

FINAL REPORT

The Current Status of Moluccan Cockatoo as Umbrella Species and Conservation Efforts on Ambon Island



APRIL 30st 2023

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**Oriental
BIRD CLUB**

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THE CURRENT STATUS OF MOLUCCAN COCKATOO AS UMBRELLA SPECIES AND CONSERVATION EFFORTS ON AMBON ISLAND

This program was carried out in collaboration between Perkumpulan Konservasi Kakatua Indonesia and Biology Department Faculty of Mathematic and Natural Science Pattimura University

Funded by:
Oriental Bird Club (OBC)
@2022

Team Field Survey

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Introduction

Maluku Province is a group of large and small islands totaling of 1,337 islands (BPS, 2022). Located in the eastern region of Wallace Line and the western of Mayr Line (Sahusilawane, 2018). The biogeographical region of Wallace, a transition zone between fauna in Asia and Australia, is a well-known hotspot of avian endemism (Coates & Bishop 2000). Geographical location, the arrangement of thousands of islands and the geological history that composed them together make Maluku have a very high collection and unique of endemic flora and fauna and very rich biodiversity. Maluku Province was identified as having 675 bird species, 188 endemic bird species and 31 species that are globally endangered (Lepage, 2023). Birds are an important component in a forest ecosystem (Mackinnon et al. 1998). The bird existence that can be found at every level of altitude, habitat type and various types of feed makes birds a balance controller in the ecosystem. The presence of frugivorous species is important because of their function to help plants with pollination and spreading of seeds (Tella et al. 2019). The birds of prey are designed to occupy the top predators to control their prey populations in the food chain cycle. Birds can also play a role in pest control, even their droppings provide nutrition for the soil (Silahooy, 2020).

The Salmon-crested Cockatoo, *Cacatua moluccensis*, also known as the Moluccan or Salmon-crested cockatoo, has been referred to as the most endangered cockatoo in Indonesia (Collar et al., 1994). The Salmon-crested Cockatoo (*Cacatua moluccensis*) is endemic to Southern Maluku and has higher extinction risk in contrast to other species that have a wider distribution range. Trapping and illegal smuggling is the main threat to this flagship species. There are no recent records from Saparua and Haruku, and it may only survive at one locality on Ambon, leaving almost the entire population on Seram, where it was once abundant, but has suffered declines, including an estimated 20-40% in one region during the 1990s (BirdLife International, 2023). In the past five years, BKSDA Maluku confiscated a total of 891 parrots, including 47 *C. moluccensis* (Nandika et. al, 2021). Three factors were significantly predictive of trade variation, whether the species was disposable (i.e. most legally exported species), enjoyable (i.e. most attractive), and accessible by people, suggesting that demand- and opportunity-based factors together can partially explain the illegal parrot trade in Indonesia (Pires et. al, 2021).

The main threat to birds in Ambon Island is habitat degradation and conversion of the population growth and development of the Province city. Almost all of the left forest in Ambon Island is fragmented with the settlement and no connecting corridor to each other forest. As explained by Suhendy (2009) in urban areas with all their development, the presence of water is very much needed, but the development of urban areas actually makes the vegetated land for water absorption increasingly narrow. Besides habitat degradation, several parrots and songbirds are still high trapping for selling as pets is a big threat issue. Almost is Maluku Archipelagos, which still use animals as traditional tribe ceremonies like *C. moluccensis* and from Familia Columbidae and Megapodidae usually consumed meals and eggs. This project is important to maintain the sustainability and threat of local extinction of *C. moluccensis* on Ambon Island which is declining rapidly due to hunting and fragmented habitats due to the growth and development of the provincial capital. If the population is isolated into several metapopulations, that would lead to genetic deterioration, inbreeding, or local extinctions such as those on Haruku Island, Saparua, and Nusa Laut. The population study in Ambon Island is expected to contribute to gathering new data, creating a methodology for decision-making, and creating community awareness.

Project Objective

1. To identify population data of *Cacatua moluccensis* on Ambon Island within a year
2. To spread cockatoo conservation awareness message to 500 villagers in 5 villages around Ambon Island
3. To identify all endemic and threatened bird in Ambon Island for update threat assessment currently facing

