Threatened Birds of Asia:
The BirdLife International Red Data Book

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GREY IMPERIAL-PIGEON
Ducula pickeringii

Critical □ —
Endangered □ —
Vulnerable ■ B1+2a,b,c,d,e; C1

This small-island specialist occupies a very small range, currently occurring at perhaps fewer than 10 locations, and is inferred to have a small population. Both are undergoing continuing declines owing to increasing conversion of natural forests, qualifying it as Vulnerable.

DISTRIBUTION The Grey Imperial-pigeon (see Remarks 1) is confined to very small islands near Palawan and in the Sulu Archipelago in the southern Philippines, the Talaud islands of Indonesia, and Malaysian islands off north Borneo, with a few mainland records in Sabah, Sarawak and Brunei. It has not been recorded recently from many of the islands on which it was historically found, and it appears that its distribution and population may have significantly decreased in recent decades. A hypothetical listing for Seram (Marsden 1998) was added at the insistence of a referee (S. J. Marsden *in litt*. 2000) and is entirely wrong.

■ ***PHILIPPINES*** Islands from which the species has been recorded (see Remarks 2) were listed alphabetically in Collar *et al.* (1999) but are here arranged and mapped by island group north to south:

Calauit unspecified date (Agaloos and Nepomuceno 1977);

Palawan **Cadlao** island, April or May 1997 (Gonzalez *et al.* 1997); **Lagen** island, April or May 1997 (Gonzalez *et al.* 1997);

Ursula unspecified localities apparently since the 1930s down to the present (Manuel 1936c, Jensen and Hornskov 1992, Hornskov 1995a, Evans *et al.* 1993a, N. Bostock verbally 1994, R. J. Timmins *in litt.* 1997).

Balabac unspecified locality and date (Manuel 1936c), and Dalahuan Bay, Minagas Point, April 1962 (male in YPM);

Lumbucan unspecified date (Manuel 1936c);

Mangsi (type locality) before 1854 (in Dickinson *et al*. 1991);

Calusa unspecified date (Manuel 1936c);

Cagayan **Cagayancillo**, unspecified date (Manuel 1936c);

Cavili unspecified date (Manuel 1936c);

Cagayan Sulu reportedly abundant (Guillemard 1885), and present in the 1930s (Manuel 1936c);

Baguan at two research stations on the island, including "Baguan Hill", May 1991 (IPAS Technical Survey documentation passed to MJC);

Bolod Islands **East Bolod** and **West Bolod**, February 1904, where type material of the form *langhornei* was collected (Mearns 1905b);

Jolo unspecified locality, 1883 (Guillemard 1885);

Dammi sight record (presumed race *langhornei*), January 1906 (in Dickinson *et al*. 1991: 88 and 191);

Tandubatu **Langtad**, where five birds were apparently seen in mangroves, January 1995 (Diesmos and Pedregosa 1995);

Loran unspecified date (Mearns 1905b);

Sipangkot December 1971 (duPont and Rabor 1973a);

Sibutu July 1893 (Sharpe 1894a, Manuel 1936c);

Tumindao sight record (presumed race *langhornei*), October 1906 (in Dickinson *et al*. 1991: 88 and 191).

■ ***MALAYSIA*** ■ ***Sabah*** The species occurs on certain islands around the coast of Sabah and has been recorded occasionally on the mainland, with records as follows:

Banggi island May 1987 (Lomosse and Lomosse 1987);

