NDF WORKSHOP CASE STUDIES
WG 6 – Birds
CASE STUDY 4
Cacatua sulphurea
Country – **INDONESIA**
Original language – English

CASE STUDY: *CACATUA SULPHUREA*

AUTHOR:
Siti Nuramaliati Prijono*
*Research Center for Biology, the Indonesian Institute of Sciences Cibinong Science Center, Jl. Raya Bogor-Jakarta Km 46, Cibinong, Indonesia.

I. Background information on the taxa

The Yellow-crested Cockatoo *Cacatua sulphurea* is one of Indonesia's most striking and popular parrots, which has had a long association with its people and culture. There are four subspecies of *Cacatua sulphurea*. It is endemic to Indonesia and Timor Leste, where it was formerly common throughout Nusa Tenggara (from Bali to Timor), on Sulawesi and its satellite islands, and the Masalembo Islands (in the Java Sea). It is one of the Indonesian parrots threatened by trade and habitat degradation. Although there can be no doubt that habitat loss must have contributed substantially to the overall decline in the species population, the blame for the precipitous drop in numbers in the past quarter of the 20th century lies entirely with unsustainable exploitation for trade whether domestic or international. This bird is currently classified as a *Critically Endangered* species. It was listed in Appendix I-CITES, and is protected by Indonesian laws as well.

In this document we explain the NDF process for Appendix II species used in Indonesia, which is the process that was used when *Cacatua sulphurea* was appendix II.

1. BIOLOGICAL DATA

1.1. SCIENTIFIC AND COMMON NAMES:

— Class : Aves
— Order : Psittaciformes
— Family : Psittacidae
— Genus *Cacatua*
— Species : *Cacatua sulphurea* (Gmelin, 1788)
— Subspecies :
Cacatua sulphurea sulphurea (Gmelin, 1788)
Cacatua sulphurea citrinocristata (Fraser, 1844)
Cacatua sulphurea parvula (Bonaparte, 1850)
Cacatua sulphurea abbotti (Oberholser, 1917)

—Common names:
English : Yellow-crested cockatoo, Lesser Sulphur-crested cockatoo
French : Cacatoès soufré
Spanish : Cacatúa sulfúrea
German : Gelbwangenkakadu
Indonesian : Kakatua-kecil jambul-kuning

1.2. Distribution

The Yellow-crested or Lesser Sulphur-crested cockatoo is a virtual endemic to "Wallacea" in the central archipelagos of Indonesia, and on Timor Leste (known formerly as East Timor), occurring in four races, including the remarkably large and nearly extinct *C. s. abbotti*. In addition there are feral populations in Singapore and Hong Kong (Long, 1981; Lever 1987). Only in the wetter parts of north and central Sulawesi does it appear to have been naturally absent.

There are four known subspecies. The *C. s. sulphurea* was formerly widely distributed in Sulawesi, however since the early 1980s it has

become very rare (it may be locally extinct through much of its range) because of high rates of capture. *C. s. parvula* inhabits most of the Lesser Sunda Islands as Penida, Lombok, Sumbawa, Moyo, Komodo, Flores, Pantar, Alor, Timor, and Semau. *C. s. abbotti* occurs only on Masakambing, one of the Masalembo Islands in the Sulawesi Strait, this subspecies is already extinct on Masalembo. *C. s. citrinocristata* is endemic to Sumba island. In Timor Leste, *C. s. parvula* were recorded in six locations (Tilomar, Fatumasin, Sungai Clere, Lore, Monte Paitchau – Iralalora, Mount Diatuto) (Trainor, 2002).

1.3. Biological characteristics

1.3.1. *General biological and life history characteristics of the species*

The Yellow-crested Cockatoo nests in holes in tree. The nesting trees of the Yellow-crested Cockatoo, i.e. two species of Datiscaceae (Jones *et al*. 1995), *Stercula foetida, Tetrameles nudiflora, Ficus benyamina, Duabanga moluccana, Ceiba pentandra, Sterculia oblongata, Corypha utan, Borrassus flabelifer, Erythrine, Macaranga, Eugenia, Garuga floribunda* and coconut tree (Setiawan, 1996). Nest hole was located at the height of 6 -18 m above ground. The eggs are white and there are usually two to three in a clutch. The female lays the eggs in a tree hole, and the incubation is shared by both parents, the female at the night, the male during the day. Incubation commenced with the first egg and lasted 28 days. Hatching weight of 16 g. The young are naked and blind when hatched. The chicks' eyes start to open at about 12 days. The young leave the nest when about 3 months old. The age of first breeding in this or indeed most other cockatoos is unknown, but possibly not in the first year. As in most parrots, the sexes in this species form very strong bonds: Schmutz (1977) reported how the widowed mate of a bird he shot from a crop-raiding flock and hung up (in a vain attempt at discouragement) returned later to sit in silence close to the body of its partner. The birds may live at least 30 years.

The breeding season appears protracted. White and Bruce (1986) gave September–October for Button and April-May for Nusa Tenggara, but in reality the situation is more complicated, although these periods do seem to represent peaks. On Button, 1996, a pair seen entering a nest-hole in mid July were still occupying the site in November (Catterall, 1997). A pair was investigating a potential nest-hole in a tree at the edge of forest in September on Tanahjampea (Dutson, 1995). On Masakambing nest prospecting was witnessed (in a coconut palm) in October, and nesting reported in coconuts in November/December (Cahyadin *et al*, 1994a). On Flores, nest were recorded in November (one), February (one) and April (three)

(Verheijen, 1964); two young males not fully fledged were brought in at the end of April, and gonads of a female from July were slightly swollen (presumably following breeding, since these two pieces of evidence were taken to indicate a breeding season in March and April. Of 46 active or old nests found (in August-October, 1995) on Sumba and 30 potential nesting trees have been found (in March-April, 2005), whereas 18 were active on Sumba.

