



In-Situ Conservation Project

Technical Progress Report

September - December 2012



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Puerto Princesa City, Palawan, Philippines
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TECHNICAL PROGRESS REPORT

COUNTRY: PHILIPPINES

PROJECT TITLE: PHILIPPINE COCKATOO CONSERVATION PROGRAMME
In-situ Conservation Project

PROJECT DURATION: September - December 2012

PROJECT SITE: Palawan, Philippines

PROJECT COOPERATORS:

Department of Environment and Natural Resources (DENR)
Municipal Government of Narra, Palawan, Philippines
Municipal Government of Dumaran, Palawan, Philippines
Municipal Government of Rizal, Palawan, Philippines
Municipal Government of Balabac, Philippines
Municipal Government of Patnanungan, Quezon, Philippines
Municipal Government of Polillo, Quezon, Philippines
Bgy. Culasian Government, Rizal, Palawan, Philippines
Bgy. Burdeos Government, Polillo, Quezon, Philippines
Bgy. Pandanan Government, Balabac, Palawan, Philippines
Local Protected Area Management Committees (LPAMC)
Sagip Katala Movement-Narra Chapter, Inc. (SKM-NC, Inc)
Palawan Council for Sustainable Development Staff (PCSDS)
Jewelmer Corporation Inc.
Polillo Islands Biodiversity Conservation Foundation, Inc.
Concerned agencies and authorities

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EXECUTIVE SUMMARY

Output 1: Conservation of cockatoo population on Pandanan and Bugsuk Islands, Balabac

1. A field house has been completed which improves considerably activities in this project site. The house has simple kitchen, sleeping quarter and bathroom facilities.
2. Monitoring of people entering the forest area has to be increased and nocturnal patrolling will commence as a reaction to the single poaching attempt during the last breeding season.
3. Patrolling of the area is done regularly and 42 nest trees of cavity breeders have been characterized.
4. The tree nursery is maintained and provided 94 trees for a reforestation plot.
5. A conservation education campaign was conducted on November 30 for about fifty participants. Topics included cockatoo and wildlife ecology and conservation.
6. A remarkable observation was a cockatoo recorded inside a nest hole on 29 September, well outside of the breeding season. This could indicate early occupation for the next breeding season.
7. The owner of the coconut plantation in Malinsuno which serves a cockatoo roost site agreed to the continued protection of the site. A resolution to avoid disturbance of the site was drafted by KFI and adopted by the barangay council on November 9.
8. Other roost sites in Pandanan and neighboring islands seem to remain unstable and occupation seems to follow weather patterns.

Output 2: Re-introduction of Philippine cockatoos into parts of the historical range

9. The opposition of KFI to the proposed coal plant opposite of Rasa Island has consequences for procurement of founder birds (rescued nestlings) for the reintroduction project. The two issues cannot be kept separate and the coal issue has to be resolved first.
10. A facility for hand-raising rescued Philippine Cockatoos with minimal human contact in KIEBC is finalized.
11. The fact that cockatoos "self-introduced" into the adjacent mainland of Rasa indicates that Rasa itself may be close to its carrying capacity for the species.
12. The IUCN-SOS funded assessments for reintroduction sites in the Oceanic Philippines continued with five additional sites covered in the present reporting period: Subic Forest Reserve (E. Luzon), Mt. Palay-Palay (S. Luzon, Southern Samar, and Southern Leyte).
13. Highest scoring site during the reporting period was the Subic Forest Reserve. Concerns regarding this site include persistent poaching by outsiders, and the presence of one of the last populations of the Green Racquet-tail *Prioniturus luconensis*, another highly threatened cavity nester and a potential competitor for nest sites.

Output 3: Conservation of cockatoo population on Rasa Island Wildlife Sanctuary (RIWS), Narra continued

14. No extension of existing coconut plantations or forest encroachment was observed in Rasa during monitoring of existing claims.
15. Increased infestation with mites was observed in the past breeding season. Lapses in monitoring by wardens were identified during the breeding season assessment.

Prophylactic treatment of all nest holes has to be done before onset of every breeding season.

16. On November 14-16 wildlife wardens from all PCCP project sites in Palawan came together in Narra for a refresher course of their job skills. Lectures included methods of nest and forest protection and patrolling, paralegal procedures, bird watching and identification, first aid, and family planning.
17. The boundaries of Apis Forest were measured which will provide the basis for setting monuments. Patrolling has to continue to prevent illegal encroachment of the area.
18. Conservation education activities were stepped up considerably due to the increased dispersal of cockatoos on the mainland, with focus on rarely visited communities. A total of 701 persons were reached during campaigns in six barangays and the local university within the reporting period.
19. The previously observed trend continued that more than a pair of cockatoos is present around nest holes. We recorded up to eight cockatoos present around a single nest tree. It is until now unclear if this is an indication for nest helpers.
20. On December 1 a dead cockatoo was turned over to KFI from the mayor's office which got electrocuted on an electric power line.
21. As in the previous reporting period, the process of cockatoos "self-introducing" themselves to the mainland of Palawan continues. This includes the establishment of a roost site each in the coastal mainland area and another one on Rasa which however both are not permanent.
22. Numbers of cockatoos observed foraging on the mainland increased again significantly compared to the previous year.

Output 4: Conservation of cockatoo population on Dumaran Island, Dumaran continued

23. Outside of the breeding season wardens were mainly occupied in expanding the tree nursery in preparation for the new corridor reforestation project.
24. Upgrading of the nursery included expansion of the seedling area and improvement of the lay-out to minimize travel time for seedling hauling and watering, the construction of a new shed, including sleeping quarter, toilet and storage room for equipment and supplies.
25. The reforestation corridor and critical habitat project were highly supported by the LPAMC and the present leadership.
26. As of December 2012 the nursery stock considerably increased to 10,915 seedlings of fifteen major timber trees and several unidentified species.
27. The Local Protected Areas Management Committee meeting for this reporting period was conducted on September 10. An on-going issue is illegal logging.
28. After the death of our wildlife warden Tirso Sy, the family members have taken over the task of recording cockatoos on their roost site in the Sy coconut plantation.

Output 5: Conservation of cockatoo population in Culasian Managed Resource Protected Area (CMRPA), Rizal continued

29. KFI-wardens in Culasian were requested to assist in the National Greening Program which is countrywide implemented by the DENR. Wardens provided wildlings of native trees and planted within the boundaries of CMRPA.
30. As of end of the rainy season in October 4,549 planted trees survived in two different locations, whereas 551 died.
31. The regular LPAMC meeting was held on September 14. The illegal fishpond which was demolished in the last reporting period was observed to have been revived. We reported this case to authorities and awaiting action.

Output 6: Support for Polillo Islands Parrot Project

32. No field work conducted within the period.

Output 7: Katala Institute for Ecology and Biodiversity Conservation

33. The construction of the cockatoo nursery/clinic was finalized. The facility will allow hand-raising of birds while avoiding human imprinting.
34. On December 22, Silver (the aggressive male) attacked and killed his long-time mate Blue, despite having his wings clipped earlier.
35. Fencing continued to secure the perimeters of KIEBC. A loop trail was laid out with rice hulls and through removing overhanging vegetation.
36. The access road was further improved by adding and compacting an additional layer of gravel.
37. As of end of the current reporting period there were 3,911 seedlings of 36 tree species present in the nursery.

Output 8: Cockatoo advocacy

38. On August 16 the Barangay Council of Panacan issued Resolution No. 17 endorsing the Makati-based company DMCI Power Corporation proposal to put up a 15 MW coal-fired power plant in Panacan, the fishing community to which Rasa Island Wildlife Sanctuary administratively belongs, without conducting public consultation among barangay residents and other stakeholders.
39. In the September meeting of the PAMB, the coal plant issue was brought up. It was revealed that the proposed site was situated on a peninsula just opposite or Rasa Island, only about 1 km away from the protected area.
40. On October 8 the Environment and Natural Resources Committee of the PCSD deliberated on the matter and KFI voiced out its concerns, particularly effects on the critically endangered Philippine Cockatoo for which Palawan has a special responsibility.
41. KFI prepared and distributed a position paper based on its own findings and on mostly open access publications, many of which were peer-reviewed.
42. One major concern is that the proposed project site would effectively cut off the flight path of cockatoos to and from their foraging areas on the mainland, since the plant was planned to be built on a peninsula which forms the closest connection between Rasa and the mainland. It was stated that the project would result in direct losses (as

demonstrated by the electrocuted cockatoo in December within this reporting period), and indirect losses due to the fact that foraging routes would be cut off from the island, resulting in increased incidences of chick mortality, particularly during drought years, and ultimately in decreased carrying capacity of Rasa for Philippine Cockatoos.

43. A public consultation in Panacan, the proposed host village, was conducted on Oct. 24 and 25. It became apparent that the majority of affected inhabitants of Panacan and neighboring barangays were opposing the project.
44. On November 5 we met with Dr. Lim of PAWB to discuss the strategy regarding the proposed coal-fired power plant. It was agreed that PAWB should issue a memorandum for the Environmental Management Bureau of DENR highlighting the environmental concerns surrounding the project.
45. International PCCP partners (LPF, ZGAP, Northern England Zoological, Zooparc Beauval and Zoo Landau) sent letters expressing their concerns to the municipal mayor of Narra and the governor of Palawan by email and as hard copies.
46. On Nov. 29 another PCSD Council Meeting was held, KFI reiterated its opposition and was supported by the representative of the NGOs in the council.
47. Another public hearing was held in Panacan on December 3. Inhabitants of the village now had more information on the project than before and opposition was evident. KFI presented before the Narra council on December 3 its opposition.
48. Since the consultation process for the proposed coal-fired power plant is deeply flawed, legal advice has to be sought by KFI.

Other highlights

49. Upon request of LPF and ZGAP, Peter visited the parrot project of Burung Indonesia on the island of Halmahera, Maluku Utara, Indonesia from October 5-24.
50. PCCP participated in this year's Birdfest held at Rizal Park, Manila on 7-9 December 2012. We presented before high school and college students the plight of the Philippine Cockatoo.

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ACRONYMS

CE	Conservation Education
CENRO	Community Environment and Natural Resources Office(r)
CEPA	Conservation des Espèces et Des Populations Animales
CMRPA	Culasian Managed Resource Protected Area
DENR	Department of Environment and Natural Resources
DGHT	German Herpetological Society
ELAC	Environmental Legal Assistance Council
IUCN	International Union for the Conservation of Nature and Natural Resources
KEEC	Katala Environmental Education Center
KFI	Katala Foundation, Inc.
KIEBC	Katala Institute for Ecology and Biodiversity Conservation
LGU	Local Government Unit
LPAMC	Local Protected Area and Management Committee
LPF	Loro Parque Fundación
MENRO	Municipal Environment and Natural Resources Officer/Office
MMPL	Mt. Mantalingahan Protected Landscape
MOA	Memorandum of Agreement
PA	Protected Area
PAMB	Protected Area Management Board
PAWB	Protected Areas and Wildlife Bureau
PASu	Protected Area Superintendent
PCCP	Philippine Cockatoo Conservation Program
PCSD(S)	Palawan Council for Sustainable Development (Staff)
PENRO	Provincial Environment and Natural Resources Office
PFTCP	Philippine Freshwater Turtle Conservation Program
PNP	Philippine National Police
PTFCF	Philippine Tropical Forest Conservation Foundation
PWRCC	Palawan Wildlife Rescue and Conservation Center
RA 9147	Republic Act 9147 otherwise known as the Wildlife Protection Act
RIWS	Rasa Island Wildlife Sanctuary
SDENRO	Special Deputy Environment and Natural Resources Officer
WPU	Western Philippines University
ZGAP	Zoologische Gesellschaft für Arten- und Populationsschutz

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INTRODUCTION

The Philippine cockatoo *Cacatua haematuropygia*

The Philippine Cockatoo or Red-vented cockatoo *Cacatua haematuropygia* is restricted to lowland forest areas and mangroves in the Philippines. Formerly, it could be found all over the archipelago (Dickinson *et al.* 1991). Only in the last decades a rapid decline set in, which brought the species to the brink of extinction (e.g. Boussekey 2000a; Lambert 1994). The reasons for the decline of the populations are (e.g.; Collar *et al.* 1999; Lambert 1994; Widmann *et al.* 2001):

- Habitat destruction, particularly in respect of nesting and food providing trees.
- Persecution as crop pest.
- Poaching for pet trade.
- Potential diseases caused by the introduction of captive birds in the range of wild populations.
- Tropical storms and typhoons

Habitat destruction and poaching are the most important factors threatening the Philippine cockatoo.

Since almost twelve years Katala Foundation Inc. (KFI) implements the PCCP in the Philippines. Comprehensive conservation projects are currently undertaken in four sites in Palawan (Fig. 1): Rasa Island (Narra), Dumaran Island (Dumaran), Culasian (Rizal), and most recently Pandanan and Bugsuk Islands (Balabac). The three former sites contain by now protected areas declared on municipal levels, specifically demarcated to include the remnant cockatoo populations. The latter site is predominantly owned by Jewelmer Corporation, with which KFI has a Memorandum of Agreement for the conservation of the species.

We estimate that between 600–1000 Philippine cockatoos exist in the wild (assuming few populations have been overlooked in recent surveys of historical locations, and 100–150 individuals survive in the Sulus, for which only incomplete information is available).

The single-most important Philippine cockatoo population on Rasa is secured under presidential proclamation as “Rasa Island Wildlife Sanctuary” since February 2006, in addition to local legislations. Pandanan, the latest site, holds possibly the second-most important population with at least 80 individuals. One additional site is in the Polillo group of islands in the Luzon Faunal Region, the only known location in the Luzon Faunal Region.

With the four project sites in Palawan and one in Luzon, it is estimated that between one- to two-third of the remaining wild population is currently covered in PCCP projects. Cockatoo populations are stable or increasing in all sites and improved legal conservation could be achieved (e.g. through creation of cockatoo reserves). However, law enforcement by state agencies remains weak and pressure on these areas is rather increasing (migrant influx to Palawan, mining, planned large-scale establishment of bio-fuel plantations). Warden schemes remain the single-most important tool to assure the short-term survival and recovery of the species, whereas lobbying, conservation education, habitat restoration and reintroduction, as well as provision of alternative livelihood options are important for the long-term improvement of the frame conditions for cockatoo conservation in the Philippines.

Objective of the Philippine Cockatoo Conservation Program

Conservation and restoration of the most viable subpopulations of the Philippine cockatoo and their habitats, including associated flora and fauna under involvement of all key stakeholders, resulting in a down-listing of the species from 'Critical' to 'Endangered' through reversing its population decline and under consideration of the precautionary principle.

Program Strategy

The main strategy of the programme is to conserve *in-situ* the most important subpopulations of the Philippine cockatoo through adopting participative methods.

The general program strategies are:

- Management of local resources in the framework of Philippine law;
- Capacity-building for local decision-makers and key stakeholders to ensure sustainability of the conservation efforts; and,
- Ecosystemic conservation approach with the Philippine cockatoo as flagship species.



Figure 1. Map of the Philippines indicating sites of the Philippine Cockatoo Conservation Program: 1. Culasian Managed Resource Protected Area, Rizal; 2. Pandanan, Balabac; 3. Rasa Island, Narra; 4. Omoi and Manambaling Cockatoo Reserves, Dumaran; 5. Patnanungan Island, Polillo group of Islands, Quezon.

Deliverables

Objective 1: Conservation of cockatoo population on Pandanan and Bugsuk Island, Balabac

- Warden scheme on Pandanan Island continued and extended to Bugsuk Island.
- Survey cockatoo population and habitat assessment on Bugsuk Island conducted and monitoring on Pandanan continued.
- Networking with local stakeholders, particularly with Jewelmer Corporation, the largest private landowner, continued.
- Conservation education on Pandanan Island continued and extended to adjacent mainland and Bugsuk Island.
- Small livelihood projects for key-stakeholders continued.

