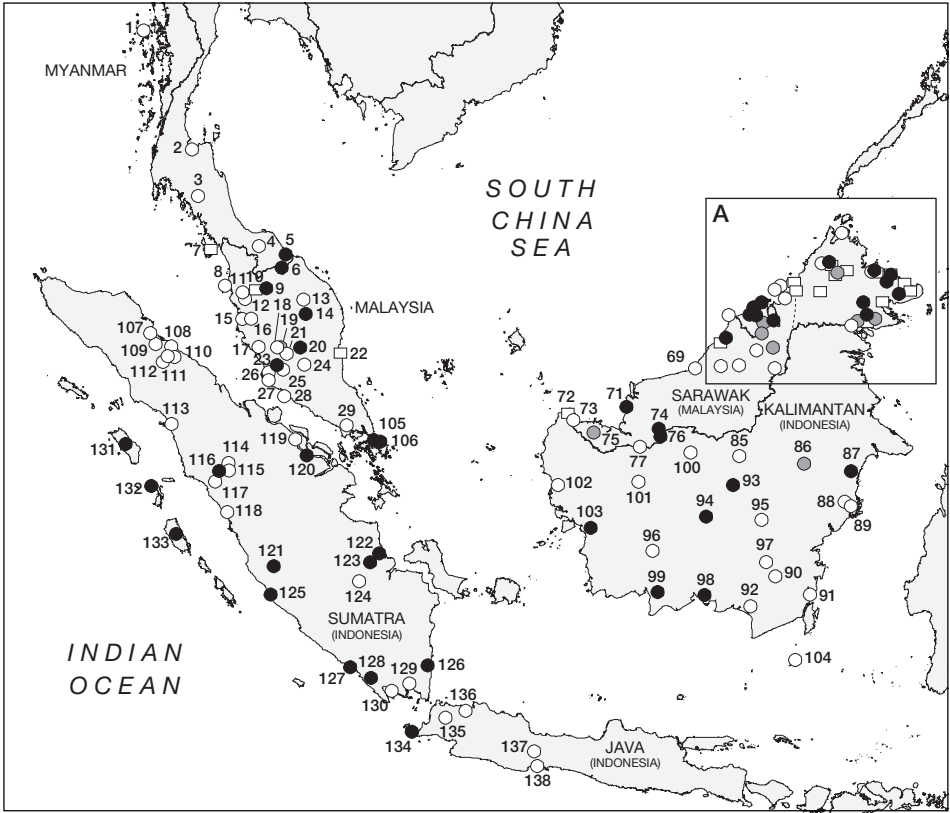
■ **INDONESIA Kalimantan** ■ *East Kalimantan* “Northern Boundary” (boundary with Sabah), 1912 (Kloss 1930a); **Long Cehan**, May/June 1916 (Voous 1961); **Tabang**, August 1956 (two specimens in MZB); **Kutai National Park**, “common”, July–September 1974 (Pearson 1975), August 1977 to September 1979 (Leighton and Leighton 1983) and in the Kutai region, July–August 1990 (Holmes 1997); **Samarinda**, February 1933 (male in MZB); **Sungai Mahakam**, April/June 1916 (Voous 1961)—site mapped as the estuary but probably somewhere in the river’s middle reaches; ■ *South Kalimantan Rangas*, south-east Borneo near Barabai, around 1881 (Blasius 1884b); **Klumpang bay**, type locality for the race *messopora*, January 1908 (Oberholser 1924); **Banjarmasin**, 1850s (Mottley and Sclater 1863); ■ *Central Kalimantan* above **Muara Joloi** at the confluence of the Busang and Murung rivers, 130–200 m, Barito Ulu (Barito river headwaters), July–September 1989 (Wilkinson *et al.* 1991a,b), and this evidently the area of the “Jolo river”, where the species was recorded in the mid-1980s (Holmes and Burton 1987); **Tumbangmarikoi**, mid-1980s (Holmes and Burton 1987); **Muarateweh** on the Tewehe river, mid-1870s (Brüggemann 1877); **Riam**, Kotawaringin, October–December 1935 (three specimens in AMNH; also Mayr 1938); **Telang**, undated (Everett 1889); **Pendahara**, mid-1980s (Holmes and Burton 1987), this clearly being the source of the record from Katingan river, undated (Smythies and Davison 1999); **Tanjung Puting National Park**, in period since c.1970 (bin Jalan and Galdikas 1987, Wilkinson *et al.* 1991a), including along the Sekonyer river near Natai Lengkuas (Nash and Nash 1988); ■ *West Kalimantan Putussibau* (“Poetos”), March 1907 (Parrot 1908); **Sintang**, May 1902 (male in RMNH); **Pontianak**, undated (Everett 1889); **Gunung Palung National Park** at Cabang Panti, 1986–1995 (Laman *et al.* 1996);