1.3.2 *Habitat Types*

This is a bird which inhabits primary and tall secondary lowland and hill forest and forest edge, scrub and agriculture (in Sulawesi), moist deciduous monsoon forest and gallery forest (in Nusa Tenggara), and adjacent areas of lightly wooded scrub and cultivation, mainly in the lowlands to 1,200 m (Watling, 1983; Butchart *et al*. 1996; Coates & Bishop 1997). The species eats many cultivated foods, so a high proportion of records (where any records exist) are from the neighbourhood of settlements. On Sumba the birds are absent or rare in forest area of less than 10 km^2, and they prefer undisturbed primary forests characterised by large trees offering nest sites (Kinnaird, *et al*., 2003). The case of Masakambing (Masalembo islands), where all original habitat except the mangroves has been cleared, indicates that substantial modification of landscape can still be tolerated by the species. In Komodo National Park the birds were found in dry coastal monsoon woodland and thorn scrub (Bishop, 1992; Butchart *et al*. 1996), but they commonly also use mangroves. On Sumbawa the birds were seen in semi-evergreen forest and roosting in tall riverine forest dominated by Duabanga moluccensis; on adjacent Moyo island it was present in "rainforest and gardens" (Johnstone *et al*. 1996; Butchart *et al*. 1996). On Flores it penetrates into cultivated land and has been recorded in remote savanna at Wae Wuul (Sudaryanto, 1997 in litt.).

1.3.3. *Role of the species in its ecosystem*

The role of the Yellow-crested Cockatoo in its ecosystem is insufficiently known. However, this species feeds on seeds, nuts, berries and fruits (Forshaw, 1989, Setiawan 1996) and might probably play a role in the distribution of plants. Furthermore, it is part of the food chain. For example, the Komodo dragon (*Varanus komodoensis*) preys upon eggs and uses nests of the Yellow-crested Cockatoo during their arboreal phase. There is a competition between the dragon and cockatoo in using *Sterculia foetida* for nesting (Agista & Rubyanto, 2001). Birds of prey might also attack young and adult Yellow-crested Cockatoo. There are two species, Spotted kestrel (*Falco moluccensis*) and White-bellied Sea-eagle (*Haliaeetus leucogaster*) have observed by Behrens

(1995) and Agista & Rubyanto (2001) to attack the cockatoo. The cockatoos can exploit cultivated plants to a considerable degree. The consequent pest status of the birds in certain areas has led to rural people catching them primarily to protect their livelihoods, and by extension to turn this self- defence into profit. However, some important scientific work is needed to assess the degree of damage the birds do to crops and to determine methods of reducing impact. It should not be assumed that the problem is either massive or insoluble (PHPA/BirdLife International-IP, 1998).

1.4. Population

1.4.1. *Global population size*

Sumba appears to support the largest remaining population, tentatively estimated (in 1992) at c.3,200 birds (but declining, perhaps by 500 birds annually with just 10% of the island still forested in 34 fragments), with other significant (but considerably smaller) populations on Komodo (c.500 individuals), Sulawesi, Buton, Moyo and Timor-Leste (Trainor, 2002). The Komodo population alone (where poaching is virtually absent) declined by an estimated 49% since 2000 (Agista & Rubiyanto, 2001). Its current status on several small islands is unclear. *C. s. abbotti*: In 1999, only five (5) individual of the Yellow-crested Cockatoo remained on Masakambing island (Setiawan *et al*. 2001). *C. s. sulphurea*: In Rawa Aopa Watumohai National Park Yellow-crested Cockatoo was only recorded in the southern area of the park near Laea-Hukaea and estuaries of the Laea, Pampaeae and Mempaho rivers dominated by lowland forest, mangroves and agricultural land. The total population size of Rawa Aopa Watumohai National Park is estimated to be about 100 individuals, and this is probably the most important population on the mainland Sulawesi (Agista *et al*. 2001).

On Pasoso island, however, the total population is estimated only 7-15 individuals (the biggest group recently observed was 7 individuals) with these mostly distributed in the south and central parts of the island in mixed secondary forest, scrub and dryland agricultural plots (Agista *et al*. 2001). *C. s. citrinocristata*: Studies from 1989 to 1992 (Marsden 1995) estimated the total population of Yellow-crested Cockatoo was between 1,150 – 2,644 birds. BirdLife Indonesia's survey (2002) resulted in an estimate of the total population of 229 – 1,195 birds outside the National Parks in Sumba (Persulessy et al. 2003). In 2002 Wildlife Conservation Society (WCS) conducted survey, which estimated the population density of 4,3 birds/km2 in four forest blocks in two national parks in Sumba. (Kinnaird, 2003). *C. s. parvula*: Like in the islands of Nusa Tenggara (part of lesser Sunda islands), the Yellow-

crested Cockatoo on Flores has declined dramatically. Until 1997, cockatoo was found only limited on few sites in small population. In the past 10 years, population of more than ten cockatoo have been found only on two locations. In 1997, 14 individuals was recorded in Ria and in 1998 it was recorded a flock of 15 individuals at Watubuku forest (part of Lewotobi area) (Setiawan *et al*. 2000). On one field survey, it was encountered 80 individuals on Alor Island, 29 individuals in Pantar Island, and 18 individuals in West Timor. Population estimate was 678-784 individuals in Alor Island and 444-534 individuals in Pantar Island. The survey in Moyo Island recorded 10 individuals and the abundance was estimated at 0,0278 individuals/km^2 in the sampling area (Setiawan *et al*. 2000). In Komodo National Park the Yellow-crested Cockatoo is still relatively common, being most frequently recorded in dry tropical forest (at sea level to 350 m) dominated by *Tamarindus indicus* and *Sterculia foetida* (Agista & Rubyanto 2001). Total population size for Komodo National Park is estimated to be 600 individuals with 500 on Komodo island and about 100 individuals on Rinca island. The population in Komodo National Park is believed to be the largest for the sub species *parvula* (Agista & Rubyanto, 2001). Survey in 1994 in Sumbawa it was observed at three sites and reported by islanders to occur at 14 more, albeit in very low numbers (Setiawan, 1996). Population size for Timor-Leste is crudely estimated at 500-1,000 individuals (Trainor *et al. in litt* 2004).

1.4.2. *Current global population trends:*

___increasing √√_X_decreasing ___stable ___unknown

The Yellow-crested Cockatoo has suffered (and may continue to suffer) an extremely rapid population decline, probably equivalent to more than 80% over three generations (given its longevity) (BirdLife International, 2001).

C. s. abbotti was "easily found" until 1980s, but they have been now apparently disappearing from Masalembo islands. Only 8-10 birds could be found on Masakambing island in early 1994 (Cahyadin et al. 1994a), and the latest survey by BirdLife and Kutilang IBC in 1999 found only five (5) individuals remaining on the island (Setiawan *et al*. 2001).