Objective 2: Re-introduction of Philippine cockatoos into parts of the historical range

- Assessment of potential translocation sites and potential remnant populations within the historical range continued using the quantitative tool developed during the re-introduction workshop.
- Workshops for a comprehensive Philippine Cockatoo Conservation Action and Management Plan conducted and results for re-introduction procedures incorporated.

- Translocation site preparation commenced, e.g. through conservation education, habitat restoration, improvement of legal frame conditions, once a suitable site is identified.
- Protocols for hand-raising of orphaned chicks with minimal exposure to humans and related facilities further improved.

Objective 3: Conservation of cockatoo population on Rasa Island, Narra

- Warden scheme continued.
- Members of the Local Protected Areas Management Committee capacitated in the management of the Philippine Cockatoo and Rasa Island Wildlife Sanctuary and meetings facilitated.
- Conservation education for stakeholders, particularly in mainland areas which are regularly frequented by cockatoos continued.
- Experimental habitat restoration on mainland initiated.
- Planting of food plants on mainland continued to offset damages on agricultural crops caused by cockatoos.
- Research on conservation-related aspects of cockatoo biology on Rasa continued, with focus on factors influencing breeding success and foraging ecology.

Objective 4: Conservation of cockatoo population on Dumaran Island, Dumaran

- Warden scheme continued.
- Incoming members of Local Protected Areas Management Committee assisted and capacitated in the management of the Philippine cockatoo, as well as Omoi and Manambaling Cockatoo Reserve.
- Buffer zone restoration around existing cockatoo reserves continued.
- Effectiveness of previous conservation education evaluated.
- Local government assisted in land use planning, particularly in respect to demarcation of extensive *Jatropha* plantations.

Objective 5: Conservation of cockatoo population in Culasian Managed Resource Protected Area, Rizal

- Warden scheme continued.
- Members of Local Protected Areas Management Committee capacitated in the management of the Philippine cockatoo and Culasian Managed Resource Protected Area and Culasian headwaters within the Mt. Mantalingahan Protected Landscape and meetings facilitated.
- Alternative funding sources for PA management further secured.

Objective 6: Support for Polillo Islands Parrot Project

- Warden scheme for Philippine cockatoo and other parrot species continued.
- Conservation education for threatened parrot species within the archipelago continued.
- Location for locally protected parrot reserve identified and promoted with stakeholders.

Objective 7: Katala Institute for Ecology and Biodiversity Conservation

- Captive management of Philippine cockatoo and other highly threatened species continued through employment and training of zookeepers and volunteers.
- Establishment of a training centre initiated.

- Quarantine area to accommodate rescued cockatoos and/or cockatoos destined for translocation improved.
- Landscaping with native species propagated in the Katala nursery continued and trail system initiated.
- Proposal submission to other potential donors continued.

Objective 8: Cockatoo Advocacy

- Palawan Council for Sustainable Development and other law-enforcing bodies assisted in formulation and implementation of regulations pertaining wildlife and natural resource management.
- Land use planning in project municipalities assisted.
- Conservation education campaigns conducted in Iwahig Penal Colony and buffer zone of Puerto Princesa Underground River National Park.
- Promotional video for the Philippine cockatoo conservation Programme produced and disseminated.

Description of Project Sites

Rasa Island, Narra, Palawan

Rasa is a small coral island of 8.34 km² area situated in the Sulu Sea, just offshore of the Municipality of Narra, Palawan, Philippines (Fig. 2). About 1.75 km² are covered with coastal forest, mangrove (5.60 km²), cultivated areas (predominantly coconut; 0.39 km²), 0.60 km² are barren or sparsely vegetated sand and coral outcrops. In February 2006, the island became a Wildlife Sanctuary through Presidential Proclamation 1000 and since a Protected Area Management Board is functioning as management body for Rasa Island Wildlife Sanctuary (RIWS). In 2008, RIWS was chosen as Top 13 Bird Watching Sites in the Philippines by the Department of Tourism.

The island is the pilot site of the program since 1998. Key component of this project site is the wardening scheme which involves patrolling and protection of the birds during and outside the breeding season. This scheme has proven to be efficient. It has more than doubled the population of cockatoos on the island over ten years.

Rasa Island probably holds the highest population density of Philippine cockatoo that remains in the wild. The world population of Philippine cockatoo was estimated to range between 1,000 to 4,000 individuals (Lambert 1994). More recent estimates put the number of cockatoos remaining in the wild between 870 and 2,300 (Widmann 2001). About 70 to 75% of this population is probably found in Palawan (Boussekey 2000b). This makes Rasa a high priority area for the protection of this species.

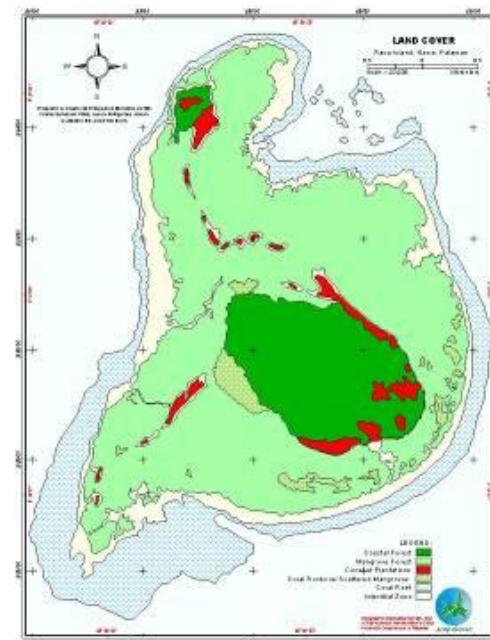


Figure 2. Vegetation and land-use of Rasa Island, Palawan, Philippines.

Not only Philippine cockatoos live on the island, but a variety of other species, with an unusual high percentage of globally threatened and near-threatened taxa (IUCN 2010), considering the small size of Rasa. Noteworthy among the 104 recorded bird species are Grey imperial pigeon *Ducula pickeringii* and Mantanani scops-owl *Otus mantananensis*.

Dumaran Island, Dumaran, Palawan

Dumaran is situated in north-eastern Palawan between 10°22' and 10°41'N and 119°28' and 119°55'E. Nine Barangays are situated on Palawan mainland, seven on western Dumaran Island. The island is situated in the Sulu Sea and separated by a ca. 7 km wide channel from the mainland.

PCCP currently manages three areas on the island: Omoi and Manambaling Cockatoo Reserves (Fig.3) and the traditional roosting site in Lagan. A Local Protected Area Management Committee (LPAMC) functions as its management body.

All natural terrestrial ecosystems in Dumaran are tree-dominated. On Dumaran Island only few small and isolated forest patches remain, none of them larger than 103 ha. The most abundant formation is evergreen and semi-evergreen lowland forest with Ipil *Intsia bijuga*, Amugis *Koordersiodendron pinnatum* being emergent tree species of commercial value.

Ornithological surveys conducted by Katala Foundation so far yielded 136 species from the island. A prominent species of conservation concern is the Philippine cockatoo, which can be found with viable population in the mangroves and forest remnants of Dumaran Island, but apparently not anymore on the mainland. The last remaining forest patches are therefore of global conservation concern. This notion is supported by the recent records of other globally threatened species, particularly the Philippine forest turtle *Siebenrockiella leytensis*.

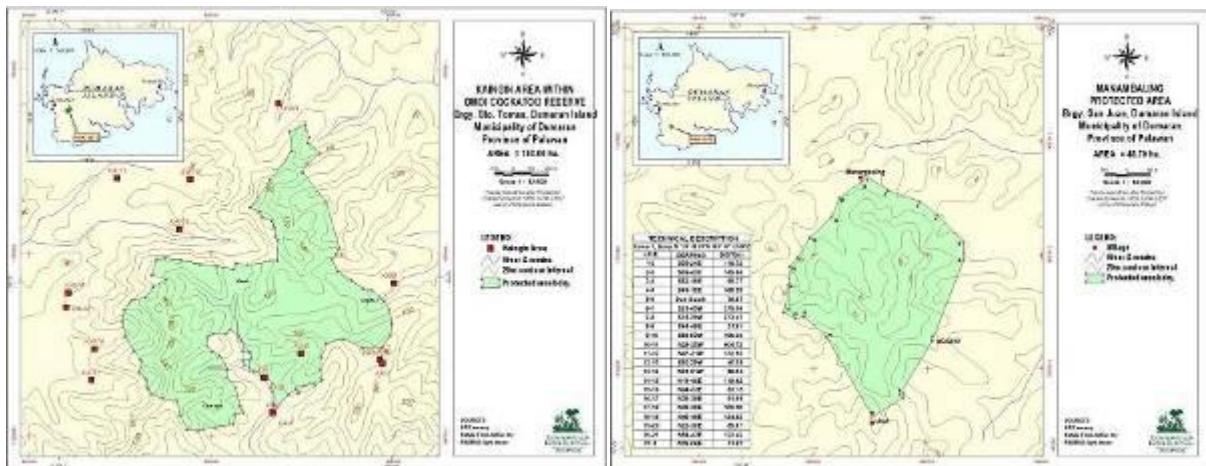


Figure 3. Omoi Cockatoo Reserve (left) and Manambaling Cockatoo Reserve (right) cover the last forest patches on Dumaran Island.

Other species of conservation concern are Palawan hornbill *Anthracoceros marchei*, Blue-headed racquet-tail *Prioniturus platenae* and Palawan pencil-tailed tree-mouse *Chiropodomys calamianensis*. A yet unidentified shrew species has been caught in one of the last forest patches.

Habitat degradation and destruction, rather than poaching, remain the biggest challenges for cockatoo conservation in Dumaran. In the current phase ca. five hectares of secondary forest and grassland were purchased with support of the Stadtholding Landau in the course of a

carbon-mitigation project. These areas have been rehabilitated and integrated in the buffer zone of the Omoi Cockatoo Reserve.

Culasian Managed Resource Protected Area (CMRPA), Rizal, Palawan

The Protected Area (PA) is located in the southern portion of Palawan Island in the municipality of Rizal. It is situated in the coastal plain facing the South China Sea, between the coordinates 8°52' to 8°47'N and 117°27' to 117°31'E. The PA comprises 1,954 hectares.

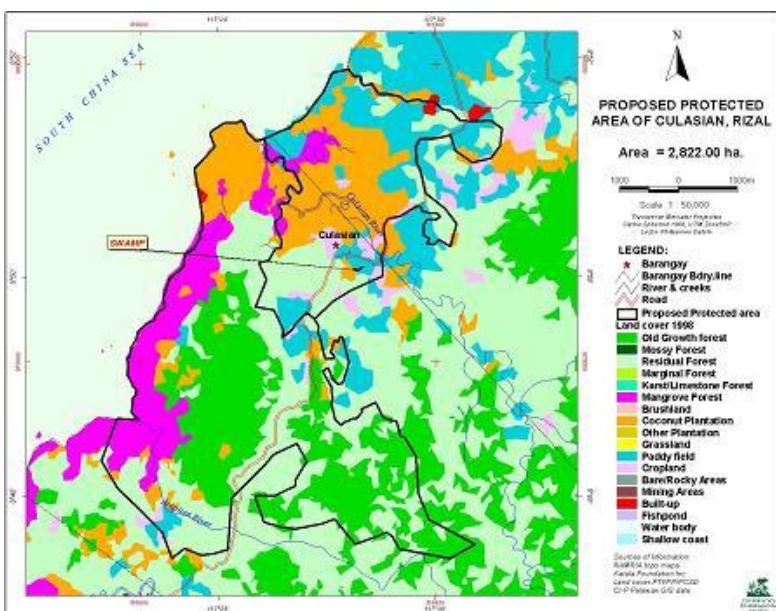


Figure 4. Vegetation, land use and boundaries of Culasian Managed Resource Protected Area, Rizal, Palawan.

CMRPA ranges from sea level to about 140ma.s.l. south of Culasian proper. The terrain is flat in the narrow coastal area, and rolling to moderately steep in the remaining portions. The two largest forest areas persist north of the highway near Tagbalugo on an isolated moderately steep hill reaching 120ma.s.l. and a highly fragmented rolling forest area south of the highway from ca. 20 to 140ma.s.l. near Darapiton, Malutoc, Balingasag and Tuburon. Two permanent rivers mark the periphery of CMRPA: Culasian River in the north and Arapitan River in the south. Smaller ephemeral creeks and stagnant water bodies can be found inside the area.

The major terrestrial ecosystem in the PA is lowland dipterocarp forest. Unlike most forests in Palawan, canopy heights are very high, often thirty to forty meters, with “Apitong” *Dipterocarpus grandiflorus*, “Manggis” *Koompassia excelsa* being the most conspicuous emergent tree species. Particularly in Rizal is the only location in the Philippines where *Koompassia excelsa*, the tallest tree species in Asia, can be found. Other emergent trees are for example *Dipterocarpus gracilis*, *Dipterocarpus hasselti*, *Intsia bijuga* and *Koordersiodendron pinnatum*.

Level areas are dominated by permanent cultivation. Shifting cultivation is also most common along the roads, but can frequently be found isolated in forested areas, often on steep slopes. Emergent "Manggis" and "Apitong", isolated in cultivated areas, indicate nest sites of parrots or hill mynas which are 'owned' by a poacher, and therefore were not cut during the area was cultivated. The PA holds the highest known density of the near-threatened Blue-naped parrot in the country, and is likely of global importance for this

species. Since habitat is very suitable and poaching is reduced significantly, reasons for the stagnant population could be over-aged breeding pairs or competition with other tree-cavity breeders (particularly Blue-naped parrots).

To date, 133 bird species are recorded within the CMRPA. Of outstanding conservation concern (IUCN 2010) are particularly the larger tree cavity nesters, like Palawan hornbill *Anthracoboceros marchei*, all three parrot species of Palawan, Philippine cockatoo *Cacatua haematuropygia*, Blue-naped parrot *Tanygnathus lucionensis* and Blue-headed racquet-tail *Prioniturus platena*. The cockatoo population in Culasian remains stable, but on a very low level.

Pandan Island, Balabac

Pandan Island in Bgy. Pandanan belongs to the north easternmost municipality of Balabac in Palawan (Fig. 5). Coastal forests are dense and stock on flat limestone originating from elevated coral reefs. Large trees in the coastal forest are mostly deciduous and widely spaced due to water stress during the dry season. The understorey is very dense with abundant vines. Emergent trees comprise the genera *Dipterocarpus*, and *Ficus*. A narrow rim of beach forest with *Erythrina*, *Calophyllum* and *Barringtonia* is present. The dense coastal forest cover is as well protected because the large portion of the island is privately-owned and entries are monitored by private guards. Coconuts are the major crop grown in the coastal areas and shifting cultivation including lowland rice, corn, and root crops inside forested areas are common land use forms. Extensive mangroves are thriving.

So far, 47 bird species have been recorded in and around Bgy. Pandanan, but inventories are still ongoing. Among these are six globally threatened and six near-threatened species (IUCN 2010). Of outstanding conservation concern are particularly the larger tree cavity nesters, like Palawan hornbill *Anthracoboceros marchei*, all three parrot species of Palawan, Philippine cockatoo *Cacatua haematuropygia*, Blue-naped parrot *Tanygnathus lucionensis* and Blue-headed racquet-tail *Prioniturus platena*, and other conservation relevant species like Grey imperial pigeons *Ducula pickeringii* and Mantanani scops-owl *Otus mantananensis* (Widmann et al. 2008).

The implementation of the warden scheme recruiting cockatoo poachers resulted in significant increases of the cockatoo population in the first two years of project implementation, comparable to those of the early stages on Rasa Island. In recent surveys, roosting site is at a coconut plantation in Malinsuno Island just across Pandanan Island. Highest number of cockatoo observed was 80 in October 2010.

