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.

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BirdLife International is a UK-registered charity

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

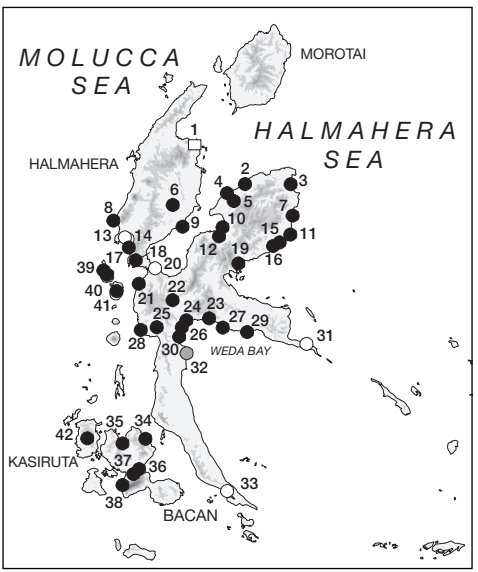
WHITE COCKATOO
Cacatua alba

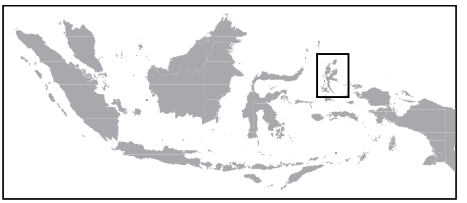
Critical □ —
Endangered □ —
Vulnerable ■ A2b,c,d

This parrot has undergone an observed population decline, principally owing to unsustainable levels of exploitation for the cagebird trade. This is likely to increase in the near future, unless recently revised trapping quotas are effectively enforced, and it thus qualifies as Vulnerable.

DISTRIBUTION The White Cockatoo has been listed as endemic to the islands of Halmahera, Bacan, Ternate, Tidore, Kasiruta and Mandiole in the North Moluccas, Indonesia, with records from Obi and its satellite Bisa considered to reflect introductions (White and Bruce 1986, Lambert 1993a,b, Coates and Bishop 1997). In the absence of a clear record from Mandiole this locality is discounted here, although the species's presence there is entirely plausible (the island is apparently still well forested: F. R. Lambert verbally 1999). On the other hand, its absence from Morotai appears to be real, and inexplicable (Smiet 1985), while the lack of records from the south-western and south-eastern arms of Halmahera may merely reflect a lack of visitors (MKP), although the south-western arm is composed largely of ultrabasic rock, so that the forest growing there is discouragingly dry and depauperate (K. D. Bishop *in litt*. 2000). Records are from:

■ ***INDONESIA*** *Halmahera* **Tobelo**, undated (five specimens in RMNH); **Labilabi**, July 1998 (I. Mauro *in litt*. 1999) and inland from Labilabi, February–March 1995 (Poulsen *et al*. 1999); **Akelamo**, 1990 (K. D. Bishop *per* MKP) and Akelamo Kao (Lambert 1993a,b); **Hilaitetor**, December 1994 (Fuller undated); **Sungai Ifis**, 1994 (Fuller undated); **Tolewang** sago swamp, inland from Kao, April 1996 (Poulsen *et al*. 1999); **Lolasita**, March 1995 (BirdLife fide MKP); **Peot**, just to the south of Gunung Gamkonora, September 1983 (K. D. Bishop *in*





The distribution of White Cockatoo *Cacatua alba*: (1) Tobelo; (2) Labilabi; (3) Akelamo; (4) Hilaitetor; (5) Sungai Ifis; (6) Tolewang; (7) Lolasita; (8) Peot; (9) Kao; (10) Dodaga; (11) Sungai Sosolat; (12) Gunung Subaim; (13) Jailolo; (14) Todowongi; (15) Miaf; (16) Jakarta Baru; (17) Matui; (18) Kali Batu Putih; (19) Buli; (20) Dodinga; (21) Sungai Oba; (22) Kulo; (23) Sagea; (24) Lelilef; (25) Hijrah; (26) Kobe; (27) Waleh; (28) Woda; (29) Dotte; (30) Weda; (31) Patani; (32) Tilope; (33) Gani; (34) Gorogoro; (35) Yaba; (36) Wayamega; (37) Sungai Ra; (38) Sawadai; (39) Danau Tolire Besar; (40) Gamalama; (41) Tidore; (42) Kasiruta.
○ Historical (pre-1950) ◍ Fairly recent (1950–1979)
● Recent (1980–present) □ Undated