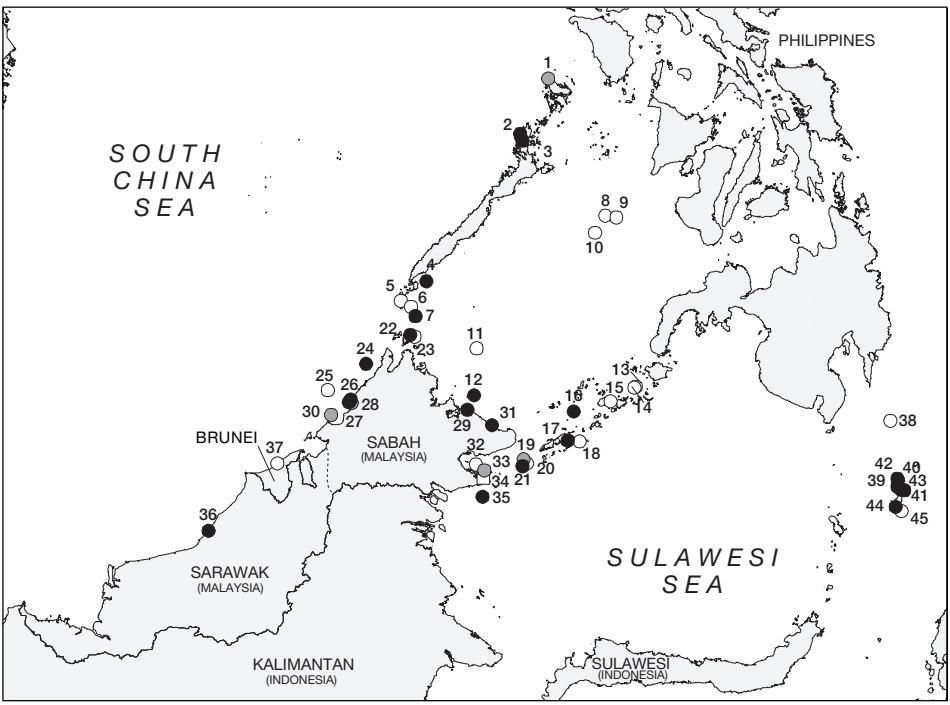
Balambangan (Bilang Bilangan) May–June 1912 (Riley 1930b);

Mantanani islands including Pulau Mantanani Besar, in "abundance" (Everett 1888, 1889), December 1891 (13 specimens in BMNH), June 1921 (Kloss 1930b), March 1982 (Sheldon 1983);

Mengalum islands, April 1892 (eight specimens in BMNH, MCML), July 1928 (Kloss 1930b);

Pulau Gaya, 1.5 km off Kota Kinabalu, now in Tungku Abdul Rahman National Park, September 1898 (four specimens in BMNH), with birds flying to roost in March 1984 (Smith 1984), fulfilling an expectation in Wells (1976);

Mamutik, also in Tungku Abdul Rahman National Park, September 1998 (C. Brooks *in litt*. 1999) and Manukan, in the same park, August 1995 (Melville 1997), with 31 flying from the mainland to roost there between 17h00 and 18h00 on 8 September 1999 (A. C. Sebastian *in litt*. 1999; also *Suara Enggang* September–October 1999: 42, Smythies and Davison 1999);



The distribution of Grey Imperial-pigeon *Ducula pickeringii*: (1) Calauit; (2) Cadlao; (3) Lagen; (4) Ursula; (5) Balabac; (6) Lumbucan; (7) Mangsi; (8) Calusa; (9) Cagayancillo; (10) Cavili; (11) Cagayan Sulu; (12) Baguan; (13) East Bolod; (14) West Bolod; (15) Jolo; (16) Dammi; (17) Langtad; (18) Loran; (19) Sipangkot; (20) Sibutu; (21) Tumindao; (22) Banggi island; (23) Balambangan; (24) Mantanani islands; (25) Mengalum islands; (26) Pulau Gaya; (27) Mamutik; (28) Tanjong Aru; (29) Mumiang; (30) Tiga islands; (31) Kuala Segama; (32) Pulau Bakungan; (33) Sibuan; (34) Semporna; (35) Sipadan; (36) Similajau National Park; (37) Tutong river; (38) Miangas; (39) Sungai Lobo; (40) Beo; (41) Sungai Rae; (42) Sungai Essang; (43) Rainis; (44) Lirung; (45) Kabaruang.

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

Mainland (sequence for next eight sites slightly different from that on map and key) **Tanjong Aru**, Jesselton, December 1956 (Smythies 1963, Gore 1968); **Mumiang**, September–October 1984, occasional in low numbers (Beadle and Whittaker 1985); **Kuala Segama**, regularly (Smythies and Davison 1999); **Semporna**, including in Darvel Bay, undated (Gore 1968, Sheldon *et al*. in press);

Tiga islands, July 1959 (Smythies 1981);

Pulau Bakungan May 1912 (Riley 1930b);

Sibuan, Darvel Bay, August 1959 (Smythies 1963, 1981);

Sipadan, October 1989 (Lambert 1993c), confirming a probable (undated) record there (Smythies 1963, 1981; but see Remarks 3).