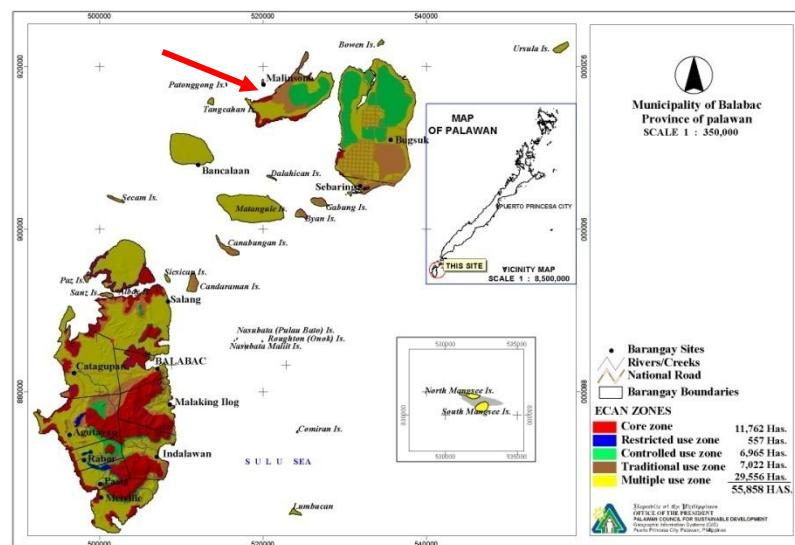


Figure 5. Location map of Pandanan Island indicated by red arrow (Map Source: PCSDS).

Patnanungan, Polillo group of islands, Quezon

The Polillo group of islands in Quezon is possibly the last area containing a population of the critically endangered Philippine cockatoo *Cacatua haematuropygia*, or 'Kalangay' as known locally, in the Luzon faunal region (Gonzalez 1997, Collar *et al.* 1999, Widmann 2001).

Patnanungan Island (Fig. 6) is mostly covered by scattered fragments of logged primary lowland evergreen forest and patches of secondary growth forest. About 95 species of birds were recorded from Patnanungan Island, of which 18 species are endemic to the Philippines and three are restricted to Greater Luzon. (Gonzales, 2007).

Forests, particularly in the northern and central portion of the island, are frequently transformed into slash-and-burn fields. The small diameter classes of cut trees indicate that rotational periods might be shorter than fifteen years. Principal crops planted are corn, cassava, banana and papaya.

Cockatoos persist in very low numbers. Habitat is seriously degraded and lack of nest trees might be a limiting factor. Due to the relative proximity to Manila as potential market, illegal logging and wildlife trade remain rampant in the area. Poaching for the pet trade is still ongoing, due to insufficient law enforcement, particularly in remote areas.

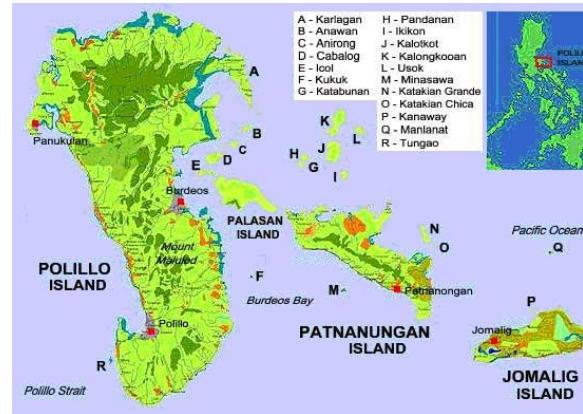


Figure 6. Map of the Polillo Islands, Philippines indicating the major islands and settlements, a global priority site for biodiversity conservation (adopted from Hampson *et al.*, 2003).

Methods

The Philippine Cockatoo Conservation Programme (PCCP) employs an ecosystemic and community-based approach to biodiversity conservation using the Philippine cockatoo as its flagship species. The main components of the program are nest protection or wardening schemes; scientific researches on feeding, biology and ecology of the Philippine cockatoo and other threatened species; identification, protection and management of key conservation sites; conservation education; habitat restoration; and capacity building. Researches on the Philippine cockatoo include distributional surveys, rescue of individual birds, translocation assessments, and conservation breeding for later re-introduction.

Information on the biology and ecology of the cockatoo is gathered through direct observation. On Rasa, movements of the cockatoos can be best observed from a boat, from beaches or coral outcrops. Very dense vegetation on the island considerably hampers visibility on transect walks or point counts. On Dumaran, Rizal and Polillo, movements are observed through wardens monitoring and patrols at protected areas and roost sites.

Monitoring of the population trend on Rasa, Dumaran and Pandanan in Balabac is done through counting individuals at a traditional roost site. A traditional roost site is situated in a mangrove area on Rasa and can be observed from a boat while in Dumaran a privately-owned coconut plantation serves as the roost site bordering close to a mangrove area. On

Balabac, at least two roosting sites are presently monitored; one in Malinsuno Island and the other on Pandanan Island. Counts are conducted monthly either before sunset on Rasa and Balabac islands and daily on Dumaran. Counts are also conducted during dawn before birds leave the roost site. Whenever possible, counts on Rasa are conducted under similar weather and light conditions. No roosting sites are known from Culasian and Patnanungan.

The core component in all project sites is the wardening scheme, employing former poachers as wildlife wardens. Wardens inspect and verify existing and potential nest trees starting end of September. During the breeding season, the nest trees are under permanent surveillance. Trees are climbed and nest holes controlled every ten days during that time. For safety reasons, dead or damaged trees are not climbed. Nest trees are characterized through species identification, tree height, diameter at breast height (DBH), height of nest hole, exposition of nest hole, diameter of hole, and diameter at base and depth of cavity. The geographic location of each nest tree is taken with the help of a GPS and marked in a map.

Presence or absence and condition of adult birds, eggs, nestlings or nest predators are noted. Nestlings are weighed with Pesola spring balances/and or electronic balance and banded with aluminum rings bearing the inscription of the Department of Environment and Natural Resources (DENR), the number and year (e.g. DENR 11-0001).

Volunteers are detailed in monitoring stations at the mainland coasts of Narra within and outside the breeding season. These volunteers record all sightings of cockatoos and other significant wildlife in the area of assignment.

Surveys to find remnant cockatoo populations are based on historical sources or recent information. To initially narrow down the searches, non-formal interviews with key informants (poachers, other forest users, barangay officials, school teachers) are conducted. Surveys aim to identify remnant cockatoo populations or areas which are suitable for translocation.

Herbarium collections are made of key plants in cockatoo habitats, particularly food-providing plants, and nest and roost trees. The physical structures of cockatoo breeding habitats are characterized through forest profiles. Phenological information on fruiting and flowering of food-providing trees are systematically collected on Rasa and Dumaran.

Restoration of mangrove is conducted on Rasa through transplanting of nursery-grown trees. Experimental restoration of lowland forest habitat is done in Dumaran. Particularly nest- and food-providing plants for cockatoos are systematically tested for their suitability for reforestation. MS Access and excel programs are used for analysis.

Composition of remaining bird communities in project and survey sites is assessed using MacKinnon-Lists and, occasionally, mist-netting. Composition of mammal, reptile and amphibian communities in project sites is assessed through direct observations, mist- and harp-netting, live-trapping (Sherman type and locally-made cage type) and pitfall trapping.

To identify potential cooperators for the projects, livelihood needs, and capacities, stakeholder and SWOT analyses are employed. Participatory planning is done through goal-oriented project planning methodology. Alternative livelihood is provided for key-stakeholders of the cockatoo and the PAs, based on the needs assessments.

Conservation education activities employ the PRIDE approach which uses marketing methodologies to galvanize community support for conservation. The approach conducts pre and post project surveys to assess changes in levels of knowledge, awareness and behavior among target audience by using control groups. Survey Pro is used for analysis on changes over time. Proven marketing vehicles like billboards, posters, fact sheets, puppet shows,

school and community visits, festivals and media participation are used to deliver relevant and compelling conservation messages.

Relevant trainings and seminars are conducted to help capacitate local partners in conservation. Cross visits to Rasa and other project sites are encouraged to facilitate exchange of experiences, lessons learned and good practices to boost morale of local partners and reinforce knowledge.

Please refer to each output for particular methodologies used in achieving results.

RESULTS AND PROGRESS

Output 1: Conservation of cockatoo population on Pandanan and Bugsuk Islands, Balabac

Nest protection and wardening scheme

Field activities in the area have been considerably improved with the completion of a basic field house constructed mainly with locally available materials. Facilities include sleeping quarters, kitchen and bathroom and septic tank. The house is secured by fence consisting of bamboo lattice.

The yearly breeding season assessment was conducted within the reporting period. It was decided to conduct nocturnal patrols during the next breeding season and to increase monitoring of people entering the area, as a reaction to the single poaching incident last year. Of four damaged nest trees, two could not be improved (one fell, one was drilled out during poaching activities in 2000), two were repaired and rain-proofed.

Monitoring of the area is continuously conducted by wardens, in this reporting period in combination with nest tree characterization. Illegal cutting, presumably for own consumption, persists in the area, but only on a smaller scale. A total of 42 nest trees was characterized regarding tree and nest hole parameters, geographic location, surrounding vegetation, among others.

The established nursery was maintained through weeding. A total of 94 trees were planted during the reporting period. A former shifting cultivation area in Dalahican with secondary growth was enriched by planting ten seedlings each per species from the nursery stock. Additional *Intsia bijuga* and *Koordersiodendron pinnatum* seedlings were planted as shade trees along trails on the island. As of December 194 seedlings remained in the nursery.

A conservation education campaign was conducted on November 30 for about fifty 4Ps beneficiaries (livelihood and education project provided by the national government). Topics included cockatoo and wildlife ecology and conservation.

Sightings of cockatoos in Camiaran Island between August and September have been reported by Bahirrudin A. Buhangin from Balabac. This needs to be verified.



Figure 7. Completed Katala field house in Pandanan project site. ©RAntonio

A remarkable observation was a cockatoo recorded inside a nest hole on 29 September, well outside of the breeding season. This could indicate very early occupation for the next breeding season or could be the first record of birds sleeping in the nest hole outside of the breeding season. The whole month of September was extremely wet and windy in southern Palawan. In the month of November cutting of twigs (an indication for early nest tree occupation) was regularly recorded.



Figure 8. Wardens monitor a *Dracontomelon* nest tree. ©RAntonio

Roost site monitoring

Roost counts in Malinsuno were strongly influenced by monsoon winds in the first half of the reporting period. September was also extremely wet with 546 mm of precipitation recorded on Dalahican.

Numbers of birds increased slightly until November and then dropped again in

December. The latter may be due to birds transferring to nest trees in Pandanan due to the onset of the breeding season. Due to the vicinity of the roost site to human settlements on the small island of Malinsuno, we consulted with the private landowner of the coconuts where the roost is situated on options to protect the site from disturbances. He agreed that KFI should draft a resolution for the protection of the site. A draft was prepared and presented during the regular barangay council session on November 9 and particularly includes restrictions of access from late afternoon to early morning, in order not to disturb roosting birds.

Roost sites in Pandanan and neighboring islands seem to remain unstable and occupation seems to follow weather patterns. Residents of the east portion of Pandanan reported roosting of twenty cockatoos in a coconut plantation on December 15 and 16. No occupation was recorded in the subsequent days.

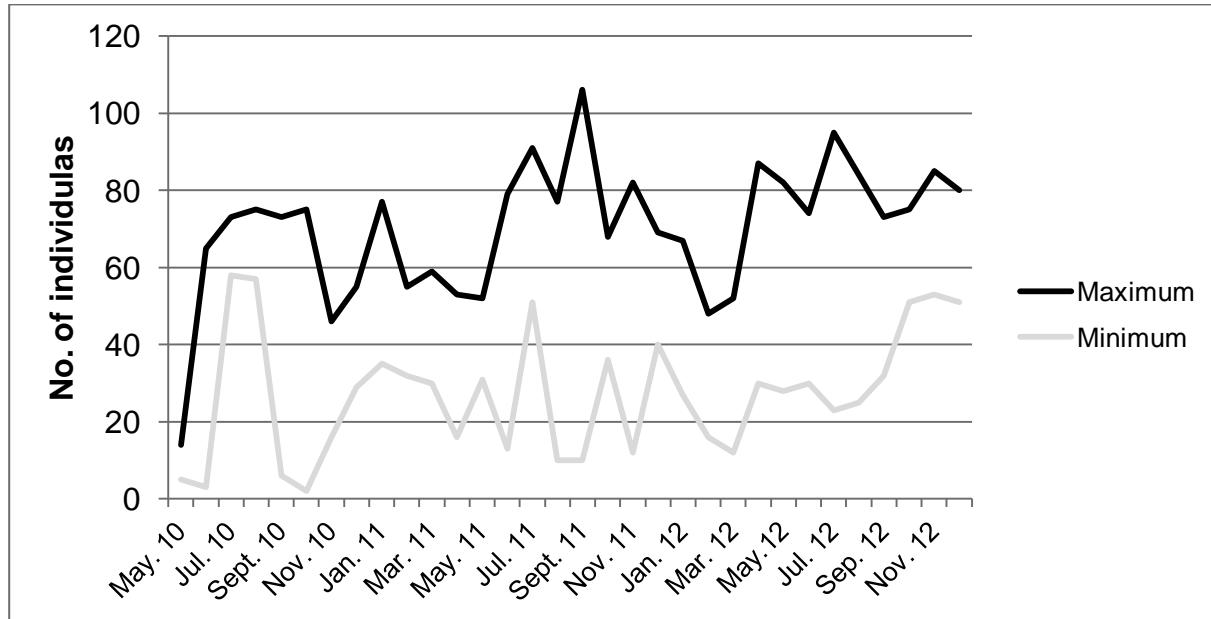


Figure 9. Minimum and maximum simultaneous monthly roost count of Philippine Cockatoos on Malinsuno Island, off Pandanan.

Constraints and measures taken

- Nocturnal patrols have to be conducted and monitoring of people entering the forest area has to be intensified during the next breeding season to avoid poaching incidents.

Output 2: Reintroduction of Philippine cockatoos into parts of the historical range

Preparation of a founder population

The opposition of KFI to the proposed coal plant in the immediate vicinity of Rasa Island (see Output 8) has consequences also for the reintroduction project. The Palawan Council for Sustainable Development (PCSD) is pushing for the coal project. It is also arguably the institution deciding if cockatoos are allowed to be brought out of Palawan. Currently the two issues are not kept separate.

A facility for hand-raising rescued Philippine Cockatoos with minimal human contact in KIEBC is finalized (see Objective 6).

The fact that birds are increasingly found on the mainland opposite of Rasa and for the first time since observations started established a temporary roost site there in the coastal area indicates that the population is close or at carrying capacity of the island, and that birds could be available for reintroduction without harming the founder population.

Assessments of potential re-introduction sites

The IUCN-SOS funded assessments for reintroduction sites in the Oceanic Philippines continued with five additional sites covered in the present reporting period: Subic Forest Reserve (E. Luzon), Mt. Palay-Palay (S. Luzon, Southern Samar, and Southern Leyte. This brings

the total number of assessed sites to ten, including one site in Busuanga, within the Palawan Faunal Region (1-11; Fig.10). Siargao Island was already visited in 2005 and should be revisited, if time permits. In the meantime KFI receives additional suggestions for potentially suitable sites, particularly from members of the Wild Bird Club of the Philippines, who often have first-hand information on areas within the archipelago which are sparsely visited by birders or conservationists.

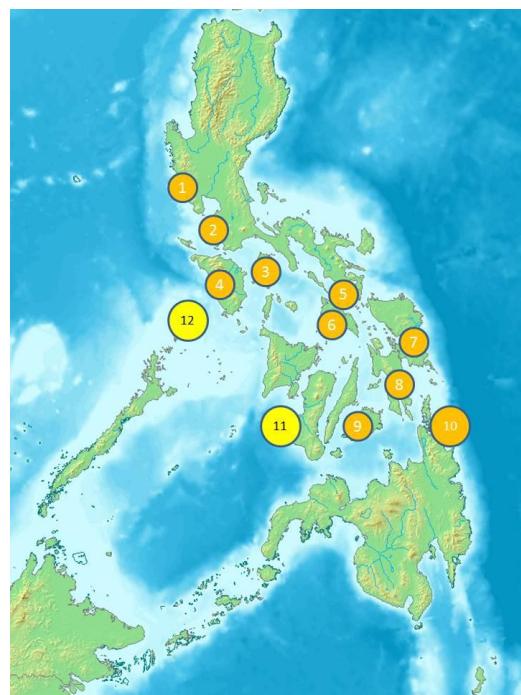


Figure 10. Map indicating cockatoo reintroduction assessments conducted within the historical range of the species: 1) Subic Forest Reserve, 2) Mt. Palay-Palay, 3) Marinduque (scheduled for next reporting period), 4) Mindoro Occidental, 5) Ticao, 6) Masbate, 7) Southern Samar, 8) Southern Leyte, 9) Bohol, 10) Siargao (to be scheduled for revisit), 11) Danjugan, 12) Busuanga

Results of the assessment for the sites visited are summarized below. Findings of the site assessment will be covered more comprehensively in a separate report.