litt. 2000); **Kao** (or Kau), on the southern peninsula, undated (Salvadori 1880–1882) and on the Teluk Kao road, 1990s (K. D. Bishop *in litt*. 2000); **Dodaga**, April 1996 (MKP); **Sungai Sosolat**, east coast of Lalobata peninsula, March 1995 (MKP); **Gunung Subaim**, July/September 1994 (Fuller undated); **Jailolo**, undated (Salvadori 1880–1882), April 1931 (male in ZMB; see Remarks 1); **Todowongi**, February 1929 (specimen in IRSNB); inland from **Miaf**, April 1995 (Poulsen *et al*. 1999); **Jakarta Baru**, April 1995 (MKP); **Matui**, August and October 1996 (J. O. Gjershaug and N. Rov *in litt*. 1999); **Kali Batu Putih** ("Domato") near Sidangoli, 1983–1999 (K. D. Bishop *in litt*. 2000), July 1987 (Lambert and Yong 1989) and subsequently (many observers *in litt*. 1999), including Telepeh, December 1995 (C. Donald *in litt*. 1999); inland from **Buli**, March–April 1995 (Poulsen *et al*. 1999), September 1996 (J. O. Gjershaug and N. Rov *in litt*. 1999); **Dodinga**, December 1874, January 1875 (Salvadori 1880–1882; female in RMNH); **Sungai Oba**, August 1994 (Poulsen *et al*. 1999); inland from **Kulo**, July 1994 (Poulsen *et al*. 1999); **Sagea**, May 1999 (D. Agista *in litt.* 1999); **Lelilef** (Lelilef Waibulan), April 1999 (D. Agista *in litt*. 1999); **Hijrah**, May 1999 (D. Agista *in litt.* 1999); **Kobe**, May 1999 (D. Agista *in litt.* 1999); **Waleh**, May 1999 (D. Agista *in litt.* 1999); inland from **Woda**, June–July 1994 (Poulsen *et al*. 1999); **Dotte**, May 1999 (D. Agista *in litt.* 1999); **Weda** (as "Wedareise"), February 1894 (von Berlepsch 1903), July 1994 (SvB) and, at Tanjung Ulie and Gemaf, May 1999 (R. F. A. Grimmett verbally 1999), including "Nucifera", May 1949 (male in ZMA); **Patani**, January 1894 (von Berlepsch 1903); **Tilope**, 5 m, October 1950 (female in ZMA); **Gani**, undated (Vorderman 1898b);

Bacan many records in the nineteenth and early twentieth centuries (Guillemard 1885, Vorderman 1898b, specimens in AMNH, BMNH, RMNH); **Gorogoro**, October/November 1991 (Lambert 1993a,b); **Yaba**, October/November 1991 (Lambert 1993a,b); **Wayamega**, October/November 1991 (Lambert 1993a,b); **Sungai Ra**, October/November 1991 (Lambert 1993a,b); **Sawadai**, October/November 1991 (Lambert 1993a,b);

Ternate unspecified localities, 1861–1862, 1871, March 1872, October 1875, August 1876, March 1880 (Salvadori 1880–1882, Pleske 1884, specimens in BMNH, MNHN, RMNH and SMF), 1980 (White and Bruce 1986); **Danau Tolire Besar**, September 1995 with 25 there in October 1996 (J. O. Gjershaug and N. Rov *in litt*. 1999), August 1998 (I. Mauro *in litt*. 1999), with 4–6 birds there (and apparently investigating a nest hole), May 1999 (R. F. A. Grimmett verbally 2000), and six birds during an hour-long visit, July 1999 (C. Bell *in litt*. 1999); base of **Gamalama** volcano, regularly in 1980s, although not clear if the birds involved were a natural population or escapes (Inskipp *et al*. 1988);

Tidore unspecified localities, November 1863 (male in RMNH), December 1874 (Salvadori 1880–1882), October 1996 (J. O. Gjershaug and N. Rov *in litt*. 1999);

Kasiruta unspecified localities, 1991 (Lambert 1993a,b).