■ ***Sarawak*** There is a single record, from a mainland coastal site: **Similajau National Park**, September 1995 (Duckworth *et al*. 1996).

■ ***BRUNEI*** There is a single record, presumably from a site close to the coast: **Tutong river**, before 1898 (specimen in BMNH).

■ ***INDONESIA*** The species is known only from the Talaud islands and outliers north of Sulawesi towards Mindanao in the southern Philippines, as follows:

Miangas ("Palmas"), undated (Mearns 1909a);

Karakelang (Talaud) in the nineteenth century (Meyer and Wiglesworth 1894, Hartert 1898b; see Remarks 4); **Sungai Lobo**, September 1995 (Riley 1997b); various places in the northern interior of the island, 1996 (F. R. Lambert *in litt*. 1999), including the extensive Karakelang Hunting Reserve (Wardill *et al*. 1997); remnant forest south of **Beo**, January and February 1997 (J. C. Wardill *in litt*. 1999); **Sungai Rae**, March 1997 (J. C. Wardill *in litt*. 1999); **Sungai Essang**, March 1997 (J. C. Wardill *in litt*. 1999); **Rainis**, August 1998 (I. Mauro *in litt*. 1999);

Salibabu listed (Meyer and Wiglesworth 1898); behind **Lirung** (Liriung), two or three birds, May 1986 (Bishop 1992a);

Kabaruang undated (Meyer and Wiglesworth 1898).

POPULATION Numbers and trends of this species are very difficult to judge with confidence owing to its fluctuations in distribution (see under Movements). It has been considered rare, seasonally more common but very local (Dickinson *et al*. 1991), and apparently declining in many areas (Lambert 1993c).

Philippines It was apparently abundant in the neighbourhood of the crater-lakes on Cagayan Sulu in the nineteenth century (Guillemard 1885). However, in recent years on Ursula no observer has found more than 30 (see Distribution). Even in 1971–1972 it was considered rare in the Tawitawi archipelago, when just one of a pair was taken on Sipangkot (duPont and Rabor 1973a); on recent visits the species has not been observed (D. Allen *in litt*. 1997, T. M. Brooks *in litt*. 1998), although (a) it is considered "likely to occur at least occasionally" and perhaps overlooked because of identification difficulties (D. Allen *in litt*. 1997), and (b) records would be more likely from small coastal islands than from the main islands in the group.

Malaysia It was abundant on Mengalum and Mantanani in the early twentieth century (Kloss 1930b). In September 1999 31 birds flew in to roost on Manukan Island, Sabah, in small flocks (maximum eight) and singles (A. C. Sebastian *in litt*. 1999; also *Suara Enggang* September–October 1999: 42); and in September 1998 20 birds were observed on neighbouring Mamutik (C. Brooks *in litt*. 1999).

Indonesia On Talaud the species was recently reported by local people to be the rarest of the four *Ducula* species and restricted to the forested central hills (Riley 1997b). Nevertheless what was claimed as "probably one of the largest flocks of the species ever recorded"—consisting of 18 birds—was seen going to roost on Talaud in February 1997 (Riley 1997a).

