BAKO BUNTAL BAY

East Asian-Australasian Flyway
Network Site

DOSSIER

Concepts for Sustainable Use

Sarawak Forestry
January 2017

Message from the Controller of Wildlife

Sarawak is located less than a degree north of the equator and has an equatorial climate throughout the year. With a coastline of about 1,035km long, its coastal habitat consists of sandy beaches, tidal flats and rocky shores. Migratory birds are birds which fly from the northern hemisphere to our part of the world during the winter period and return again to breed in summer. These birds depend on tidal flats as their feeding areas.

In Sarawak, conservation of migratory birds began way back in 1985/6 where surveys were conducted by Interwader (now Wetlands International after merging with several entities) in conjunction with NPWO, Forest Department Sarawak. Surveys were mainly aerial and land where boats were used to approach areas where the birds were found in large numbers and surveys were concentrated on the west coast of Sarawak with Pulau Patok-Bruit as a major wintering site.

Since then sporadic surveys on the site has been carried out and numbers were found to be dwindling. Twenty years later in 2006, another extensive survey was carried out by SFC and JOCV volunteers along the Sarawak coastline. This time the survey or better known as AWC concentrated on the southern coastline and most of the surveys were on land where large concentrations of birds were recorded on the western coast of Sarawak with the highest at Bako Buntal Bay, Kota Samarahan and Kuala Paloh. However numbers of shorebirds recorded at Pulau Patok-Bruit showed a drastic decline even though numbers of egrets and terns remain the same as previous surveys in the 80s.

Bako Buntal Bay remained quite significant a part of Sarawak coastline due to large numbers of migratory birds recorded and also species which were globally threatened. Overall there was an increase of 16.52% in 2006 from 3.78% in total number of birds (waders including egrets and terns) as recorded in the 1985 survey; comparisons were made between the different sectors of coastline surveyed. Such species include the Chinese egret which comprises over 80% of egrets recorded and is categorized as 'vulnerable'. A small number of Nordmann's greenshank was also recorded which is considered 'endangered' and Far Eastern curlew which is 'near threatened.' Several interesting observations were made in the AWC in 2009, where sightings were made of a pied avocet, an oystercatcher, and a skua (seabird of temperate seas) which were also first records for Borneo.

As a result, efforts were made to further enhance awareness on the importance of BBB as a major wintering site, thus the partnership to EAAFP. In securing the site as a Flyway Site, the initiative also enhanced Malaysia partnership to the EAAFP.

It is an honour for me to congratulate the team of Sarawak Forestry and the consultant as well as major stakeholders from agencies such as State Planning Unit, MRPE, DBKU and MNS involved in putting up this dossier.

HAJI SAPUAN AHMAD
Controller of Wildlife,
Forest Department, Sarawak

Message from the Chief Executive Officer

We are privileged to live in a State which hosts a plethora of biodiversity including migratory birds from the order Charadriiformes which breeds in the northern hemisphere and flies thousands of kilometres southwards during the winter and in the process, stop at "refueling stations" where they feed and replenish energy supplies before they continue their journey back to their breeding grounds.

Bako Buntal Bay (BBB) as covered by this document is one of the areas where this group of birds has been recorded in numbers and BBB fulfills the criteria of being a Flyway site on the East Asian-Australasian Flyway Partnership. The Bay is also listed as one of the Important Bird Areas (IBAs) in Malaysia, globally significant as an important site for waterbirds.

The Bako Buntal Bay spans an area of 2,800 hectares starting from the tip of the Santubong Peninsula and ends at Batang Sadong in the second division, and is owned or looked after by various stakeholders for various uses from national parks, private land, companies, local authorities, factories, agricultural activities, local communities, state lands, mangrove reserves, tidal flats and water bodies.

The Sarawak State Government has been exploring options to develop a Site Management Plan for the Bako Buntal Bay East Asian-Australasian Flyway Network Site which is located close to Kuching, with the primary aim to strategically merge the management needs of a globally significant wetland with the development needs of the State Capital of Sarawak.

This document is required to address various development and conservation needs or efforts that might affect the habitat and population of migratory birds ensuring that the site continues to serve as staging and wintering sites for these birds.

WONG TING CHUNG
Chief Executive Officer

Foreword by DGM, PABC

The document dossier is written here with the purpose of conserving migratory waterbirds and their habitat with participation of local stakeholders. It is not a conventional conservation plan but takes into consideration sustainable use of the area and habitat conservation as well as concepts for developing sustainable use activities, projects or programmes. The main thrust of the document is conservation and tourism along the bay.

The Dossier outlines conceptual needs to be considered and is included in a well-designed, internationally credible and locally relevant Sustainable Use Concept document for the site in context with its proximity with the State Capital, two national parks and the current and future multiple use of coastal resources.

The Dossier describes the need for this project and how the project will deliver an innovative approach for the wise use of a wetland to benefit both conservation and economic growth. The document will provide evidence base for the State Government to assess, seek and secure funds for its implementation.

This document is a desk-based conceptualization of opportunities for developing and managing the Bako Buntal Bay Flyway Network Site to support:

- Conservation and wise use of globally important waterbird populations (resident and migratory)
- Recreational needs of tourism along the coast north of Kuching City for visitors and residents
- Needs of and opportunities for the local residents of the larger area (Kg Buntal, Kg Bako, Kg Moyan, Asajaya)
- Future expansion of existing tourism product which is the Damai/Santubong peninsula
- Long term maintenance of biodiversity values and ecosystem services of the two national parks (Santubong National Park and Bako National Park)

This dossier was prepared by Rebecca D'Cruz, with initial discussions with a team of stakeholders from State Planning Unit, Ministry of Resource Planning & Environment, Dewan Bandaraya Kuching Utara and Malaysian Nature Society and a number of Sarawak Forestry staff.

OSWALD BRAKEN TISEN
Deputy General Manager

Table of Contents

LIST OF MAPS

LIST OF TABLES

INTRODUCTION TO THE PROJECT

The area identified as Bako Buntal Bay was designated as an Important Bird Area (IBA) in 2007. It is listed as MY37 in the *Directory of Important Bird Areas in Malaysia, Key Sites for Conservation*.

In 2013, the Sarawak State government nominated Bako Buntal Bay as an East Asian-Australasian Flyway Network Site (EAA Flyway Network Site) under the East Asian-Australasian Flyway Partnership (EAAFP). The site was listed on 23 August 2013 and is the first EAA Flyway Network Site in Sarawak. (Note: In the rest of this document, the Site is referred to as the "BBB EAA Flyway Network Site").

The IBA site covers an area of 3,590ha, and includes the two gazetted protected areas of Santubong and Bako National Parks, and areas of mangrove forests along the coast.

The BBB EAA Flyway Network Site covers an area of 2,800ha, and excludes the two National Parks and parts of the remaining brackish forest reserves (since degazetted for development); the area of open sea has been increased. The management of the BBB EAA Flyway Network Site is under the authority of the Sarawak Forestry Corporation Sdn. Bhd. (SFCSB).

This study was commissioned by SFCSB as part of its initiative to establish an effective working protocol for the development of a Master Plan for the Sustainable Use of Sarawak's first EAA Flyway Network Site. This dossier (*Concepts for Sustainable Use*) is intended to inform and advice decision-making related to developing a management plan for this site, and to enable the allocation of appropriate resources to manage the site.

The overall aim of this study is to develop a sustainable-use (refer text box) concept for the BBB EAA Flyway Network Site. The rationale for developing this concept is that the site lies within a high-use zone, close to the Sarawak State Capital, Kuching. The site envelopes a significant portion of the coastal environment bordering a major city, it has a high tourism industry presence, two national parks, and significant fisheries and agriculture industries. The conditions under which such a network site is managed are therefore an integral part of the equation.

> Sustainable use means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. Convention on Biological Diversity (CBD) 1992 1 Article 2.

SCOPE OF WORK

This desk-based study aims to conceptualise the opportunities for developing and managing the BBB EAA Flyway Network Site to support:

- the conservation and wise use of the globally-important waterbird populations (resident and migratory);
- the recreational needs of tourism along the coast north of Kuching city for visitors and residents;
- the needs of (and opportunities for) residents in the larger area (Kpg. Buntal, Kpg. Bako, Kpg. Moyan, and Asajaya);
- the future expansion of the existing tourism product centre (Damai/Santubong peninsula); and
- the long-term maintenance of the biodiversity values and ecosystem services of the two national parks (Santubong NP and Bako NP).

THE PREPARATION OF THE REPORT

This Dossier was prepared by aonyx Consultancy, under a contractual arrangement with the Sarawak Forestry Corporation. The work was conducted between August and December 2016. This report was prepared by Rebecca D'Cruz, Director, aonyx Consultancy.

PRESENTATION OF THIS SUSTAINABLE-USE CONCEPT

This sustainable-use concept is presented in the form of a Dossier. The Dossier contains 5 stand-alone documents. The first two are background documents, summarising the current information available on the EAAF Network Site and the waterbirds that utilise the site. The other three each present a concept for developing sustainable use activities, projects or programmes centred around a defined theme or objective.

Below is a checklist of the 5 stand-alone documents contained in this Dossier:

1	BACKGROUND 1:	Ecological Character of the BBB EAA Flyway Network Site
2	BACKGROUND 2:	Waterbirds of the BBB EAA Flyway Network Site
3	CONSERVATION:	Managing the BBB EAA Flyway Network Site for Wintering Waterbirds
4	TOURISM:	Managing the BBB EAA Flyway Network Site for Wildlife Watching
5	SUSTAINABLE USE:	A Branding Concept for the BBB EAA Flyway Network Site

1

BAKO BUNTAL BAY

East Asian-Australasian
Flyway Network Site

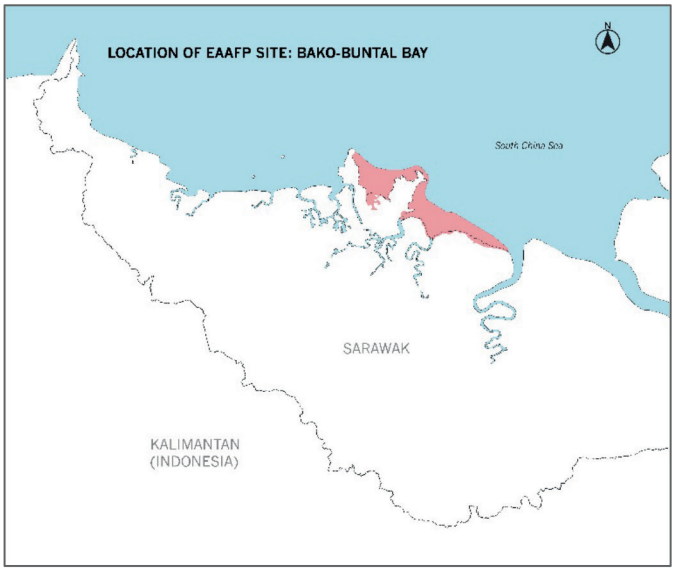
BACKGROUND

Ecological Character of Bako Buntal Bay

PHYSICAL DESCRIPTION OF THE SITE

The site extends 51.31km from its northernmost point, Tanjung Buluh (N1° 42' 47.66", E110° 28' 44.94") to the easternmost point, Tanjung Setok (N1° 33' 31.78", E110° 37' 09.85"). Refer Map 1.

Its western boundary is formed by the eastern shoreline of the Santubong peninsula, continuing southwards through the village of Kampung Buntal and onwards along the true right bank of the Buntal river. It turns away from the main river along the first tributary, following the course of this small waterway as it circles an area of remaining forests, returning to the coastline. This forest patch is a remnant of the Sarawak Mangrove Forest Reserve (Hutan Rizab Bakau Sarawak).



Map 1 Location of the BBB EAA Flyway Network Site

The boundary then heads east towards the mouth of the Bako river. From this point, the site's boundary follows the entire coastline of the Bako peninsula (which is also Bako National Park), to the mouth of the Sarawak river.

The boundary heads upstream of the Sarawak river till just after Goebilt village, then follows the true right bank of the river back to the sea. From the estuary of the Sarawak river, the site's boundary heads eastwards following the alignment of the land reclamation bund all the way to the mouth of the Sadong river, a distance of about 28km in a straight line. Along this landward boundary, the boundary crosses the Samarahan river estuary. The eastern end of the boundary is at Tanjung Setok, which is the true left point of the mouth of the Sadong river.

The boundary then heads northwest (heading N303°) back to Tanjung Buluh on the eastern tip of the Santubong peninsula. The detailed dimensions of the boundaries are: From Batu Pisang (Tj. Selabat) 3.5km out to sea heading N90 (due east); From the estuary of Sg. Moyan, heading 4km due north; From Tj. Gemuruh, mouth of Sg. Semera, 3.5km due north; From the mouth of Sg. Buntal, 9km due north; From Tj. Rhu (Bako NP) due north 1.5km.

The BBB EAA Flyway Network Site covers an area of 2,800ha, and is divided into two portions: the western sector and the eastern sector.

The western sector is the large bay (called Bako Buntal Bay), bordered to the west by the Santubong peninsula, and to the east by Bako National Park. The eastern sector is the coastal environments (rocky coastline, mangrove forests, tidal flats and open sea) stretching from the western shore of Bako National Park to the mouth of the Sadong river.

ECOLOGY

This site represents the last significant area of strongly tidal-influenced coastal habitats along the northern coast of Borneo. Westwards from the twin sandstone promontories of the Santubong and Bako peninsulas the coastline is predominantly sandy and rocky.

The three major rivers that flow northwards into the sea here are the Sarawak, Samarahan and Sadong rivers. There are seven smaller rivers outflowing into the sea, the major ones being the Buntal, Bako, Moyan and Semera rivers.

All these rivers bring a large amount of silt, and form a long coastline of tidal mudflats. To the west, sandflats dominate.

The site is subject to the northeast monsoon winds from October to March annually. This distinct “rainy” season is characterised by strong winds, strong wave action, heavy rainfall and high tides. This causes dramatic changes to the shape and distribution of the sand and mud deposits. This dynamic environment makes navigation at any time of the year dangerous, and access to rivers sometimes impossible.

The beach formations also change from year to year, with large shifts in the sandbank locations each year. The annual damage to mangrove stands is unpredictable. The mangrove fringe along this entire coastline is a mixture of accreting and eroding forests, most apparent along the base of the Bako Buntal Bay (western site) and the coastal stretch of the eastern site.

Behind the mangrove fringe is a long bund, which was formed by excavating a large canal and dumping the substrate on the seaward edge of the canal. This 5m-high bund was built during the 1970s and 1980s as part of an integrated agricultural and land consolidation scheme, which aimed to reclaim land for agriculture. The land behind the bund was secured from the effects of saltwater, and subsequently, developed for agriculture. Rice was the original crop planted, but this was subsequently switched to coconut. Coconut is still the major agricultural practice in the area.

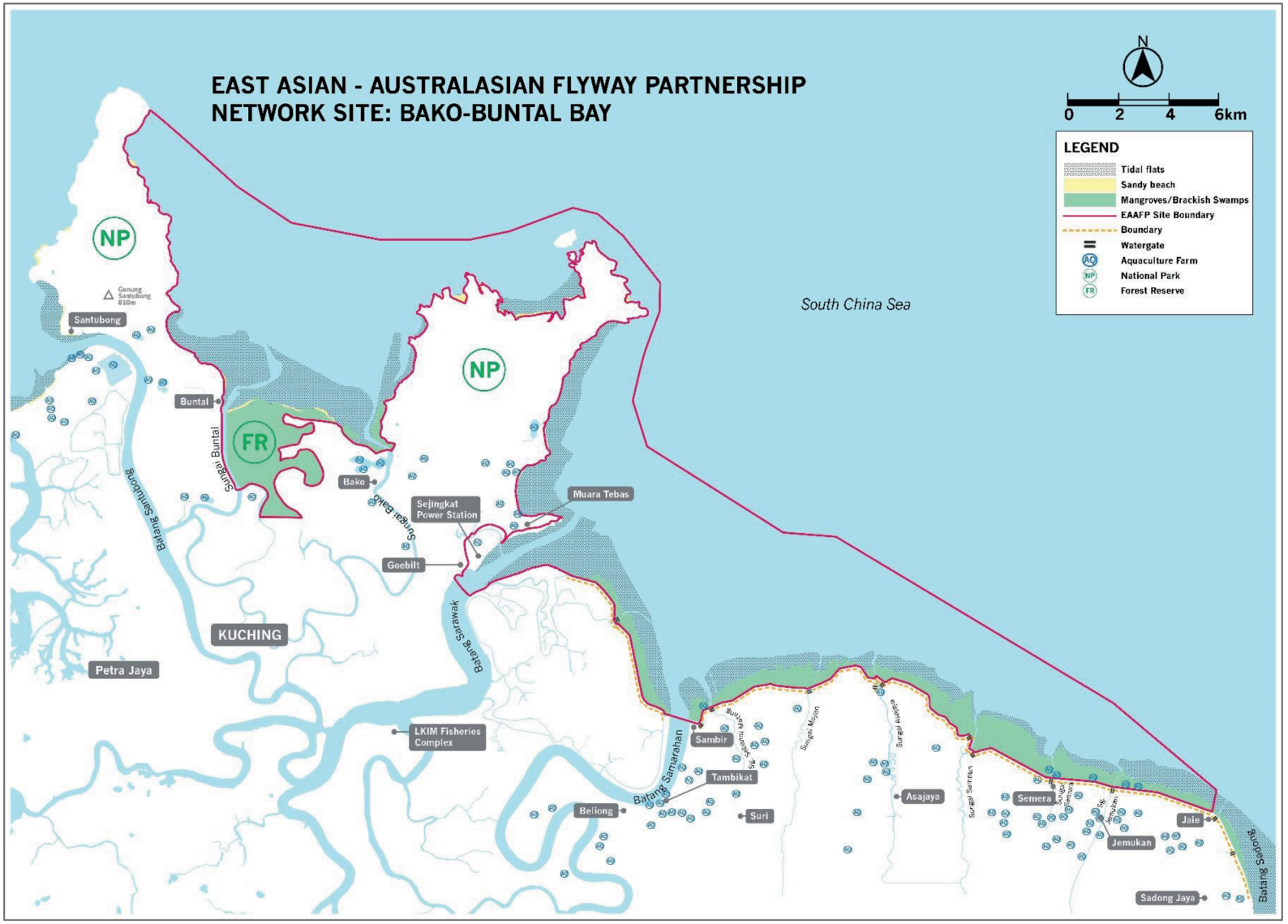
HABITATS

Table 1: HABITATS IN THE BBB EAA FLYWAY NETWORK SITE

HABITAT	DESCRIPTION
Sandy Beaches	▪ Accumulation of silicates at the water's edge, subjected to wave action. All the sandy beaches within the site are narrow, not exceeding 20-30m in width. Most are backed by forests, comprising mostly coastal beach forest. ▪ Brackish forests are present in some places. ▪ A major habitat type within the site, along the boundaries of the two National Parks. Rare elsewhere.
Rocky coastlines	▪ Accumulation of sandstone boulders, almost always in association with sandy beaches. ▪ Several rocky outcrops are present, either as islands or as promontories extending out from the beaches. Several of these have been connected to the land by the accumulation of sand and mud deposits over time, and colonised by mangroves.
Mangroves	▪ All remaining mangrove forests within the site are in strips on the seaward side of the irrigation bund. Strips vary in width from 100m to 500m. ▪ Most mangroves are accreting forests, comprised primarily of seaward (high salinity) mangrove zone. *Sonneratia* spp. and *Avicennia* spp. dominate. ▪ Areas of more diverse and mature mangrove forests occur along the coastline of Bako National Park.
Brackish Swamp forests	▪ Mixed brackish swamp forest comprising mangrove trees, *Heritiera* sp. and *Nipa/Oncosperma* stands. ▪ Mainly located in one area, along the left bank of the Sg. Buntal. This is part of the former Sarawak Mangrove Forest Reserve. ▪ Small patches also found at the estuary of Batang Sarawak (opposite Muara Tebas).
Sandflats / Mudflats	▪ The intertidal zone is influenced by wave action and comprises a mixture of sandflats and mudflats. Often mud accumulates as a shallow layer over sand. ▪ The western sector is predominantly sandflats. The eastern sector has deeper mud accumulation. ▪ The pattern of sandbanks changes annually following the northeast monsoon.
Shallow coastal waters	▪ The sediment deposition along this coast is extensive, and reaches several kilometres out to sea. The resulting sea is very shallow, but still too deep to be used by shorebirds. ▪ These shallow waters cause very large and strong waves during periods of high winds, most strongly felt during the monsoon season (October to March).
Small rivers	▪ The site has several small rivers flowing into it from the south. Most of these have been bunded, with a narrow riparian strip maintained. ▪ Many of these rivers have settlements further upstream, some 2km from the sea-bund.
Large rivers	▪ Two large rivers flow into the site: Batang Sarawak and Batang Samarahan. Both these rivers exceed 1km at their mouths, and carry significant sediment loads into the site.

Map 2 below depicts coarse scale distribution of habitats, aquaculture ponds, canals and bunds in and around the BBB EAA Flyway Network Site.

Map 2 Overview of the Bako Buntal Bay East Asian-Australasian Flyway Network Site



WILDLIFE

No systematic documentation of the wildlife in the BBB EAA Flyway Network Site and the surrounding areas has been conducted to date. Migratory birds have been the primary focus of the site, and most of the information available is on the waterbird fauna. The site undoubtedly does support other wildlife; other species known to occur (from incidental sightings) are described below.

Mammals

Three species of civets (Family Viverridae) are known to occur: Masked Palm Civet *Paguma larvata*, Small-toothed Palm Civet *Arctogalidia trivirgata* and Common Palm Civet *Paradoxurus hermaphroditus*. All these occur in the mangrove forest, and are occasionally seen in the coconut plantations and secondary scrub vegetation. The Slow Loris *Nycticebus coucang* also occurs within the mangroves. The Bearded Pig *Sus barbatus* is present within the mangrove and dryland forest. Lesser Mousedeer *Tragulus javanica* has been recorded upstream of Sg. Buntal. The Flying Lemur *Cyanocephalus variegatus* is widespread in the forests around the Bay, and is commonly seen in the coconut plantations.

Three species of primates use the Bako Buntal Bay area: Long-tailed Macaque *Macaca fascicularis*, Silvered Leaf Monkey *Trachypithecus cristatus* and Proboscis Monkey *Nasalis larvatus*. The main population base for Proboscis Monkey is Bako National Park, but the population regularly spreads out from the park into the Buntal and Santubong areas.

Two species of otters occur in the area: Smooth Otter *Lutra perspicillata* and the Oriental Small-clawed Otter *Aonyx cinerea*. Both species regularly visit the aquaculture ponds, and are considered a threat to fish stocks. Fences are sometimes erected to keep them away, but dogs are the most common means of deterring otters from raiding the ponds.

Three species of dolphins are regularly recorded within the Bako Buntal Bay: the Irrawaddy Dolphin *Orcaella brevirostris*, the Finless Porpoise *Neophoecaena phocaenoides* and the Indo-Pacific Hump-backed Dolphin *Sousa chinensis*. The Irrawaddy Dolphin is the most prominent species, and the population in the site is the most important breeding population in Malaysia. A small number of sightings of the Irrawaddy dolphins in the Kuching area have been made as far as 8 kilometres (km) upriver. The Indo-Pacific Hump-backed Dolphin population in the Sarawak waters is a distinct sub-species, recognized by its almost white or pinkish colour. This coastal dolphin occasionally enters the larger rivers.

The *Sarawak Dolphin Project Report* notes that fishing gears such as jellyfish hooks, trammel nets, bag nets, stake nets and push nets are regularly used in the areas within the BBB EAAF Flyway Network Site. Gillnets were mostly seen in Santubong River estuary, Buntal River, Sibu Laut river and along the coast of Santubong and Bako Buntal Bay. Their analysis shows that unattended gillnets are always within 2km radius of a dolphin group and this suggests that the dolphins face a high risk of entanglement.

Reptiles

The Malayan Box Turtle *Cuora amboinensis* is the most common turtle in the Bako Buntal Bay area. There are no records of river turtles to date, but their presence cannot be discounted. Sea turtles do not nest in the Bako Buntal Bay, as there are no suitable nesting beaches within the bay. The Mangrove Cat Snake *Boiga dendrophila* and Dog-faced Water Snake *Cerberus rynchops* both occur in the mangroves and on the mudflats. The Mangrove Pit Viper *Trimeresurus purpureomaculatus* and Wagler's Pit Viper *Tropidolaemus waglerii* have both been recorded from Bako National Park. Although no records of pythons have been obtained, the Reticulated Python *Python reticulatus* almost definitely occurs, based on observations from the surrounding areas.

The Mangrove Skink *Emoia atrocostata*, Common Sun Skink *Mabuya multifasciata*, Flying Lizard *Draco volans* and Crested Tree Lizard *Calotes versicolor* are common lizards in the bay, as is the Water Monitor *Varanus salvator*. The King Cobra *Ophiophagus hannah* has been recorded.

The Estuarine (Saltwater) Crocodile *Crocodylus porosus* occurs within the site. A healthy population is present, with large individuals regularly seen.

Birds

Raptors, both resident and migratory species, are well represented in the Bako Buntal Bay. Seven migratory raptors have been recorded: Oriental Honey Buzzard *Pernis ptilorhynchus*, Grey-faced Buzzard *Butastur indicus*, Japanese Sparrowhawk *Accipiter gularis*, Chinese Sparrowhawk *Accipiter soloensis*, Peregrine Falcon *Falco peregrinus*, Black Kite *Milvus migrans*, and the Osprey *Pandion haliaetus*.

The Oriental Pied Hornbill *Anthracoceros albirostris* also occurs here.

SOCIO-ECONOMICS & RESOURCE USE

FISHERIES

Fisheries is the biggest economic industry within the BBB EAA Flyway Network Site. This industry encompasses commercial fishing, seafood produce, *ambal* collection, aquaculture and sport fishing, and is briefly described below.

Commercial Fishing

Many fishermen live in the villages just outside the bund which forms the boundary of the site. Fishing takes place out at sea, largely outside the boundaries of the BBB EAA Flyway Network Site. However, a significant portion of this commercial fishery occurs inshore. Local villagers fish throughout the year but yield is highest outside the monsoon period which lasts from October to March each year. Fishing is their primary source of income.

Most of the catch is sold to businesses that, in turn, sell it to markets and restaurants, mainly in Kuching. The catch is generally off-loaded at private or illegal jetties, which often are also the place where catch is sold.

Local fishing companies have their own fleet of fishing vessels and purchase catch from the local villagers. The catch is packed on-site, then transported by vehicle to Kuching.

There are anecdotal reports about foreign fishermen operating in the area. However, there is no information available on who these people are, or how they operate. The local residents are unhappy about this situation, and claim that their “authorised” areas for fishing are being encroached upon.

A new fisheries complex is being constructed along the Batang Sarawak, opposite the Sejingkat village (Refer Map 2). Due to be completed in 2017, this will be the largest fish-landing facility in Sarawak. It is being developed by the Fisheries Development Authority of Malaysia (LKIM), under the Ministry of Agriculture and Agro-based Industries. This LKIM complex is expected to serve as a hub for local fishermen to berth and land their catch. It will also govern regulations, restrictions and the distribution of fishing.

Fish Produce

The main fish-derived products from the area are salted fish and dried anchovies (Ikan bilis, or ikan pusu, in the local language). There is no published information on the extent of these industries in the areas adjacent to the BBB EAA Flyway Network Site.

The Fishermen Association of Buntal (PNK Buntal) has over 1,400 members comprising fishermen from Kampung Buntal, Kampung Santubong, Kampung Salak, Kampung Pasir Pandak and Kampung Bako. In 2014, the association made RM744,988 through economic projects funded by the government; this included processing seafood, commercialising barbeque fish, supplying fresh, processed and cooked seafood, selling subsidised diesel to fishermen, supplying marine equipment, and the construction of boats and buildings. The most popular product produced by the PNK members is 'belacan' (shrimp paste) and powdered belacan). In 2015, the Association's belacan sale amounted to RM23,258. In the same year, the PNK received the national-level "Persatuan Nelayan Kawasan Jaya" award.

Jellyfish

Jellyfish fishing is a big industry in the area. This activity is seasonal, but the market for the product is significant. Most Chinese restaurants in Sarawak (and in Malaysia) serve jellyfish as a high-priced delicacy. Dried or salted jellyfish fetches between RM5-6 a kilogramme. An entrepreneur from Kampong Bako said he processed and exported about 100 tonnes in a year, all to Japan and South Korea. The jellyfish-catching season is from March to June, and involves some 50 boats from the village.

Two primary species of jellyfish landed in Sarawak - the White Jellyfish *Lobonema smithii* and Red Jellyfish *Rhopilema esculenta*. White Jellyfish are generally found between March to June, while the Red Jellyfish is found during the monsoon season, between October and December. There is also a third species harvested, the Spotted Jellyfish *Mastigias papua*. Bako Buntal Bay is the main area in Sarawak for the White Jellyfish.

Razor Clams (Ambal)

The main species of Razor Clam with commercial value in Sarawak is *Solen regularis*. There are several other species, including an endemic (*Solen sarawakensis*), described from, and confined to, the Bako Buntal Bay.