The island of Obi—and, with more conviction, its offshore satellite Bisa—have been cited historically as holding White Cockatoos (Guillemard 1885, Hartert 1903a), but in June 1990 (K. D. Bishop *in litt*. 2000) and 1992 none was seen, and both trappers and traders were unanimous that the species did not occur on these islands; however, captive birds are taken to Obi from Bacan, so records from Obi and Bisa—if not simply mistaken—may have been of captive or briefly feral birds (Lambert 1994a); there are several specimens in MZB labelled Bisa (Lambert 1993a,b) and one from Obi, in October/November 1898 (in AMNH) (although the main port on Obi is opposite Bisa, so birds from Bisa could easily be labelled from Obi: F. R. Lambert verbally 1999).

POPULATION Total numbers are very difficult to gauge, but trade figures are given under Threats. In 1979–1981 the species was found locally common throughout its range in the North Moluccas (Smiet 1985). Lambert (1993a,b) estimated the total world population in 1991–1992 at 49,765–212,430 birds. It seems possible, however, that these values represent an underestimate given the high densities subsequently found at some sites in

longer periods of fieldwork (MKP). The species occurs singly, in pairs and small groups, occasionally in flocks of c.15, but in the afternoon gathers in congregations of up to 50 (Coates and Bishop 1997).

Halmahera In July 1986 in the Sidangoli area flocks of up to 15 birds and daily totals up to 50 were seen, whereas in July 1987 the largest group recorded was three, and no more than 10 birds were seen per day, suggesting that a serious decline had occurred, or else that the majority of the population had temporarily left the area (Lambert and Yong 1989). This decline has been confirmed by another observer and is probably attributable to excessive trapping (F. Verbelen *in litt.* 1993 to MKP) compounded by hunting with guns for recreation and food (K. D. Bishop *in litt*. 2000). A decline in numbers appears to have occurred throughout the island but is most notable in the north (Mangold 1999). There have been two population estimates made, but these are not comparable (although the densities from which the figures are derived show a high level of agreement). The first involved the entire "Halmahera Island Group", based on survey work in 1991–1992, and resulted in the range 42,545–183,129 (Lambert 1993a,b). The second involved the 1,060 km^2 of protection forest targeted for conversion to the Lolobata Wildlife Reserve on the north-east peninsula of Halmahera, where the population in late 1994 was estimated at 9,300 individuals, with a range of 6,200–14,100 (Fuller undated). These figures seem low but a key problem with estimating populations of this species is that it appears to be absent from large areas (MKP).

Bacan In July–August 1985 abundance was judged to be low: the species was recorded 48 times (total of 76 birds, rarely in groups larger than two, maximum seven), usually going to roost at dusk, and interviews suggested that numbers had by then been significantly reduced by trapping (Milton and Marhadi 1987). However, despite intensive trapping pressure, the species was still relatively common on the island in 1991, with a population (including the satellite islands of Kasiruta and, at least hypothetically, Mandiole) estimated at 7,220–29,300 individuals; it was, however, scarce above 300 m (Lambert 1993a,b). Curiously, it was found as high as 1,400 m—and the population density considered highest of any island—during a visit some time in the late 1990s (Mangold 1999).

Tidore The modern situation is unknown; however, as the island is heavily settled, the likelihood is that the species has been entirely trapped out (F. R. Lambert verbally 1999).

Ternate There have been very few recent records, all involving small numbers (Lambert 1993a,b), but in July 1999 six birds seen in an hour at Lake Toli Besar suggested the species might still be common on the island (C. Bell *in litt*. 1999). However, it is perhaps more appropriate to assume that this is a very small but highly visible population which is under extreme human pressures from habitat loss and trapping (R. F. A. Grimmett *in litt.* 2000).

Kasiruta The species was relatively common at 300–500 m in 1991 (Lambert 1993a,b).

ECOLOGY ***Habitat*** Records are from both primary and logged forest, where birds chiefly occupy the canopy and emergent strata (Lambert 1993a,b). Although in an earlier study the species was judged commonest (though perhaps just easiest to see) in secondary forest, around clearings and along rivers (Smiet 1985), BirdLife surveys on Halmahera in the 1990s encountered it most frequently in primary forest, but (if results from one very rich primary area, Miaf, were excluded) with no significant difference between frequencies in primary and selectively logged forest (Poulsen *et al.* 1999, Poulsen and Lambert 2000, MKP; see Remarks 2). Moreover, on Ternate sightings in the 1980s were restricted to patches of primary forest, and on Bacan and Halmahera sightings were most often from primary forest (F. G. Rozendaal *in litt.* 1987 to T. P. Inskipp). On Halmahera birds have been recorded in secondary forest, plantations, coconut stands and near mangroves (ZMA label data, MKP), but these are evidently less important to the species than primary forest, and it is not regarded as a bird of