Subic Forest Reserve

The status of Subic Bay as US naval base until 1992 with its restricted access prevented large-scale deforestation as in other parts of the country. In October 1999 the Subic Bay Metropolitan Authority initiated the Protected Areas Management Plan (PAMP) Project for Subic Bay in order to protect the still existing partly intact marine ecosystems, as well as old-growth lowland forests and mangroves. Two sites were assessed within the park: the lowland dipterocarp forest of the Subic Bay Watershed Reserve and the adjacent mangrove park. Due to the long-term protection large diameter classes (av. 80 cm of emergents) of potential nest trees are available in the former (Fig. 11). The mangroves were less suitable as nest habitat, since only few *Sonneratia* in smaller diameter classes were present. Our visit was accompanied by staff of the port management authority and the Subic Bay Ecology Center, and there was a keen interest in having the project in Subic. We were kindly provided with information on status of flora, fauna and ecosystems.



Figure 11. Measurement of emergent tree in Subic Forest Reserve ©JSquerata

Concerns regarding the site include the presence of another highly threatened parrot species, the Green Racquet-tail *Prioniturus luconensis* for which the area is of crucial importance and which may compete with the cockatoo for nest sites.

Visiting birders informed us that trapping and shooting of birds occasionally is observed by poachers originating from neighboring municipalities.



Figure 12. Subic Mangrove Park with evergreen lowland dipterocarp forest in the background ©PWidmann

Mt. Palay-Palay

This protected area is an isolated forest stocking on limestone in southern Luzon. The protected area comprises 3,900 ha. It is partly under private ownership and partly within installations of the Armed Forces of the Philippines, which partly explains the persistence of forests, partially down to sea level.



Figure 13. Evergreen lowland dipterocarp forest in Mt. Palay-Palay ©PWidmann

A protected Area Management Board (PAMB) was recently created, including a representative of the Wild Bird Club of the

Philippines. Challenges in the area include land disputes and infrastructure development (i.e. road construction). The latter may eventually lead to increased influx of people.



Figure 14. Coastal forest and shrub on limestone in Mt. Palay-Palay ©PWidmann

Constraints and measures taken

- The coal plant issue has to be resolved prior to entering into further discussions regarding cockatoo founder population from Rasa. Both issues have to be kept strictly separate.

Output 3: Conservation of cockatoo population on Rasa Island Wildlife Sanctuary (RIWS), Narra continued

Wardening scheme

Existing coconut plantations on Rasa were monitored within the reporting period. In no case extension of plantation or encroachment of forest areas was recorded.

During the annual breeding season assessment performance of wardens and other involved parties were assessed in order to improve procedures for the breeding season monitoring in the future. A challenge identified was the increase of nest predation, often with the predators remaining unidentified. Based on marks on egg shells, rats were suspected. In

September newly identified nest trees were flushed with metal sheets to prevent rats climbing up tree trunks.

Infestation with mites was high. There were also lapses in monitoring infestations and treatment observed on wardens' side. Since most active nest trees are now occupied every year, mite infestation may be now a more permanent phenomenon on Rasa. In previous years dormant mites in unoccupied nests may have simply perished, if no nestlings were available during the breeding season.

Warden's visit to Sumbiling

Wildlife wardens were invited for a visit to communities in Sumbiling, Bataraza to share their experiences with the KFI-initiated revolving funds which are functional to this day. This visit was also part of the assessment of ELAC-implemented project funded by Carpus.



Figure 15. Wildlife warden Agui shares his experience with beneficiaries form the Sumbiling project. ©KFI

Warden Refresher's Course

On November 14-16 wildlife wardens from all PCCP project sites in Palawan came together in Narra to brush up their job skills over the course of two days. Courses included methods of nest and forest protection and patrolling, paralegal procedures, bird watching and identification, first aid, and family planning (with demonstrations!). Resource speakers included DENR staff, Phil. Red

Cross, Phil. National Police, LGU and KFI staff. Beyond the learning of new skills, wardens from the different sites had the rare opportunity to exchange experiences with their colleagues.

Although still early in the year, the KFI Christmas party followed the official part, since all wardens and staff were already joined together in a single location.



Figure 16. KFI wardens from the Culasian project site practice First Aid ©KFI

The wardens from project sites other than Rasa had for the first time the chance to visit the facilities in KIEBC and got a tour to the enclosures and the wood- and wetland restoration areas.



Figure 17. External KFI wardens were able to visit the cockatoo aviary in KIEBC ©KFI

Apis Forest Restoration

Monitoring in the Apis forest continued throughout the reporting period. Illegal

logging in adjacent areas continues unabated, and with toleration from allegedly government officials. Apis forest is only spared due to presence of wardens. Challenges in protecting the area are the remoteness of the area and the costs involved in deploying wardens.

A survey team was assisted in the demarcation of the area and the installation of monuments, which hopefully will prevent outside encroachment in the future.



Figure 18. Survey team with transit measuring boundaries in Apis Forest ©KFI

Capacity building of the Protected Area Management Board (PAMB) of the Rasa Island Wildlife Sanctuary (RIWS)

The regular PAMB meeting was conducted in 28 September. This was the first time the coal plant project was brought to the Board through Capt. Danao of Panacan 2 who learned that the project will be constructed near Rasa Island.

Capt. Mahinay of Panacan 1 reported that an endorsement was already given by Bgy. Panacan 1 council. CENRP Tactay said it was too premature to discuss about it since there is no proposal handed over to PAMB. KFI reiterated that PAMB should take part in this decision as the location is in very close proximity to the protected area and the proposed location is within the flight path of the Philippine cockatoos.

It was during this meeting as well that KFI reported results of the breeding season 2012. The board also decided on the increase of conservation fee from 130 to 180 pesos.

Conservation education and eco-tourism

Conservation education activities were stepped up considerably due to the increased dispersal of cockatoos on the mainland, with focus on rarely visited communities. The objective was to freshen up the notion of "Share a Place to Live" in order to avoid human-cockatoo conflicts in the newly frequented communities. Activities typically include lecture segments on the cockatoo, Rasa Island and other wildlife, art competition (face painting, street drawing, origami, etc.) and tree-planting. A total of 701 persons were reached during campaigns in six barangays and the local university within the reporting period.

Lectures in Panacan and adjacent barangays of the proposed power plant site also included topics on health and environmental effects of burning coal.

In December, an information campaign on the cockatoo was conducted before ca. 650 kids and adults of a religious congregation in Narra.



Figure 19. Kataly draws attention during a school visit in Barangay Antipuluan ©KFI



Figure 20. Lecture held in Estrella village, one of the more remote settlements now reached by cockatoos ©KFI



Figure 21. Lecture in Panacan on health effects of coal-fired power plants. ©KFI

Systematic collection of data on breeding and feeding biology and population dynamics of Philippine Cockatoo continued

Wardens monitored nest trees for signs of occupation for the next breeding season. Starting November birds were present again at nest trees, as indicated by cut twigs and fresh feces.



Figure 22. Six cockatoos present around nest hole. Indication for helpers? ©PWidmann

The previously observed trend continued that more than a pair of cockatoos is present around nest holes. We recorded up to eight cockatoos present around a single nest tree. It is still unclear whether the ‘additional’ birds are offspring from previous breeding seasons or unrelated to the pair. Monitoring in the evening indicated that some birds sleep close by the nest hole or possibly even inside. This behavior so far was only recorded during the breeding season and may explain the recently observed fluctuations of cockatoo numbers in the traditional roost site.

On December 1 a dead cockatoo was turned over to KFI from the mayor’s office. A resident had observed a single cockatoo perching on an electric wire in downtown Narra. It apparently tried to reach out for the adjacent wire and when the beak made contact, it got electrocuted. Serious burn marks were recognizable in the face and less so at the feet of the bird.

Necropsy conducted in Palawan Wildlife Research and Rescue Center in Puerto Princesa indicated that the crop was full with *Moringa* seeds.



Figure 23. Philippine Cockatoo electrocuted on electric wire in Narra ©KFI



Figure 24. Necropsied cockatoo with crop filled with *Moringa* seeds ©KFI

Roost Count

As in the previous reporting period, the process of cockatoos “self-introducing” themselves to the mainland of Palawan continues. This includes the establishment of a roost site each in the coastal mainland area and another one on Rasa which however both are not permanent. In addition, birds now increasingly seem to stay overnight close-by nest trees. Consequently roost counts for the time being do not reflect the actual population

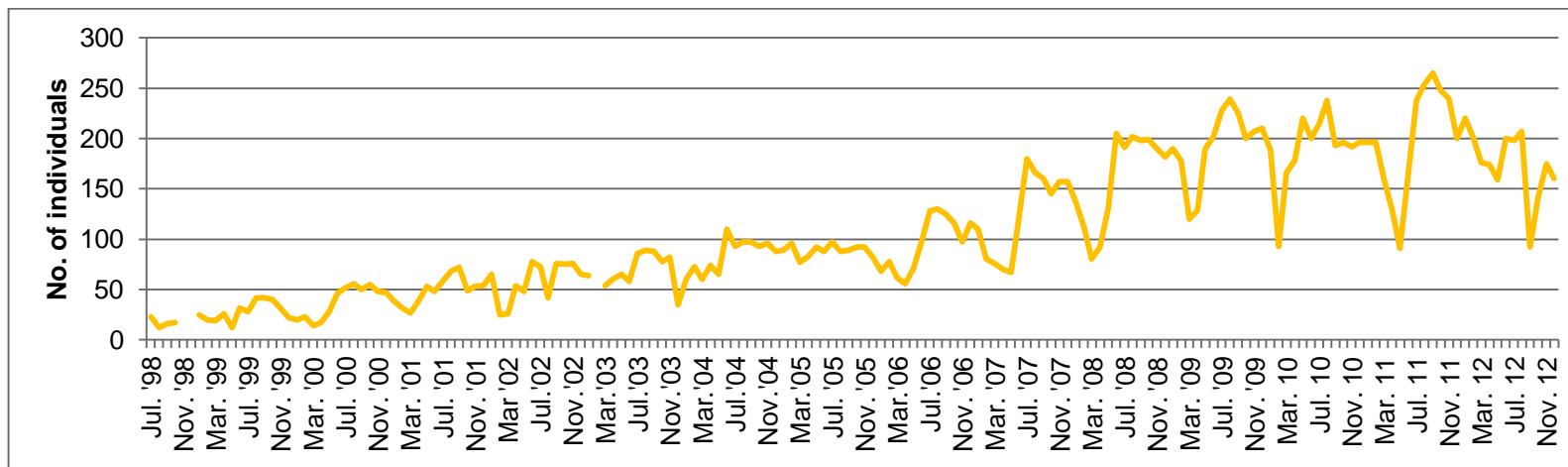


Figure 25. Maximum simultaneous number of cockatoo individuals during monthly counts at traditional roost site on Rasa Island.

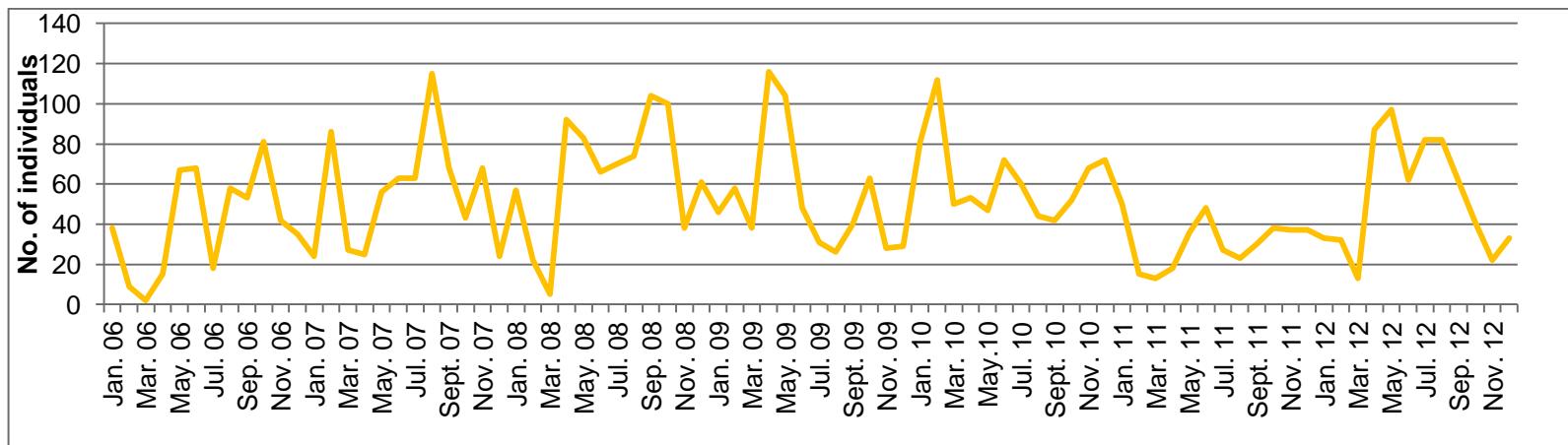


Figure 26. Maximum simultaneous number of cockatoo individuals during monthly counts in coastal mainland stations opposite Rasa Island.

numbers of cockatoos in Rasa and vicinity, unlike in the past 14 years.

Mainland counts

Numbers of cockatoos observed foraging on the mainland increased again significantly compared to the previous year. Still, a temporal pattern is not yet discernible, but availability of food, particularly fruits of *Moringa oleifera* is likely to play a role.



Figure 27. One-year old (leg band colour) female (eye colour) cockatoo feeding on fruit of *Moringa oleifera* in Bgy. Panacan, Narra
©PWidmann

As in the previous reporting period, birds occasionally roost on the mainland now, but sites are changing permanently which makes monitoring and particularly synchronised counts difficult. No roost observations were made from the established coastal monitoring stations during the reporting period. Cockatoos were however recorded early in the morning flying to Rasa, indicating that

smaller roost sites may occasionally be established further inland. Foraging flocks also occasionally reach more remote barangays in a radius of about eight kilometres around Rasa.

Constraints and measures taken

- There were high incidences of mite infestation in this year's nests, with single losses of hatchlings occurring. Prophylactic treatment of nest holes before the onset of the breeding season is obligatory, and monitoring for ecto-parasites on nestlings and substrate needs to be intensified.
- The increased presence of cockatoos on the mainland poses challenges on monitoring and conservation. Simultaneous counts on all roost sites have succeeded only partially, since two sites are not yet firmly established. In the future, distance sampling methods may have to be employed in order to monitor the cockatoo population on Rasa and adjacent areas.
- Since cockatoos reach far-flung areas on the Palawan mainland opposite of Rasa, conservation education activities have been stepped up considerably.

Output 4. Conservation of cockatoo population on Dumaran Island, Dumaran continued

Wardening scheme

Outside of the breeding season wardens were mainly occupied in expanding the tree nursery in preparation for the new corridor reforestation project. Routine patrolling activities were conducted during which also wildlings and tree seeds were collected. Flashing of nest trees were repaired in preparation for the breeding season.

Upgrading of the nursery included expansion of the seedling area and improvement of the lay-out to minimize travel time for seedling hauling and watering. A new shed was constructed, including sleeping quarter, toilet and storage room for equipment and supplies. A growth chamber was constructed to accommodate freshly collected wildlings.

