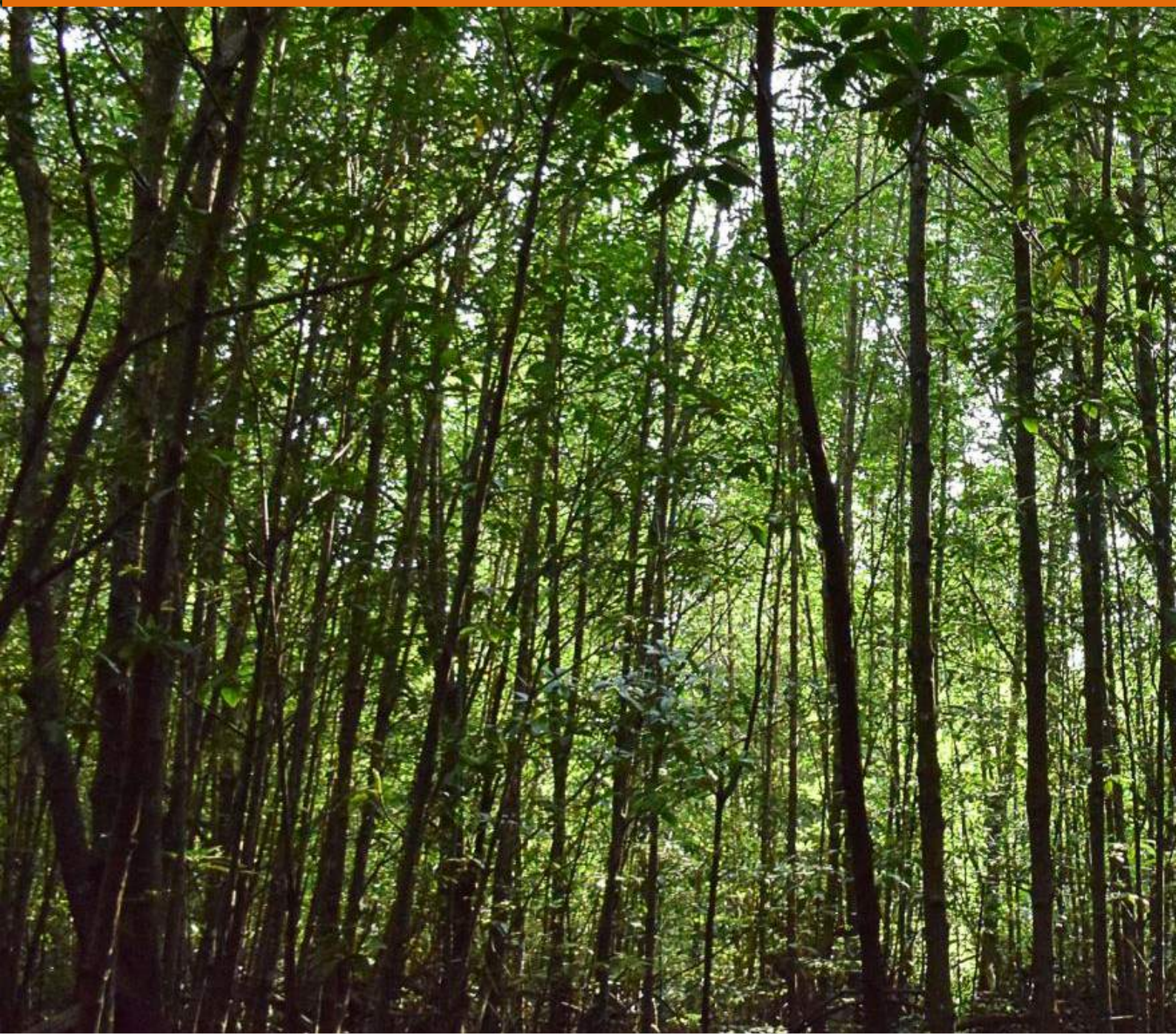
# The Kota Kinabalu Wetlands

## Management Plan, 2016-2025




# The Kota Kinabalu Wetlands Management Plan, 2016-2025

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In association with:

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Sabah Biodiversity Centre
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| | |
|---|---|
| CBO | Community-Based Organizations |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna or Flora |
| CMS | Convention on the Conservation of Migratory Species of Wild Animals |
| COP | Conference of the Contracting Parties |
| CSR | Corporate Social Responsibility |
| DBKK | Dewan Bandaraya Kota Kinabalu |
| DID | Department of Irrigation and Drainage |
| DO | Dissolved Oxygen |
| DOE | Department of Environment |
| EPD | Environmental Protection Department |
| GEF | Global Environment Facility |
| IUCN | International Union for Conservation of Nature |
| JPN Sabah | Jabatan Pelajaran Negeri Sabah |
| KPI | Key Performance Indicators |
| KKWC | Kota Kinabalu Wetland Centre |
| KUYS | Kolej Universiti Yayasan Sabah |
| LWSMC | Likas Wetlands Sanctuary Management Committee |
| MICE | Meetings, Incentives, Conventions and Exhibitions |
| MMWQCS | Malaysia Marine Water Quality Criteria and Standards |
| MNS | Malaysian Nature Society |
| MNRE | Ministry of Natural Resources and Environment |
| MTCE | Ministry of Culture, Tourism and Environment |
| NAHRIM | National Hydraulic Research Institute of Malaysia |
| NGO | Non-governmental Organization |
| PDRM | Polis Diraja Malaysia |
| PWD | Public Works Department |
| SaBC | Sabah Biodiversity Centre |
| SEDIA | Sabah Economic Development and Investment Authority |
| SEPA | Sabah Environmental Protection Association |
| SGF | Small Grants Fund |
| SGP | Small Grants Programme |
| SICC | Sabah International Convention Centre |
| STB | Sabah Tourism Board |
| STGA | Sabah Tourist Guides Association |
| SWCS | Sabah Wetlands Conservation Society |
| SWD | Sabah Wildlife Department |
| TRPD | Town and Regional Planning Department |
| UMS | Universiti Malaysia Sabah |
| UNDP | United Nations Development Programme |
| UNCED | United Nations Conference on Environment and Development |
| UNESCO | United Nations Educational, Scientific and Cultural Ogranization |
| WWF | World Wide Fund for Nature |

# Chapter 1
# INTRODUCTION

## 1.1 KOTA KINABALU WETLANDS

The Kota Kinabalu Wetlands (KKW) in Likas is one of the last remaining patches of once extensive mangrove forests that were found along the coastline of Kota Kinabalu. The inland forest remnant was once degraded but through conservation efforts, survives today as an isolated but healthy sample of the wetland ecosystem. Ten mangrove tree species exists within this patch of forest which serves as a refuge and breeding ground for over 90 species of birds (see Appendix III) and a host of other wildlife ranging from herpetofauna, fish, crustaceans, mollusks, and insects.

Located on the periphery of the highly urbanised areas of Kota Kinabalu (Figure 1-1), KKW covers an area of 24.194 ha. It is an important green lung for the city and plays a role in mitigating downstream flooding during heavy rainfall. KKW attracts both local and foreign visitors who can experience nature right at the doorstep of city. Every year, hundreds of students participate in activities organised at the wetlands on environmental awareness and nature education, which is centered on wetlands conservation. The KKW is now an important natural heritage for the city of Kota Kinabalu.

## 1.2 BACKGROUND AND HISTORY

Kota Kinabalu Wetlands was first designated as a Bird Sanctuary in September 1996 under the provision of the Sabah Land Ordinance (Sabah Cap 68) for 'Land Reserve for Public Purpose'. The Wetlands, which was then known as the Kota Kinabalu City Bird Sanctuary, was placed under the custodianship of the Sabah Wildlife Department. Its designation as a Bird Sanctuary aimed to help foster better understanding and awareness on the value of the Wetlands. Later in 1998, the Bird Sanctuary was gazetted as a State Cultural Heritage Site under the then, newly enacted, Cultural Heritage (Conservation) Enactment, 1997, recognising its importance as a heritage for the state of Sabah. This also provided the Wetlands with a second layer of protection as a conservation area. The Bird Sanctuary officially opened to the public in March 2000.

The Likas Wetlands project was itself initiated by the then Chief Minister of Sabah who directed the establishment of a committee, the Likas Wetlands Sanctuary Management Committee (LWSMC), to oversee and coordinate the planning and development of the wetlands. The committee comprised of 16 stakeholders representing government agencies, private organisations, community groups and local NGOs. WWF-Malaysia, who was a key member of this committee, served as the secretariat for the LWSMC. In 1997, WWF-Malaysia was tasked to develop a Development and Management Plan (SWCS, undated) to serve as a reference and guideline for the LWSMC.

In 2005, the Sabah Wetlands Conservation Society (SWCS) was established with the purpose of facilitating the establishment of a legitimate and accountable entity to manage the wetlands in an independent manner. With its establishment, the LWSMC was dissolved in 2006, and the custodianship over the wetlands was subsequently transferred from the Wildlife Department to SWCS. To better reflect its overall importance as a wetland ecosystem, the Kota Kinabalu City Bird Sanctuary was renamed as the Kota Kinabalu Wetlands Centre (KKWC).


Figure 1-1: Location of Kota Kinabalu Wetlands

## 1.3 SABAH WETLANDS CONSERVATION SOCIETY

The SWCS was established after the dissolution of the LWSMC. It is a registered non-governmental society. SWCS is responsible in overseeing the management of the KKW and the operation of the KKWC. SWCS's vision is to contribute towards the 'conservation and sustainable management of Sabah's wetlands', and its mission is 'to ensure protection and wise use of all wetlands in Sabah, through education, research and advocacy'.

This vision and mission is embodied in SWCS's three guiding objectives which are as follows:

1. To promote the conservation of wetlands in Sabah and the variety of plants, birds and other kinds of living organisms found in them;
2. To raise public awareness and appreciation of the wetlands and public involvement in protecting wetlands;
3. To manage Kota Kinabalu Wetlands as a model wetland centre for the purpose of conservation, education, recreation, tourism and research.

## 1.4 RAMSAR STATUS

The Convention of Wetlands of International Importance was adopted in the city of Ramsar, Iran in 1971. Commonly known as the Ramsar Convention, it provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources (Ramsar, 2011). The convention came into force in 1975 and is the only global international treaty that targets a specific ecosystem.

The main objective of the convention was to develop and maintain an international network of wetlands for conserving global biological diversity and maintaining ecosystem services that are important for sustaining human life. As of June, 2015, 2,208 Ramsar sites were listed worldwide covering an area of over 2.1 million square kilometers. Malaysia officially ratified the Ramsar Convention in March 1995 with Tasek Bera listed as Malaysia's first Ramsar site a year earlier. There are now six Ramsar sites in the country; four in Peninsular Malaysia and one each in the states of Sabah and Sarawak which cover an area of 134,158 ha.

Due to its importance as a wetland ecosystem with significant conservation and socio-economic value, the KKW was submitted for recognition as a Ramsar site under four listed criteria as follows:

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*Criterion 1: Wetlands of international importance due to representative, rare, or unique examples of a near-natural wetland type found within the appropriate biogeographic region.*

KKW is a particularly good representative example of a natural mangrove system, characteristic of the Borneo (Udvardy, 1975) biogeographical region and critical in maintaining local biodiversity due to the extensive loss of mangrove forests that once existed in the coastal Kota Kinabalu

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*Criterion 2: Wetland of international importance supporting vulnerable, endangered, or critically endangered species or threatened ecological communities.*

| Common Name | Scientific Name | IUCN Status | CITES Appendix | CMS Appendix | National Status* |
|---|---|---|---|---|---|
| Birds | | | | | |
| Lesser Adjutant | *Leptoptilos javanicus* | Vulnerable | - | - | Protected |
| Chinese Egret | *Egretta eulophotes* | Vulnerable | - | I | Protected |

.

*Criterion 3: Wetlands of international importance supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.*

KKW supports more than ten species of mangrove trees and a large diversity of animals including more than 12 species of fauna, 97 species of resident and migratory birds, 6 reptilian species like monitor lizards and mangrove skinks, 21 piscine species including mudskippers, archerfish, catfishes and halfbeak, 19 crustacean species such as mud lobsters and fiddler crabs, 13 molluscs species comprise of the class bivalves and gastropods, 2 species of chelirates 55 species of insects such as firefly and cicada and 1 species of Cnidaria.

*Criterion 8: Wetlands of international importance due to its role of as a source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.*

KKW is an important spawning and nursery ground for fish, prawn and crab. There are 21 species of fish, 19 species of crustacean, 13 species of molluscs, one species of horseshoe crab and one species of jellyfish (Cnidaria).

## 1.5 THE MANAGEMENT PLAN

This management plan documents the outcome of the management planning process for the KKW. The plan aims to be a tool to facilitate effective management of the wetlands, in particular on conservation and wise utilisation, and within the context of the wetlands as a Ramsar site. It will chart a development process over the course of 10 years, from 2016 to 2025. Specifically, this management plan aims to address the following objectives:

1. To define objectives of site management based on a shared vision among all stakeholders;

2. To address pressing issues and threats, including those originating from the surrounding area, and to rationalise these conflicts;
3. To describe management actions required to achieve the agreed management objectives;

4. To communicate and engage with stakeholders on the importance of the wetlands, also during development planning at the local level;

5. To source, obtain and utilise funding, and other resources effectively;

6. To develop the monitoring framework and strategies for adaptive management.

# Chapter 2
# A DESCRIPTION OF THE WETLANDS

## 2.1 INTRODUCTION

KKW is a natural mangrove swamp which is influenced by daily diurnal tidal changes. It receives freshwater from rainfall and from the surrounding watershed, from the west via a short concrete drain; from the south via a canal which runs along the boundary of wetlands; and from the east via a canal origin from a man-made pond. Both tidal events and freshwater flow affect the depth of water within the wetlands which varies from approx. 50 - 80 cm in the central areas of open water, to about 10-30 cm elsewhere, while the tidal range in the main drain is less than one metre (WWF-Malaysia, 1997). At this interface between land and sea, saltwater, freshwater and fluctuating water levels give rise to very inhospitable conditions where only highly adapted organisms are able to survive. Although not rich in tree species, mangroves are of major ecological importance, and considered as one of the most productive and biologically diverse ecosystems in the world.

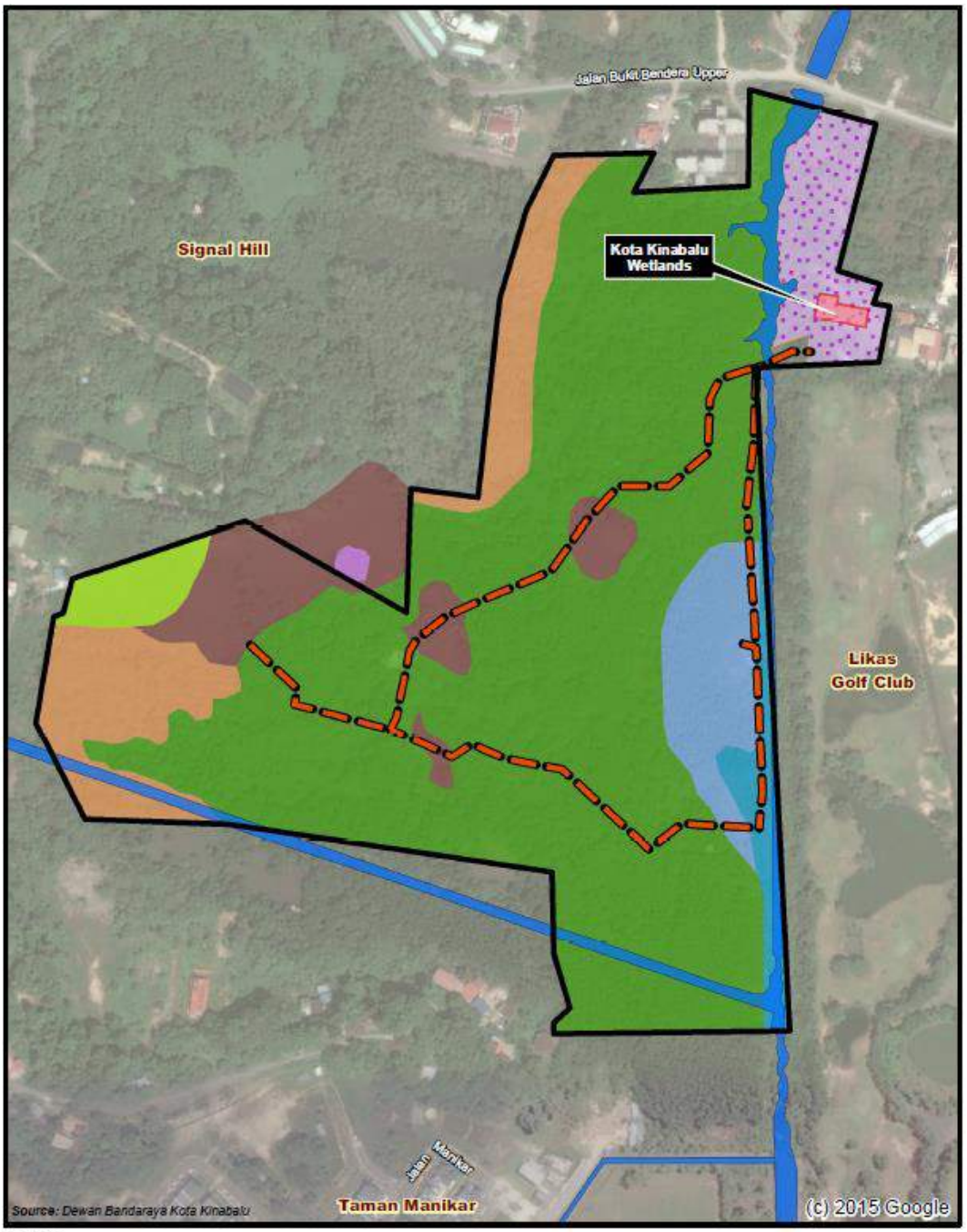
## 2.2 FLORA

KKW is a brackish water environment where the main vegetation type is mangrove forests. The mangrove can be separated into three distinct species specific belts that follow soil and inundation patterns (Figure 2-2). Firstly, in the riverine margins of the mangrove, sturdy mangrove pioneers such as *Avicennia marina* and *Avicennia alba* are predominant and occur together with Rhizophora trees. Within the swampy areas of the wetlands, *Rhizophora apiculata* and *Rhizophora mucronata* occur almost exclusively and is the most dominant vegetation type. However, along the western fringe of the KKW, Avicennia belts are found along the border of KKW. Other associates commonly found in these zones are *Brugueira cylindrica*, *Lumnitzera littorea, Lumnitzera racemosa* and *Sonneratia alba*.

Table 2-1: Mangrove and mangrove-associated species found in KKW

| COMMON NAME | SCIENTIFIC NAME |
|---|---|
| Bakau Minyak | *Rhizophora apiculata* |
| Bakau Kurap | *Rhizophora mucronata* |
| Api-api Putih | *Avicennia alba* |
| Api-api Jambu | *Avicennia marina* |
| Api-api Ludat | *Avicennia officinalis* |
| Perepat | *Sonneratia alba* |
| Teruntum Merah | *Lumnitzera littorea* |
| Teruntum Putih | *Lumnitzera racemosa* |
| Bakau Putih | *Bruguiera cylindrical* |
| Tengar | *Ceriops tagal* |
| Golden Leather Fern | *Acrostichum aureum* |
| Sea Hibiscus | *Hibiscus tiliaceus* |

Source: SWCS, 2012




LEGEND

- KK Wetland Boundary
- Boardwalk Corridor
- Car Park / Administration Area
- Waterways

Natural Vegetation

- Acrostichum (Mangrove Fern)
- Avi-Cum-Rhi-Bruguiera
- Avicennia
- Avicennia-Rhizophora
- Non-mangrove
- Rhizophora
- Sonneratia

0 100 200
metres

Figure 2-1: Distribution of Vegetation Types

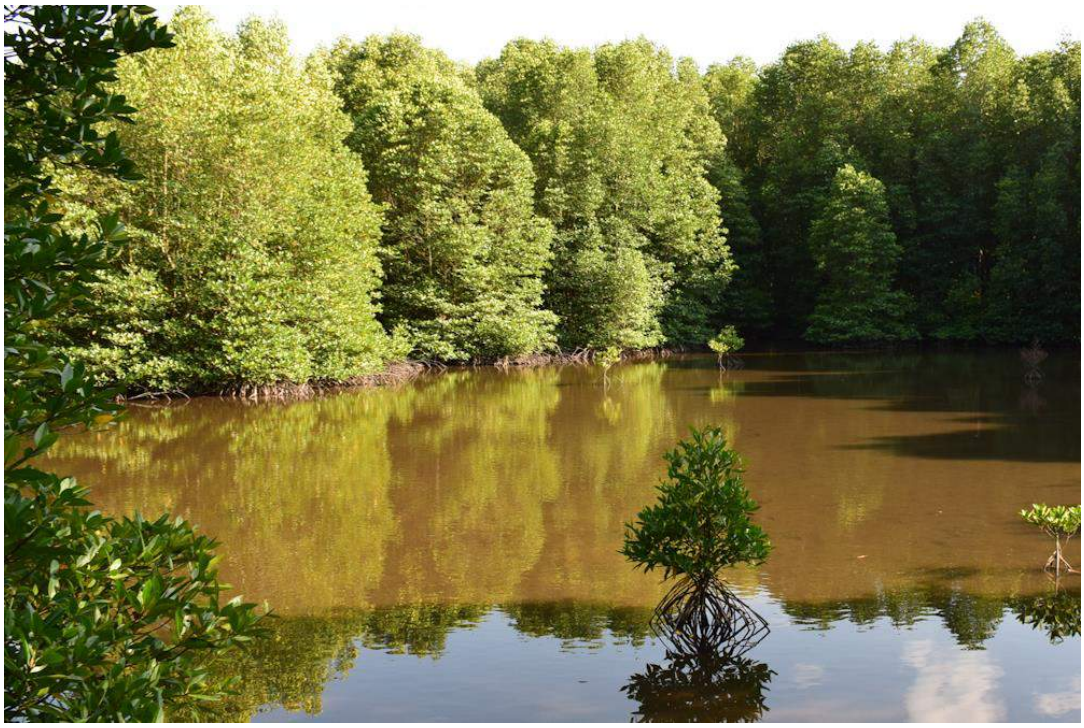


Plate 2-1: Rhizophora are generally dominant in the swamp areas

Plate 2-2: Avicennia can be found along the riverine margins

Plate 2-3: The seeds of some mangrove species germinate into a cylindrical propagule before dropping and lodging itself vertically in the muddy substrate below

Plate 2-4: The aerial roots of the mangrove tree is an adaptation to support the tree trunk and allow for respiration which is difficult in water-logged soil

Towards the land, mangrove-associated plants such as Sea Hibiscus (*Hibiscus tiliaceus*) and Golden Leather Fern (*Acrostichum aureum*) can be found along the fringe of the wetlands. The mangrove fern is often described as a pest as it usually predominates in areas that have suffered disturbances or clearing (Davison *et al.*, 1997). Other minor vegetation such as the sedge-grass communities and shrubs are found in areas where soils are poorly drained and water-logged. Flora within KKW are not listed as internationally protected or under the state, i.e. Sabah Wildlife Conservation Enactment, 1997. However, five of the mangrove tree species which occur here are Protected Plants listed in the Second Schedule (Part II) of the Wild Life Protection Ordinance of Sarawak State which has the same mangrove of characteristic Borneo i.e. *Sonneratia alba*, *Avicennia alba*, *Avicennia marina* and *Avicennia officinalis*.

## 2.3 FAUNA

### 2.3.1 Terrestrial Fauna

KKW has been an important refugee and breeding ground for many resident and migratory bird populations with more than 90 species recorded within this remnant mangrove habitat. Migratory bird populations flock to the wetlands during the northern winter periods while some make it a stopover to feed during their migration to the Australasian region. Two of the 90 species of birds found in the wetlands, which are the Lesser Adjutant (*Leptoptilos javanicus*) and Chinese Egret (*Egretta eulophotes*), are both classed as vulnerable under the IUCN Red List and are nationally protected.

Five species of the family Ardeidae (Egrets) have been recorded in the area which includes two species that are protected under Sabah Wildlife Conservation Enactment (1997) namely Little Egret (*Egretta garzetta*) and Intermediate Egret (*Egretta intermedia*). The wetlands are also a breeding ground for Purple Heron (*Ardea purpurea*) which is protected under Sabah Wildlife Conservation Enactment 1997. Other bird species found within the site and protected under the Sabah Wildlife Conservation Enactment (1997) are Grey Heron (*Ardea cinerea*), Striated Heron (*Butorides striatus*), Black-crowned Night Heron (*Nycticorax nycticorax*) and Brahminy Kite (*Haliastur indus*).

The Wetlands also supports a large diversity of other animals which include six reptilian species such as monitor lizards and mangrove skinks and 55 species of insects such as the firefly and cicadas. The full list of fauna species in KKW is shown in Appendix III.

Plate 2-5: The Intermediate egret browses the mudflats in search of food

Plate 2-6: The Mangrove skink soaks in the sun along the boardwalk

### 2.3.2 Aquatic Life

There are 21 fish species recorded in KKW such as mudskippers, gobies, eels and catfish, 18 crustacean species (mud lobsters and fiddler crabs), 13 mollusc species (bivalves and gastropods) and one species of jellyfish. Most of the fish species recorded in KKW are marine and brackish types which have a high tolerance towards fluctuations in water levels and salinity. Some aquatic life such as seabass, eels, mud crabs, clams and prawns are commercially important. The list of aquatic species in KKW is shown in Appendix IV.

## 2.4 THE KOTA KINABALU WETLANDS WATERSHED

KKW is located within a watershed encompassing an area of approx. 340 ha. The highest region within this watershed is Signal Hill, on the west of KKW, which rises to approx. 70m above sea level. Land use within the watershed is mainly dominated by residential and commercial areas, particularly on the eastern and south eastern regions.

Towards the north of the wetlands there are several high rise buildings namely Likas Square, Sabah Trade Centre, Wisma Perindustrian and a few existing (and under-construction) apartment blocks. Sports and recreational, and government buildings can also be found concentrated into the south of the Wetlands (Figure 2-2). Signal Hill which consist mainly secondary forests is relatively undeveloped although small orchards and residential buildings can be found particularly along the main road that leads up the hill.


Figure 2-2: Major Land Uses within the Watershed

## 2.5 FACILITIES AND ACTIVITIES

The KKW Centre comprises of a single-storey building with an administration office, library and audio-visual room. Its outdoor facilities include a 1.5-km boardwalk that takes visitors deep into the mangrove swamp (Figure 2-3). The boardwalk is integrated with an outdoor classroom, a bird-hide and observatory tower. KKW has a modern exhibition centre with themed exhibits on Ramsar sites, fauna and flora in mangroves, and the water cycle.

Bird-watching is a major attraction at KKW. A guidebook on birds found at the Wetlands is available and visitors can also rent binoculars. Guided tours of the mangrove can be arranged for visitors to experience the interpretative walk, mud walk, tree-planting activities or for guided bird-watching. KKW also receives students groups who do volunteer work such as the preparation of replanting sites and the collection of rubbish.

Through its environmental education programmes, KKW continuously educates people about the importance of mangrove conservation and the various uses of mangroves products. KKW runs environmental education programmes for a range of different target groups. It also conducts capacity building programmes for school teachers, leadership programmes for both primary and secondary school students, and public talks and other outreach programmes.

KKW's operation hours are from 8.00 am to 6.00 pm, from Tuesday to Sunday. It facilities are available also available for private companies and other NGOs to conduct meetings and workshops.

Plate 2-7: The boardwalk extends for 1.5 km into the mangrove

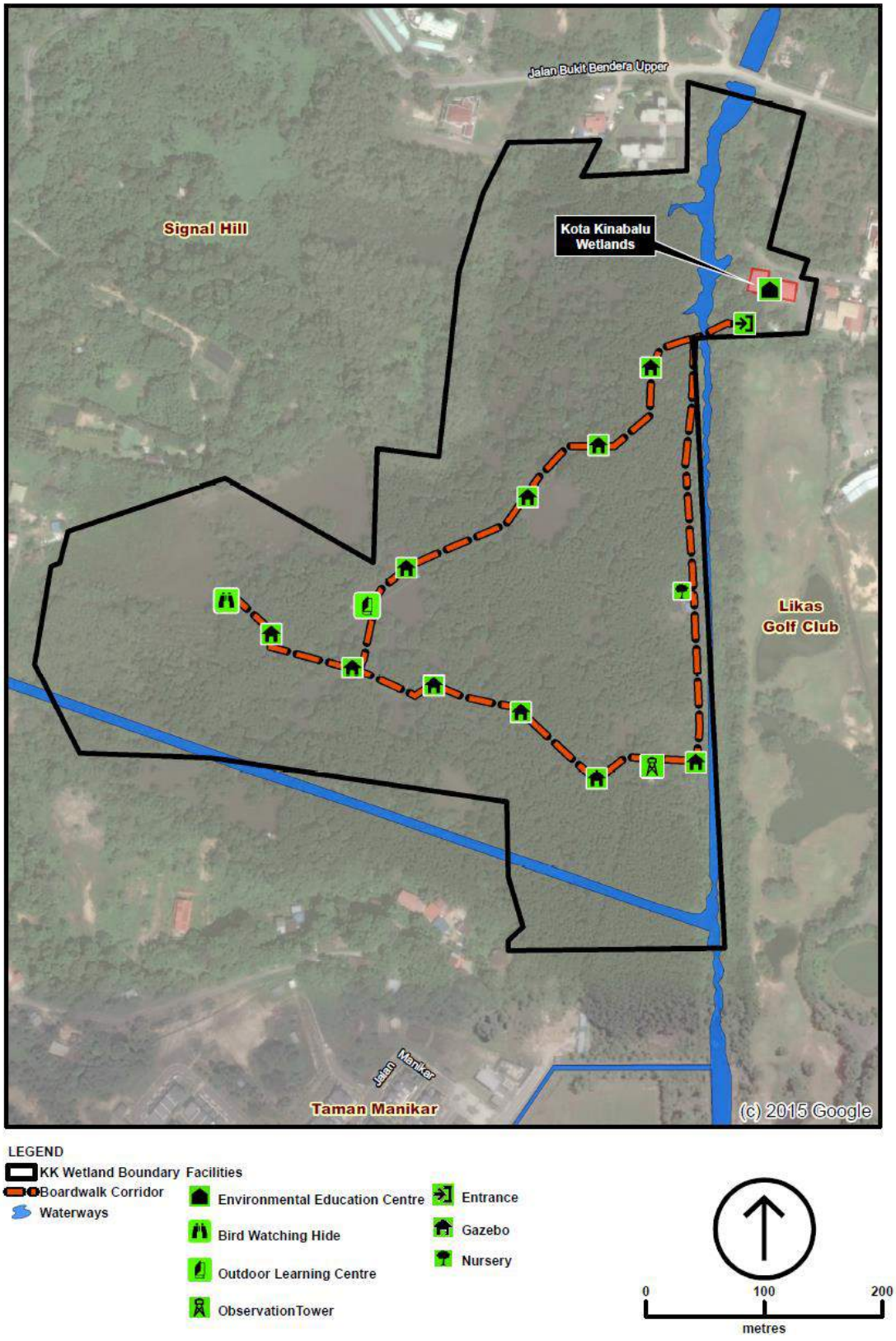



Figure 2-3: Location of Main Facilities

Plate 2-8: The outdoor classroom is used for environmental education programmes

Plate 2-9: The gravel trail – a walk in the mud for the more adventurous visitor.

# Chapter 3
# CHALLENGES

## 3.1 INTRODUCTION

KKW is a remarkable story of how a derelict site can be rehabilitated into a thriving habitat that today supports wildlife populations and serves as a recreational area and green lung for Kota Kinabalu. The early efforts undertaken by very dedicated individuals were instrumental in overcoming the initial challenges in establishing and rehabilitating KKW. However, KKW still faces many issues that affect its conservation value and sustainable utilisation.