mangroves (Poulsen and Lambert 2000). In one study, forest on limestone held the highest densities of birds (Fuller undated), but in more intensive work forest on volcanic rock was found to yield the highest densities (MKP). The upper altitude limit on Halmahera has been tabulated at 900 m (Poulsen *et al.* 1999), but birds seem mainly to stay below 550 m, while on Kasiruta the limit is 600 m (birds mainly below 500 m) and on Bacan 550 m (mainly below 300 m) (Coates and Bishop 1997). Birds roost in groups in single large trees (Smiet 1985); Fuller (undated) referred to communal roosts "in hollow trees" suggesting overnight concealment in holes.

Food Fruits of trees appear to be the main food, but bark-peeling behaviour on Bacan, and frequent investigations of clumps of epiphytic vegetation, suggest that some larger invertebrates are also eaten (Lambert 1993a,b). Indeed, one recent observer witnessed larger crickets being eaten and, once, a skink *Cryptoblepharus*, along with fruits of *Canarium*, durian, papaya, langsat and rambutan, plus maize growing in fields, where the birds can sometimes do considerable damage (Mangold 1999). The stomachs of two birds contained maize (Vorderman 1898b), and birds were seen foraging on the ground amidst old maize plants (SvB) and feeding on durian in gardens (F. G. Rozendaal *in litt.* 1987 to T. P. Inskipp).

Breeding The species nests in holes in trees, and from available evidence it appears that only holes in the largest forest trees are suitable (e.g. Pleske 1884); nest holes are commonly situated where large branches have broken off the main trunk, and commercially valuable trees such as *Anisoptera* have been found to be used, with a record of a nest with a young bird in a *Canarium* tree in August (Lambert 1993a,b). Nest-holes are generally 5–30 m up (Mangold 1999). Several breeding pairs were seen in high rainforest trees in April 1981 (Smiet 1985), and early-year breeding (young in March on Bacan, nests reported in May on Halmahera) has been established (Lambert 1993a,b, MKP). The breeding season appears to extend from January to October, but according to local people only one young is ever reared (Mangold 1999). Wild-caught birds do not breed in captivity until they are six years old, and in captivity the clutch size is 2(–3), incubation takes 25–28 days, and birds may live at least 40 years (Lambert 1993a,b).

Migration Some nomadism may occur (see Population).

THREATS The White Cockatoo is one of (now) eight threatened members of the suite of 26 bird species that are entirely restricted to the "Northern Maluku Endemic Bird Area", threats and conservation measures in which are profiled by Sujatnika *et al.* (1995) and Stattersfield *et al.* (1998). The threats to this species are from habitat loss combined with human exploitation pressures.

Habitat loss Much forest in the North Moluccas is still intact; at the start of the 1990s it was reported that 88.5% of the total area of Morotai, Halmahera and Bacan remained forested (Lambert 1993a,b). However, these habitats are under considerable and increasing pressure (for Halmahera see equivalent section under Sombre Kingfisher *Halcyon funebris*). The one protected area in North Maluku, on Bacan, is at risk (see Measures taken).

Trade Vorderman (1898b) reported that the species damages corn crops, making it locally unpopular. It is shot for food and trapped for cagebird markets, using decoys (Lambert and Yong 1989). The relative resilience of this and other Moluccan species under trade pressure has been attributed to combinations of factors which include (a) considerable reproductive capacity, (b) adaptability to habitat alteration (which tends to produce superabundant fruiting and flowering plants), (c) persistence of patches of original habitat on most islands, and (d) lack of predators and competitive species (Smiet 1985). A total of 6,395 birds was recorded as traded out of the Moluccas in 1983, accounting for 15% of the islands' psittacine exports (Smiet 1985). However, later review of official CITES reports provided a considerably worse set of statistics, with imports to various countries per year, 1981–1985, totalled as follows: 4,876 in 1981, 3,666 in 1982, 13,206 in 1983, 12,193 in 1984, and 7,374 in 1985 (Inskipp *et al.*