Study Area

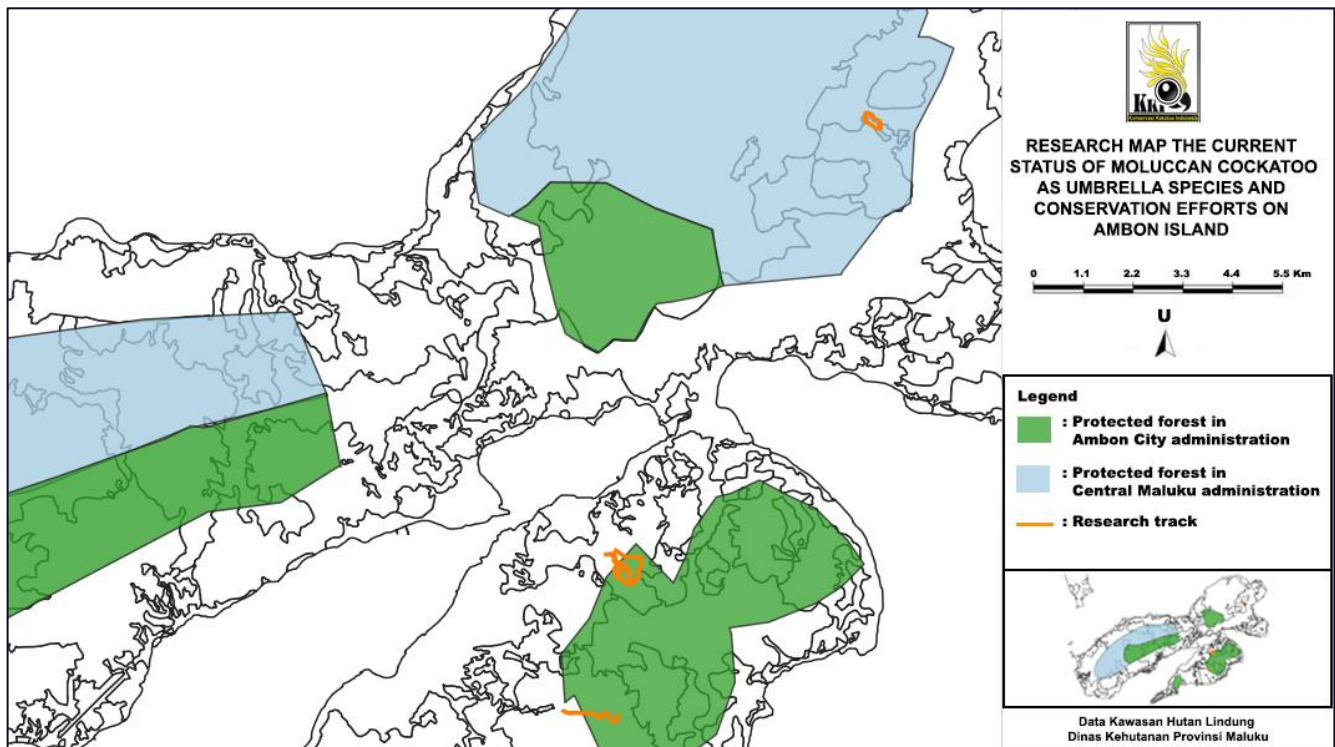


Figure of Map Study Area in Ambon Island

Ambon Island is one of the islands in the Maluku Archipelagos which is the center of government in Maluku province. Geographically, Ambon Island is located 3.487 S - 3.800 S and 127.917 E - 128.357 E. Ambon Island has a sloping topography, hilly to mountainous with Salahutu Mount as the highest with 1225 m asl, and 761 km² area (BPS, 2022). In the history, Ambon Island is one of the islands that are grouped in the Lease archipelago, namely means uninhabited islands. The original inhabitants of Ambon Island come from residents and they are come from Seram Island who spread from residents who live in the mountains or are called the Alifuru people.

Administratively, the island consists of Central Maluku Regency and Ambon City, both controlling each half of the island's area. Ambon City has an area that mostly consists of hilly areas with steep slopes with a slope of more than 20% covering an area of approximately 186.9 km² or 73%, and a slope of

around 10% covering approximately 55 km² or 17% of the total land area (Suhendy, 2009). Ambon Island is divided into two regions, namely Ambon City (49.54%) and Central Maluku Regency (50.46%) of the total area of Ambon Island, which is 761 km² (BPS Central Maluku Regency, 2023). As the center of government, city of Ambon has the highest population density about 1,163 people/km² (BPS Province of Maluku, 2022).

Ambon has several protected forest areas, such as the Mount Nona Protected Forest, Mount Sirimau Protected Forest, Salahutu Protected Forest and Leihitu Protected Forest (Parera et al. 2020). Ambon Island, covers only about 45.047 ha of green area (forest and cultivation). The status of all forest habitat in Ambon is Protected Forest (Hutan Lindung) about 29.514 ha divided into 20,004 ha is including the Central Maluku Region and 9,510 ha including the Ambon city area (Fransz, 2019). In general, the type of forest is a lowland forest to a lower mountain forest that has been disturbed due to moving farming, illegal logging, and forest fires.

The program focus on two places in Ambon Island:

1. Salahutu Mount (3.517 S – 3.554 S; 128.246 E – 128.288 E), administratively located at Salahutu District, of Central Maluku - Maluku Province
2. Sirimau Mount (3.654 S – 3.725 S; 128.204 E – 128.279 E), administratively located at Sirimau District and Leitimur District, of Ambon City – Maluku Province

Methods

1. Identifying population data of *Cacatua moluccensis* in Ambon Island

Study of this program is collaboration with Biology Pattimura University in Ambon, where KKI signed a Memorandum of Understanding. The capacity building for all volunteer students from the University. This activity was carried out by holding material sessions on bird identification and the methods used in research. Furthermore, the practice of collecting data in the field is carried out by observing birds in the campus area.

The survey uses two different methods: first, we use direct random interviews with local community members to collect information on wild *Cacatua moluccensis* and as supporting data, several species of birds also recorded like popularly hunted for traditional ceremonies, trade or for consumption, and other threats faced by the birds in Ambon Island. Data on all of these species would be valuable, and could be collected in parallel. Our target demography will focus on people up to 50 years old, owners of farmers who spent considerable time in the forest in Ambon. Then, to collect data for population estimate, we will use fixed-width line transects (FWLT) encountered by the birds along the transects with two km distance between tracks and 50 m of visibility left and right at each transect. The transect will be selected by a result from direct interviews with the local community. We will count *C. moluccensis* based on direct observations and calls. To identify *C. moluccensis* calls, all teams will have the video recording of this species to remind differences from other parrot calls.

As supporting data, all bird species observed, especially parrots, endemic species and threatened bird. While we also identify locations, save GPS tracks, vegetation and make an assessment of the threats facing each, such as habitat loss, hunting, etc. This information will be collected in parallel and it will inform more focused follow-up work to address each threat. The length of the transect adjusts to the paths of the palm tree climbers. The length of the transect route is four km in Halong village, 2.1 km in Soya village, where the two villages are included in the protected forest area of Mount Sirimau. Then for the village of Waai Panjang transect 1.6 km in the Salahutu mountain forest area.

2. Awareness raising about cockatoo conservation

The message of conservation awareness to stop trapping *C. moluccensis* will be transmitted by printed materials, including up to 10 banners displayed in strategic places, 500 stickers, and 100 posters for 5 villages around Ambon as beneficiaries of the campaign. The villages are Liang village, Waai village, Halong village, and Adat Soya village. Community-based interactions are carried out by encouraging the active participation of local stakeholders. Initiating conservation awareness is essential to encourage protection by local stakeholders (villagers), and to mitigate cockatoo conservation issues. As the main target of the awareness-raising component is stakeholders who are part of the threat and often have easy access to the forest such as farmers, loggers, palm sap tappers, indigenous peoples and local village staff.