## 3.2 FUNDING NEEDS

An analysis of financial accounts obtained from KKW over the past five years (i.e. from 2010 to 2014) shows that funding are comes from three major sources: donations, project grants and the conservation levy (Figure 3-1). Donations has formed the bulk of revenue over the last five years, however in some years, donations have been limited as collections are mostly in response to fund-raising activities. Project grants forms the second major source of funding but similar with donations, project grants are dependent upon the availability and ability to secure grants. The most stable form of funding is the conservation levy imposed upon visitors. Over the last five year, the conservation levy contributed between 8 to 26% of annual revenue.

Overall, KKW finances have remained healthy but neither stable nor sufficient which limits the ability of SWCS to support its operational and development needs as well as to do long-term planning and development. While the present staff capacity is sufficient to keep KKW Centre running, there is very little opportunity to develop full management capacity. Important tasks such as promotion and marketing, and stakeholder engagement are unfortunately not given the required attention.

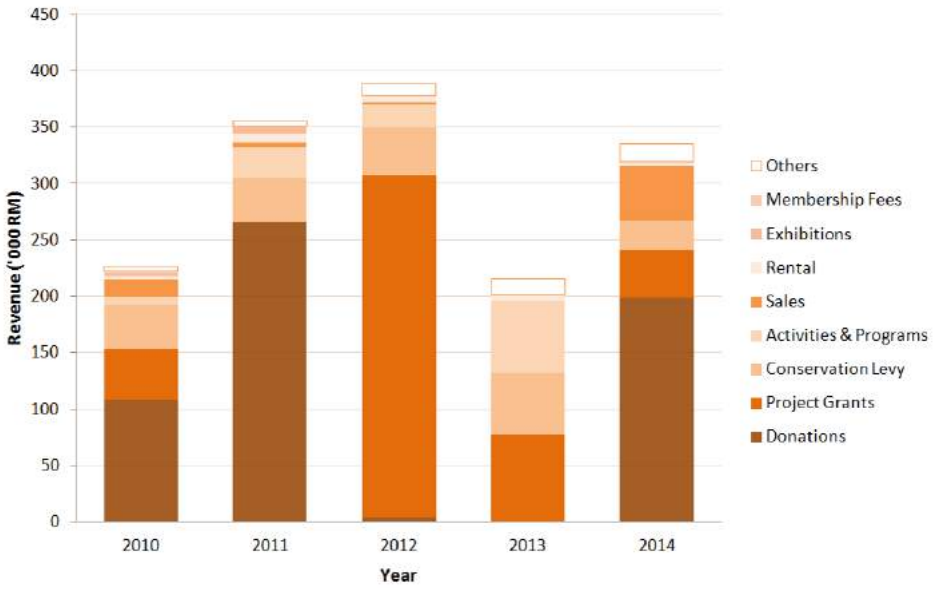
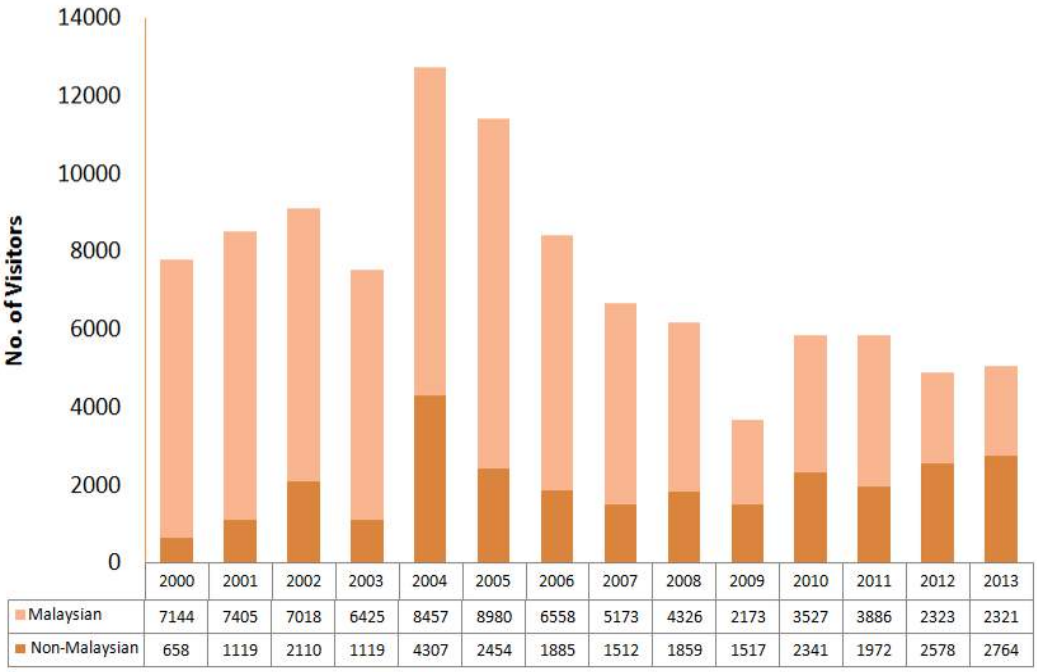


Figure 3-1: Sources of Funding from 2010 to 2014

## 3.3 DECLINING NUMBER OF VISITORS

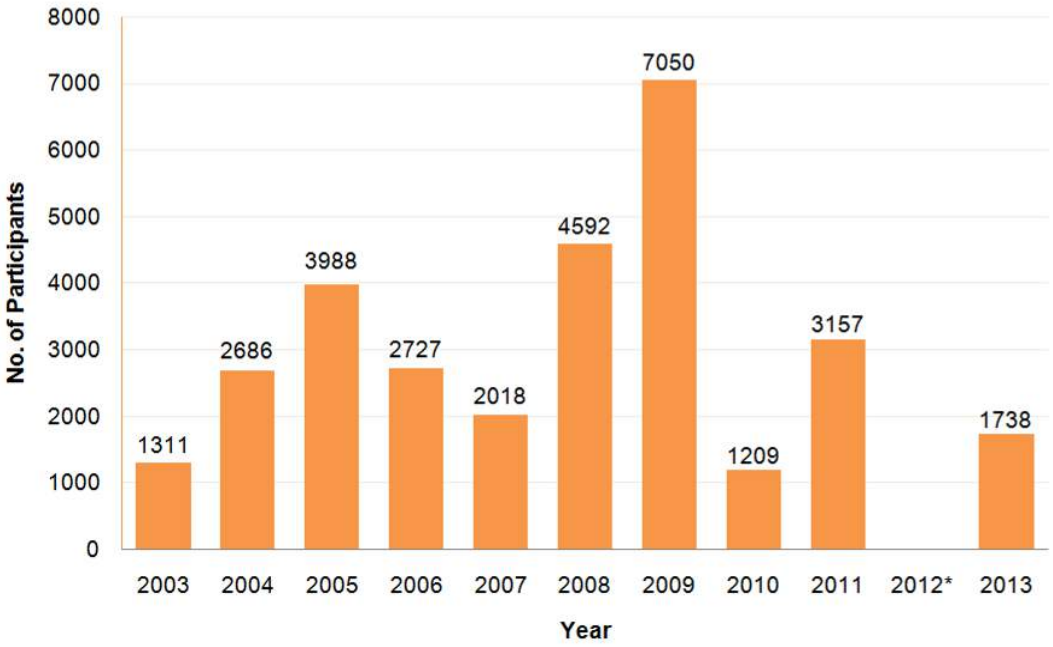
From visitor records obtained from KKW from 2000 to 2013, the number of visitors to the wetlands has been declining over recent years. From a peak of 12,764 visitors in 2004, visitor numbers have dropped to only 5,085 visitors in 2013 (Figure 3-2). This decline was more prominent among Malaysian visitors. It is difficult to pinpoint exactly the cause of lower visitor numbers; however KKW does suffers from a lack of visibility as a tourist destination among both local and international tourists. Although listed as a tourist destination on both local and international tourism web portals, is difficult to find printed publicity material on KKW at many tourist points such as the airports, hotels and tour agencies. Lower visitor numbers ultimately means that there is a lower collection of the conservation levy collected from each visitor which is a source of income for KKW.

Nature and environmental education has been a core function of KKW. In 2009, a total of 7,050 individuals participated in environmental education activities organised at KKW (Figure 3-3). However, there has been a decline since then which can be attributed to a decline in sponsored projects. The state of Sabah offers many environmental education sites that all compete for sponsored projects on environmental education. To become more competitive, KKW must leverage upon its niche of wetlands-related programmes. In addition, there are opportunities to offer such programmes for adult groups as well as tourists.




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Malaysian | 7144 | 7405 | 7018 | 6425 | 8457 | 8980 | 6558 | 5173 | 4326 | 2173 | 3527 | 3886 | 2323 | 2321 |
| Non-Malaysian | 658 | 1119 | 2110 | 1119 | 4307 | 2454 | 1885 | 1512 | 1859 | 1517 | 2341 | 1972 | 2578 | 2764 |

Figure 3-2: No. of Visitors from 2000 to 2013




*No data available for 2012

Figure 3-3: No. of Participants in Environmental Education Programmes from 2003 to 2013

## 3.4 MAINTAINING INFRASTRUCTURE AND FACILITIES

SWCS has been struggling to maintain the facilities at KKW which now require a significant input of funds. The boardwalk, which was funded by the Wildlife Department, needs to be replaced as it is now in constant need of repair (Plate 3-1). Other facilities such as the main entrance, car park and office building are no longer attractive and require an upgrade to make KKW more conducive to receive visitors and to conduct activities. In addition, KKW has experienced incidents where visitors were robbed of their belongings. For the small workforce at KKW Centre, it has been difficult for them to monitor the large site which is generally freely accessible to any intruder. The lack of security is therefore a concern as it not only puts visitors at risk but also the staff at KKW Centre.

Plate 3-1: Outdoor facilities deteriorate over time and are a safety concern among visitors

## 3.5 WATER POLLUTION AND HYDROLOGICAL IMPACTS

KKW is situated in an urbanised watershed from which it receives freshwater. Residential areas, such as Taman Manikar, Taman Prestij, and Taman Fantasi, and commercial areas, such as Likas Court and Ujana Sri Fantasi, are located just upstream of KKW. These areas are a source of sullage, sewage and solid waste which contribute towards the pollution of water which enters the wetlands (Plate 3-2). Sullage is considered as wastewater originating from kitchens, showers, and laundry which is high in organic matter and nutrients (such as phosphate and nitrate). Sullage should be discharged into the sewerage system, however many households and commercial premises discharge sullage directly into the drains. Sewage is also an issue due to poorly built toilets and individual septic tanks that have not been maintained which release untreated or partially treated wastewater.

As the watershed surrounding KKW becomes more urbanized, there can be an expected increase in impervious areas such as buildings, roads and car parks. During storm events, impervious areas result in a greater volume of rainwater being channelled into the river, with less discharge into the water table. Over the long term, this increases the risk of flooding events and the disruption of the freshwater and marine water interface, which is critical for the maintenance of the wetland habitat.

Plate 3-2: Water pollution such as oil and grease originate from the surrounding watershed that feeds into the wetlands

## 3.6 MAINTAINING THE WETLAND HABITAT

KKW was once degraded where the lost of mangrove trees resulted in enlarged mudflats. The mudflats are inundated during high tide and played an important role in attracting migratory water bird populations – a key feature of KKW (Plate 3-3). As the rehabilitated wetland continues its transition into a stable habitat, mangrove expansion will progress and result in the colonization of the mudflats (Figure 3-4). While this transition is a natural process, it will have impact on the existing fauna populations. There are many personal accounts that indicate that the population of birds has been declining over the years. Other populations may also be at risk, such as the small colony of fireflies whose habitat is restricted to only certain tree species.

In light of the loss of much of the wetlands in the surrounding areas, KKW remains an important refuge for wildlife and needs to be managed to ensure that these populations thrive. It will therefore be important to identify the right habitat components to ensure that the integrity of the wetlands is maintained while being able to support targeted wildlife populations. For example, there is a need to determine optimal tree cover *vs.* inundated mudflats to support water bird populations.

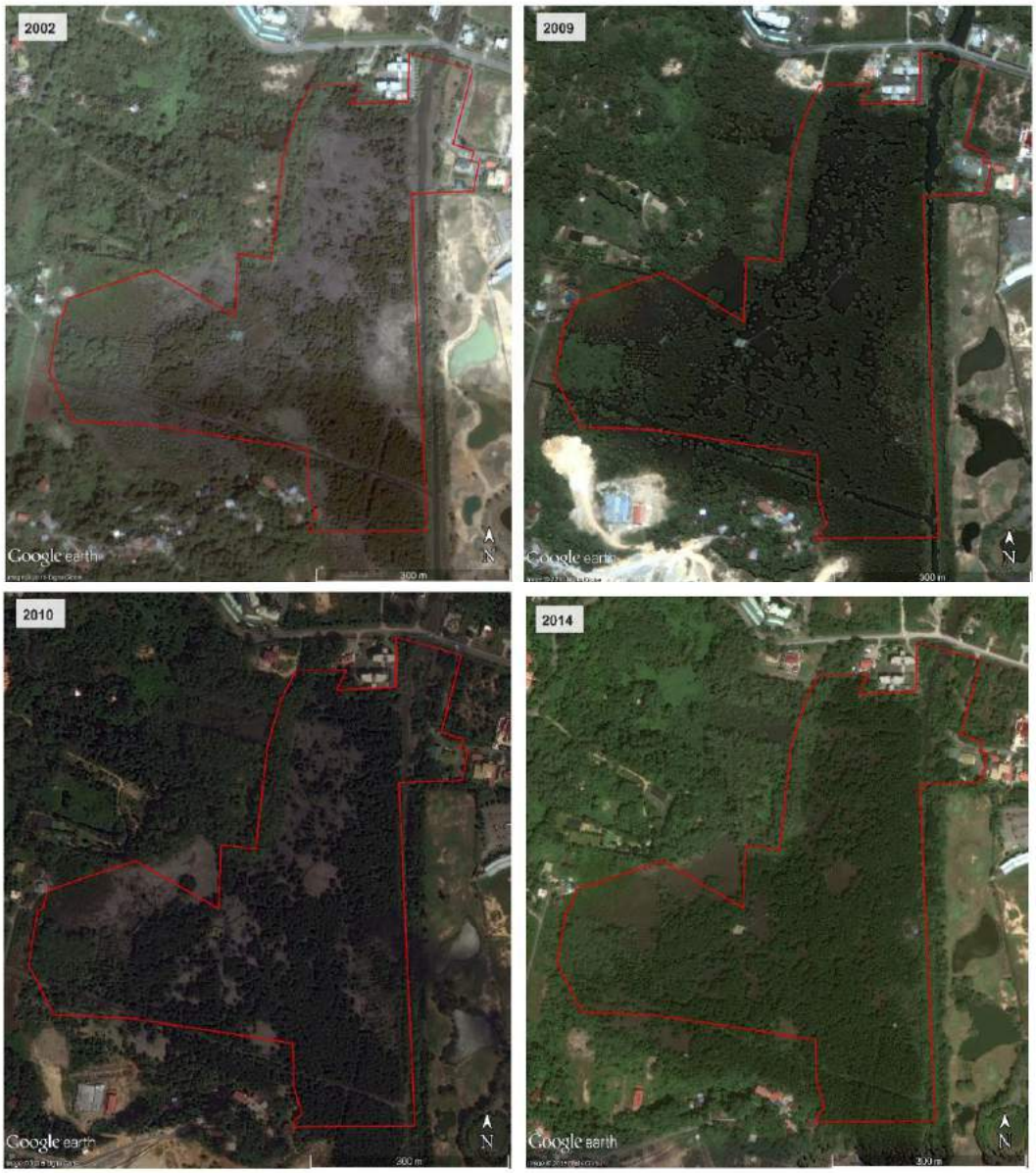



Figure 3-4: Satellite imagery showing change to vegetation cover from 2002 to 2014

Plate 3-3: The mudflats provide a range of food sources for bird populations

## 3.7 ILLEGAL HARVESTING OF RESOURCES

The harvesting of aquatic resources near the intertidal coastal area is still a common practice among many local communities throughout Sabah. Aquatic resources such as fish, crabs and shellfish are harvested at a small-scale for both personal consumption as well as a source of income. In habitats which are not protected and where harvesting is not regulated, this often leads to a decimation of the targeted resource. The protected habitat of KKW offers an abundance of certain aquatic resources and therefore regularly experiences encroachment by individuals or groups who set out to harvest these resources.

These individuals or groups are generally considered as non-traditional users (such construction workers from nearby work sites) who may or may not be aware that their actions are considered illegal. The harvesting of aquatic resources within KKW can threaten the health of the targeted aquatic populations and also result in the destruction of mangrove trees which are often cut down when illegal collectors try to gain access into the wetlands.

## 3.8 PRESSURE FROM URBAN DEVELOPMENT

KKW is one of the last few undeveloped lowland areas in Kota Kinabalu. While the site is now secure and protected from development, there is still intense pressure for redevelopment outside the catchment. In recent years, there have been many proposals to develop high-rise residential and commercial buildings near KKW which could be detrimental to bird populations. Birds are often killed when they crash into high-rise structures that are clad in glass, which they fail to see because the buildings reflect the sky, water or trees. Based on the Kota Kinabalu Local Plan 2010, about 65% of the land area within the KKW watershed has been demarcated for development and only 29% will be retained as open space and for landscape purposes (Table 3-1). The areas immediately surrounding

KKW have however been earmarked for low and medium density residential development (Figure 3-2).

Table 3-1: Future Land Use within the Water Catchment of KKW

| LAND USE | AREA (HA) | PERCENTAGE (%) |
|---|---|---|
| Government & Community | 43.6 | 12.8 |
| Open space and landscape | 99.4 | 29.2 |
| Commercial | 17.8 | 5.2 |
| Residential | 159.5 | 46.8 |
| Wetland | 20.7 | 6.1 |
| *Total* | *340.94* | *100.00* |

Source: DBKK, 2010

In the current draft of the Kota Kinabalu Local Plan 2020, a large part of the areas surrounding KKW has been designated as Special Residential areas which restrict development to only low density residences. Nevertheless, with demand for new residential and commercial spaces on the rise, it can be expected that there will still be attempts for redevelopment of the areas surrounding KKW.

## 3.9 COPING WITH CLIMATE CHANGE

The impacts of climate change are a long-term phenomenon that will affect coastal areas in the state of Sabah. A study by NAHRIM (2013) projected that Sabah will experience an increase in temperature of between 1.3 to 1.7°C and an increase of maximum monthly rainfall of 5.1% by 2050. It also projected that sea level will rise between 4.3 to 10.6 mm/year in 2100. For mangrove habitats, rising sea level will promote the growth of trees landward but with limited areas for expansion, some species will be displaced and lost.

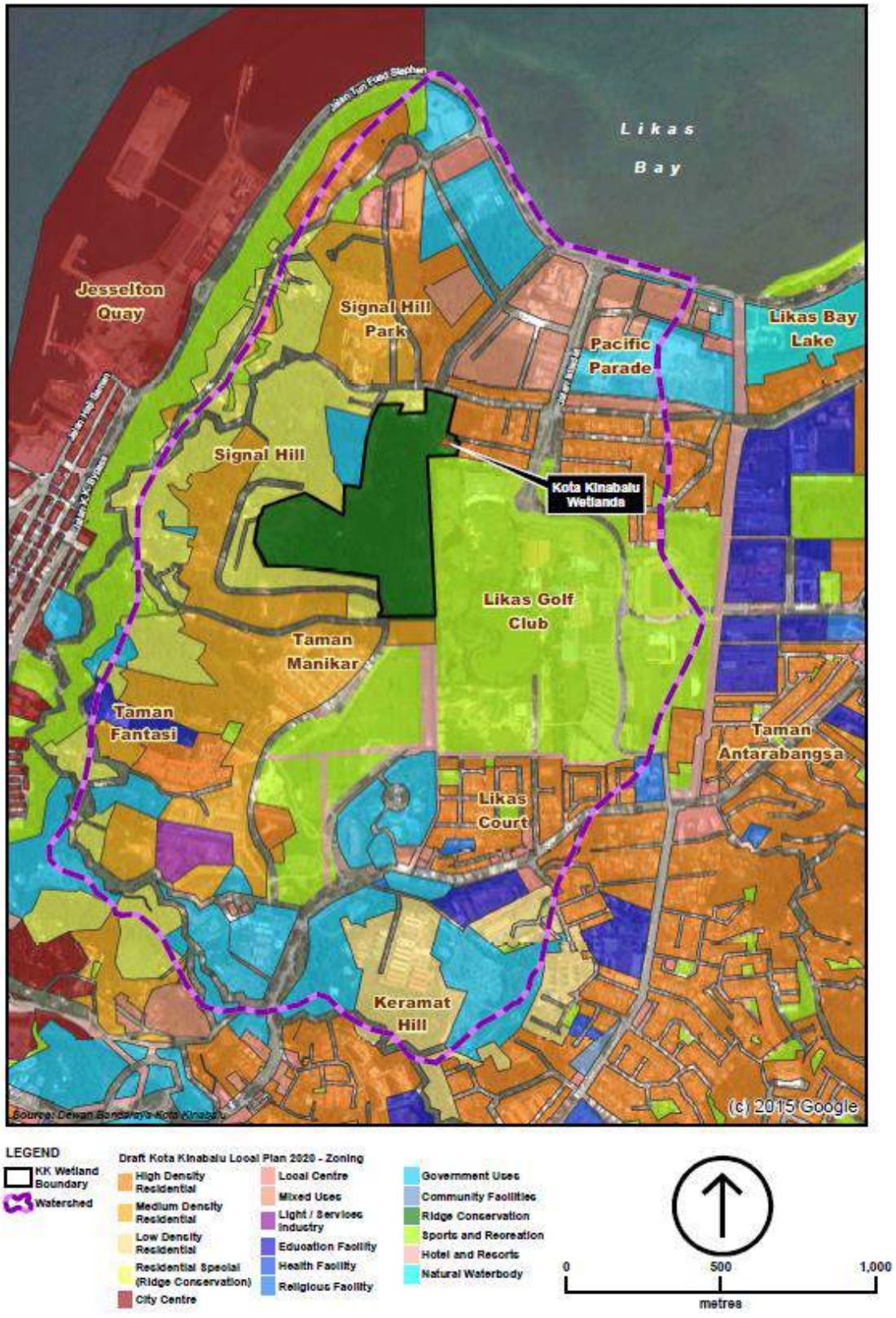



Figure 3-5: Future Land Uses Surrounding KKW

# Chapter 4
# MANAGEMENT OBJECTIVES

## 4.1 VISION STATEMENT

Previously, the KK Wetlands did not have a formal vision statement. However, the Sabah Wetlands Conservation Society (SWCS), as part of its objectives highlights the aim "to manage Kota Kinabalu City Bird Sanctuary as a model wetland centre for the purpose of conservation, education, recreation, tourism and research". Based on this intention, and feedback from stakeholder groups, the proposed vision statement for the KK Wetlands has been expanded as follows:

THE KK WETLANDS SHALL BE AN EXEMPLARY URBAN WETLANDS FOR THE PURPOSE OF CONSERVATION, EDUCATION AND TOURISM

## 4.2 MANAGEMENT OBJECTIVES

In general, this Management Plan aims to provide a framework to guide the site manager(s) in realising the vision of making KK Wetlands as an exemplary urban wetlands within Kota Kinabalu which is centred on sound conservation efforts, its role as a centre for environmental education, and as one of the city's key tourist attractions. There are four major components that will be addressed by this Plan:

1. Habitat and Species Conservation
2. Mitigating External Threats
3. Enhancing Environmental Education
4. Enhancing Tourism

The components address key areas that are by no means exclusive but aim to provide a clear and simple guide for management interventions. Each component will be guided by a management objective and key performance indicators (KPIs) which help define and measure progress towards achieving the management objective.

**What are Key Performance Indicators?**

KPI are quantifiable measurements that reflect the critical success factors of the interventions. If a KPI is going to be of any value, there must be a way to accurately define and measure it. Everything can be theoretically measured. But at the same time we have to be aware that we cannot always design indicators that will measure things perfectly. KPIs are there to give us information which helps us to make better informed decisions. It is about reducing uncertainty and it is therefore acceptable to use proxy indicators.

## 4.3 HABITAT AND SPECIES CONSERVATION

Management Objective 1

THE HABITAT AND RICHNESS OF FLORA AND FAUNA OF THE KK WETLANDS ARE SAFEGUARDED AND ENHANCED.

The integrity of the wetland ecosystem and the richness of flora and fauna at KK Wetlands must be adequately protected. This means that all the vital elements of the ecosystem, i.e. the biological community together with its abiotic environment, are intact and functioning. Efforts must be undertaken so that species diversity and richness is maintained and, where possible, enhanced.

Proposed Indicators:
1. Increase in species diversity among bird populations;
2. Increase in total annual or seasonal bird counts;
3. Increase in species diversity of aquatic populations e.g. fish, aquatic insects etc.

## 4.4 MITIGATING EXTERNAL THREATS

Management Objective 2

ALL EXTERNAL THREATS TO KK WETLANDS ARE REDUCED AND/OR MANAGED.

All the external threats must be identified and interventions put in place to reduce or manage these pressures. These include land use changes outside the wetlands that result in pollution that could threaten the water bodies, encroachment along its boundaries and the illegal harvesting of resources.

Proposed Indicators:
1. Improvements in water quality (Water Quality Index);
2. Reduction in the frequency of incidences of illegal entry.

## 4.5 ENHANCING ENVIRONMENTAL EDUCATION

Management Objective 3

ENVIRONMENTAL EDUCATION PROGRAMMES AT KK WETLANDS ARE EFFECTIVE

Environmental education programmes will remain as a core focus of the KK Wetlands. Education programmes must therefore be effective and memorable while reaching out to a larger audience. Participants who attend these programmes must feel that they have learnt something useful, understand about the wetlands and the environment, and last of all would have enjoyed the experience.

Proposed Indicators:
1. Increase in the total number of participants;
2. Increase in the number of repeat participants and/or organisers;
3. Increase in the participants' level of satisfaction.

## 4.6 ENHANCING TOURISM

Management Objective 4

KK WETLANDS BECOMES THE TOP DESTINATION FOR ALL TOURISTS TO KOTA KINABALU

KK Wetlands must be the place that every tourist to Kota Kinabalu wants to visit. In addition to dedicated group of nature lovers, the KK Wetlands must also cater to a diverse group of visitors with different intentions and expectations. The wetlands, its flora and fauna, the interpretation, visitor facilities and the whole experience must be such that everyone who comes to Kota Kinabalu desires to spend time at the KK Wetlands.

Proposed Indicators:
1. Increase in the total number of visitors;
2. Increase in positive feedback by visitors on tourism web portals;
3. Increase in rankings among other tourist destinations.

# Chapter 5
# THE ZONING PLAN

## 5.1 INTRODUCTION

A well-managed protected area is usually divided into zones where actions are prescribed based on management objectives set out which describes how the zone is expected to be utilised and where restrictions should be applied. Based on the vision and objectives proposed in the previous section, the zoning scheme will account for two main focus areas, (1) the area within the boundaries of KKW, and (2) the watershed where KKW is situated.

## 5.2 ZONING

For the areas within KKW, the zoning scheme is based on conservation and utilisation objectives. Six zones that were considered important have been identified and boundaries of the zones presented in this section are derived from inputs provided by SWCS and also a general understanding of the present wetlands habitat. However, a detailed on-the-ground survey would need to be carried out to determine the exact boundaries of the proposed zoning areas which are as follows:

1. Bird Habitat
2. Boardwalk Corridor
3. Education Zone
4. Rehabilitation Zone
5. Strict Conservation Areas
6. Administration Zone

For the watershed area, which is outside of the boundaries of KKW, the zoning scheme is based on land-use categories as identified in the Draft Local Plan for Kota Kinabalu 2020 produced by the Dewan Bandaraya Kota Kinabalu (DBKK).

## 5.3 BIRD HABITAT

HABITAT IS MANAGED AND ENHANCED TO CONTINUOUSLY SUPPORT RESIDENT AND MIGRATORY BIRD SPECIES.

The bird habitat zone is focused on the mudflat areas which are inundated during high tide which extends over an area of approx. 4.8 ha (Figure 5-1). The vegetation within this zone comprises of mangrove trees and more open areas where sparse shrub is found. It hosts the highest number of water-bird populations of both resident and migratory birds which use the habitat for feeding, nursing and resting grounds. The open areas are however expected to undergo succession where shrubs become denser and eventually mangrove trees take root. In the absence of any disturbances, open water may be lost which can affect the

overall attractiveness of the habitat for water-birds. It was therefore proposed that approx. 20% of the KKW is maintained as open water.

Management Prescriptions:

- The central area is off-limits except during maintenance
- No harvesting of plants is allowed
- No fishing or harvesting of aquatic resources is allowed
- Infrastructure development will be limited to the boardwalk and bird-hide which ideally is located along the periphery of the lagoon
- Research activities may be allowed
- Visitors will need to adhere to standard wildlife observation guidelines

## 5.4 BOARDWALK CORRIDOR

THE BOARDWALK AND ITS FACILITIES ARE ENHANCED TO PROVIDE A SAFE AND ENJOYABLE EXPERIENCE FOR VISITORS.

The boardwalk that extends into the mangrove is the most active area utilised by visitors. The boardwalk is important as it not only provides safe access into the wetlands but also regulates the movement and behaviour of visitors. The proposed boardwalk corridor consists of the boardwalk itself which is approx. 1.5 km in length and a buffer of 10m on both sides of its alignment, as well as the outdoor classroom and bird-hide (Figure 5-2). These facilities cover an area of approx. 2.0 ha. This zone area is considered a high-impact area where management interventions will need to be put in place to manage any negative impacts as a result of visitor use.

Management Prescriptions:

- No harvesting of plants along the corridor is allowed
- No fishing or harvesting of aquatic resources is allowed
- No visitors are allowed to step out into the mangrove except during replanting activities or other approved activities
- Visitors will need to adhere to standard wildlife observation guidelines

## 5.5 EDUCATION ZONE

EDUCATIONAL ACTIVITIES AND AWARENESS PROGRAMMES ARE PROMOTED WHILE ENSURING THESE ACTIVITIES DO NOT AFFECT THE ECOLOGICAL INTEGRITY OF THE WETLANDS.

The proposed education zone primarily encompasses the 500m gravel path located in the east of the Wetlands (Figure 5-3). It covers an area of approx. 2.3 ha. This zone is where visitors are able to interact closely with the mangrove habitat through activities such as guided nature walks, mangrove tree replanting and other physical activities. Similar with the

boardwalk corridor, this zone is considered a high-impact area where management interventions will need to be put in place. However, as opposed to the boardwalk zone, the gravel path would attract less visitors but at times be used be large groups. In the absence of any physical structures or path hardening, this zone will experience direct impacts from use.

Management Prescriptions:

- No harvesting of plants along the corridor is allowed
- No visitors are allowed to step out into the mangrove except during replanting activities or other approved activities
- The condition of the path (soil erosion and damage to vegetation) shall be monitored to avoid deterioration
- If remedial work is required, the path shall be closed until work is done
- Visitors will need to adhere to standard wildlife observation guidelines

## 5.6 REHABILITATION ZONE

REHABILITATION EFFORTS ARE TARGETED AT DEGRADED AREAS TO ENHANCE ITS ECOLOGICAL FUNCTION.

Some parts of the mangrove are unhealthy due to a variety of reasons which include poor soil conditions, inadequate water circulation and pollution. Continuous studies and assessments are required to determine contributing factors, after which rehabilitation efforts can be undertaken at the identified sites. Once rehabilitation is successful, this area will be rezoned for other uses or kept as a strict conservation area. The present target area for rehabilitation extends over 2.2 ha. (Figure 5-4). However, this area would consist of both healthy and degraded patches.

Management Prescriptions:

- This zone is strictly off-limits except when rehabilitation work is conducted
- Research activities may be allowed

## 5.7 STRICT CONSERVATION AREAS

THE CORE CONSERVATION AREA IS PROTECTED WHILE SUPPORTING RESEARCH ACTIVITIES ON THE WETLAND ECOSYSTEM.