Table 1. Numbers of White Cockatoos officially reported to CITES as exported from Indonesia, Singapore and all other countries combined (CITES annual report data, CITES Secretariat/UNEP-WCMC *per* J. Caldwell *in litt.* 2000). The low figures for 1999 might reflect incomplete returns by management authorities, but must also reflect (despite the figure of 22) the zero quota imposed by Indonesia for that year (but see text on trade volume in Ternate, 1999).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Indonesia	7,252	6,851	5,571	2,823	100	2	928	1,173	588	22
Singapore	208	0	0	706	783	129	0	198	522	39
All others	43	4	196	23	105	61	28	49	28	66
Total	7,503	6,855	5,767	3,552	988	192	956	1,420	1,138	127

1988; see Remarks 3). The basis for the quotas set in the 1980s was not known, but there appeared to have been no surveys to relate harvest levels to total numbers (Inskipp *et al.* 1988).

In 1990 the total number taken from the wild was officially recorded as 6,600 (6,479 for export, 121 as pets), but such records are considered to represent one quarter to one half of the actual trade at any given period, and anecdotal evidence suggested that some 7–10% of birds die prior to export (Lambert 1993a,b); and subsequently, as Table 1 shows, the official figure rose. The catch quota for Bacan in 1991 was only 200 birds, yet during the period from October 1991 to February 1992 960 birds were seen in holding cages on the island and between 2,355 and 3,700 birds were estimated to have been exported (Lambert 1993a,b). Consequently it was judged that at that time trappers might be removing in the order of 17% of the world population annually, a clearly unsustainable situation (Lambert 1993a,b). At Kali Bati Putih the species was "apparently being extirpated from the locality" in 1991 (Hornskov 1992), although it persisted into 1999 (F. R. Lambert *in litt*. 1999). However, in 1994 it was common in plantations around villages on Halmahera's north-east peninsula, with only low numbers held locally as pets, suggesting low trapping pressure; apparently birds are more valuable when they can "talk", so are commonly kept 1–2 years in villages as pets (Fuller undated). Overall the species was still being traded in fairly large numbers in 1998–1999, and probably continues to experience exploitation at a rate of several thousand individuals annually (F. R. Lambert *in litt*. 1999); indeed, monitoring of trade volume in shops and markets in Ternate in the second half of 1999 indicated that White Cockatoos "were being traded through Ternate in numbers far in excess of government quotas" (M. F. Kinnaird *in litt*. 2000). Table 1 shows volume and trends in the official records of trade in the last decade of the twentieth century, revealing a distinct drop in numbers in mid-decade; by far the largest consumers of these birds were the USA (10,143, all but four in 1990 and 1991), Singapore (2,724), South Africa (2,246), Japan (1,883) and Taiwan (1,470) (CITES annual report data, CITES Secretariat/UNEP-WCMC *per* J. Caldwell *in litt.* 2000).

The fact that birds were fairly commonly observed in captivity on Sulawesi, Flores and other Indonesian islands during travels in 1992 was evidence of significant internal trade in this species (N. Bostock *in litt*. 1999), all of which would involve birds other than the numbers reported through CITES.

The species was omitted from protection under Indonesian government law in 1999 (M. Indrawan *in litt*. 1999), and there appeared to be no enforcement of the zero quota announced in that year for the species, with birds being widely available in local markets during 1999 (F. R. Lambert *in litt*. 1999).

MEASURES TAKEN The species was placed on CITES Appendix II in 1981 (Inskipp *et al.* 1988) and the IUCN survey of its status (Lambert 1983a,b) was a major contribution to an understanding of its conservation needs; indeed, the response of the authorities was reportedly to adopt the quota levels recommended by this survey (Collar *et al.* 1994). It was, in 1988,

unprotected by Indonesian law, but legislation had then recently come into force to require government permits for catching, owning, breeding or transporting all unprotected wildlife species (Inskipp *et al*. 1988).

The Indonesian government has issued quotas for this and other species of traded wildlife, apparently since becoming a party to CITES (Inskipp *et al*. 1988). In the past considerable confusion existed over whether the quotas were for capture or for export, and whether birds purchased as souvenirs ("oleh-oleh") were covered by them, but in 1998 a ministerial decree clarified that (a) the quota is for capture and (b) each annual decree accompanying the quota will state whether souvenirs are to be included in quotas (F. R. Lambert *in litt*. 1999, R. F. A. Grimmett *in litt.* 2000). In 1999 no quota for the White Cockatoo was issued, meaning that any trapping during the year was illegal and that no oleh-oleh permits could be issued (F. R. Lambert *in litt*. 1999). The zero quota remained in place over 2000, and was proposed again for 2001 (R. F. A. Grimmett *in litt.* 2000).