This species capacity building focuses on students to shape their interests and demonstrate the impact of the wild parrot trade. Students are encouraged to learn to respect not only cockatoos and other wildlife, but also forests, and with them, their own homeland. Then, the program raises awareness with print media, which will positively influence environmental knowledge, attitudes, and ultimately the behavior of stakeholders.

Data Analysis

a. Species Richness using Menhinick Index (1964)

$$R_2 = \frac{S}{\sqrt{N}}$$

R : Index of Menhinick Richness

S : Total species observed

N : Total individuals in each transect

b. Species Diversity using Shannon-Wiener Index (1949)

$$H' = -\sum \frac{n}{N} \ln \frac{n}{N} = -\sum p_i \ln p_i \quad H' : \text{Shannon-Wiener Diversity Index}$$

-
- n : Total number species
 - N : Total individuals of all species
 - Pi : Proportion species

If the value of $H' > 3.5$ then the diversity of a species is high or abundant, if the value of $H' 1.5 \leq H' \leq 3.5$ then the diversity of the species is moderate, and if the value $H' < 1.5$ then the diversity is low (Magurran 1988).

c. Species Evenness using Pielou Index (1975)

$$E = \frac{H'}{\ln S}$$

- E : Evenness Index of Pielou
- H' : Species Diversity Index
- ln : Natural Logarithm
- S : Total all species

d. Dominance or Density (D)

$$D = \frac{\text{Total one species of bird}}{\text{Large of sample plot}}$$

Results

Bird Diversity

The results of the study recorded in two observations transects, at Sirimau Mount (in the Petuanan Forest of Halong Village and Petuanan Forest of Soya Village), and at Salahutu Mount (represented by Waai Village observation transect). The observations recorded 42 species of birds from 19 families (appendix 1).

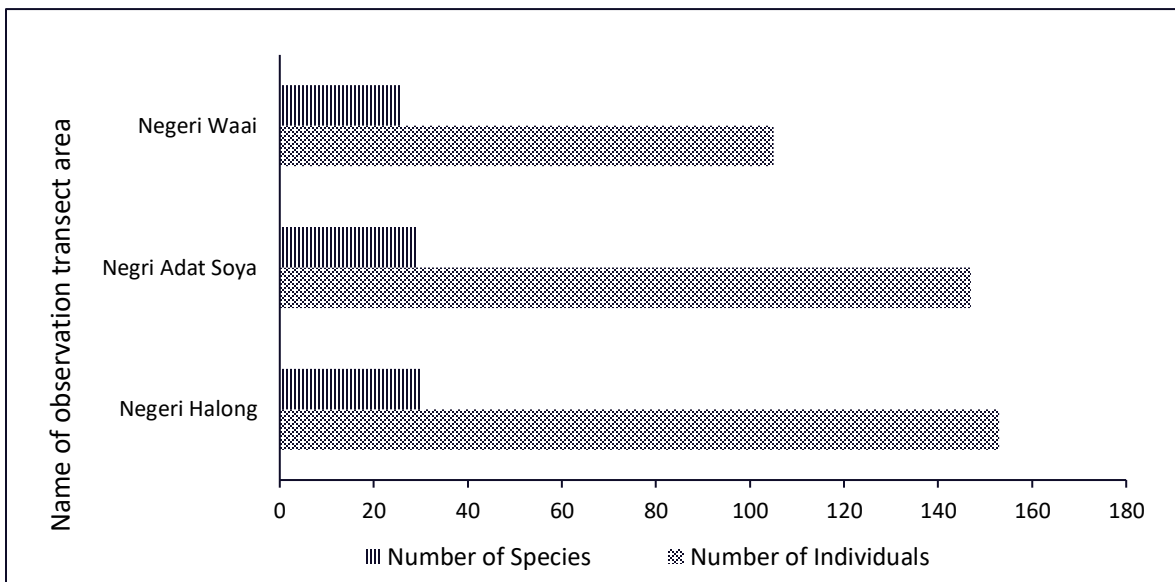


Figure of Comparison of the number of individual and number of species in each observation transect

In general, the number of species and the number of individuals observed in all observation transects is relatively similar. The transect line in Halong village had the highest number of species and individuals, about 30 species with 153 individuals. Then the transect line of Soya village recorded 147 individuals of 29 species and then the transect line of Waai village recorded 105 individuals of 26 species.



Figure of Moluccan Cuckoo *Cacomantis aeruginosus aeruginosus* (left); Variable Goshawk *Accipiter hiogaster* (middle); Common Cicadabird *Edolisoma tenuirostre amboinense* (right)

Based on the composition of the bird species observed is identified in the forests of Ambon Island, 36% were insect eaters, 31% were fruit and seed eaters, 14% were meat eaters, 11% were flower eaters and 7% were seed eaters. If viewed from Menhinick's species richness, it is inversely proportional because the observation transect on Salahutu Mount through Waai village actually has the highest species richness index value, about $R2 = 2.54$ then in Halong village transect with $R2 = 2.43$ and village Soya transect about $R2 = 2.39$.

The species diversity in the three locations has a middle abundance and the species are relatively similar, only a few species have an evenness index above the average. The highest species diversity was in Halong village at about $H' = 3.09$, in Soya villaat ge about $H' = 2.76$ and Waai villaat ge about $H' = 2.58$ (appendix 2). While the species that dominate the other species above the average in this study with have an evenness index (E) above 0.03 to close to 1 at about 11 species. *Aplonis metallica*, *Geoffroyus geoffroyi rhodops*, *Eos bornea bornea*, *Leptocoma aspasia aspasioides*, and *Dicaeum vulneratum* were the dominating species in all observation transects both on Sirimau and Salahutu Mount. Meanwhile, the species that dominated not in all observation transects, like *Collocalia esculenta esculenta* only dominated in the Negeri Soya and Negeri Waai transect, *Probosciger aterrimus* only dominated in the Negeri Soya route.