The strict conservation zone comprises of the larger areas of the wetland located in the northern and southern regions of KKW (Figure 5-5). It covers 10.9 ha. which is almost 50% of the wetlands area. These proposed strict conservation area is currently not utilised for any activities and consist of very good forest stands. This zone is should be off-limits to visitors. At present, minimal interventions are required but these areas may be used for research activities as well as to collect seed stock for replanting activities.

Management Prescriptions:

- This zone is strictly off-limits
- Research activities may be allowed

## 5.8 ADMINISTRATION ZONE

A PROMINENT 'ENTRY STATEMENT' INTO THE WETLANDS IS ESTABLISHED WHILE ALL FACILITIES ARE CONDUCIVE, COMFORTABLE, AND ENVIRONMENTALLY-FRIENDLY.

This administration zone comprises of the entrance to KKW, office building, exhibition hall, and the car park (Figure 5-6). This zone is contained on a 0.7 ha plot. This zone is the entrance point that will lead and attract visitors into the wetlands. As a focal point, the administrative zone needs to be made prominent and attractive. Facilities should be comfortable, well-maintained and conducive for both staff members and visitors. The administration area must also integrate sustainability in its design and operation.

Management Prescriptions:

Nil

## 5.9 THE KOTA KINABALU WETLANDS WATERSHED

IMPACTS OF WATER POLLUTION FROM THE WATERSHED ARE REDUCED TO RAISE THE QUALITY OF WATER RECEIVED BY THE WETLANDS.

KKW receives its water from a highly urbanised watershed (Figure 5-7). One of the main concerns is the impact from sullage, sewage and other water-based pollution that flow into the wetlands from both residential and commercial areas. The local communities and business owners will therefore be a target of engagement programmes aimed at raising awareness and reducing activities that result in water pollution. The zoning scheme for this area will also be in accordance to land-use as designated in the Draft Local Plan for Kota Kinabalu 2020. Any development in these watershed areas will comply with the development requirements as stated in the Draft Local Plan which includes setback limits, building heights, development density and etc.

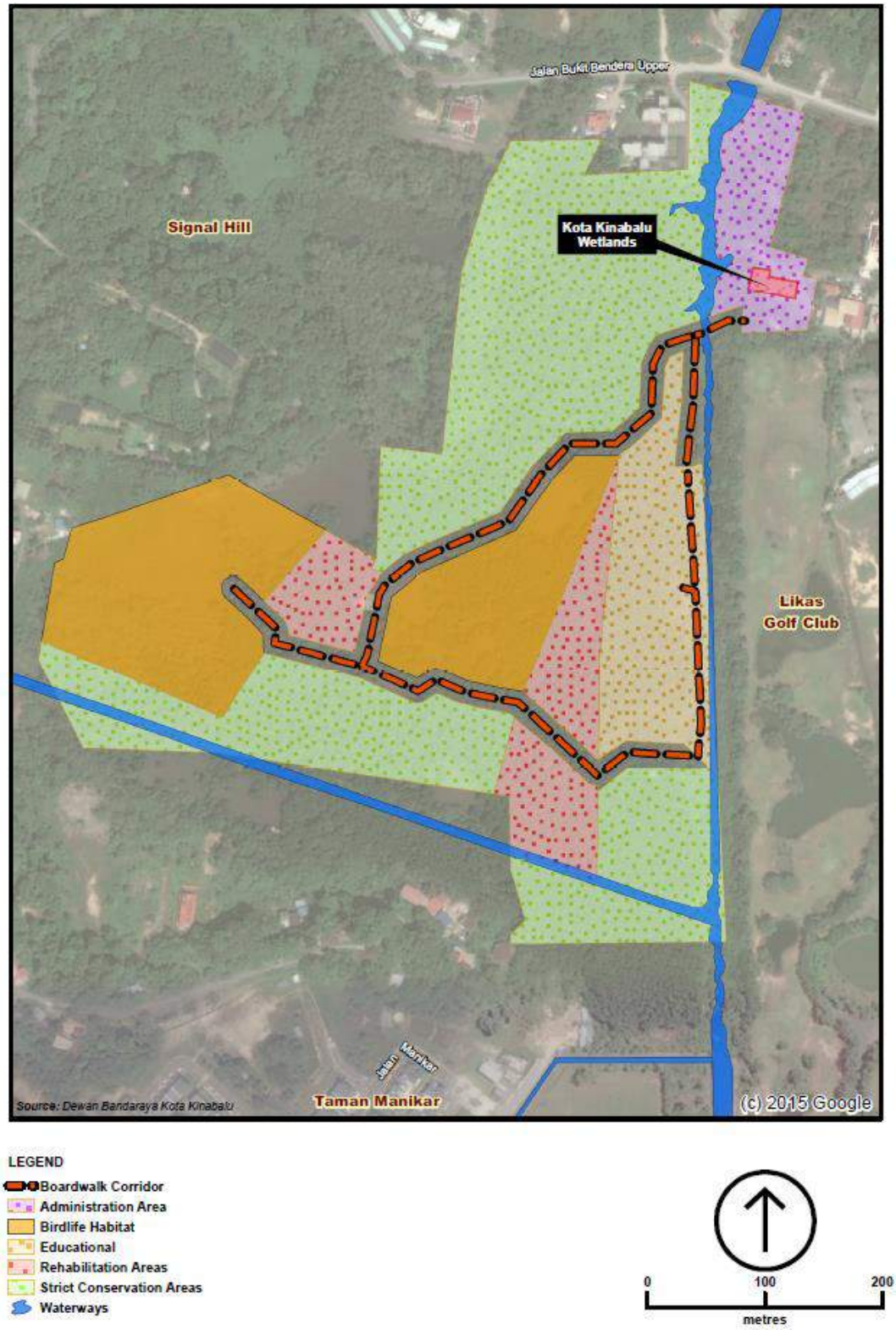



Figure 5-1: Bird Habitat

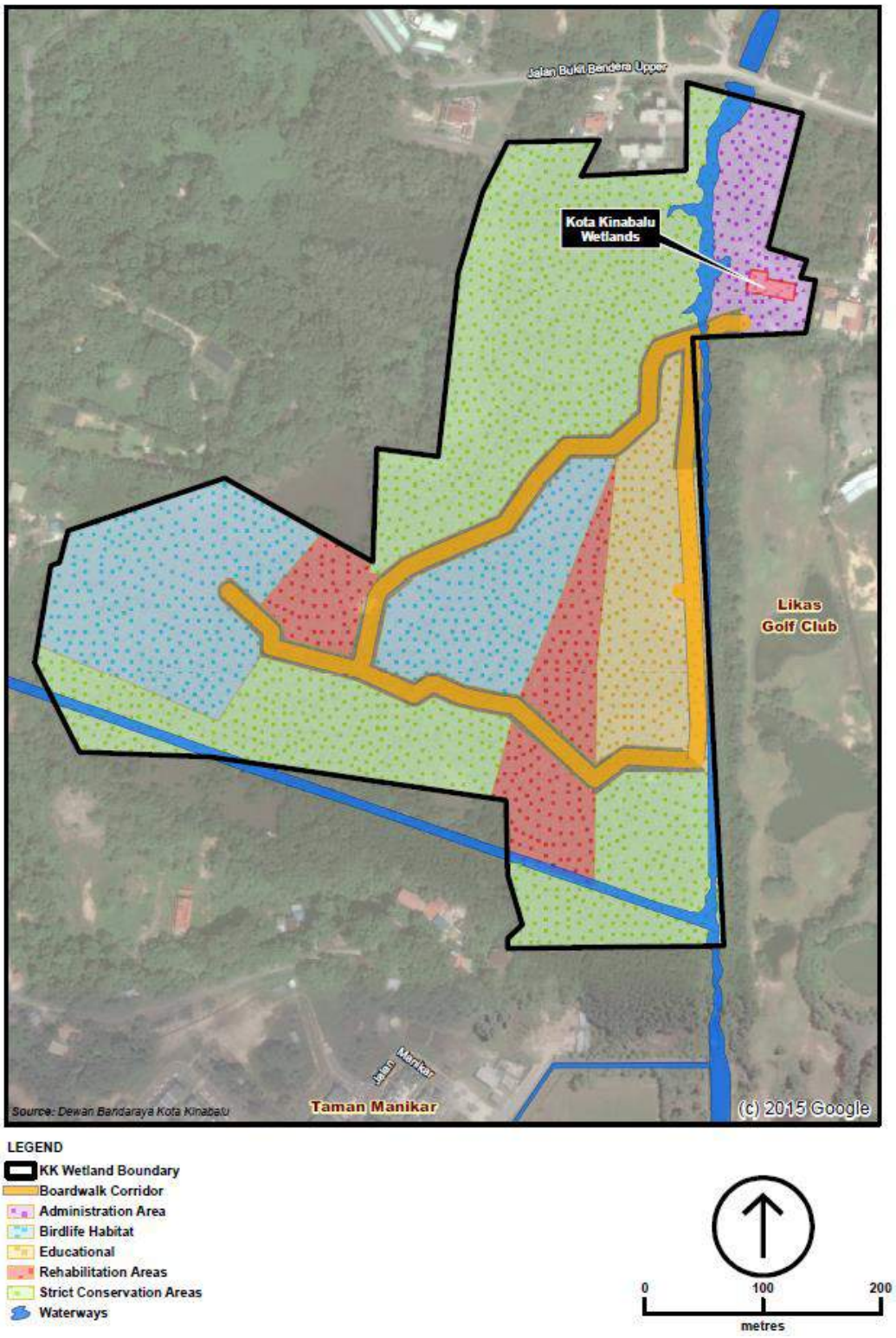



Figure 5-2: Boardwalk Corridor

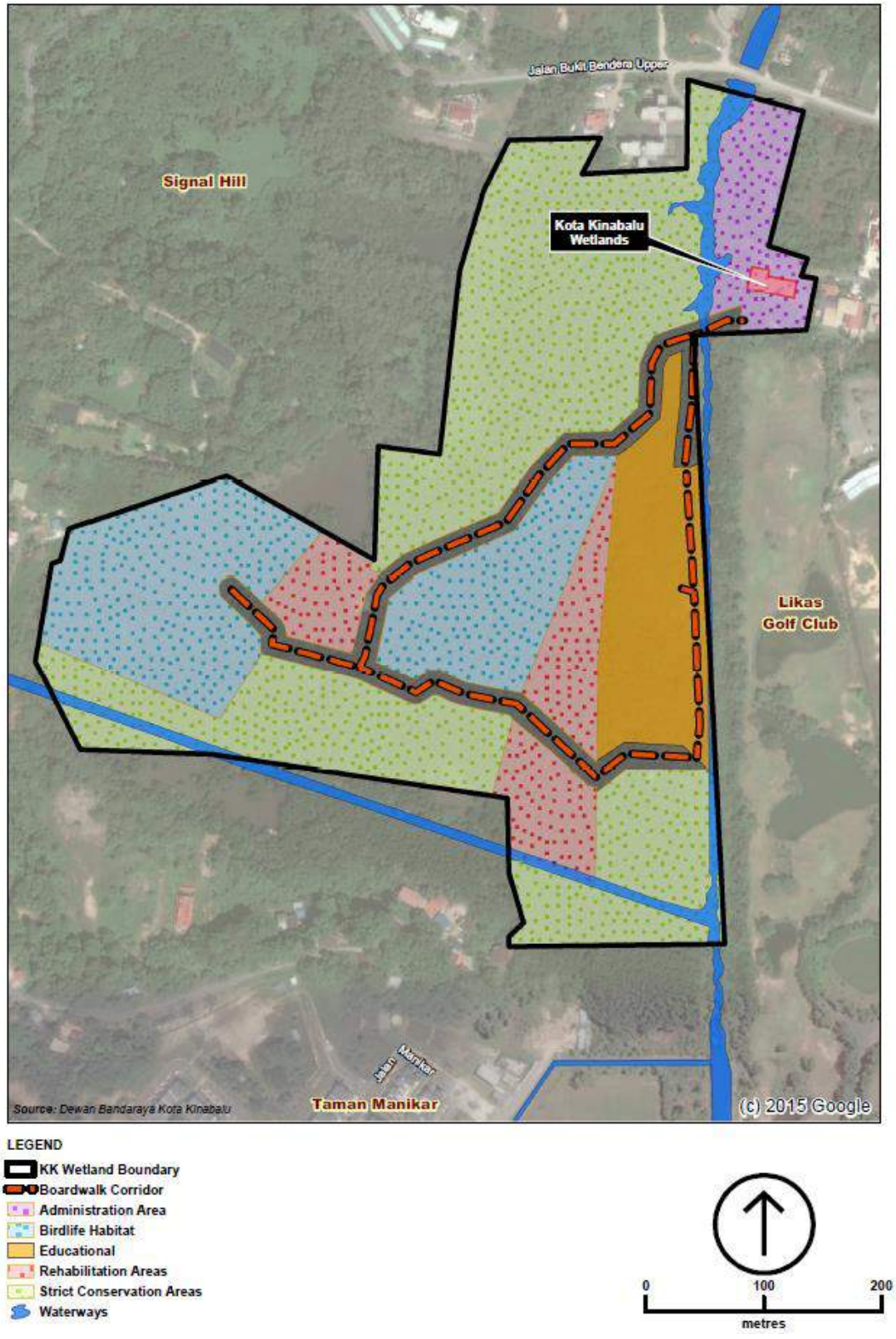



Figure 5-3: Education Zone

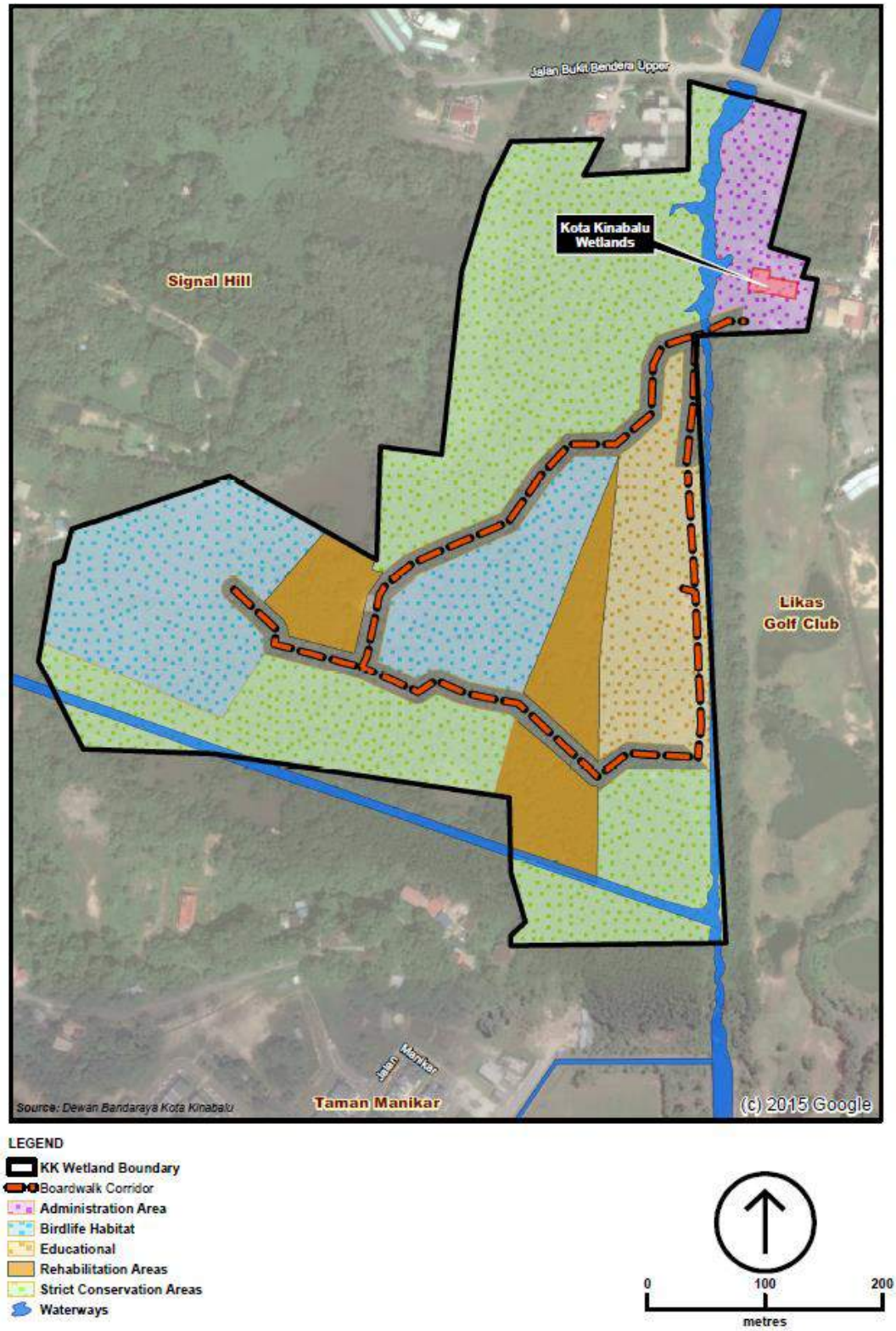



Figure 5-4: Rehabilitation Zone

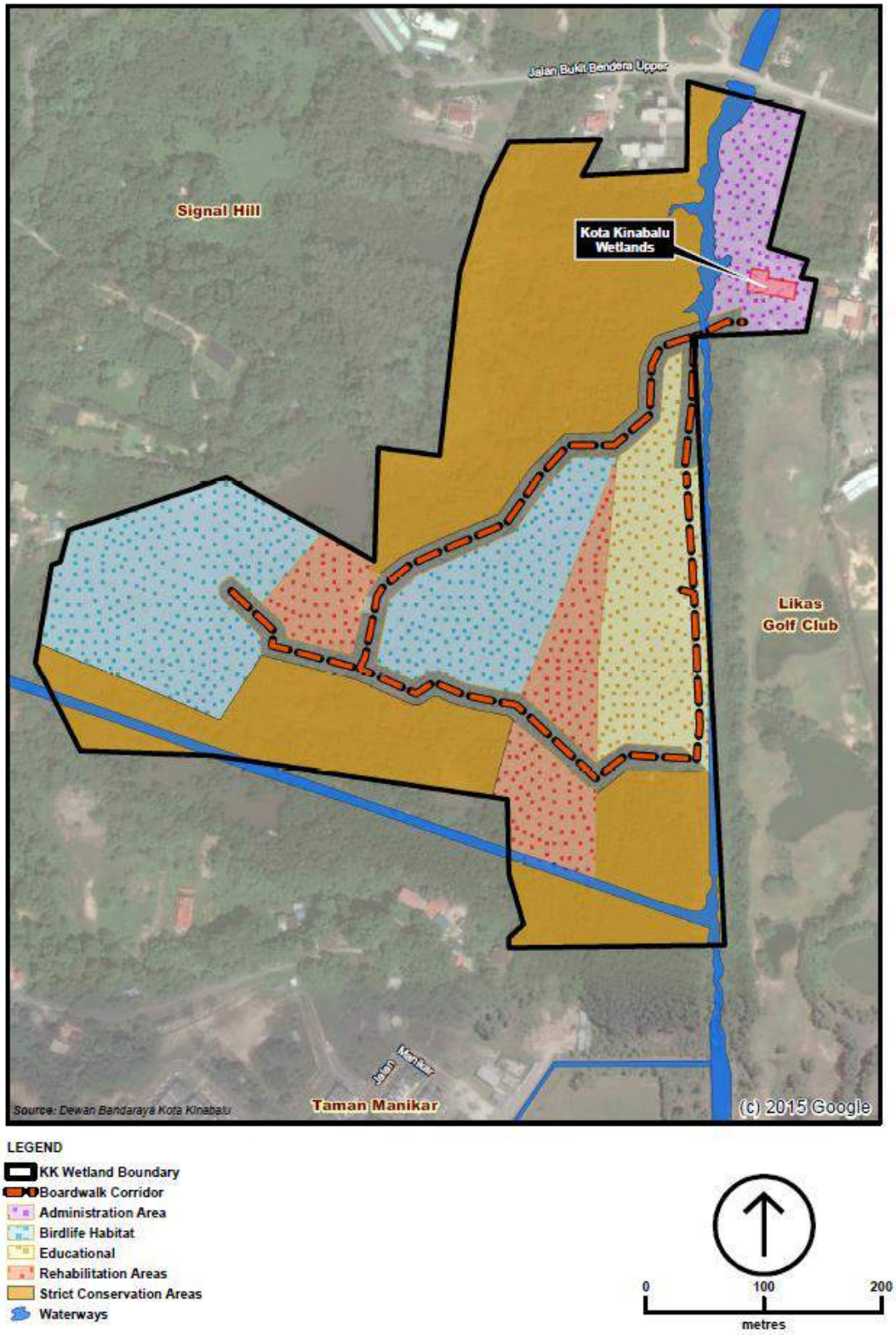



Figure 5-5: Strict Conservation Areas

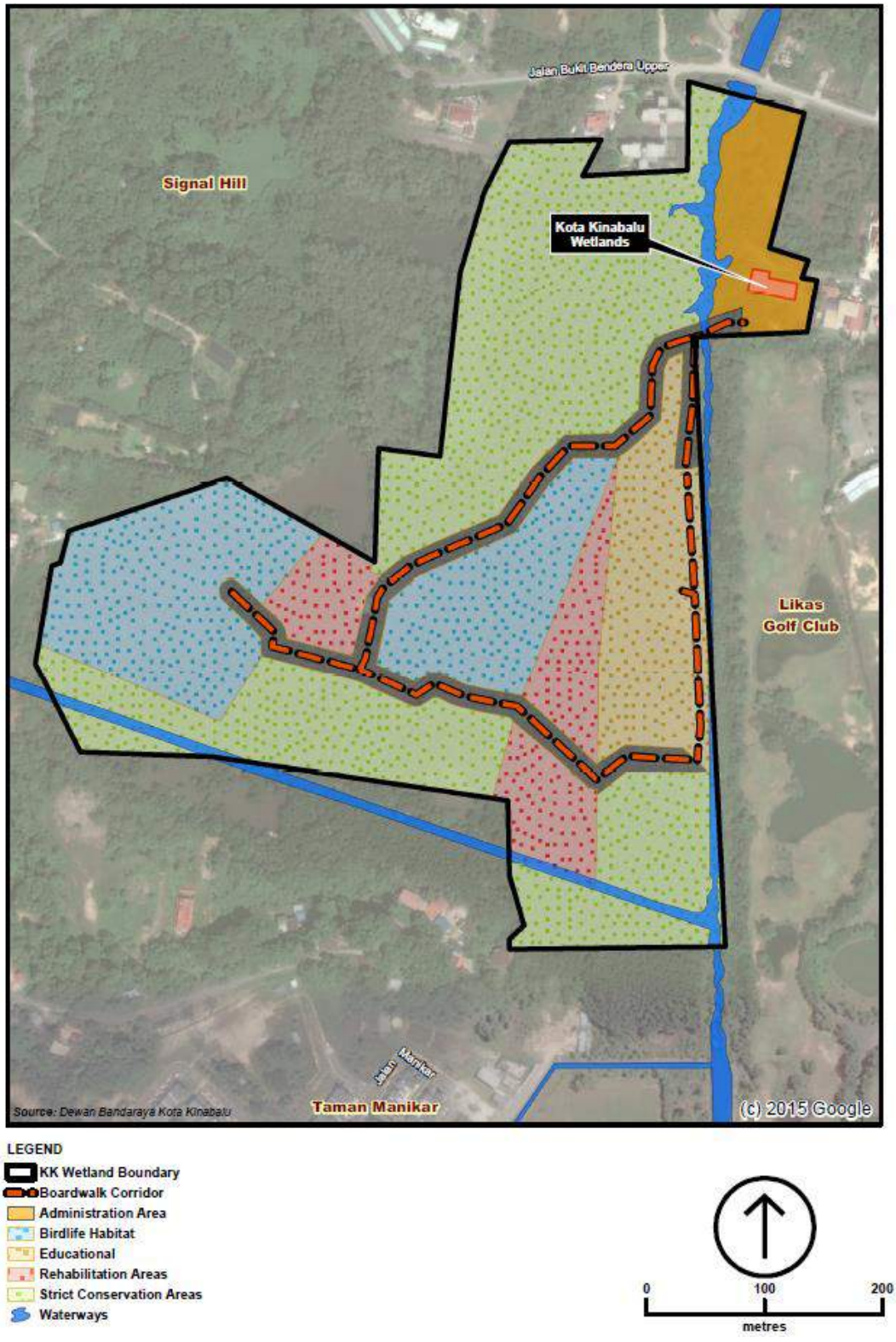



Figure 5-6: Administration Zone

# Chapter 6
# STRATEGIES AND ACTION PLANS

## 6.1 INTRODUCTION

The strategies and actions plans have been formulated based on the management objective and zoning plan which aims to contribute towards achieving the vision of making KKW as an 'exemplary urban wetlands for the purpose of conservation, education and tourism'. The strategies and action plans proposed below therefore aims to highlight key concerns and target issues that require both priority action and funding.

## 6.2 STRATEGIES

Eight management strategies have been developed as follows:

- Strategy 1: Enhance habitat protection and conservation
- Strategy 2: Improve hydrological management
- Strategy 3: Strengthen education and visitor programmes
- Strategy 4: Increase visibility through promotion and marketing
- Strategy 5: Build the skills and capabilities of staff and volunteers
- Strategy 6: Improve infrastructure and facilities
- Strategy 7: Improve stakeholder engagement
- Strategy 8: Develop funding framework

## 6.3 ACTION PLANS

Each management strategy details a set of actions with each action described according to its background, objectives, actions required, the agency(s) responsible, and its priority status. The actions are expected to be initiated over a 10-year period and the length of time required is indicated as follows:

| Short | Medium | Long |
|---|---|---|
| 1 year | 2 to 5 years | More than 5 years |

The action plans for each strategy will be elaborated in this section except for Strategy 7 and 8 which will be elaborated in their respective sections i.e. Section 7 and 8.

## 6.4 STRATEGY 1: ENHANCE HABITAT PROTECTION AND CONSERVATION

Strategy 1 addresses actions within the Conservation, Rehabilitation, and Bird Habitat zones. The main objective of these actions is to ensure the protection and conservation of

the wetland habitat while enhancing its ecological function as an integrated unit across the KKW landscape. Five action plans have been formulated for this strategy, namely:

1.1: Monitor and Assess the Health of the Mangrove Habitat
1.2: Maintain the Mudflat Habitat for Birds
1.3: Rehabilitate Firefly Habitat
1.4: Develop Research Programmes for Undergraduate and Postgraduate Researchers

### 6.4.1 Action Plan 1.1: Monitor and Assess the Health of the Mangrove Habitat

Background:

Since KKW was gazetted in 1996, the wetland habitat has regained much of its integrity as a result of replanting and other restoration efforts. While the wetland habitat has improved, there has been very little scientifically-based monitoring and assessment that charts this progress. Trends in terms of species composition and abundance can provide important indications on how the habitat has responded to positive human interventions as well as natural and anthropogenic stresses. This information can provide managers a better understanding on how to manage KKW.

Objective:

Systematically obtain scientific information on the mangrove habitat to aid planning and decision-making.

Action:

- Implement a comprehensive long-term monitoring programme to assess health of the mangrove habitat. The programme should be scientifically sound but based on available resources to ensure that it can be easily conducted over the long-term. Guides should be developed to indicate:
    - Methodologies (see Appendix V for sample)
    - Data collation and analysis
    - Reporting and evaluation
- The monitoring and assessment could focus on (but not limited to) the following areas:
    - Mangrove trees – bole diameter (age, growth rate); species type (abundance, diversity, distribution)
    - Bird populations – species type (abundance, diversity)
    - Aquatic fauna – species type (abundance, diversity); body size (health)
    - Firefly populations – population counts (abundance, health)
- The monitoring efforts could involve volunteers and/or community groups.
- Research and tree planting can be carried out in proposed rehabilitation zones (Refer to Figure 5-7)

| | |
|---|---|
| Zone | Conservation, Rehabilitation, Bird Habitat |
| Start Date | 2017 |

| | |
|---|---|
| Implementation (Term) | Long |
| Supporting Agency/Group | UMS, STGA |
| Estimated Costs | RM 270,000 (over 9 years) |

### 6.4.2 Action Plan 1.2: Maintain the Mudflat Habitat for Birds

Background:

At a climax stage, mangrove forests form closed canopies where any gaps due to disturbances are slowly occupied through a process of succession. This natural process will eventually lead to the loss of open areas which now form part of the feeding ground for water birds. Early succession often involves the establishment of pioneer species such as the Golden Leather Fern (*Acrostichum aureum)* which needs to be controlled to ensure that at least a proportion of the KKW is kept relatively open (at least 20%) and made available for water birds.

Objective:

Ensure sufficient mudflat habitat is available to support bird populations.

Action:

- Identify the current size of mudflats areas that are important for bird populations.
- Monitoring vegetation growth within these areas.
- Maintain the mudflats through periodic removal of shrubs and young trees.
- Vegetation removed must be disposed off in a responsible manner.
- This exercise shall be carried out annually by the Conservation Officer and Assistant Conservation Officer.
- A third-party may be engaged to carry out thinning operations.

| | |
|---|---|
| Zone | Bird Habitat |
| Start Date | 2018 |
| Implementation (Term) | Long |
| Supporting Agency/Group | - |
| Estimated Costs | RM 80,000 (8 years) |

### 6.4.3 Action Plan 1.3: Rehabilitate Firefly Habitat

Background:

Fireflies are a potential night-time attraction for visitors to KKW but its population is believed to have dwindled due to the loss of habitat. Currently, fireflies can only be found at the south western region of the wetlands which is largely inaccessible to visitors. Juvenile fireflies spend most of their lifespan on the ground where food sources such as snails are abundant. It is only during the adult stage that the firefly uses the mangrove trees to socialise where they can be easily seen. To make it an attraction, efforts could be explored to identify and rehabilitate suitable firefly habitat which is nearer to the boardwalk.

Objective:

Initiate efforts to support the maintenance of a firefly colony in an area accessible to visitors.

Action:

- Determine potential habitats in the central area of the wetlands near the boardwalk. The following criteria must be taken into account:
    - Mudflats with high density of decomposed plant materials;
    - Availability of food sources (small insects, snails, slugs etc.);
    - Availability of suitable mangrove species for fireflies and aquatic invertebrates.
- If suitable habitat is found, identify process to migrate the firefly colony to the new area.
- The study can be carried out in collaboration with undergraduate or postgraduate researchers from educational institutions as identified under Action Plan 1.5.

| | |
|---|---|
| Zone | Conservation, Boardwalk Corridor |
| Start Date | 2019 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | UMS |
| Estimated Costs | RM 50,000 (over 5 years) |

### 6.4.4 Action Plan 1.4: Develop Research Programme for Undergraduate and Postgraduate Researchers

Background:

KKW, due to its proximity to Kota Kinabalu and relatively diverse habitat, presents an opportunity for both undergraduate and postgraduate researchers to conduct research in a fairly conducive environment. Over the years, many researchers have in fact conducted ad-hoc studies on various subjects in KKW. However, it can be assumed that while many studies have benefited researchers, few results would have been directly useful for the site managers in aiding decision-making.

Objective:

Streamline research activities to ensure that both the researchers and KKW Centre benefit from these studies.

Action:

- Identify research priorities targeting current gaps in information or issues that need to be addressed.
- The research areas may include:
    - Water pollution inventory;
    - Diversity, distribution and health of mangrove habitat;
    - Firefly population;
    - Water bird migration and distribution.
- Develop a programme in collaboration with higher education institutes to identify the types of studies that are required which could then be offered to undergraduate and postgraduate students who want to conduct research at KKW.
- This will also provide an opportunity for the results of different cohorts of researchers to be merged to develop a longer term perspective that would be useful for monitoring and assessment.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | UMS, KUYS |
| Estimated Costs | Nil (Involves staff resources) |

## 6.5 STRATEGY 2: IMPROVE HYDROLOGICAL MANAGEMENT

Strategy 2 addresses actions required to reduce hydrological impacts within KKW and its watershed. These include monitoring of the water quality within KKW as well as an initial effort to identify the major sources of pollution within the watershed where subsequent actions can be initiated.