Bacan Milton and Marhadi (1987) referred to "the recent establishment of the Gunung Sibela reserve with its almost undisturbed tracts of forest" on Bacan. Indeed, as at late 1999 the Gunung Sibela Strict Nature Reserve remained the only established protected area in North Maluku, occupying c.230 km^2 of which around half is montane forest, half lowland forest (Poulsen *et al*. 1999). The reserve is under serious threat from agricultural encroachment (penetrating several kilometres inland into areas supposed to be gazetted) and gold prospecting, and it is feared that wide-ranging lowland species in particular may be unable to survive there long-term (Poulsen *et al*. 1999). An application has been lodged with PKA to mine gold (using mercury) in the extreme western peninsula of the reserve, covering c.6% of its area (F. R. Lambert *in litt*. 1999).

MEASURES PROPOSED The history of terrestrial conservation proposals for Halmahera is approximately as follows, with the last point being the key relevant item here (as taken from Poulsen *et al*. 1999). (1) In 1981 the National Conservation Plan proposed the establishment of four protected areas on the island, at Aketajawi (Ake Tajawe), Lalobata, Saketa and Gunung Gamkonora (Gamkanara). (2) The Biodiversity Action Plan for Indonesia (1993), calling for an integrated protected area system for all major habitats, highlit Lalobata, with boundaries encompassing 1,890 km^2. (3) Allowing for logging interests and land-use changes, a single inland area of 1,200 km^2 embracing Ake Tajawe and Lalobata was proposed as a national park (Jepson 1996). (4) In 1997 the Protected Areas System Review for the Indo-Malayan Realm listed Lalobata and Ake Tajawe as priority areas for urgent gazettement. (5) A national park comprising the areas of Lalobata (c.1,400 km^2) and Ake Tajawe (730 km^2) should now be established, with the intervening and surrounding areas of protection, production and limited production forest being given official protection as a buffer zone (and including the Dodaga mangrove area as a satellite to the park; see Remarks 2). With some proposed amendments, this last proposal now has the formal approval from the local government of Central Halmahera, and awaits formal declaration by the Ministry of Forestry (R. F. A. Grimmett *in litt.* 2000).

Studies on Halmahera suggested that this species may be absent or highly reduced in forest on ultrabasic rock (although such forest is botanically and probably therefore entomologically important: Jepson 1996); it is therefore essential that future protected areas embrace lowland habitat which is clearly favoured by the species (MKP).

To achieve greater confidence in setting quotas on trapping this species, high-quality data are needed on population size and age structure, population dynamics, ranging behaviour and the effects of factors like logging and fires; this needs scientific investment of many years (Lambert 1993a,b). There was, however, such concern about the low abundance of the White Cockatoo on Bacan in the mid-1980s that a temporary ban on *all* trade in the species appeared to be most appropriate (Milton and Marhadi 1987). Indeed, the current zero quota reflects

this concern, and it is the formal BirdLife position that a zero quota should remain at least until a reliable system of trade management is in place (R. F. A. Grimmett *in litt.* 2000). If trade is reinstated, reduced interim quotas (1,160 was proposed) would need to be strictly enforced, coupled with (a) a long-term campaign to promote the taking of eggs and young rather than adults, and (b) an experiment to introduce trapping concessions, allowing bidders to obtain monopolies on parrot harvesting in certain areas and thus increasing the incentives for the trade to regulate itself more stringently (Lambert 1993a,b).

REMARKS (1) Records from "Gilolo" or "Djailolo", perhaps refer to the island of Halmahera, not the town of that name (MKP). (2) Despite its evident productivity for cockatoos, Miaf is not covered by existing protected area proposals; this is presumably because it is already under concession, and any attempt to have the concession revoked might compromise the endeavour to fulfil the current protected area proposals (F. R. Lambert verbally 1999). (3) These figures overlap and part-supersede ones provided in Collar and Andrew (1988) for 1984–1986 (7,886, 7,164 and 7,884 respectively).