In the meantime the corridor and critical habitat project was endorsed by the Local Protected Area Management Committee (LPAMC). This is highly supported by the municipal government through the leadership of the Mayor. In September the survey of lots within the corridor were assessed and the consultation process with interested farmers commenced.



Figure 28. Wardens construct new nursery shelter ©MPlazos

This year's breeding season assessment meeting for Dumaran was conducted on September 9. A main issue is the disturbance of nest trees due to on-going shifting cultivation activities. It is hope that such impacts could be reduced in the future with the implementation of the critical habitat project.



Figure 29. The Nursery terrain is levelled or terraced to create more space for seedlings
©MPlazos

As of December 2012 the nursery stock considerably increased to 10,915 seedlings of fifteen major timber trees and several unidentified species.



Figure 30. The tree nursery in Dumaran has been considerably expanded in preparation for the corridor reforestation project
©PWidmann

Members of Local Protected Areas Management Committee assisted and capacitated

The Local Protected Areas Management Committee meeting for this reporting period was conducted on September 10. An ongoing issue is illegal logging. Even official building projects suffer from scarcity of lumber. Since natural forests are already seriously depleted, this situation is likely to become more pressing. Long-term solutions only lie in

the establishment of timber plantations. However, the political will to endorse such plantations is low, since benefits cannot be reaped with one or two legislative periods.

Systematic collection of data on breeding and feeding biology and population dynamics of Philippine Cockatoo continued

Flocks of up to 17 birds were regularly observed in Manambaling and up to 13 in Omoi Cockatoo Reserve. Due to their typical vocalization some could be identified as immature birds from this year's breeding season. Mid of November cockatoos were observed around nest trees.

After the death of our wildlife warden Tirso Sy, the family members have taken over the task of recording cockatoos on

their roost site in the Sy coconut plantation. Number of cockatoos on the roost site declined during the reporting period, indicating that some birds may stay around nest trees overnight.



Figure 31. The new forest restoration project is endorsed by the Mayor Publico of Dumaran during the LPAMC regular meeting. ©PWidmann

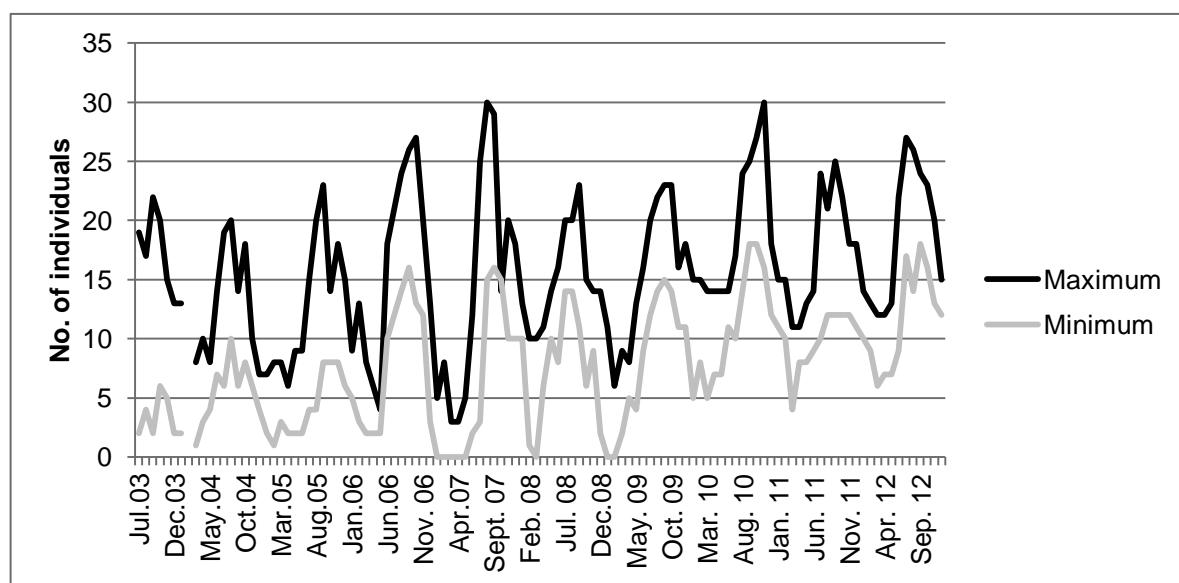


Figure 32. Maximum and minimum simultaneous number of cockatoo individuals during monthly counts at traditional roost site in Lagan, Dumaran Island.

Constraints and measures taken

- Illegal logging and shifting cultivation remain as problems in Dumaran, for which there are no easy fixes. It is hoped that the creation of the critical habitat,

- particularly the reforestation of a corridor between the two cockatoo reserves will lessen the pressure on the remaining nest trees.
- Illegal logging, although not taking place in the cockatoo reserves, but in their vicinities, is currently

insufficiently addressed. Only long-term solutions present themselves (plantations) to resolve the timber crisis.

Output 5. Conservation of cockatoo population in Culasian Managed Resource Protected Area (CMRPA), Rizal continued

KFI-wardens in Culasian were requested to assist in the National Greening Program which is countrywide implemented by the DENR. Wardens provided wildlings of native trees and planted within the boundaries of CMRPA, for which compensation from DENR was promised, but was delayed several times. As of end of the rainy season in October 4,549 planted trees survived in two different locations, whereas 551 died.

The regular LPAMC meeting was held on September 14. The illegal fishpond which was demolished in the last reporting period was observed to have been revived. We reported this case to authorities and awaiting action.

Cutting of mangroves for charcoal making and logging of dipterocarps for fishpond reinforcement was reported as well, likewise without prompting action from the agencies in charge.

Constraints and measures taken

- Reporting illegal activities within the protected areas to authorities and then waiting in vain for said authorities to take action has become a permanent and frustrating fixture in this project site. The alleged involvement of local government officials or at least their tolerance of illegal activities seems to have a paralyzing effect on law-enforcing bodies in the site. This systemic problem is difficult to address on site only, but has to be resolved

on higher levels within the Philippine National Police, PCSD and DENR.

Output 6. Support for Polillo Islands Parrot Project

No field work conducted within the period.

Output 7. Katala Institute for Ecology and Biodiversity Conservation

Captive management of Philippine cockatoo and other threatened target species

Philippine Cockatoo and Freshwater Turtles

The construction of the cockatoo nursery/clinic was finalized during the reporting period. The facility will allow hand-raising of birds while avoiding human imprinting. If not used for this purpose it could be used for quarantine of newly acquired birds or other small- to medium-sized animals. The structure is relatively sound-proof; glass bricks instead of glass windows were installed so that passing people on the outside cannot be recognized. Through these measures it is hoped that imprinting on humans of rescued cockatoo nestlings can be minimized. Air circulation is passive through roof vents and active through wall fans.



Figure 33. Front view of the newly constructed cockatoo nursery and clinic ©KFI



Figure 34. Work benches for hand-feeding boxes on the inside ©KFI

On December 22, Silver (male) attacked and killed his long-time mate Blue (female). Silver showed signs of aggression towards other birds and consequently had his wing clipped, but apparently still was able to corner Blue in the breeding area of the aviary. Blue sustained heavy injuries on head and neck, which were likely the cause of death, as detailed in the necropsy report conducted in the Palawan Wildlife Rescue and Conservation Center. Silver was permanently placed in an aviary within the quarantine area after the incident.

As of December 31, the assurance colony held 26 *S. leytenensis*, 72 *C. amboinensis*, 9 *C. dentata*, and 1 *D. subplana*.

Infrastructure development

Fencing continued to secure the perimeters of KIEBC. A loop trail was laid out with rice hulls and through removing overhanging vegetation. It eventually will cover all publicly accessible enclosures and will be provided with selected signboards from the “Seeds-of-Life” exhibit. Additional signboards will contain information on other features of the area, like the ephemeral ponds, the reforested areas, the nursery and the vegetable garden for feeds production.

The access road was further improved by adding and compacting an additional layer of gravel.

TOTAL BUILDING AREA: 396.42 sq.m.

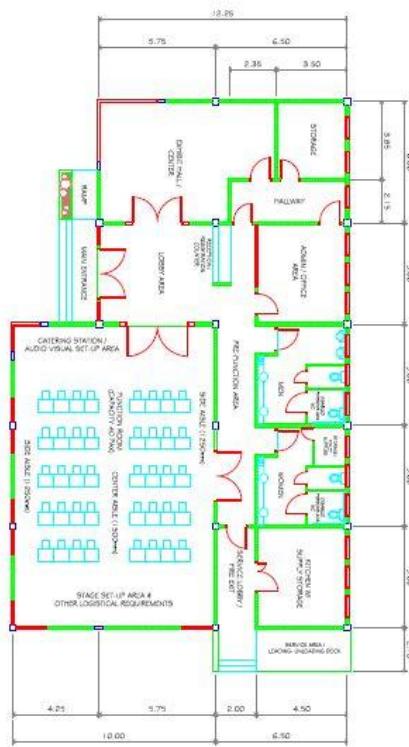


Figure 35. Floor plan of proposed education center in KIEBC ©KFI

A plan for an education center was prepared for submission to donors. The facility includes a lecture hall with capacity of 40 visitors, exhibit area, kitchen and office.

Nursery

A growth chamber was established to acclimatize newly acquired wildlings. Initial survival rate was low since ventilation was insufficient and temperatures inside the chamber rose dramatically.

Within the reporting period 482 trees were planted in the KIEBC compound.

As of end of the current reporting period there were 3,911 seedlings of 36 tree species present in the nursery.



Figure 36. Seedlings in the KIEBC tree nursery are stepwise exposed to the sun before they are planted out ©KFI

Constraints and measures taken

- The unpredictable aggression of Silver makes it necessary to isolate him permanently from other birds. He now occupies a spacious enclosure within the quarantine area.
- No funding could so far be secured for the proposed education center, partly due to time restrictions in identifying potential donors, and partly due to the high costs of the project. Proposals will be prepared, as soon as time permits.

Output 8. Cockatoo Advocacy

In September KFI received information that the Makati-based company DMCI Power Corporation intends to put up a 15 MW coal-fired power plant in Panacan, the fishing community to which RIWS administratively belongs. No technical descriptions or site map of the project was available during the time. Nevertheless, an endorsement of the proposed project was already signed on August 16 by the Barangay Council of Panacan through Resolution No. 17 endorsing of the coal-fired power plant,

even without conducting public consultation among barangay residents and other stakeholders.

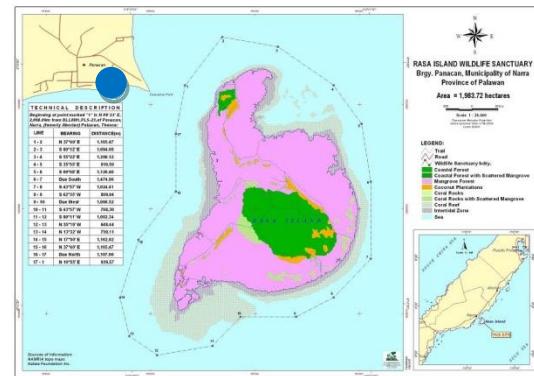


Figure 36. Proposed site (blue circle) of the 15 MW coal-fired power plant opposite of Rasa Island Wildlife Reserve

In the September meeting of the PAMB, the coal plant issue was brought up by a member of the PAMB. It was revealed that the proposed site was situated on a peninsula just opposite or Rasa Island, only about 1 km away from the protected area. This caused considerable concern, since the proposed site was situated directly within the flight path of cockatoos from and to their forging areas on the mainland.

The following gives an account of the major events in connection to this issue, but it has to be noted that networking with decision makers, affected community members and concerned agencies was done intensively on a daily basis from September onwards.



Figure 37. View from proposed site of coal plant to Rasa Island Wildlife Sanctuary
©PWidmann

On October 8 PCSD through its Legal and Environment and Natural Resources Committees conducted a public hearing, which however was not held in the vicinity of the proposed site. KFI manifested its concerns regarding the project. DMCI, proponent of the coal-fired power plant has a powerpoint presentation which was insufficient to answer all the questions and issues raised by attending stakeholders. Copy of the Initial Environmental Examination (IEE) Report was persistently asked from the proponent and this was ignored.

On October 24 a public hearing in Panacan, Narra (host barangay) was initiated by the Sanggunian Bayan of Narra (municipal council). During the event KFI offered its technical expertise to the proponent DMCI, since the former was working on the conservation of Rasa since more than 14 years. The DMCI representative, Mr. George Baquiran declined this offer, since according to him it is easy for the company to buy outside expertise.

Information on the project shared with the public and local decision makers by the proponent was very scant and consisted of a short PowerPoint presentation and a promotional brochure describing the proposed fluidized bed technology. Upon

request of KFI, the proponent refused to share their IEE report for the project with us.

The following day, KFI presented in Narra Lagoon Center how the coal-fired power plant obstructs the flight path of the Philippine Cockatoo during another public hearing initiated by the Narra SB. There was resounding opposition among Narranians. It became apparent that the majority of affected inhabitants of Panacan were opposing the project; however, local decision makers were divided in their stand. Particularly members of the village councils were in favor of the project. KFI presented its concerns in form of a PowerPoint presentation, as did the Environmental Legal Assistance Council (ELAC). The project now got so much exposure that the issue was featured in local TV and national print media (Annex 2).

KFI prepared and distributed a position paper based on its own findings and on mostly open access publications, many of which were peer-reviewed (see Annex 1). Major concerns included health issues related to coal plants, environmental considerations, particularly given the fact that very low quality coal from the Philippines was proposed as fuel for power plant and effects of the project on local livelihoods. One major concern is that the proposed project site would effectively cut off the flight path of cockatoos to and from their foraging areas on the mainland, since the plant was planned to be built on a peninsula which forms the closest connection between Rasa and the mainland. It was stated that the project would result in direct losses (as demonstrated by the electrocuted cockatoo in December within this reporting period), and indirect losses due to the fact that foraging routes would be cut off from the island, resulting in increased incidences of chick mortality, particularly during drought years, and

ultimately in decreased carrying capacity of Rasa for Philippine Cockatoos. It was therefore feared that the proposed coal plant could advance a single-most important threat factor for the species as a whole. Since the area holds at least one quarter of the world population of the species.

On November 5 we met with Dr. Lim of PAWB to discuss the strategy regarding the proposed coal-fired power plant. It was agreed that PAWB should issue a memorandum for the Environment Management Bureau of DENR highlighting the environmental concerns surrounding the project, particularly the expected impacts on the Philippine Cockatoo. The latter agency reviews IEEs and IECs and issues clearances on national level.

KFI decided at this point to forgo an international campaign for the time being to give local decision makers time to reach an informed decision, without being pressured by international criticism. International PCCP partners however offered to write letters expressing their concerns to the municipal mayor of Narra and the governor of Palawan. Letters were sent by email and as hard copies from LPF, ZGAP, Northern England Zoological, Zooparc Beauval and Zoo Landau. Whereas Mayor Demaala of Narra voiced out his support in the fight against the coal plant in its currently proposed site, no reaction from Governor Mitra on the issue was received.

Since the statements of KFI regarding flight paths of cockatoos during the PCSD meeting were met with skepticism, on November 27-28 a PCSDS team went to Narra to check on cockatoo's presence at proposed site. Presence of cockatoos and the flight path in the proposed site were confirmed.

On Nov. 29 another PCSD Council Meeting was held, KFI reiterated its

opposition and was supported by the representative of the NGOs in the council. The representative from DENR, Regional Technical Director Bambalan also raised to the Council the concerns raised by the KFI. An expert from Cebu was invited to share his findings on the effects of coal plants on health of affected communities. Despite his plea not allow such coal plants in Palawan, the project proposal received support within the council from representatives of the private sector, the League of Barangays and other council members who questioned particularly effects on health of coal plants in general and in the Philippines in particular.