Solen species have a wide distribution around intertidal mudflats, sandy bars and beaches within the BBB EAA Flyway Network Site. Among the popular razor-clamming areas are Buntal, Bako, Muara Tebas, Sambir, Sebandi, Moyan Laut, Asajaya Laut and Sampun.

Razor clam harvesting season runs from October to April, which coincides with the monsoon season. The conditions change with the monsoon, which brings winds that generate strong waves. During this season, the mud and sand mixture separates, leaving the tidal sandflats cleaner of mud than usual. It is during these conditions that the razor clams proliferate, and are then harvested. During the rest of the year, the mud mixes with the sand, and conditions are not ideal for razor clams.

Razor clams fetch over RM20 per kilogramme in the local market. Locally called "Ambal", this is a widely popular seafood in restaurants. This is one of the few fisheries in Sarawak that still adheres to traditional methods. There are strict taboos involved, and the traditional way of catching clams is firmly adhered to by the villagers. This practise involves mostly women and children.

Local people use a traditional method to collect razor clams. The surface of a mudflat is tapped with a wooden stick which has one sharpened end (locally called "penugal", about 1 m in length) to detect razor clam burrows. Subsequently, a slender, elongated stick ("lidi", about 30 cm in length) is inserted into the burrow. This stick is coated with a paste mixture containing slaked lime, ash and salt which act as irritants that force the clams out of their burrows. Another method used by local people in Buntal and Bako to collect *S. sarawakensis* is to stab a slender, elongated metal rod with a hook at one end ("penguris", about 60 cm in length) into a clam burrow.

A 2011 study concluded that the natural supply of razor clams in the western part of Sarawak showed signs of overfishing. This could be due to unregulated fishing efforts which reduce the number of spawning adults and influence the population structure of razor clams.

In 2014, the annual Ambal Festival was included in the Sarawak Tourism Calendar; the stated plan is to put Asajaya on the map as the premier destination for ambal-related activities.

Blood Cockles

The blood cockle *Anadara granosa* is harvested in the Sg. Sabang area in Asajaya, and supplied to most of the seafood markets in the Kuching Division. However, a 2014 study revealed the presence of heavy metals such as Cadmium (Cd) and Lead (Pb) in the cockles, a result of solid and liquid wastes emanating from the industrial activities on land (food processing and canning, processing of agricultural products, and feed mills). The study concluded that the concentrations of Cadmium and Lead in blood cockles from four sites in Asajaya exceeded the maximum permissible limits set under the Food Regulations 1985 (Twenty-Sixth Schedule [Regulation 360A (7)].

Processed sea products

There is no information on processed sea products from the area. However, products on sale there include packed crackers, seafood snacks, and other products made from seafood e.g. Fish balls, fish cakes. It is believed that a local industry exists.

AGRICULTURE

The site borders a large agricultural landscape. The Samarahan Division was designated an agricultural area in the 70s, and through funding from Japan, a large-scale project was undertaken west of the Batang Sadong, extending to the Batang Sarawak. A large bund was constructed behind the mangrove forests that fringed the coastline, thus reclaiming land from the saline environment. A series of canals were built behind this sea bund, and the five main rivers were also bunded.

The land behind the bund was then irrigated and kept largely free of saltwater influence. Rice planting was attempted from the 80s, but without success. Today the area is almost completely coconut plantations. Coconut plantations remain a major activity in the area, with high-end processing plants and factories established through private sector investments, and some government aided projects. The main products are coconut extracts, kernel oils and coconut milk in liquid and powdered forms. Most of this is exported.

Local villagers make use of the landward side of the bund, along a narrow strip between the raised bund and the irrigation canal, to plant vegetables, corn and other cash crops. Attempts to farm on the seaward side of the bund were made in the past, along the Semera to Jaie stretch, but without success. These farms have been abandoned.

There are 43 villages in the Asajaya District, with a total population of 23,757. Of this, 2,969 are engaged in farming. The main industries in the Asajaya District comprise coconut plantations, oil palm plantations, tiger prawn farming, and fruit production.

Coconut

The Samarahan District is the main coconut-producing district in Sarawak. Coconut is planted almost entirely by smallholders. The average size of the coconut farms is about 2 hectares. Yield varies from 3,000 to 8,000 nuts per hectare. In 2009, 14,903 hectares were planted under coconut. Products from the coconut plantations include coconut cream, desiccated coconut, coconut dust & fibre, granulated charcoal, activated charcoal, refined coconut, and copra cake.

Cocolin Industries Sdn. Bhd. is the largest coconut products producer in the Asajaya District. They have 19,000 acres of coconut plantations of coconut plantations comprising small and medium-sized plantations, extending to Sadong Jaya. They manufacture and export low fat desiccated coconut, coconut cream powder, and frozen pasteurized coconut milk to China, Malaysia, India, Pakistan, Bangladesh, Turkey, Brunei, Sri Lanka, and are set to expand to other international markets. Another major coconut producer is Good Harvest Plantation Sdn. Bhd., a joint-venture between SEDC (30%) and Cocolin Industries Sdn. Bhd. (70%) involved in the development of a 2,115-hectare coconut plantation in Asajaya.

Major Fruit Crops in the Asajaya District

In 2015, the hectarage of fruit crops in the Asajaya District amounted to 1,370.0 hectares. A total of 1,171.3 hectares was harvested that year. The total production harvested amounted to 13,252.2 Metric tonnes, valued at RM 21,476,176.

Table 2: MAIN (by Value) FRUIT CROPS HARVESTED IN THE ASAJAYA DISTRICT IN 2015.

No.	Crop	Harvested (Metric tonnes)	Value (Ringgit Malaysia)
1	Banana	777.4	11,991,839
2	Pineapple	119.5	3,276,042
3	Water melon	187.0	2,642,980
4	Durian	63.4	1,831,375
5	Limau Manis	79.6	1,027,030
6	Rambutan	55.1	157,600
6	Mango	22.5	123,280
8	Papaya	5.8	106,000
9	Starfruit	5.0	104,625
10	Jackfruit	27.1	82,650
Total			**21,343,421**

Limau Manis Madu

Sarawak is the major producer of Limau Manis (*Citrus sinensis*) in Malaysia. In 2009, the Asajaya District had 294 hectares planted with *C. sinensis*. The average harvest at that time was 224,960 kilograms, and the returns from the harvest amounted to RM 528,656. In 2015, 331.3 metric tonnes of Limau Manis were harvested from 26.5 hectares in the Asajaya area, and valued at RM 1,027,030.

AQUACULTURE

Fish and shrimp farming is a major industry in the area. Most of the farms are on the landward side of the bund, and farm freshwater species. There are a few aquaculture farms on the seaward side of the bund, but only one has sustained its operations, since 1999.

Map 3 below shows the extent of aquaculture farming in one part of the area (eastern section). Most of the farms are local enterprises by the villagers, and these tend to be small ventures, comprising 3-6 ponds. Larger farms are operated by companies, and some are very large.

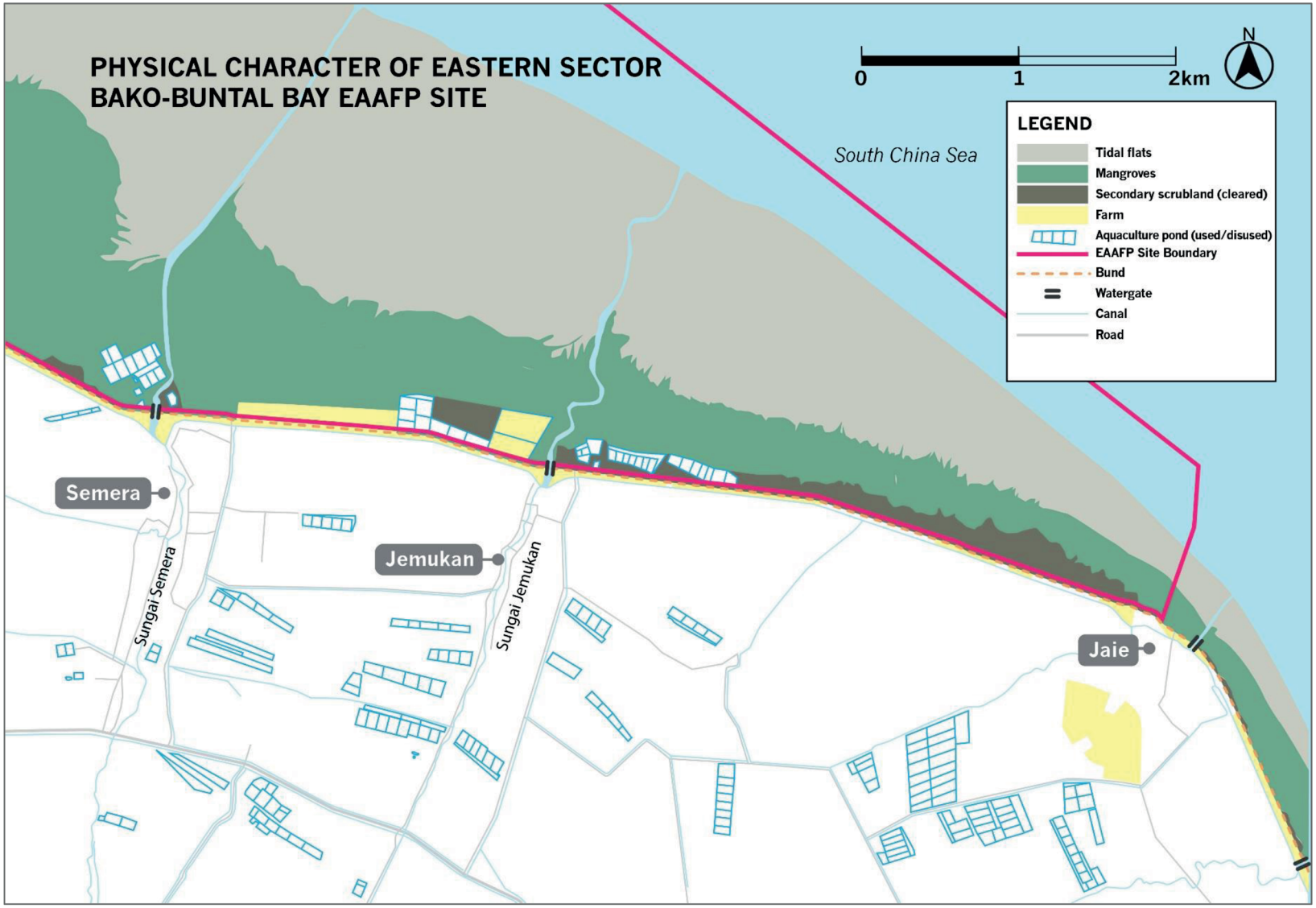
Fish and shrimp farming has not demonstrated sustainability in the long term. Profits are substantial within the first 3 years, and then yield declines rapidly and farms are abandoned. Disease is a major cause for abandonment of these farms. There are many abandoned farms in the area. Map 3 does not differentiate between ponds currently in use and abandoned ponds.

A 2013 study indicated that the shrimp farms in the area discharged a large amount of orthophosphate, nitrate-nitrogen, ammonia-nitrogen, biochemical oxygen demand and total suspended solids into the adjacent water body. This has resulted in the decline of the river water quality.

In 2005, LTT Aquaculture Sdn Bhd began culturing Empurau (*Tor tambroides*), Sarawak's most highly-priced freshwater fish, in the Asajaya District. The company invested about RM4mil in its 12ha Asajaya farm, which breeds the empurau in 64 special concrete ponds. The Empurau was initially sold to restaurants in Kuching and in Peninsular Malaysia. Today, they export live fish to Hong Kong, China, Macau, Singapore, Brunei and Taiwan, where it can fetch as much as RM750 per kg.

The Empurau is listed on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species. It is categorised as Data Deficient (DD). Anthropogenic modification of river morphology impacts this species by reducing or interrupting water flow. Logging, deforestation and agriculture occurs throughout the species range, with associated impacts on the aquatic environment expected.

Map 3 Distribution of aquaculture farms in the Eastern section of the BBB EAA Flyway Network Site



PROTECTED AREAS

The BBB EAA Flyway Network Site borders two protected areas: Santubong National Park (1,410ha) and Bako National Park (2,727ha). Santubong NP is one of Sarawak's newest protected areas, gazetted in 2007, while Bako NP is Sarawak's first and oldest protected area, gazetted in 1957.

These two national parks are not within the boundary of the BBB EAA Flyway Network Site, but are part of the greater Bako Buntal Bay IBA (MY37). The presence of these two parks greatly add to the overall biodiversity of the area, with their dryland habitats and vegetation and species compositions.

The network site plays an important role as extensions of the national parks.

TOURISM

The tourism industry is currently focused on the western sector of the BBB EAA Flyway Network Site. The beach resorts cater to foreign visitors as well as the people of Kuching. Nature-based activities include wildlife-watching tours, boat tours, and jungle treks.

The two national parks are also tourism destinations.

BIBLIOGRAPHY

Abu Talib A., K. Salim, C. Phaik-Ean, M. Mohammad Isa and L. Chai Fong. 2003. An overview of the socioeconomic status of fisheries in Malaysia. p. 517 - 542. In G. Silvestre, L. Garces, I. Stobutzki, M. Ahmed, R.A. Valmonte-Santos, C. Luna, L. Lachica-Aliño, P. Munro, V. Christensen and D. Pauly (eds.) Assessment, Management and Future Directions for Coastal Fisheries in Asian Countries. WorldFish Center Conference Proceedings 67, 1 120 p.

http://www.worldfishcenter.org/content/overview-socioeconomic-status-fisheries-malaysia

Azizan Marzuki. (2010). Tourism Development in Malaysia. A Review on Federal Government Policies. School of Housing Building and Planning, Universiti Sains Malaysia, 11800 Penang, Malaysia. Theoretical and Empirical Researches in Urban Management, Number 8 (17) / November 2010.

https://www.academia.edu/2267672/Tourism_Development_in_Malaysia._A_Review_on_Federal_Government_Policies

Cindy Peter. (2015). Sarawak Dolphin Project: Final Report, IWC Small Cetacean Fund, January 2015

https://iwc.int/sarawak-coastal-cetaceans-mintonpeter-2012-13

Coconut Industry Development Program (CIDP): 10th Malaysia Plan (10MP), Mechanics and Guidelines.

https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=COCONUT+INDUSTRY+DEVELOPMENT+PROGRAM+(CIDP)+10th+MALAYSIA+PLAN+(10MP)+MECHANICS+AND+GUIDELINES

Convention on Biological Diversity (CBD), United Nations 1992 (Article 2).

https://www.cbd.int/doc/legal/cbd-en.pdf

Department of Agriculture, Putrajaya, Malaysia. (2015). Statistik Tanaman Buah-buahan (Fruit Crops Statistics) Malaysia 2015.

http://www.doa.gov.my/c/document_library/get_file?uuid=38001cda-4dbe-4e1e-82bf-b05d258f600a&groupId=338810

Food Regulations 1985

https://extranet.who.int/nutrition/gina/sites/default/files/MYS%201985%20Food%20Regulations_0.pdf

Information Sheet on the Bako Buntal Bay EAA Flyway Network Site

http://www.eaaflyway.net/documents/network/sis/sis-malay-eaaf112.pdf

Md. Faruk Hossen, Sinin Hamdan, and Md. Rezaur Rahman. (2014). Cadmium and Lead in Blood Cockle (*Anadara granosa*) from Asajaya, Sarawak, Malaysia. ScientificWorldJournal. 2014; 2014: 924360.

Published online 2014 Nov 4. doi: 10.1155/2014/924360

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4236887/

Mohammad Samaun Safa (2004). Potential Fishery Industry Activities and Financial Aspects of East Malaysian Marine Fisheries. University Putra Malaysia, International Institute of Fisheries Economics and Trade.

https://ideas.repec.org/p/pra/mprapa/10887.html

Official Website of the Department of Agriculture Sarawak

http://www.doa.sarawak.gov.my/modules/web/pages.php?mod=webpage&sub=page&id=468

Sarawak Dolphin Project (2011). Gianna Minton and Brian D. Smith (Eds.). Determining and quantifying threats to coastal cetaceans: A regional collaborative workshop, February 22-24, 2011, Permai Rainforest Resort (Kuching, Sarawak).

http://www.iucn-csg.org/wp-content/uploads/2010/03/Feb-2011-Threats-to-coastal-cetaceans-workshop-Complete-Report-Final.pdf

Siti Akmar Khadijah Ab. Rahim. (2011). Razor Clam (*Solen* spp.) Fishery in Sarawak, Malaysia. Department of Aquatic Science, Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, Sarawak, Malaysia. Kuroshio Science 5-1, 87-94, 2011.

https://ir.kochi-u.ac.jp/dspace/bitstream/10126/4829/1/kuro5-1.87.pdf

Online news reports:

Borneo Post Online

Fishing industry lucrative – Assemblyman, April 2, 2015

http://www.theborneopost.com/2015/04/02/fishing-industry-lucrative-assemblyman/

Private fishery jetties banned soon, October 5, 2016

http://www.theborneopost.com/2016/10/05/private-fishery-jetties-banned-soon/

Bigger Ambal fest on map for Asajaya – Abdul Karim, November 30, 2014

http://www.theborneopost.com/2014/11/30/bigger-ambal-fest-on-map-for-asajaya-abdul-karim/

Ali Babas 'robbing' local fishermen, June 22, 2015

http://www.theborneopost.com/2015/06/22/ali-babas-robbing-local-fishermen/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+theborneopost%2FeZwo+%28BorneoPost+Online+%7C+Borneo+%2C+Malaysia%2C+Sarawak+Daily+News+%C2%BB+Sarawak%29

The Star Online

LTT Aquaculture to boost empurau exports, 29 March 2010

http://www.thestar.com.my/business/business-news/2010/03/29/ltt-aquaculture-to-boost-empurau-exports/

One of Malaysia's largest fish breeders offers farm for research activities, 10 March 2016

http://www.thestar.com.my/metro/community/2016/03/10/a-model-farm-one-of-malaysias-largest-fish-breeders-offers-farm-for-research-activities/

Other online sources:

Where have all the Semah gone?

http://www.azam.org.my/3rdvoice_details.asp?id=188

BACKGROUND

2

BAKO BUNTAL BAY

East Asian-Australasian
Flyway Network Site

Waterbirds of Bako Buntal Bay

Bako Buntal Bay as a Wintering Site

Borneo receives migratory birds annually. The northern coast of Borneo, extending from western Sarawak (Tanjung Datu) to the northeastern tip in Sabah (Kudat peninsula), is a major wintering area for waterbirds arriving from the eastern leg of the East Asian - Australasian migratory flyway. This portion of the flyway is used primarily by populations coming from the northeastern Asia (Eastern Russia, Japan, Korea and eastern China). This flyway also features sporadic additions from the west-American migratory routes.

Studies on the composition of this flyway has produced better understanding of the species that use this route, and where some of the populations originate. Bird-banding results are contributing to this knowledge.

The BBB EAA Flyway Network Site is the very western-most site along the migratory route that arrives on Borneo from the Philippine islands, and divides into two: half continuing due south down the eastern coast of Borneo, onwards towards the Lesser Sundas, Moluccas and to Australia, and New Zealand. The other half takes a right turn and heads down the northern cost of Borneo, along the coastlines of western Sabah, Brunei and Sarawak. By the time they reach Bako Buntal Bay, they have run out of habitat suitable for feeding and roosting, and so they stay.

The productivity of these feeding grounds, combined with suitable areas to sit-out the high tides (high tide roosts) determine the size of the wintering populations here. The site has shown a high productivity, and is at present the site with the highest wintering population of waterbirds in the whole of Malaysia.

Important Shorebirds

Shorebirds of the families Charadriidae and Scolopacidae make up the largest representation of species and individuals in the site. A Sarawak state-wide survey of waterbirds in 2011, conducted by the Malaysian Nature Society, recorded a total of 35,338 birds in the whole BBB EAA Flyway Network Site. This represented 50% of all shorebirds counted in Sarawak, making Bako Buntal bay the most important site for migratory birds in the State.

Three leg-flagged shorebirds have been observed in the BBB EAA Flyway Network Site. These are birds which have been trapped, tagged and released in other countries, as part of a global monitoring programme to track the migratory movement of species within flyways, including the BBB EAA Flyway Network Site.

Table 3: TAGGED BIRDS RECORDED IN & AROUND BBB EAA FLYWAY NETWORK SITE

SPECIES	LOCATION RINGED	LOCATION OBSERVED
Bar-tailed Godwit *Limosa lapponica*	Chongming island, Shanghai Municipality, PR China.	Recorded at the Sg. Bako estuary, 27th Oct 2011
Great Knot *Calidris tenuirostris*	Chongming island, Shanghai Municipality, PR China.	Recorded at the Sg. Bako estuary, 27th Oct 2011
Curlew sandpiper *Calidris ferruginea*	Bay of Bohai, Tianjin Municipality, PR China.	Recorded at aquaculture pond in Jemukan, on 24th Jan 2011 (Outside BBB EAA Flyway Network Site)

Summary of Species

Table 4: SUMMARY OF FAMILY / SPECIES DIVERSITY, AND PERCENTAGE MIGRATORY

Group:	SEABIRDS	HERONS & STORKS	DUCKS	RAILS	SHOREBIRDS	GULLS & TERNS
No. of Species:	8	14	4	7	38	11
%age migratory:	88%	64%	75%	29%	95%	64%

Total Number of Species: 82

15 species are either completely resident, or have resident populations which are added to by migratory populations in the northern winter. Gulls & terns have four resident species. Shorebirds are strongly migratory, with only 2 species breeding in Sarawak. Annex 1 lists the species recorded in BBB EAA Flyway Network Site.

Threatened Species

Four species are listed in the IUCN Red List of Threatened Animals as species of global concern.

Table 5: GLOBALLY THREATENED SPECIES IN BBB EAA FLYWAY NETWORK SITE

SPECIES	IUCN STATUS	REMARKS
Christmas Frigatebird *Fregata andrewsi*	Critically Endangered (CR)	This very large, flocking seabird breeds only on Christmas island. They are regularly seen off the shores of north-western Sarawak. Regularly seen in Bako Buntal Bay, with 25 individuals the largest flock recorded.
Spotted Greenshank *Tringa guttifer*	Endangered (EN)	Also called Nordmann's Greenshank, the entire world population breeds on the coasts of the Sea of Okhotsk, and on Sakhalin island, in eastern Russia. Regular winter visitor to Bako Buntal Bay in small numbers.
Chinese Egret *Egretta eulophotes*	Vulnerable (VU)	One of the world's rarest egrets, with the world's entire breeding population in eastern Russia, Korean peninsula and in the Yellow Sea. They nest exclusively on islands. An estimated 22% of the world's population winters in Sarawak, the majority in Bako Buntal Bay.
Lesser Adjutant *Leptoptilos javanicus*	Vulnerable (VU)	Sarawak's largest bird with a wingspan of 2m. Remaining population along the mangroves from Pulau Bruit to the Bako Buntal Bay area.

Global Status of BBB EAA Flyway Network Site

Bako Buntal Bay qualifies as a Network Site under the East Asian-Australasian Flyway Partnership by fulfilling criterion 2, 5 and 6 of the Ramsar Convention. It is also designated as an Important Bird Area (IBA), registered as Malaysian IBA MY37, because it meets the criteria of the Birdlife International's Important Bird Areas. The site's qualifications are summarised below.

Table 6: QUALIFICATION CRITERIA AS AN EAFFP NETWORK SITE

CONVENTION	CRITERIA	BAKO BUNTAL BAY
Ramsar Convention	Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.	One CR, one EN and two VU species.
	Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.	Regularly supports 30-40,000 waterbirds
	Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.	>1% world population: Five species (Chinese Egret, Lesser Sand Plover, Spotted Greenshank, Bar-tailed Godwit, Eastern Curlew). >1% EAAFP population: 4 species (Whimbrel, Common Redshank, Terek Sandpiper, Eurasian Curlew).
Birdlife International	A1 Globally threatened species: The site is known or thought regularly to hold significant numbers of a globally threatened species, or other species of global conservation concern.	Chinese Egret (est 12%) is listed as Vulnerable
	A2 Restricted-range species: The site is known or thought to hold a significant component of a group of species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA).	None
	A3 Biome-restricted species: The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome.	Biome 14 (Sundaic lowland forest). *Note: the Santubong and Bako National Parks are included in the Malaysian IBA (MY37).*
	A4 Congregations: A site may qualify on any one or more of the four criteria listed below: i. Site known or thought to hold, on a regular basis, ≥ 1% of a biogeographic population of a congregatory waterbird species. ii. Site known or thought to hold, on a regular basis, ≥ 20,000 waterbirds or ≥ 10,000 pairs of seabirds of one or more species.	Site support at least 12% of the congregatory biogeographic population of Chinese Egret; Site regularly supports >30,000 waterbirds of >80 species

HIGH TIDE ROOSTS

Table 5 below lists the major high tide roosts throughout the site. Selected roosts located outside the site are also included. These roosts are considered of the highest conservation importance for the waterbird population of the site.

Table 7: HIGH TIDE ROOSTS IN BBB EAA FLYWAY NETWORK SITE

ROOST LOCATION	DESCRIPTION
Kuala Buntal N1 42' 08.24" E110 23' 09.98"	▪ Extensive sandflats within a large bay ▪ Includes secondary roost: tree roost at Tanjung Batu (N1 43' 11.35"; E110 21' 27.07") ▪ Tree roosts, and bamboo fishing stakes also used. ▪ Used during medium tide only. ▪ Supports >5,000 birds
Sejingkat Power Station N1 38' 20.11" E110 27'57.34"	▪ Ash-ponds, bunds within fencing. ▪ High and medium tide roosts ▪ Supports <2,000 birds
Pasir Puteh N1 39' 14.54" E110 30' 01.28"	▪ Wide bay with mudflats and accreting mangroves ▪ Includes secondary roost: Batu Pisang (N1 40' 13.61"; E110 30' 01.28") ▪ Supports >7,000 birds
Sg. Asajaya N1 35'30.42" E110 34' 45.58"	▪ Tree roost ▪ Accreting mangroves next to estuary ▪ Supports >2,000 birds
Sg. Semera N1 33' 38.86" E110 40'15.75"	▪ Aquaculture Ponds, bare earth bunds and sea-facing mangrove forests ▪ both sides of mouth of Sg. Sampun are utilised. ▪ Ponds used as high tide roost, trees used during high and medium tide. ▪ Supports >1,000 birds
Jemukan N1 32' 17.40" E110 42' 10.05"	▪ Aquaculture ponds, about 2.5 km inland. Outside site. ▪ High tide roost. ▪ Supports >2,000 birds

ANNEX 1: WATERBIRDS & SEABIRDS RECORDED IN BBB EAA FLYWAY NETWORK SITE				
NO.	COMMON NAME	SCIENTIFIC NAME	IUCN	STATUS
1	Bulwer's Petrel	*Bulweria bulwerii*		M
2	Wedge-tailed Shearwater	*Puffinus pacificus*		M
3	Pomarine Jaeger	*Stercorarius pomarinus*		M
4	Masked Booby	*Sula dactylatra*		M
5	Red-footed Booby	*Sula sula*		M
6	Brown Booby	*Sula leucogaster*		M
7	Christmas Island Frigatebird	*Fregata andrewsi*	CR	M
8	Lesser Frigatebird	*Fregata ariel*		R
9	Grey Heron	*Ardea cinerea*		M
10	Purple Heron	*Ardea purpurea*		R
11	Great Egret	*Egretta alba*		M
12	Intermediate Egret	*Egretta intermedia*		M
13	Little Egret	*Egretta garzetta*		M
14	Chinese Egret	*Egretta eulophotes*	VU	M
15	Pacific Reef Egret	*Egretta sacra*		R
16	Cattle Egret	*Bubulcus ibis*		M
17	Chinese Pond Heron	*Ardeola bacchus*		M
18	Little Heron	*Butorides striatus*		R
19	Rufous Night Heron	*Nycticorax caledonicus*		M
20	Yellow Bittern	*Ixobrychus sinensis*		M
21	Cinnamon Bittern	*Ixobrychus cinnamomeus*		R
22	Lesser Adjutant	*Leptoptilos javanicus*	VU	R
23	Wandering Whistling Duck	*Dendrocygna arcuata*		R
24	Northern Pintail	*Anas acuta*		M
25	Garganey	*Anas querquedula*		M
26	Tufted Duck	*Aythya fuligula*		M
27	Slaty-breasted Rail	*Rallus striatus*		R
28	Red-legged Crake	*Rallina fasciata*		R
29	Ruddy-breasted Crake	*Porzana fusca*		M
30	White-browed Crake	*Porzana cinerea*		R
31	White-breasted Waterhen	*Amaurornis phoenicurus*		R
32	Watercock	*Gallicrex cinereal*		M
33	Common Moorhen	*Gallinula chloropus*		R
34	Grey Plover	*Pluvialis squatarola*		M
35	Pacific Golden Plover	*Pluvialis fulva*		M
36	Little Ringed Plover	*Charadrius dubius*		M
37	Kentish Plover	*Charadrius alexandrinus*		M
38	Malaysian Plover	*Charadrius peronii*		R
39	Lesser Sand-Plover	*Charadrius mongolus*		M
40	Greater Sand Plover	*Charadrius leschenaulti*		M
41	Oriental Plover	*Charadrius veredus*		M
42	Whimbrel	*Numenius phaeopus*		M
43	Eurasian Curlew	*Numenius arquata*		M
44	Eastern Curlew	*Numenius madagascariensis*		M
45	Black-tailed Godwit	*Limosa limosa*		M
46	Bar-tailed Godwit	*Limosa lapponica*		M
47	Spotted Redshank	*Tringa erythropus*		M
48	Common Redshank	*Tringa totanus*		M
49	Marsh Sandpiper	*Tringa stagnatilis*		M

ANNEX 1: WATERBIRDS & SEABIRDS RECORDED IN BBB EAA FLYWAY NETWORK SITE				
NO.	COMMON NAME	SCIENTIFIC NAME	IUCN	STATUS
50	Common Greenshank	*Tringa nebularia*		M
51	Spotted Greenshank	*Tringa guttifer*	EN	M
52	Wood Sandpiper	*Tringa glareola*		M
53	Common Sandpiper	*Actitis hypoleucos*		M
54	Terek Sandpiper	*Xenus cinereus*		M
55	Grey-tailed Tattler	*Heteroscelus brevipes*		M
56	Ruddy Turnstone	*Arenaria interpres*		M
57	Asian Dowitcher	*Limnodromus semipalmatus*		M
58	Pintail Snipe	*Gallinago stenura*		M
59	Common Snipe	*Gallinago gallinago*		M
60	Red Knot	*Calidris canutus*		M
61	Great Knot	*Calidris tenuirostris*		M
62	Sanderling	*Calidris alba*		M
63	Red-necked Stint	*Calidris ruficollis*		M
64	Long-toed Stint	*Calidris subminuta*		M
65	Temminck's Stint	*Calidris temminckii*		M
66	Curlew Sandpiper	*Calidris ferruginea*		M
67	Broad-billed Sandpiper	*Limicola falcinellus*		M
68	Ruff	*Philomachus pugnax*		M
69	Black-winged Stilt	*Himantopus himantopus*		M
70	Red-necked Phalarope	*Phalaropus lobatus*		M
71	Oriental Pratincole	*Glareola maldivarum*		R
72	Black-headed Gull	*Larus ridibundus*		M
73	White-winged Tern	*Chlidonias leucoptera*		M
74	Whiskered Tern	*Chlidonias hybridus*		M
75	Gull-billed Tern	*Gelochilidon nilotica*		M
76	Black-naped Tern	*Sterna sumatrana*		R
77	Common Tern	*Sterna hirundo*		M
78	Bridled Tern	*Sterna anaethetus*		R
79	Little Tern	*Sterna albifrons*		R
80	Caspian Tern	*Sterna caspia*		M
81	Great Crested Tern	*Sterna bergii*		R
82	Lesser Crested Tern	*Sterna bengalensis*		M

CONSERVATION

3

BAKO BUNTAL BAY

East Asian-Australasian
Flyway Network Site

Managing Bako Buntal Bay for Wintering Waterbirds

INTRODUCTION

This document outlines concepts for on-site conservation actions to enhance and manage the site for migratory birds. Each concept is outlined in terms of its objectives, proposed approach and strategy, and includes a preliminary listing of actions to be considered in developing these concepts into full project design proposals.

CONCEPT 1 – CREATING & MANAGING MAN-MADE ROOSTING PONDS

BACKGROUND

There is a clear relationship between the wintering bird population and the availability of high tide roosting sites. There is also a relationship between the distance of the roosting site and feeding areas of mudflats (or sandflats).

There are only a few aquaculture ponds within the boundary of the BBB EAA Flyway Network Site. Therefore, these ponds should be the focus of conservation actions directed at managing these ponds specifically for their use by migratory birds.

Some ponds are active; others are abandoned. The active ponds have working structures and machinery (e.g. watergates) to manage water levels within the ponds. The abandoned ponds have likely removed these water-management structures. Many of these abandoned ponds have vegetation regrowth over the entire site, and some of the older ponds have mangrove trees established inside the ponds. These no longer have any value as roost sites.

OBJECTIVE

To restore an abandoned aquaculture pond to serve as a permanently-managed waterbird roost.

STRATEGY

The conservation strategy would be to identify one abandoned pond to be managed as a high tide roost. The objective would be to rehabilitate this abandoned pond as a permanent roosting site for birds, and to eventually build bird-watching facilities to enable public access to the site. Accessibility to this site will influence its success as a bird-watching facility, but its primary purpose is to create a safe, well protected refuge and roost site in the best available location.

PROPOSED ACTIONS

1. Conduct a survey of all the aquaculture farms (in operation and abandoned) within the BBB EAA Flyway Network Site, to determine their use by birds during high tides.
2. Identify the best site for the creation of a permanent roost site. The chosen site should be an abandoned pond. There can be more than one pond chosen, if adjacent.
3. Develop a restoration plan for this site. The restoration plan should include: 1) stated objective; 2) reference site; 3) water management plan; 4) habitat management plan; 5) monitoring plan; 6) financial plan.
4. Implement the restoration plan. Work should be undertaken outside of the migratory period.

5. STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This project will contribute greatly to the availability of secure roosting sites for the wintering bird populations
- It will increase the ability of the area to support more birds throughout the year.

Weaknesses

- Potential/suitable disused ponds within the BBB EAA Flyway Network Site boundaries are limited.

Opportunities

- A safe and regularly used roosting site will be a demonstration site for positive conservation action within the BBB EAA Flyway Network Site.
- A restored dis-used aquaculture pond will be a demonstration site (and pilot site) for restoration actions in the State
- Opportunities for developing facilities for bird watching and education activities.

Threats

- Land ownership may be an issue, depending on the locations of the chosen site.
- Poaching of birds can threaten the site and its usage by birds.

CONCEPT 2 – PROMOTING MIGRATORY BIRD FRIENDLY PRACTICES AT SELECTED AQUACULTURE FARMS

BACKGROUND

There is a clear relationship between the wintering bird population and the availability of high tide roosting sites. There is also a relationship between the distance of the roosting site and feeding areas of mudflats (or sandflats).

There are only a few aquaculture ponds within the boundary of the BBB EAA Flyway Network Site. Therefore, these ponds should be the focus of conservation actions directed at managing these ponds specifically for the use by migratory birds.

Some ponds are active, others are abandoned. The active ponds have working structures and machinery (e.g. watergates) to manage water levels within the ponds. These water levels are constantly managed as part of the operations of the farm, for harvesting, cleaning and switching ponds for "airing".

These active farms therefore usually have some ponds which retain shallow water levels, or are left dry for periods of time. These ponds are used by birds during high tides. During very high tides when tree roosts are unavailable to them, these birds will also use the exposed bunds of the aquaculture farms.

These active farms are providing a big and important contribution in providing these safe roosting sites for the birds. These farms are also able to increase their contribution through managing their operations in such a manner as to always provide these safe havens.

OBJECTIVE

To enhance existing roosting sites to support more birds.

STRATEGY

The basic concept is to form an agreement with selected active farms to modify their operations in such a way to make the correct conditions (habitat) available for birds to use at certain times.

Through managing water levels in their ponds, the managers of these farms can do the following:

1. During the months of October to March, they agree to keep a set of ponds (2, 3 or even 4 for larger farms) empty. The ponds set aside for this project may be retained for the entire duration (Ocober-March) or they may be changed.
2. They control the water levels to have not more than 4cm of standing water in these ponds.
3. There should also be areas of dry substrate. The larger these areas are, the better for roosting birds. However, these "dry" areas should not be completely dry. They should have the water table right at the surface.
4. They can locate these "managed ponds" in the least disturbed areas of the farm, for example, at the far end closest to the mangroves.
5. They agree to prohibit their workers, and their dogs, from venturing near these ponds according to the time of day (at high tides).
6. During months when there are king tides, these roosts become even more important, and these farms may further modify their operations by making more ponds available to the birds for those few days of the highest tides.

PROPOSED ACTIONS

1. Conduct a survey of all the aquaculture farms (in operation and abandoned) within the BBB EAA Flyway Network Site, to determine their use by birds during high tides.
2. Identify the best site for establishing a conservation agreement with the owner/management of the selected aquaculture farm.

3. The details of the contract/agreement between the Sarawak Forestry Corporation Sdn. Bhd. (SFCSB) and the Farm Manager are subject to negotiation. The ideal arrangement will benefit both the birds and the owners of the farm. Incentives can be included to encourage the farm owners to participate in this project.
4. Work with the farm manager to develop a plan to manage a selected number of ponds for roosting birds, at specific times of the day, week and month. Managing water levels is crucial to the success of this project. Trial periods will likely be needed to finally arrive at the correct water levels for use by the birds.
5. The plan should include monitoring actions, either by the farm workers or by SFCSB officers. It is vital that the use of these ponds is monitored regularly to determine use by birds, and by which species. Very shallow water levels may attract different species than completely dry ponds.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- A strong state-initiated effort to bring economic activities into sync with conservation needs, along the concept that one does not have to replace another: both profit-making and conservation can work hand-in-hand.
- This project will contribute greatly to the availability of secure roosting sites for the wintering bird populations
- It will increase the ability of the area to support more birds throughout the year.
- Provide incentives for farms to commit to longer term business plans, thus securing commitment from participating farms to sustain operations over the long term, and not seek quick profits with the intention of abandoning farms after a few years.

Weaknesses

- Potential aquaculture farms may be difficult to convince to participate in this project.
- Current profit-orientated mindsets of local businesses will seek to obtain quick profits from such an initiative
- Inculcating conservation objectives with aquaculture companies may face resistance.

Opportunities

- A functioning aquaculture farm with inbuilt safeguards and operational systems specifically catering for migratory birds is an excellent example of positive conservation action within the East Asian-Australasian Flyway Partnership Network Site.
- Opportunities for these farms to become show-case destinations for visitors to observe and learn how such an operation is planned and executed, and be able to watch the birds too.

Threats

- No threats identified. A successfully operating farm will self-secure the site and the birds.

CONCEPT 3 – CREATE A COLLABORATIVE PARTNERSHIP WITH THE SEJINGKAT POWER STATION

BACKGROUND

Throughout the migratory bird flyway, coal-fired power stations on the coast have been used as high tide roosts. The location of these coal-fired power stations along the coast are because of the need to transport coal to the stations, usually by ships. Seawater is also used for cooling, because heat is produced in the generation of power.

The by-product of burning coal is ash, which needs to be stored in a wet state to prevent it becoming dispersed by wind. Ash-ponds are therefore an integral feature of such power stations. These ash ponds vary in size, to several soccer-fields in size, and are always wet. They are an ideal place for birds to roost.

The power station located at the Sejingkat has two ash-ponds, and these have been used by birds for many years. The station management has been collaborating with the Malaysian Nature Society for many years, and are aware of the importance of their ash-ponds for migratory birds. Bird-watchers are permitted to enter the site (the station is a high security area) to monitor the roosting birds.

Data from the annual waterbird census shows that the Sejingkat Power Station is a major site for the larger shorebirds, particularly Eastern Curlew *Numenius madagascariensis*, which use the site throughout the year in varying numbers. During the highest tides, many other species use these ash-ponds.

OBJECTIVE

To form a partnership with a major power producer for waterbird conservation.

STRATEGY

The EAAFP global strategy promotes the forming of strategic partnerships with private sector companies and stakeholders to deliver better management of network sites. The Sejingkat Power Station is well-placed as a major corporate stakeholder with a facility within the BBB EAA Flyway Network Site. Its facility is also one of the six roost sites, and the management of the station are aware of this. They have shown enthusiasm towards the existence of globally important migratory birds within their facility.

The SFCSB should capitalise on this opportunity to form a conservation partnership with Sarawak Energy Berhad (SEB) to develop a programme around managing their ashponds for migratory birds.

With proper investigations, and agreements from the management over water management, these ponds can be enhanced as a high tide roost.

PROPOSED ACTIONS

1. Initiate high-level engagement between SFCSB and SEB on this project. If agreement can be reached, craft an agreement that will co-fund the partnership over a specified timeframe.
2. Develop a strategy for managing the ashponds for waterbirds.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This project will contribute greatly to securing and possibly expanding one of the important roosting sites within BBB EAA Flyway Network Site.
- It will increase the ability of the area to support more birds throughout the year.
- The operators and management of the power station are very positive towards this concept, and have already been working with the Malaysian Nature Society towards this end.
- The security of the site from poaching and human disturbance is guaranteed.

Weaknesses

- No weaknesses identified.

Opportunities

- This concept presents a rare opportunity for a corporate entity (Sarawak Energy Berhad) and the state government to work together towards a conservation objective. This opportunity is further enhanced by the willingness and interest from the corporate entity.
- This will be an excellent site for demonstrating corporate partnerships and waterbird conservation in the State, in fulfillment of the EAAFP Global Strategy: promoting the forming of strategic partnerships with private sector companies and stakeholders to deliver better management of network sites.
- This can be a popular site for visiting dignitaries, international delegations and the conservation community, with opportunities for developing a visitor centre with facilities for bird watching and education activities.

Threats

- The operational needs of the power station in storing ash will require special considerations for the ponds that are used by birds.

CONCEPT 4 – INCREASING ROOSTING STRUCTURES IN BAKO BUNTAL BAY

BACKGROUND

Availability of suitable roosting sites during high tides is the biggest influencing factor in the distribution of the wintering population throughout the BBB EAA Flyway Network Site. All the most important roosting sites have certain characteristics in common. These commonalities are:

- Security of the site from hunting and human disturbance.
- Beyond the reach of the highest tides, thus a safe place to rest until the tide recedes.
- Suitable substrates, like open wet ground, and trees with large boles that allow wading birds to perch.
- At a reasonably close distance from feeding sites, so that the birds do not have to expend too much energy flying between the roost and their food sources.

It is also apparent that different species use, or prefer, different kinds of roosts. Whimbrel seem to use tree roosts exclusively, while Curlews prefer large open spaces, like the ash ponds. Smaller sandplovers use smaller trees if there is space for them to perch, but will congregate on open mud banks or on the bunds of aquaculture ponds. Redshanks appear willing to use bushy trees, squeezing themselves in between foliage, as do egrets, but if fishing stakes are present, they would prefer to use these exposed structures instead. Godwits and sanderlings always prefer sandbanks, and terns always seek exposed structure (or electricity wires) to roost.

The numbers of birds using BBB EAA Flyway Network Site can be increased if there were more roosting sites available. This also means that the existing roosting sites can be managed in such a way as to increase their ability to provide safe refuge for roosting birds. This can be achieved by creating roosting structures at these sites.

OBJECTIVE

To increase the number of birds at roosting sites in BBB EAA Flyway Network Site.

STRATEGY

Increasing the ability of a congregatory site to support more birds is a strategy in wildlife management. There are two approaches to such a strategy: create new locations for birds to use for roosting, and enhance existing roosts to accommodate higher numbers of birds. Generally, it is better to adopt the second strategy, because the efforts are more likely to achieve positive results. The rationale is that the selected site is already being used as a roost, and therefore is assumed to already have the natural attributes that birds seek in a roost.

Creating new sites is acceptable, but will not always result in success. In exceptional circumstances, this approach may be warranted. However, in the case of Bako Buntal Bay, it is prudent to choose enhancement over creation.

The concept is to design and install, at selected sites, structures that provide more place for birds of different kinds to roost. Here are two examples used in other sites in Asia:

> *Bamboo structures* – most coastal and tidal environments are also used by fishermen, and a common fishing technique throughout Asia is the erecting of bamboo structures out over the tidal flats. These structures can be reached by boats during high tides, and fishermen can spend the night on these structures fishing with lines or nets. These structures are used by birds, especially egrets, when fishermen are not present. These structures also deteriorate over time, and new structures are then built to replace these fishing platforms. The abandoned platforms gradually collapse, but can remain standing for many years. These platforms are used by egrets, terns, gulls and shorebirds as high tide roosts.

Fishing stakes – another common fishing technique on tidal estuaries is the erection of long lines of stakes in the mud or sand, along or across channels. Nets are attached to these stakes, forming long net-lines. Fish are caught in these nets when the tide is in, and collected during low tides. These stake lines sometimes have ropes attached to them, to strengthen them against wave action, and to attach nets. Disused stake lines with ropes on them are used by shorebirds for roosting.

These structures could be built in appropriate locations within, or close to roosting sites.

PROPOSED ACTIONS

1. Prepare a feasibility assessment of the use of installed structures at specific sites to increase the "carry capacity" of existing roosting sites. Select sites that are best suited to such a project.
2. Design the selected design of roosting structures, and the materials to be used. Designs are important to cater for weather and tide conditions. Structures will likely have limited lifespans, to be replaced after several years.
3. Implement monitoring surveys at selected sites to develop baseline data on usage of the roosts, covering times of the year, and species that use the site. Segregating species according to their roosting preference would be very valuable information. Monitoring surveys will continue after installation of such structures.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This project will increase the availability of roosting structures for migratory birds within BBB EAA Flyway Network Site.
- It will increase the ability of the area to support more birds throughout the year.

Weaknesses

- Only certain species of shorebirds will use such structures. A variety of structures may be required according to target species.
- The locations of such structures are important, and ideal and safe sites may be difficult to identify.
- The durability of these structures may compromise their effectiveness, with the harsh sea conditions especially during the monsoon season.
- Costs of these structures can be high, depending on how often they are designed for replacement.

Opportunities

- This project is a demonstrable action consistent with efforts in other countries, where a globally significant site is actively managed to enhance its value to wildlife (in BBB EAA Flyway Network Site, for migratory birds).
- This project can be attractive for corporate contributions towards conservation activities, in the same line as mangrove-planting, and reef-ball seabed restoration.
- The involvement of the private sector in this project will be in line with the EAAFP Global Strategy: promoting the forming of strategic partnerships with private sector companies and stakeholders to deliver better management of network sites.

Threats

- Human disturbance can affect this initiative.

CONCEPT 5 – PROTECTING TREE ROOSTING SITES IN BAKO BUNTAL BAY

BACKGROUND

The population of wintering birds across the entire BBB EAA Flyway Network Site is dependent on two crucial elements: the presence of the mudflats as their feeding grounds, and the availability of roosting sites during high tides. The mudflats are always present, and are unlikely to change drastically in the near future. The high tide roosts are much more vulnerable.

The human disturbance levels at the high tide roosts are high. The aquaculture ponds are not all available to the birds, and are also not available at the correct times. The only permanent high tide roosts available to the birds are locations within the mangroves where the trees are suitable for roosting. The ash-ponds of Sejingkat Power Station is also a permanent roosting site, but disturbance levels are high, and the conditions are not ideal for all species of waterbirds.

The tree roosts are therefore very important for the BBB EAA Flyway Network Site waterbird population. These sites are currently under no protection at all.

OBJECTIVE

To afford permanent and effective protection of tree roosts in the BBB EAA Flyway Network Site.

STRATEGY

There are 3 tree roosts of the highest importance within the site: Pasir Puteh, Sg. Asajaya and Sg. Semera.

Pasir Puteh is a large bay at the southeastern corner of Bako National Park. This bay and its sandflats and mudflats, and coastal features (rocky outcrops, accreting mangroves) should be given special protection status.

This protection can be given through an extension of the national park's effective management zone, which allows the Park's management regime to cover this site without having to go through the process of gazetting an extension to the park.

The estuary of Sg. Asajaya is an area of accreting and mature mangroves, in an area where human presence is minimal. This low human presence is possibly why the birds have chosen this site as a high tide roost.

The estuary of Sg. Semera is also an area of accreting mangroves mixed with mature stands of tall *Avicennia* trees. It differs from the other sites with an active aquaculture farm present just behind the tall mangrove forest area. This is perhaps the oldest operating aquaculture farm in the area, and always has empty ponds during the monsoon period.

The "settled" environment here (mudflats, tall trees and aquaculture ponds) is likely the reason this is one of the most used sites by the birds, and particularly the Chinese Egret. The largest congregations of Chinese Egrets are always in this location; the birds use both the ponds and the trees as roosts.

Both these estuary sites are ideally situated for a community project to be initiated around the protection of the roosting (and feeding) birds. The village communities, and the aquaculture farm owners, can form a partnership that adopts the high tide roosts as theirs to protect.

Alternatively, all these three sites can be made *special protection zones* under a new category, such as a no-go zone, or non-hunting zones, or a wildlife protection zone. Creating such a category of protection under the management plan for the BBB EAA Flyway Network Site would avoid the legislative requirements of the state laws to be tackled. This can be part of a zonation exercise for the BBB EAA Flyway Network Site. This will also enable any future EAA Flyway Network Sites in Sarawak to follow the same approach.

PROPOSED ACTIONS

1. Conduct a feasibility assessment of the three tree-roost locations, to determine the appropriate approaches and strategies to afford them the best possible protection. Protection strategies do not have to be legislative, but these should be included in the feasibility assessment. The potential role of the Bako National Park management authority (for the Pasir Puteh site) should also be assessed.
2. Conduct more detailed monitoring surveys to obtain better quality data on the usage of these sites. These surveys should be conducted monthly, to ensure data is also available for usage of these sites outside the migratory seasons.
3. Design a participatory engagement strategy to engage and involve the communities and businesses close to these sites in a joint protection effort. Include incentives and conservation covenants in the design.
4. Investigate the introduction of special protection zones as a conservation tool in Sarawak. This has wider applications, such as identified locations for highly endangered species in the State.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- Special protection zones should afford better and more permanent protection to the most important roosting sites within the overall BBB EAA Flyway Network Site.
- Resource allocation within custodian agencies in the state will be easier with the existence of such areas.
- The BBB EAA Flyway Network Site management plan will be able to budget for, and allocate appropriate resources, to ensure that the security of the site from poaching and human disturbance is guaranteed.

Weaknesses

- Bureaucratic red-tape makes any form of legal area designation or gazettement difficult in the state.
- Designation of priority conservation area under specific legislations, including area management plans, are possible, but the custodian agencies are ill-equipped to undertake such processes which often involve different agencies.
- Application of human and financial resources towards long-term monitoring and patrolling such areas are often absent, or simply not a priority.

Opportunities

- The opportunity to involve other agencies in such an undertaking will reinforce the overall objectives of managing the EAA Flyway Network Sites as multi-stakeholder (and multi-agency) responsibilities.
- Joint management efforts will enhance and link conservation actions between those of the two national parks and the BBB EAA Flyway Network Site.
- Opportunities to work, and form partnerships, with local communities.
- If successful, a new conservation tool for the state can be developed around the concept of special conservation zones bringing effective conservation as an additive to legislative mechanisms.

Threats

- The disturbance and poaching at the high priority conservation sites (the high tide roosts) may destroy some of the sites before this initiative can take off.
- Disturbance at the sites can also result in the birds moving away, and seeking other sites.

4

BAKO BUNTAL BAY

East Asian-Australasian
Flyway Network Site

TOURISM

Managing Bako Buntal Bay for Wildlife Watching

INTRODUCTION

The opportunities for watching wildlife in the BBB EAA Flyway Network Site are good. Its proximity to the State capital benefits the development of tourism activities within and adjacent to the site.

The two primary features of the BBB EAA Flyway Network Site in terms of tourism activities are: a) the site is predominantly a coastal site, with a large area of sea; and b) options for land-based facilities are minimal.

The best access to the interesting features of the site are by boat. This means future development of the BBB EAA Flyway Network Site for tourism activities will strongly feature sea-based tourism. In terms of land-based facilities for tourism, the site has limited potential. The best options would be to build facilities that are required (basic infrastructure) and facilities that enable access to key features, such as roosting birds.

Three areas concepts for developing tourism activities are considered here:

OBJECTIVE	CONCEPT	OPPORTUNITY
Public enjoyment of the BBB EAA Flyway Network Site's exceptional landscape	• The landscape within the site is arguably one of the most scenic in Sarawak. In the western sector, there are several vantage points along the inside of the bay that offer wonderful views of Santubong mountain, sweeping panaromas of the sandflats and the distant shimmering views of the sandstone cliffs of Bako National Park. • Landscape viewing is an activity that supports tourism development and planning of the Santubong peninsula, and the two National Parks. • There are no open country scenic trails in Sarawak at present. Existing walking trails are within forest, involve difficult climbing.	Create an open country scenic walking trail from Kpg. Bako to Kpg. Buntal. (CONCEPT 1)
Increase opportunities for bird watching in the BBB EAA Flyway Network Site	• Watching birds is the obvious prime activity within the network site, with a wealth of exciting and rare birds present almost throughout the year. Viewing these birds from a distance is relatively easy, with several good vantage points at Kpg. Buntal. • Getting close to the birds is more difficult, but possible through private transport to areas where roosts are present. These are however, only known to local birdwatchers and SFCSB officers. • Facilities need to be built at selected sites to enable access for bird watching. These should be proper footpaths out to vantage points, bird hides and other amenities such as toilets. Simple screens also allow for roosts to remain shielded from observers, often providing spectacular close-viewing of the birds. • Bird-watching by boat is not ideal, and is seldom a rewarding experience that people would want to repeat. Observing flying (or roosting) birds from boats is difficult.	Build facilities at a permanent high tide roost for bird watching. (CONCEPT 2)
Support boat cruising activities in the BBB EAA Flyway Network Site.	• Being out at sea in a boat is an attractive experience, especially during cool periods such as during sunset and sunrise. The negative part of this experience is the quality and comfort of the boat, the weather and the sea conditions. High quality boats for cruising are very expensive to purchase and maintain, and results in high pricing for tourists. The sea conditions off Sarawak's	Provide support to existing boat cruising operators in the site. (CONCEPT 3)

coasts can be unpredictable and dangerous at certain times of the year.

- The potential for open-sea cruising exists, and should be considered in future development planning.
- Coastline cruising has high potential along the forested coastline in the western sector, and scenic views of Santubong mountain and Bako National Park.
- The eastern sector has extensive mudflats, preventing boats from approaching close to the shore except along the five rivers. The very shallow seas are dangerous because of high turbidity, shifting mudbanks and the constant danger of getting grounded and stranded.
- Dolphin watching is already an on-going activity in the western sector of the BBB EAA Flyway Network Site. The eastern sector also has potential for dolphin watching, especially for the Finless Porpoise.

SUPPORTING INFORMATION ON THE BBB EAA FLYWAY NETWORK SITE

Historical significance of Bako Buntal Bay

The significance of this site for migratory birds was recognised 150 years ago. Naturalists visiting Sarawak under the patronage of the Brookes' used to sail down the Sarawak and Santubong rivers to the coast to observe and collect waterbirds. The Sarawak Museum archives contain evidence of specimen collecting at Kampung Buntal dating back to 1850, including some globally significant records such as two specimens of the Chinese Crested Tern *Sterna bernsteini*, a species thought extinct until a recent discovery of 4 pairs in Taiwan. There is an ongoing world-wide search for the remaining living birds, and all sites with historical sightings, such as in the BBB EAA Flyway Network Site, are prime search areas.

Other interesting facts include the only record for Borneo of the Pygmy Sperm Whale *Kogia breviceps* from a stranding at Buntal on 19th February 1958. The type specimen for the Borneo White dolphin *Sotalia borneensis* was collected at Tanjung Sipang, on the eastern side of the Bako promontory in 1901, but has since been included as a predominantly pink form of the Indo-Pacific Humpbacked Dolphin *Sousa chinensis*.

A Birdwatching attraction

Bako Buntal Bay is an outstanding site for bird-watching because of its location at a "dead-end" of a 1,000km flyway route. The site regularly receives "lost species", which are individuals of species that are not the normal users of this flyway, but get carried along with the masses every now and then. This phenomenon is not uncommon during migrations, but wherever these "special" species are regularly seen, these sites attract birdwatchers seeking that rare bird sighting.

Over the years, Bako Buntal Bay has delivered fascinating individuals, to the delight of Malaysian birdwatchers who make the trip here just to tick these special birds.

Rare Ducks: The Family Anatidae is uncommon as migrants through Borneo. Migratory ducks seen here are the Northern Pintail *Anas acuta*, Tufted Duck *Aythya fuligula*, and regular sightings of flocks of Garganey *Anas querquedula*, with 15 birds in the largest flock observed in 2009.

Rare Shorebirds: Pied Avocet *Recurvirostra avosetta*, Eurasian Oystercatcher *Haematopus ostralegus* and Christmas Island Frigatebird *Fregata andrewsi* are amongst the most spectacular occasional visitors.

Seabirds: The open seas within the BBB EAA Flyway Network Site are also known for visiting seabirds, although these are seldom seen unless one takes a boat out. All three Boobies are present: Masked Booby *Sula dactylatra*, Red-footed Booby *S. sula* and Brown Booby *S. leucogaster*. Wedge-tailed Shearwater *Puffinus pacificus* and Bulwer's Petrel *Bulweria bulwerii* have both been recorded offshore. Perhaps the most common regular migrant in these waters is the Red-necked Phalarope *Phalaropus lobatus*, often in very large numbers resting out at sea.

STRATEGY

To focus on the western sector of the site for developing wildlife-watching activities.

PROPOSED APPROACH

1. Enhance existing activities being conducted by local communities and tour operators.
2. Provide infrastructure to improve conditions for wildlife watching activities.
3. Develop new product concepts, for implementation by local communities or tour operators.
4. Promote partnerships between tour operators and local communities.

CONCEPT 1: A WALKING TRAIL FROM KAMPUNG BUNTAL TO KAMPUNG BAKO

BACKGROUND

Walking trails are a big attraction for tourists and locals who enjoy the outdoors. Kuching has very few walking trails of sufficient length and character, and the demand for more walking trails is high. The southern shoreline of the western sector bay is ideal for a walking trail, and is of suitable terrain to be usable for a wide cross-section of Kuching's resident population and visitors.

Depending on the time of year and tidal conditions, the experience will vary. Wildlife along this trail will also vary. Viewing of shorebirds and egrets is guaranteed at any time of the year, with obviously the monsoon months being the prime time to observe flocks of thousands of shorebirds in flight or feeding on the sandflats. Walking this southern shore of the bay is a highly-rated experience.

OBJECTIVE

Create a 7km nature walking trail for public use.

STRATEGY

A walking trail should be established along the southern shoreline of the bay between Kampung Buntal and Kampung Bako. The trail will be about 7km in length, and can be accessed from either village. Tour operators can arrange drop-offs at one village and pick-ups at the other village. The trail will have the following features:

1. Proper jetties at both ends (at the two villages) for tourists to cross the rivers (Sg. Buntal and Sg. Bako)
2. Boat ferry arrangements with both villages.
3. Boardwalks along certain sections which are within mangrove forests.
4. Bridges over creeks and swampy areas.
5. Rest-stops, with roofs and toilets.
6. An observation tower along the trail.
7. Marked access points to beach areas where tourists are permitted to walk out onto the sandflats.
8. Signage for directions, safety information and reminders on dos & don'ts.

PROPOSED ACTIONS

1. Map out the alignment for a walking trail with built facilities from Kampung Buntal to Kampung Bako.
2. Develop a concept for this trail, including boat jetties at either end of the trail.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This project will provide the first such walking trail tourism product in the whole of Malaysia.
- It will be a huge outreach initiative to the resident and visitor community of Kuching, and Sarawak, making one of Sarawak's (and Malaysia's) most scenic landscapes accessible to the general public under the auspices of an East Asian-Australasian Flyway Partnership Network Site.
- It will provide unprecedented opportunities for local, national and international publicity for BBB EAA Flyway Network Site.
- Benefits to both villages (Kpg. Buntal & Kpg. Bako) will be significant from direct tourism and service provision revenue.

Weaknesses

- The alignment of this trail will overlap with lands under several different land-owners, who would need to be brought into the partnership.
- Investments into the facilities (jetties, rest houses, bridges) may be significant, but not excessive.

- Maintenance of facilities requires long term investments.

Opportunities

- This concept presents an opportunity for several government and private sector agencies to form partnerships, particularly from the tourism industry.
- This project can become the flagship feature of BBB EAA Flyway Network Site, contributing to both national parks, the Santubong/Damai tourism destination and to local people.
- It can also demonstrate corporate partnerships and waterbird conservation in the State, in fulfillment of the EAAFP Global Strategy: promoting the forming of strategic partnerships with private sector companies and stakeholders to deliver better management of network sites.
- This can be a popular site for visiting dignitaries, international delegations and the conservation community, with opportunities for developing a visitor centre with facilities for bird watching and education activities.

Threats

- Providing public access to the beaches and sandflats within BBB EAA Flyway Network Site may cause environmental degradation through mis-use.
- Future development may be attracted to this prominent tourism feature, with hotels and restaurants emerging along the trail on privately-owned lands.

CONCEPT 2: A PERMANENT HIGH TIDE ROOST WITH BIRD OBSERVATION FACILITIES

BACKGROUND

Creation of man-made environments to attract birds is a strategy that has been used all over the world with great success. Well-managed man-made sites can sometimes exceed natural sites in terms of the abundance and diversity of the birds that use them. This strategy is widely used for wetland species, and is globally recognised as a major contributor to bird conservation, and to the wise-use of wetlands.

The established usage of the aquaculture ponds by the wintering birds provides an ideal opportunity to undertake such an approach in the BBB EAA Flyway Network Site. There are several sites suitable for restoration and which could then be managed as roosts for shorebirds.

Most of the 82 species of waterbirds recorded in the BBB EAA Flyway Network Site have been recorded in aquaculture ponds at some point. Some species use aquaculture ponds regularly; others infrequently. There are a few species that do not use aquaculture ponds at all.

This concept expands on another concept presented in this Dossier, i.e. to restore and manage a selected aquaculture pond to serve as a high tide roost within the BBB EAA Flyway Network Site. This concept adds the building of facilities for bird observation to enable birdwatchers and tourists to visit the site. Adding bird watching facilities at a managed pond does not have to be at a pond that is solely for conservation purposes. It can be implemented at any other pond which is managed for birds. The decision on whether to combine the management of a pond for both birdwatching and bird conservation may be considered on a case-to-case basis.

OBJECTIVE

To build facilities that enable birds to be observed without disturbance.

STRATEGY

A suitable site should be identified as a bird observation site.

The facilities to be constructed should include:

1. Screens along all areas where visitors arrive, assemble, walk, approach and stand/sit to observe birds.
2. Screens should be of sufficient height to completely shield visitors from being seen by roosting birds.
3. Materials used should be suitable for the climate, be resistant to strong winds and must last at least 3 years before they need to be replaced. Local materials are ideal. If the materials are painted, the colours should be appropriate.
4. One or two bird hides should be built continuous with the screens, such that visitors approaching the hide cannot be seen by birds.
5. Hides should be designed appropriately, with appropriate materials.
6. Approaches to the hides should be paths (or boardwalks) that do not create noise when used, and shielded from birds.
7. Assembly areas (and car parks) should be of sufficient distance from the bird roosting areas, so noise and vehicles do not disturb the birds. Vehicles should be able to approach within 100m of the roost area.
8. Toilets and rest areas should be available at appropriate distances from the birds.

PROPOSED ACTIONS

1. A feasibility assessment should be conducted to determine the appropriate location for such a facility.
2. A full detailed plan of execution should be prepared, including full costing, long term management responsibilities and resource allocations.
3. A full-time management team should be established, so that the site can be managed full time, with permanent presence of staff.
4. Construction of hides and screens should be done at the appropriate times of the year, so as to not disturb roosting birds.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This project will create a man-made environment designed specifically to attract the largest number of birds and attracting the highest diversity of species. This differs from the other concepts (restoring dis-used ponds, or managing active ponds) by being completely created right from the start.
- This concept therefore can be designed for exactly the species of waterbirds targeted, for example, Chinese Egrets. In this way, this site can be highlighted as a concerted conservation action for the most priority species that use BBB EAA Flyway Network Site.
- The security of the site from poaching and human disturbance is guaranteed.

Weaknesses

- The primary challenge would be the costs of designing, locating, building, operating and maintaining such a facility.

Opportunities

- This entire facility can be the flagship Visitor Centre for BBB EAA Flyway Network Site, incorporating administration offices, educational centre and restaurants or other visitor facilities.
- Wetland restoration is frequently packaged with mainstream development these days, with major wetland centres around the world being man-made environments within, or close to, cities. This concept has the opportunity to be positioned as a major wetland creation project.
- Developing partnerships with corporates, universities and educational institutions, businesses and NGOs will enhance the value of this site for public and research use. This also demonstrates fulfillment of the EAAFP Global Strategy: promoting the forming of strategic partnerships with private sector companies and stakeholders to deliver better management of network sites.

Threats

- The development of the site can impact on the overall BBB EAA Flyway Network Site.

CONCEPT 3: SUPPORT FOR BOAT-BASED ACTIVITIES IN BBB EAA FLYWAY NETWORK SITE

BACKGROUND

Existing use of boats for recreational purposes within the BBB EAA Flyway Network Site can be divided into the following categories:

ACTIVITY	DESCRIPTION
Sea cruising	• The primary purpose is to experience a boat ride on the sea and rivers. Sunset watching and opportune sightings of wildlife such as birds, crocodiles or dolphins are a bonus. Cruises follow specific routes. • Many locals with boats participate in this activity, and many have invested in more and larger boats out-fitted to take tourists out. • Tour Operators – several companies (and resorts) have boats for cruising.
Wildlife watching	• The primary purpose is to observe wildlife. Depending on time of day, or tide conditions, cruises change routes depending on the type of wildlife that is sought-after. These cruises focus on bird watching, crocodiles, dolphins and fire-flies. • Both locals and tour operators conduct such cruises, often combining it with leisure cruising as above.
Sport fishing	• The primary purpose is a fishing expedition. These trips are conducted overnight, or sometimes over several nights at sea. • Many local fishermen participate in this, with their boats out-fitted for this purpose. This activity is primarily run from Muara Tebas in the eastern sector of the BBB EAA Flyway Network Site. • There are some private boat owners who take fishing groups out.

Boat operators use the basic facilities at the villages to take tourists out. There are no proper facilities for locals to use for boat-based tourism in the area. There are no regulatory frameworks under which such tourism activities can be managed, enhanced and brought to a higher standard. Higher standards deliver a) better quality viewing of landscapes and wildlife, thus delivering better experiences to tourists; b) better safety that prevents accidents and incidences damaging to the tourism industry; and c) better protection and care afforded to the wildlife and natural features of the site, thus ensuring long term sustainability of the attractions themselves.

OBJECTIVE

To support the boat-tourism industry within BBB EAA Flyway Network Site.

STRATEGY

The strategy is not to replace the existing tourism, but to enhance it through identifying the needs of the operators, and providing the necessary support to increase the quality of the experience.

Some of the needs of the industry are:

1. Identification of new routes that boat cruises can use, in new areas.
2. Provide locals and tour operators with the necessary information on the natural attractions they are taking tourists to see, such as what species of birds are there. This increases the quality of the interpretation, which ultimately defines the quality of a nature-based tourism experience.
3. Provide locals and tour operators with guidelines on how to conduct nature tours with wild animals, especially dolphins and crocodiles. Adhering to rules of conduct is important to maximise viewing experiences, minimise impacts to the animals, and ensure the total safety of tourists at all times.

4. Provide boat cruises operators with the appropriate training in conducting tours and using the guidelines in place.
5. Built facilities such as jetties in appropriate locations for use by locals and tour operators. This would include seeking the best financial arrangements for each purpose-built facility.

PROPOSED ACTIONS

1. Conduct an assessment of the boat tourism industry in the BBB EAA Flyway Network Site, in order to develop a comprehensive understanding of its drivers, investors, challenges and solutions.
2. Develop a strategic development plan to enhance the boat tourism industry, which covers all partners, practitioners, investors and also the users from all sectors.

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This project will limit the impacts of sea-based tourism on the attributes of BBB EAA Flyway Network Site, primarily the sea life that uses the site, and the roosting site for birds.
- The guidance provided will also ensure the sealife, particularly cetaceans, will continue to use the site and therefore continue to be attractions within BBB EAA Flyway Network Site.
- It will also add to the value of interpretation of nature within BBB EAA Flyway Network Site, resulting in increased tourism, and consequently, increased income levels amongst locals.

Weaknesses

- A significant education and public awareness investment will be required amongst all stakeholders within and in the immediate vicinity of BBB EAA Flyway Network Site for this concept to be successful with good buy-in from locals.
- Significant resources towards training for boat operators and nature guides will be required.

Opportunities

- Packaging this concept within a sustainability approach for BBB EAA Flyway Network Site adds value to the management approach for EAA Flyway Network Sites, in line with the EAAFP's global strategy. Bringing economic benefits to local communities and stakeholders is a vital component of wise use and effective management of conservation network sites.
- Demonstrating benefits to local communities will increase acceptance, and build confidence in the state's efforts to conserve this site.

Threats

- No threats identified.

SUSTAINABLE USE

5

BAKO BUNTAL BAY

East Asian-Australasian
Flyway Network Site

Branding Concept for Bako Buntal Bay

BACKGROUND

The BBB EAA Flyway Network Site has been defined by its use by migratory birds. However, the site is also very important for other socio-economic activities. The fisheries industry within the Network Site is significant, agricultural produce is exported internationally from the site, and there is significant tourism activity. The long-term sustainability of any conservation-focussed site must successfully integrate the ecological features of the site with the human use of the site.

Managing landscapes (and specific sites) for conservation values is a major challenge for developing countries. Managing human activities and resource use in conservation landscapes is an even bigger challenge. The underlying reason for this is under-developed governance systems. Sarawak is no exception.

Given this scenario, undertaking wise-use concepts to integrate waterbird conservation, tourism and resource use within the BBB EAA Flyway Network Site is challenging. A simple and pragmatic approach is required. The best system will undoubtedly fail simply because it does not have the governance model to support it. Adopting a government-led (and designed) approach is also unlikely to succeed because it will not have the elements of long-term investment applied to the projects. Adopting the alternative, i.e. a community-led approach, is also unlikely to succeed because of lack of informed and trained leadership, lack of capital for start-up and lack of capacity to sustain the initiatives.

The most practical approach to start-up integration projects would be to first integrate the "players" at a governance level, and build into the structure an incentive and investment portfolio. This means having to demonstrate the tangible benefits to each potential partner (individuals or groups) right from the start.

Phasing the implementation of this approach is also important. In developing economies, people need to be convinced of the success and benefit before they will participate. Companies need to see clear financial benefits before they commit investments.

A branding concept is presented here, to deliver on creating an identity for the BBB EAA Flyway Network Site and everything that is collected, made and used there.

A Branding initiative is a simple and non-controversial strategy that binds everything that is taking place within the BBB EAA Flyway Network Site into one identity. It revolves around a visible symbol. This can be a logo, a label or a sign. The chosen symbol represents several things:

- *It represents products that come from a specific place, in this case, the BBB EAA Flyway Network Site.* Processed seafood, agricultural products and aquaculture products that are harvested from within and adjacent to the BBB EAAFP will carry this symbol on their packaging.
- *It represents activities and services that take place within and adjacent to the BBB EAA Flyway Network Site.* Tour operators can use this symbol to promote their tour packages. Walking trails are branded with the symbol. Homestay operators, hotels, restaurants and shops within and adjacent to the BBB EAA Flyway Network Site can display the symbol at their premises.
- *It represents a conservation initiative for birds.* This means a concerted messaging that the BBB EAA Flyway Network Site is a place that brings people, industry and government together to conserve birds in one area. It encourages people to purchase products to support this effort, and it generates awareness that such an effort exists in Sarawak.

Some of the products originating from the BBB EAA Flyway Network Site and its vicinity that could be part of a product labelling programme are: Fish/shrimp/crab-processed products (crackers, cakes, balls), Razor Clams (Ambal), dried Fish, squid and shrimp, fresh fish, fresh shrimp, fresh crabs and processed jellyfish.

Some of the nature-based activities in the BBB EAA Flyway Network Site that could be part of a product labelling programme are: Walking Trail (The "Made for Birds Trek"), and Dolphin-watching tours.

Table 8: THE BENEFITS OF BRANDING INITIATIVE BUILT AROUND BBB EAA FLYWAY NETWORK SITE

ISSUE	BUSINESS AS USUAL	NETWORK SITE LABEL
Each product originating from the BBB EAA Flyway Network Site is recognised as a product but its origin is not known to the consumer.	· Brand loyalty is to the manufacturer	· Builds brand loyalty for the BBB EAA Flyway Network Site. · Does not compete with existing brands, but adds value to them.
	· Local producers only supply manufacturers	· Labels reward local producers through a chain of custody. · Companies seek out labelled producers.
	· Local communities are anonymous suppliers	· Local communities receive recognition through the label. · Companies seek out labelled supplies.
Sustainability of the harvest (e.g. ambal, jellyfish, etc.) is not guaranteed	· Collection of produce remains opportunistic, unregulated and potentially damaging to the BBB EAA Flyway Network Site	· Harvesters receive recognition (and a price premium) for their products. · Harvesters agree to sustainable harvesting methods and practices. · Conservation values of the BBB EAA Flyway Network Site are better used, remain undamaged. · The BBB EAA Flyway Network Site can provide resources indefinitely (sustainably).
	· Consumers are not aware of the importance of the BBB EAA Flyway Network Site as a source of products	· Consumers become aware that the products they buy come from a well-managed BBB EAA Flyway Network Site. · Consumers become aware that buying this labelled product contributes to conserving Sarawak's most important waterbird site.
Profits from products originating from the BBB EAA Flyway Network Site should fetch higher prices (there is currently no economic value attributed to the BBB EAA Flyway Network Site)	· Market pricing is based on product, and not where it comes from	· Higher pricing of labelled products justified by their contribution to conserving Sarawak's biodiversity (benefit to waterbirds), and raising economic benefits to local communities (benefit to local people). · The BBB EAA Flyway Network Site receives more attention (benefit to government).
	· Sustainable practices at the network site receive no financial benefit to villagers or companies	· Villagers and companies that participate in the product labelling initiative receive increased income. · Sustainable practices become known, and are replicated elsewhere.
	· The BBB EAA Flyway Network Site has no public presence/identity to those who purchase products originating from it.	· Consumers have a sense of contributing to the conservation of a Sarawakian network site by purchasing labelled products. · The BBB EAA Flyway Network Site receives more recognition (and attention) amongst Malaysians.
Tourism activities in the site do not deliver tangible and direct benefits to all the people living within the BBB EAA Flyway	· Walking tours, boat rides, dolphin watching or bird watching are activities marketed around the activity	· Visitors who pay for tours are made aware that they are not only going to watch dolphins, but are visiting a place where dolphins are protected. Likewise for birds, walking tours, etc. · Visitors are educated on the conservation efforts being undertaken at the BBB EAA Flyway

ISSUE	BUSINESS AS USUAL	NETWORK SITE LABEL
Network Site	itself, and not where it takes place.	Network Site, including why it is important, and how they are contributing towards this effort.
Conservation efforts at the BBB EAA Flyway Network Site are known (recognised & appreciated) by a very small informed audience	· Conservation efforts are part of the State's usual activity, with no national or international attention.	· Conservation efforts receive wider attention. · The BBB EAA Flyway Network Site itself receives wider attention and appeal. · Visitor numbers increase over time. · New opportunities present themselves to improve the site, its birds and its socio-economics, bringing increased benefits to local communities and businesses.

OBJECTIVE

To create a recognisable brand label for the BBB EAA Flyway Network Site to showcase its wise use.

STRATEGY

The strategy to develop and implement a branding programme for the BBB EAA Flyway Network Site has three basic components, each briefly described below.

PROGRAMME COMPONENT	BRIEF CONCEPT OVERVIEW
Designing the Branding programme	· A label that identifies a product as originating from the BBB EAA Flyway Network Site, or an activity that takes place there. · A document that describes how the programme will be implemented, including how revenue is generated and distributed. · A cooperative organisation that will manage the programme. · A regulatory protocol for compliance and participation in the branding programme.
Implementing the Branding programme	· Establishment of the branding (labelling) organisation. · Developing sustainable practices for each activity in the BBB EAA Flyway Network Site that delivers products that can be labelled, or brings visitors to the site. · Engaging with villagers, farmers, companies to change their practices to comply with label.
Promoting the Brand	· A communications & marketing programme to promote the label.

The key strategic achievements within the first year are to a) achieve participation of some villagers and companies in this programme; and b) demonstrate market presence of the labelled products.

The programme will grow slowly and cannot be expected to deliver large profit increases immediately. Getting the participation of the local community should be the first focus. Beyond that, the focus needs to be expanded to include more individuals, as well as communities and companies.

PROPOSED ACTIONS

1. Commission the design of a labelling programme for the BBB EAA Flyway Network Site that incorporates the key products that originate from the area. A selected few products would be initially targeted, and this can be expanded to other products over time. *Note: an important element in designing this branding programme is to create a name for the programme. One of the challenges faced by the network site is its listed name: Bako Buntal Bay. This name is official, and used in all official documents and international listings. However, locally, it has two weaknesses: a) the name does not properly represent the entire Network Site, which causes confusion; and b) for the western sector of the network site, the name also causes conflict with the two villages names Bako and Buntal. For branding purposes, a different name would be ideal.*
2. Conduct detailed resource use assessments of the key products and activities, especially those that have impacts on the wintering waterbird populations, or on the habitats these birds depend upon. These assessments will produce recommendations for alternative collection or harvesting techniques that minimise or avoid disturbance or other negative impacts on wintering birds. Alternative methods may also include having closed seasons for certain products, e.g. using mudflats close to roosting sites for periods when the sites are most used.
3. Consideration of impacts should include other practices that indirectly impact bird populations, e.g. the dumping of diesel fuel from vessels in areas close to the mudflat areas that are important as feeding grounds for birds.
4. The design of such conservation-friendly practises should be discussed with locals, and their agreements obtained prior to finalisation of the programme.
5. Strategically phase the implementation of the programme, selecting parts of the programme that will begin first.
6. The communications component to this programme is vital to its success. Within the first three years of implementation, success should be demonstrated through increased incomes for those companies and villagers who participate.
7. Define the label with an attractive symbol, logo or phrase. The phrase should be brief, and capture the essence of the network site, e.g. ***Made for Birds***!

STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

Strengths

- This medium-term initiative will strengthen the footprint of BBB EAA Flyway Network Site, gradually gaining acceptance, recognition and a sense of belonging amongst the local community, business and other stakeholders in the area. This is a fundamental pre-requisite to long term sustainability of a conservation site within a development landscape.
- This will bring direct economic benefit to local people and businesses.

Weaknesses

- This concept has a strong human and social element, which is always a challenge when multiple parties and interests are present.
- A sustained and substantial investment of resources and human capital is required from all parties, but a lead agency is required to provide the initial start-up capital.
- This initiative has limited potential for private sector or corporate investment.

Opportunities

- This project will bring businesses operating within, and around, BBB EAA Flyway Network Site into the equation, over time. This is the best way to ensure the security of the site.

- This project will also serve as the basis to solve issues and problems, especially those involving human activity. Committees will be able to bring affected (and causative) parties to the discussion table to find amicable and viable solutions.

Threats

- The concept can be perceived as competition by some businesses, and be rejected.

ANNEX 1: Bako Buntal Bay Sustainable Use Concepts - Gantt Chart (2018-2022)

Managing Bako Buntal Bay for Wintering Waterbirds										
Concept	**Tasks**	**2018**	**2019**	**2020**	**2021**	**2022**	**Duration**	**% Complete**	**Budget (RM)**	**Assigned to**
1. CREATING & MANAGING MAN-MADE ROOSTING PONDS	1.1 Conduct a survey of all the aquaculture farms (in operation and abandoned)						1 year		20,000	SFC, FDS, Unimas, MNS
	1.2 Identify the best site for the creation of a permanent roost site.						1 year		10,000	SFC, FDS, Unimas, MNS
	1.3 Develop a restoration plan for this site.						2 years		40,000	SFC, FDS, Unimas, MNS
	1.4 Implement the restoration plan. Work should be undertaken outside of the migratory period.						2 years		30,000	SFC
2. PROMOTING MIGRATORY BIRD FRIENDLY PRACTICES AT SELECTED AQUACULTURE FARMS	2.1 Conduct a survey of all the aquaculture farms (in operation and abandoned)						2 years		20,000	SFC, FDS, Unimas, MNS
	2.2 Identify the best site for establishing a conservation agreement with the owner.						3 years		30,000	SFC
	2.3 The details of the contract / agreement between Sarawak Forestry Corporation (SFCSB) and the Farm Manager are subject to negotiation.						3 years		15,000	SFC, FDS, DOA
	2.4 Work with the farm manager to develop a plan to manage a selected number of ponds for roosting birds, at specific times of the day, week and month.						4 years		40,000	SFC, FDS, Unimas, MNS
	2.5 The plan should include monitoring actions, either by the farm workers or by SFCSB officers.						4 years		40,000	SFC, FDS, Unimas, MNS
3. CREATE A COLLABORATIVE PARTNERSHIP WITH THE SEJINGKAT POWER STATION	3.1 Initiate high-level engagement between SFCSB and SEB on this project.						1 year		20,000	SFC, SEB
	3.2 Develop a strategy for managing the ashponds for waterbirds.						1 year		30,000	SFC, FDS, Unimas
4. INCREASING ROOSTING STRUCTURES IN BAKO BUNTAL BAY	4.1 Prepare a feasibility assessment of the use of installed structures at specific sites to increase the "carrying capacity" of existing roosting sites.						1 year		30,000	DOA, Inland Fisheries
	4.2 Design the selected design of roosting structures, and the materials to be used.						2 years		30,000	DOA, Inland Fisheries
	4.3 Implement monitoring surveys at selected sites to develop baseline data on usage of the roosts, covering times of the year, and species that use the site.						5 years		50,000	SFC, FDS, Unimas, MNS

5. PROTECTING TREE ROOSTING SITES IN BAKO-BUNTAL BAY	5.1 Conduct a feasibility assessment of the three tree-roost locations, to determine the appropriate approaches and strategies to afford them the best possible protection.						3 years		30,000	SFC, FDS, Unimas, MNS
	5.2 Conduct more detailed monitoring surveys to obtain better quality data on the usage of these sites.						1 year		20,000	SFC, FDS, Unimas, MNS
	5.3 Design a participatory engagement strategy to engage and involve the communities and businesses close to these sites in a joint protection effort.						3 years		40,000	SFC, FDS, SPU, JKKK kg
	5.4 Investigate the introduction of special protection zones as a conservation tool in Sarawak.						3 years		30,000	SPU, MRPE, SFC, FDS
Managing Bako Buntal Bay for Wildlife Watching										
1. A WALKING TRAIL FROM KAMPUNG BUNTAL TO KAMPUNG BAKO	1.1 Map out the alignment for a walking trail with built facilities from Kampung Buntal to Kampung Bako.						1 year		30,000	SPU, MRPE, SFC, FDS, L&S, JKKK kg
	1.2 Develop a concept for this trail, including boat jetties at either end of the trail.						3 years		30,000	SFC, FDS, MTAC, JKKK kg
2. A PERMANENT HIGH TIDE ROOST WITH BIRD OBSERVATION FACILITIES	2.1 A feasibility assessment should be conducted to determine the appropriate location for such a facility.						1 year		30,000	SFC, FDS, Unimas, MNS
	2.2 A full detailed plan of execution should be prepared, including full costing, long term management responsibilities and resource allocations.						3 years		40,000	SFC, FDS, MRPE, MTAC
	2.3 A full-time management team should be established, so that the site can be managed full time, with permanent presence of staff.						3 years		60,000	SFC to source
	2.4 Construction of hides and screens should be done at the appropriate times of the year, so as to not disturb roosting birds.						3 years		60,000	SFC, FDS, MTAC, MRPE
3. SUPPORT FOR BOAT-BASED ACTIVITIES IN BBB EAAFP	3.1 Conduct an assessment of the boat tourism industry in the BBB EAAFP, in order to develop a comprehensive understanding of its drivers, investors, challenges and solutions.						2 years		30,000	JKKK of relevant villages/kgs, R&DOs, Kuching, Samarahan
	3.2 Develop a strategic development plan to enhance the boat tourism industry, which covers all partners, practitioners, investors and also the users from all sectors.						1 year		30,000	SFC, FDS, MTAC, MRPE, DBKU, SEB
Branding Concept for Bako Buntal Bay										
1. DESIGNING THE BRANDING PROGRAMME	1.1 Commission the design of a labelling programme for the BBB EAAFP that incorporates the key products that originate from the area.						2 years		30,000	SFC, FDS, MTAC, MRPE, DBKU, SEB

	1.2 Conduct detailed resource use assessments of the key products and activities, especially those that have impacts on the wintering waterbird populations, or on the habitats these birds depend upon.						1 year		60,000	SFC, FDS, Unimas, MNS, MTAC, MRPE
	1.3 Consideration of impacts should include other practices that indirectly impact bird populations, e.g. the dumping of diesel fuel from vessels.						1 year		20,000	SFC, FDS, Sarawak Rivers Board
	1.4 The design of such conservation-friendly practises should be discussed with locals, and their agreements obtained prior to finalisation of the programme.						1 year		20,000	SFC, FDS, JKKK kg
2. IMPLEMENTING THE BRANDING PROGRAMME	2.1 Strategically phase the implementation of the programme, selecting parts of the programme that will begin first.						1 year		20,000	SFC, MTAC, MRPE, SPU
3. PROMOTING THE BRAND	3.1 The communications component to this programme is vital to its success.						2 years		20,000	SFC, MTAC, MRPE, SPU
	3.2 Define the label with an attractive symbol, logo or phrase. The phrase should be brief, and capture the essence of the network site, e.g. ***Made for Birds!***						1 year		30,000	SFC, MTAC, MRPE, SPU
4. OTHER ASPECTS	4.1 Conduct a survey to determine the socio-economic status of the local community to inform the development of tourism plans in the area.						1 year		30,000	SFC, MTAC, MRPE, SPU, Unimas, R&Dos, local councils
	4.2 Infrastructure development should take into consideration the potential impacts on the ecological features of the Network Site.						3 years		30,000	SFC, FDS, SPU, MRPE, Unimas
	4.3 Give emphasis to the involvement of the local community in the implementation of the recommendations in this report.						3 years		25,000	SFC, FDS, R&Dos, DBKU, JKKK kg
	4.4 Training & capacity building for local communities, aquaculture operators						2 years		50,000	SFC, FDS, SPU, MRPE, Unimas, MNS
								Grand total:	1,170,000	