Two action plans have been formulated for this strategy, namely:

2.2: Monitor Water Quality and Quantity
2.1: Assess Sources of Water-Based Pollution in the Watershed

### 6.5.1 Action Plan 2.2: Monitor Water Quality and Quantity

Background:

KKW is influenced by both the quantity and quality of water its receives from its surroundings. The monitoring of water quality and quantity is therefore important to detect and understand changes which may have short and long term impacts on the mangrove habitat. EPD monitors water quality at four locations along the perimeter of the wetlands and near Likas Bay. When possible, sampling should be conducted within the wetlands to supplement data collected by EPD.

Objective:

To streamline water quality and quantity assessments to aid in planning and decision making.

Action:

- This action calls for the establishment of a systematic framework to collate, analyse and review water quality sampling results by EPD.
- Water quality results that are generated quarterly must be compiled and assessed to detect pollution episodes and long-term trends.
- Water quantity can be monitored based on the daily and monthly rainfall data collected by the Department of Meteorology Malaysia.
- When funding permits, water quality stations may be established within KKW and a programme establish to sample water quality.
- Reports that are generated shall be tabled during management meetings.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | EPD, DOE, DID |
| Estimated Costs | RM 60,000 (over 10 years) |

### 6.5.2 Action Plan 2.1: Assess Sources of Water-Based Pollution in the Watershed

Background:

There are numerous activities within the watershed that contribute towards both point and non-point sources of water pollution. Polluted water that enters KKW impacts on the health of the wetland ecosystem. To manage water-based pollution, various efforts will be required but it is important to identify and assess the impact of activities that contribute towards water pollution. With this information, the relevant groups can be targeted as part of communication, education and public awareness programmes.

Objective:

To determine the major sources and impacts of water pollution.

Action:

- All pollution sources within the watershed of KKW will be enumerated. The major sources of pollution include:
    - Residential areas
    - Commercial premises
    - Industries
- Pollution sources can be identified and mapped based on information obtained from government agencies such as DoE, EPD, and DBKK.
- The general inventory method is as follows:
    - Type of Premises (e.g. Restaurant)
    - Location (in sub-catchment) (e.g. Taman Fantasi)
    - Type of Discharge (e.g. Sullage from Kitchen)
    - Estimate Volume of Discharge (e.g. 10 cubic meters per day)
    - Estimated Pollution Load (e.g. mg/l Biochemical Oxygen Demand)
- From the information obtained, the pollution load for each type of pollutant can be estimated.
- This inventory shall be carried out by the Manager of KKW Centre and assisted by the Conservation Officer and Assistant Conservation Officer.

| | |
|---|---|
| Zone | Watershed |
| Start Date | 2018 |
| Implementation (Term) | Short |
| Supporting Agency/Group | DOE, DBKK |
| Estimated Costs | RM 10,000 (One-off) |

## 6.6 STRATEGY 3: STRENGTHEN EDUCATION AND VISITOR PROGRAMMES

Environmental education and visitor programmes have been a core function of KKW and attracts hundreds of participants annually. Nature programmes play an important role in raising awareness and understanding of the mangrove ecosystem, conservation initiatives and the environment. Visitor programmes comprise of specific activities at the wetlands for individuals or groups that walk-in or make prior arrangements. Both programmes must therefore be well-designed to provide all participants with an excellent and memorable experience. Strategy 3 targets actions to improve environmental education and visitor programmes at KKW:

3.1: Enhance Environmental Education Programmes
3.2: Develop Core Visitor Programmes
3.3: Improve Facilities at the Education Zone
3.4: Revise Information Leaflets and Develop Booklets

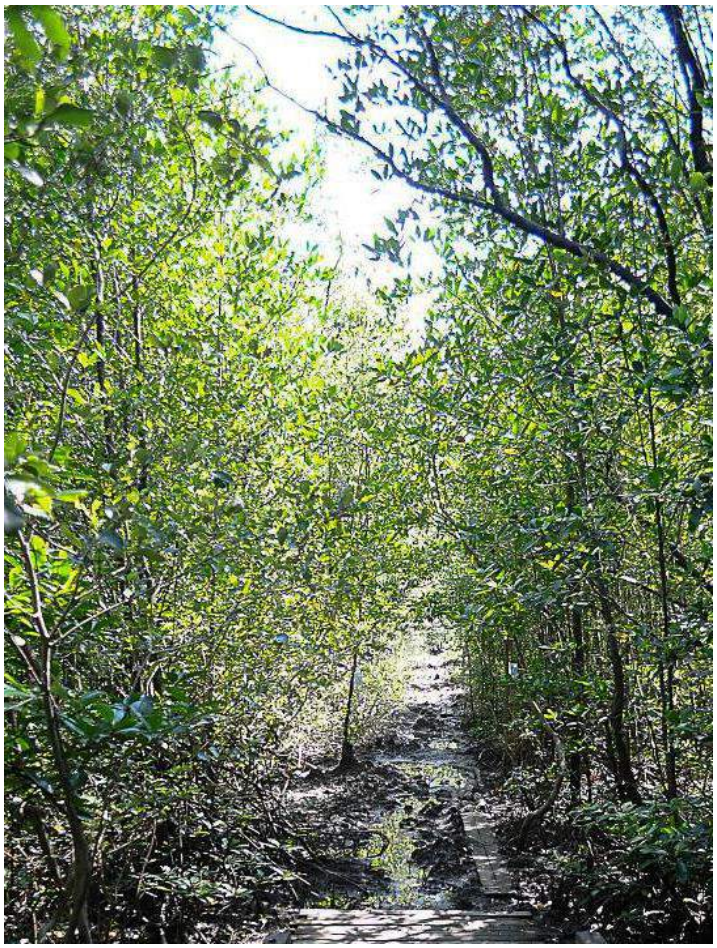


Plate 6-1: The 500m ‘gravel’ trail is an opportunity to directly interact with the wetlands

### 6.6.1 Action Plan 3.1: Enhance Environmental Education Programmes

Background:

Environmental education programmes offered at KKW are mainly for schoolchildren who mostly come from schools around Kota Kinabalu. There is an opportunity to further develop and enhance environmental education programmes through updated modules and activities that also target a wider audience of adult participants and tourists. Environmental education programmes that meet the expectations of the participants will result in a demand among organisers which can then be a source of revenue for KKW.

Objective:

Develop high quality environmental education programmes for schoolchildren and other visitors.

Action:

- Review and upgrade of current environmental education programmes to ensure that all relevant components are integrated.
- A range of modules shall be developed for:
    - Different target groups (e.g. primary school students, secondary school students, adult groups, corporate organizations etc.)
    - Various time formats (e.g. half-day, one day, or longer programmes)
- Some of the proposed new education programmes as follow:
    - 'Camping in the Wetlands' in which schoolchildren or adult groups can camp at the Rotary Nature Activity Centre and carry out night activities e.g. observe nocturnal wildlife.
    - 'Treasure Hunt' which can be carried out within the wetlands or at the education zone to educate and raise awareness of the participants on wetland ecosystem.

| | |
|---|---|
| Start Date | 2017 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | STGA, WWF, SEEN |
| Estimated Costs | RM 60,000 (over 3 years) |

### 6.6.2 Action Plan 3.2: Develop Core Visitor Programmes

Background:

KKW attracts a diverse range of visitors from among local and international tourists, recreationalist, nature lovers, students and other specialist groups. Among these, there are many visitors who step into KKW without prior information on the types of attractions and activities available. They are often left to wander around without much guidance and information, which can often leave visitors disappointed with the whole experience. KKW has a lot to offer but its attractions and activities need to be properly developed, packaged and made available to visitors.

Objective:

Develop core visitor programmes that can enhance the experience of all visitors.

Action:

- Review and upgrade current visitors programme to ensure that all relevant components are integrated.
- A range of programmes shall be developed, for example:
    - Guided nature walks (including night walks) for groups;
    - Bird-watching;
    - Mangrove replanting.
- These programmes can be conducted by staff, volunteers, or by hired qualified guides.
- Feedback shall be collected from the participants and/or organisers to improve the programmes.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | STB, STGA, WWF, SEEN |
| Estimated Costs | RM 60,000 (over 3 years) |

### 6.6.3 Action Plan 3.3: Improve Facilities at the Education Zone

Background:

The education zone is the area designated for educational activities and awareness programmes. This zone which encompasses the 500m path is surrounded by trees which allow direct interaction with the mangrove habitat. The education zone is considered a high-impact area that will cater for large numbers of visitors in higher frequencies as compared with other areas in the wetlands. Care must therefore be taken to reduce negative impacts on the natural habitat and to ensure the safety of visitors.

Objective:

Upgrade facilities at the education zone and implement programme to manage visitor impacts.

Action:

- Develop and establish information boards as part of an interactive education experience.
- Introduce site-hardening measures such as gravel paths, bridge crossings, handrails etc. for areas with high visitor frequency.
- Enhance the safety of the visitors by providing necessary gear for each participant, leaflets on 'dos and don'ts', signboards to guide visitors, and barriers for areas where visitors are not allowed to enter.
- Develop a monitoring plan to monitor and inspect the area which includes:
    - Items to be inspected;
    - Frequency of inspection;
    - Schedule of maintenance.

| | |
|---|---|
| Zone | Education |
| Start Date | 2018 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | SWD, STGA |
| Estimated Costs | RM 120,000 (over 3 years) |

### 6.6.4 Action Plan 3.4: Revise Information Leaflets and Develop Booklets

Background:

For a visitor to any site, good and informative leaflets and booklets can greatly enhance the visitor experience whether they are individuals or in groups. The lack of clear information is probably the most common grouse among visitors to any site or attraction. A good set of information leaflets and booklets is therefore essential for KKW.

Objective:

Enhance the quality of printed material for distribution to all visitors.

Action:

- Information leaflets shall be reviewed and revised into a high-quality material which will incorporate information such as:
    - Guided maps within the wetlands;
    - Information on the mangrove resources;
    - Information on programmes and activities;
    - Links to relevant websites
- Develop booklets incorporating more detail descriptions on mangrove flora and fauna. The booklets can be sold to interested visitors.
- The leaflets and booklets should be translated into major languages to account for both local and international visitors to Kota Kinabalu.
- The leaflets and booklets should be made available at the registration counter.

In addition to the above, mobile applications can be developed which contain all the information above. Such applications can be downloaded by visitors onto their mobile devices without the need for printed material.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | STB, STGA |
| Estimated Costs | RM 10,000 (One-off) |

## 6.7 STRATEGY 4: INCREASE VISIBILITY THROUGH PROMOTION AND MARKETING

As a natural attraction, and an education and ecotourism site, adequate visibility is required to attract visitors. Therefore, promotion and marketing efforts which are strategic and cost-effective need to be urgently implemented. This is to ensure that all visitors are aware of the wetlands and its attractions. A number of measures are proposed under Strategy 4 as follows:

4.1: Update KKW Website with Interactive Content
4.2: Develop Publicity Materials
4.3: Develop and Implement a Marketing Plan to Promote KKW
4.4: Organise Road-Shows in Schools throughout the State
4.5: Monitor and Respond to Reviews by Visitors on Travel Web Portals
4.6: Increase Road Signage Leading to KKW
4.7: Organise Activities during Internationally Significant Events

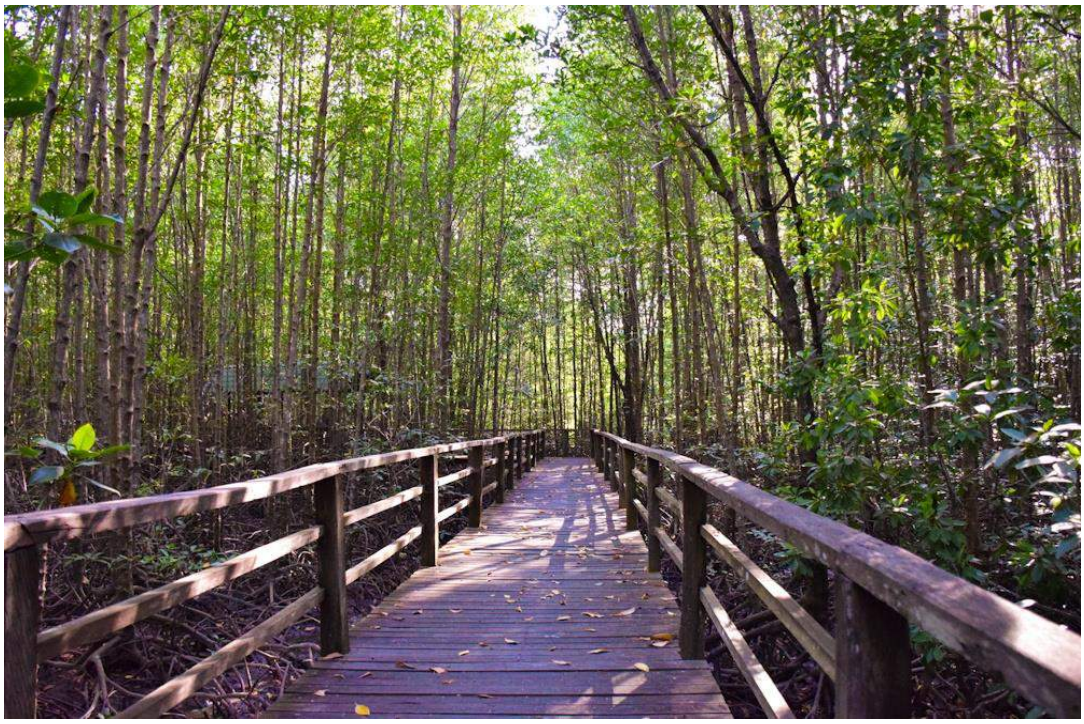


Plate 6-2: The boardwalk enables all types of visitors to access deep into the wetlands.

### 6.7.1 Action Plan 4.1: Update KKW Website with Interactive Content

Background:

Today, the internet and social media has become an indispensable tool in the search for information and an effective way to promote and market services and products. Most international tourists leverage upon these resources to search for attractions and 'must visit' places for destinations they are visiting. A search for KKW on any web browser will ultimately lead the visitor to the SWCS's website (www.sabahwetlands.org). The enhancement of the website is therefore necessary to help promote KKW and its activities.

Objective:

To ensure that the KK Wetland website sufficiently caters to potential visitors who use online resources.

Action:

- Upgrade the SWCS website or create a new website to showcase a full range of information to promote and market KKW.
- The website shall feature articles, graphics, photographs, and videos explaining the wetland ecosystem, its attractions, and environmental education and visitor programmes.
- The website shall also provide a channel for visitors to communicate directly with KKW staff to ask questions and clarifications and to book and organise activities.
- The website needs to be constantly updated with the latest information and any inquiry posted must be responded without undue delay.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | - |
| Estimated Costs | RM 10,000 (One-off) |

### 6.7.2 Action Plan 4.2: Develop Publicity Materials

Background:

Good publicity material is an effective method to publicise and attract visitors to KKW. The publicity material can be distributed at airports (and other ports of entry), tour agencies, hotels and transport providers to introduce and promote KKW. At present, there is limited material available on KKW that is easily distributed.

Objective:

To develop high-quality publicity material for distribution as part of promotion efforts.

Action:

- Publicity materials should be developed together with professional designers to highlight all information relevant for potential visitors:
    - Attractions and programmes
    - Operating hours
    - Instructions on how to get there
    - Necessary contacts numbers.
- Various types of publicity material that are easily distributed can be developed, for example postcards.
- The publicity materials should be translated into major languages to account for both local and international visitors to Kota Kinabalu.
- The publicity materials should be made available and distributed at point of entry (airport and ferry terminal), hotels, tourist information centres, transport providers, tour agencies etc.

| | |
|---|---|
| Start Date | 2017 |
| Implementation (Term) | Short |
| Supporting Agency/Group | STB, STGA |
| Estimated Costs | RM 10,000 (One-off) |

### 6.7.3 Action Plan 4.3: Develop and Implement a Marketing Plan to Promote KKW

Background:

The promotion of KKW is a continuous long-term effort that can be made effective through the development of a marketing plan. A marketing plan will help to strategise and provide direction and guidance to KKW's team in implementing promotion efforts and to assess the effectiveness of such efforts. With limited funding, the marketing plan will help to identify the most cost-effective methods that should be undertaken.

Objective:

Implement an effective strategy that will integrate and manage all on-going and future promotion efforts.

Action:

- The marketing plan will comprise of both short- and long-term promotion strategies for targeted groups which could include:
    - Posting of advertisements, press releases, notifications in social media;
    - Preparation of newspaper and magazine articles;
    - Participation in exhibitions and conducting road shows;
    - Developing partnerships with the tour operators, travel agencies, and transport providers.
- A marketing consultant could be engaged, if necessary, to develop the marketing plan.

| | |
|---|---|
| Start Date | 2017 |
| Implementation (Term) | Long |
| Supporting Agency/Group | STB |
| Estimated Costs | RM 160,000 (over 8 years) |

### 6.7.4 Action Plan 4.4: Organise Road-Shows in Schools throughout the State

Background:

Primary and secondary school students collectively form the largest target audience for environmental education programmes at KKW. Over the years, hundreds of students have participated in programmes at the wetlands; however the numbers are declining, partly due to the loss of sponsorship for such programmes. KKW nevertheless is an ideal location for environmental educational programmes, especially when environmental education is today a prominent feature of the education system. Efforts are therefore required to bring more student groups to KKW.

Objective:

To increase participation of school groups in environmental education programmes at KKW.

Action:

- Road-shows to schools have been previously conducted by KKW and should further continue as part of its promotion efforts.
- The main schools targeted first should be those are within close vicinity of the wetlands which includes both primary and secondary schools.
- The road-show could comprise of talks and exhibitions on KKW at the school and a brief on programmes being offered.
- School officials or teachers could then be approached to organise visits to KKW for student groups or even teachers.

| | |
|---|---|
| Start Date | 2017 |
| Implementation (Term) | Long |
| Supporting Agency/Group | JPN Sabah |
| Cost | RM 120,000 (over 6 years) |

### 6.7.5 Action Plan 4.5: Monitor and Respond to Reviews by Visitors on Travel Web Portals

Background:

Travel web portals compile an extensive and detailed listing of thousands of sites and attractions available in each tourist destination. In addition to providing travel information, members can submit reviews of sites and attractions they have visited which contribute towards the ranking of a site or attraction. Reviews often highlight visitors' likes and dislikes and can be used by site managers to identify and address both strengths and weakness of its programme, activities, facilities and its staff.

Objective:

To source for feedback on programmes, activities and attractions to improve services.

Action:

- A weekly or monthly schedule can be developed to collate information on KKW from travel web portals such as Trip Advisor, Lonely Planet, Booking.com etc.
- Data can be collected on visitor profiles (age, sex, nationality, type of visitors) and visitors' likes and dislikes.
- Where possible, responses can be prepared and submitted to respond to both positive and negative feedback as part of customer service.
- Feedback that is compiled should then be analysed and actions taken to address and rectify major issues.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | - |
| Estimated Costs | Nil (Involves staff resources) |

### 6.7.6 Action Plan 4.6: Increase Road Signage Leading to KKW

Background:

Clear and prominent road signage is important to provide visitors with information on how to reach KKW. Some signage is already available however it can be difficult for visitors who are not familiar with the area to locate the site, particularly international tourists who sometimes walk. Road signage could be improved along major roads to lead visitors into the wetlands.

Objective:

Increase signage to KKW along major roads.

Action:

- Better signage can be established along :
    - Jalan Tun Fuad Stephens
    - Jalan Istiadat
    - Jalan Coastal
    - Jalan Mat Salleh
    - Jalan Kepayan
    - Jalan Sulaman

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | JKR |
| Estimated Costs | Nil (Involves staff resources) |

### 6.7.7 Action Plan 4.7: Organise Activities during Internationally Significant Events

Background:

There are many internationally and nationally significant events celebrated in Malaysia. These events often garner a significant amount of publicity and can be leveraged upon to attract visitors to the wetlands. Events organised could be themed accordingly although it may not necessarily be related to nature or the environment. This could attract a diverse range of visitors who would have not thought of visiting the wetlands.

Objective:

Develop programmes to attract a wider range of visitors to KKW.

Action:

- Determine and schedule a few events to be organised during the year such as:
    - World Wetlands Day (2 February)
    - Earth Hour (28 March)
    - World Environment Day (5 June)
    - International Mangrove Day (26 July)
    - Merdeka Day (31 August)
    - Malaysia Day (16 September)
    - Other cultural and religious celebrations
- The type of activities to be organised may not necessarily be large but could encompass activities such as:
    - Movie screenings;
    - Art and crafts making;
    - Treasure hunts;
    - Dinner functions.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | STB,EPD |
| Estimated Costs | RM 400,000 (over 8 years) |

## 6.8 STRATEGY 5: BUILD THE SKILLS AND CAPABILITIES OF STAFF AND VOLUNTEERS

Human resources is a critical component to ensure that the wetland has adequate capacity to manage and organise activities for visitors. This strategy addresses measures to enhance competency and capability of the staff members, volunteers and interns in performing the assigned tasks and work. Five action plans have been formulated for this strategy, namely:

5.1: Increase the Number of Staff at KKW
5.2: Improve the Skills of All Staff Members
5.3: Appoint Honorary Wildlife Wardens
5.3: Develop Specialised Nature Guides among Staff and Volunteers
5.4: Strengthen the Work Program for Volunteers and Interns
5.5: Establish a Voluntary Wetland Watch Programme

### 6.8.1 Action Plan 5.1: Increase the Number of Staff at KKW

Background:

There are various tasks and activities that need to be carried out to operate KKW Centre, of which the responsibilities fall on the shoulders of all staff members. Their responsibilities will further increase with the implementation of this management plan. To operate effectively and independently, the centre needs sufficient number of staff members. Each staff member needs to be acutely aware of his/her scope of responsibility, functions, and key outputs right at the start which should be aligned to the overall vision and management objectives of KKW.

Objective:

Develop staff capacity to effectively manage KKW.

Action:

- Identify human resources needed taking into account the action plans recommended in this Management Plan and the availability of funds.
- Revise the scope of work for each staff member to ensure their scope of work and responsibilities are clearly defined which address the management needs of KKW.
- Specify key performance indicators in the scope of work which will help individual staff, their supervisors and the management committee to monitor and assess progress.

| | |
|---|---|
| Start Date | 2017 |
| Implementation (Term) | Long |
| Supporting Agency/Group | - |
| Estimated Costs | Nil (See proposed staffing requirements) |

### 6.8.2 Action Plan 5.2: Improve the Skills of All Staff Members

Background:

Handling environmental education and visitor programmes that are of high quality can be extremely demanding and require staff members to be skilled across a range of competencies such as communication, facilitation, knowledge and inter-personal skills. With a small team, all staff members can be expected to perform multiple duties, and therefore it is important that all staff members are adequately equipped with the necessary skills.

Objective:

Develop relevant competencies of all staff members.

Action:

- All staff members, especially new recruits, must undergo at least basic skills development for the core competencies.
- A long-term training programme specifying the competencies expected to be developed including shall be developed which should include:
    - Communication and inter-personal skills
    - Management and operation of KKW
    - Basic knowledge on the mangrove habitat and resources
- Training courses may be run in-house, where possible, or staff members can take part in courses organised by other parties.
- A training needs assessment should be carried out to identify the current skills and competencies levels of the staff.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | MNS, WWF |
| Estimated Costs | RM 200,000 (over10 years) |

### 6.8.3 Action Plan 5.3: Appoint Honorary Wildlife Wardens

Background:

Security at KKW remains an issue; however staff at the wetlands have limited legal authority to stop activities such as the illegal harvesting of resources. Under the Wildlife Conservation Enactment, 1997, Honorary Wildlife Wardens can be appointed among members of the public with good standing. The wardens share similar powers of authority as wardens from the Wildlife Department. The appointment of wardens among the staff and/or volunteers can address the need to increase enforcement efforts.

Objective:

To provide legal authority to the staff/volunteers to stem illegal activities related to wildlife.

Actions:

- Staff and/or volunteers at the KK Wetland can be nominated for the positions of Honorary Wildlife Wardens.
- Nominated individuals will need to undergo a 2½ day course conducted by the Wildlife Department which is to familiarise participants on:
    - Offences and penalties provided for in the Wildlife Conservation Enactment 1997;
    - Enforcement procedures in accordance to the Wildlife Conservation Enactment 1997, Penal Code and Evidence Act;
    - Roles and responsibilities of honorary wildlife wardens.
- The appointments are made for a period of three years but can be renewed.
- The warden will then be empowered with the power of arrest and supplied with a warrant card and vest to be used in carrying out duties in their respective area.
- As a priority, the proposed Groundkeeper (presently Gardener) and the Conservation Officer shall be nominated as Honorary Wildlife Wardens immediately.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | SWD |
| Estimated Costs | RM 15,000 (over 3 years) |

### 6.8.4 Action Plan 5.4: Develop Specialised Nature Guides among Staff and Volunteers

Background:

Nature guides play an important role in the interpretation of natural attractions which can substantially increase the experience of any visitor. There are already groups of nature guides available; however guides with 'in-house' knowledge and experience at KKW can add great value to the education and visitor programmes. While staff members are expected to be equipped with interpretation skill, they can be supported by volunteers with the Voluntary Guardian Programme at KKW, who can be trained to provide this service.

Objective:

To enhance the competency of the staff members and volunteers in conducting guided tours.

Action:

- Develop a training programme and run the training programme periodically to train nature guides on a range of competencies including:
    - Communication and inter-personal skills
    - Knowledge on mangrove ecology
    - Natural history of KKW
- Specialised groups can be established to collaborative develop competencies on areas such as birdlife, night-walks etc.

| | |
|---|---|
| Start Date | 2019 |
| Implementation (Term) | Long |
| Supporting Agency/Group | SWD, STB, STGA |
| Estimated Costs | RM 35,000 (over 7 years) |

### 6.8.5 Action Plan 5.5: Strengthen the Work Program for Volunteers and Interns

Background:

KKW benefits from an active Volunteer Guardian Programme which enables interested and dedicated persons to volunteer their time and services. At present, volunteers attend to three areas of work i.e. Wetland Management, Environmental Education and Fund-Raising. To fully leverage upon the resources that volunteers make available, and to also provide all volunteers with an enriching experience while contributing towards the needs of KKW, it is important that a work programme (and training) is institutionalised for the volunteers.

Objective:

To increase the capacity of volunteers and interns to effectively facilitate tasks and activities at the wetlands.

Action:

- Develop a work programme in collaboration with the volunteers to identify and develop the tasks and activities at KKW that require attention, i.e.:
    - Monitoring of health of the mangrove habitat;
    - Monitoring of water quality;
    - Monitoring of infrastructure and facilities;
    - Replanting of mangroves.
- Identify staff members to facilitate the engagement and coordinate activities with the volunteers, including on training needs, if required.

| | |
|---|---|
| Start Date | 2018 |
| Implementation (Term) | Short |
| Supporting Agency/Group | - |
| Estimated Costs | Nil (Involves staff resources) |

### 6.8.6 Action Plan 5.6: Establish a Voluntary Wetland Watch Programme

Background:

KKW is faced with a number of issues that threaten the mangrove ecosystem. Some of the threats that are periodically faced include the illegal harvesting of resources within the wetlands, water pollution episodes, damage to infrastructure and facilities, and possibly encroachment along its boundary. With the existing staff capacity, monitoring the wetland becomes a burden. To lighten the burden of the staff member, volunteers and member of the community around the wetlands could be engaged to assist and carry out this function.

Objective:

To increase security/safety by involving volunteers/residents to monitor activities in and around the wetlands.

Action:

- A Wetland Watch programme can be formalised where volunteers could comprise of regular visitors or residents who live nearby.
- These volunteers would be tasked to report any suspicious activities or events to the KK Wetland staff.
- A range of communication modes could be used including:
    - Telephone hotlines
    - Mobile telephone messaging groups such as Whatsapp, LINE etc.
    - Facebook pages

| | |
|---|---|
| Start Date | 2018 |
| Implementation (Term) | Short |
| Supporting Agency/Group | PDRM (encroachment), EPD or DOE (water pollution) |
| Estimated Costs | RM 15,000 (One-off) |

## 6.9 STRATEGY 6: IMPROVE INFRASTRUCTURE AND FACILITIES

Numerous infrastructure and facilities are available at KKW which supports the range of activities and programme at the wetlands. The existing infrastructure and facilities require maintenance while there is a need to develop new infrastructure and facilities to cater for a growing and diverse range of visitors. Strategy 6 addresses a range of actions required to address these needs:

6.1: Upgrade the Boardwalk and Bird-Watching Hide
6.2: Improve All Signage and Information Stations along the Boardwalk
6.3: Improve Landscaping Around the Main Office and Exhibition Centre
6.4: Construct Basic Facilities for Researchers and/or Visitors for Activities
6.6: Implement a Monitoring and Inspection Programme for Infrastructure and Facilities.
6.7: Install CCTVs

### 6.9.1 Action Plan 6.1: Upgrade the Boardwalk and Bird-Watching Hide

Background:

The boardwalk is presently the most active area utilised by visitors. The boardwalk not only provides safe and ease of access into the wetlands but also regulates the movement and behavior of visitors. Similarly, the bird-watching hide in an important facility used by bird-watchers and other visitors. Both are over 15 years old, and its structures are not as sturdy as before. Parts of the boardwalk and bird-watching hide are prone to collapse and require regular maintenance.

Objective:

To ensure the boardwalk and bird-watching hide are both kept in good condition.

Action:

- Assess the boardwalk to determine which stretches are in good condition and can be salvaged whereas stretches that are in poor condition will need to be replaced.
- Refurbish and upgrade sections of boardwalk which are in poor condition and deemed unsafe for visitors.
- Assess the bird-watching hide to determine the condition of the hide.
- Refurbish the bird-watching hide if necessary, and ensure that the facility is always in clean condition and ready for use by visitors.

| | |
|---|---|
| Zone | Education |
| Start Date | 2018 |
| Implementation (Term) | Short |
| Supporting Agency/Group | SWD |
| Estimated Costs | RM 300,000 (Two upgrades in 10 years) |

### 6.9.2 Action Plan 6.2: Improve All Signage and Information Stations along the Boardwalk

Background:

Good signage and information stations are vital for nature parks such as KKW. It allows visitors to feel secure and comfortable, enhances nature interpretation and the visitor experience, and allows individuals or groups to explore the site at their own pace. The signage particularly those along the boardwalk need to be refurbished as the wordings have faded and may not be relevant anymore. New educational signage can also be installed to enhance the experience of the visitors.

Objective:

To improve nature interpretation and the visitors experience among individuals and/or groups.

Action:

- Review existing signage and information stations ensure that they are still relevant and provide clear and useful information to the visitors such as:
    - Direction and distance
    - Special features of the specific area
    - Explanation of natural resources
- This exercise can be carried out as a collaborative project together with guides, volunteers and experts who could help determine the types of information required and how it is presented to enhance the visitor experience.

| | |
|---|---|
| Zone | Boardwalk |
| Start Date | 2017 |
| Implementation (Term) | Short |
| Supporting Agency/Group | STB, STGA, WWF |
| Estimated Costs | RM 10,000 (One-off) |

### 6.9.3 Action Plan 6.3: Improve Landscaping Around the Main Office and Exhibition Centre

Background:

As the point of entry, the administration zone provides visitors with their first visual experience as they enter the wetlands. The administration zone of the KKW therefore needs to be made prominent with an outdoor landscape that is maintained well and is welcoming.

Objective:

To improve the outlook of KKW when visitors arrive.

Action:

- Good landscaping is about managing the viewers' eye. Some principles to follow are:
    - Functional: allows ease of movement for visitors and during maintenance
    - Ease of maintenance: requires minimal use of fertilisers, pesticides, water, equipment and labour
    - Environmentally-friendly: utilises the right type of plants which require minimal maintenance and other inputs
    - Cost-effective: proper design and planning can reduce cost; landscaping is a long-term exercise i.e. plants can be allowed to grow naturally.
    - Visually-pleasing: enhance the positive and down-play the negative
- The target areas for landscaping are as follows:
    - Entrance to KKW
    - Main office area
    - Open space at the starting point of the boardwalk

| | |
|---|---|
| Zone | Administrative |
| Start Date | 2019 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | - |
| Estimated Costs | RM 200,000 (over 5 years) |

### 6.9.4 Action Plan 6.4: Construct Basic Facilities for Researchers and/or Visitors for Activities

Background:

Over the years, many undergraduate and postgraduate researchers have conducted studies at KKW. Although basic work stations are available, the provision of facilities such as accommodation and a better equipped laboratory could enhance fieldwork by allowing researchers them to spend more time at the wetlands, particularly if it involves night-time surveys or experiments. In addition, these facilities could also benefit other visitors when night-time education and visitor programmes are developed.