Pulau Matasiri, type locality for the race *passorhina*, December 1907 (Oberholser 1917);

Bintan (Riau archipelago) **Tanjong Sambang**, June 1995 (Rajathurai 1996); **Pasir Panjang**, February and August 1994 (Rajathurai 1996);

Sumatra (see Remarks 4) ■ *Aceh Sungai Besitang*, Aru Bay, February 1906 (four specimens in USNM; Oberholser 1924); ■ *North Sumatra Saentis*, April 1912 (de Beaufort and de Bussy 1919); **Tanjong Slamet**, Langkat, February 1918 (Robinson and Kloss 1919b); **Delitua** (Deli Tuwa), Deli, December 1917 (Robinson and Kloss 1919b); **Deli-Serdang**, 1880s (Hagen 1890, Hartert 1889, 1902a; see Population and Threats), September 1909 (male in RMNH); **Tuntungan**, Deli, December 1917 (Robinson and Kloss 1919b); **Tapanuli bay**, February/March 1902 (Richmond 1903); ■ *West Sumatra Kayutanam*, September 1878 (Salvadori 1879); **Sungai Bulu**, September 1878 (Salvadori 1879); **Panti**, August 1984 (Holmes 1996); **Ophir district**, May 1915 (three specimens in RMNH); **Duku** (Doukou) undated (Schlegel 1862–1873); ■ *Riau Sungai Siak*, December 1906 (two specimens in USNM); **Sungai Metas**, April 1991 (Holmes 1996); ■ *Jambi Rantaupondan*, June 1991 (Holmes 1996); ■ *South Sumatra Sungai Simpangagas*, April 1989 (Verheugt *et al.* 1993); **Sungai Kepahiang** (Kepayang river), May 1989 (Verheugt *et al.* 1993); **Kluang**, Palembang, July 1933 (male in MZB); ■ *Bengkulu Ipuh*, October 1989 (Holmes 1996); ■ *Lampung Way Kambas National Park*, 1989 (Lewis *et al.* 1989), August 1993 and February 1994 (Parrott and Andrew 1996), specific localities including Rawa Pasir, July 1984, and Pos Way Kanan, July 1991 and November 1995 (Parrott and Andrew 1996); **Ujung Tanjung**, April 1991 (Holmes 1996); **Bukit Barisan Selatan National Park**, at some time since 1980 (O’Brien and Kinnaird 1996b), including at Way Canguk, 1997–1999 (Winarni 1999); **Telukbetung**, undated (six specimens in RMNH, ZMB), with a bird taken between there and “Sockedana”, 1876 (Tweeddale 1877c); **Way Lima**, December 1921 (two specimens in MZB; also Kloss 1931);

Nias between Lahusa and Gomo (both untraced), May 1990 (Dymond 1994); near Bodsjihona (untraced), May 1990 (Dymond 1994);



Telo August 1985 (Holmes 1994);

Siberut unspecified localities in August 1982 and 1985 (Holmes 1994), including Rorogot, September 1999 (Kemp 1999);

Java ■ **West Java Ujung Kulon National Park**, flock of 10–15 at the Cigenter waterfalls, October 1988 (*Oriental Bird Club Bull.* 9 [1989]: 38–44); near **Pepanggo** (“Oethan badak”), March 1882 (Vorderman 1882–1885); **Jakarta**, nineteenth century (Vorderman 1882–1885, Hoogerwerf 1948a); ■ **Central Java Majingklak**, Bandjoemas, mid-Java, February 1921 (Chasen 1940); **Kali Pucang** (Kalipoetjang), Bandjoemas, mid-Java, February 1923 (Chasen 1940).