Another rather unexpected support in the fight against the plant came from Bart Duff from the Chamber of Commerce, who presented a calculation that a mix of renewable energy (particularly mini-hydropower) and conventional fuel (diesel, bunker) could even be competitive with electricity rates than coal. He also presented data that power outages were to more than 80% an effect of distribution problems due to the dilapidated grid in Palawan and not a power generation problem. He therefore manifested that there is no power crisis in Palawan, a coal-fired power plant would not be needed, and there was ample time and potential to develop renewable energy.

Another public hearing was held in Panacan on December 3, again initiated by the Narra SB. Inhabitants of the village now had more information on the project than before and opposition was evident. KFI presented its point again during a session of the municipal council and its points were overall well received. KFI presented to the SB Narra during its Committee on Environment session the salient points/issues against the coal plant in its proposed location. The SB was very receptive to KFI's position.

In the meantime a request of KFI addressed to PCSDS to share technical description details, in particular the mandatory IEE report by the proponent, in order to better assess the project was denied by said agency.

In the process, KFI along with other organizations and concerned individuals forged the Alliance for Clean Energy in order to push forward renewable energy for Palawan.

Constraints and measures taken

- The consultation process for the proposed coal-fired power plant is deeply flawed, since, unlike other projects in the past, it is deliberated in PCSD even before the complete set of local endorsements is collected by the proponent. Furthermore, the barangay (village) endorsement was given even before a public hearing was conducted. Crucial information on the project is not shared with the public. Legal advice has to be sought by KFI.
- The discussion seems to be dominated by political maneuvering rather than by weighing facts. The IEE-Report which should contain most information on the technical details of the project is crucial to assess impacts, is not openly available for the public. KFI will continue to demand the access to this document.
- Knowledge, particularly on health and environmental impacts of coal-fired power plants is insufficient among stakeholders. KFI and other involved organizations need to increase dramatically information campaigns for these groups.

Other highlights

Other reported wildlife within the reporting period:

IUCN 2012: CR (Critically Endangered), EN (Endangered), NT (Near Threatened), VU (Vulnerable).

Green Turtle *Chelonia mydas* (EN)

Two slaughtered individuals were recorded in Malinsuno village proper in December.

Grey Imperial-pigeon *Ducula pickeringii* (VU)

Two individuals were observed feeding on fruits of *Garuga floribunda* on September 11 in Rasa Island.

Blue-naped Parrot *Tanygnathus lucionensis* (NT)

A total of 83 birds hatched on Pandanan in the 2012 breeding season.

After many years of absence a single bird was recorded on Rasa on 29 September. It is likely that the bird is a vagrant from the mainland.

Larger flocks of up to 36 individuals could be recorded from Culasian, Rizal.

Blue-headed Racquet-tail *Prioniturus platenae* (VU)

Larger flocks continue to be recorded on Pandanan: 35 individuals (16.11.), 28 (18.11). A larger flock in Dumaran comprised 14 birds (26.11.). Small flocks up to seven birds were regularly recorded from Rasa throughout the reporting period.

Palawan Hornbill *Anthracoceros marchei* (VU)

Larger flocks continue are recorded from Pandanan: 20 individuals (13.9.; 1.10.; 20.11), 15 (22.11), as well as from Culasian Rizal: 14 (12.11).

Great Slaty Woodpecker *Mulleripicus pulverulentus* (VU)

Continued presence in the smallish Omoi and Manambaling Cockatoo Reserves on Dumaran Island was reconfirmed on October 8 and November 8 respectively.

Burung Indonesia Project visit in Halmahera, Indonesia

Upon request of LPF and ZGAP, Peter visited the parrot project of Burung Indonesia on the island of Halmahera, Maluku Utara, Indonesia from October 5-24 in order to discuss possibilities of community-based conservation approaches, similar to those of PCCP. Additionally, cooperation with other stakeholders, methods for parrot surveys and release were assessed. A report was submitted to LPF and ZGAP.



Figure 39: A White Cockatoo *Cacatua alba* near Lake Toliri, Ternate, Indonesia. ©P. Widmann, KFI

Summary of relevant seminars, expeditions and workshops organized and attended

8th Philippine Bird Festival

PCCP participated in this year's Birdfest held at Rizal Park, Manila on 7-9 December 2012. We presented before high school and college students the plight of the Philippine Cockatoo.



Figure 40. Jewil assisting participants of a bird quiz during the 8th Philippine Bird Festival
©KFI

A booth was attended for two days informing fellow birdwatchers on the conservation efforts and possibilities to see Philippine cockatoo in the wild.

PCSD Science Fare

KFI participated in this affair with cockatoo-related IEC in Robinsons Mall, Puerto Princesa City. Around 80 students attended.

Papers published, submitted for publication to relevant journals, relevant reports and media mileage

- Article on proposed coal plant in Philippine Inquirer on October 28 (Annex 2)
- A report on the Burung Indonesia project visit in Halmahera was submitted to LPF and ZGAP.

Equipment status

- The engine of the service boat in Narra was repaired; but will need an overhaul.

Implications for further work

It becomes apparent that the proposed coal plant has the potential to develop into a major threat for the most important remaining Philippine cockatoo population.

KFI is seeking allies within the NGO community of Palawan and steps up advocacy with decision-makers and information campaigns with stakeholders considerably. It appears that the consultation process is deeply flawed and KFI has to be prepared to take legal steps. It was very frustrating to see how long-year allies suddenly abandoned all thoughts of conservation at the prospect of DMCI entering the community. At the same time it was encouraging to see how the Mayor of Narra and the majority of the municipal council of Narra stood by their commitment to protect Rasa and the Narranians.

Planned targets and activities for the next reporting period

Objective 1: Conservation of cockatoo population on Pandanan and Bugsuk Islands, Balabac

- Warden scheme on Pandanan and Bugsuk Island continued and extended to adjacent mainland.
- Monitoring of cockatoo population and habitat on Pandanan and Bugsuk Island continued.
- Networking with local stakeholders, particularly Jewelmer Corporation, the largest private landowner, continued.
- Conservation education in Pandanan Island and adjacent mainland continued.
- Research on conservation-related aspects of cockatoo biology on Rasa continued, with focus on factors influencing breeding success and foraging ecology.

Objective 2: Re-introduction of Philippine Cockatoo

- Site evaluation continued.

Objective 3: Conservation of cockatoo population on Rasa Island, Narra

- Warden scheme continued.

- Members of Protected Areas Management Board in the management of the Philippine Cockatoo and Rasa Island Wildlife Sanctuary capacitated and meetings facilitated.
- Conservation education for stakeholders continued.
- Research on conservation-related aspects of cockatoo biology on Rasa continued, with focus on factors influencing breeding success and foraging ecology.

Objective 4: Conservation of cockatoo population in the Sulu-Sea coastal plain of Palawan

- Monitoring of new mainland flocks initiated (municipalities of Narra, Aborlan), and of existing one (Iwahig Penal Colony) continued.
- Intensive conservation education initiated for communities visited by foraging flocks.
- Habitat restoration and management in Apis, Aborlan continued.

Objective 5: Conservation of cockatoo population on Dumaran Island, Dumaran

- Warden scheme continued.
- Members of Local Protected Areas Management Committee in the management of the Philippine cockatoo, as well as Omoi and Manambaling Cockatoo Reserve assisted and capacitated.
- Research on conservation-related aspects of cockatoo biology on Rasa continued, with focus on factors influencing breeding success and foraging ecology.
- Buffer zone restoration around existing cockatoo reserves continued.
- Creation of forest corridor connecting the two existing cockatoo reserves continued.

Objective 6: Support for Polillo Islands Parrot Project

- Warden scheme for Philippine cockatoo and other parrot species continued.

Objective 7: Conservation of Culasian Managed Resource Protected Area

- Warden scheme for cavity-breeding birds continued.
- Members of Local Protected Areas Management Committee in the management of the Philippine cockatoo, as well as Culasian Managed Resource Protected Area assisted and capacitated.
- Potential for cockatoo supplementation explored.
- Handing over to the Protected Area Management Board of the Mt. Mantalingahan Protected Landscape initiated.

Objective 8: Education and research at the Katala Institute for Ecology and Biodiversity Conservation

- Captive management of Philippine Cockatoo and other highly threatened species continued through employment and training of zookeepers and volunteers.
- Landscaping with native species propagated in the Katala nursery continued.
- Educational trail, enclosures and visitors facilities upgraded.

Objective 9: Cockatoo Advocacy

- Engagement with the Palawan Council for Sustainable Development and other law-enforcing bodies in the formulation and implementation in the fields of wildlife trade, illegal logging, establishment of large-scale agricultural projects, particularly plantations.

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ANNEX 1:

Katala Foundation's Position Paper on the Proposed Coal-fired Power Plant of DMCI Power Corporation in Panacan, Narra, Palawan

Prepared by

Katala Foundation, Inc. (KFI)

Puerto Princesa City, Palawan, November 2012; updated July 2013



Introduction

Electricity demand in Palawan is predicted to rise significantly in the future, partly due to increase of population and businesses, and partly due to system losses due to deterioration of existing power generation and distribution infrastructure. Based on this projection the Palawan Electric Cooperative awarded a service contract for a 15 MW coal-fired power plant to DMCI Power Corporation. The proposed site for the plant is Panacan, Narra (Fig. 1).

Katala Foundation, Inc. (KFI) wants to point out that it welcomes efforts to increase energy security in the province; it therefore strongly supports a long-term and strategic consultation process involving the general public, LGUs, academe, government agencies and non-government organizations, based on openly available information, best practice and scientific evidence in order to achieve the best possible solution to meet the power demands of the province in the future. Hence, we take the opportunity not only to voice out our concerns on selected aspects of the proposed project, but also indicate possible alternatives and solutions.

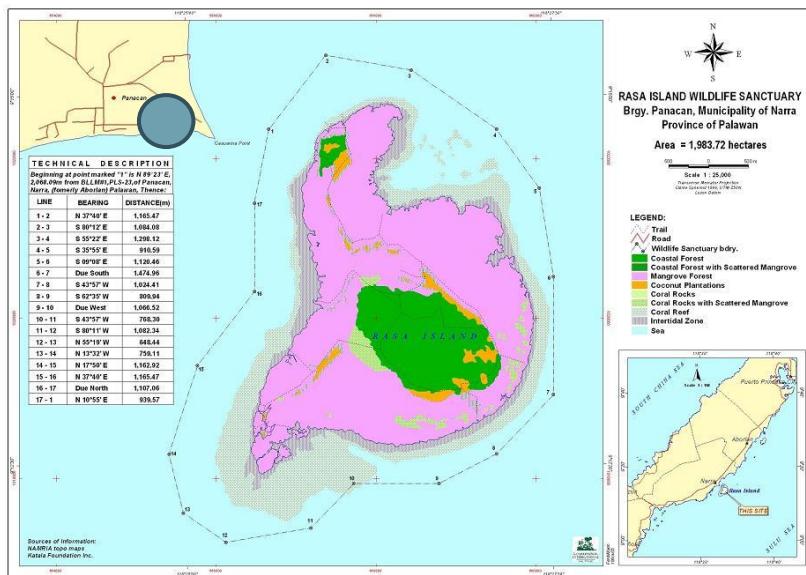


Figure 1. Location of proposed coal-fired power plant in Panacan, Narra (blue circle) in the immediate vicinity (ca. 1,000m) of Rasa Island Wildlife Sanctuary.

Sources of Information and Scope of Position Paper

Assessments and evaluation in this position paper is based on oral presentations of the proponent during public hearings (PowerPoint presentation). DMCI did not provide any written material during these occasions to support their proposal. Technical description of the proposed project could so far neither be secured from PCSD, DENR or the local government units of Narra.

The imparted information by DMCI seemed to be highly biased towards the interest of the proponent, and therefore does not allow for thorough outside review, which is crucial for an informed decision-making process by the public, involved agencies and other stakeholders, considering the size of the project and its potential impacts.

The presented information in this position paper is therefore additionally based on own reviews of reports on similar projects, or on aspects of operations of coal-fired power plants elsewhere, as well as peer-reviewed scientific findings (all cited in the reference section), and therefore accessible to everyone and verifiable.

KFI is working in Narra and particularly on Rasa since fourteen years. We therefore have expertise in issues related to biodiversity, including species and ecosystem in the area. Results presented in this context are mostly from original research conducted by KFI over many years, some of which published in peer-reviewed papers and cited as well.

Given the scarcity of information on the proposed project, KFI restricts itself to position itself in lieu of the following aspects for which it feels it has technical competence and/or on the ground experience in its more than decade of conservation work in the Province of Palawan:

- Health impacts on humans
- Livelihood impacts on local community in Panacan
- Impacts on biodiversity in Panacan (species and ecosystems)
- Mitigation of carbon emissions

Assessment

Impacts on Health

Coal and its combustion can lead to a wide array of illnesses due to physical (mechanical, thermal, radioactive) and chemical properties of the material. **Observed effects on human health include irritation of eyes, lungs, respiratory tract, changes in immune response, heart rate variability, asthma, cardiovascular diseases, in severe cases leading to heart failure, lung cancer and eventually death (EH&E, 2011).** Health risks arise during exposure due to coal dust during, mining and handling of the raw material (MAK, 2002a), during combustion when soot is emitted and from residues of the combustion process, particularly from boiler and fly ash.

It is envisioned by DMCI to utilize predominantly coal originating from Semirara, which is considered low-grade; this means that caloric value is low, and a high amount of ash is produced in exchange for a relatively modest yield in energy. Low-grade coal contains a wide range of chemicals which are released during the combustion process into the atmosphere or accumulate in the residues after combustion. DMCI proposes to utilize the three-decade old fluidized bed technology to reduce sulphur dioxide and nitrous oxides. Since generation and/or reduction of these gases is dependent on temperature, the effective elimination is only possible for the sulphur dioxide (at high operation temperatures), or for nitrous oxides (at low

operation temperatures, *but not for both types of gases at the same time!* Technical capturing is not yet economically possible for carbon dioxide, which is a potent greenhouse gas. The latter aspect will be discussed later in more detail, since it is highly relevant in respect to human-caused climate change.

Among the 84 pollutants identified emitted through operations of coal-fired power plants, particularly those toxic in small doses are of major concern for human health, like mercury, arsenic, beryllium, cadmium, lead or chromite (EH&E, 2011). **Although high percentages of fly ash can be retained through electric precipitators, considering the huge total quantities of coal incinerated will cause emissions of several hundred kilograms of fly ash per month into the atmosphere with elevated levels of toxic substances (see Box 1)**

Box 1

The contamination of environment and consequently the health effects on humans are affected by the absolute amount of pollutants emitted. If a high amount of coal is incinerated, a high amount of pollutants is set free in the environment:

- DMCI states that 99.9% of fly ash is contained through the capture system.
- The plant intends to burn 6,000t per month of Semirara coal (ca. 12% ash content).
- Fly ash generated in 1 month: 720,000 kg

Fine ash EMITTED INTO THE AIR (0,1%): 720 kg per month (equivalent in weight to almost 15 sacks of rice every single month).

Fly ash contains hazardous chemicals in high concentrations, like heavy metals, mercury, arsenic, complex and toxic organic chemicals like furans and dioxins.

Many of these chemicals accumulate in the food chain and their effects are getting worse over time, month for month.

during their PowerPoint presentation and may be revised as more precise data are provided by the proponent. Even if a theoretical efficiency of 99.9% of fly ash retention can be achieved during everyday operation, as stated by the proponent, still about 720 kilograms are emitted through the smoke stack into the environment.

The term “clean coal technology” therefore is a contradiction in itself. Coal remains the most polluting fossil fuel.

Fine dust

Fine particulate matter dispersed in the air, commonly termed “soot”, consists of a mix of chemical components, including silica, metal oxides, halogenic acids, and traces of highly toxic heavy metals and complex organic molecules (Davison et al., 1974; EH&E, 2011). Because of their microscopic size, these can be easily inhaled or ingested by humans or other organisms. **Highest concentrations of some of these chemicals (acids, some forms of mercury) can be found in the immediate surroundings of the smoke stack (EH&E, 2011).**

Prominent health problems are therefore related to the respiratory system, including asthma, bronchitis and potentially lung cancer. From there, toxins can be absorbed in the blood stream can affect other organ systems. Particulate matters or “soot” emitted from coal-fired power plants in the

US cause public health costs of 3.7 billion US\$ every year (EH&E, 2011). A recent study of

67 coal-fired power plants indicated that operation results in 33,000 years of premature death and loss of 700,000 working days annually due to coal-related sickness among the affected population (Preiss et al., 2013).