Figure of Palm Cockatoo *Probosciger aterrimus* in Negeri Soya

Dicrurus bracteatus amboinensis, *Lonchura atricapilla*, and *Passer montanus malaccensis* dominated in Negeri Halong and Waai, then the species that only dominated in Negeri Waai is *Lonchura molucca*. Black-faced munia (*Lonchura molucca*) is a species that is not too common to be found on Ambon Island, unlike its close relatives like Chestnut munia (*Lonchura atricapilla*).



Figure of Red-cheeked Parrot *Geoffroyus geoffroyi rhodops* and Red Lory *Eos bornea bornea*

The results of observations noted that most (62%) of bird species were endemic to the Maluku Islands, 11.9% were migratory birds, introduced birds and birds with a wider distribution. In the study it was also noted that one species Black-billed Koel had an inappropriate distribution. If this bird categorized as introduction, the observation results note that this species is not only in Ambon but also recorded on Seram Island.

The Current Status of Moluccan Cockatoo



Figure of Salmon-crested Cockatoo *Cacatua moluccensis*

The observations result noted that cockatoos were only found in forests of Negeri Halong about four individuals and Negeri Soya, about five individuals. The condition of the forest in the three observation sites is lower montane forest, most of each site has been converted into clove, nutmeg, durian and palawija farm (cassava, corn, long beans, pineapples, caladium, and peanuts). Only a few remaining

native forest plants and scattered. Besides hunting, the land conversion also makes the cockatoo's habitat on Ambon Island decreased.



Figure of habitat in Ambon (landscape)

With a low population size, the relative frequency of Salmon-crested Cockatoo is very low, only 2.61% in the Negeri Halong transect and 3.4% in the Negeri Soya transect. The condition of the road which is slippery, rocky and interspersed with sticky red soil due to high rainfall with hilly track topography is an obstacle in the research process in the field. The cockatoo density per transects as endemic animals with relatively high hunted is about 6.56 individuals/km² in Negeri Halong and 8.20 individuals/km² in Negeri Soya. But, if viewed from cockatoo density in Ambon island is very low about only 1,17 ekor/km², because a lot places were not founded this species.

Cockatoo is not found in transect of Negeri Waai – Salahutu Mount, as similar as local community information which is not found again this species on their village. Based on interview information of local community in Leihitu, no one has informed the existence of cockatoos in their area. However, this data still needs to be studied and further research is carried out because the exploration is still very poor.

In February 2022 a farmer from Halong said that he had taken 2 cockatoo chicks that were in a durian tree nest which had fallen due to rain and strong winds. A local community from Halong was also recorded as keeping Salmon-crested Cockatoo which was tame and every morning he let it loose on a tree beside his house, and this cockatoo he has kept for the last two years which he bought from Seram Island.

Poaching and Pet Birds



Figure of trapping and hunting of Cuscus and birds for consumption

The development of the capital city of Maluku Province and the needs of urban settlements are major challenges faced by the conservation program in Ambon City. Besides that, poaching of wildlife in Maluku, especially on the islands of Ambon and Seram, is a big issue that is still a threat to preserving wildlife. In addition to high market demand, hunting in Maluku also occurs due to the existence of a hunting culture that still continues today and customary demands for indigenous peoples. Hunting for commercial purposes is actually contrary to the local wisdom of the indigenous people on Seram Island because hunting is considered "Pamali" (prohibited for the purpose of enriching themselves). However, cultural shifts, mindsets, demands the necessities of life, and ways to get money without capital, which can be done at any time when needed are the reasons for shifts and violations of cultural norms.

In general, indigenous peoples on Seram Island and Ambon hunt wild animals to fulfill their daily protein consumption. Indigenous peoples utilize more than 50% of wildlife species, especially from groups of mammals, birds, and in smaller quantities from reptiles and fish. People on Ambon Island is similar with people on Seram Island, in that they have a habit of having pets at home, especially parrot species. Based on exploration carried out on Ambon Island, the observed species were the Salmon-crested Cockatoo, sulphur crested cockatoo, palm cockatoo, eclectus, rainbow lorikeet, and red lory.

Discussion

Species Diversity

Sirimau Mount and Salahutu Mount on Ambon Island are two of the four protected forest areas which have an important role in maintaining the ecological balance of wildlife, especially birds and forests as their habitat. However, forest conversion and hunting are complex issues in efforts to conserve wild birds and their habitats. The study of the diversity of bird species on Ambon Island is very important to review the richness of the bird species and the threat faced by the bird species on this island. The bird diversity decline and the population of each species is not only causing a direct exploitation factor, but also very closely related to the decline in the quality of the forest as a habitat and source of food availability. Wildlife is under pressure from the threat of habitat destruction and unrestricted hunting (Djuwantoko, 2000).

The diversity of bird species can reflect the high biodiversity of other wildlife (Sujatnika, 1995). Birds are excellent bioindicators for the health of the environment and ecological/ environmental change (Mekonen 2017). Guilds such as insectivores showed a significant positive relationship with relatively undisturbed habitat, whereas nectarivores and granivores were associated with disturbed habitat (Chettri et al. 2005). Based on this, it can be concluded that the habitat conditions on Sirimau Mount and Salahutu Mount are still in good indication, marked by the high presence of insectivores' birds and frugivores birds. Although in terms of species composition, habitat conditions on Ambon Island are still indicated to be good, but the decline in populations of the Columbidae and Psittacidae families shows that the quality of their habitat is in a problematic condition. Frugivore birds are a species that is very sensitive to habitat fragmentation (Loiselle and Blake, 1992). Seed dispersal by frugivores can help restore and manage damaged habitat (Silva et al. 2000). Decreasing populations of frugivores as seed dispersers have disrupted forest recovery on Ambon Island. Long-term monitoring at landscape level is necessary to understand the dynamics of habitat use patterns by bird communities in relation to spatial and temporal changes (Chettri et al. 2005).