The population of *C. s. citrinocristata* in Sumba Island is also facing the same decline from 1980s until today. The sub species *C. s. citrinocristata* can only be found in the remaining forest blocks on Sumba Island, and the decrease of its population is due to habitat loss and trapping for trading (Persulessy *et al*. 2003). Based on up-to-date

BirdLife Indonesia's survey and data in 2003, the estimation population of *C. s. citrinocristata* in three different forest habitat types (outside national parks areas) in Sumba Island is 1-2 birds/1000 ha.

At many other sites in Sulawesi where *C. s. sulphurea* was once recorded, it has now disappeared. All the modern evidence, amassed in compilations and fieldwork by Andrew & Holmes (1990), Cahyadin *et al*. (1994b), and Mallo & Setiawan (1996), suggests that a very steep decline in population throughout the island has occurred in the past 20 years (PHPA/LIPI/BirdLife International-IP 1998).

Flores suffers massive declines in *C. s. parvula* population. The subspecies was "very common all over the island" in the early 1980's, but from the latest survey it was recorded only 15 individuals at Watubuku forest (PHPA/LIPI/BirdLife International-IP 1998; Setiawan et al. 2000). The representative populations of this sub species still occur in Alor, Pantar and Komodo Islands. West Timor and other small islands in Nusa Tenggara can only support few individuals (PHKA/LIPI/BirdLife International-IP 1998, Setiawan *et al*. 2000, Agista & Rubyanto 2001). Although the *C. s. parvula* race occurs on the largest islands in the Lesser Sundas, populations on Timor, Flores and Sumbawa have been decimated by captures for trade (BirdLife, 2001). The single largest population is considered to persist on Komodo Island (311 km^2) in Komodo National Park. Flocks of 20-30 birds were seen during brief observations from 1989 to 1995, and in 1999 an estimated 100 birds were seen by I. Mauro (BirdLife, 2001).

Table 1. Past (2000) and Current (2005) population of *Cacatua sulphurea* on Komodo Island (Agista & Rubiyanto, 2001)

Site	Population (2000)	Population (2005)	Density /km^{-2} (2000)	Density /km^{-2} (2005)	Population decline
Loh Wenci	6	6	14.29	14.29	0%
Loh Sebita	82	50	19.20	11.71	-39%
Loh Liang	190	62	30.45	9.94	-67%
Loh Pinda	18	3	10.00	1.67	-83%
Loh Wau	44	16	51.16	18.60	-64%
Total	**340**	**137**	**25.02**	**11.24**	**-60%**

The current population of Yellow-crested Cockatoo on Komodo (2005 survey) was only 137 birds, compared to the 340 birds in 2000 (Agista & Rubyanto 2001), which represents a major decline over a period of 5 years. There was a significant decline in the counts of Yellow-crested Cockatoo at the five valleys in 2005 compared with the results of the

2000 study, population declines per valley was varied from 0-80% (Imansyah, *et al* 2005). The Yellow-crested Cockatoo population on Komodo Island is largely immune from forest loss and captures for trade, yet we report a population decline of 60% between 2000 and 2005. Komodo Island presents a different context to the other Indonesian islands: cockatoo harvesting is effectively zero because of surveillance and enforcement and there is negligible loss of mature trees or forest loss through illegal logging (Ciofi & de Boer, 2004). On other islands, captures for trade and loss of mature hollow-bearing trees is undoubtedly driving the decline of populations, but on Komodo (where large hollow bearing trees are probably naturally limited) it might be caused by older trees senescing, and regular wild-fires that might have a greater impact on mature rotten and hollow bearing trees. The sub species *C. s. parvula* in Flores, Alor, Pantar, Timor and Moyo islands was found in moist-deciduous monsoon forest. This type of habitat is under severe pressure because of illegal timber cutting and forest fire. The main factor of population decline is illegal trade in 1980's. Another major factor is loss of forest area (Setiawan *et al*. 2000).

1.5. Conservation status

1.5.1. *Global Conservation status* (according to IUCN Red List)

_X_ Critically endangered	___ Near Threatened
___ Endangered	___ Least Concern
___ Vulnerable	___ Data deficient

The biological status of *C. sulphurea* is critically endangered: A 1cd + 2cd. Numbers have declined dramatically due to illegal trapping for the cage-bird trade. The current population is estimated at less than 10,000. In 1981 *C. sulphurea* was listed in CITES Appendix II and since 2002, it was listed in Appendix I of CITES. Appendix I is reserved for species threatened with extinction and for which commercial international trade is prohibited.

All sub species remain in very small populations, some of them are even nearly extinct. *C. s. sulphurea* and *C. s. parvula* survive in very small and isolated populations, and they are regarded as having low viability in the long term (PHPA/LIPI/BirdLife International-IP 1998). Significant population of *C. s. sulphurea* only exist in Rawa Aopa Watumohai National Park and Pasoso Island, and probably already extinct in north Sulawesi (Agista *et al*. 2001; BirdLife International, 2001). *C. s. parvula* is nearly extinct in Sumbawa (Butchart *et al*. 1996;

Johnstone *et al*. 1996; BirdLife International 2001) and is probably now extinct in Lombok with the only viable population in Komodo National Park, Alor Island, Pantar Island and Timor Leste (Agista & Rubyanto 2001, Setiawan *et al*. 2000, Trainor *et al*. 2004). *C. s. abbotti* is considered to be nearly extinct (Setiawan *et al*. 2001). *C. s. citrinocristata* has a small and declining and highly threatened but the species is probably viable population in Sumba Island (PHPA/LIPI/BirdLife International-IP 1998; Persulessy *et al*. 2003).

1.5.2. *National conservation status for the case study country*

Since 1999 all sub-species of *C. sulphurea* is fully protected in Indonesia in accordance with the Government Regulation No. 8 of 1999. A cooperative recovery plan has been developed and adopted. Populations occur in several protected areas, the most important being Rawa Aopa Watumohai and Caraente National Parks (on Sulawesi) which supports up to 100 individuals (Nandika, 2006), Suaka Margasatwa Nature Reserve on Pulau Moyo, Komodo National Park and two national parks on Sumba: Manupeu-Tanahdaru and Laiwangi-Wanggameti. The declared Nini Konis Santana National Park in Timor holds an estimated 100 birds (Trainor, 2002). Moratoria on international trade have been effective at allowing several subpopulations on Sumba to increase in number between 1992 and 2002, although densities remained below those typical of other cockatoo species (Cahill *et al*., 2006).

1.5.3. *Main threats within the case study country*

___No Threats
_X_Habitat Loss/Degradation (human induced)
___Invasive alien species (directly affecting the species)
_X_Harvesting (Hunting/gathering)
___Accidental mortality (e.g Bycatch)
___Persecution (e.g. Pest control)
___Pollution (affecting habitat and/or species
___Other_____
___Unknown

Its precipitous decline is almost entirely attributable to unsustainable exploitation for internal and international trade. The capture of Yellow-crested Cockatoo for trade has undoubtedly been the most critical factor in its population decline over the past three decades, and is the key factor that limits its recovery. Large-scale logging and conversion of forest to agriculture across its range has exacerbated the decline, and the use of pesticides since around 1989 is a further potential threat. At least formerly, the species was regarded as a crop-pest,

and consequently persecuted. High rainfall years appear to limit productivity considerably resulting in very low recruitment. Conversely, rainfall on Komodo has been low in recent years leading to limited availability of water sources. Competition for cavity nest sites with other parrots and owls in large trees (those by logging activities) leads to low productivity.

2. SPECIES MANAGEMENT WITHIN THE COUNTRY FOR WHICH CASE STUDY IS BEING PRESENTED

2.1. Management measures

2.1.1. *Management history*

Indonesia regulates the trade in wild caught birds through the allocation of capture quotas. The total number of birds taken from the wild in the period 1981-1992 could have been as high as 190,000 (PHPA/LIPI/BirdLife International-IP, 1998). The actual numbers of individuals caught in the wild during this period must be higher than these figures since mortality, domestic trade and any illegal trade must be added to export and import figures. No data exists on the magnitude of these factors. The high level of trade in this species during the 1980s prompted concern, and in 1992, *C. sulphurea* was among 24 species that were the subject of a Significant Trade Review on behalf of the CITES Animals Committee (WCMC, 1992. The recommended action of the review was that "The CITES Management Authority of Indonesia should institute a moratorium on exports until island surveys have been carried out, particularly in Sumba and eastern Nusa tenggara". Indonesia subsequently imposed a zero export quota and prohibition of hunting of the species in 1994, backed up in subsequent years by local (regency-level) legislation. Hence 1993 was the last year when this species was reported in export in large numbers, and the fall-off in international trade in wild birds from Indonesia has been complete. However, it cannot be assumed that the problem is solved. Since a zero quota caught birds was established in Indonesia, there has been increase of international trade in supposedly captive-bred birds; 900 alone in 2000 according CITES permit. Unfortunately, neither the zero quota nor the EU and US import bans for wild specimens appear to be effective. There is substantial evidence that birds still being taken from the wild, with some then passed on as captive-bred birds for international trade. Since 2002, this bird was listed in Appendix I of CITES.

2.1.2. *Purpose of the management plan in place*

a. To maintain viable wild populations of *C.sulphurea*;
b. To halt and reserve the decline in the status and distribution of the Yellow-crested Cockatoo;
c. To reduce poaching of *C. sulphurea*;
d. To promote a recovery of the Yellow-crested Cockatoo population through controls on capture and trade;
e. To conserve habitat and key features of habitat for the species throughout its range, include protect nest-trees;
f. To strengthen control and monitoring of trade;
g. To strengthen capacity and awareness in Indonesia, amongst government agencies, NGOs and local people, to support implementation of the Recovery Plan;
h. To enforce the law;
i. To provide alternative source of *C. sulphurea* through captive breeding.

The development a national management plan or equivalent is necessary to build the political will to establish the process of sustainable use.

2.1.3 *General elements of the management plan*
The species is included in CITES Appendix-I so that international trade in the specimens of the species is strictly regulated. National management plans has been developed in conjunction with local inputs. General elements of the management plan, i.e:

a). HABITAT CONSERVATION
- Conserve habitat and key features of habitat for the species throughout its range;
- Legal action and regulation from the forestry agency to prevent the cutting of tree which are used for nest holes;
- Conserve nesting trees;
- Establishment more protected areas and more a national park management unit;
- Explore ways using adapt (traditional) law to provide protection for the species and its habitat

b). RESEARCH
- Develop baseline of information on populations throughout the range, and undertake monitoring to assess effectiveness of plan;
- Monitoring of population and breeding success, with trials involving nest boxes;

- Determine status and distribution through island-wide survey and carry out population census for selected forest blocks;
- Encourage research into captive husbandry of *C.sulphurea*

c). Awareness.
- Promote community awareness through awareness programme and mass media;
- Training, through participation, in field survey and census methodologies;
- Essential educational activities are those concerned with reducing trapping of Yellow crested Cockatoos in the wild

d). Law enforcement
- Cooperation in traffic control ;
- Bupati (Regency) Decree to enhance national legislation and promote other aspects of recovery plan;
- Develop collaboration with CITES Management Authorities in main importer and exporter countries, to assist with implementation of Recovery Plan and especially prevent illegal trade.

e). Captive Breeding
- Establish captive breeding facilities and develop management system for captive breeding including licencing and regulatory mechanism.

2.1.4. *Restoration or alleviation measures*

Several strategies were identified and developed for habitat and species restoration which included:

a. protecting the remaining habitats from destructive human activities;
b. conserve nesting trees
c. initiating enhancement planting of native species of trees which are used for nest holes;
d. conserve and planting food plants;
e. expanding crucial food supplies, roost sites and water supplies.

2.2. Monitoring system

2.2.1. *Methods used to monitor harvest*

Monitoring of the harvest is vital and essential to ensuring the sustainability of any harvest.. Quotas alone do not provide adequate control of harvests and exports. To be effective, they must be combined with an integrated capture and export permit system that is tracted and

monitored. Permits must identify permissible harvests of each species for both domestic and international trade.

Monitoring of the harvest was carried out by Scientific Authority, student/researchers from local universities, wildlife personnel, NGO and local people. Information that have been considered for monitoring purposes includes distribution/range and population trends.

2.2.2. *Confidence in the use of monitoring*

A Scientific Authority may know that direct population estimates are conducted, but the budgetary, staffing and other constraints result in such population counts only being conducted at long intervals, insufficient to monitor the effects of an annual harvest programme. As well as the lack of confidence in the management system the harvest monitoring strategy is far from adequate. There is a need for field level studies or harvest impact. The current system of national export monitoring is likely to be relatively unreliable considering the lack of knowledge regarding levels of illegal trade.

2.3. Legal framework and law enforcement:

The species is totally protected in Indonesia, meaning that no capture, possession or trade in the specimens of the species is allowed. Liability for the infraction is up to five years in prison and up to 200 million rupiahs fine. A species recovery plan is in place and has been partially implemented.

Until 1997 *C. sulphurea* was unprotected in Indonesia. However, since 1994 catch quotas were set to zero. There were several local decrees. For *C. s. parvula* hunting of all birds has been prohibited on Lombok and Sumbawa since 1994 (instruction No. 20, 1994 of the Governor of Nusa Tenggara Barat) and similarly on Sumba, Flores and Timor (instruction No. 15, 1994 of the Governor of Nusa Tenggara Timur). On West and East Sumba, collection and transport of cockatoos has been banned since 1992 and 1993 (Decree No. 147, 1992 and No. 21, 1993 of the Mayor of the Regency of this island). *C. s. abbotti* has been protected since 1995 by Decree No. 5, 1995 (Regency of Sumenep, East Java). In 1997 *C. s. citrinocristata* was declared as a protected species by Ministerial Decree (Decree of the Minister of Forestry No. 350/Kpts-II/1997: 9 July 1997). Since 1999 all sub-species of *C. sulphurea* is fully protected in Indonesia in accordance with the Government Regulation No. 8 of 1999 (BirdLife International, 2001).

Indonesia has established protected areas important for protection of the species. These include: Rawa Aopa Watumohai National Park (105.194 ha); Pulau Pasoso (49-200 ha, depend sea water tide), Marine

Wildlife Sanctuary; Komodo National Park (1.817 km^2), off the west coast of Flores, which is also a World Heritage Site.

In 1998 following a recommendation by BirdLife Indonesia, the Indonesian Government represented by Ministry of Forestry created 2 (two) National Parks on Sumba, Manupeu-Tanadaru and Laiwangi-Wanggameti. Besides the two national parks, other forest areas on Sumba need also attention because they have the potential to support Yellow-crested Cockatoos (Persulessy *et al*. 2003).

The Tatar Sepang area has been proposed as a 40,000 ha Natural Forest Reserve (either Wildlife Sanctuary or Nature Reserve) located in south-west Sumbawa in Nusa Tenggara Barat (Sumbawa District). An important population of cockatoos along the Sejorong River has almost disappeared during the mine construction phase but the nest trees have been protected. Conserving cockatoo populations in adjacent areas will aid re-population of the cockatoo sanctuary in the Sejorong valley.

3. UTILIZATION AND TRADE FOR RANGE STATE FOR WHICH CASE STUDY IS BEING PRESENTED

3.1. **Type of use** (Origin) **and destination** (purposes)

Cacatua sulphurea has been traded in large numbers as pets and exhibits in zoos.

3.2. Harvest

3.2.1. Harvesting regime:

The aim of harvest regime for a species has a considerable bearing on the probability that a harvest will be sustainable. The main principle applied by Scientific Authority in Indonesia:

a. The harvests do not lead the population of each species (notably at the sub-species level) towards extinction.
b. When a species (i.e. sub species) of wildlife could be successfully bred in captivity the harvest of such species (sub-species) from the wild is immediately stopped.

Such principles are then applied in the following rules of action endorsed by the Indonesian Scientific Authority:

a. Species inhabiting man-made environments could be harvested as long as the harvest is ecologically sound;
b. Species which pairs for life sound only be subject to harvesting in a limited numbers;
c. Harvesting hole-nesting species is to be limited;
d. Harvesting only nestlings and not adults.

3.2.2. *Harvest management/control* (quotas, seasons, permits, etc.)

The national management plan was developed in conjunction with local inputs, because the majority of harvested species are likely to be patchily, so any harvest was managed at the local level to avoid local extirpations. Management plan at provincial level would be the equivalent of national management plan. Consequently, the optimum harvest management situation will include approved an co-ordinated local and national management plans. All harvests will be undertaken in a way that ensures environmental impacts are minimised.

Export quotas are the control measure of choice for the Management and Scientific Authority because Indonesia covers a vast geographic area which would require a large amount of resources to enforce otherwise. A new quota is set every year by the Indonesian CITES Scientific Authority, usually at the end of the year to take effect the following year. The quota is assigned by the Director of Biodiversity Conservation, Forestry Department and delivered through the Regional Office for the Conservation of Natural Resources (BKSDA, Conservation Unit Office) in all provinces and districts, from where it is distributed to traders/exporters. In accordance with the Decree of the Minister of Forestry the BKSDA office issues permits to catch *C. sulphurea* in the field based on the quota allocated for each province. The provincial offices of the Management Authority (BKSDA) control and enforce catch and collection permits, and implement quota management and monitoring for CITES-listed species in their administrative jurisdictions. For domestic transport, the specimens must be covered by permits issued by BKSDA or its Section Offices. Permits for domestic transport are issued in accordance with the annual quota and with reference to catch permits. The domestic transport permit, started from January 2005, is now standardized throughout Indonesia to facilitate better control. All permits (collection and domestic transport permits) are recorded and then reported to the Management Authority, which is expected to improve monitoring of internal (domestic) trade.

3.3. Legal and illegal trade levels :

3.3.1. *Legal international trade*

For many years *Cacatua sulphurea* was traded in large numbers for international pet market. Export data are available since 1981. Subspecies were not distinguished. International trade figures show a steady increase in volume of internationally traded cockatoos, so that by the end of the 1980s it was some four times higher than that at the start of decade. From 1981 to 1989 export numbers from Indonesia

increased dramatically with a total of 61,774 birds exported from Indonesia during that period.

Indonesia regulates the trade in wild caught birds through the allocation of capture quotas. Capture quotas for *C. sulphurea* for the period 1984-1991 are shown in Table 2. It is clear from import data (derived from CITES permits) that the actual trade (and presumably captures) for the years 1988-1991 must have exceeded the capture quotas set for the years. Some of the birds exported in 1988 may have been caught in the previous year, but traders do not generally keep stock for long periods so they are very unlikely to have been caught in years previous to 1987.

Since 1992 there have been an increasing trade of captive bred individuals. The Philippines, Singapore, South Africa and Indonesia are the main states exporting captive bred specimens of *Cacatua sulphurea*. Especially for Indonesia and Singapore there was a sudden turn up of captive bred specimens since 1994, the time the legal trade in wild-taken specimens stopped. Since few years ago Indonesia has exported captive bred specimens. Captive breeding operation on *Cacatua sulphurea* in Indonesia is running by two companies namely PT. Bali Exotica Fauna and PT. Anak Burung Tropikana. Both of these companies were located in Bali Province. Since the year 2002 PT. Bali Exotica Fauna was not running their business and since the year 2003 this company was taken over by PT. Anak Burung Tropikana.

Table 2. Capture quotas for C. sulphurea in Indonesia (1984-1991), divided by province, compared to reported exportd (no information is available on the quota for 1996) (PHPA/LIPI/BirdLife International-IP, 1998)

Sub species/ Province	**1981-1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**
C.s.sulphurea Sulawesi		9,250	4,800	—	2,525	2,900	4,265	3,065	1,900		
C.s parvula East Nusa Tenggara		2,250	1,500		550	550	725	1,100	2,950		
C.s citrinocristata – East Nusa Tenggara		2,000	1,500		600	1,500	2,300	1,500	—		
C.s.parvula West Nusa Tenggara		625	500		250	250	300	265			
C.s.parvula East Timor		0	0		0	0	0	500			
TOTAL QUOTA		15,125	8,300		3,925	5,200	7,400	6,430	5,700		1,000
Exports-Indonesia	22,948	7,680	5,199	6,244	8,930	10,510	13,467	10,748	9,099	2,055	1,440
TOTAL IMPORTS		**8,000**	**5,898**	**7,045**	**9,752**	**11,014**	**13,734**	**6,114**	**5,879**		**2,439**

3.3.2. *Illegal trade*

What is at once evident from available data is that, whilst reported trade in Yellow-crested Cockatoos has decreased enormaously since the export moratorium imposed by Indonesia in 1994, a significant number of Yellow-crested Cockatoos are still traded (Table 3).

Table 3. Reported in C. sulphurea, 1993-1996 based on CITES Annual Report data analysed by WCMC (WCMC in PHPA/LIPI/BirdLife International-IP 1998)

	1993	**1994**	**1995**	**1996**
C. sulphurea				
Net exports incl. captive bred	2055	411	359	288
Captive bred only	75	169	116	238
C.s.citrinocristata				
Net exports incl. captive bred	472	262	290	137
Captive bred only	54	57	59	73
Total net exports (All spp)	2,527	673	649	425

Illegal trade is a major threat to *Cacatua sulphurea*. On Buton island *C. s. sulphurea* is under great pressure from illegal trapping. Birds are readily available in markets at Kendari (capital city of the province of South-east Sulawesi), and locally trapped birds can be seen throughout Buton island (Caterall, 1997). On Komodo National Park trapping occured in remote areas of the National park (Butchart et al. 1996). On Sumba illegal trade in *C. s. citrinocristata* is continuing (Jones *et al*. 1995; Persulessy *et al*. 2003). Furthermore, in 1999 the species was still offered in two of Jakarta's bird markets (Indrawan in BirdLife International, 2001). In 2000, in Java and Bali 127 birds were found in bird markets in which 49 birds were from Sumba. Field data from an investigation team of NGOs showed that in June 2002 one collector in Waikabubak exported 52 Yellow-crested Cockatoos to other islands (Persulessy et al. 2003). In June 2003, 52 individual birds were shipped from Sumba (based on BirdLife Indonesia investigation data). One from 10 wildlife traders on Sumba has been sent to the first ever prison (6 months in jail and heavy fine) in 2003.

The major exporting nations are now two of Indonesia's close neighbours, Singapore and Philippines. Indonesia is frequently mentioned as the country of origin for non captive-bred birds, in particular for the many birds have been exported from Singapore. There is a strong possibility that wild caught *C. sulphurea* are leaving Indonesia illegally and are then being traded legally from other countries in Southeast Asia. Since 1992 illegal birds were confiscated, summing up to 70 birds (WCMC, 2001). There is a strong possibility that wild caught Yellow-crested cockatoos are illegally transferred from Indonesia to other countries in Southeast Asia, e.g. Singapore, and then traded legally (PHPA/LIPI/BirdLife International-IP 1998). Evidently, more than 1,000 birds were smuggled on this way after 1993 (BirdLife International 2001). During 2001-2003, there were 100-300 birds still found in bird markets in Java and Bali. The Yellow-crested Cockatoo still smuggled to Singapore through Batam Island. In 2002, 8 *Cacatua sulphurea* which was known to be not captive bred birds, found in pet shop in Singapore. In 2003, there were 10 non captive bred birds found in pet shop in Singapore (based on ProFauna, an East-Javan-based NGO's investigation data). A significant proportion of captive-bred birds originate in the Philippines. In total, in three years (1994-1996) after exports of Yellow-crested Cockatoos from Indonesia was stopped, an average of 237 captive birds were reported in trade each year, of which 430 (60% of the total) originated in the Philippines. There is possibility that not all of these individuals are captive bred, and that some may derive from wild caught birds illegally imported into the Philippines by boat. Many Philippine fishing boats trade in

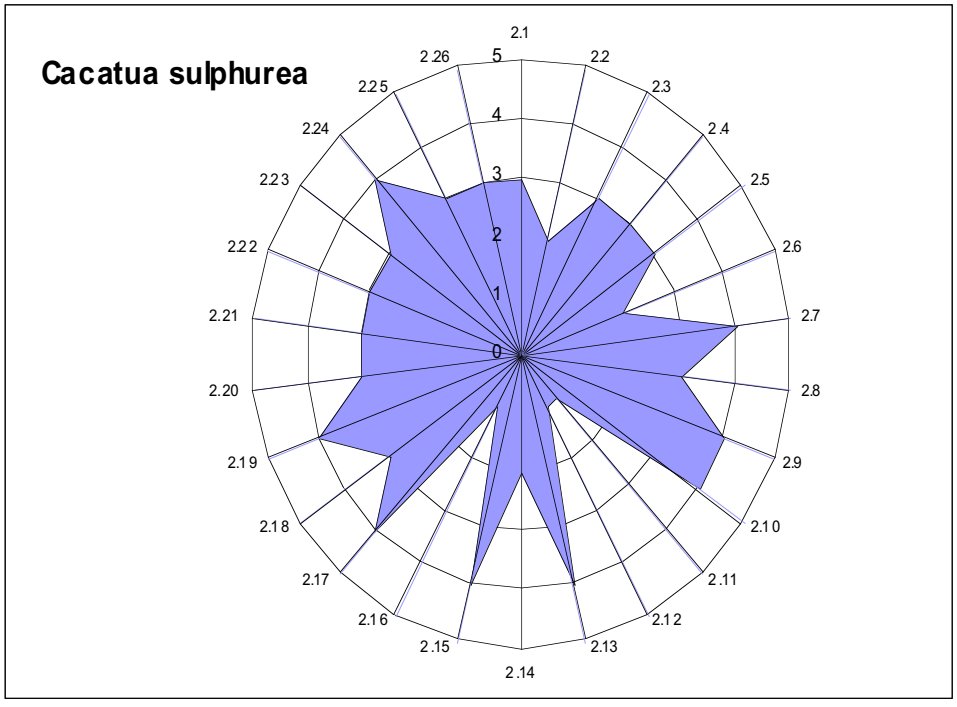
Indonesian waters, and some are known to carry illegal shipments of Indonesian parrots to Mindanao (Lambert 1997).

II. NON-DETRIMENT FINDING PROCEDURE (NDFS)

Provide detailed information on the procedure used to make the non-detriment finding for the species evaluated.

1. IS THE METHODOLOGY USED BASED ON THE IUCN CHECKLIST FOR NDFs?

_X_yes ___no



2. CRITERIA, PARAMETERS AND/OR INDICATORS USED

The Indonesian Scientific Authority uses a wide range of information to determine whether export of this bird will not be detrimental to the survival of the species. The status of *C. sulphurea* is assessed by field inventories, population assessments, scientific literature, monitoring local harvest levels, and district conservation and protection efforts.

3. MAIN SOURCES OF DATA, INCLUDING FIELD EVALUATION OR SAMPLING METHODOLOGIES AND ANALYSIS USED

Data accumulated from unregular monitoring programmes on species and conducted by Scientific Authority, Management Authority, NGOs, local universities and local peoples. BirdLife Indonesia, for example, has always participated in providing the scientific authority with actual data on *Cacatua sulphurea* population in the wild. Other source of data come from foreign scientists who conducted population surveys in Indonesia. When all data are available, the assessment of harvest level of traded species is a simple matter, but this has not always been the case. When data are minimum, the above rules of actions plays on important role in assessing the harvest level for the reason that such rules could manage wild populations of traded species. Another method of acquiring some information on the status of the species in the wild is to record data presently available from harvest activities. Transport and export permits provide information on the number of specimens for each species that has been harvested. Other information are the information on level of harvest of species under national and local protection and species of economic value, and statistics of international trade in these species; data on species distribution, population status, threats, protected measures taken, rearing and breeding conditions; domestic trade statistics from companies trading in animal parts and from specialized association related to wildlife use, etc.; local data sources comprise: biologists from local universities who have undertaken studies of distribution and status, or of use: national biodiversity inventories; government department of forestry, who may have figures on rates of habitat conversion, protected area managers, who can asses the proportion of the range or population under effective protection.

4. EVALUATION OF DATA QUANTITY AND QUALITY FOR THE ASSESSMENT

Data quantity an quality for the assessment of status population of *Cacatua sulphurea* are available, but field survey for monitoring their population should be continued,by repeating surveys conducted 8-10 years ago .

A reasonable knowledge of the biology of a species can permit one to predict fairly accurately whether a species is sensitive to exploitation. Based on this, one could lay down guidelines or quotas for exploitation of each species, taking account of domestic as well as international trade.

5. MAIN PROBLEMS, CHALLENGES OR DIFFICULTIES FOUND ON THE ELABORATION OF NDF

There are many constraint affecting the making of non-detriment findings by the SA in Indonesia, including a shortage of funds to allow the SA to work more independently and a lack of personnel with a strong biological background. In addition, there is a lack of complete and centralized information on the levels of harvest and use of species.

6. RECOMMENDATIONS

- Conduct further surveys to identify the most appropriate areas for conservation action and to periodically monitor key populations by repeating surveys conducted 8-10 years ago;
- Study the abundance and distribution of nest holes and water sources;
- Conduct ecological research to clarify options for its management and conservation;
- Encourage research into captive husbandry of *C. sulphurea*;
- Establish captive breeding facilities and develop management system for captive breeding including licencing and regulatory mechanism;
- Maintaining regular terrestrial patrols is a necessary approach to prevent disturbance to the population of Sulphur-crested Cockatoos in protected areas.
- Promote community awareness programmes;
- Provide support for relevant protected areas and conservation initiatives within its range and protect nest-trees where possible;
- Strengthen control and monitoring of trade;
- Improve law enforcement;
- Promote widespread community-based conservation initiatives;
- Providing artificial water sources near nest locations, i.e water ponds, is essential for Yellow-crested Cockatoo on Komodo Island.

REFERENCES

AGISTA, D. & D. Rubyanto. 2001. Telaah awal Status, Penyebaran dan Populasi Kakatua-kecil jambulkuning (*Cacatua sulphurea parvula*) di Taman Nasional Komodo, Nusa Tenggara Timur. PHKA/BirdLife International-Indonesia Programme, Bogor, Laporan No.17.

AGISTA, D., Sumardin, A. Hamid, F.N. Mallo, S. Alam, Harjun, and C. Mamengko. 2001. Telaah awal status, penyebaran dan populasi Kakatua-kecil jambul-kuning (*Cacatua sulphurea sulphurea*) di Taman Nasional Rawa Aopa Watumohai, Sulawesi Tenggara dan Pulau Pasoso, Sulawesi Tengah. PHKA/BirdLife International-Indonesia Programme, Bogor. Laporan No.16

ANDREW & D.A. Holmes. 1990. Sulawesi Bird Report. *Kukila* 5: 4-26

ARNDT, T. 1994. Zurück in die Freiheit. BBC Wildlife, Juli: 1-2.

BEHRENS, S. 1995. Ein Hilferuf für den Gelbwangenkakadu. Papageien 9: 280-285.

BIRDLIFE Indonesia. 2001. Conservation species: Yellow-crested Cockatoo *Cacatua sulphurea*. http://www.birdlife-indonesia.org/yellow.htm.

BIRDLIFE International, 2001. Threatened birds of Asia: The BirdLife International Red Data Book. Cambridge UK: BirdLife International.

BISHOP, 1992. New andinteresting records of birds in Wallacea. *Kukila* 6: 8-34.

BUTCHART, S.H.M., T.M. Brooks, C.W.N. Davies, G. Dharmaputra, G.C.L. Dutson, J.C. Lowen & A. Sahu. 1996. The conservation status of forest birds on Flores and Sumbawa, Indonesia. Bird Conservation International 6(4): 335-370.

CAHILL, A.J., J.S. Walker, and S.J. Marsden. 2006. Recovery within a population of the Critically Endangered citon-crested cockatoo *Cacatua sulphurea citrinocristata* in Indonesia after 10 years of international trade control. Oryx 40: 161 – 167.

CAHYADIN, Y., P. Jepson & S. Arif, 1994a. Status *Cacatua sulphurea abbotti* di Kepulauan Masalembo, Indonesia (The status of *Cacatua sulphurea abbotti* on the Masalembo Islands, Indonesia). PHPA/BirdLife International, Bogor, Laporan No. 2.

CAHYADIN, Y., P. Jepson & dan M. Syarief, 1994b. Telaah Singkat Status *Cacatua sulphurea sulphurea* di Propinsi Sulawesi Selatan (A rapid status assessment of *Cacatua sulphurea sulphurea* in South Sulawesi Province). PHPA/BirdLife International, Bogor, Laporan No.3.

CATTERALL, M. 1997. Operation Wallacea: results of the 1996 bird survey of Button Island, Sulawesi, Indonesia. Unpublished.

CIOFI, C & M.E. de Boer. 2004. Distribution and Conservation of the Komodo Monitor (Varanus komodoensis). Herpetological Jornal 14: 99-107.

COATES, B.J. & K.D. Bishop. 1997. A Guide to the Birds of Wallacea. Alderley, Queensland: Dove Publications.

DUTSON, G. 1995. The Birds of Salayar and the Flores Sea Islands. Kukila 7: 129-142.

Forshaw, J. M. 1989. Parrots of the world. Third (revised) Edition. London: Blandford Press.

IMANSYAH, M.J., D.G., Anggoro, N. Yangpatra, A. Hidayat and Y.J. Benu. 2005. Distribution and Characteristics of nesting tree of the Yellow Crested Cockatoo (*Cacatua sulphurea*) on Komodo Island in the Komodo National Park. (In Indonesian)). CRES Komodo Project-TN. Komodo, Denpasar. Report (Laporan) no. 4.

JOHNSTONE, R.E., P. Jepson, S.H.M. Butchart, J.C. Lowen & D. Prawiradilaga. 1996. The birds of Sumbawa, Moyo and Sangeang Islands, Nusa Tenggara, Indonesia. Records of the Western Australian Museum 18: 157-178.

JONES, M.J., M.D. Linsley & S.J. Marsden. 1995: Population sizes, status and habitat associations of the restricted-range species of Sumba, Indonesia. Bird Conservation

International 5 (1): 21-52.
KINNAIRD, M.F., A.F. Sitompul, J.S.Walker, and A.J. Cahill. 2003. Pulau Sumba. Ringkasan Hasil Penelitian 1995-2002: Dengan rekomendasi konservasi bagi Rangkong sumba, Kakatua cempaka dan habitatnya. PHKA/Wildlife Conservation Society-Indonesia Program, Memorandum Teknis 6.
LAMBERT, F.R. 1997. Field Assessment of the Conservation Status of the Red-and-Blue Lory *Eos histrio* in Indonesia. IUCN. Bangkok.
LONG, J.L. 1981. Introduced birds of the world. David and Charles, London, UK. Pp. 238-249.
LEVER, C. 1987. Naturilized of the world. Longmans, London, UK. Pp. 243-245.
MALLO, F.N. & I. Setiawan. 1996. Telaah Status *Cacatua sulphurea sulphurea* di Sulawesi Tengah. PHPA/BirdLife International, Bogor, Laporan No. 7.
MARSDEN, S.J. 1995. The ecology and Conservation of the Parrots of Sumba, Buru and Seram, Indonesia. Manchester: Department of Biological Sciences, Manchester Metropolitan University (Ph.D Thesis).
NANDIKA, D. 2006. Recent observations of the critically endangered sulphurea subspecies of yellow-crested cockatoo: Rawa Aopa Watumohai National Park SE Sulawesi, Indonesia. Psittascene 18: 10-11
PERSULESSY, Y., Y.B. Djawarai, and R. Marut. 2003. Survei Populasi dan Distribusi Kakatua-kecil jambul-kuning *Cacatua sulphurea citrinocristata* dan empat jenis paruh bengkok lain di Pulau Sumba (pada blok hutan di luar Taman Nasional). BirdLife Indonesia/ZGAP.
PHPA/LIPI/BirdLife International-IP. 1998. Yellow-crested Cockatoo Recovery Plan. PHPA/LIPI/BirdLife International-Indonesian Programme, Bogor, Indonesia.
SETIAWAN, I. 1996. The status of *Cacatua sulphurea parvula* in Nusa Penida, Bali, and Sumbawa, West Nusa Tenggara, Indonesia (Status *Cacatua sulphurea parvula* di Nusa Penida, Bali, dan Sumbawa, Nusa Tenggara Barat, Indonesia). PHPA/BirdLife International, Bogor, Report No. 6.
SETIAWAN, I., A. Jati, D. Lesmana, C. Trainor, and D. Agista. 2000. Telaah awal Status dan Penyebaran Kakatua-kecil jambul-kuning (*Cacatua sulphurea parvula*) di Pulau Alor, Pantar, Timor Barat, Flores dan Moyo. PHKA/BirdLife International-Indonesia Programme, Bogor. Laporan No.12.
SCHMUTZ, E. 1977. Die vogel der Manggarai (Flores), 2. Niederschrift. Unpublished.
TRAINOR, C. 2002. A Preliminary list of Important Bird Areas in East Timor: Interm list of priority sites for biodiversity conservation in Asia's newest country. BirdLife International – Asia Programme.
TRAINOR, C., F. Santana, A.Xavier, L. Dos Santos, F. Xavier, and J. Dos Lorenzo, in litt. 2004. Status of globally threatened, near threatened and restricted-range birds and internationally significant biodiversity sites in Timor-Leste (East Timor) based on participatory surveys. Summary information with particular reference to the proposed 'Conis Santana National Park (CSNP)'. BirdLife International – Asia Programme.
VERHEIJEN, J.A.J. 1964. Breeding Season on the Island of Flores, Indonesia. *Ardea* 52: 194-201.
WATLING, D. 1983. Ornithological Notes from Sulawesi. Emu 83 (4): 247-261.
WCMC, 1992. Review of Significant Trade in Animal Species Included in CITES Appendix II. Detailed Reviews of 24 Priority Species. Final report to the CITES Animals Committee. WCMC and IUCN Trade specialist Group. Cambridge.
WHITE, C.M.N. & D. Bruce. 1986. The Birds of Wallacea (Sulawesi, The Moluccas & Lesser Sunda Islands, Indonesia). British Ornithologists' Union, c/o Zoological Society, Regent's Park, London, NW1 4RY.