Rehabilitation of Indonesian Parrots from the Illegal Wild Bird Trade: Early Experience on Seram Island, Indonesia

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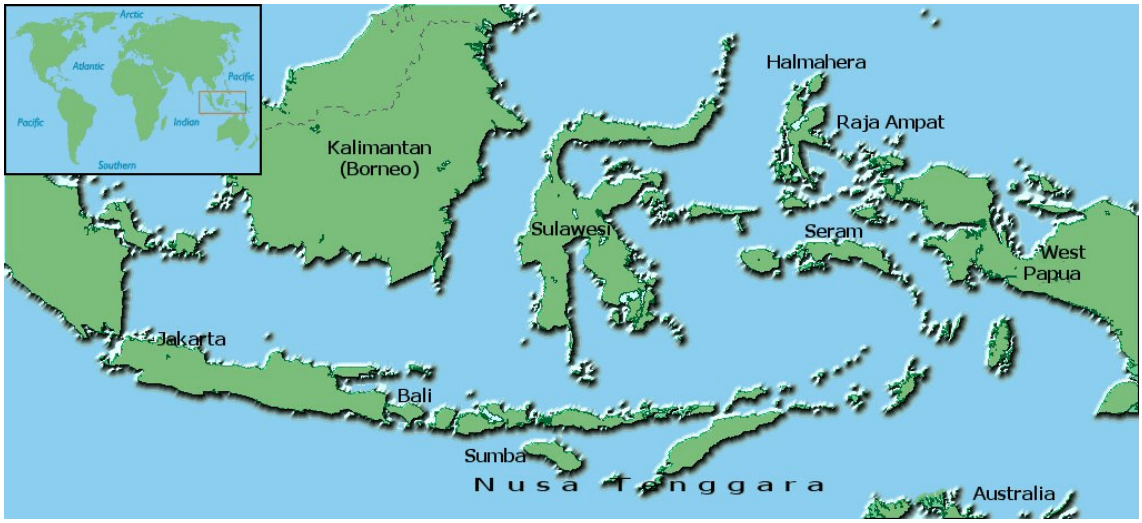
Abbreviations Used

- IBT= Illegal (Wild) Bird Trade
- IPP= Indonesian Parrot Project
- PBW= Project Bird Watch
- KKI= Konservasi Kakatua Indonesia
- CAP= Conservation-Awareness-Pride program
- PBFD= Psittacine Beak and Feather Disease

A. Background

In marked contrast to the relative affluence of the Western half of the Indonesian archipelago, the half that lies to the East is poorer and has a relative paucity of modern technological capabilities (including those required for both human medicine and veterinary medicine). However, the eastern archipelago is rich in natural resources such as its remarkable avifauna and its magnificent forests. The two are inextricably related, of course, since on some islands, loss of habitat greatly impairs the availability of nesting sites for some species of psittacine birds.



Map of the Indonesian archipelago

Threats to Indonesian Cockatoos, Parrots and Lories

- Trapping for illegal bird trade (international and domestic)
- Habitat destruction
- Miscellaneous: hunting, disease?, predators

For example, on Sumba Island:

Forest Cover (%)	**Citron-crested cockatoos (per 1000ha)**
1927 = 55%	1970= 100
1996 = 13%	1980= 13
2000 = 8%	2000= 2 (-98%)

Poverty and ignorance have together driven an unsustainable consumption of such natural resources; the results are striking levels of deforestation and the illegal wild-bird trade (IBT), both of which have threatened numerous species of psittacine birds (Metz, 2005) . However, IBT barely helps the plight of those forced to poach for a living. For example, a wild-caught Salmon-crested (Seram cockatoo ;*Cacatua moluccensis*) brings only $5-25 to the trapper, although prices rise greatly as the birds pass through the hands of middlemen, rising to about $30-150 by the time the cockatoos reach the infamous *pasar burung* ("bird markets") of western Indonesia (KSBK,2002; Metz, 2003; Metz and Nursahid, 2004) . Prices increase much more steeply in the hands of exporters . For *Cacatua alba*, the price increases by about two-thirds between trapper and the supplier on Ternate; the price rises fivefold more at the Java markets. Black-capped lories from West Papua yielded only Rp 25,000 ($US 2-3) for the trapper; this quadruples for the middleman and rises 2.5-fold again upon reaching the marketplace. Even before the Indonesian ban on the export of the wild-caught birds in 2002 (Nursahid, 2003), approximately 80% of the IBT in Indonesia remained within the country. While money drives the initial steps of the IBT, the motivation of the final owner lies not only a national passion for songbirds which are believed to bring good luck, but the desire of the affluent and powerful to display their positions by actually flaunting laws aimed at the IBT. Illegally-obtained caged birds acted as symbols of prestige, power, and affluence in the homes of the well-heeled and well-connected.

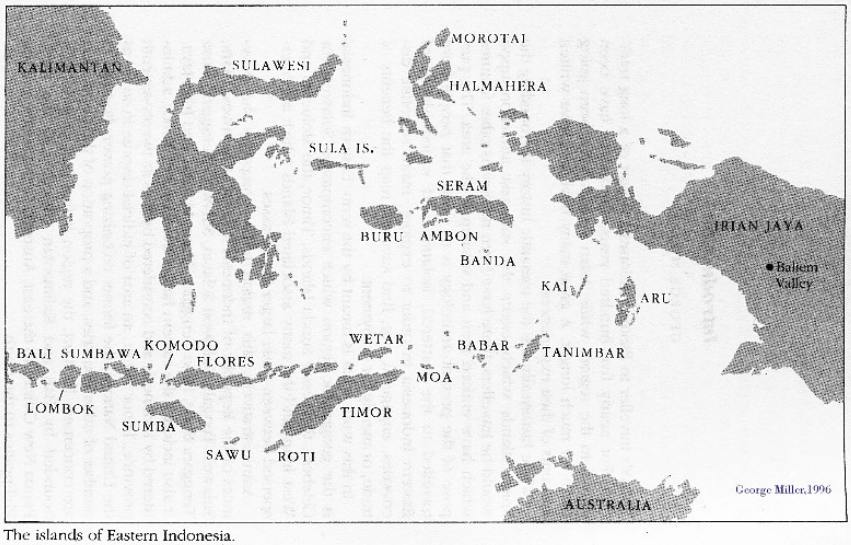
Interdiction of IBT is limited by the vast size of the country dominated by water; government officials are impeded by extremely limited knowledge and resources for dealing with the IBT in psittacine birds; and corruption has been well documented (KSBK, 2002; Metz, 2003,2005; Metz and Nursahid, 2004; Nursahid, 2003). Therefore interdiction can only play a secondary and limited role in fighting the IBL. In the long term it will be necessary to fertilize a 'paradigm shift' in the way that trappers perceive the IBT and its limited and unsustainable gains for them. It will also require a parallel shift in the way that the innate worth of natural resources such as birds (and the sanctity of life) are viewed on ethical and moral bases. It should be noted in passing that Indonesia is the largest Islamic country in the world, with well over 80% of its citizen being Muslim. The Q'uran strongly supports the protection of animal lives and welfare as important tenets of Islam, stating that "*there is not an animal on earth, nor a bird that flies on its wings, but they are communities like you…".* (Qur'an 6:38).

B. The Avifauna of Indonesia

The avifauna of Indonesia is spectacular. In the province of Maluku (often called the Moluccas in other countries, and, in history, the Spice Islands), there exist nearly 350 species of birds (20% of those in Indonesia), with at least 81 species being endemic to that region. This number actually exceeds the number of endemic species of entire favored birding countries such as Ecuador or Columbia and even approaches the mega-diversity countries such as Peru (125 species). In addition, many of the Moluccan psittacine species are renowned for their exquisite beauty or behavioral traits and intelligence, making many of them (seemingly) excellent choices as pets. The birdlife in West Papua (formerly "Irian Jaya") is perhaps even richer, and includes in addition the Birds of Paradise , of which there is only a single representative species in Maluku(Wallace's Standardwing *Semioptera wallacii* in North Maluku).

Almost all psittacine birds are native to islands east of Wallace's line, the bio-geographical construct which separates Sulawesi from Kalimantan (Borneo) and stops just East of Bali (see Maps, above and below). The few exceptions are the Blue-crowned hanging parrot, the Blue-rumped parrot, and several *Psittacula* species. Places of note for psittacine birds in Maluku are:

- North Maluku (eg, Halmahera, Ternate, Tidore, Obi)
- Central Maluku (Seram, and the port city of Ambon to the SW)
- The southern & southwestern regions include the Tanimbar group (home to Goffin's cockatoo and Blue-streaked lory) as well as Wetar and Babar.
- Southeast Maluku includes the Kei and Aru archipelagos. Recently, we have received several Goffin's cockatoos and a Blue-streaked lory from "Kei", where these birds are not endemic. This suggests the presence of an active smuggling route from Tanimbar through the Kei Islands, likely on to Thailand and other overseas markets.
- Buru, to the West of Seram



The islands of Eastern Indonesia.

In view of the number of cockatoo species which are native to Maluku, the Salmon-crested cockatoo *Cacatua moluccensis* is now referred to as the "Seram" (rather than the "Moluccan") cockatoo. They are felt to be extinct on Saparua and Haruku Islands due mostly to extensive logging there. A small number are present on in Ambon but their origin is unclear (Poulsen and Jepson,1996). The "Umbrella" cockatoo has a natural range limited to North Maluku. Triton cockatoos *C. galerita triton* and *C galerita eleonora* are largely restricted to Papua and the Aru Islands, respectively. The Indonesian range of the Palm cockatoo *Probosciger aterrimus goliath,* is largely limited toWest Papua and Aru . *C. sulphurea* and its subspecies, in contrast, are found only in Nusa Tenggara and Sulawesi (see maps) and we almost never receive them at our Rehabilitation Center. Lesser Sulphur-crested cockatoos have recently been uplisted to Appendix 1 of CITES; therefore, four of the five cockatoos on Appendix 1 are Indonesian (the one exception being Philippine or Red-vented cockatoo *C. haematuropygia*). On Seram, at least in the north of the island, it is adult cockatoos which are usually trapped using snares (as described in Metz and Nursahid, 2004); however, juvenile Eleonora cockatoos reach Ambon (and thence, our Center) from Aru, suggesting that chicks might be taken directly from the nest.

Eclectus parrots are found throughout these ranges. Of the varied and spectacular *loriinae* found in Indonesia, the most prominent in the IBT of Maluku are the Chattering lory *Lorius garrulus* and the Violet-necked lory *E. squamata riciniata* or *E.s.obiensis* in North Maluku. The Moluccan Red lory *Eos bornea* and the Purple-naped lory *Lorius domicella* are from Seram. The Blue-cheeked lory *Eos semilarvata* - a Seram endemic - seems rarely to reach the IBT. West Papua has a multiplicity of lories and lorikeets; however, the one which most often pass through Ambon is the Black-capped lory (*Lorius lory*).

C. The Magnitude and Nature of the ILB in Maluku and Papua

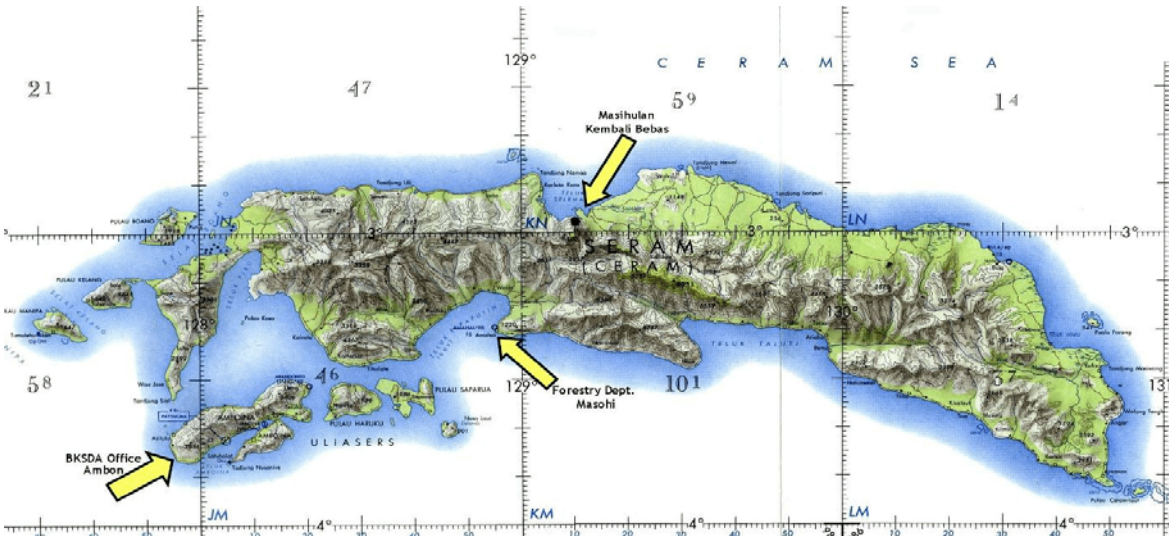
The ongoing trade IBT has recently been documented in two undercover investigations carried out by the Indonesian NGO, ProFauna Indonesia (KSBK, 2002; Metz and Nursahid, 2004). The first focused in North Maluku and Papua. The second took place in Ambon and Seram and was a collaborative project with our group, the Indonesian Parrot Project/Project Bird Watch (IPP/PBW). These studies documented not only the cruel methods used to trap (Figure 1) and transport the birds, but also the substantial magnitude of the illegal trade and the complicity of some government officials in it.

D. Disposition of Confiscated Parrots

Until very recently, there was no satisfactory arrangement to deal with psittacine birds confiscated from IBT in Central Maluku. They were either released directly onto the Hitu Peninsula on Ambon Island (where presumably many died of starvation, disease, and or debilitation from their prior handling) or they were brought to the offices of Conservation and Natural Resources (BKSDA) on Ambon. The fate there was no better - many died of starvation; it is unknown whether disease also killed some of these birds . The Indonesian Parrot Project has been working since 1999 in the villages of Masihulan and Sawai on North Seram. We have developed close working relationships both with the villagers, and with the officers of BKSDA in Ambon and of the Department of Forestry of Manusela National Park on Seram.

On September 23rd, 2004, officers from Manusela National Park on Seram arrested a long-term smuggler following up on a tip about his illegal activities which had been provided by a colleague of IPP/PBW. Officers confiscated 9 Seram cockatoos, 2 Eclectus parrots (*E.roratus roratus*) and 5 Red-cheeked parrots *Geoffroyus geoffroy*i). These birds had been trapped by the Huaulu villagers, a small indigenous tribe. Cages for these birds were hastily assembled on the fringe of the National Park just outside the tiny village of Masihulan. The birds became the first parrots delivered us for care. This unexpected and sudden event marked the establishment of the Kembali Bebas Rehabilitation Center and Sanctuary for psittacine birds on North Seram Island. ("*Kembali Bebas*" is Indonesian for 'Return to Freedom'). Currently, both BKSDA and the Department of Forestry relinquish essentially all confiscated immediately parrots to us unless they need to be held in Ambon for a period as evidence in upcoming legal proceedings. The Center is currently housed on 2.6 Ha of lowland forest. It is an easy walking distance from Masihulan village (Christian) and a short-distance to the much larger, Muslim oceanside village of Sawai.

In addition, we have provided training in the specialized care of parrots to government officials, thanks to Drh. Wahyu Widyayandani and her colleagues at the Bali Wild Animal Rescue Center. We also are upgrading caging (both in terms of quality and capacity) at the Ambon BKSDA and Seram Forestry Offices, so that they may serve as temporary quarantine and holding sites until birds can safely be transported to Seram. By having "satellite" mini-centers at the offices of the confiscating agencies, we hope to be able to cut own on the transport time required for highly stressed birds to receive some immediate care following their confiscation, and prior to the arduous transport to the Center (see Map, below).



Map of Seram and Ambon, with yellows markers indicating three key locations: 1) office of Conservation and Natural Resources (BKSDA) on Ambon; 2) Department of Forestry offices on South Seram; and Kembali Bebas Center on North Seram. The long distances required to transport confiscated parrots to the Center can be appreciated.

E. The Programs of the Indonesian Parrot Project (IPP)

Our Mission: Help to Conserve Indonesia's Cockatoos, Parrots, and Lories

- Work with governmental authorities to improve the welfare and survival of confiscated birds
- Rehabilitate and release confiscated parrots back into the wild (Kembali Bebas Avian Center, Seram Island)
- Teach the principles and lasting value of conservation
- Replace trapping of parrots with sustainable economic alternatives
- Conduct scientific research into the ecology and biology of parrots
- Serve as a source of information and education

The Kembali Bebas Avian Center is divided into the following general areas:

- Quarantine Cages
- Socialization Flight cages, 8-9 metres L x 4 metres W x 3 metres H (cockatoos or large parrots) or 5L x 5W x 3H (lories and lorikeets)
- Sanctuary Flight cages, same dimensions
- Isolation Cages
- Simple veterinary clinic building
- Prelease cages (14 m. long x3 x3 meters)

Psittacine Birds Currently at Kembali Bebas

- **Cockatoos** (Moluccan, Citron-crested, Triton and/or Eleonora, Goffin's,"Umbrella"
- **Lories/Lorikeets** (Purple-naped, Chattering, Green-naped ("Rainbow"), Red, Blue-streaked, Black-capped)
- **Eclectus** (Red-sided, Vosmaer, Grand, Aru)

Although the census varies, it currently it stands at over 120. The overwhelming majority is split almost evenly between *cacatuinae* and *loriinae*, with Eclectus or other parrots comprising ~ 5%. Not surprisingly, the Seram cockatoo *Cacatua moluccensis* is the most common cockatoo, followed by much smaller numbers of Medium Sulfur-crested cockatoos *C. galerita eleonora* or *triton* (from SE Maluku and West Papua); and *C. alba* from North Maluku. *Lorius lory* (Black-capped lory, from West Papua) is the commonest lory, followed by *Trichoglossus haematodus* (Green-naped lorikeet), *Lorius garrulus (*both *garrulus and flavopalliatus* races*)* Chattering lory from North Maluku; and *Lorius domicella* Purple-naped lory from Seram. Four races of Eclectus are represented: *polychloros, aruensis, Vosmaeri* and *roratus*.

F. Release Back into the Wild

Return to the Wild of Confiscated, Wild Psittacine Birds (IUCN; CITES)

- *"Given that any release incurs some risk, we must adopt the following 'precautionary principle': if there is no conservation value in releasing confiscated specimens, the possibility of accidentally introducing into the environment a disease that is not already present, however unlikely, will rule out returning confiscated specimens to the wild."* (CITES; IUCN)
- Where the existing population is severely threatened, re-introduction might improve the long-term conservation potential of the species as a whole, or of a local population of the species.
- Makes a strong political/educational statement concerning the fate of animals and may serve to promote local conservation values.
- Have the possibility of continuing to fulfill their biological and ecological roles
- Alleviating suffering and providing a humane disposition are not mentioned as primary goals

1. Veterinary Disease and Testing

Most of the acute problems seen in the parrots after confiscation relate to starvation and the consequent effects of malnutrition, or traumatic injuries, sometimes with secondary infection. The feathers of many of the birds shows stress bars (Figure 2) and underdevelopment (Figure 3), superficially resembling Psittacine Beak and Feather Disease Psittacine Circoviral Disease). These which revert to normal with re-feeding (Figures 4 and 5). Some parrots, however, do not survive (Figures 2 and 3). Some have received broken wings from being shoved roughly into, or removed from, PVC pipes used to hide them during transport; others have sustained head trauma from physical beatings (Figure 6). Remarkably, feather plucking or Self-Mutilation Syndrome has not been a major problem. The possible presence of intestinal worms is always a concern.

The birds are fed forest-derived, natural foods once a day, and market-derived foods (largely fruit, corn, and beans) for a second meal. The larger birds are especially fond of the nuts derived from *Canarium* trees, which we now make available to bird keepers outside of Indonesia as "MoluccaNuts" [see Section G, below). *Loriinae* are fed artificial lory nectar carried in from outside the country, in addition to fresh foods.

However, a major concern involved in re-introduction programs for confiscated birds is the possibility of covert transmissible disease. In addition to concern about general well-being (especially nutrition) and about common bacterial or parasitic diseases, one must be careful not to introduce birds with latent viral or (intracellular) bacterial diseases. This concern may have a particular "face" when dealing with Old World psittacine bird - "Psittacine Beak and Feather Disease" (PBFD as it is usually called in the US) and "Psittacine Circoviral Disease" (sometimes in Australia).

Potential Problems due to Latent Disease in Avian Release Programs

- Quarantine by itself is insufficient to detect many sub-clinical diseases. Some diseases remain undetected for over a year and then kill the host or spread to other birds.
- It is possible for birds to develop resistance to clinical disease and become carriers. Upon entering an immunologically "naïve" area where there is no resistance, they cause an epizoonotic outbreak.
- Zoonotic diseases, such as avian influenza, aspergillosis, avian tuberculosis, and salmonellosis, are a threat to animal care workers.

However, we found that PBFD was essentially unrecognized as a disease of parrots in Indonesia, even among veterinarians or animal rescue workers. The photo (Figure 7), taken of a cockatoo confiscated in Jakarta and provided to us by Pramudya Harzani, appears to be a case of severe PBFD - the only such photo we have found. Although there are no published systematic data on the prevalence of this disease in Indonesian birds in their native habitat, it is felt to be enzootic in at least some Old World psittacine birds in the wild, and is increasingly identified in captive, hand-bred birds with the advent of modern DNA testing:

Distribution of PBFD – In Captivity

- Has been found in virtually every type of parrot
- In screening studies:
  - Italy: 8%
  - Germany: 39%
  - Thailand: 5%
  - Israel: 14 - 27%
  - Australia: 75 – 90% of Sulfur-crested cockatoos (lower in other

Distribution of PBFD – In the Wild

- Australia – many species. 40 – 90% of cockatoos have antibodies but only 20% or less have clinical signs
- Africa – Cape parrots; some lovebirds
- New Guinea – two Blue-eyed cockatoos imported into Italy
- Phillipines – Red- vented cockatoos
- Solomon Islands – Ducorp's cockatoos (?)
- Indonesia ??
  - 0.5% of Indonesian cockatoos imported into the US had clinical PBFD
  - Many *C. sulphurea* in 1970's later died of PBFD; where did they acquire it?
  - 90% entering Bahrain via Taiwan w/positive test and/or clinical disease

Other concerns in wild Indonesian birds are chlamydophila, herpesvirus, polyoma and aspergillus (found in nests in wild Philippine cockatoos). Not a single case of H5N1-avian influenza has been well documented to occur in the field in psittacine birds (Metz, 2006); however, in Indonesia, this cannot be taken for granted. We screened for these diseases in preliminary studies involving 60 birds: 50 Seram cockatoos; 3 Eclectus; 2 Red-cheeked parrots, 1 Citron-crested cockatoo, 2 Middle Sulphur-crested *C. galerita*; and 2 Moluccan Red lories. Using samples of cloacal/choanal swabs and blood. Samples were analyzed in the USA using Real-Time (Taq-Man ®) PCR-DNA assays performed at Research Associates Laboratories, Dallas. In addition, replicate samples were assayed for circovirus courtesy of Dr. Shane Raidal of Charles Sturt University, Wagga Wagga NSW,Australia (Khalesi *et al*., 2005), using three assays: a PCR assay which employs a different set of primers from those used in the US; hemagglutination [HA] assay; and hemagglutination inhibition [HI] assay, the latter assessing antibodies to circovirus.

Initial PCR Results

United States [1] by PCR (n=60; 50=Seram cockatoos):

- Psittacine Beak and Feather Disease: 0
- Chlamydophila: 0
- Polyoma virus: 0
- Aspergillus: 0
- Herpesvirus: 1 (1.7%; *C. galerita;* swab only, not blood = carrier bird died)

Australia[2] (tests for PBFD only)

- PCR: 1/59 (1.7%; *Eos bornea*, hard-released)
- Hemagglutination: 0/56
- Hemagglutination Inhibition: 21/58 = 36.2%

1 Research Associates Laboratory, Dallas, Texas
2 Dr. Shane Raidal, School of Agricultural and Veterinary Sciences, Charles Sturt University, New South Wales

Essentially all PCR tests were negative with the possible exception of herpesvirus DNA on a swab (but not in blood) from a single cockatoo, and a positive test for PBFD virus DNA in one Moluccan Red lory (which unfortunately was released without our consent by Indonesian authorities before any follow-up could be obtained). These results suggested that the aforementioned viral, fungal, and (intracellular) bacterial diseases were not widely prevalent in latent or clinically-detectible stages in this small sample of psittacine birds. However, results can not be extrapolated to other psittacine birds who might have had different exposures to various environmental factors of the IBT (e.g., smugglers, cages, holding facilities, transportation, cities, other animals and varying levels of stress, including

malnutrition). Furthermore, these samples represent only single samples in time, not an exhaustive or systematic evaluation. The positive HI tests to circovirus (which reflect an antibody response - Khalesi *et al.*, 2005) do suggest that up to 1/3 of these birds had been exposed in some unknown location and at some unknown time to the PBFD circovirus causing PBFD. Thus far, no bird has developed clinical evidence of PBFD in the period since these samples were collected, and assayed (November of 2005).

2. Release and Post-release Follow-up.

In its paper "*Guidelines for the Placement of Confiscated Animals (2002)",* the World Conservation Union IUCN and the Species Survival Commission state that "there are benefits of returning confiscated animals to the wild, providing the pre-requisite veterinary, genetic, and other screening is undertaken and post-release monitoring programmes are established (as per IUCN 1998)."

a. In situations where the existing population is severely threatened, re-introduction might improve the long-term conservation potential of the species as a whole, or of a local population of the species

b. Return to the wild makes a strong political/educational statement concerning the fate of animals and may serve to promote local conservation values. However, as part of any education or public awareness programmes, the costs and difficulties associated with the return to the wild must be emphasized.

c. Species returned to the wild have the possibility of continuing to fulfill their biological and ecological roles."

For our program, the most important reason for releasing confiscated parrots back into the wild, is not so much to increase their numbers as it is to foster pride and conservation values on Seram and Ambon. It is true that in the short-term, any reduction of smuggling is an important (and humane) goal. However, a long-term reduction in trapping will require a change in attitudes. It is our goal via the Release Program to foster the latter by

- Demonstrating the value placed on individual birds;
- Teaching the concept that it is important to keep birds in the wild and not in cages as pets;
- Informing about international approbation which comes from the efforts of the local stakeholders;
- Hiring former trappers to care for the birds, to introduce a sustainable and legal alternative to trapping which use parrots as the resource.

Kembali Bebas Program for Rehabilitation and Release

- Exam and quarantine for >30-60 days; samples collected for PCR/DNA testing
- Then, move to socialization cages; avoid human interaction
- Feed a mixture of market-bought food and natural food
- Enrichment: natural materials; flight
- Exam; move to pre-release cage (10x3x3m) for one month
- "Soft-release" – birds leave at own pace and will; provide supplements for several weeks
- Monitor (leg bands; tail coloration)

The "soft-release technique is used. In brief, birds are placed in large (10 x 3 x3 metres) with an exit door facing upwards; they remain there for about a month to acclimate to the sights and sounds of the release location. On the day of release, the exit door is opened and the parrots are allowed to leave of their own volition. Supplementary food is provided for the birds at the release cage for two-weeks or for as long as they choose to return to eat it. Observation is continued at the release site until birds have dispersed from the area

FOLLOW-UP: Birds are fitted with stainless steel bands. Ultra-short term monitoring (days) is facilitated both by fitting the contralateral leg with colored plastic bands, and for longer periods, by marking tail feathers with various colors using a permanent felt marker pen. In preliminary studies of captive birds, such markings were found to persist on feathers for many months. Despite the variety of colors of India ink which are available, this substance seemed to render the feathers sticky and presumably might damage their function. In the future we hope to initiate a formal radio-collaring program

PRELIMINARY RESULTS OF FIRST RELEASE (MARCH, 2006): The three Salmon-crested cockatoo released in March of 2006 exited the release cage in less than 15 minutes and flew first to a nearby copse of trees, and then out of sight. Despite monitoring the release area for several hours twice/daily, none of the three birds was observed to return to the release site. All three cockatoos together were allegedly spotted by villagers (not directly involved in the Program) on two occasions 2-3 weeks after their release. After that, the third bird was lost to follow-up whereas the other two have been seen seeing flying together for at least 8 months, within several hundred yards of Kembali Bebas and the release site. At the end of 2006, a nest was built by a mated pair (tentatively including at least one release bird) in a tree only about 400 meters from the release site ; however, this nest was apparently failed due to heavy monsoons. By April of 2007, a new nest was spotted in the same tree with a fledgling cockatoo; at least one of the two parents was again felt to be a release bird, judging from the presence of a steel leg band. Thus the preliminary data to date suggest that the release was successful in the short-term by meeting one end-point [breeding in the wild]; however, integration into wild flocks and/or dispersal from the release area, have not been documented. Indeed, only a limited number of studies involving the release of adult, wild, confiscated parrots have been reported, with varying success:

Release of Confiscated Psittacine Birds from IBT into the Wild

- **Thick-billed parrot**, Arizona, USA (24 birds**). Endpoints**: short term survival, 2 fledges + several nestings
- **Golden-capped conure**, Brazil (10 birds**). Endpoint**: "increase in population"
- Yellow-shouldered Amazon, Margarita Island, Venezuela (14 birds. **Endpoints:** survival>1 yr; integration into wild flocks; 2 fledges + 2 additional nestings
- **Blue & Gold macaw**, Trinidad Island (14 birds in 1999, 12 in 2003). **Endpoints**: pairing; >12 fledges; dispersal in loose flocks; population >40
- **Citron-crested cockatoo**, Sumba Island, Indonesia (11 birds with 8 monitored using radio- telemetry). **Endpoint**: survival ~1 yr.
- **Salmon-crested cockatoo**, Seram Island (current studies;3 birds). **Endpoints**: short-term survival, nesting (1 or 2); 1 fledge (?)

G. Other Anti-trapping Programs of the Indonesian Parrot Project

Other Anti-Poaching Programs of IPP

- Trappers as care-givers at Kembali Bebas Center
- Eco-tours (Seram, West Papua)
- Sustainable agri-business (Molucca-nuts)
- Changing Attitudes (children):
  Conservation-Awareness-Pride (CAP) Program
  - Maluku (rural; Eastern archipelago)
  - Jakarta (urban; Western archipelago)

The Indonesian Parrot Project leads eco-tours to Seram (and West Papua) annually. Ex-trappers and other villagers earn income during these tours by acting as bird guides, porters, and cooks. Both they and the village children see through such eco-tours that their birds can attract people from halfway around the world, who will bring needed money into the village economy. It is hoped that this will install pride in the local avifauna, in addition to an appreciation of their sustainable economic value to the community. The day-to-day care of the parrots at Kembali Bebas is provided by former parrot poachers.

In addition, villagers are employed to collect and process the nuts of the "kenari" tree (*Canarium* species) which are a staple of the diet of the larger cockatoos. These are sold to parrot owners outside of Indonesia to provide as bird snacks; all proceeds are used to pay workers to collect the next batch of nuts. The aggregate effect of these programs has been to essentially eliminate the trapping of parrots in the Sawai district of North Seram, as documented via undercover investigation of the IBT in Central Maluku (Metz and Nursahid,

2004).

H. The Future & Research

1. CAP Program

As mentioned above, the interdiction of trapping and smuggling, and the release of confiscated birds back to the wild, are only limited and short-term "band-aids" which do not get at the economic, social, and moral roots of the problem. A long-term solution to the pillaging of Indonesia's avifauna will require changes in attitudes - a true paradigm shift in the value placed on these national treasures. This will require introduction of conservation values to children in school (and other venues). Towards this goal, the Indonesian Parrot Project and Konservasi Kakatua Indonesia have begun its CAP Program-which stands for "Conservation-Awareness-and Pride " Program. An Indonesian NGO (called a "*perkumpulan*") was established in order to become involved in advocacy work. Currently, this program is headed by two recent Indonesian graduates who are visiting schools (at several grade levels) in and around Jakarta itself and conducting slide-show presentations ; soon they will lead bird-watching expeditions. The goal is to introduce basic concepts and questions such as

- What is a parrot, where are they found and why are they endangered? How can they be conserved?
- Why do people keep birds in their homes? What do you feel when you see a bird flying? What do you feel when you see one in a cage?

Initial entry questionnaires suggest that, sadly few if any students have seen birds in the wild; few were aware of what differentiates a parrot from other birds, or had any knowledge of the WBT. Yet many reported the presence of captive cage birds in their households.

2. Improving veterinary care

Status of Avian Care at Kembali Bebas

- Kembali Bebas is located on the edge of rainforest; conditions are very basic, with no electricity; only gross necropsy; on-site vet unskilled in exotics
- No formal lab procedures on site
- Thus, it is a "nascent" (embryonic) center
- We could use YOUR help to be part of an exciting avian conservation and veterinary project AND spend time in a true Eden of Birds, Nature, People and Adventure

There are many challenges facing the Rehabilitation Center. One is the logistical complexity of providing **adequate veterinary facilities and support** in a location that is as remote as north Seram Island and which lacks fixed **electrical power**- and therefore, refrigeration,

modern lighting, incubators, computers, Internet, e-mail, and significant on-site laboratory testing. One of our next steps will be to try to obtain power for these via use of non-polluting solar panels (both fixed and portable), with a concomitant decrease in the necessity for the use of polluting and expensive generators. Simultaneously, we are just beginning the task of establishing collaborations and setting up **PCR assays for key psittacine diseases** in Indonesia; these tests will likely be run in an urban setting in the Western part of the archipelago.

Another difficulty lies in obtaining **permanent, on-site veterinary staffing**. In part related to the problems cited above, it is difficult to attract qualified vets to move from the much-more affluent and modern areas of Java and Bali, to a remote island and care solely for parrots. We hope to supplement our current veterinary staff with veterinarians from other countries who might be interested in spending a **"sabbatical" period on Seram** for three or more months, helping to care for the birds and improve our facilities. They in turn would receive totally unique access to, and experience with, a wide variety of psittacine birds representing all three subfamilies, but also the opportunity to immerse oneself in the peoples, forest, and unparalleled outdoor habitat and activities of a true Eden.

Interested parties should contact Dr. Stewart Metz at projectbirdwatch@gmail.com

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Figure 1: *C. moluccensis*, trapped in a snare (from KSBK, 2002). Photo: ProFauna Indonesia

Figure 2: Black stress bars in the tail of a severely malnourished cockatoo (see Figure 3). Photo: S. Metz

Figure 3: Evidence of severe malnutrition in this cockatoo is also evident in the underdeveloped down and flight feathers, and the markedly protruding keel. This Salmon-crested cockatoo died a few hours later, despite emergency feeding. His proventriculus was found at necropsy to be filled with, and presumably obstructed by, green-painted wood chips he might have consumed out of hunger. His distended crop was filled with a cheesy compounded suspected to be *Candida.* Photo: S.Metz

Figure 4 Major feathering and other abnormalities in these Eclectus parrots (photographed in the offices of government officials) have largely reverted (Figure 5) after 10 months of treatment at Kembali Bebas. Photo: B. Zimmermann

Figure 5 The two Eclectus from Figure 4 (and a pal) after 10 months in Kembali Bebas. They are now recognizable as *Eclectus roratus aruensis.* Photo: S. Metz

Figure 6 This *Cacatua moluccensis* had been severely beaten on the head by a smuggler. Vitreous fluid was observed dripping from both eyes, which were opaque and partially collapsed. He died shortly thereafter of his injuries. Photo: M. Andrea

Figure 7: Photo of a Sulphur-crested cockatoo confiscated by government officials in Jakarta. It appears to demonstrate a case of severe PBFD in Indonesia - the only such photo we have found. Photo: Pramudya Harzani