Objective:

To establish a conducive work environment for undergraduate and postgraduate researchers.

Action:

- Plans have already been developed for a number of the facilities listed below:
    - Chalets and dormitories
    - Basic laboratory
- The facilities can be designed and constructed in collaboration with UMS or SWD when funds become available.

| | |
|---|---|
| Zone | Administrative |
| Start Date | 2021 |
| Implementation (Term) | Medium |
| Supporting Agency/Group | UMS |
| Estimated Costs | RM 300,000 (3 years) |

### 6.9.5 Action Plan 6.5: Implement a Monitoring and Inspection Programme for Infrastructure and Facilities.

Background:

All infrastructure and facilities will have a tendency to breakdown due to wear and tear over time. However, infrastructure and facilities at any nature site needs to be maintained at an acceptable level to ensure the safety of visitors and to enhance the visitor experience. The monitoring and inspection of facilities is therefore critical to reduce risks by anticipating breakdowns, planning scheduled maintenance, and for estimating resources required for upgrading work. Early detection and resolution of problems can at times result in substantial cost savings.

Objective:

To ensure all infrastructure and facilities are adequately maintained and issues detected early.

Action:

- Determine infrastructure and facilities that needs to be monitored and develop criteria for monitoring (for sample, see Chart C, Appendix V)
- The frequency of inspection will depend on the type of infrastructure or facilities examined. Some may require daily checks such as the boardwalk while others may require only monthly examinations.
- All data collected shall be assessed to identify priorities and determine interventions required.
- The inspection shall be carried out by the Conservation Officer and Assistant Conservation Officer.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | - |
| Estimated Costs | Nil (Involves staff resources) |

### 6.9.6 Action Plan 6.6: Install CCTVs

Background:

As related above, the safety of visitors to KKW is a priority. However, there have been incidences such as thefts which have occurred over the years. Monitoring what is taking place around the wetlands is not an easy task due to the size of the facility, limited number of staff that can be positioned outside, and the ease of access which increases the risk posed by intruders to visitors. The installation of CCTVs can be a cost-effective solution to improve security around the site.

Objective:

To enhance the safety of visitors and staff members at KKW.

Action:

- CCTVs can be installed at strategic points such as:
    - Entrance point
    - Outside and Inside the office
    - Along the Boardwalk
    - Education zone

| | |
|---|---|
| Start Date | 2018 |
| Implementation (Term) | Short |
| Supporting Agency/Group | - |
| Estimated Costs | RM 80,000 (Installation and future upgrade) |

### 6.9.7 Action Plan 6.7: Install Fence around the Perimeter of KKW

Background:

Trespassing and encroachment into KKW has long been an issue which may be a result of individuals or groups who are unaware of the boundaries of the protected area or who may purposely enter for the illegal activities such as the harvesting of aquatic resources such as fish. These activities can lead to the destruction mangrove trees i.e. trees are cut down plants to gain access, or threaten the health of targeted aquatic species. The installation of a perimeter fence aims to mark the boundary of the wetlands as well as serve as a physical barrier to reduced intrusion.

Due to the nature of the wetlands, the fence should not be a fully concrete structure which may be damaged by ground water and/or the growth of vegetation. The fencing should allow for some permeability so that the movement of smaller wildlife such as birds, lizards, snakes will not be hindered.

Objective:

To reduce trespassing and encroachment into KKW for illegal activities

Action:

- Determine the boundaries of KKW
- Obtain proposals on appropriate fencing solutions and pricing by contractors
- Install fencing around the boundary of KKW.

| | |
|---|---|
| Start Date | 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | - |
| Estimated Costs | RM400,000 |

## 6.10 SUMMARY ACTION PLANS

The action plans for Strategies 1 to 6 are summarised in Table 6-1 below according to their terms of implementation, costs and supporting agency. The schedule of implementation is presented in Table 6-2.

The cost for each strategy is summarised as follows:

Strategy 1 : Enhance Habitat Protection and Conservation
No. of Actions : 4
Total Cost : RM 400,000

Strategy 2 : Improve Hydrological Management
No. of Actions : 2
Total Cost : RM 70,000

Strategy 3 : Strengthen Education and Visitor Programmes
No. of Actions : 4
Total Cost : RM 250,000

Strategy 4 : Increase Visibility through Promotion and Marketing
No. of Actions : 7
Total Cost : RM 700,000

Strategy 5 : Build the Skills and Capabilities of Staff and Volunteers
No. of Actions : 5
Total Cost : RM 265,000

Strategy 6 : Improve Infrastructure and Facilities
No. of Actions : 7
Total Cost : RM 1,290,000

The total cost of the action plans for Strategy 1 to 6 is RM 2,975,000.

Table 6-1: Summary of Action Plans, Estimated Costs and Supporting Agencies (Strategies 1 to 6)

| ACTION PLAN | TERM | EST. COSTS (RM) | SUPPORTING AGENCY |
|---|---|---|---|
| **STRATEGY 1: ENHANCE HABITAT PROTECTION AND CONSERVATION** | | | |
| 1.1: Monitor and Assess the Health of the Mangrove Habitat | Long | 270,000 | UMS, STGA |
| 1.2: Maintain the Mudflat Habitat for Birds | Long | 80,000 | - |
| 1.3: Rehabilitate Firefly Habitat | Medium | 50,000 | UMS |
| 1.4: Develop Research Programme for Undergraduate and Postgraduate Researchers | Short | Nil | UMS, KUYS |
| **STRATEGY 2: IMPROVE HYDROLOGICAL MANAGEMENT** | | | - |
| 2.2: Monitor Water Quality and Quantity | Long | 60,000 | EPD, DOE, DID |
| 2.1: Assess Sources of Water-Based Pollution in the Watershed | Short | 10,000 | DOE, DBKK |
| **STRATEGY 3: STRENGTHEN EDUCATION AND VISITOR PROGRAMMES** | | | |
| 3.1: Enhance Environmental Education Programmes | Medium | 60,000 | STGA, WWF |
| 3.2: Develop Core Visitor Programmes | Medium | 60,000 | STB, STGA, WWF |
| 3.3: Improve Facilities at the Education Zone | Medium | 120,000 | SWD, STGA |
| 3.4: Revise Information Leaflets and Develop Booklets | Short | 10,000 | STB, STGA |
| **STRATEGY 4: INCREASE VISIBILITY THROUGH PROMOTION AND MARKETING** | | | |
| 4.1: Update KKW Website with Interactive Content | Short | 10,000 | - |
| 4.2: Develop Publicity Materials | Short | 10,000 | STB, STGA |
| 4.3: Develop and Implement a Marketing Plan to Promote KKW | Long | 160,000 | STB |
| 4.4: Organise Road-Shows in Schools throughout the State | Long | 120,000 | JPN Sabah |
| 4.5: Monitor and Respond to Reviews by Visitors on Travel Web Portals | Long | Nil | - |
| 4.6: Increase Road Signage Leading to KKW | Short | Nil | DBKK |
| 4.7: Organise Activities during Internationally Significant Events | Long | 400,000 | STB |
| | | | |

| ACTION PLAN | TERM | EST. COSTS (RM) | SUPPORTING AGENCY |
|---|---|---|---|
| **STRATEGY 5: BUILD THE SKILLS AND CAPABILITIES OF STAFF AND VOLUNTEERS** | | | |
| 5.1: Increase the Number of Staff at KKW | Long | Nil | - |
| 5.2: Improve the Skills of All Staff Members | Long | 200,000 | MNS, WWF |
| 5.3: Appoint Honorary Wildlife Wardens | Medium | 15,000 | SWD |
| 5.4: Develop Specialised Nature Guides among Staff and Volunteers | Long | 35,000 | SWD, STB, STGA |
| 5.5: Strengthen the Work Program for Volunteers and Interns | Short | Nil | - |
| 5.6: Establish a Voluntary Wetland Watch Programme | Short | 15,000 | DBKK |
| **STRATEGY 6: IMPROVE INFRASTRUCTURE AND FACILITIES** | | | |
| 6.1: Upgrade the Boardwalk and Bird-Watching Hide | Medium | 300,000 | SWD |
| 6.2: Improve All Signage and Information Stations along the Boardwalk | Short | 10,000 | STB, STGA, WWF |
| 6.3: Improve Landscaping Around the Main Office and Exhibition Centre | Medium | 200,000 | - |
| 6.4: Construct Basic Facilities for Researchers and/or Visitors for Activities | Medium | 300,000 | UMS |
| 6.5: Implement a Monitoring and Inspection Programme for Infrastructure and Facilities. | Long | Nil | - |
| 6.6: Install CCTVs | Short | 80,000 | PDRM |
| 6.7: Install Fence around the perimeter of KKW | Short | 400,000 | - |

Note:

DBKK : Dewan Bandaraya Kota Kinabalu
DID : Department of Irrigation and Drainage
DOE : Department of Environment
EPD : Environment Protection Department
JPN : Sabah State Education Department
KUYS : Kolej Universiti Yayasan Sabah
MNS : Malaysian Nature Society
PDRM : Royal Malaysian Police
PWD : Public Works Department
SEPA : Sabah Environmental Protection Association
STB : Sabah Tourism Board
STGA : Sabah Tourist Guides Association
SWD : Sabah Wildlife Department
UMS : Universiti Malaysia Sabah
WWF : World Wide Fund for Nature, Malaysia

Table 6-2: Implementation Plan for the Action Plans (Strategies 1 to 6)

| ACTION PLAN | PRIORITY | TERM | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **STRATEGY 1:** | | | | | | | | | | | | |
| 1.1: Monitor and Assess the Health of the Mangrove Habitat | High | Long | | | | | | | | | | |
| 1.2: Maintain the Mudflat Habitat for Birds | High | Long | | | | | | | | | | |
| 1.3: Rehabilitate Firefly Habitat | Medium | Medium | | | | | | | | | | |
| 1.4: Develop Research Programme for Undergraduate and Postgraduate Researchers | Low | Short | | | | | | | | | | |
| **STRATEGY 2:** | | | | | | | | | | | | |
| 2.2: Monitor Water Quality and Quantity | Medium | Long | | | | | | | | | | |
| 2.1: Assess Sources of Water-Based Pollution in the Watershed | Medium | Short | | | | | | | | | | |
| **STRATEGY 3:** | | | | | | | | | | | | |
| 3.1: Enhance Environmental Education Programmes | Medium | Medium | | | | | | | | | | |
| 3.2: Develop Core Visitor Programmes | High | Medium | | | | | | | | | | |
| 3.3: Improve Facilities at the Education Zone | High | Medium | | | | | | | | | | |
| 3.4: Revise Information Leaflets and Develop Booklets | Low | Short | | | | | | | | | | |
| **STRATEGY 4:** | | | | | | | | | | | | |
| 4.1: Update KKW Website with Interactive Content | Medium | Short | | | | | | | | | | |
| 4.2: Develop Publicity Materials | Low | Short | | | | | | | | | | |
| 4.3: Develop and Implement a Marketing Plan to Promote KKW | Medium | Long | | | | | | | | | | |
| 4.4: Organise Road-Shows in Schools throughout the State | Medium | Long | | | | | | | | | | |
| 4.5: Monitor and Respond to Reviews by Visitors on Travel Web Portals | High | Long | | | | | | | | | | |
| 4.6: Increase Road Signage Leading to KKW | Medium | Short | | | | | | | | | | |
| 4.7: Organise Activities during Internationally Significant Events | Medium | Long | | | | | | | | | | |
| | | | | | | | | | | | | |
| **STRATEGY 5:** | | | | | | | | | | | | |
| 5.1: Increase the Number of Staff at KKW | Medium | Long | | | | | | | | | | |
| 5.2: Improve the Skills of All Staff Members | Medium | Long | | | | | | | | | | |

| ACTION PLAN | PRIORITY | TERM | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.3: Appoint Honorary Wildlife Wardens | High | Medium | | | | | | | | | | |
| 5.4: Develop Specialised Nature Guides among Staff and Volunteers | Medium | Long | | | | | | | | | | |
| 5.5: Strengthen the Work Program for Volunteers and Interns | Low | Short | | | | | | | | | | |
| 5.6: Establish a Voluntary Wetland Watch Programme | Low | Short | | | | | | | | | | |
| **STRATEGY 6:** | | | | | | | | | | | | |
| 6.1: Upgrade the Boardwalk and Bird-Watching Hide | High | Medium | | | | | | | | | | |
| 6.2: Improve All Signage and Information Stations along the Boardwalk | Medium | Short | | | | | | | | | | |
| 6.3: Improve Landscaping Around the Main Office and Exhibition Centre | Medium | Medium | | | | | | | | | | |
| 6.4: Construct Basic Facilities for Researchers and/or Visitors for activities | Low | Medium | | | | | | | | | | |
| 6.5: Implement a Monitoring and Inspection Programme for Infrastructure and Facilities. | High | Long | | | | | | | | | | |
| 6.6: Install CCTVs | Low | Short | | | | | | | | | | |
| 6.7: Install Fence Around the perimeter of KKW | Medium | Short | | | | | | | | | | |

# Chapter 7
# STAKEHOLDER ENGAGEMENT

## 7.1 THE ROLE OF STAKEHOLDERS

Well-managed and maintained wetlands offer numerous ecological services and biodiversity benefits to society. In addition to providing habitats for plant and animal species, wetlands can help improve water quality and storage, reduce pollution, and slow riverbank and coastal erosion. They help to mitigate floodwaters and reduce fire risks; scenarios which are expected to occur with increasing frequency in the future due to climate change. Wetlands also moderate strong winds and offer a cooling effect to local areas. In addition to these benefits, wetlands situated in urban areas act as green spaces which contribute to local wellbeing in terms of their natural aesthetic, and provide opportunities for education and recreation for local residents (Government of Australia, 2013).

Nonetheless, there remains a general lack of public awareness concerning the biodiversity value of wetlands and the ecological services they provide (UNESCO, 2002b), including amongst direct stakeholders in these wetlands. In many instances, stakeholders may only be willing to support wetland conservation if they understand the environmental importance of these areas *and* are engaged in the management process in a consistent, meaningful and inclusive manner. The involvement and empowerment of stakeholders in both problem-setting and problem-solving is essential to the sustainable management of urban wetlands; and yet this degree of participation is currently lacking in many urban wetland areas (UNESCO, 2012). Governance of urban development and wetland management should be participatory, conducted with all relevant stakeholders, and decentralised to the lowest appropriate level (UNESCO, 2012).

Whilst the Ramsar Convention itself contains no concrete prescriptions on best practices for stakeholder consultation, the decades since its inception have seen the release of numerous guiding documents targeted at Ramsar site managers - principally in the form of Resolutions adopted during the triennial Conference of the Contracting Parties (COP) to the Convention. In this literature, a stakeholder is defined as any individual, group or community living within the influence of a Ramsar wetland, and/or those whose activities may impact upon said site (UNESCO, 2002a). Stakeholder interests in the wetland are to be valued and safeguarded by managers as far as is possible, and careful negotiations are to be entered into where these interests may have detrimental effects on the ecological character of the site. These principles have been endorsed by Malaysia in the National Ramsar Information Toolkit (MNRE, 2011).

This section offers some general guidance as to how the managers of the Kota Kinabalu Wetlands can strategise stakeholder consultations in a manner compatible with Ramsar best practices, following a suggested stage-by-stage approach to stakeholder engagement in the management process.

## 7.2 FOUR-STAGE APPROACH TO STAKEHOLDER ENGAGEMENT

Stakeholder engagement should be treated as an iterative process. Each of the four stages described in this section are not rigid and do not need to be followed in strict sequence. They should be taken as broad guidance, as the reality of stakeholder engagement may well require that the engagement process be conducted in a variant of cycles based on the needs and circumstances of different stakeholders. It should be remembered that each cycle of engagement will generate lessons learnt that should be embraced to aid the development of improved engagement approaches and techniques over time. Neither should the management team be afraid of repeating stages of engagement, or starting over from the beginning, as the process is ultimately about building long-term and mutually respectful relationships. It is an indivisible long-term component of effective management and as such it will require a great deal of dedication and time.

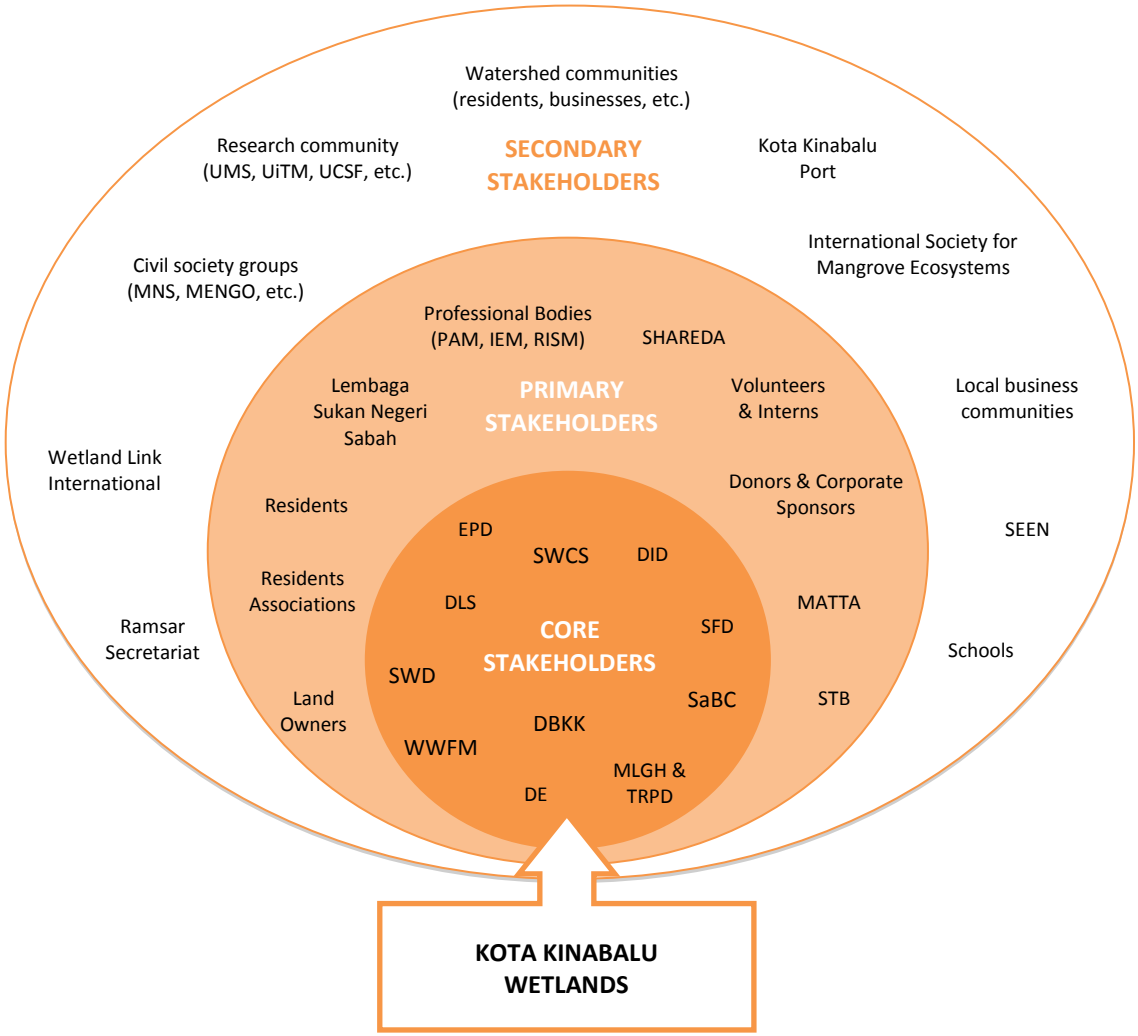
### 7.2.1 Stage 1: Identify the Stakeholders

Prior to operationalising a management plan – ideally during the management planning process - all relevant ecological, economic and socio-cultural information should be gathered about the site. At this stage, the management team should begin defining the stakeholders who have an influence on the long-term management of the wetlands.

Figure 7-1 shows the suggested stakeholders identified to date (see Appendix Vi for contact details). Stakeholders can include local populations, relevant government and non-government bodies, the private sector, research communities as well as local and international visitors (UNESCO, 2002a). Stakeholders have been divided into core, primary and secondary tiers based on current relationships with the management team. While core and primary tiers represent key priorities, all stakeholders should be viewed as a fundamental source of information and allies in effective management.

Next, the management team will need to collect data that describes each of the stakeholders. The kinds of data that can be collected include, where appropriate, information about the individual/organisation and their contact details, current land uses especially for areas adjacent to the wetlands that are owned or occupied by stakeholders, and their relationship to the site.

In addition to information gathering, this process offers an opportunity for the management team to begin building relationships with stakeholders. It is important that the authority vested with management planning should be clearly identified to all stakeholders from the earliest possible stage (UNESCO, 2002a). The precedent for the stakeholder engagement process must also be set clearly from this stage, and data collection should be conducted with techniques which are sensitive to individual and collective rights, gender and cultural issues (UNESCO, 2002a).




**ABBREVIATIONS**

| | |
|---|---|
| DBKK | : Kota Kinabalu City Hall |
| DE | : Department of Education |
| DID | : Department of Irrigation & Drainage |
| DLS | : Department of Lands & Surveys |
| EPD | : Environment Protection Department |
| IEM | : Institution of Engineers Malaysia |
| MATTA | : Malaysian Association of Tour & Travel Agents |
| MENGO | : Malaysian Environmental NGOs |
| MLGH | : Ministry of Local Government & Housing |
| MNS | : Malaysian Nature Society |
| PAM | : Malaysian Institute of Architects |
| RISM | : Royal Institution of Surveyors Malaysia |
| SaBC | : Sabah Biodiversity Centre |
| SEEN | : Sabah Environmental Education Network |
| SFD | : Sabah Forestry Department |
| SHAREDA | : Sabah Housing & Real estate Developers Association |

Core stakeholders
Primary stakeholders
Secondary stakeholders

| | |
|---|---|
| STB | : Sabah Tourism Board |
| STGA | : Sabah Tourist Guides Association |
| SWCS | : Sabah Wetlands Conservation Society |
| SWD | : Sabah Wildlife Department |
| TRPD | : Town & Regional Planning Department |
| UCSF | : University College Sabah Foundation |
| UiTM | : Universiti Teknologi MARA |
| UMS | : Universiti Malaysia Sabah |
| WWFM | : World Wide Fund for Nature Malaysia |

Figure 7-1: Stakeholders of the Kota Kinabalu Wetlands

Once data has been collated, the management team can begin to identify the relationships, roles and responsibilities of each stakeholder in relation to the management of the site. Guidance, such as that shown in Box 7-1, should be refined or established to provide strategic and objective criteria to understand the rationale and degree to which the management team will be engaging with different types of stakeholders. This understanding will enable the management team to develop mechanisms for long-term stakeholder involvement in management.

**Box 1: Guidance for Stakeholder Tiers**

Core Tier: Core stakeholders are the vital agencies required to meet all management objectives for the Kota Kinabalu Wetlands. Engaging with core stakeholders is the top priority for effective long-term management.

Primary Tier: Primary stakeholders are key individuals/organisations that are required to increase the management effectiveness of Kota Kinabalu Wetlands. Engaging with primary stakeholders is a top priority and should seek to:

1. Reduce external threats to the wetlands, especially from areas immediately adjacent to the boundary;
2. Increase tourism visibility and visitation to the wetlands;
3. Boost the capacity of the management team by encouraging volunteerism and community involvement in management actions; and
4. Enhance financing by attracting donors and corporate partnerships.

Secondary Tier: Secondary stakeholders are individuals/organisations/groups who have an influence on the wetlands, and are particularly important for networking, publicity and capacity building. Engaging with secondary stakeholders should aim to increase the positive impacts while reducing the negative impacts of stakeholders on the wetlands.

The management team should establish a dedicated multi-disciplinary team tasked specifically with stakeholder engagement as well as a forum (such as a working group or similar) to facilitate engagement and conflict resolution (UNESCO, 2002b). This forum should convene regular meetings during the management planning process, and should be open to all identified stakeholders; especially those in the core and primary tiers. The forum can also function as sub-committees so that specific issues can be addressed through the formation of specialised working groups.

### 7.2.2 Stage 2: Set the Scene for Participatory Management

Stakeholders should be informed at the earliest possible stage about the intent to produce and implement a management plan, especially core and primary stakeholders. Forum meetings during this stage represent an important “first contact”, during which stakeholders can meet the management team and express their feelings regarding potential issues of concern. These initial meetings also help the management team and stakeholders to get to know one another, and for stakeholders to select who will be their representatives for further consultation. With an atmosphere of transparency and inclusivity, stakeholders are likely to take a sense of ownership and responsibility over the management process, and be engaged about potential strategies to address management issues (Paul, 2013).

At this stage, stakeholder engagement should not enter the realm of negotiation. This stage should focus on reassuring stakeholders of the value of their role in the management process and that their interests will be given due weight by management (UNESCO, 2002a). The most important early message is that everyone will be consulted and involved and that all interests will be given proper consideration. The management team need to convey the message that they are open minded and will deal as objectively as possible with all issues (UNESCO, 2002a).

In addition to being open and transparent throughout all engagements with stakeholders, the management team should always be prepared to allow as much time as is necessary to discuss issues raised by stakeholders. Minutes of all stakeholder meetings should be circulated amongst attendees, and if possible all members of the multi-disciplinary stakeholder engagement team should be present to answer legal and/or technical questions should they arise (Paul, 2013).

Crucially, managers should envision relationships between themselves and stakeholders to be long term, and should seek to strengthen these relationships from the earliest possible opportunity. Once the management team feels that they have an adequate understanding of the issues raised by stakeholders (and the stakeholders themselves agree that this is the case), then the forum can enter into discussions concerning the management of the site.

### 7.2.3 Stage 3: Refine the Management Framework through Consultation

Once the structure for stakeholder engagement is in place and representatives display the beginnings of a positive working relationship, the process can enter the next stage of engagement. At this stage, the management team will need to familiarise stakeholders with the management plan. The management plan should be considered a public document, and the management team should take particular care to ensure that all stakeholders are given copies of the management plan, even at the earliest stages of stakeholder engagement (UNESCO 2002a).

The management team can begin discussing the rationale for management and goal-setting, strategies and action plans together with stakeholders in participatory manner that reflects the needs of all concerned. This stage of engagement should be about presenting ideas or proposals for discussion, inclusively, with all three stakeholder tiers. While the core stakeholders will likely play more direct roles in management and the primary stakeholders will likely boost management effectiveness, this should not diminish the influence and roles of secondary stakeholders as equal allies in achieving management objectives.

Importantly, the management team should formulate a comprehensive overview of what they are trying achieve and identify which areas are open to negotiation, before these discussions take place. The protection of ecological and biodiversity values of a wetlands are of primary importance for a Ramsar site, and should not be considered negotiable. However, it must be remembered that such ecological values often exist because they are maintained by surrounding local populations, and as such it is very important that stakeholders are *not* given the impression during consultations that site management will automatically lead to restrictions on legitimate uses and activities (UNESCO 2002a).

When considering the potential impacts of human activities on the ecological character of a site, evidence should be weighed and action taken in accordance with the precautionary approach, as adopted under Principle 15 of the 1992 Rio Declaration on Environment and

Development adopted by the United Nations Conference on Environment and Development (UNCED) (UNESCO, 2002a). Every effort should be taken to ensure that all stakeholder views and concerns are taken into consideration, and a balance is struck between supporting wise use of wetlands without compromising the ecological integrity of the site (MNRE, 2011).

At this stage, the management team will need to establish a framework for decision-making so that it is clear to all stakeholders how their rights, needs and concerns will be evaluated in the management of the site. Ideally, decision-making will be inclusive and based on multi-criteria that allow for an objective evaluation of the ecological, economic and socio-cultural values of wetlands (UNESCO, 2002a). Different weightings may be applied in order to prioritise different stakeholder requirements, but no concern should be ignored. In any decision, the cost-benefits of ecological and socio-cultural values should be considered equally with any economic considerations (UNESCO, 2002b).

This process of identifying and agreeing upon a management framework with stakeholders is liable to be a lengthy one, but one which is invaluable in fostering a sense of long-term inclusivity and meaningful engagement amongst stakeholders. Once all members of the forum are satisfied as to the overall management framework for the site, they can move on to the next stage of consultation and identify the actual actions and activities required.

### 7.2.4 Stage 4: Embark on Management through Collaborative Action

The management team should seek to identify the most appropriate actions to meet the agreed objectives. Stakeholder consultation is critical at this juncture, as it may often be possible to identify a range of alternative management actions which meet objectives whilst simultaneously fulfilling secondary objectives of interest to stakeholders (MNRE, 2011).

Stakeholder forum meetings should be held regularly during this stage, since fine-tuning management actions to optimise benefits for all stakeholders without compromising Ramsar core values may involve lengthy discussion and negotiation. It is here that the importance of building strong relationships with stakeholders from an early stage and fostering a sense of empowerment and long-term responsibility in the management process can pay dividends.

Once the management actions have been agreed upon, the implementation plan can be produced. Activities can now be conducted in the spirit of collaborative action with stakeholders. These action plans should also be integrated with other activities and related planning elements at the local, regional and national levels (UNESCO 2002a). For example, the current annual calendar of the Kota Kinabalu Wetlands includes three key activities that provide the immediate basis where stakeholder engagement can take place in a positive and festive atmosphere:

1. World Wetlands Day, 2nd February;
2. World Environment Day, 5th June;
3. *Minggu Alam Sekitar* Malaysia, 3rd week of October.

Finally, this stage of engagement should not end with the conduct of activities; rather should extend to include stakeholders in the regular monitoring and evaluation of management effectiveness. These can range from participatory evaluations of the impact of specific activities, performance appraisals, to broader assessments of management effectiveness as a whole. Enabling stakeholders to have a say in how management can improve will deepen

and strengthen the role of stakeholders as custodians of the wetlands, and is fundamental to successful stakeholder engagement.

## 7.3 AN ONGOING AND DYNAMIC PROCESS

Above all, it should be remembered that management is an ongoing and dynamic process, and even more so when it comes to stakeholder engagement. The composition and constitution of stakeholders is likely to change over time, as will the roles and responsibilities of different stakeholders. The stakeholder engagement process will need to be responsive to these changes and reflect sensitivity to the pressures experienced by stakeholders. Indeed, the management actions themselves may well result in outcomes that change the *status quo*, and thereby induce further changes to relationships with existing stakeholders or bring about the emergence of new stakeholders. There will also be changes to the wider economic, political and socio-cultural context of Kota Kinabalu, the State of Sabah and Malaysia, in addition to regional and global shifts, such as in markets and climate, that will exert influence over the integrity and viability of the wetlands.

The challenges of change will be best met with a solid foundation in stakeholder engagement, which has been laid from the earliest stages of the engagement process, and has created an atmosphere where stakeholders feel free to voice their concerns and opinions, and have these heeded. It is these stable stakeholder relationships that will ensure a resilient and effective stakeholder forum that would continue with regular activities and enable inclusive, balanced decision-making.