POPULATION The Large Green-pigeon has always been fairly common (e.g. Mann 1987, Wells 1999) in appropriate habitat. However, by the mid-1950s a general assessment on Borneo considered it “sparingly distributed” through the island, and “scarce in most areas compared with the smaller green pigeons” (Smythies 1957, 1981). It has been remarked that on Borneo this pigeon “flits about in ones and twos and, though a flock may feed together, individuals seem to come and go independently, and the massed flights characteristic of some other species are rare” (Banks 1935a). Even so, its habitat has suffered such severe destruction in the past few decades (see Threats) that it must have undergone a steep decline in numbers over this period. It may experience ecological competition from the less stenotopic Green Imperial-pigeon *Ducula aenea*, and its numbers may be constrained when the latter is common in an area (Nash and Nash 1988).

Myanmar There is no recent information.

Thailand It is thought to be threatened in Thailand (Round 1988a) and indeed now close to extinction there (Wells 1999).

Peninsular Malaysia Flocks of 200–300 birds were reported as normal in the early twentieth century (Robinson and Kloss 1910–1911, Robinson and Chasen 1936). It is now regarded as a rare resident (Jeyarajasingam 1999), being found in large tracts of lowland forest, “but even here flocks are very few and far between” (Lambert 1989c).

The distribution of Large Green-pigeon *Treron capellei* (maps opposite): (1) Thayawthadangi; (2) Surat Thani; (3) Thale Song Hong; (4) Ban Yah; (5) Chalerm Prakiat Wildlife Sanctuary; (6) Hala-Bala Wildlife Sanctuary; (7) Langkawi; (8) Penang; (9) Temengor Forest Reserve; (10) Kenering; (11) Selama; (12) Pondok Tanjung Forest Reserve; (13) Aring; (14) Taman Negara National Park; (15) Changkat; (16) Parit; (17) Bernam; (18) Semangko pass; (19) Fraser’s Hill; (20) Kuala Lompat; (21) Bentong; (22) Pekan Sebrang; (23) Templer Park; (24) Triang; (25) Dusun Tua; (26) Klang; (27) Langat; (28) Melaka; (29) Gunong Pulai; (30) Benkoka river; (31) Poring hot springs; (32) Kinabalu Park; (33) Ranau; (34) Kabili-Sepilok Forest Reserve; (35) Ensuan; (36) Betotan; (37) Ulu Meliau; (38) Sandakan; (39) Tampias; (40) Kinabatangan river; (41) Abai; (42) Sukau; (43) Mawau; (44) Segama river; (45) Lambidan; (46) Klias; (47) Saliwangan; (48) Labuan; (49) Lumerau; (50) Tabin Wildlife Reserve; (51) Ulu Melian; (52) Mengalong river; (53) Silam; (54) Danum Valley Conservation Area; (55) Kalabakan Forest Reserve; (56) Gunung Magdalena; (57) Kalabakan; (58) Brumas; (59) Lawas river; (60) Baram river; (61) Limbang river; (62) Gunung Mulu National Park; (63) Sungai Melinau; (64) Batu Niah estate; (65) Kubaan river; (66) Baram district; (67) Gunung Dulit; (68) Kabulu; (69) Bintulu; (70) Lio Matu; (71) Rajang river; (72) Samunsam Wildlife Sanctuary; (73) Lundu; (74) Lanjak Entimau Wildlife Sanctuary; (75) Semengo Forest Reserve; (76) Batang Ai National Park; (77) Paku; (78) Jerudong; (79) Tutong; (80) Lamunin; (81) Andulau Forest Reserve; (82) Benutan river; (83) Ulu Temburong National Park; (84) Northern Boundary; (85) Long Cehan; (86) Tabang; (87) Kutai National Park; (88) Samarinda; (89) Sungai Mahakam; (90) Rangas; (91) Klumpang bay; (92) Banjarmasin; (93) Muara Joloi; (94) Tumbangmarikoi; (95) Muarateweh; (96) Riam; (97) Telang; (98) Pendahara; (99) Tanjung Puting National Park; (100) Putussibau; (101) Sintang; (102) Pontianak; (103) Gunung Palung National Park; (104) Pulau Matasiri; (105) Tanjung Sambang; (106) Pasir Panjang; (107) Sungai Besitung; (108) Saentis; (109) Tanjung Slamet; (110) Delitua; (111) Deli Serdang; (112) Tuntungan; (113) Tapanuli bay; (114) Kayutanam; (115) Sungai Bulu; (116) Panti; (117) Ophir district; (118) Duku; (119) Sungai Siak; (120) Sungai Metas; (121) Rantau Pandan; (122) Sungai Simpangagah; (123) Sungai Kepahiang; (124) Kluang; (125) Ipuh; (126) Way Kambas National Park; (127) Ujung Tanjung; (128) Bukit Barisan Selatan National Park; (129) Telukbetung; (130) Way Lima; (131) Nias; (132) Telo; (133) Siberut; (134) Ujung Kulon National Park; (135) Pepanggo; (136) Jakarta; (137) Majingklak; (138) Kali Pucang.