Bio-accumulation and -magnification of toxins

The highest long-term health risks pose those chemicals which are not only highly toxic in low concentrations, but are also long-lived and accumulate in the food chain, foremost mercury, but also complex organic molecules, like furans and dioxins.

The largest single man-made source for mercury contaminations are coal-fired power plants (EH&E, 2011). This aspect of pollution is particularly relevant for Palawan, where a high proportion of animal protein for human nutrition is derived from fish and other seafood. Mercury is long known to accumulate in food chains (Prabhu and Hamdy, 1977), particularly marine ones, and can cause severe health problems for humans consuming contaminated sea food. Concentrations of chemicals (bio-magnification, Fig. 2) which have the tendency to bio-accumulate are highest in filter feeders, like shellfish and larger fish at the end of the food chain (Kidd et al., 2011), like groupers ("lapu-lapu") or ("maya-maya"). The argument of DMCI that prevailing winds are not directed towards settled areas is therefore of little concern, since then the toxic emissions would affect fishing grounds or agricultural areas of Panacan.

Effects on mercury on the human body are many-fold and can include damage to the central nervous, immune, circulatory, digestive and excretory systems, causing among others autoimmune disorders, kidney, cardiac, and respiratory problems, arthritis, depression, dermatitis, dizziness, fatigue, gum disease, nausea, vomiting, hair loss, insomnia, headache, joint pain, memory loss, diarrhoea, muscle degeneration, speech impediment, blindness and paralysis (MAK, 2002b).

The best known example of mercury-related poisoning due to consumption of sea food took place in the Bay of Minamata, Japan in the 1950s, after which the disease caused by acute methyl mercury is named (Eto et al., 2010).

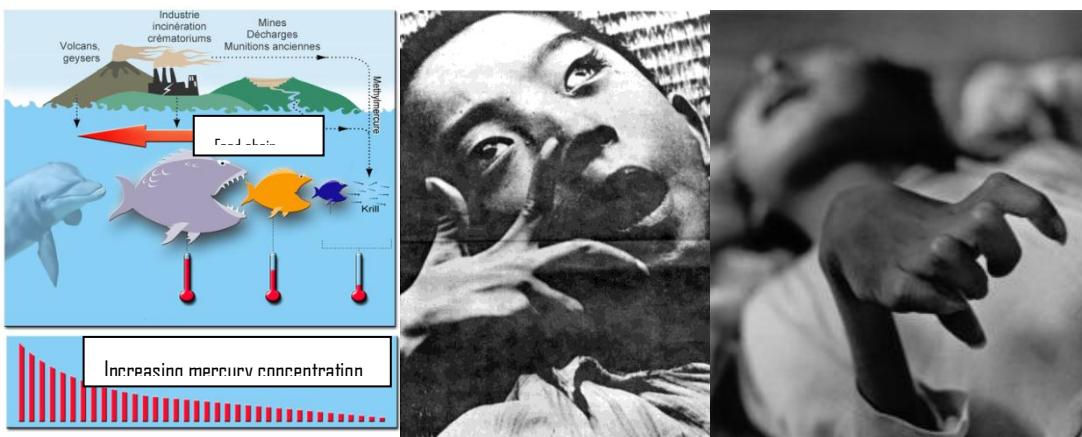


Figure 2. Bio-accumulation and -magnification of mercury in marine food chain; mercury is accumulated in tissues and magnified from one step of the food chain to the next; the higher up in the food chain an organism is situated, the higher the concentration of mercury in the tissue gets; dolphins, birds of prey and humans are on top of the marine food chains (left); mercury poisoning victim from Minamata, Japan (center and right; Source: Wikimedia Commons)

Radioactivity

"In fact, the fly ash emitted by a power plant—a by-product from burning coal for electricity—carries into the surrounding environment 100 times more radiation than a nuclear power plant producing the same amount of energy."

(Hvistendahl 2007)

Coal contains traces of radioactive elements, foremost thorium and uranium, which are concentrated during the burning process in the fly ash to up to ten times their original level (Hvistendahl, 2007). Radioactivity in lower exposures is associated with increased risks of cancer and congenital defects. Uranium from fly ash may leak into soil, freshwater tables and the marine environment and may be ingested by people via the food chain, particularly when living within the "stack shadow" (0.8 to 1.6 km radius surrounding the plant; Hvistendahl, 2007).

Problematic in this context is the prospect of using fly ash as filling material for the production of cement, as suggested by DMCI. Its use in residential buildings would lead to permanent exposure of inhabitants to increased levels of radioactivity.

The suitability of fly ash from Semirara coal for use in cement depends on levels of radioactivity found in the mined coal; should it turn out that it is unsuitable for the purpose, or demand by cement companies for fly ash produced by the Panacan plant is not sufficient, Panacan would be the storage site of huge amounts of fly ash accumulating month for month during the whole lifespan of the power plant. The long-term plans, particularly monitoring and maintenance of the fly ash ponds in Panacan to avoid leakage was not clarified by DMCI.

Additional mortalities due to cardiopulmonary disease and lung cancer caused by 88 coal-fired power plants co-financed through US development aid was estimated to range between 6,000 to 10,700 (Penney et al., 2009). Coal is deadly for some of us.

Impacts on Livelihoods

The community in Panacan, Narra, heavily depends on marine and agricultural resources for their subsistence and market economies. Both terrestrial and marine resources will be impacted negatively by the proposed project.



Figure 3. View from old trident pier, the proposed unloading site; Rasa Island in the background less than a kilometre away (left); sea bottom near existing pier; extensive dredging would be necessary to allow unloading of large coal barges (right).

The site for the establishment of the unloading pier, the former Trident pier, would either need extensive dredging, or substantial extension of the existing and dysfunctional pier rudiment.

Ocular inspection of the site by ELAC and KFI indicate that the sea bottom in the proposed pier site mainly consists of boulders, sand, silt and other unconsolidated sediments. **Both improvements to the pier would cause substantial disturbance of these sediments, resulting in smothering of coral reefs and seagrass beds, as well as man-made devices like fish pens or traps.**

The proposed docking site is an important anchorage ground for smaller fishing vessels, particularly during Amihan, a time when very few sheltered places in Panacan are available for fishing boats. Construction and operation of an unloading pier for coal barges would make safe anchoring grounds for small fishing boats scarce in the Panacan beach area and might lead to conflict among fisherfolks.

About 45-50% of energy produced in the coal-combustion process is lost due the need of cooling. Use of seawater by the power plant operators likely will have aggravating effects on coral bleaching in El Nino years through thermal pollution.

Emissions from the plant may have negative effects on growth of mangroves (see following paragraph). The majority of fisherfolks depends on coral- and mangrove associated marine life for their incomes. **Degradation of coral reefs and mangroves through thermal and chemical pollution will directly affect livelihoods of fisherfolks in Panacan by reducing catch and diminishing fish recruitment.**

Soot or fine dust emitted from smoke stacks settling down on agricultural crops can reduce rates of photosynthesis and therefore decrease yield and income for the farmer. Mercury and

other heavy metals bio-accumulate and -magnify in terrestrial ecosystems as well, however, since terrestrial food chains tend to be shorter than aquatic ones, concentrations of heavy metals in crops and livestock usually are less problematic than in seafood.

Rasa Island supports a moderate ecotourism influx mainly through birdwatching which benefits local hotels, restaurants and boat operators. **Rasa Island is promoted as one of the top-ten bird-watching destinations in the Philippines. Narra itself promotes rightly as the “Philippine Cockatoo Capital of the World”. Construction and operation of a power plant just beside Rasa Island would certainly negatively affect visitor numbers due expected impacts on biodiversity, particularly the Philippine Cockatoo.**

Impacts on Biodiversity

Philippine Cockatoo

The most prominent non-human species affected by the proposed power plant is undoubtedly the globally critically endangered Philippine Cockatoo (IUCN, 2013), for which Rasa Island and the adjacent mainland is the key habitat. “Critically Endangered” is the highest threat category in the red list of the International Union for Conservation of Nature (IUCN); the next highest category would be extinct. Critically endangered species have an extinction risk of 50% within the next five years or three generations (IUCN, 2013).

KFI started a conservation project in 1998 and recovered the population starting with only 23 to 25 individuals (Fig. 4), employing integrated conservation strategies (Widmann et al., 2001; Widmann et al., 2006). **In 2012 at least 240-260 individuals inhabit Rasa and the adjacent mainland which account for at least one quarter of the world population of this highly threatened species; remaining populations are mostly scattered and all significantly smaller. Rasa Island and Panacan mainland therefore is of global conservation importance for the survival of the species.**

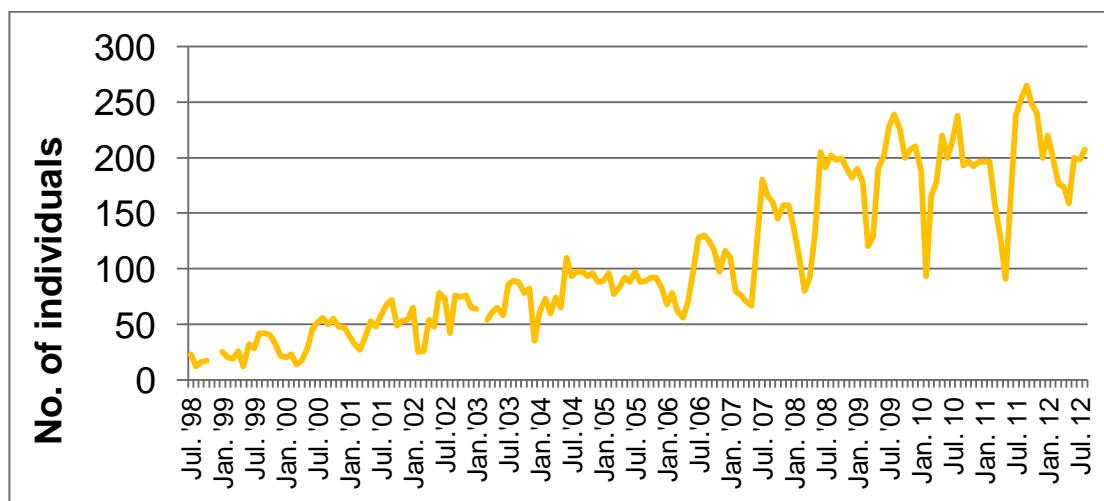


Figure 4. Highest simultaneous numbers of Philippines counted on traditional roost site on Rasa Island from 1998-2012.

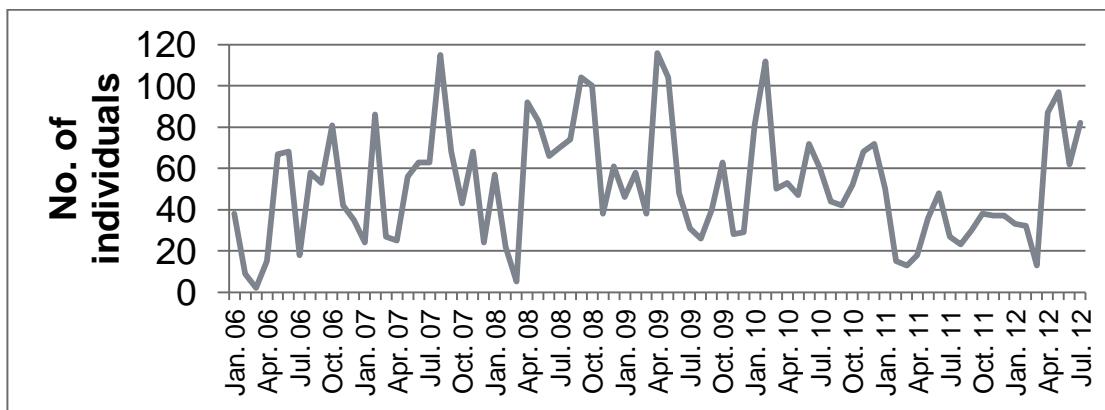


Figure 5. Highest simultaneous numbers of Philippine Cockatoos on mainland opposite of Rasa Island from 2006-12 demonstrating the importance of Panacan as foraging ground.

Panacan mainland is an important foraging ground for cockatoo flocks from Rasa (Fig. 5). Whereas birds leave the island in the morning via separate routes, the majority return following the coastline of Panacan. The construction and operation of the proposed power plant including feeding power lines, smoke stack, conveyor belts would seriously disrupt this movement pattern (Fig. 6).

Direct mortalities of larger birds are common in structures of power plants and along power lines (Bevanger, 1994; Martin, 2011) and would certainly occur for cockatoos as well. Disruption of the movement of birds returning to Rasa by the power plant infrastructure would lead to additional mortalities of hatchlings waiting for food brought to their nests. Birds instinctively take the most energy-efficient route back to the nest once they found food, and this would be obstructed by the power plant. This behaviour is hard-wired, and cannot be readily changed, even by intelligent birds like cockatoos, since it provides considerable natural selection advantages, because of its energy efficiency and direct benefits for survival of offspring. Cutting off this movement pattern would very likely reduce the carrying capacity of Rasa Island for the cockatoo, since foraging on the mainland would become too costly for the birds in terms of energy spent.

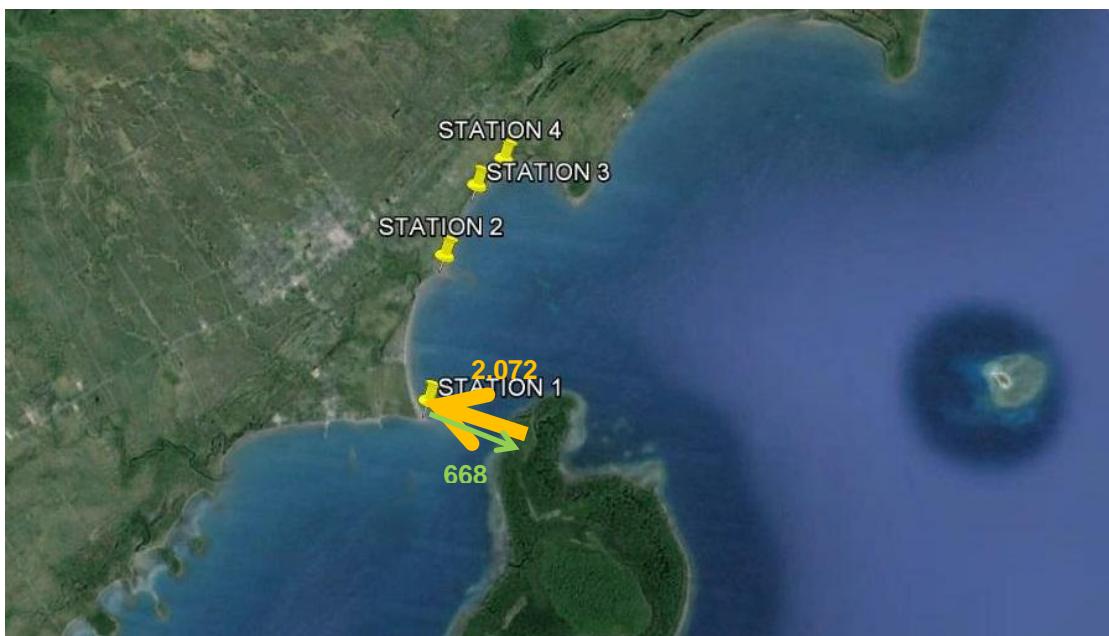


Figure 6. Foraging routes and numbers of Philippine Cockatoos from and to Rasa Island between January 1 and May 31 2012. Birds are using the shortest and most energy-efficient route, which would be blocked by the coal plant.