## 7.4 STRATEGY 7: IMPROVING STAKEHOLDER ENGAGEMENT

Stakeholder engagement is a long-term component that is essential for the effective management of the Kota Kinabalu Wetlands. All core, primary and secondary stakeholder tiers require a great deal of dedication and time to build collaborative working relationships that increase the positive impacts and reduce the negative impacts on the wetlands. Using the 4-Step Approach to Stakeholder Engagement as guidance, the following actions are proposed:

7.1 Develop and maintain a stakeholder information database
7.2 Develop a land use map of the KKW watershed area
7.3 Establish a multi-disciplinary stakeholder engagement team
7.4 Develop and maintain a stakeholder information pack
7.5 Develop and maintain a grievance mechanism
7.6 Establish a special forum with land-owners, residents and resident associations surrounding KKW
7.7 Establish and sustain healthy working relationships with all stakeholders
7.8 Develop an annual activity calendar for stakeholder involvement

### 7.4.1 Action Plan 7.1: Develop and Maintain a Stakeholder Information Database

Background:

From the outset, the management team must have a clear and comprehensive understanding of who are the stakeholders and what is their relationship - historically and presently - to the wetlands. The management team need to develop and maintain an up-to-date central database containing all relevant information offered voluntarily by stakeholders. The database is one reference that guides the management team in planning the direction of stakeholder engagements, management prescriptions which impact upon stakeholders, and overall zonation of the wetland.

Objective:

Identify parties who have a stake in the management of the wetlands and to familiarise the management team with the background, interests and concerns of stakeholders.

Action:

- Data will be descriptive, numeric, and pictorial (the latter primarily in the form of GIS and other maps), and derived from information contributed by stakeholders either during meetings or upon request by the management team.

- Data may include, *inter alia*, relevant policy and planning documents from government and non-governmental bodies, local urban codes and statutes, and information garnered from local residents and residents' associations.

- From inception, the database should be maintained and periodically updated by the management team.

- The database will also serve as a means to document in a chronological manner all issues or objections concerning the site raised by any stakeholders, and the subsequent resolution (or lack thereof) of these issues.

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | DBKK |
| Cost | RM 5,000 (One-off) |

### 7.4.2 Action Plan 7.2: Develop a Land Use Map of the KKW Watershed Area

Background:

The management team must have a clear and comprehensive understanding of the land use prescriptions and land use patterns in and around the wetlands. The development and maintenance of a land use map, and the accompanying spatial database, will inform management action and provide direction so that stakeholder engagement is relevant to the achievement of management goals.

Objective:

To ensure a current and detailed knowledge of the land uses and land use prescriptions of areas in and around KKW.

Action:

- Develop the land use map and associated spatial database using reliable GIS software (such as ArcGIS) and include satellite imagery of the site.
- The map can include layers that show zoning prescriptions, current land uses, and spatial data on habitat types and faunal species presence. Where relevant, digitised cadastral maps supplied by respective authorities is also an important source of information.
- Versions of the map can be printed for use at stakeholder engagement meetings, during which local residents can discuss and add information on local land uses.
- All new information should be digitised and incorporated into the GIS database to ensure that information is up-to-date.

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | DBKK, TRPD, DLS, DID, EPD, SWD, SFD |
| Estimated Costs | RM 10,000 (One-off) |

### 7.4.3 Action Plan 7.3: Establish a Multi-Disciplinary Stakeholder Engagement Team

Background:

In order to work effectively with stakeholders, the management team will have to be well versed in a range of technical and legal fields that often extend beyond the ecological expertise required to manage wetlands. A multi-disciplinary team of experts should be established to provide this expertise and enable the management team to effectively respond to stakeholder concerns and interests from multiple technical angles.

Objective:

To ensure that management planning is informed by the best technical expertise locally available, and that stakeholders are given the opportunity to question and learn from this expertise.

Action:

- Assembled a multi-disciplinary team composed of professionals with expertise in biodiversity conservation, protected area management, hydrology, limnology, urban planning, property development, arbitration and litigation, education, facilitation and communications, tourism development and any other field relevant to stakeholder concerns.

- This team will contribute to overall stakeholder engagement planning and design, and be present during stakeholder consultations to offer technical input.

- The team will likely be composed of both management team members, professionals from the core and primary stakeholder pools, and third-party professionals who can provide advice on an *ad hoc* (but regular) basis.

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | Core and primary stakeholders, third-party professionals |
| Estimated Costs | Nil (Involves staff resources) |

### 7.4.4 Action Plan 7.4: Develop and Maintain a Stakeholder Information Pack

Background:

Stakeholders require access to detailed and up-to-date information so that they can contribute effectively to wetlands management and associated activities. It is important for the management team to prepare reference materials that stakeholders can use at their leisure.

Objective:

To equip stakeholders with knowledge and understanding of the biological and ecological importance of KKW, and the management prescribed for this site.

Action:

- Develop and maintain a stakeholder information pack. The information pack should include:
    - General literature about the importance of wetlands,
    - International designations such as those afforded under the Ramsar Convention
    - Local information on KKW such as species lists and other biophysical characteristics, along with detailed and user-friendly maps.
- The pack should also contain materials aimed at younger audiences, so that local residents are easily able to explain the significance of KKW to their children, who are likely to themselves become local stakeholders in the future. Most importantly, stakeholders should be given copies of the management plan

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | Core and primary stakeholders, third-party professionals |
| Estimated Costs | RM 10,000 (One-off) |

### 7.4.5 Action Plan 7.5: Develop and Maintain a Grievance Mechanism

Background:

A grievance mechanism is a central part of management best practice. It provides management with a clear procedure for receiving and recording complaints or concerns voiced by stakeholders (or other parties, such as visitors), track the processing of a grievance, and document how it has been addressed by the management team with the support of the multi-disciplinary stakeholder engagement team, or the relevant authority as the case may be. This creates a systematic and transparent way in which management can address stakeholder concerns.

Objective:

To ensure integrity and transparency in management and that stakeholders have a reliable and open avenue to raise grievances and understand how they are being addressed.

Action:

- Develop and establish a systematic procedure for addressing grievances from stakeholders. This includes:
    - Clear procedural steps for receiving and recording grievances; dialogue and mediation with parties; arbitration and/or conciliation; and appeals (see Appendix VII for sample Grievance Form).
    - Information on further avenues for action, such as referral to higher authority or litigation, should also be clearly stated.
- Define the roles and responsibilities of the management team, multi-disciplinary stakeholder engagement team and any other authority in the grievance mechanism so that stakeholders have a good understanding of how their grievances will be processed.
- Establish a robust record-keeping system to ensure that all grievance processing is well-documented.

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | Core stakeholders |
| Estimated Costs | Nil (Involves staff resources) |

### 7.4.6 Action Plan 7.6: Establish a Special Forum with Land-Owners, Residents and Resident Associations Surrounding KKW

Background:

Adjacent areas form the default buffer to the wetlands. Having good relationships with the owners and occupants of these areas is critical. A special forum must be established to facilitate this engagement, which includes joint problem-setting and problem-solving, and to serve as the main stage for conflict resolution.

Objective:

To provide an inclusive and transparent means for land owners and residents to understand the management rationale and its technical justifications, discuss land use prescriptions, express concerns, and contribute to the management process.

Action:

- Conduct the special forum with the involvement of the management team, multi-disciplinary stakeholder engagement team, land owners, residents and residents' associations.
- Meetings of this forum should be held in an inclusive and diplomatic manner and on a regular basis (e.g. bi-monthly) with provisions for more frequent meetings in times of need.
- Meeting minutes and other relevant information from forum meetings will be included in the databases outlined in Action Plans 1 and 2 above

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | Core and primary stakeholders |
| Estimated Costs | RM 50,000 (10 years) |

### 7.4.7 Action Plan 7.7: Establish and Sustain Healthy Working Relationship with All Stakeholders

Background:

Healthy relationships between stakeholders and the management team are crucial to the long-term viability of the management process. This should be founded on trust and respect, and all attempts at stakeholder engagement are liable to founder if these relationships are not strong enough.

Objective:

To create and maintain open and trusting relationships between stakeholders and the management team over the long-term, which will ensure successful collaborative action in the management of the wetlands.

Action:

- Design and conduct engagement activities for different target stakeholders, which should allow for regular contact with stakeholders.
- From the start, an atmosphere of transparency, inclusivity, and mutual respect must be established. The management team should always be conscientious that they are creating an atmosphere in which stakeholders can freely express their concerns, with mechanisms established by which stakeholders may contact the management team with queries at any time.
- Provide adequate time and space to discuss issues that stakeholders wish to raise, and the management team must make all necessary efforts to ensure that stakeholder issues are resolved without compromising the integrity of the wetlands.
- Stakeholders should be given opportunities to regularly participate in activities, and their contributions given due recognition.
- This is an ongoing and iterative process that will require a great deal of dedication, resources and time, but is essential for effective management of the wetlands.

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Long |
| Supporting Agency/Group | Core and primary stakeholders |
| Estimated Costs | Nil (Involves staff resources) |

### 7.4.8 Action Plan 7.8: Develop an Annual Activity Calendar for Stakeholder Involvement

Background:

Activities that involve stakeholders, ranging from forum meetings, educational outreach to evaluations of management effectiveness, should be designed to enable the full and effective participation of stakeholder audiences. This requires careful and advanced planning on the part of the management team to ensure that stakeholders have adequate notice to prepare for activities and organise their participation.

Objective:

To enable stakeholders to actively participate in engagement events.

Action:

- Finalised the annual activity calendar as early as possible for the year and should contain the scheduled dates of all planned forum meetings and activities organised by the management team (such as World Wetlands Day and Minggu Alam Sekitar Malaysia).

- Dates, format and – where possible - content for future forum meetings and activities should be discussed and agreed upon by core and primary stakeholders prior to the production of the annual calendar.

| | |
|---|---|
| Start Date | January 2016 |
| Implementation (Term) | Short |
| Supporting Agency/Group | Core and primary stakeholders |
| Estimated Costs | Nil (Involves staff resources) |

## 7.5 SUMMARY OF STRATEGIES AND ACTION PLANS

The action plans for Strategies 7 are summarized in Table 7-1 below according to their terms of implementation, costs and supporting agency. The schedule of implementation is presented in Table 7-2. The total cost of all action plans is RM 75,000.

Table 7-1: Action Plans for Strategy 7

| ACTION PLAN | TERM | EST. COSTS (RM) | SUPPORTING AGENCY |
|---|---|---|---|
| **STRATEGY 7: IMPROVING STAKEHOLDER ENGAGEMENT** | | | |
| 7.1: Develop and maintain a stakeholder information database | Short | 5,000 | DBKK |
| 7.2: Develop a land use map of the KKW watershed area | Short | 10,000 | DBKK, TRPD, DLS, DID, EPD, SWD, SFD |
| 7.3: Establish a multi-disciplinary stakeholder engagement team | Long | Nil | Core and primary stakeholders, third-party professionals |
| 7.4: Develop and maintain a stakeholder information pack | Short | 10,000 | Core and primary stakeholders, third-party professionals |
| 7.5: Develop and maintain a grievance mechanism | Long | Nil | Core stakeholders |
| 7.6: Establish a special forum with land-owners, residents and resident associations | Long | 50,000 | Core and primary stakeholders |
| 7.7: Establish and sustain healthy working relationships with all stakeholders | Long | Nil | Core and primary stakeholders |
| 7.8: Develop an annual activity calendar for stakeholder involvement | Short | Nil | Core and primary stakeholders |

Note:

DBKK : Dewan Bandaraya Kota Kinabalu
DID : Department of Irrigation and Drainage
DLS : Department of Lands and Survey
EPD : Environment Protection Department
SFD : Sabah Forestry Department
SWD : Sabah Wildlife Department
TRPD : Town and Regional Planning Department

Table 7-2: Plan of Implementation for Strategy 7

| ACTION PLAN | TERM | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **STRATEGY 7:** | | | | | | | | | | | |
| 7.1: Develop and Maintain a Stakeholder Information Database | Short | | | | | | | | | | |
| 7.2: Develop a Land Use Map of the KKW Watershed Area | Short | | | | | | | | | | |
| 7.3: Establish a Multi-Disciplinary Stakeholder Engagement Team | Long | | | | | | | | | | |
| 7.4: Develop and Maintain a Stakeholder Information Pack | Short | | | | | | | | | | |
| 7.5: Develop and Maintain a Grievance Mechanism | Long | | | | | | | | | | |
| 7.6: Establish a Special Forum with Land-Owners, Residents and Resident Associations | Long | | | | | | | | | | |
| 7.7: Establish and Sustain Healthy Working Relationship with All Stakeholders | Long | | | | | | | | | | |
| 7.8: Develop an Annual Activity Calendar for Stakeholder Involvement | Short | | | | | | | | | | |

# Chapter 8
# FINANCING OPTIONS

## 8.1 INTRODUCTION

Stable and sufficient funding is fundamental to support long-term operations of the Kota Kinabalu Wetlands (KKW) which include staffing, maintenance and development. To develop funding that is sustainable, there is a need to diversify the funding sources while integrating innovative approaches in raising and managing funds. The section provides an overview of the present and future funding sources and where, possible, highlights mechanisms to source for these funding.

## 8.2 FUNDING NEEDS

Overall, the proposed action plans in Section 6 and 7 involve a range of activities that require funding in terms of human resources, operational and capital expenditures. The major expenditures for the ten-year plan which will run from 2016 to 2025 are summarised as follows:

Table 8-1: Summary of Total Expenditure

| STRATEGY | TOTAL COST (RM) |
|---|---|
| 1: Enhance Habitat Protection And Conservation | 400,000 |
| 2: Improve Hydrological Management | 70,000 |
| 3: Strengthen Education And Visitor Programmes | 250,000 |
| 4: Increase Visibility Through Promotion And Marketing | 700,000 |
| 5: Build The Skills And Capabilities Of Staff And Volunteers | 265,000 |
| 6: Improve Infrastructure And Facilities | 1,290,000 |
| 7: Improve Stakeholder Engagement | 75,000 |
| Staffing Requirements | 3,192,663 |
| *Total* | *6,242,663* |

The estimated costs of staffing requirement are shown in Appendix VIII. The funding needs based on annual requirements are shown in Table 8-4 at the end of this Chapter.

## 8.3 FUNDING SOURCES

The proposed funding model consists of the following components:

1. Government grants
2. Conservation levy
3. Donations
4. Sales and services
5. Sponsorship and Grants for donor agencies

6. Corporate Social Responsibility

### 8.3.1 Government Grants

In general, the financial responsibility for the implementation of the management plan will fall heavily on both the federal and state governments. While it is acknowledged that national allocations are still inadequate, they remain as the most feasible and secure source of funding. Under the Federal budgetary system, there are no specific budget lines for conservation or the environment. Federal funds are provided through (i) budgetary allocations from current accounts, and (ii) development funds from development accounts.

Development allocations will therefore be required to cover the bulk of costs on conservation-related expenditure. At the Federal level, allocations from other relevant ministries may also be used to defray some development costs. For example, actions plans relating to tourism-related activities may be sourced from development funds from the Federal Ministry of Culture, Arts and Tourism. State funding arrangements function in a similar to the federal funding model. However, state allocations that are available would be much smaller compared with federal allocations.

As an NGO, the Sabah Wetlands Conservation Society (SWCS) will not have direct access to these budgets. However, SWCS can submit applications for funding either through the Sabah Wildlife Department (SWD), who is the custodian of the KKW, or its ministry the Ministry of Culture, Tourism and Environment (MTCE), Sabah. If endorsed, these applications will then be submitted together with the agency's overall application to the State government.

Applications for funding through the SWD have previously been made by SWCS but this has been on an ad-hoc basis. This process needs to be formalized where annual applications are made either through SWD or MTCE (and other relevant agencies) based on the annual requirements of the management plan. To do so, the following elements need to be determined:

1. Format of applications – what are the justification, details required, templates that should be used, and the officer in charge where applications should be submitted.

2. Timing of applications – annual applications should be timed to meet the agency(s) budget application deadline. Sufficient time must be allocated to allow for processing, approval and integration within the agency(s) overall budget application.

3. Engagement with relevant officers – continuous dialogue needs to be established with the officer in charge to follow-up on applications that are made to ensure that it meets the requirements of the agency or, if the application is not successful, the reasons behind this. This would help SWCS is strategizing how future applications are made.

### 8.3.2 Conservation Levy

Presently, KKW collects a conservation levy from every visitor who visits the wetlands. Local visitors are charged an entrance fee of RM 5 per person (RM 3 for children) while international visitors are charged RM 15 (RM 10 for children). Fees are also collected for

filming, photography, guides and boating. The conservation levy has in some years, contributed close to 26% of the operational expenditure of KKW. It is therefore considered as a significant source of funding.
The collection of the conservation levy can be considered very low and can be increased by (1) attracting more visitors to KKW, and (2) by raising the levy that is imposed. Both are however dependent on a number of factors which have been addressed in the strategies and action plans, namely the need to strengthen education and visitor programmes, to increase visibility through promotion and marketing, and to improve infrastructure and facilities.

When all three strategies reach some level of maturity over the course of the management plan, visitor numbers will be anticipated to improve and higher conservation fees can be imposed to commensurate with an improved level of service. The conservation levy itself can be utilized to support both operational and development expenditures.

### 8.3.3 Donations

At related in Section 3, donations has formed the bulk of revenue for KKW over the last five years. Donations collected has however fluctuated considerably from year to year as it is primarily dependent on fund-raising efforts undertaken. Donations nevertheless remains as an important source of funding. The levels of donations collected can however be stabilised if fund-raising efforts are executed in a planned and consistent manner. There are various fund-raising efforts that can be undertaken together to secure donations:

1. Appeal Letters – Appeals letters are common way to source for donations. The appeal letters can target a variety of donors such as SWCS members, private corporations, and individuals. Appeal letters that successfully engage the donor need to explain why funds are required and how it will be used, i.e. what are the target activities and its impacts. Donors should subsequently receive feedback on activities implemented which can be done through regular updates via email, letters etc. The preparation of appeal letters should be an annual campaign before the end of each year.

2. Special Events – This encompasses a range of fund-raising events such as charity dinners. Charity dinners have in fact already been organised by KKW where tables are sold to the public or corporations. Special events that are effective have a clear target audience and are essentially connected with the mission of the organisation. The events must nevertheless be feature driven, educational and fun to participate in. Fund-raising events can be carried out during other organised events (see Action 4.7).

3. Crowd Funding – Crowd funding represents a recent trend in sourcing for donations which leverages upon the online resources and social media. An online platform is used to setup a public campaign for accepting donations. The campaign will provide details of the fund-raising drive and donors can donate specific amounts during the campaign period. Crowd funding can reach a wider audience where even small individuals donations can have significant end results. There are a number of available online platforms that can be used such as Razoo, Causes, Crowdrise etc.

### 8.3.4 Sales and Services

The generation of revenue from sales and services are presently underdeveloped. Sales and services are considered as direct revenue, and similar with fees collected from the conservation levy, are funds that can be used for the full range of operational and development expenditure. There are a number of streams where revenue can be generated, some of which have already been explored previously by KKW:

1. Merchandise and refreshments – Although some merchandise and refreshments have been sold at KKW, there is still an opportunity to develop sales further. For example, merchandise could be expanded to a full range of souvenirs (t-shirts, key-chains, stickers, mugs, pens, fridge magnet etc.), equipment (leech socks, water bottles, insect repellant etc.), and books on the wetlands. Refreshments will be required after visitors visit the wetlands or take part in activities outdoors. This can in fact be further expanded into a small café.

2. Visitor and education programmes – As visitor and education programmes are developed at KKW (see Strategy 3), fees that are collected will start to generate revenue, which can be substantial when visitor numbers increases. As part of marketing strategies, partnerships should be developed with tour operators to bring tourists to the wetlands, and to participate in these programmes when ideally are suited for larger groups.

3. Meetings, Incentives, Conventions and Exhibitions (MICE) – KKW has the potential to be a perfect platform for a corporate getaway within the city due to its close location and natural environment. It is ideal for small groups for a range of functions from meetings, seminars and workshops. Many groups already use the facilities at the wetlands but this can be further expanded to target an ever growing market, for example the new development of Jesselton Quay near to KKW will result in a growth of businesses and visitors. Facilities would however require some improvements after which packages can be developed and offered to the public. MICE will be strategic for KKW as it will fill a period during weekdays where visitor numbers are low.

4. Accommodation – There have already been plans to develop basic accommodation facilities for researchers and/or visitors. Although only very few of such facilities can be constructed, accommodation such as chalets that are designed and constructed well can attract local and international tourists who want to get away from the city. Some discussions are required to determine the right model for this to be successful. The volume of rooms that can be provided would be small and below a number that can be profitable unless boutique-type facilities are offered which can command higher rates.

### 8.3.5 Grants and Sponsorship from Donor Agencies

External grants are a major source of funding for conservation activities and there are a host of international grants (and donations) available. Most grants are designed with specific objectives and types of activities that can be funded which limits how the grants can be utilised. However, a range of activities can be funded such as capacity building, research, conservation activities, awareness and education.

Some examples of the funding available include:

Ramsar Small Grants Fund (SGF) – SGF aims to help developing countries support the conservation and wise use of wetland resources. Since 1990, the Fund has provided over eight million Swiss Francs to over 240 projects from 110 countries, for example helping countries to accede to the Convention and designate Ramsar Sites, funding the development of site management plans and national wetland inventories or policies, raising awareness of how to care for a wetland, and training wetland managers around the world.

The GEF Small Grants Programme (SGP) – SGP is a Global Environment Facility (GEF) funded corporate programme implemented by the United Nations Development Programme (UNDP) on behalf of the GEF partnership. SGP provides grants of up to US$50,000 directly to local communities including community-based organizations and other non-governmental groups for projects in biodiversity conservation, climate change, sustainable forest management etc. To date, the SGP Malaysia has provided funds to support over seventy NGOs and CBOs through more than one hundred projects.

Funding Requirements

SWCS will need to understand what their funding requirements are based on the strategies and actions plans that have been set out in this management plan. SWCS will then need to undertake the following actions:

1. Identify funding needs – SWCS will need to identify the types of activities or projects that would require funding. Most grants will not provide for normal operational expenditures unless it is project related.

2. Identify grants that are available – While there are a host of grants available, the objectives and types of activities that can be funded are specific to each grant. SWCS will have to match their needs for KKW with the right grants.

3. Establish a portfolio of grants – Most grants will only provide for activities with specific timeframes. To sustain activities within their sites, SWCS will need to develop a portfolio of funding sources that will bridge across a longer time period. There is therefore a need to actively seek a range of funding opportunities over the long term.

Grant Application

The application for grants is a competitive process. Applicants must not only demonstrate that projects to be funded will result in tangible achievements but also meet requirements for technical and financial documentation. The preparation of grant applications therefore requires some amount of technical skills and knowledge, for example understanding Project Cycle Management and tools such as the Logical Framework Approach.

For most managers this will be huge hurdle even before any activities can be realised on the ground. The time and resources spent in preparing grant applications can also be a burden if applications are not successful. However, this is very much part of the process of securing grants and such investments will be required. The establishment of team for proposal

preparation and project management will be an ideal investment. KKW's team i.e. Manager, Conservation Officer and Education Officer can be trained for this purpose and will slowly gain experience as they start to prepare grant applications.

Responsibility of Grantees

SWCS will need to be aware of their responsibilities to donor agencies.

1. Reporting – Funds are provided for specific activities and outputs. Grantees are expected to provide periodic technical and financial reports on how these funds are utilised.

2. Management capacity – SWCS need to ensure that they have the capacity to implement and manage project activities. If required, this could be outsourced to other parties.

3. Financial capacity – Some grants will only co-fund projects. Applicants need to be able to secure co-funding either internally or from other agencies.

### 8.3.6 Corporate Social Responsibility

The private sector has a major role to play in contributing towards conservation activities are have largely channeled funding through Corporate Social Responsibility (CSR) programmes. CSR describes activities that safeguard the environment, communities, employees, shareholders and other affected parties interest as an integral part of the operations of a company. A large of part of the focus is to lay a foundation for long-term sustainable and shared value creation. Many companies in Malaysia have been practising CSR but there is now more awareness and visibility. In 2006, Bursa Malaysia launched a framework for the implementation and reporting of CSR measures by listed companies. Companies were subsequently required to disclose of any CSR activities.

Previously, most CSR programmes were focused on the employees of the companies i.e. education, training, welfare etc. However, there are now more market-oriented CSR activities that are driven by a growing awareness among consumers particularly on how businesses affect society and the environment. In the past, CSR activities were primarily through small individual one-off donations and where companies had very little interaction with the beneficiaries.

However, there have been recommendations that companies now need to play bigger roles – programmes should be long-term, directed at specific projects and have tangible outcomes. There are already some notable examples:

> In 2006, HSBC Bank embarked on its Green Partnership Programme with the Malaysian Nature Society. The five-year programme, based at the Kuala Selangor Nature Reserve, aims to increase the level of environmental education, awareness and conservation of all stakeholders within the Kuala Selangor community. Activities that are conducted include the planting of mangrove saplings as part of the ecosystem enrichment programme.

In 2008, Sime Darby Plantation pledged RM 25 million for the restoration of 5,403 ha of logged-over forest in northern UluSegama in the UluSegama Forest Reserve in Sabah. The 10-year programme, under Sabah Forestry Department, will aim to rehabilitate habitats that are extensively used by orang-utan populations.

In Sept. 2011, Nestlé launched RiLeaf, a 3-year programme aimed at restoring 2,400 ha of riparian forest along Sg. Kinabatangan in Sabah. The restored riparian will form a natural buffer filtering pollutants (soil sediments and agricultural run-off from oil palm plantations) from entering the river and supporting wildlife populations. The project will be community-based where local villagers will be engaged to produce forest seedlings and carry out tree-planting activities, thereby raising local incomes.

In 2013, Astro Kasih attempted and set the Guinness World Records for the Longest Underwater Clean Up at the Tunku Abdul Rahman Marine Park. The activity, which saw the participation of 134 volunteers divers from all over the world, aimed to raise greater awareness in marine conservation.

Since its establishment, KKW has received various sponsorships from corporate organizations including HSBC, Shell Malaysia, Rotary Club Malaysia, Bank Islam Malaysia Berhad and Mullion Co. Inc. Funding has been in numerous forms such as donations, sponsorships or jointly organized programmes with volunteers. There is therefore still an opportunity to tap into the developing market for CSR services to develop larger secure funding sources among corporate organizations.However there are some measures that need to be taken:

- Identify potential corporate donors;
- Identify types of activities that donors would be interested to support;
- Design programmes that will meet both conservation objectives and donor requirements;
- Engage with donors to determine the amount of funding and scope of services.

Any programme designed needs to have clear objectives with time-bound outputs. SWCS also need to ensure that adequate resources are allocated for communication strategies to provide donors with sufficient mileage for their contributions.

## 8.4 PROPOSED FUNDING MODEL

The funding model for KKW can be developed based on an analysis of KKW's current funding sources and further deliberations which can follow a six-step approach (Kim et al., 2011):

1. Analyze the current approach to funding
2. Learn from funding approaches of peer organizations
3. Identify and narrow the range of funding model options
4. Evaluate revenue potential and costs of short-list funding models
5. Select funding model to implement
6. Develop and implementation plan

At this stage, the sources of funding that have the best potential to consistently generate net revenue for the implementation of actions within this plan (see Table 8-2) based on the funding sources described above are as follows:.

1. Annual Government Grants – Government grants will need to be secured on an annual basis either through SWD or MTCE. This is aimed to ensure that KKW has at least some level of financial stability, particularly in ensuring that essential expenses are covered. A proposed allocation of at least RM 150,000 annually should be sought through a grant application with SWD or MTCE. SWD or MTCE will then submit this as part of annual budget applications, either to the State or Federal government. This process will however require some lead time and, if successful, the grant should be expected to commence from Year 3 onwards. The application is expected to be an annual exercise and KKW's Manager shall facilitate this process and any engagements with SWD or MTCE.

2. Ramsar Grant – The Ministry of Natural Resources and Environment Malaysia currently provides a grant of RM 1,000,000 for sites that are recognised under the Ramsar Convention. The grant shall be expected to finance actions for at least fours years which should allow KKW to develop its other sources of funding.

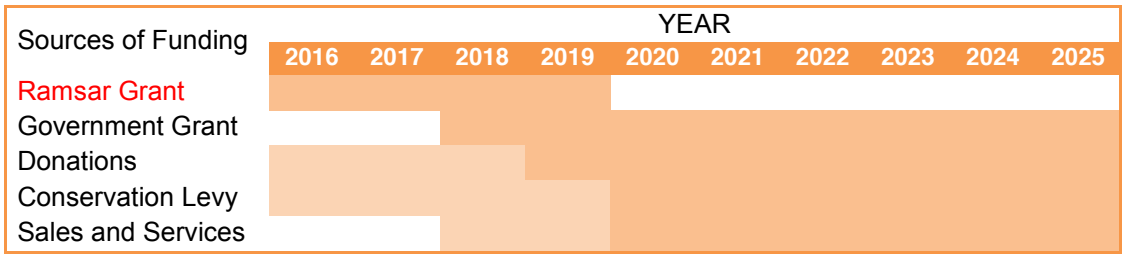
3. Donations – Although not entirely stable, donations will form one of the major sources of funding which can be used to supplement other funding sources. Annual fundraising campaigns must therefore be organized to leverage upon this source and should target a collection of at least RM 100,000 annually. In addition to charity dinners that have been previously conducted, KKW should explore a range of other methods to collect donations such as annual appeal letters etc.

4. Conservation Levy – The conservation levy forms a stable source of funding. It has contributed up to 26% of annual revenue. KKW should target visitor numbers of at least 20,000 annually which would result in a collection of approx. RM 100,000 per year. These numbers should then be gradually increased and the conservation levy raised as facilities are upgraded after Year 4. A collection of at least RM 250,000 should then be targeted annually.

5. Sales and Services – This source remains undeveloped but can form a substantial source of funding for KKW. This includes sales of merchandise and refreshments, fees from visitor and education programmes, and rentals from MICE packages. Actions related to these are expected to be completed by Year 4 onwards. Overall, sales and services should target a net profit of at least RM 100,000 annually.

Other sources of funding such as grants and sponsorship for donor agencies and CSR programmes can then be

Table 8-2: Proposed Sources of Funding from 2016 to 2025




Legend:

Major Minor None

## 8.5 MATCHING FUNDING NEEDS

Table 8-3 below provides a summary of how funding sources can be used to support the implementation of actions proposed under this management plan. Overall, it highlights to need to diversity sources in order to raise funds but also emphasizes that funding must be targeted for different expenditures. For example, the upgrade of the boardwalk should ideally be sourced from government grants, and not from the conservation levy or sales and services, which can be used to fund operational expenditures. Annual operating plans that are prepared, based on the action plans proposed in this management plan, must therefore take in consideration both funding needs and sources to ensure that all activities that are planned can be executed successfully.

Table 8-3: Funding Sources and Types of Expenditure

| Sources of Funding | Type of Expenditure |
|---|---|
| Government Grants | • Development |
| Conservation Levy | • Operational<br>• Development<br>• Human resources |
| Donations | • Operational<br>• Development<br>• Human resources |
| Sales and Services | • Operational<br>• Development<br>• Human resources |
| Sponsorship, Grants and CSR | • Project activities<br>• Equipment (if required for activities)<br>• Human resources (partial) |

Table 8-4: Estimated Annual Expenditure from 2016 to 2025

| COMPONENTS | COST PER YEAR (RM) | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | |
| Strategy 1 | Nil | 30,000 | 40,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 40,000 | 40,000 | *400,0000* |
| Strategy 2 | 6,000 | 6,000 | 16,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | *70,000* |
| Strategy 3 | 10,000 | 40,000 | 80,000 | 80,000 | 40,000 | Nil | Nil | Nil | Nil | Nil | *250,000* |
| Strategy 4 | 10,000 | 10,000 | 70,000 | 70,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | *700,0000* |
| Strategy 5 | 20,000 | 20,000 | 35,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | *250,000* |
| Strategy 6 | 400,000 | 10,000 | 155,000 | 115,000 | 40,000 | 140,000 | 140,000 | 140,000 | 75,000 | 75,000 | *1,290,000* |
| Strategy 7 | 5,000 | 30,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | *75,000* |
| Staff Resources | 164,160 | 271,066 | 285,451 | 300,614 | 316,597 | 333,446 | 351,209 | 369,936 | 389,682 | 410,502 | *3,192,663* |
| *Total (Annual)* | *615,160* | *417,066* | *686,451* | *651,614* | *572,597* | *649,446* | *667,209* | *685,936* | *630,682* | *651,502* | *6,242,663* |

# Chapter 9
# IMPLEMENTATION FRAMEWORK

## 9.1 INTRODUCTION

This management plan consists of strategies and action plans that will run from 2016 to 2025. The plan shall be implemented by the Sabah Wetlands Conservation Society (SWCS), through its team of personnel at the Kota Kinabalu Wetlands (KKW) Centre, together with the support of various government agencies, non-governmental and private organizations, volunteers etc. SWCS and the KKW Centre will however form the main platforms for the implementation of the management plan for KKW.