ECOLOGY ***Habitat*** This small-island specialist primarily inhabits lowland forest (Dickinson *et al*. 1991), tolerating secondary growth and cultivation with some trees (del Hoyo *et al*. 1997). It has been recorded in a variety of habitats including mangroves (Diesmos and Pedregosa 1995), original dipterocarp forest (duPont and Rabor 1973a) and trees growing from limestone cliffs (Sheldon 1993). On Talaud it has been found in primary forest in the island's hilly interior (F. R. Lambert *in litt*. 1999) and indeed this is the area to which islanders report the species as being confined (Riley 1997b), although it has also been recorded in "degraded monsoon woodland" within cultivation (Bishop 1992a, K. D. Bishop *in litt*. 2000) and in 1997 and 1999 singles or pairs were occasionally recorded within agricultural land, in plantations mixed with secondary forest, suggesting that the species is not strictly dependent on forest for food (Riley 1997a, J. Riley, J. C. Wardill *in litt*. 1999). A single bird was seen "in a casuarina tree by the shore" at Tanjong Aru, north Borneo (Smythies 1960), and on "Sapidan" (Sipadan), a bird was collected in palms near the beach (BMNH label data; see Remarks 3). Intriguingly, despite "the almost total absence of trees" around Cagayancillo (though see comments under Food), the species was abundant there (McGregor 1904a). The smallest islands appear to be favoured: the species was very abundant on the tiny and remote Cagayan islands earlier this century, but absent from the larger Cuyo islands to the north (McGregor 1904a, 1909–1910, Hachisuka 1931–1935). It is often in the company of Pied Imperial-pigeon *Ducula bicolor* (e.g. Evans *et al.* 1993a, R. J. Timmins *in litt.* 1997). It has been seen on several occasions associating with Green Imperial-pigeon *D. aenea* on the Talaud islands, where it was also found roosting in a large tree *Terminalia catappa* near to, although not actually accompanying, Red-and-blue Lory *Eos histrio*, Blue-tailed Imperial-pigeon *D. concinna* and Golden-mantled Racquet-tail *Prioniturus platurus* (Riley 1997a). At Manukan Island birds flew in to roost between 17h00 and 18h00, the last arriving at 18h03, all landing on palm trees on the landward side (A. C. Sebastian *in litt*. 1999).

Food Figs have been reported three times and are doubtless important: birds seen on Lagen foraged on *Ficus* fruit (Gonzalez *et al*. 1997), as did individuals on Mantanani Besar (Sheldon 1983) and in the Talaud islands (alongside Black-naped Fruit-dove *Ptilinopus melanospila,* Green Imperial-pigeon and Channel-billed Cuckoo *Scythrops novaehollandiae*) (Riley 1997a). Other birds in the Talaud islands were watched feeding on the fruit of *Cananga odorata* before going to roost in nearby trees (Riley 1997a). Birds on Sipangkot fed among the branches of a tall tree in dipterocarp forest (duPont and Rabor 1973a), while on Cagayancillo the species was reportedly observed feeding entirely on the young leaves of trees (McGregor 1909–1910, Hachisuka 1931–1935), although McGregor (1904a) had earlier stated that many individuals were "feeding on blossoms and leaves as well as on fruit."

Breeding Two mated pairs were apparently about to breed in January 1906 on Palmas (Miangas) (Mearns 1909a) and an egg was collected at this site in the same month (del Hoyo *et al*. 1997). On Sibuan, Malaysia, at least two pairs were possibly breeding with Pied Imperial-pigeons in August 1956 (Smythies 1960). An immature male was taken on Balambangan in May–June, suggesting breeding some months beforehand (Riley 1930b). A juvenile was collected on Sipadan, July (BMNH label data).

Migration The species is reportedly resident on the northern Bornean islands (Smythies 1960). However, its apparently real absence from some areas at certain times (it is a large and often vocal bird, and thus relatively obvious when present) suggests that it may move some distances, even between islands, in search of fruiting trees (Riley 1997a, J. C. Wardill *in litt*. 1999). There are several reports of small flocks departing from islands (e.g. Hornskov 1995a) and occasionally appearing on the adjacent mainland (del Hoyo *et al*. 1997). Like many small-island specialists it is presumably nomadic in search of fruit and other favoured food, regularly appearing on very remote islands.

THREATS The species is threatened because of the increasing scarcity of suitable habitat on small islands. Native forest within its range is being replaced by palm plantations (Baptista *et al*. 1997) and other cultivation, although the extent to which it depends on mangrove habitat on mainland Borneo has never been assessed, and few surveys have been conducted in this area (Lambert 1993c). It is encouraging that the species appears to tolerate the fringes of agricultural landscapes in several areas (Riley 1997a), but there is the worrying possibility that introduced mammals or reptiles might cause birds to abandon islands. Large size and an unwary disposition render the species vulnerable to hunting pressure wherever it comes into contact with the human population: it is trapped and hunted with air-rifles for food on the Talaud islands, with some birds kept as pets or traded (Riley 1997a), and there is great concern that this, compounded by further forest degradation and loss, will seriously affect the species (J. C. Wardill *in litt*. 1999); information on threats to Karakelang Hunting Reserve is given in the equivalent section under Red-and-blue Lory. Although not exclusively dependent on forest for food, the species may be susceptible to the patchy temporal distribution of fruiting figs (Riley 1997a). Miangas (Indonesia) is reportedly entirely deforested and planted to coconut (Lambert 1997), although inevitably this needs verification (see Measures Proposed for a comment about Pulau Garat). Sipadan (Malaysia) is being developed for tourism, income from which is sufficiently great that its ownership is (or recently was) disputed by Indonesia (Lambert 1993c).