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

Sabah It was common in the late 1880s (Sharpe and Whitehead 1889–1890), and is still fairly common where habitat remains, such as in Danum Valley (I. Mauro *in litt.* 1999), but is at best local (Gore 1968).

Sarawak It was still “very common in some parts” of Sarawak in the 1930s (Banks 1935a). Fogden (1976) reported it uncommon (defined as “seen only a few times”) in the Tutoh headwaters in early 1965. It was also described as much less common than other *Treron* species in the Fourth Division of Sarawak in the 1980s (Duckett 1985). There appears to be little modern evidence of its status.

Brunei The species was considered common around the mid-1980s (Mann 1987), although a decade later it was described as a scarce resident, possibly commoner in the upper Temburong (Vowles and Vowles 1997).

Kalimantan There appears to be little modern evidence of its status. Usually only singletons are to be seen in Tanjung Puting (Nash and Nash 1988), while it is considered “rare” in Gunung Palung (Laman *et al.* 1996).

Sumatra It was regarded as commoner in Sumatra in the 1910s than it was at that time in the Malaysian Peninsula, with large numbers being trapped in the Padang lowlands near Indrapura in February 1914 (Robinson and Kloss 1919b). Around Deli in the 1880s it was very common (Hagen 1890, Hartert 1902a); but see Threats. It was described as common by van Marle and Voous (1988), but this assessment was regarded as requiring review (Holmes 1996). It is “the least common of the lowland green pigeons” in Way Kambas National Park (Parrott and Andrew 1996).

Java There appears to be a single recent record (1988) from Java, where, in contrast to elsewhere in its range, the species has always been extremely rare (Vorderman 1882–1885, Hoogerwerf 1949, Hellebrekers and Hoogerwerf 1967, van Balen 1987).

ECOLOGY Habitat The Large Green-pigeon is a bird of level lowland and low foothill primary forest in the Sundaic region. On the Malay Peninsula it was judged “to keep almost exclusively to old and fairly old open jungle”, apparently not close to the coast (Robinson and Kloss 1910–1911, Robinson and Chasen 1936), although evidently it occasionally enters mangroves (see, e.g., Holmes 1996). On Borneo there is a seemingly anomalous record from 1,500 m in Sabah (see Distribution), but it is otherwise found “only in the low country” (Hose 1893), where it occupies the upper strata and canopy of primary rainforest (Pearson 1975, Mann 1987, Lambert 1989c, Smythies and Davison 1999). It has only been recorded in lowland forest in Gunung Palung (Laman *et al.* 1996), and both Hoogerwerf (1948a) and Sody (1956) put an upper elevational limit of 800 m for Java. Records from or near Bukit Fraser, Peninsular Malaysia, are exceptionally high and one of them is certainly associated with migration (see above and below).

Food The species feeds in the crowns of high trees (Hartert 1889, Sharpe and Whitehead 1889–1890, Robinson and Kloss 1910–1911, Robinson and Chasen 1936), and is a fig specialist (Lambert 1989c). One early identified food was *Urostigma* (= *Ficus*) *sumatrana* (Nicholson 1882), a strangler fig (see Leighton and Leighton 1983) while another was called “lapei” in Sumatra (Hartert 1889), doubtless also a fig; the key element of the diet is certainly figs, with 12 of 25 species of bird-attracting *Ficus* being exploited in Kuala Lompat, namely *F. caulocarpa*, *F. delosyce*, *F. pisocarpa*, *F. kerkhovenii*, *F. stricta*, *F. crassiramea*, *F. bracteata*, *F. cucurbitina*, *F. dubia*, *F. stupenda*, *F. drupacea* and *F. subcordata*, all but the first of which produce fruit over 10 mm wide and long, and with a preponderance of the large *cucurbitina*, *dubia*, *stupenda* and *subcordata*, all of which are stranglers with large, high-canopy crowns (Lambert 1989a; also Wells 1999). Birds at a fruiting tree show a “boisterous” feeding activity, commonly dropping fruits either deliberately (fruit not ripe) or accidentally: in one case fruit-fall was at a rate of 36 per minute while the birds fed (corresponding to 24% of figs picked) compared to 0.3 per minute after the birds had finished feeding (Lambert 1989d).

Evidence supports the view that *Treron* pigeons are important dispersers of fig seeds (Lambert 1989d), and given this species's specialisation on large-fruited figs it may play a crucial role in the distribution of strangling figs in the Sundaic lowland forest ecosystem.

Breeding Copulation was witnessed in Taman Negara, January 1990 (*Enggang* 3,1: 4, Jeyarajasingam 1999), and a nest (platform of twigs 3–4 m up on a broad bough) was found there in April 1990 (Jeyarajasingam 1999); another copulation on the Peninsula was in July (Wells 1999). The species can sometimes nest in gardens within the forest (D. Yong verbally 1999). A female with an egg close to laying was collected in Sabah in March (Sheldon *et al.* in press). A female with nest material was seen in August at Samunsam, Sarawak (MacKenzie 1981). Two birds were flushed, apparently off a nest, in November, Way Kambas, Sumatra (Parrott and Andrew 1996). Two specimens from Wai Lima, Lampong, Sumatra, December, consisted of a female with enlarged gonads in company with a juvenile male (MZB label data). A juvenile male was taken in March in Java (Vorderman 1882–1885). The type of the supposed subspecies *messopora* from South Kalimantan was shot off a nest with two eggs in January (USNM label data).

Migration An adult male attracted to light at Bukit Fraser one night in September 1971 was described as the first indication of long-distance dispersal by this species (Wells 1974). However, occasional records from Bukit Fraser had previously been noted, along with use of Semangko Pass for short-distance feeding movements (Robinson 1928, Robinson and Chasen 1936). New island records on Siberut and Nias prompted the consideration that all involved birds that had wandered from mainland Sumatra (Dymond 1994).

THREATS This species may be particularly compromised by forest degradation, as it is only half as abundant in logged areas as in primary forest, with significantly lower visitation rates at fruiting trees, owing to its dependence on large figs for food (Lambert 1992, Zakaria and Nordin 1998). It is “at definite risk from plains-level deforestation” and “will shortly depend absolutely on a small clutch of wildlife refuges and reservoir catchments with valley-bottom forest below the hill-foot boundary” (Wells 1999).

Habitat loss Deforestation in the Sundaic lowlands—biologically one of the most diverse biomes in the world—has proceeded at catastrophic speed in the past few decades, seriously compromising the future of every one of the uncountable multitude of primary-forest life-forms in the region, including that of this particular species, even inside key protected areas (for an outline of the crisis, see Threats under Crestless Fireback *Lophura erythrophthalma*). The dangers facing Siberut's forests are outlined in Threats for Storm's Stork *Ciconia stormi*.

There is a further point of concern over this species. As an extreme dietary specialist, it is potentially highly vulnerable to large-scale fluctuations in food supply, and selective logging unfortunately targets *Ficus* trees, so that populations of the large-fruited species favoured by the Large Green-pigeon are likely to be reduced to extremely low densities (Lambert 1989c). If this happens, and these trees then undergo a *non*-fruiting synchronisation, species that are dependent on them may simply starve to extinction; consequently, if the trees themselves depend on animals such as the Large Green-pigeon for the dispersal of their seeds, then they, too, may eventually die out.

Hunting Large pigeons tend to be hunted for food throughout Asia, and although the evidence is very slight it seems likely that this species is amongst those constantly targeted in many areas. In Deli, Sumatra, in the 1880s whole boatloads of Large Green-pigeons were caught with slingshots and lime at the adjacent coast and brought alive to the town to be sold (Hagen 1890, Hartert 1902a). The record from the Metas river, Riau, Sumatra, was of one which had been captured along with hundreds of Thick-billed Green-pigeons *Treron curvirostra* for sale to restaurants (Holmes 1996). In Sarawak the species was considered “the best eating of all” but also, owing to its powerful flight, “the hardest to hit of all” (Banks 1935a).

MEASURES TAKEN The only conservation this species has experienced is through protected areas (in which category “forest reserves” do not fall). It has been recorded from (*Thailand*) Chalerm Prakiat and Hala-Bala Wildlife Sanctuaries; (*Peninsular Malaysia*) Taman Negara National Park, Templer Park; (*Sabah*) Kinabalu Park, Danum Valley Conservation Area, Tabin Wildlife Reserve and presumably Kinabatangan Wildlife Sanctuary (for new status of this last, see Measures Taken under Storm’s Stork); (*Sarawak*) Gunung Mulu and Batang Ai National Parks, Lanjak-Entimau Wildlife Sanctuary and Samunsam Wildlife Sanctuary; (*Brunei*) Batu Apoi National Park, which embraces Ulu Temburong (see Dawn 1993); (*Kalimantan*) Kutai, Gunung Palung and Tanjung Puting National Parks; (*Sumatra*) Bukit Barisan Selatan and Way Kambas National Parks; and (*Java*) Ujung Kulon National Park. Establishment of a national park on Siberut was finally achieved in 1998 (see equivalent section under Storm’s Stork); but see Threats.

MEASURES PROPOSED Urgent concerted survey of and conservation effort for major tracts of extreme lowland primary forest in the Sundaic region is called for in the equivalent section under Crestless Fireback.

Retention of enough large strangling figs of the right species, to provide a dependable year-round supply of fruit, is critical to the survival of this species (Wells 1999). Even so, its ecology needs to be clarified through studies of population density, breeding success, feeding patterns, dispersal and survival in a number of carefully evaluated habitats. The results of this work will allow for improved reserve design and habitat management in all future efforts to secure viable populations of the species.

The fact that this species extends onto relatively small islands within the Sunda region suggests some vagility and perhaps some ecological flexibility in these fringing areas. Its niche in, and the status of, the forest environment on such places as the Mergui and Riau archipelagos and the West Sumatran islands need further investigation, as these places may prove to hold important “reserve” populations.

REMARKS (1) No-one seems to have taken three races, *passorhina* from Pulo Matasiri (Oberholser 1917), *messorpora* from Borneo and *panochra* from eastern Sumatra (Oberholser 1924), seriously. However, although considered monotypic in del Hoyo *et al.* (1997), the species divides into two very weakly marked forms, the nominate on Java and eastern Sumatra and race *magnirostris* elsewhere; following Kloss’s (1931) call for the validation of the latter (the problem then being the paucity of nominate material), Chasen (1940) examined two skins from Java and one from Lampung and showed that the bills of these three were always shallower (no overlap) and usually shorter, and wings as short as or shorter, than birds from elsewhere. The boundary between these taxa in Sumatra has not subsequently been investigated, but given that the species is almost certainly extinct on Java, the nominate race itself must be close to extinction. (2) Riley (1938) gave the date of these specimens as 1897, but they are “unambiguously 1927” (P. C. Rasmussen *in litt.* 2000). (3) This record is presumably the undated one given as for Bukit Fraser by Robinson (1928). (4) Two untraced localities on Sumatra are “Kitta Dhawa” (presumably the same as “Kotto Djama” in White-winged Duck *Cairina scutulata*, and probably in West Sumatra *vide* Rudyanto), undated (Nicholson 1882); and Bukit Sanggul, 500 m, August 1936 (two males in MZB).