## 9.2 SABAH WETLANDS CONSERVATION SOCIETY

SWCS was established in 2005with the purpose of facilitating the establishment of a dedicated office to manage the wetlands in an independent manner. SWCS is responsible in overseeing the management of KKW and the operation of the KKW Centre.

### 9.2.1 SWCS Committee

According to its rules and constitution, the SWCS committee comprises of the following persons:

- President
- Deputy President
- Honorary Secretary
- Honorary Assistant Secretary
- Honorary Treasurer
- Honorary Assistant Treasurer
- Four Ordinary Committee Members
- Seven Ex-Officio Members

The function of the Committee is to organize and supervise the overall activities of the Society and to make decisions on matters affecting its running within the general policy laid down by the general meeting. The Committee meets once in every three months.

The seven Ex-Officio Members comprise of the following representation:

1. Director of Sabah Wildlife Department
2. Director of Environment Protection Department
3. Director of Sabah Education Department
4. Director of Department of Irrigation and Drainage
5. Mayor of Kota Kinabalu City
6. Permanent Secretary of Ministry of Local Government and Housing

7. Executive Director of WWF-Malaysia

At present, the Ex-Officio represents all key stakeholders which form the supporting platform for the implementation of the management plan.

### 9.2.2 SWCS Executive Committee

The SWCS Executive Committee (or EXCO) comprises of the following persons:

- President
- Deputy President
- Honorary Secretary
- Honorary Treasurer

The function of the EXCO is to supervise the day-to-day activities of the Society, and to make decisions on matters affecting its running within the general policy laid down by the Committee. The EXCO meets at least once in every two months.

## 9.3 THE KOTA KINABALU WETLANDS CENTRE

### 9.3.1 Present Secretariat

The KKW Centre represents SWCS's secretariat for the management of day-to-day operations of KKW. It is presently staffed by full-time personnel who occupy the following positions:

- Manager
- Conservation Officer
- Environmental Education Officer
- Clerk cum Administration and Accounts Assistant
- Gardener cum Grounds worker and Security

Overall, KKW's Team coordinates and implements a range of activities related to the following main scope of work:

- Administration and financial management;
- Implementation of education and visitor programmes;
- Implementation of research and restoration programmes;
- Promotion and fund-raising activities;
- Collection of fees, donations and sales;
- Maintaining buildings and facilities;
- Full-time manning of the premises during operation hours.

The Secretariat reports directly to the EXCO and carries out its function according to the general policy laid down by the EXCO.

### 9.3.2 Proposed Secretariat

The scope of work of the present staff encompasses all the core area which is required to manage KKW. However, the full implementation of this management plan will require an expansion of the scope of work as such the responsibilities placed upon KKW's team will be expected to increase tremendously. Therefore, there is a need to increase the capacity of the team. It is recommended that at least three new staff members are recruited to provide the support and assistance required while the roles and responsibilities of the existing staff members are strengthened.

The proposed new and existing positions are listed as follows:

- Manager
- Conservation Officer
- Education Officer
- Administration and Finance Officer (expanded role of the Clerk)
- Sale and Marketing Executive (new)
- Assistant Conservation Officer (new)
- Assistant Education Officer (new)
- Groundkeeper (expanded role of the Gardener)

The new organisational structure is now proposed as follows:

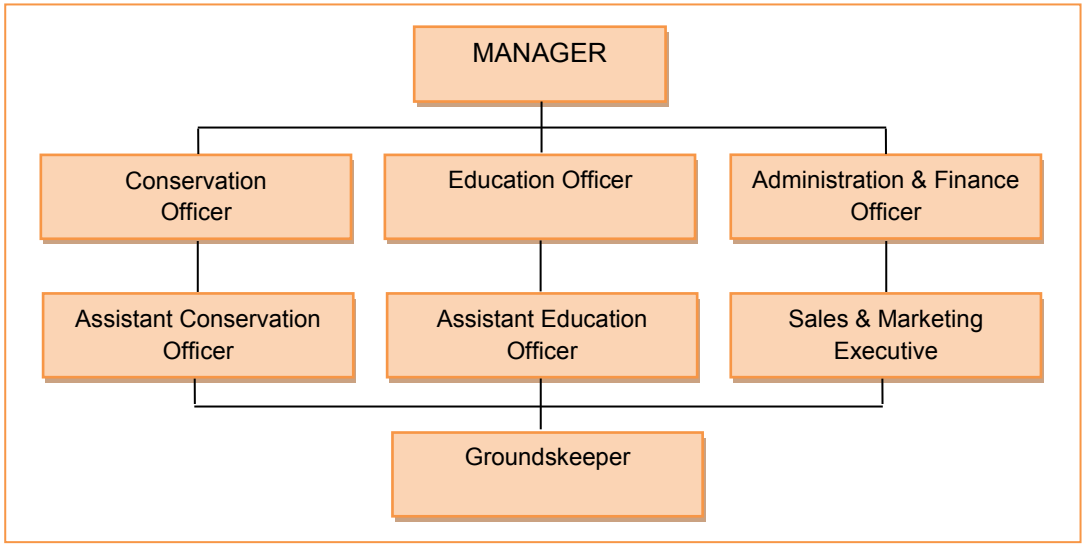



Figure 9-1: Proposed organisational structure of KKW's Team

In addition to the scope of work detailed in the above section, the proposed tasks and responsibilities for each staff member in relation to the strategies and action plans detailed in Chapter 6 are shown in Table 9-1 below. The full scope of for each staff is given in Appendix IX.

Table 9-1: Action Plans and Responsible Staff Members

| ACTION PLAN | M | CO | ACO | EO | AEO | SME | AFO | GK |
|---|---|---|---|---|---|---|---|---|
| **STRATEGY 1: ENHANCE HABITAT PROTECTION AND CONSERVATION** | | | | | | | | |
| 1.1: Monitor and Assess the Health of the Mangrove Habitat | | ■ | ■ | | | | | |
| 1.2: Maintain the Mudflat Habitat for Birds | | ■ | ■ | | | | | ■ |
| 1.3: Rehabilitate Firefly Habitat | | ■ | ■ | | | | | ■ |
| 1.4: Develop Research Programme for Undergraduate and Postgraduate Researchers | ■ | ■ | | | | | | |
| **STRATEGY 2: IMPROVE HYDROLOGICAL MANAGEMENT** | | | | | | | | |
| 2.2: Monitor Water Quality and Quantity | | ■ | ■ | | | | | |
| 2.1: Assess Sources of Water-Based Pollution in the Watershed | ■ | ■ | ■ | | | | | |
| **STRATEGY 3: STRENGTHEN EDUCATION AND VISITOR PROGRAMMES** | | | | | | | | |
| 3.1: Enhance Environmental education Programmes | | | | ■ | | | | |
| 3.2: Develop Core Visitor Programmes | ■ | ■ | | ■ | | | | |
| 3.3: Improve Facilities at the Education Zone | | | | ■ | ■ | | | ■ |
| 3.4: Revise Information Leaflets and Develop Booklets | ■ | ■ | | ■ | | ■ | | |
| **STRATEGY 4: INCREASE VISIBILITY THROUGH PROMOTION AND MARKETING** | | | | | | | | |
| 4.1: Update KKW Website with Interactive Content | | | ■ | | ■ | ■ | ■ | |
| 4.2: Develop Publicity Materials | ■ | | | | | ■ | | |
| 4.3: Develop and Implement a Marketing Plan to Promote KKW | ■ | | | | | ■ | ■ | |
| 4.4: Organise Road-Shows in Schools throughout the State | | ■ | | ■ | ■ | ■ | | |
| 4.5: Monitor and Respond to Reviews by Visitors on Travel Web Portals | ■ | | | | | ■ | | |
| 4.6: Increase Road Signage Leading to KKW | | | | | | | ■ | |
| 4.7: Organize Activities during Internationally Significant Events | ■ | | | | | ■ | ■ | |
| **STRATEGY 5: BUILD THE SKILLS AND CAPABILITIES OF STAFF AND VOLUNTEERS** | | | | | | | | |
| 5.1: Increase the Number of Staff at KKW | ■ | | | | | | | |
| 5.2: Improve the Skills of All Staff Members | ■ | | | | | | | |
| 5.3: Appoint Honorary Wildlife Wardens | ■ | ■ | | ■ | | | | ■ |

| ACTION PLAN | M | CO | ACO | EO | AEO | SME | AFO | GK |
|---|---|---|---|---|---|---|---|---|
| 5.4: Develop Specialised Nature Guides among Staff and Volunteers | ■ | ■ | ■ | ■ | ■ | | | |
| 5.5: Strengthen the Work Program for Volunteers and Interns | ■ | ■ | | ■ | | | ■ | |
| 5.6: Establish a Voluntary Wetland Watch Programme | ■ | | | | | | ■ | |
| **STRATEGY 6: IMPROVE INFRASTRUCTURE AND FACILITIES** | | | | | | | | |
| 6.1: Upgrade the Boardwalk and Bird-Watching Hide | ■ | ■ | | ■ | | | | ■ |
| 6.2: Improve All Signage and Information Stations along the Boardwalk | | ■ | | ■ | | | | ■ |
| 6.3: Improve Landscaping Around the Main Office and Exhibition Centre | ■ | | | | | | ■ | ■ |
| 6.4: Construct Basic Facilities for Researchers and/or Visitors for Activities | ■ | ■ | | | | | | |
| 6.5: Implement a Monitoring and Inspection Programme for Infrastructure and Facilities. | ■ | | ■ | | ■ | | ■ | ■ |
| 6.6: Install CCTVs | ■ | | | | | | | ■ |
| **STRATEGY 7: STAKEHOLDER ENGAGEMENT** | | | | | | | | |
| 7.1: Develop and Maintain a Stakeholder Information Database | ■ | | | | | | ■ | |
| 7.2: Develop a Land Use Map of the KKW Watershed Area | ■ | | | | | | ■ | |
| 7.3: Establish a Multi-Disciplinary Stakeholder Engagement Team | ■ | | | | | | | |
| 7.4: Develop and Maintain a Stakeholder Information Pack | | ■ | | ■ | | | ■ | |
| 7.5: Develop and Maintain a Grievance Mechanism | ■ | | | | | | ■ | |
| 7.6: Establish a Special Forum with Land-Owners, Residents and Resident Associations | ■ | ■ | | ■ | | | ■ | |
| 7.7: Establish and Sustain Healthy Working Relationship with All Stakeholders | ■ | ■ | | ■ | | | | |
| 7.8: Develop an Annual Activity Calendar for Stakeholder Involvement | ■ | | | | | ■ | ■ | |

Note:

M : Manager
CO : Conservation Officer
ACO : Assistant Conservation Officer
EO : Education Officer
AEO : Assistant Education Officer
SME : Sales and Marketing Executive
AFO : Administration and Finance Officer
GK : Groundskeeper

## 9.4 ROLES AND RESPONSIBILITIES

The following section provides a proposal on the main roles for each of the management platforms described above:

SWCS Management

SWCS Management will have the following responsibilities:

1. Provide strategic direction to the EXCO and KKW's Teamon the implementation of the management plan;
2. Coordinate all other on-going activities undertaken by committee members and by other stakeholders in relation to KKW;
3. Review the implementation of the action plans proposed under the management plan, and other relevant initiative in relation to KKW;
4. Facilitate the sourcing and application of funding from relevant parties;
5. Approve relevant budget allocation for the implementation of the management plan.

SWCS Executive Committee

The EXCO will have the following responsibilities:

1. Report to and advise SWCS Management on the implementation of the management plan;
2. Monitor the implementation of the action plans proposed under the management plan;
3. Provide technical advice to KKW's Team on the implementation of the action plans;
4. Review annual work plans and budget allocations for the implementation of the action plans.

SWCS Sub Committee

The Sub Committee falls directly under the EXCO and will be responsible to implement activities and action plans related to:

1. Fundraising and corporate social responsibility
2. Community based activities
3. Infrastructure development and maintenance
4. Environmental education programmes
5. Memberships
6. Publications
7. Conservation and science activities

Kota Kinabalu Wetlands Team

KKW's team is directly responsible for facilitating the implementation of the proposed action plans, including monitoring all outputs. It will have the following roles and responsibilities:

1. Communicate the management plan and its objectives among all stakeholders;
2. Facilitate the implementation of the proposed action plans in collaboration with the government agency responsible;

3. Monitor progress and identify issues related to the implementation of the proposed action plans;
4. Prepare annual work plans and budget allocations for the implementation of the action plans;
5. Assist in the sourcing of funding through the preparation of all necessary paperwork;
6. Report to the EXCO on the implementation of the management plan, and other related activities.

## 9.5 MONITORING AND REPORTING

KKW's team will be expected to prepare annual work plans based on the action plans proposed under Chapter 6 and 7 as well as on other activities that have been approved by the EXCO. The annual work plan shall include the start date, duration of the activity and its financial cost. The annual work plan shall be submitted for review by the EXCO and endorsed by the SWCS Management. The annual work plan will then form the core platform for monitoring and reporting.

The EXCO presently meets at least every two months, or if required, at an earlier time if there are pressing issues that need to be resolved. KKW's team, led by the Manager, will be responsible for providing the EXCO with reports on progress based on the activities proposed in the annual work plan as well as on other issues and opportunities, which will be deliberated for decisions on necessary actions to be taken. All outputs provided by the KKW team shall be approved by the EXCO.

The SWCS Management convenes every three months, or if required, at an earlier time, if there are pressing issues that need to be resolved. The EXCO, led by the President, will be responsible in providing updates on progress, decisions made and actions taken. This can however be delegated to KKW's Manager. In addition, the SWCS Management will also be the platform where all other government agencies report on progress made in the implementation of the management plan. All outputs provided by the EXCO shall be approved by the SWCS Management.

An annual review of the action plans (and strategies) shall be conducted at the end of each year based on the annual work plan (see Appendix X for sample monitoring form). The monitoring exercise shall capture a number of important data which includes:

1. Progress of the Action (report on achievements and challenges faced)
2. Feasibility of the Action (decisions if the action should be revised or is no longer valid)
3. Costs (information if the cost needs to be revised)

As a principle, flexibility must be allowed to facilitate the use of adaptive management strategies in the overall implementation of the management plan. This should also be applied to the organizational and management as well as on monitoring and reporting requirements.

Appendix I

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Appendix II

# POLICY AND PLANNING FRAMEWORK

## 1. NATIONAL POLICIES AND PLANS

### A1.1 Malaysia's National Policy on Biological Diversity

The National Policy on Biological Diversity, 1998, was formulated with the aim to conserve the country's biological diversity and to ensure that its components are utilised in a sustainable manner for the continued progress and socio-economic development of the nation. This policy has outlined six objectives to be achieved through the eleven policy principles. The objectives are:

1. To optimise economic benefits from sustainable utilisation of the components of biological diversity;
2. To ensure long-term food security for the nation;
3. To maintain and improve environmental stability for the proper functioning of ecological systems;
4. To ensure the preservation of the nation's unique biological heritage for the benefit of present and future generations;
5. To enhance scientific and technological knowledge, educational, social, cultural and aesthetic values of biological diversity;
6. To emphasise bio-safety considerations in the development and application of biotechnology.

The Kota Kinabalu Wetlands (KKW) play a role in the conservation of biodiversity – it houses over 90 species of birds and herpetofauna, crustaceans, fish, molluscs and insects. KKW also plays a function in regulating flooding and, due to its vicinity close to Kota Kinabalu, is important for awareness-raising and educational purposes.

### A1.2 National Wetlands Policy

The National Wetlands Policy was passed by the Cabinet in 2004 to ensure the conservation and wise use of wetlands as well as to fulfil Malaysia's obligation under the Ramsar Convention. The policy's objectives include to "protect and conserve each type of wetlands" and to "integrate wetlands conservation interest into overall natural resource planning, management and decisions". KKW is an important wetland ecosystem with significant conservation and socio-economic value as stated above. Its application for recognition as a Ramsar site demonstrates its direct role in contributing towards the objectives set out in this policy.

### A1.3 National Policy on the Environment

The National Policy on the Environment lists eight principles and seven strategies to achieve the objectives of a clean, safe, healthy and productive environment for present and future generations; conservation of the country's unique and diverse cultural and natural heritage with effective participation by all sectors of the society, and sustainable lifestyles and patterns of consumption and production.

The Second Principle emphasises the conservation of natural ecosystems to ensure the integrity of biodiversity and life support systems, while the Third Principle highlights the need for continuous improvement in the productivity and quality of the environment while pursuing economic growth and human development objectives. The Sixth and Eighth Principles strengthen the roles of the private sector and international community respectively in environmental protection, management, conservation, and enhancement. Among its seven strategies, emphasis was placed on environmental education and awareness-raising as per the recommendations of Agenda 21; a role that KKW adequately embodies.

## A1.4 National Ecotourism Plan

The National Ecotourism Plan was developed in 1996 to assist the government at both federal and state levels in the development of Malaysia's ecotourism potential. It is intended to serve both as an appropriate instrument within the overall sustainable development of Malaysia and the economy as a whole, and as an effective tool for conservation of the natural and cultural heritage of the country. KKW remains as an important destination for both local and international visitors and contributes towards the development of eco-tourism in Malaysia.

## A1.5 National Urbanisation Policy

The National Urbanisation Policy (NUP), developed in 2006, aims to ensure that urban centres would be engines of growth providing a high quality of life through a systematic and planned urbanisation process. The NUP consist of six main thrusts:

1. An efficient sustainable urban development;
2. Development of an urban economy that is resilient, dynamic and competitive;
3. An integrated and efficient urban transportation system;
4. Provision of urban services, infrastructure and utility of quality;
5. Creation of a conducive liveable urban environment with identity; and
6. Effective urban governance.

KKW is located on the periphery of the highly urbanized areas of Kota Kinabalu and contributes towards the growing needs of urban dwellers for green recreational spaces.

## A1.6 National Water Resources Policy, 2012

The National Water Resources Policy (NWRP) aims to ensure the sustainability of water resources to ensure safe and adequate water for all through sustainable use, conservation and effective management. The NWRP has four guiding tenets and nine strategic thrusts:

Guiding Tenets:

1. Water for people;
2. Water for food and rural development;
3. Water for economic development; and
4. Water for the environment.

Strategic Thrusts:

1. Water intelligence;
2. Water resource integrity;
3. Use of alternative water resources and sources;
4. Water related disaster risk reduction;
5. Criteria for water resources characterisation;
6. Conservation and protection of water resources and bodies, both natural and artificial;
7. Stakeholder inclusiveness and engagement;
8. Shared water resources governance; and
9. Capacity building and awareness.

Under the NWRP, a number of proposed actions, both direct and indirect, address the conservation of natural resources. For example, Thrust 6 advocates the development of protection plans for the conservation of water resources, catchments and bodies to sustain water resources, including rehabilitation and improvements covering the ecological, physical systems and aesthetical aspects.

# 2. STATE STRATEGIES

## 2.1 Sabah Conservation Strategy

The Sabah Conservation Strategy was prepared by WWF-Malaysia for the Ministry of Tourism and Environmental Development Sabah in 1990. The Strategy emphasised that wise land use was the key to conservation and development in Sabah. It called for the establishment of a variety of protected areas, as well as improved management of resources on a regional basis. The preparation and implementation of the Strategy greatly supports conservation efforts and plays a role in helping the State meet both its development and conservation needs. Although relatively small compared with other protected areas in the state, KKW remains as an important conservation areas and contributes to various goals of this policy.

## 2.2 Sabah Biodiversity Strategy

The Sabah Biodiversity Strategy 2012-2022 is a 10-year strategy to fulfil the pledge made by the country to implement the Convention on Biological Diversity (CBD). It builds upon the Sabah Conservation Strategy, which provided an overview of biodiversity rich areas in the state and proposed conservation actions. In keeping with the international campaign for biodiversity, the Strategy closely parallels the CBD Strategic Plan for Biodiversity 2011-2020 and has adopted all the key goals which provide a comprehensive framework for strategic intervention.

Five strategies (with 154 interventions) were formulated:

1. Engaging the People of Sabah
2. Reducing Pressures on Biodiversity
3. Building Ecosystem Resilience
4. Improving Our Understanding
5. Strengthening Our Capacity to Manage Biodiversity

Many of the strategies and thrusts proposed under the Sabah Biodiversity Strategy embody the aspirations of the KK Wetland.

## 2.3 Sabah Environmental Education Policy

The Environmental Education Policy aims to instil environmental stewardship and sustainable lifestyle among the people of Sabah, in order to elevate current efforts in environmental education. This policy is in line with the National Policy on the Environment (2002) which highlights education and awareness as one of its green strategies.

The policy strategies to achieve the objectives mentioned above include:

a. Government agencies should actively implement environmental education;
b. Non-governmental organisations (NGO's), the media, private sectors, professional bodies and the public should be actively involved in environmental education;
c. Educational institutions should actively participate in and implement environmental education;
d. Efficiency and effectiveness of environmental education programmes and activities should be enhanced;
e. Strengthen the functions of Sabah Environmental Education Network (SEEN) and other similar networks;
f. Strengthen the capacity and capability of environmental education personnel.

Education and awareness-raising programmes has been a core focus of KKW. Due to its ease of access, the wetland is an ideal location for a range of programme related to environmental education.

## 2.4 Sabah Environmental Policy

The Sabah Environmental Policy aims to establish a framework for environmental management in many aspects which are built on values such as a green economy; balanced production and consumption; participation in carbon balancing and good governance. This policy was developed in line with the National Policy on the Environment (2002)

The main objective of this policy is to guide and inspire the population of Sabah to maintain the State as a healthy and prosperous place to live. Specifically it provides:

- A vision of the environmental conditions and standards which shall be targeted in the development of Sabah;
- An environmental framework to guide the continued development of environmental regulatory mechanisms in Sabah;
- Guidance for all decision makers and implementing agencies in the execution of their mandates and duties.

The policy is also based on a set of principles which includes:

- Maintenance of the living environment
- Preservation of environmental and cultural heritage
- Conservation of biodiversity
- Environment as a strategic pillar of sustainable development
- Global environmental conservation

# 3. STATE PLANS

## 3.1 Sabah Structure Plan 2033

The Sabah Structure Plan 2033 (SSP2033) is a 20 year state wide spatial plan. SSP2033 aims to translate national and state policies on land use development into spatial plans that will provide a framework for the preparation of district and local plans. Its overall vision is to develop Sabah into a 'high income earning state with vibrant towns and cities, custodian to a rich environment and a successful economy' by 2033.

Four main goals were identified:

1. Goal 1: Create healthy communities with high quality of life;
2. Goal 2: Provide successful environment (by conserving, rehabilitating and managing the environment and its natural resources) ;
3. Goal 3: Encourage sustainable economy;
4. Goal 4: Promote robust infrastructure (by improving connectivity, equitable distribution of growth and opportunity).

Spatial strategies were proposed for four sectors under the SSP2033 i.e. (1) town centres and settlements, (2) transportation and (3) the environment. Under the environmental sector, the following actions were identified as relevant for KKW:

- Environmentally Sensitive Areas shall be identified and integrated in the planning and management of land use and natural resources to ensure sustainable development;
- Development on coastal areas shall adopt climate change adaptation measures;
- Socio-cultural aspect shall be an important factor for all development consideration.

## 3.2 Sabah Shoreline Management Plan

The Sabah Shoreline Management Plan, 2005 aims to establish a framework for strategic guidelines and sustainable policies to manage Sabah's vast shoreline. Seven key target areas were addressed under this plan:

1. Risk of coastal erosion
2. Impact of marine pollution
3. Impact of shoreline development
4. The conservation of critical coastal habitats
5. Impacts of inland activities on the coastal zone
6. Development of coastal tourism
7. Development of coastal infrastructure for industries

## 3.3 Integrated Coastal Zone Management Plan for Sabah

The Integrated Coastal Zone Management (ICZM) Project in Sabah was part of the national pilot project in Malaysia jointly funded by DANCED (Danish Co-operation for Environment and Development) and Sabah State Government. The rationale for the ICZM Project came from a growing awareness of the problems experienced in coastal areas and their linkage to economic development and increasing population pressure. The key problem identified in Sabah was the unsustainable

management of the coastal zones which was reflected in the increased pollution experienced in coastal areas, in the physical degradation of coastal environments and in the deterioration of coastal habitats and resources. One of the key recommendations was for the management of mangrove coasts to be adopted where any construction was restricted in the inter-tidal mangrove fringes.

## 3.4 Kota Kinabalu Structure Plan 2030

The Kota Kinabalu Structure Plan 2030 is a long-term plan that contains strategic urban planning policies for Kota Kinabalu. The overall vision is to develop Sabah as a "nature resort and maritime city by 2030. This Plan is part of five master plans for Kota Kinabalu which also includes public transport, solid waste management, landscaping, and sewerage treatment. The Structure Plan is centred on housing, commercial as well as infrastructure and utilities. Five main objectives of the Plan were identified:

- To promote Kota Kinabalu as a world class tourism destination;
- To provide good and efficient infrastructure facilities;
- To promote environmental sustainable design;
- To promote maritime related business and industries; and
- To improve and upgrade local living standard.

## 3.5 Kota Kinabalu Local Plan 2020

The Kota Kinabalu Local Plan 2020 (KKLP 2020) aims to coordinate and plan public and urban infrastructure and development for both the local authority and developers for the next five years. The Plan, which is still being finalised has two components, a written statement and a memorandum. The written statement contains background information on the city as well as the City Hall's policies on all key sectors. The memorandum is a statutory document under the Town & Regional Planning Ordinance (Section 7(1) (a)) and contains planning and development guidelines as well as definitions and land use zones.

Two sectors of relevance were (1) tourism and (2) open space where the following policies and actions were identified:

Tourism Policy 1: Increase efforts and funding to improve and enhance tourism attractions

Actions:

- Improving and developing tourism attractions in Kota Kinabalu;
- Providing and enhancing the interpretation quality at tourism attractions;
- Providing quick and convenient access to tourism opportunities across the city; and
- Ensuring the support facilities optimise the visitor's experience and convenience.

Conservation Policy 2: Kota Kinabalu City Hall to ensure only appropriate development is allowed in mangrove swamp and conservation areas. Mangrove swamps shall be protected as natural flood detention ponds and filters and for recreational and educational purposes where possi

Appendix III

# RECORDED TERRESTRIAL FAUNA

## A. BIRDS

| Common Name | Scientific Name | Status |
|---|---|---|
| Heron, Storks, Darters | | |
| Purple Heron | *Ardea purpurea* | Protected |
| Rufous Night Heron | *Nycticorax caledonicus* | Protected |
| Grey Heron | *Ardea cinerea* | Protected |
| Black-crowned Night Heron | *Nycticorax nycticorax* | Protected |
| Little Heron | *Butorides striatus* | Protected |
| Yellow Bittern | *Ixobrychus sinensis* | Protected |
| Cinnamon Bittern | *Ixobrychuscinnamomeus* | Protected |
| Malaysian Night Heron (Tiger Bittern) | *Gorsachius melanolophus* | Protected |
| Chinese Egret | *Egretta eulophotes* | IUCN - Vulnerable; Protected |
| Pacific Reef Egret | *Egretta sacra* | Protected |
| Great Egret | *Ardea alba* | |
| Intermediate Egret | *Egretta intermedia* | Protected |
| Little Egret | *Egretta garzetta* | Protected |
| Oriental Darter | *Anhinga melanogaster* | IUCN - Near Threatened; Protected |
| Lesser Adjutant | *Leptoptilos javacinus* | IUCN - Vulnerable; Protected |
| Waders | | |
| Pacific Golden Plover | *Pluvalis fulva* | |
| Little Ringed Plover | *Charadrius dubius* | |
| Common Redshank | *Tringa tetanus* | |
| Marsh Sandpiper | *Tringa stagnatilis* | |
| Common Greenshank | *Tringa nebularia* | |
| Wood Sandpiper | *Tringa glareola* | |

| Common Name | Scientific Name | Status |
|---|---|---|
| Common Sandpiper | *Actitis hypoleucos* | |
| Terek Sandpiper | *Xenus cinerea* | |
| Grey-tailed Tattler | *Heteroscelis brevipes* | |
| Snipe | *Gallinago sp.* | |
| Swinhoe's Snipe | *Gallinago megala* | |
| Black-winged Stilt | *Himantopus himantopus* | |
| Kingfisher | | |
| Common Kingfisher | *Alcedo atthis* | |
| Blue-eared Kingfisher | *Alcedo meninting* | |
| Stork-billed Kingfisher | *Pelargopsis capensis* | |
| Black-capped Kingfisher | *Halcyon pileata* | |
| Collared Kingfisher | *Todiramphus chloris* | |
| Bee-Eaters | | |
| Blue-throated Bee Eater | *Merops viridis* | |
| Raptors | | |
| Osprey | *Pandion haliaetus* | |
| Brahminy Kite | *Haliastur indus* | |
| White-bellied Sea Eagle | *Haliaeetus leucogaster* | Protected |
| Crested Serpent Eagle | *Spilornis cheela* | |
| Oriental Honey Buzzard | *Pernis ptilorhynchus orientalis* | Protected |
| Rails and Allies | | |
| Slaty-breasted Rail | *Gallirallus striatus* | Protected |
| White-breasted Waterhen | *Amaurornis phoenicurus* | |
| Common Moorhen | *Gallinula chloropus* | |
| Pigeons, Doves and Parrots | | |
| Little Green-Pegion | *Treron olax* | |
| Pink-necked Green-Pigeon | *Treron vernans* | |
| Green Imperial-Pigeon | *Ducula aenea* | |
| Feral Pigeon (Rock Pigeon) | *Columbia livia* | |
| Thick-Billed Green-Pigeon | *Treron curvirostra* | |

| Common Name | Scientific Name | Status |
|---|---|---|
| Spotted-Necked Dove | *Streptopelia chinensis* | |
| Zebra Dove (Peaceful Dove) | *Geopelia striata* | |
| Emerald Dove | *Chacophaps indica* | |
| Cuckoos and Coucals | | |
| Plaintive Cuckoo | *Cacomantis merulinus* | Protected |
| Lesser Coucal | *Centropus bengalensis* | |
| Greater Coucal | *Centropus sinensis* | |
| Frogmouths, Nightjars and Swifts | | |
| Large-tailed Nightjar | *Caprimulgus macrurus* | |
| Glossy Swiftlet (White-bellied Swiftlet) | *Collocalia esculenta* | |
| House Swift (Little Swift) | *Apus nipalensis* | |
| Woodpeckers | | |
| Sunda Woodpecker | *Picoides moluccensis* | |
| Swallows | | |
| Barn Swallow | *Hirundo rustice* | |
| Pacific Swallow | *Hirundo tahitica* | |
| Whistlers, Woodswallows and Shrikes | | |
| White-breasted Woodswallow | *Artamus leucorhynchus* | |
| Thrillers and Minivets | | |
| Pied Triller | *Lalage nigra* | |
| Ashy Minivet | *Aegithina viridissima* | |
| Leafbirds | | |
| Green Iora | *Aegithina viridissima* | |
| Common Iora | *Aegithina tiphia* | IUCN - Near Threatened |
| Greater Green Leafbird | *Chloropsis sonnerati* | |
| Yellow-vented Bulbul | *Pycnonotus goiavier* | |
| Olive-winged Bulbul | *Pynonotus goiavier* | |
| Red-eyed Bulbul | *Pycnonotus zeylanicus* | |
| Straw-headed Bulbul | *Pynonotus zeylanicus* | |

| Common Name | Scientific Name | Status |
|---|---|---|
| Thrushes and relatives | | |
| Oriental Magpie Robin | *Copsychus saularis* | Protected |
| Babblers, Warblers and Prinias | | |
| Ferruginous Babbler | *Trichastoma bicolor* | Protected |
| Bold-striped Tit-Babbler | *Macronous borneensis* | Protected |
| Oriental Reed Warbler (Eastern Reed Warbler) | *Acrocephalus orientalis* | |
| Striated Grassbird | *Megalurus palustris* | |
| Ashy Tailorbird | *Orthotomus ruficeps* | |
| Rufous-tailed Tailorbird | *Orthotomus sericeus* | |
| Yellow-bellied Prinia | *Prinia flaviventris* | |
| Flycatchers and Whistlers | | |
| Pied Fantail | *Rhipidura javanica* | |
| Narcissus Flycatcher | *Ficedula narcissina* | |
| Mugimaki Flycatcher | *Ficedula mugimaki* | |
| Shrikes | | |
| Brown Shrike | *Lanius cristatus* | |
| Wagtails and Pipits | | |
| Paddyfield Pipit | *Anthus rufulus* | |
| Starlings and Mynas | | |
| Asian Glossy Starling | *Aplonis panayensis* | |
| White-shouldered Starling | *Sturnus sinensis* | |
| Sunbirds and Spiderhunters | | |
| Brown-throated Sunbird (Plain-throated Sunbird) | *Athreptes malacensis* | |
| Purple-naped Sunbird | *Hypogramma hypogrammicum* | |
| Olive-backed Sunbird | *Nectarinia jugularis* | |
| Little Spiderhunter | *Arachnothera longirostra* | |
| Eastern Crimson Sunbird | *Aethopyga siparaja* | |
| Flowerpeckers | | |
| Yellow-breasted Flowerpecker | *Prionochilus* | |

| Common Name | Scientific Name | Status |
|---|---|---|
| Orange-bellied Flowerpecker | *Dicaeum trigonostigma* | |
| Scarlet-backed flowerpecker | *Dicaeum cruentatum* | |
| Sparrows, Munias, White-eyes | | |
| Dusky Munia | *Lonchura fuscans* | Species known only to Borneo |
| Chesnut Munia (Black-headed Munia) | *Lonchura atricapilla* | |
| Eurasian Tree Sparrow | *Passer montanus* | |
| Owls | | |
| Collared Scops-Owl | *Otus bakkamoena* | |
| Brown Hawk-Owl | *Ninox scutulata* | |
| Buffy Fish-Owl | *Ketupa ketupu* | |