MEASURES TAKEN *Philippines* Baguan Island lies within Turtle Islands Marine Natural Park, a CPPAP site which probably confers a certain degree of protection to terrestrial wildlife in the area. No other actions have been taken which might benefit this bird (but see equivalent section under Sulu Hornbill *Anthracoceros montani*). *Malaysia* The species is legally protected in Sarawak (Smythies and Davison 1999). Tungku Abdul Rahman National Park (Sabah) embraces the islands of Gaya, Mamutik and Manukan, from which the species has been recorded in recent years. It has also been recorded in Similajau National Park (Sarawak). *Indonesia* On the Talaud islands, conservation awareness work by Action Sampiri in the late 1990s has focused on the Karakelang Hunting Reserve protected area (Wardill *et al*. 1997) and includes village meetings (16 of the island's 50 to date), school talks (42 of the island's primary, middle and high schools), local government seminars and workshops, capacity building of PKA, production of posters, stickers and leaflets, all aiming to draw attention to the importance of Karakelang's protected area for biological diversity (including this species), and to begin to find solutions to the threats this diversity faces (J. C. Wardill *in litt*. 1999).

MEASURES PROPOSED No direct measures have been proposed, although control of hunting, deforestation and the introduction of exotic predators on islands within its range would appear to be the key to conserving this species. A clearer understanding of its current status and movements is an important step in this process, and islands where it has occurred should be visited and surveyed where possible. A clearer understanding of its ecological specialisation will eventually be needed. *Philippines* The species has been recorded from one "key site" (the Sibutu/Tumindao islands; see Appendix) and appropriate portions of this area should be formally protected under the NIPAS process (if possible taking into account the requirements of other threatened species dependent on forest in the area: see equivalent section under Sulu Hornbill). *Malaysia* The degree to which this species depends on mangrove areas on mainland Borneo has never been assessed, and this needs rectifying. *Indonesia* The extensive mangroves on the coast of east Kalimantan deserve investigation (Lambert 1993c), especially as they are under increasing threat of conversion (D. A. Holmes *in litt*. 1999). Pulau Garat (under 50 ha) in the Miangas (Palmas) group is reportedly uninhabited and entirely forested, and it may therefore prove to be a site at which the species persists; this should be investigated (J. Riley *in litt*. 1999). Comments on the furtherance of bird tourism

on Sangihe–Talaud and the conservation of the Karakelang Hunting Reserve are made in the equivalent sections under Red-and-blue Lory and Talaud Rail *Gymnocrex talaudensis* respectively.

REMARKS (1) There is a baffling remark by Kloss (1930b) that "This grey fruit pigeon is, of course, not a full species, but I am unable to say how it should be indicated trinomially". White and Bruce (1986) thought it probably an allospecies of Pink-headed Imperial-pigeon *Ducula rosacea*. It has been broken into several subspecies, *D. p. langhornei* on West Bolod, Philippines (Mearns 1905b) and *D. p. palmasensis* on Miangas (Palmas) Island, Indonesia (Mearns 1909a), but differences may merely reflect seasonal or individual variation (White and Bruce 1986), and are certainly very slight; therefore no subspecies are recognised here. (2) The species was for some reason expected on Siquijor but there is no evidence that it occurs (Rand and Rabor 1960). (3) There is a juvenile from "Sapidan, near Semporna, SE North Borneo", July 1956 (in BMNH). (4) The title of the paper by Hartert (1898b) confuses two islands as one, so that it seems uncertain whether the record he gave involved Karakelang or Salibabu; however, the title also indicates that the largest Talaud island is involved, hence Karakelang (which presumably was known then by its main town), and in AMNH there is a specimen from "Lirung I., Talaut Is", April 1897. Thus Riley (1997b) was mistaken in thinking that Bishop (1992a) provided the first record from Karakelang.