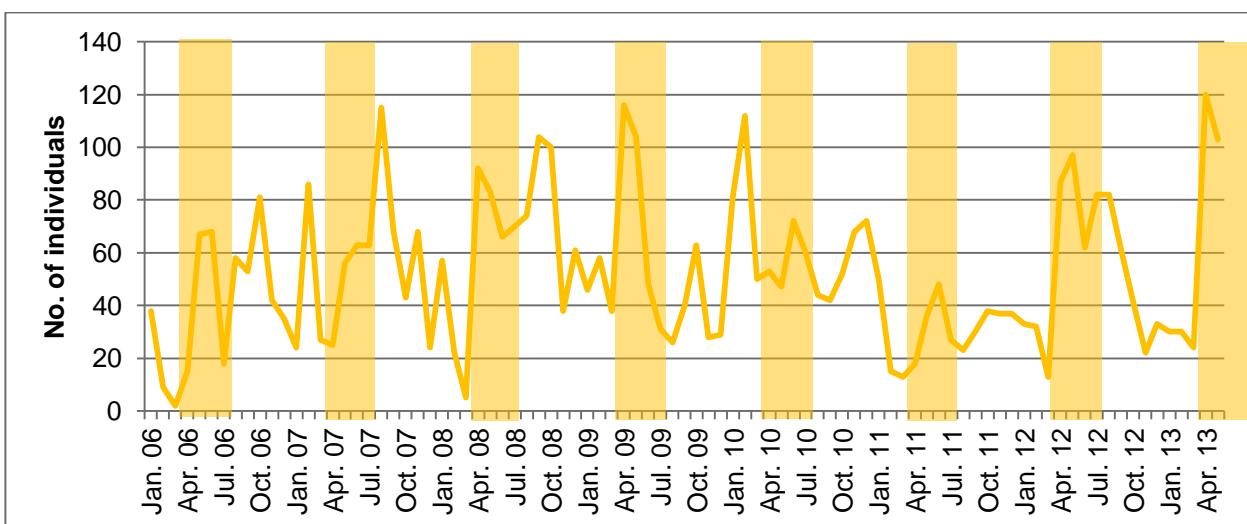


Figure 7. Maximum daily numbers by month of cockatoos foraging on mainland from January 2006 to July 2013. Most birds forage during the breeding season (orange bars) when nestlings require additional food from the adult parent birds.

The Philippine Cockatoo is a protected species under the Wildlife Act (RA 9147); killing one bird could be fined with up to 1 million Philippine Pesos. **Taking the price that members of congress thought a cockatoo is worth to the Filipino People as basis, the construction and operation of a power plant in the proposed site would entail cost tens of millions of pesos due to direct and indirect losses of the Philippine Cockatoo alone. The**

proposed power plant has the potential to advance as the single-most threat factor for the survival of the critically endangered species as a whole.

Rasa Island Wildlife Sanctuary

Rasa Island was declared as nationally protected area as a Wildlife Sanctuary under Presidential Proclamation 1000 in 2006. It is unique because it retains one of the last examples in the Philippines of a mostly intact coastal forest on a flat coral island, sheltered by a broad belt of mangrove, seagrass and coral reefs (Fig. 1). Consequently flora and fauna are unique, with a high proportion of locally, nationally and globally threatened species.

To date 109 bird species have been reported (Widmann and Widmann, 2008), at least nine mammals, including the globally vulnerable Dugong, eleven reptiles, including three species of globally threatened sea turtles, 137 coral fish species are recorded from the island as well (Widmann, 2002). The species lists can be found in the annex.

For many species threats would derive from exposition to pollutants. Mangroves have been recorded to react to coal sludge from Semirara with stunted growth (Burgos, 2009). Direct poisoning due to mercury or dioxin is a threat for animals at the end of the marine food chain; White-bellied Sea-eagle (Fig. 7) is most likely the most vulnerable species on Rasa, followed by a number of egrets, of which one, Chinese Egret, is globally threatened. Poisoning can be direct and cause mortalities in adults or indirect, affecting the reproductive success of the birds by increasing embryo mortality or decreasing eggshell strength (Newton et al., 1989; Newton and Galbraith, 1991).



Figure 7. White-bellied Sea-eagle (left) and Eastern Reef-Egret (right) are two species which would likely be directly affected by bio-magnification of mercury on Rasa.

Rasa Island hosts one of the largest camps of Large Flying Foxes in Palawan. The roost of this globally near-threatened species (IUCN, 2013) comprises at least 6,000 individuals. These large fruit bats are prone to electrocution by power lines, and construction of a feeder line in such close vicinity to their roost would almost certainly cause numerous fatalities.

The construction of a coal-fired power plant with a protected area of global significance within its “stack shadow” would cause unacceptable stress on the system through contamination with pollutants (many of which would bio-accumulate

over decades and possibly stay over centuries in the system), as well as due to direct and indirect losses of a high number of species which are threatened on provincial, national or global levels.

The management of Rasa Island continues to depend on foreign financial contributions; donors may be hesitant to continue their financial support, if local decision makers would value the protected area so little, as to allow a construction of a coal-fired power plant in its immediate vicinity.

Marine environment

The operation of a coal-fired plant requires the use of seawater for cooling purposes. According to information provided by the proponent, temperature of local surface seawater would increase by 3°C. **Effects of thermal contamination as cause for damages to coral reefs** is well documented (Riegl et al., 2009). During El Niño years bleaching events in coral reefs have been observed around Rasa. Bleaching is not a gradual process, but a catastrophic one once a certain temperature threshold has been passed. Thermal pollution from a coal-fired power plant in Panacan will act in addition to an already stressed ecosystem by effects of El Niño. It may well push the system over a critical temperature threshold, with potentially catastrophic bleaching effects for corals as consequence. However, information on volumes of seawater needed for cooling purposes was not provided by the proponent. Therefore it is difficult to assess the actual stress coral reefs will be exposed by the operation of the power plant.

Researchers from the University of the Philippines Visayas observed **stunted growth of mangroves which were exposed to sediments contaminated through coal-mining** in Semirara (the proposed source for the coal-fired plant in Panacan) (Burgos, 2009), **diminishing functions of this ecosystem in respect to coastal protection and wildlife habitat.**

Evaluation and Recommendations

The documentation provided by the proponent is deemed inadequate in to give merit to all relevant aspects of construction, operation and decommission of the proposed coal-fired power plant in Panacan. **Unless the proponent provides sufficient documentation** (including, but not limited to technical descriptions, actual lay-out plan, including buildings, feeder roads, conveyor belts, pier, power lines, ash ponds, operation and decommission plans, alternative sites assessments, mitigation plans for unavoidable carbon emissions) **KFI rejects the proposal on precautionary principles.**

DMCI is proposing one of the most polluting forms of generation of energy of any fossil fuels in one of the most unsuitable locations within the province of Palawan. **Therefore in the view of KFI, the following issues need urgent consideration, in order to limit and mitigate the damaging and unsustainable aspects of a revised project proposal;** KFI wants to point out that the following recommendations are not comprehensive, and others may be added:

- The proposed site in Panacan is unsuitable for the proposed purpose due to its vicinity to human settlements, fishing grounds and a protected area of global importance. The project single-handedly would push the already critically endangered Philippine Cockatoo further to the brink of extinction. Effects on human health as well as on the

Philippine cockatoo and other wildlife on Rasa in this site cannot be mitigated, therefore, alternative sites should be explored.

- Neither were carbon capturing technologies considered to be employed in the proposed plants by the proponent, nor were concrete measures proposed to mitigate the large amounts of carbon dioxide emitted during the lifespan of project. Effects of carbon dioxide as greenhouse gas enhancing human-made climate change are widely publicized, scientifically demonstrated and often termed as one of the biggest challenges humankind faces in this millennium (Byrne et al., 2012; Li, 2009; Montoya and Raffaelli, 2010; Peñuelas et al., 2012; Storm, 2009), so that a detailed discussion at this point is not necessary.

Calculation of carbon emissions are straightforward and already widely applied (Whitaker et al., 2012). These numbers then can be used to calculate areas necessary to be reforested by the proponent in order to sequester equal amounts of carbon to those released by burning coal. Areas for reforestation should be situated in areas of Palawan with low economic and ecological value. Native trees should be utilized for this purpose to create permanent forest systems to assure that carbon is stored for indefinite periods of time. Forest restoration techniques for this purpose are tested and available (Harris et al., 2006; Vieira and Scariot, 2006; Widmann and Widmann, 2011). Short-lived plantations with exotic species are not acceptable for this purpose, since carbon is eventually released back into the atmosphere due to their limited life span.

Impacts on the marine environment should be mitigated through restoration measures as well, particularly through coral reef restoration. Tested techniques are available as well (Shaish et al., 2010).

- A monitoring plan for performance should be presented including all relevant pollutants, particularly also those with tendency to bio-accumulate and -magnify, like mercury and dioxins in air, water, soil, organisms (particularly intended for consumption) and humans. This plan should include collection of baseline data before operations commence.
- A detailed plan on how to treat, store and dispose ash which accumulates during the operation of the plant should be presented by the proponent. This should particularly also include removal of ash storages after decommission of the plant, including responsibilities and cost estimates.

Considerations for long-term energy planning in the Province of Palawan

It has been estimated that including the “external” costs of energy generation (some of which are described above) through coal-fired power plants would double or triple the actual costs (Epstein et al., 2011). These include increased health costs, reduced livelihood opportunities, damage to ecosystem services, and are usually borne by the general public, particularly in the immediate vicinity of the plant.

These external costs in Palawan may be higher than elsewhere, due to still widely intact environments and related opportunity costs. It is therefore in the public interest that different energy scenarios for Palawan are explored, considering the full costs of all options. It may well turn out that under these inclusive scenarios alternative fuel sources, or measures for

energy saving (including modernization of the existing grid) may gain an competitive advantage.

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ANNEX 2:

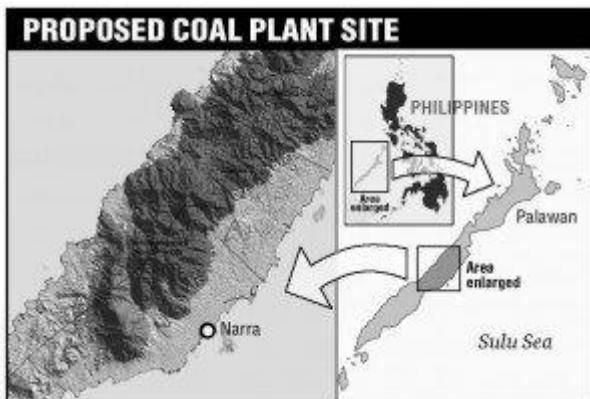
Coal-fired power plants stir debate in Palawan

By [Redempto D. Anda](#)
[Philippine Daily Inquirer](#)

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A plan to set up two coal fired power plants to meet the growing demand for electricity on the main island of Palawan has stirred fresh debate among environmentalists and other sectors in the province.

When industrial giant DMCI Holdings, through its subsidiary DMCI Power Inc., won the bidding for a 15-year, 45-megawatt supply contract with the Palawan Electric Cooperative (Paleco) in July, local and international environmental groups immediately began mapping out campaign plans to block the project.

"Coal is the dirtiest fuel around. There is no place for it in Palawan," the Environmental Legal Assistance Center (ELAC) said in a formal opposition it filed against the project now in the preliminary stage of permitting.

Palawan is considered the country's bastion for environmentalism. It is the only place in the country that has its own special law, the Strategic Environmental Plan (SEP) for Palawan Act, which was passed by Congress and designed to preserve its biological diversity and ecological uniqueness.

The plants' proposed location—right across the protected area of Rasa Island in the town of Narra, 91 kilometers south of Puerto Princesa City—has alarmed environmentalists. Rasa has long been identified as one of the few remaining habitats of the endangered and endemic Palawan cockatoo, a bird species highly sought in the illegal pet trade.

In a larger context, environmental groups such as Greenpeace International are waging a battle against coal plants. The Philippines has around 10 such plants, mostly located in Mindanao, and Greenpeace has aimed its campaign at convincing the government to shut down all or most of the plants and replace them with facilities that tap renewable energy.

A rock, hard place

A fast rise in demand for electricity, triggered by a booming tourism trade, has pushed Paleco to set a one-year deadline to outsource around 25 MW of additional power, lest the province is plunged into a debilitating power crisis and reverse an unprecedented tourism-led growth.

The city government had already recognized that the situation was at hand. In July, it passed an ordinance placing the city in a state of power emergency and asking National Power Corp. to step in and provide a bridging power supply until a new provider was contracted and able to set up more generators.

In the first instance when Paleco announced an open bidding for a 15-year supply contract, at least 10 independent power producers expressed interest to bid. All but three ended up placing actual bids after most realized that the playing field was not conducive to competition as it allowed for coal-based technologies to compete with the more expensive bunker or diesel-based providers.

"There's no way we can compete with coal, price-wise, so we decided not to bid," said Lito Abrogar, president of Palawan Power Generators Inc., which supplies the base load for the mainland grid using bunker-fed generators.

DMCI won largely because it offered the lowest bid of P9.38 per kilowatt-hour against a ballpark P13/kWh submitted by diesel-based power providers.

The power supply agreement between Paleco and DMCI was signed on July 23. All that DMCI needed was to secure a special permit called the SEP clearance from the Palawan Council for Sustainable Development (PCSD), the environmental compliance certificate from the Department of Environment and Natural Resources, and endorsement from at least two local government units.

In the first public hearing conducted by the PCSD on Sept. 8, environmental groups led by the Katala Foundation (which undertakes conservation projects on Rasa), ELAC and the Palawan NGO Network Inc. registered their formal opposition.

"It is not that we don't want additional power. We recognize the need for that. But we oppose the establishment of a coal plant," lawyer Grizelda Mayo-Anda, Elac executive director, told the PCSD.

Even Gov. Abraham Kahlil Mitra indicated that he would not allow the coal plant project. "Palawan is known for environmental protection and coal plants would not fit into provincial development plans," he said in a text message to the Inquirer.

DMCI has shrugged off the opposition, stating that it is merely exercising its contractual obligation to put up the plant as specified in its bid and approved by Paleco. "If we are not issued a permit, there are other options available," said DMCI President Nestor Dadivas, without going into details.

The reality was that renewable energy alternatives, such as hydro or biomass power, did not present themselves as readily available during the bidding period.

Langogan Power Corp., the sole renewable energy company that had initially participated in the prebidding conference, backed out during the bidding, saying the terms of reference of the project discouraged them from participating.

Rohima Sara, general manager of Paleco, said Langogan Power could only provide 6 MW "and it's not even reliable power because it relies on unpredictable run of river."

"Renewables are possible under the timeline prescribed in the bid. Whether coal is dirty or not, your choice is clear—power or no power," Dadivas said.

Alternatives

Sara pointed out that the cooperative was pushing for policies that would have renewable energy sources providing them the main source of electricity.

"We are awaiting the circular to be issued by the Department of Energy so that a renewable energy supplier will take over our existing power supply agreements," she said.

She added that the cooperative would eventually accept tenders to supply most of northern Palawan, including the municipalities of Taytay, San Vicente and El Nido, which were not yet connected to the mainland electricity grid.

Environmental groups offered a "talking point" with DMCI—stick to diesel plants and forego its main plan to construct the coal facility in Narra, while helping them develop a renewable energy power facility.

The sticky point in the debate revolved around the planned coal plant's carbon emission, this being the main source of greenhouse gases that impacts on climate change.

"Carbon dioxide is the one emission that you can't control in a coal plant. And this is important because Palawan is the environmental center of the country," Bart Duff of the Palawan Chamber of Commerce said.

Environmentalists also scored DMCI for failing to present during the public hearings actual estimates of environmental damage that the plant would cause, including the disposal of ash that would accumulate during the plant's operation. The amount of ash was estimated by DMCI officials to run as high as 600 tons a month.

They said they would bury accumulated ash in “silos” even as the Katala Foundation complained that there was not even a concrete plan where the waste material would be disposed.

DMCI insisted, however, that the proposed plant, to be built applying the latest “circulating fluidized bed” technology, had complied with the emissions cap prescribed in the country’s Clean Air Act.