The diversity of species composition based on the type of feed shows the condition of the habitat and the diversity of habitat types. Every type of living animal depends on a certain group of plant species (Ewusie 1990). The diversity of habitat types in the Negeri Waai – Salahutu Mount transect resulted in a higher species richness compared to other transects. The transect condition which is a combination of open and disturbed then followed by a transect with tighter vegetation conditions. Open and disturbed transects are marked by the presence of Eurasian Tree Sparrow, Chestnut Munia, Black-faced Munia, Olive-backed Sunbird, and Black Sunbird. Higher bird species richness and diversity were observed under open canopy conditions in the lower forest (Chettri et al. 2005). The presence of birds will be more common in habitats that have the required resources, on the other hand they are rarely or not found in unfavorable environments (Fachrul 2007).

Shannon-wiener diversity index in all lines transects shows Halong has the highest diversity. A higher species diversity index indicates an ecosystem where it is stable and provides good carrying capacity for its organisms (Odum 1993). The diversity of bird species is influenced by the diversity of habitat types (Dewi et al. 2007). Vegetation structure and availability of food in a habitat are the main factors that influence species diversity in a habitat (Tortosa 2000). The various types of vegetation found in a habitat support the availability of food for birds, so with various types of vegetation, birds will have more choices to choose the type of feed (Tews et al. 2004). A decline in quality and damage to the ecosystem is then defined as an indication that the carrying capacity of the environment has been exceeded. Excessive exploitation without regard to recovery efforts is what causes the balance of the ecosystem to be disrupted and the carrying capacity of the environment to decrease.

Species evenness was significantly associated with bird density, indicating a positive relationship with disturbed habitats as well as vertical heterogeneity with high bird density (Chettri et al. 2005). The dominance of species in an ecosystem is caused by many factors including low competitors and predators directly proportional to abundant food sources. Besides that, the abundance of food and high adaptability to changes in habitat also play an important role in species dominance. Species with low evenness values are closely related to several limiting factors such as altitude and species that have a strong tendency towards the presence of certain tree species or certain habitats (Nandika and Agustina, 2020).

The Current Status of Moluccan Cockatoo

The low number of cockatoo encounters on Ambon Island shows that there has been a serious threat facing cockatoos on this island. Eight Salmon-crested Cockatoos and three unidentified cockatoos were observed during brief searches of remaining forest patches on Ambon (Marsden, 1992). This data shows that the Salmon-crested Cockatoo population has been declining for a long time. Most of Salmon-crested Cockatoo free flying on Ambon may well be wild birds, either resident and possibly breeding, or visiting birds from Seram, which is close to Ambon (Marsden, 1992). Even others suggest that if the assumed status of Salmon-crested Cockatoo is uncertain in Ambon, the probability that a large number of captive bird escape (and are not recaptured) should be small (White and Bruce 1986).

This assumption is very reasonable considering that in the field records there were also several introduced bird species including the Palm cockatoo and some information from the public that said the Sulphur-crested cockatoo was often observed in the forests of Negeri Halong and Negeri Adat Soya. This was reinforced by the record of encountering the Sulphur-crested cockatoo on Sirimau Mount with a density about 5.66 individuals/ha (Sahusilawane, 2018).



Cacatua mollucencis perching on top tree at Negeri Adat Soya

it is a very popular cagebird and has suffered a rapid population decline as a result of trapping for trade, combined with deforestation in its small range (BirdLife International, 2023). If on Seram Island poaching is the main problem for the decline in the population of this bird, but on Ambon Island it is a combination with large-scale habitat conversion. The hilly lowland forests of Ambon Island with altitudes of 106-200 m in Negeri Halong, 246-431 m in Negeri Adat Soya and 200-360 m in Negeri Waai are suitable habitat for cockatoos. The discriminant profile suggested that cockatoos were associated with mature lowland forest closer to rather than farther away from settlements (Marsden, 1992). However, the types of food trees and specific nests whose existence has decreased due to habitat conversion are one of the factors causing the cockatoo population to develop less well on Ambon Island. Cockatoo abundance was significantly associated with presence of potential nest trees and strangling figs (Kinaird et al. 2003).

In several encounters, cockatoos observed eating rambutan fruit *Nephelium lappaceum* and durian *Durio zibethinus* (Nandika and Agustina 2020). The types of plants used by Salmon-crested Cockatoo based on other records are *Canarium vulgare*, *Eugenia rumphii*, *Horsfieldia globularia*, *Calophyllum soulattri*, *Callamus sp* and the nest tree is *Terminalia copelandii*, *Neuslea moluccana*, *Octomeles sumatrana* and *Psidium guajava* (Rumanta et al 2019). In addition, the Salmon-crested Cockatoo is more commonly found in forests with more open canopies with altitudes between 400-1000 m asl (Nandika and Agustina 2020). On Seram, cockatoos seem to be virtually absent above 1,000 m (which agrees with FAO 1981, Bowler and Taylor 1989) and rare or irregular in "other" habitats, and the species does seem to occur at higher densities in primary and disturbed primary forests than in other forests. But this record has been updated with a new record which records the presence of the Salmon-crested cockatoo at an altitude of 1,370 m (Reeve, et al. 2014).

The area of protected forest on Ambon Island only covers 38.8% of the island's area and only 4.01% is still categorized as primary dryland forest and the rest are secondary dryland forest (49.42%), dryland agriculture (0.6%), dryland agriculture mixed with shrubs (17.58%), open land (0.11%), and shrubs (28.27%) (Fransz, 2019). Cockatoo species are worldwide well known as pet birds (Engebretson 2016); their high economical value very often supports the illegal trade of these endangered exotic species. Poaching for cockatoos is still going on, this is evidenced by the presence of farmers in Negeri Halong who catch cockatoo chicks, a resident in Halong who keeps parrots and the many cockatoos that have been confiscated by the BKSDA Maluku. Reinforced by Ruben et al. (2019) who recorded 511 of 20 bird species as pet by the community in Sirimau District (Ambon) including several species of parrots which have a distribution in Seram and Ambon regions including five individuals Salmon-crested cockatoo. Likewise, several villages in South Leitimur District (Ambon) recorded 76 birds of 13 species and one of them was the Salmon-crested cockatoo (5 birds) (Maria, 2019).

Apart from being a pet, the Salmon-crested cockatoo has been exploited for trading for a long time. Net imports of Salmon-crested Cockatoos as reported to CITES (and therefore an absolute minimum) for the period 1983 to 1988 averaged 9,571 (as processed by the World Conservation Monitoring Centre in 1991) (Marsden, 1992). Likewise, with ProFauna's record of at least 50 Salmon-crested cockatoos being traded in bird markets in Java (ProFauna Indonesia, 2004). Even though this species has been included in the CITES Appendix 1 category since January 1990, it is included in the Vulnerable species in the IUCN red list data book category and is protected by law No. 5 of 1990, Government Regulation No. 7 of 1999 and the most recent is Regulation of the Minister of Environment and Forestry No. 106 of 2018. However, poaching pressure for illegal trade is a significant threat to their existence both inside and outside the national park, where law enforcement is scarce.

Poaching and Pet Birds



Figure of confiscated Salmon-crested Cockatoo by BKSDA Maluku (left); the feather of *Cacatua moluccensis* for tribe ritual of 'Cidaku' (right)

Mammals and birds are animals targets of hunting, for consumption, traditional ceremonies and the biggest one is for trading. The people of Seram Island and Ambon are still strong with traditional ceremonies which require wild animals as one of their main requirements. Based on Nandika and Agustina (2019), one of the village or Negeri that still adhere to these traditional rituals is Negeri Adat Huaulu, which has to provide cockatoos, cuscus and deer for traditional rituals called 'Cidaku' or 'Puheli'. Salmon-crested Cockatoo is also hunted for traditional tribal ceremonies by the Huaulu, Naulu, and other tribes (Nandika et al. 2021). Cidaku is traditional ceremony for children of the descendants of the Huaulu customary land who are at the age of adulthood requires that the teenagers hunt cockatoos to take their crests which will be crowned in their red ikat cloth on they head (Nandika dan Agustina 2019).

Then the next wild animals are the cuscus which will be used as sacrificial animals for their ancestors and deer skins are used to make 'Tipa' as musical instruments and their meat to be cooked as a dish for invited guests. However, in Ambon the ceremony has started to fade, only a few big ceremonies require wild animals, especially cuscus, pigs and deer to become a mandatory dish. Based on several studies, the favorite composition of wildlife species consumed by the villagers in terms of the amount of protein are Cuscus (49%), Celebes wild boar (21%), Timor deer (17%), Flying foxes (1%), wild birds (6%), Freshwater prawn (2%) and others (4%) (Sasaoka, 2003).

Apart from exploitation for traditional ceremonies, wild animals, especially birds, are animals that are often kept as pets. People generally keep birds for hobby, temporary pets before being sold and the third motive is for souvenirs for colleagues or superiors. A type of parrot other than the Salmon-crested cockatoo whose distribution comes from the islands of Seram and Ambon which are kept by the people of Sirimau District are Red lory (108 individuals), Rainbow lorikeet (44 individuals), Eclectus parrot (5 individuals), Purple-napped lory (3 individuals) and Red-checked parrot (2 individuals) (Ruben et al. 2019). While in South Leitimur District the parrot pets recorded Red lory (24 individuals), Rainbow lorikeet (14 individuals), Eclectus parrot (3 individuals), Purple-napped lory (1 individu) (Maria 2019). The common parrot pets in Sirimau and District and South Leitimur District in Ambon are Sulphur-crested cockatoo, Palm cockatoo, Chattering lory, Black-caped lory, White cockatoo, and Tanimbar corella (Ruben et al. 2019; Maria 2019).

Meeting Coordination

1. Coordination with the Biology Department Faculty of Mathematics and Natural Science Pattimura University.

The program preparation starts with meeting coordination with the lectures team and ornithology students of the Biology Department Faculty of Mathematics and Natural Science Pattimura University who help for collecting data on the field of both Sirimau month and

Salahutu month. On this collaboration, the field team who work with KKI are Biology lecture: Dr. La Eddy and three ornithology students: Friandov, Geovany and Ammar.



Figure of meeting coordination for develop the team survey with Biology of Math and Natural Science of Pattimura University and the ornithology students. From left to right: Dr. Evelin Tuhumuri, S.Si., M.Si (Biology Department Secretary), Dr. La Eddy, S.Pd., M.Si (Ornithology Lecture), Dudi Nandika (KKI), and Ornothology Student: Friandov Meilano Damaryanan, Aprilya Tehupuring, Carol Jen Latuhihin, Geovanny Leoni Leleulya, Ammar Hafid Saban

On the meeting coordination, KKI requested permit to head Biology Department Dr. Evelin Tuhumuri as Secretary to collect data and threat identification face on birds especially parrots in Ambon. KKI team also presented the aim and survey method to the ornithology students. The University very enthusiastic and supported of the program for updating data on the f cockatoo population, endemic bird, and the threat which is important to known status and for the conservation policy of those birds. A suitable conservation program with community involvement is an important part to conserve the birds and their habitat, as Ambon is the capital city with rapid population growth.





Figure of the capacity building for all volunteer students from the Pattimura University. This activity was carried out by holding material sessions on bird identification and the methods used in research. Furthermore, the practice of collecting data in the field is carried out by observing birds in the campus area

2. Meeting coordination with the local community of Negeri Adat Soya

Negeri Adat Soya is the largest tribe village in Ambon in Sirimau month as survey target. The meeting coordination are for getting permit for survey to collect data and information about bird existence, the habitat condition and threat on the village for habitat conservation.



Figure of meeting coordination with the Secretary of Negeri Adat Soya

The Negeri Adat Soya Secretary are welcoming us of the program on their area, and giving permit for collecting data and bird survey. Data 2019, Adat Soya have 9.736 people, with sex ration 4.885 male and 4851 female. On community of socioeconomic level are modern, have religion and almost of villagers have permanent job even they are village tribe category. About 53% villagers are work for government agency; 15,2% villagers are agriculture; 18,5% are entrepreneur; and 13% are work in another sector. Unfortunately, about 70% forest are change

to be cloves, nutmeg and durian planting area. The large of primary forest only left about \pm 5% from all of village area. In general, the threat of wild bird in Negeri Adat Soya (Sirimau month) is community activities. Several villagers also have air rifle which is very worrying, and several of traditional event also have hunting habits of wild animal on their tribe area claim.

Bird Campaign and Awareness

To anticipate parrot extinction in Ambon Island, that is urgent need to give conservation awareness to knowledge to the local community for develop their proud. The program is ongoing in Ambon Island collaborate with Biology of Math and Science Faculty of Pattimura University. The bird campaign to reduce the bird hunting habits especially parrot. As asset of Ambon Island, parrot not only become wealthy identity but have other function in their habitat. Parrot also become zoochory (spreading seeds) and pollinator (help for pollinate of several flowers). Parrot existence also become knowledge resources and can give benefit impact to the local community by ecotourism program.



Figure of Stop Bird Trapping Campaign in collaboration between KKI and Biology of Math and Science Faculty of Pattimura University

The hunting wild animal only giving instantaneous economic value, but behind of that will bring to extinction and incur bigger losses to next generation. The bird campaign not only direct to the local villagers, but also with preparing some of media campaign like posters, stickers, banners, and we made three billboards which is located in track to entrance the forest at Negeri Adat Soya, Negeri Taeno and Negeri Halong.



Figure of Campaign media (posters, stickers, banners, and billboards)

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Appendix 1. Bird List Observed

No	Local Name	English Name	Scientific Name	Famili	Status
1	Elang alap kelabu	Variable Goshawk	<i>Accipiter hiogaster</i>	Accipitridae	
2	Elang bondol	Brahminy Kite	<i>Haliastur indus</i>	Accipitridae	LC
3	Alap-alap sapi	Spotted Kestrel	<i>Falco moluccensis moluccensis</i>	Accipitridae	LC
4	Baza Pasifik	Pacific Baza	<i>Aviceda subcristata reinwardtii</i>	Accipitridae	LC
5	Cekakak australia	Sacred Kingfisher	<i>Todiramphus sanctus sanctus</i>	Alcedinidae	LC
6	Cekakak-pita biasa	Common Paradise Kingfisher	<i>Tanyiptera galatea nais</i>	Alcedinidae	LC
7	Walet sapi	Glossy Swiftlet	<i>Collocalia esculenta esculenta</i>	Apodidae	
8	Walet seram	Seram Swiftlet	<i>Aerodramus ceramensis</i>	Apodidae	
9	Kakatua raja	Palm Cockatoo	<i>Probosciger aterrimus</i>	Cacatuidae	LC
10	Kakatua maluku	Salmon-crested Cockatoo	<i>Cacatua moluccensis</i>	Cacatuidae	VU
11	Kepudang-sungu miniak	Common Cicadabird	<i>Edolisoma tenuirostre amboinense</i>	Campephagidae	
12	Delimukan Zamrud Asia	Common Emerald Dove	<i>Chalcophaps indica indica</i>	Columbidae	LC
13	Pergam seram	Seram Imperial Pigeon	<i>Ducula neglecta</i>	Columbidae	LC
14	Uncal Ambon	Amboyna Cuckoo-Dove	<i>Macropygia amboinensis amboinensis</i>	Columbidae	
15	Walik dada-lembayung	Claret-breasted Fruit Dove	<i>Ptilinopus viridis viridis</i>	Columbidae	LC
16	Walik wallacea	Wallace's Fruit Dove	<i>Ptilinopus wallacii</i>	Columbidae	LC
17	Tekukur biasa	Spotted Dove	<i>Spilopelia chinensis</i>	Columbidae	
18	Bubut alang-alang	Lesser Coucal	<i>Centropus bengalensis medius</i>	Cuculidae	LC
19	Kangkok ranting	Himalayan Cuckoo	<i>Cuculus saturatus</i>	Cuculidae	LC
20	Kedasi Australia	Horsfield's Bronze Cuckoo	<i>Chrysococcyx basalis</i>	Cuculidae	LC
21	Wiwik maluku	Moluccan Cuckoo	<i>Cacomantis aeruginosus aeruginosus</i>	Cuculidae	LC
22	Tuwur Sulawesi	Black-billed Koel	<i>Eudynamis melanorhynchus</i>	Cuculidae	LC
23	Cabai kelabu	Ashy Flowerpecker	<i>Dicaeum vulneratum</i>	Dicaeidae	LC
24	Srigunting lencana	Spangled Drongo	<i>Dicrurus bracteatus amboinensis</i>	Dicruridae	LC
25	Bondol rawa	Chestnut Munia	<i>Lonchura atricapilla</i>	Estrildidae	LC
26	Bondol taruk	Black-faced Munia	<i>Lonchura molucca</i>	Estrildidae	LC
27	Gosong kelam	Dusky Megapode	<i>Megapodius freycinet forsteni</i>	Megapodiidae	
28	Cikukua seram	Seram Friarbird	<i>Philemon subcorniculatus</i>	Meliphagidae	LC
29	Kehicap pulau	Island Monarch	<i>Monarcha cinerascens cinerascens</i>	Monarchidae	
30	Sikatan kelabu	Moluccan Flycatcher	<i>Myiagra galeata goramensis</i>	Monarchidae	LC
31	Kicuit kerbau	Eastern Yellow Wagtail	<i>Motacilla tschutschensis</i>	Motacillidae	LC
32	Sikatan burik	Grey-streaked Flycatcher	<i>Muscicapa griseisticta</i>	Muscicapidae	LC
33	Burung-madu hitam	Black Sunbird	<i>Leptocoma aspasia aspasioides</i>	Nectariniidae	LC
34	Burung-madu sriganti	Olive-backed Sunbird	<i>Cinnyris jugularis clementiae</i>	Nectariniidae	
35	Burung-gereja erasia	Eurasian Tree Sparrow	<i>Passer montanus malaccensis</i>	Paseridae	LC
36	Nuri Bayan	Eclectus Parrot	<i>Eclectus roratus roratus</i>	Psittaculidae	
37	Nuri maluku	Red lory	<i>Eos bornea bornea</i>	Psittaculidae	LC
38	Nuri pipi-merah	Red-cheeked Parrot	<i>Geoffroyus geoffroyi rhodops</i>	Psittaculidae	LC
39	Brinji-emas seram	Seram Golden Bulbul	<i>Hypsipetes affinis flavicaudus</i>	Pycnonotidae	LC

40	Merbah Cerukcuk	Yellow-vented Bulbul	<i>Pycnonotus goiavier</i>	Pycnonotidae	
41	Perling Ungu	Metallic Starling	<i>Aplonis metallica</i>	Strurnidae	
42	Kacamata Ambon		<i>Zosterops kuehni</i>	Zosteropidae	

Appendix 2. Bird Diversity Index in each area

No	Scientific Name	a*	b*	c*	pi	ln pi	H'a	pi	ln pi	H'b	pi	ln pi	H'c	Ea	Eb	Ec
1	<i>Collocalia esculenta esculenta</i>	5	8	10	0,03	-3,42	0,11	0,06	-2,74	0,18	0,10	-6,96	0,66	0,03	0,05	0,18
2	<i>Probosciger aterrimus</i>		6					0,05	-3,03	0,15					0,04	
3	<i>Dicaeum vulneratum</i>	9	6	3	0,06	-2,83	0,17	0,05	-3,03	0,15	0,03	-8,16	0,23	0,04	0,04	0,06
4	<i>Dicrurus bracteatus amboinensis</i>	11	3	3	0,07	-2,63	0,19	0,02	-3,72	0,09	0,03	-8,16	0,23	0,05	0,02	0,06
5	<i>Lonchura atricapilla</i>	15		5	0,10	-2,32	0,23				0,05	-7,65	0,36	0,06		0,10
6	<i>Lonchura molucca</i>			10							0,10	-6,96	0,66			0,18
7	<i>Leptocoma aspasia aspasioides</i>	9	8	3	0,06	-2,83	0,17	0,06	-2,74	0,18	0,03	-8,16	0,23	0,04	0,05	0,06
8	<i>Passer montanus malaccensis</i>	8		5	0,05	-2,95	0,15				0,05	-7,65	0,36	0,04		0,10
9	<i>Eos bornea bornea</i>	13	14	2	0,08	-2,47	0,21	0,11	-2,18	0,25	0,02	-8,57	0,16	0,06	0,07	0,04
10	<i>Geoffroyus geoffroyi rhodops</i>	7	15	3	0,05	-3,08	0,14	0,12	-2,11	0,26	0,03	-8,16	0,23	0,04	0,07	0,06
11	<i>Aplonis metallica</i>	19	40	35	0,12	-2,09	0,26	0,32	-1,13	0,36	0,33	-5,70	1,90	0,07	0,10	0,51

Note: (a) Negeri Halong; (b) Negeri Adat Soya; (c): Negeri Waai

Appendix 3. Report Finance

1. Wire transfer from OBC at 28 June 2023: GBP 1,997.22 (1 GBP = 17,782 IDR) about 35,513,717.00 IDR



Account Information TRANSACTION INQUIRY

Account	:	126050969 / PERKUMPULAN KONSERVASI KAKATUA INDONESIA (IDR)					
Period	:	01-Jun-2022		-	30-Jun-2022		
Beginning Balance	:	1,232,297.00					
Total Debit	:	35,025,000.00					
Total Credit	:	35,514,587.00					
No.	Post Date	Branch	Journal No.	Description	Amount	Db/Cr	Balance
1	28/06/2022 18.28.31	DIVISI INTERNASIONAL	991678	TRANSFER DARI PEMINDAHAN DARI 766333200001001 JOHN GREGORY P5027054 870 S06ITR0130725522	35,513,717.00	C	36,746,014.00
2	30/06/2022 09.53.59	MADIUN	341032	TARIK CHQ CN092265	35,000,000.00	D	1,746,014.00
3	30/06/2022 08.00.00	INTERNAL BRANCH	938563	JASA GIRO/BUNGA	870.00	C	1,746,884.00
4	30/06/2022 08.00.00	INTERNAL BRANCH	938563	BIAYA ADM REK	25,000.00	D	1,721,884.00

2. Expenditure

No	Item	Expenditure Amount	
		IDR	GBP
A	<i>Preparing the program</i>		
1	Communications (telephone/internet)	1,282,000	72.10
2	Printed materials	175,000	9.84
B	<i>Design the study with Biology Pattimura University</i>		
1	Meeting with Unpatti	1,000,000	56.24
2	Public transportation	500,000	28.12
C	<i>Capacity building</i>		
1	Training with the student University	3,000,000	168.71
2	Stationery	100,000	5.62
D	<i>Data collection in the field</i>		
1	Flight from Jakarta to Ambon (round trip)	9,832,000	552.92
2	Accommodation and meals for team members	4,000,000	224.95
3	Rent car and local transportation (including fuel)	6,000,000	337.42
4	Logistic in field	6,000,000	337.42
E	<i>Spread cockatoo conservation awareness</i>		
1	Banner + billboard	2,200,000	123.72
2	Printing posters	500,000	28.12
3	Printing stickers	500,000	28.12
4	Printing Mask	600,000	33.74
F	<i>Data analysis</i>		
1	Stationery	200,000	11.25
G	<i>Presentation of the result</i>		
1	Meeting with Unpatti	1,500,000	84.35
2	Public transportation	500,000	28.12
H	<i>Reporting</i>		
1	Evaluation meeting	200,000	11.25
2	Report	100,000	5.62
	Total	38,189,000	2,147.62
	<i>Total wire transfer from OBC disbursement GBP 1,997.22 (1 GBP = 17,782 IDR) June 28, 2022</i>	35,513,717	1,997.22
	Balance	- 2,675,283	- 150.40