## B. REPTILES

| Common Name | Scientific Name | Status |
|---|---|---|
| Horned Flying Lizard | *Draco cornutus* | |
| Monitor Lizard | *Varanus spp.* | Protected |
| Mangrove Skink | *Emoia atrocostata* | |
| Supple Skink | *Lygosoma bowringii* | |
| Reticulated Python | *Python reticulatus* | Protected |
| Dog-faced Water Snake | *Cerberus rynchops* | |

## C. INSECTS

| Common Name | Scientific Name |
|---|---|
| Beetles | |
| Stink Bug | Calliphara nobilis |
| Avicennia Leaf Beetle | Monolepta spp |
| Cicada | *Ayesha spathulata* |
| Cicada | *Tacua speciosa* |
| Firefly | *Pteroptyx similis* |
| Firefly | *Pteroptyx bearnis* |

| Common Name | Scientific Name |
|---|---|
| Firefly | *Phyrophanes appendiculata* |
| Dragonfly | *Orthetrum Sabina* |
| | Pantala flavescens |
| | *Neurothemis stigmatizans* |
| | *Deplacodes trivialis* |
| | *Phyothemis Phyllis* |
| | Trapezostigma propinqua |
| | Agriocnemis femina |
| | *Ischnura senegalensis* |
| Moths | |
| Leaf Miner Moth | *Phyllocnistic spp.* |
| | *Graphium doson* |
| | *Catopsilia Pomona* |
| | *Catopsilia pyranthe* |
| | *Amathusia phidippus* |
| | *Hypolimnas bolina* |
| | *Hypolimnas misippus* |
| | *Junonia almanac* |
| | *Junonia hedonia* |
| | *Junonia orithya* |
| | *Polyura Schreiber* |
| | *Arhopala denta* |
| | *Zizina otis* |
| | *Isma umbrosa* |
| | *Potanthus Omaha* |
| Ants | |
| Weaver ants | *Oecophylla smaragdina* |
| | *Monomorium sp.* |
| | *Paratrechina sp.* |
| | *Compontus spp.* |

| Common Name | Scientific Name |
|---|---|
| | *Pheidole spp.* |
| | *Odontomachus sp.* |
| | *Diacamma rugosum* |
| | *Crematogaster spp,* |
| | *Polyrhachis spp.* |
| | *Tetrapnera sp.* |
| | *Dolichiderus sp.* |
| | *Tapinoma sp.* |
| Water Insects | |
| Water Skaters | *Stenobates insularis* |
| Pond Skaters | *Limnogonus fossarum* |

Appendix IV

# RECORDED AQUATIC FAUNA

## A. FISH

| Common Name | Scientific Name |
|---|---|
| Seriding Putih | *Ambassis* sp. |
| Seriding | *Apogon* sp. |
| Badukang | *Arius* sp. |
| Jolong - jolong | *Ablennes hians* |
| Slender Mackerel Scad | *Decapterus macrosoma* |
| Tilapia | *Oreochromis mossambicus* |
| Pearlspot | *Etroplus suratensis* |
| Snakehead Gudgeon | *Ophiocara prorcephala* |
| Flat-head Goby | *Glossogobius sparsipapillus* |
| Halfbeak | *Hemiramphus* sp. |
| Seabass | *Lates calcarifer* |
| Bulan-bulan | *Megalops cyprinoides* |
| Mullet | *Liza subviridis* |
| Burrowing snake eel | *Pisodonophis* sp. |
| Gray eel catfish | *Plotosus* sp. |
| Striped eel catfish | *Plotosus lineatus* |
| Rabbit fish | *Siganus guttatus* |
| Puffer fish | *Arothron manillensis* |
| Archer fish | *Toxotes jaculator* |
| Crescent perch | *Terapon jarbua* |

## B. CRUSTACEANS

| Common Name | Scientific Name |
|---|---|
| Prawns | |
| Mangrove Snapping Prawn | *Alpheus* spp. |

| Common Name | Scientific Name |
|---|---|
| Mud Lobster | *Thalassina anomala* |
| Estuarine Prawn | *Macrobrachium sp.* |
| Marine Prawn | *Penaeus sp.* |
| Crabs | |
| Face-baned Sesarmine | *Perisesarma eumolpe* |
| Sesarmine | *Sesarma sp.* |
| Sesarmine | *Nanosesarma gordoni* |
| Sesarmine | *Utica borneensis* |
| Tree Climbing Crab | *Episersama* spp. |
| Purple climber Crab | *Metopograpsus spp.* |
| Orange signaler Crab | *Metaplax elegans* |
| Sentinel Crab | *Macrophthalmus sp.* |
| Fiddler Crab | *Uca* sp. |
| Fiddler Crab | *Uca lacteal annulips* |
| Orange fiddler | *Uca vocans* |
| Shen Crab | *Shenius anomalum* |
| Mud Crab | *Scylla serata* |
| Hermit Crab | *Diogenes sp.* |
| Allies | |
| Warty Pill-Bug | *Sphaeroma terebrans* |

## C. MOLLUSCS

| Common Name | Scientific Name |
|---|---|
| Gastropod | |
| Mud-creepers | Cerithidea obtuse |
| Belitong | Terebralia sulcata |
| Rodong | *Telescopium telescopium* |
| Belongkeng | *Laemodonta* sp. |
| Belongkeng | *Ellobium aurisjudae* |
| Belongkeng | *Cassidula* sp. |
| Mangrove Periwinkles | *Littoraria* sp. |
| Bubble Shells | *Haminoea* sp. |
| Drill | Chicoreus capucinus |
| Common Nerite | *Nerita lineata* |
| Bivalve | |
| Leaf Oyster | *Isognomon ephippium* |
| Clam | Polymesoda expansa |

## D. CHELICERATES

| Common Name | Scientific Name |
|---|---|
| Horseshoe Crab | *Carcinoscopius rotundicauda* |
| St. Andrew's Cross Spider | *Argiope mangal* |

## E. CNIDARIA

| Common Name | Scientific Name |
|---|---|
| Jelly Fish | *Acromitus falgellatus* |

Appendix V

# WORK GUIDES

## A. ASSESSMENT OF HEALTH OF THE MANGROVE

### A1.1 Mangrove Trees

- The monitoring of the mangroves involves the measurement of the size and condition of the trees.
- At least three permanent plots measuring 20m by 20m should be established within the following management zones:
    - Bird Habitat
    - Rehabilitation Zone
    - Strict Conservation Areas
- Within each plot, all trees present, except seedlings with a height of less than 100cm, are enumerated and identified by species.
- Each tree is measured in terms of bole girth and estimated for its diameter at breast (DBH) at approx. 137 cm from the ground. If the roots of the tree are higher that 137 cm, measurements are taken just above the roots.
- The condition of each tree condition is recorded i.e. healthy, damaged or diseased.
- Reference:
    - “Protocol for the measurement, monitoring and reporting of structure, biomass and carbon stocks in mangrove forests” by Kauffman and Donato (2012).

### A1.2 Bird Population

- The monitoring of bird populations involves the enumeration of species present and their abundance.
- Monitoring is ideally conducted during the monthly seasons when bird populations are found in greater abundance.
- A few locations where birds congregate are selected within the mangrove which would ideally encompass the open mudflat areas.
- The number of bird species and individuals observed during the time of observation is recorded.
- Counting and monitoring should be carried out at the same site and same period annually to ensure consistency in monitoring.

- Other relevant information that should be recorded includes date and time of the count, and, weather and tidal conditions.

- Equipment required to carry out the monitoring include binoculars or telescopes, identification guide, and tally counters.

- Reference:

    - Guidance on Waterbird Monitoring Methodology: Field Protocol for Waterbird Counting (Wetlands International, 2010).

## A1.3 Firefly Population

- The monitoring of the firefly population involves the assessment of population numbers.

- Forestry Research Institute of Malaysia has previously used digital cameras mounted on tripods to capture the flashing of the fireflies.

- Digital cameras are set-up a selected locations and images captured under pre-determined settings.

- The images captured will then be interpreted manually to estimate the number of fireflies within the area.

## A1.4 Aquatic Fauna

- Aquatic fauna comprise of fish, shellfish and crab population.

- Fish species are commonly assessed using the 'catch and release' method in which cast nets with the mesh size of 1 cm are cast at selected open water or mudflat areas during high tide. The fish species caught will be identified to the lowest taxonomy level and measured for their size in total length and weight.

- For shellfish and crab species, a quadrat measuring 1m x 1m is established at selected locations on the mudflats or mangrove areas during low tide. Sediments within the quadrat are excavated to a depth of 20 to 30 cm. All individuals are sieved and recorded in terms of species, number and size.

## A1.5 Calculating Diversity and Evenness Indices

- The diversity of the flora and fauna can be determined using the Shannon-Wiener Index and Evenness Index.

- The Shannon-Wiener Index (*H'*) is a measure of biodiversity which weighs the number of species present and the relative abundance of each species. The Shannon-Wiener Index gives a value of nil when only one species is represented in a community. When a community becomes more complex, H' values of up to 4 may be obtained.

*H'* values are calculated using the formula below:

$$H' = -\sum_{i=1}^{R} p_i \ln p_i$$

Where, $p_i$ is the proportion of individuals belonging to the *i*th species in a community of concern.

- The Evenness Index (*J'*) measures how equal all populations in a community are, i.e. how even is the distribution across all species present. If all populations present within a community are equal in terms of the number of individuals, the value of evenness is 1. As distribution becomes more uneven, the values of evenness increase.

*J'* values are calculated using the formula below:

$$J' = \frac{H'}{H_{max}}$$

Where, *H'* is derived from the Shannon-Wiener Index. $H_{max}$ equals ln*S*, where *S* is the total number of species present.

# B. WATER QUALITY MONITORING

## B1.1 Monitoring Location

In addition to the four existing water quality stations by EPD, three additional stations are proposed where samples can be collected to supplement water quality data (Figure B-1).

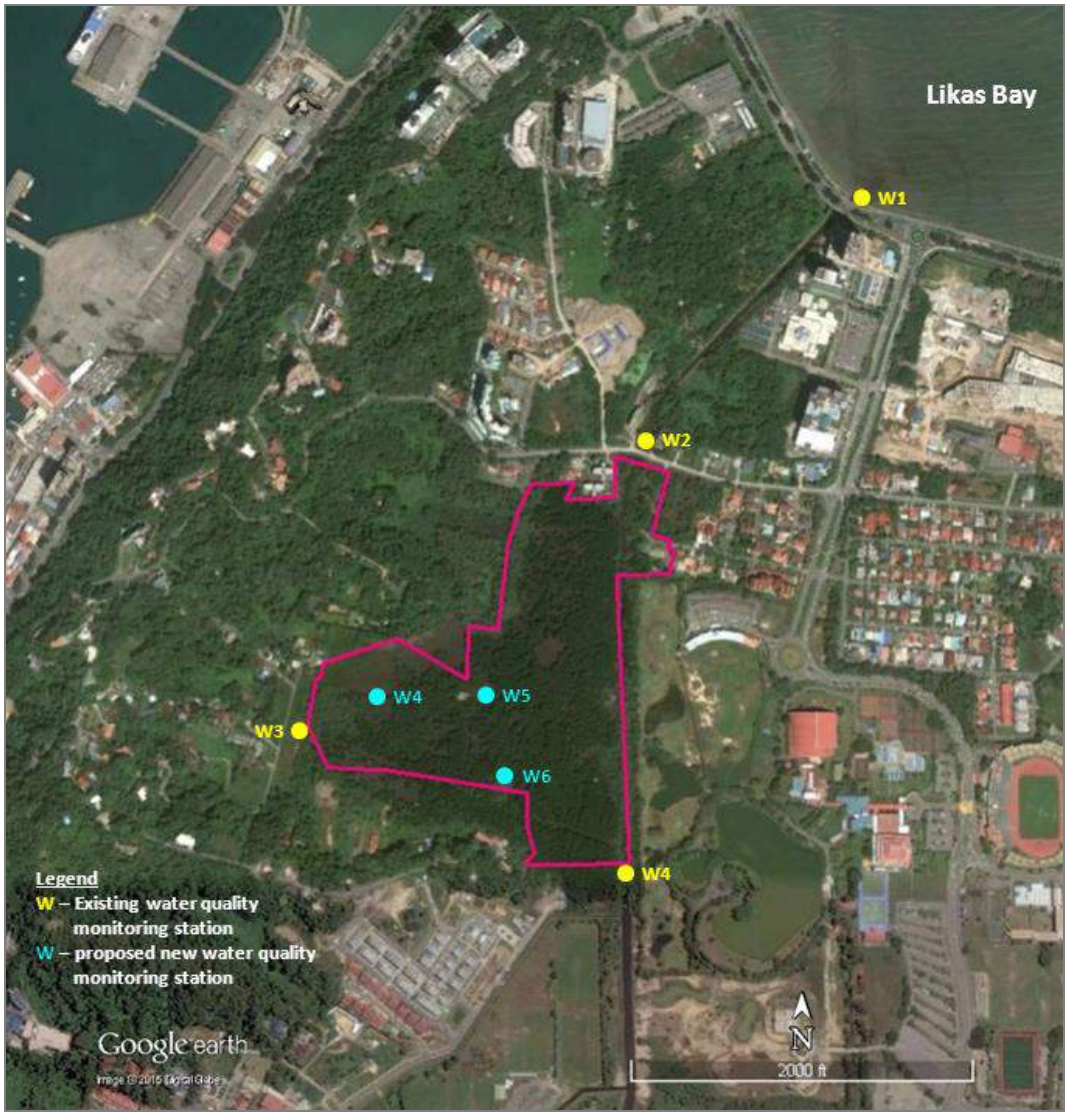


Figure B-1: Water quality sampling and monitoring stations

## B1.2 Sampling Methodology

- Water samples are collected using sampling bottles and volumes as advised by the appointed laboratory.

- The sampling bottle is usually dipped with the mouth pointed upstream to prevent contamination from the external surface of the bottle or from the sampling personnel.

- Samples will be then filtered (if necessary). It is then stored in a cooler box at 4$^{o}$C and sent to the laboratory immediately for analysis.

- At the laboratory, the various parameters will be analysed based on the respective APHA (2005) methodologies.

## B1.2 List of Water Parameters

The water quality parameters to be monitored include (but not limited to):

- Temperature
- Salinity
- pH
- Turbidity
- Dissolved Oxygen (DO)
- Biochemical Oxygen Demand (BOD)
- Total Suspended Solid (TSS)
- Ammoniacal Nitrogen (AN)
- Nitrate
- Phosphate
- Oil and Grease
- *E. coli*

### B1.3 Sampling Frequency

The water quality sampling shall be carried out every three months during high tide. One water sample shall be taken at each monitoring station.

## C. INSPECTION CHECKLIST FOR FACILITIES

An example of an inspection checklist for the facilities in KKW is shown below.

Inspection by:
Date of Inspection:

| Facility | Area Of Inspection Inspected | Remarks* |
|---|---|---|
| **1.** Exhibition Hall | • Check condition of the display board/wall, whether the drawings/display are clear, visible and presentable.<br>• Check if the interactive components e.g. sound effect buttons etc. are functional. | |
| **2.** Boardwalk | • Check condition of the wooden structure of the boardwalk. Check if there are sections that are loose, broken, etc.<br>• Check condition of the gazebo along the boardwalk. Check if there are sections that are loose, broken, etc.<br>• Check condition of the signage along the boardwalk including clarity of the display. | |
| **3.** The Rotary Nature Activity Centre | • Check condition of the building structure including floor, pillar, roof, walls etc.<br>• Check condition and functionality of the electrical appliances including fan, light bulbs etc. | |
| **4.** Watch Tower | • Check condition of the building structure including floor, pillar, stairway, roof etc. | |
| **5.** Bird-Watching Hide | • Check condition of the bird-watching hide including benches, walls, floor etc.<br>• Check condition of the reference materials/display on the table, whether they clear and can still be read. | |
| **6.** Education Zone/Gravel Path | • Check condition of the education zone/gravel path, whether there is any section of the path that is unsafe to the visitors and required refurbishment.<br>• Check condition of the signage along the gravel path including clarity of the display. | |
| **7.** Fences | • Check the fences for any damages. | |
| **8.** CCTV | • Check functionality of the CCTV including clarity of the images captured, recording of data etc | |

Appendix VI

# STAKEHOLDER CONTACT DETAILS

## 1. Department of Environment, Sabah

Aras 4, Blok A, Kompleks Pentadbiran Kerajaan Persekutuan Sabah
Jalan UMS-Sulaman
88450 Kota Kinabalu
Tel: 088-488166 / 088-488169 / 088-488172

## 2. Department of Irrigation and Drainage, Sabah

Wisma Pertanian, Jalan Tasik
88767 Kota Kinabalu
Beg Berkunci No 2052
Tel: 088-280555

## 3. Dewan Bandaraya Kota Kinabalu

No. 1, Jalan Bandaran
88675 Kota Kinabalu
Tel: 088-521800

## 4. Environment Protection Department, Sabah

Wisma Budaya, 1-3 Floor
Tunku Abdul Rahman Road
Beg Berkunci No 2078
88999 Kota Kinabalu
Tel: 088-251290, 088-251291, 088-267572

## 5. Sabah Wildlife Department

Wisma Muis, 5th Floor, Block B
88100 Kota Kinabalu
Tel: 088-215353, 088-214442

## 6. Sabah Biodiversity Council and Sabah Biodiversity Centre

Wisma Innoprise, 11th Floor
88817 Kota Kinabalu
Tel: 088-255462

### 7. Ministry of Tourism, Culture and Environment

Wisma Tun Fuad Stephens, Tingkat 5
Blok A, Karamunsing
88300 Kota Kinabalu
Tel: 088-253666, 088-210848, 088-242800

### 8. Sabah Education Department

Tingkat 4, 5 & 7, Rumah Persekutuan
Jalan Mat Salleh
88604, Kota Kinabalu
Tel: 088-513444

### 9. Lands and Surveys Department, Sabah

Jalan Perwira, Beg Berkunci No 2044
88576, Kota Kinabalu
Tel: 088-527600

### 10. Sabah Economic Development and Investment Authority

Lot 1, Wisma SEDIA
Off Jalan Pintas-Penampang
P.O. Box 17251
88300 Kota Kinabalu
Tel: 088-450650

### 11. Sabah State Economic Planning Unit

Lot 6-10, Wisma SEDIA
Off Jalan Pintas-Penampang
88300 Kota Kinabalu
Tel: 088-450800

### 12. Town and Regional Planning Department, Sabah

Wisma Tun Fuad Stephens, Tingkat 3, 4 & 5
Blok B, KM 2.4, Jalan Tuaran
88646 Kota Kinabalu
Tel: 088-222031, 088-222336

### 13. Sabah Tourism Board

51, Gaya Street, City Centre
88000 Kota Kinabalu
Tel: 088-212121

### 14. Sabah Environmental Protection Association

8AF13, 8th Floor
Kompleks Karamunsing
88300, Kota Kinabalu
Email: info@sepa.my

### 15. World Wide Fund for Nature, Sabah

6th Floor, CPS Tower, Centre Point Complex,
No. 1, Jalan Centre Point
88000 Kota Kinabalu
Tel: 088-262420

### 16. Malaysian Nature Society, Sabah

Email: mnssabahbranch@gmail.com

### 17. Rotary Club Kota Kinabalu

P.O. Box 20476,
88761 Luyang
Email: info@rotaryluyang.com

### 18. Mullion Inc. Co.

9-11, Tomihisacho
Shinjuku-ku, Tokyo
Japan #162-0067
Tel: 813-3226-7841

### 20. University Malaysia Sabah

UMS, Jalan UMS
88400 Kota Kinabalu
Tel: 088-320000

### 21. Kolej Universiti Yayasan Sabah

Jalan Ibu Pejabat JKR,
Off Jalan Mat Salleh
88100 Sembulan
Tel: 088-239498

### 22. HSBC Kota Kinabalu Branch

56, Jalan Gaya
88000 Kota Kinabalu
Tel: 088-212622

### 23. HSBC Kota Kinabalu Branch

56, Jalan Gaya
88000 Kota Kinabalu
Tel: 088-212622

### 24. Institute of Engineers Malaysia

Lot 25, 3rd Floor, Block C
Damai Point Commercial Centre
Lorong Damai Point, Off Jalan Damai
88100 Kota Kinabalu
Tel: 088-259122

### 25. Malaysian Institute of Architects

Lot 5 & 6, 3rd Floor, Block A
Damai Plaza, Phase IV
Ruang Pokok Kayu Manis
88100, Luyang
Tel: 088-232524, 088-232261, 088-232313

### 26. Royal Institution of Surveyors Malaysia

3rd Floor, Bangunan Juruukur
64-66, Jalan 52/4
46200, Petaling Jaya, Selangor
Tel: 03-79551773

## 27. Sabah Housing and Real Estate Developers Association (SHAREDA)

Lot 1-3 (F), 3rd Floor, Beverly Hills Plaza
Jalan Bundusan
88300 Penampang
Tel: 088-720848

## 28. Sabah Tourist Guide Association

Lot 13.1, 1st Floor, Lorong Lintas Plaza 3
Lintas Plaza
88300 Luyang
Tel: 012-8336838

## 29. SHELL Malaysia

P.O. Box 11027
50732 Kuala Lumpur
Tel: 1-300-881-808

Appendix VII

# SAMPLE GRIEVANCE FORM

**Reference No:**

**Full Name**

Note: you can remain anonymous if you prefer or request not to disclose your identity to the third parties without your consent

First Name:
Last Name:

❏ I wish to raise my grievance anonymously
❏ I request not to disclose my identity without my consent

**Contact Information**

Please mark how you wish to be contacted (mail, telephone, e-mail)

❏ By Telephone:
❏ By E-mail:
❏ By Post:
Please provide mailing address:

**Description of Incident or Grievance:**

What happened? Where did it happen? Who did it happen to? What is the result of the problem?

**Date of Incident/Grievance**

❏ One time incident/grievance (Date: )
❏ Happened more than once (how many times? )
❏ On-going (currently experiencing problem)

**What would you like to see happen to resolve the problem?**

**Signature:**
**Date:**

Please return this form to:

Appendix VIII

# ESTIMATED COSTS FOR HUMAN RESOURCES

The estimated costs for human resources aim to provide an indication of budget requirements for existing and new staff members. It takes into account annual increments, Employees Provident Fund (EPF), medical etc. and should be reviewed to reflect actual terms of employment.

| YEAR | M | CO | EO | ACO | AEO | SME | AFO | GK | Total Salary Per Month | *Total Salary Per Year* |
|---|---|---|---|---|---|---|---|---|---|---|
| Year 1 | RM 4,800 | RM2,640 | RM3,000 | 0 | 0 | 0 | RM1,800 | RM1,440 | RM13,680 | *RM164,160* |
| Year 2 | RM5,040 | RM2,772 | RM3,150 | RM2,400 | RM2,400 | RM3,360 | RM1,926 | RM1,541 | RM22,589 | *RM271,066* |
| Year 3 | RM5,292 | RM2,911 | RM3,308 | RM2,520 | RM2,520 | RM3,528 | RM2,061 | RM1,649 | RM23,788 | *RM285,451* |
| Year 4 | RM5,557 | RM3,056 | RM3,473 | RM2,646 | RM2,646 | RM3,704 | RM2,205 | RM1,764 | RM25,051 | *RM300,614* |
| Year 5 | RM5,834 | RM3,209 | RM3,647 | RM2,778 | RM2,778 | RM3,890 | RM2,359 | RM1,888 | RM26,383 | *RM316,597* |
| Year 6 | RM6,126 | RM3,369 | RM3,829 | RM2,917 | RM2,917 | RM4,084 | RM2,525 | RM2,020 | RM27,787 | *RM333,446* |
| Year 7 | RM6,432 | RM3,538 | RM4,020 | RM3,063 | RM3,063 | RM4,288 | RM2,701 | RM2,161 | RM29,267 | *RM351,209* |
| Year 8 | RM6,754 | RM3,715 | RM4,221 | RM3,216 | RM3,216 | RM4,503 | RM2,890 | RM2,312 | RM30,828 | *RM369,936* |
| Year 9 | RM7,092 | RM3,900 | RM4,432 | RM3,377 | RM3,377 | RM4,728 | RM3,093 | RM2,474 | RM32,473 | *RM389,682* |
| Year 10 | RM7,446 | RM4,096 | RM4,654 | RM3,546 | RM3,546 | RM4,964 | RM3,309 | RM2,647 | RM34,209 | *RM410,502* |
| | | | | | | | | | | *RM 3,192,663* |

Note:

M : Manager
CO : Conservation Officer
ACO : Assistant Conservation Officer
EO : Education Officer
AEO : Assistant Education Officer
SME : Sales and Marketing Executive
AFO : Administration and Finance Officer
GK : Groundskeeper

Appendix IX

# SCOPE OF WORK

## 1. Manager

The Manager is responsible for the overall planning, development and management of KKW. The Manager's responsibilities shall be to:

- Lead the administration and management of the KKW office including managing all its finances
- Lead the organisation and development of staff skills and capabilities
- Develop and implement fund-raising programmes
- Lead engagement with the media and public relations (in consultation with EXCO of SWCS).
- Lead the upgrade of infrastructure and facilities
- Lead the stakeholder engagement programme
- Monitor the implementation of conservation, education, marketing and development programmes
- Report the implementation of activities under any donor supported programmes
- Report on all activities and related issues to the Management Committee.
- Coordinate the Secretariat of Sabah Wetlands Conservation Society.

## 2. Conservation Officer

The Conservation Officer is responsible for all conservation and research-related programmes. The Conservation Officer's responsibilities shall be to:

- Lead the development and implementation of the habitat enhancement and conservation programme
- Lead the hydrological management programme
- Lead the implementation of programmes to develop nature guides
- Support the development of the education and visitor programmes
- Support the organisation of road shows to schools
- Support the implementation of activities for volunteers and interns
- Support the upgrades of facilities for visitors
- Support the education and stakeholder engagement programmes
- Manage all scientific material and data related to monitoring and assessment

## 3. Assistant Conservation Officer

The Assistant Conservation Officer is responsible in assisting in the implementation of all tasks under the portfolio of the Conservation Officer. In addition to the above, the Assistant Conservation Officer will support the following tasks:

- Support administrative duties as required by the Manager
- Be responsible under the Administrative and Financial Officer and the Assistant Education Officer to manage reception facilities and visitor registration
- Work together as team members to carry out other assign duties

## 4. Education Officer

The Education Officer is responsible for all education programmes. The Conservation Officer's responsibilities shall be to:

- Lead the development and implementation of all education and visitor programmes
- Lead the development of interpretative material for KKW
- Lead the organisation of road-shows to schools
- Lead the implementation of activities for volunteers and interns
- Support the implementation of programmes to develop nature guides
- Support the upgrades of facilities for visitors
- Support the conservation and stakeholder engagement programmes
- Manage all education material and other related resources

## 5. Assistant Education Officer

The Assistant Education Officer is responsible in assisting in the implementation of all tasks under the portfolio of the Education Officer. In addition to the above, the Assistant Education Officer will support the following tasks:

- Support administrative duties as required by the Manager
- Be responsible under the Administrative and Financial Officer and the Assistant Conservation Officer to manage reception facilities and visitor registration
- Work together as team members to carry out other assign duties

## 6. Sales and Marketing Executive

The Sales and Marketing Executive is a new position. The Sales and Marketing Executive is responsible for all promotion and marketing of KKW which shall include:

- Lead the development and implementation of the marketing plan
- Lead the development of publicity material
- Lead the organisation of events at KKW together with the Manager
- Manage and monitor the KKW website and social media platforms
- Monitor and analyse the reviews by visitor on travel web portals.
- Support the Manager in the development and implementation of fundraising programmes.
- Coordinate the sales of all merchandise.
- Coordinate, manage and arrange the for rental of venues for meetings, exhibitions etc.

## 7. Administration and Finance Officer

The Administration Officer is responsible in all the general office administration, accounting and managing human resources management. The responsibilities of the Administration Officer include:

- Maintain and manage financial records for the operation, sales and management of KKW.
- Assist the Manager in human resources management including recruitment and appointment of new staff members.

- Maintain and manage records on number of visitors and participants of activities and programmes in KKW.
- Maintain and manage records of the volunteers, interns and their work programmes and activities.
- Assist in the management and monitoring of the complaints or concerns voiced by the stakeholders.
- Assist the Manager in developing the annual calendar for stakeholder involvement
- Manage the visitor reception, information counter and general public relations.

## 8. Groundskeeper

The Groundskeeper is responsible for the maintenance the grounds, infrastructure and facilities in KKW.

- Perform general gardening and landscaping work.
- Maintain cleanliness of all infrastructure and facilities.
- Monitor refurbishment and upgrading of the boardwalk and bird-watching hide.
- Monitor any landscaping work.
- Monitor all other upgrading of infrastructure and facilities.
- Develop and implement a monitoring and inspection programme for infrastructure and facilities.
- Assist the Education Officer in designing and improving signage and information stations.
- Assist in the maintenance of the mudflats habitat and rehabilitation of the firefly habitat.

The groundskeeper shall also be nominated as an Honorary Wildlife Warden to increase powers to regulate illegal activities.

Appendix X

# SAMPLE MONITORING TEMPLATE

Action Plan 1.2: Maintain the Mudflat Habitat for Birds

| | |
|---|---|
| Zone | Bird Habitat |
| Start Date | 2018 |
| Implementation (Term) | Long |
| Supporting Agency/Group | - |
| Estimated Costs | RM 80,000 (8 years) |

## Progress of Action

Has the activity been conducted?

❏ Yes

What has been its result and achievement?

❏ No

What has been the challenges faced?

## Feasibility of the Action Plan:

Is the activity valid and feasible?

❏ Yes

❏ No

What revisions, if any, should be made?

## Costs:

Should the cost be revised?

❏ Yes

Please provide revised breakdown.

❏ No

Notes: