

Ras Al Khor Wildlife Sanctuary Ramsar Site, Dubai, United Arab Emirates

Ramsar Site No. 1715

Ramsar Advisory Mission Report

13-17 May 2017

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RECOMMENDATIONS FROM THE RAMSAR ADVISORY MISSION

National Government

It is highly recommended the United Arab Emirate (UAE) Ramsar Administrative Authority request the Ramsar Secretariat include the Ras Al Khor Wildlife Sanctuary (RAKWS) Ramsar Site in the Montreux Record. Considering the 13th Conference of Parties to the Ramsar Convention (Ramsar COP13) which will be hosted by the Emirate of Dubai in October 2018, the site's inclusion on the Montreux Record will be recognition of the Federal and Emirate government's commitment to address the internal and external factors adversely affecting the site's ecological character and develop a world class site that is a show-case best practice in environmental management. In addition, the positive steps taken by the Emirate of Dubai would be a good example for the other Emirates who have designated Ramsar Sites.

It is recommended the UAE develop a national wetland policy to establish the priorities and mechanisms to enhance awareness of wetland resources.

It is recommended a Strategic Environmental Assessment analysing the economic, social and ecological impacts of programs, development plans and policies be undertaken on the conservation and wise use of RAKWS Ramsar Site.

Dubai Municipality

It is recommended the Technical Advisory Committee (TAC) for RAKWS Ramsar Site be reactivated with representative stakeholders, followed by comprehensive consultations to inform development of a RAKWS Ramsar Site Management Plan by August/September 2018 prior to Ramsar COP 13 in October 2018.

It is recommended there be formal clarification of the boundary of the RAKWS Ramsar Site and whether there have been any changes since the date of designation. Any change or restriction to the boundary would need to demonstrate that it has adhered to Articles and Resolutions of the Convention.

It is recommended that a specific policy guidance document be developed for developers which reviews the existing Buffer Zone boundary and would describe permissible activities within the RAKWS Ramsar Site and its Buffer Zone with full involvement of stakeholders by August/September 2018 prior to Ramsar COP13.

It is recommended that a specific Technical Guidance document is developed and published in order to assess adverse change to human-induced impacts to the ecological

character of the RAKWS Ramsar Site from development with full involvement of stakeholders by August/September 2018 prior to Ramsar COP13.

It is recommended there be an increased level of enforcement of the Maritime Traffic Boundary and a regulation restricting RAKWS Ramsar Site overflights to no less than 500 m above ground level be implemented.

It is recommended that DM initiate dialogue with the local education and tourism authorities as important stakeholders to thus assure that the programs and facilities that could be offered at the RAKWS Ramsar Site are designed in a way that allows seamless integration with the UAE education system and tourism programmes.

It is recommended that consultation with all parties be undertaken to establish and operate a set of education, research and training facilities and programmes that would best complement and support the on-going management of RAKWS Ramsar Site.

It is recommended that the development of the visitor center, other infrastructure and restoration activities be preceded by a rigorous EIA and baseline inventory that will allow the authorities to measure the effects of the development on the ecological character of the site.

It is recommended that effort be made to build on the current interest and willingness from the private sector to invest in enhancement and sustainable funding for the RAKWS Ramsar Site by fostering cooperation and open discussion on the management objectives for RAKWS Ramsar Site.

It is recommended that DM explore opportunities in line with Resolution XI.9 to proactively create, restore, and enhance wetlands as a means for providing wetland compensation to offset future unavoidable impacts that remain after mitigation measures.

List of Abbreviations

As	Arsenic
BOD	Bio-chemical Oxygen Demand
Cd	Cadmium
CEMP	Construction Environmental Management Plan
CEPA	Communication, Capacity Building, Education, Participation and Awareness
CMWS	Coastal Zone and Waterways Management Section
cm	centimeter
COP	Conference of the Parties
Cr	Chromium
Cu	Copper
CV	Cultural Village
d3	Dubai Design District
DCH	Dubai Creek Harbour
DHC	Dubai Healthcare City
DHCA	Dubai Healthcare City Authority
DHCR	Dubai Healthcare City Regulatory
DM	Dubai Municipality
DMNRCS	Dubai Municipality Natural Resources Conservation Section
DMWQO	Dubai Municipality Water Quality Objectives
DO	Dissolved Oxygen
DSG	Ramsar Deputy Secretary General
EAS	Environmental and Awareness Section
ECS	Environmental Control Section
EEO	Environmental Emergency Office
EIA	Environmental Impact Assessment
ELARD	Earth Link & Advanced Resources Development
EPSS	Environmental Planning and Studies Section
G+5	Ground plus 5
ha	hectares
Hg	Mercury
ICT	Information and Communications Technology
km	kilometers
m	meters
NR	Nature Reserve
NRCS	Natural Resources Conservation Section
Ni	Nickle
Pb	Lead
RAKWS	Ras Al Khor Wildlife Sanctuary

RAM	Ramsar Advisory Mission
RIS	Ramsar Information Sheet
RTA	Road and Transport Authority
Se	Selenium
SEA	Strategic Environmental Assessment
SOW	Scope of Work
STRP	Scientific and Technical Review Panel
STP	Sewage Treatment Plant
SWOT	Strengths, Weaknesses, Opportunities and Threats
TOR	Terms of Reference
TSE	Treated Sewage Effluent
UAE	United Arab Emirates
WGS84	World Geodetic System 1984
WWT	Wildfowl & Wetlands Trust Consulting
WVAR	Wetland Vulnerability Assessment Report
Zn	Zinc

1.0 INTRODUCTION

The Ramsar Convention provides technical advice Contracting Parties in the management and conservation of listed sites whose ecological character is changing or likely to change because of technological development, pollution or other human interference. This is undertaken through the Ramsar Advisory Mission (RAM), a technical assistance mechanism formally adopted by Recommendation 4.7 of the Conference of the Parties¹. This mechanism enables both developed and developing countries to apply global expertise and advice to the problems and threats that could or is leading to a loss in a wetland's ecological character.

RAMs are only organized at the request of the Party concerned (Annex 1) and their main objective is to undertake fact-finding activities and to provide advice based on international best practices in solving problems relating to the maintenance of the ecological character of Ramsar Site(s). RAMs may also be able to contribute advice and assistance on other Convention implementation issues at the same time. Reports are published, once they have been agreed by the recipient government; and this offers lesson-learning benefits for the Convention as a whole.

2.0 BACKGROUND

2.1 Ras Al Khor Wildlife Sanctuary Ramsar Site

Ras Al Khor Wildlife Sanctuary (RAKWS) in Dubai Municipality was established in 1985 and officially declared a protected area on March 1, 1998 [Emirate of Dubai Local Order No. (2) 1998]. The protected status of the sanctuary, as decreed under Federal Law No. 24 (1999) for the Protection & Development of the Environment (chapter VI) and Local Order No. 61 (1991) has helped protect the wetland from increased urban pressure and habitat degradation. Upon acceding to the Convention on Wetlands (Ramsar, 1971), RAKWS was listed as the United Arab Emirates' first Ramsar Site on 29 August 2007 (Fig. 1) using designation criterion under Group B – Sites of International Importance for conserving biodiversity:

Criterion 2 - supports vulnerable, endangered, or critically endangered species or threatened ecological communities;

Criterion 4 - supports plants and/or animal species at a critical stage in their life cycles or provides refuge during adverse conditions;

Criterion 5 – regularly supports 20,000 or more waterbirds; and

Criterion 6 – regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

¹ http://www.ramsar.org/sites/default/files/documents/library/key_rec_4.07e.pdf Accessed: 16 July 2017

As a signatory to the Ramsar Convention, the UAE is committed to adhere to its principles, particularly that of the “Wise Use of Wetlands”. At the core of this principle is the maintenance of the ecological character of its Ramsar Sites in view of any human-induced activities that may impact on the wetland.

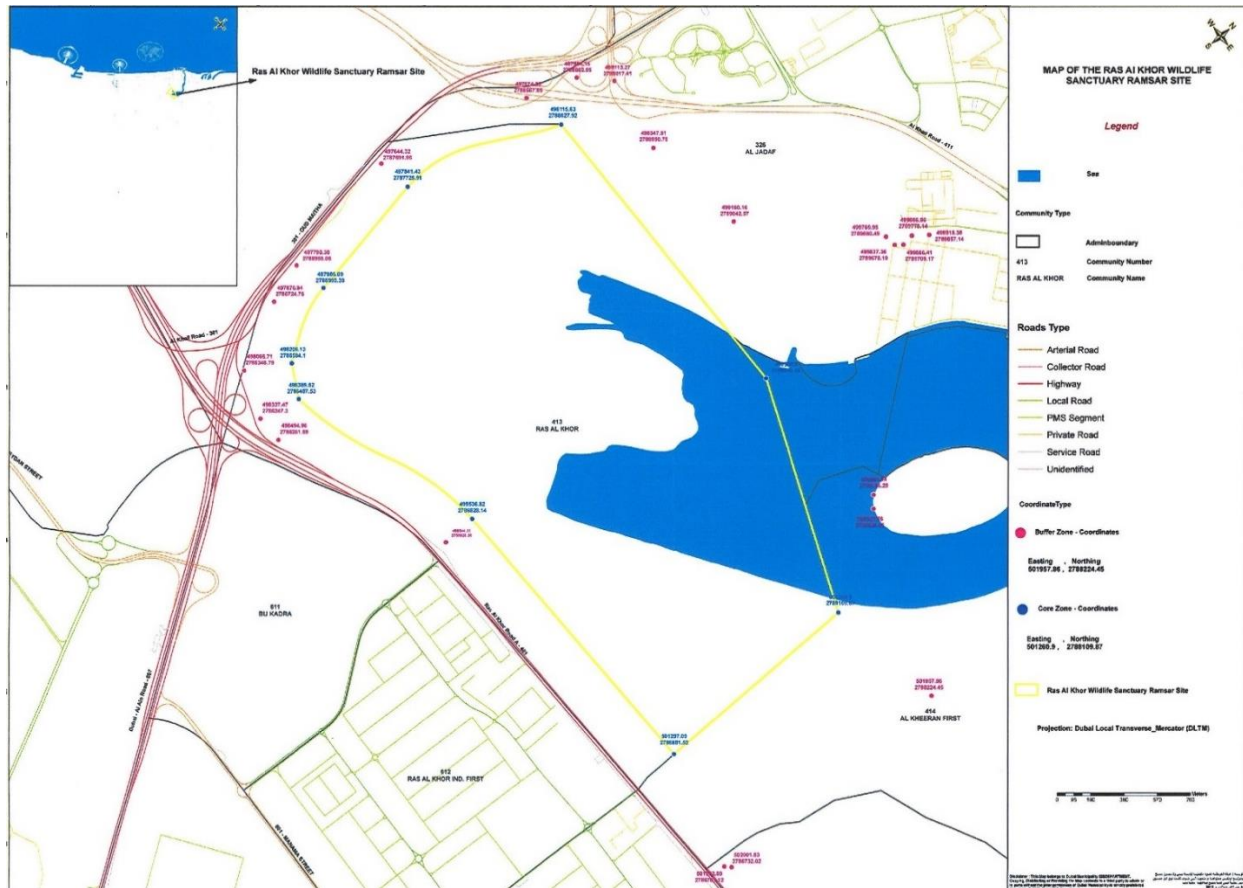


Figure 1. Finalized map of the boundaries of Ras Al Khor Wildlife Sanctuary Ramsar Site and Buffer submitted by the United Arab Emirates in 2012, produced by the Dubai GIS Department (<https://rsis.ramsar.org/RISapp/files/1955/pictures/AE1715map.pdf>).

Situated at the interface between the Gulf and onshore physical environment (Al Awir Desert), RAKWS Ramsar Site (hereafter referred to RAKWS) is an important roosting and foraging site for wintering and passing birds and supports a more varied assemblage of water bird species at much higher densities than any other site in the UAE (Evans 1994²). Open public access is allowed around the perimeter of the sanctuary. The RAKWS is located at the upper end of the highly-modified estuarine system of Dubai Creek and is surrounded by rapid urbanization and industrial development. RAKWS is increasingly becoming an important eco-tourism

² Evans M I (compiler). 1994. Important bird areas in the Middle East. Birdlife International pp 410.

destination and receives increasing numbers of local and international visitors. The natural landscape of the Site together with the adjacent Dubai Creek is used as a selling point by developers with projects that overlook it, and units with a view over the Site sell at a premium.

2.2 Site Description

The RAKWS Ramsar Site (Fig.2) is located at the western end of end of the approximately 14 km long Khor Dubai (Dubai Creek) that penetrates approximately 7 km inland from its natural entrance to the Gulf at Al Ras. An estuarine system, Dubai Creek has a restricted opening (100 m) and reduced tidal flushing. In late November 2016, the Dubai Water Canal became operational connecting the Gulf at Jumeirah to Dubai Creek along the northern boundary of RAKWS to create a water-based east-west transportation, amenity and development route within Dubai.

Road construction and dredging operations in the 1970s and '80s (Fig. 3) dramatically altered Dubai Creek's bathymetry from a wide, muddy/sandy intertidal inlet into the present-day waterway with low water depths of 6–8 m throughout its length with shallower depths (4-6 m) along the edge. Large areas of the Creek were reclaimed with dredge spoil and the only surviving area of intertidal flats occurs within the RAKWS, rapidly transitioning in approximately 200 m from a dredged depth > 6 m to tidally exposed flats that have a maximum linear distance of approximately 2.3 km. The top 50 cm of intertidal mud was largely removed in late 1993 and a network of channels established to assist with flushing of mangrove plantings (Evans 1994³)

The RAKWS is bounded by a multiple lane highway at the head of Dubai Creek and urban and industrial developments along its northern, eastern and southern boundaries. RAKWS is reported in the Ramsar Information Sheet (RIS) to include 620 hectares of sabkha, intertidal flats and mangroves, small lagoons and pools, dredging spoils, and a few tiny islands at the upper end of Dubai Creek. However, using the co-ordinates provided in the Ramsar Information Sheet Site map indicates the RAKWS is only 588 ha and is surrounded by a 432 ha buffer zone" which allows for limited construction with permission from the DM Environment Department's Environmental Planning and Studies Section (EPSS). Between the RAKWS boundary and boom barrier limiting access into the site from Dubai Creek is the unmarked RAKWS Maritime Traffic Boundary maintained by the Dubai Municipality Coastal Zones & Waterways Management Section. There is a speed restriction in place at the Creek boundary with the RAKWS of 4 knots and signage has been erected to indicate no unauthorized access is permitted to the sanctuary. Within RAKWS, the permanent open water area has a narrow 2-4 m zone before increasing to depths of 4-6 and 6-8 m. Tides are semi-diurnal and creek water depths fluctuate depending on the tidal situation, with a maximum tidal range of 2.1 m, and

³ Op. cit.

about 1-1.5 m in the upper reaches of the creek.



Figure 2. The Ras Al Khor Wildlife Sanctuary (RAKWS) and Ramsar Site located at the head of Dubai Creek, Emirate of Dubai, United Arab Emirates. The boundaries of the RAKWS (red) and Buffer (green) were drawn using co-ordinates obtained from the RAKWS Ramsar Information Sheet 2009-2012 version site map (<https://rsis.ramsar.org/RISapp/files/1955/pictures/AE1715map.pdf>) and WGS84 Dubai Local Transverse Mercator Coordinate System. Meydan LLC Planning Parcel 413-106 was digitized following the property boundary fence. Maritime Traffic Boundary approximate.

The lagoon in the southwest quadrant of the RAKWS is separated from tidal influence by berms and a sluice with stop logs which prevent tidal inputs and regulate the maximum height of the internal waters. Constructed in the mid-1990s to provide a foraging area for the flamingos and to replace habitat for foraging shorebirds lost with the planting of the mangroves, water was piped into the lagoon from areas to the west. Water input is now primarily the discharges of hypersaline water originating from construction dewatering and commercial operations south of the highway and the Ras Al Khor Industrial Area via the water pumping station on RAKWS's southern boundary beside the mangrove bird blind. Depending upon the volume of discharge, the area of standing water and “wetted” flats will expand and contract. The lagoon and associated flats are reported to be a key foraging and roosting area for wintering and migrant waterbirds.

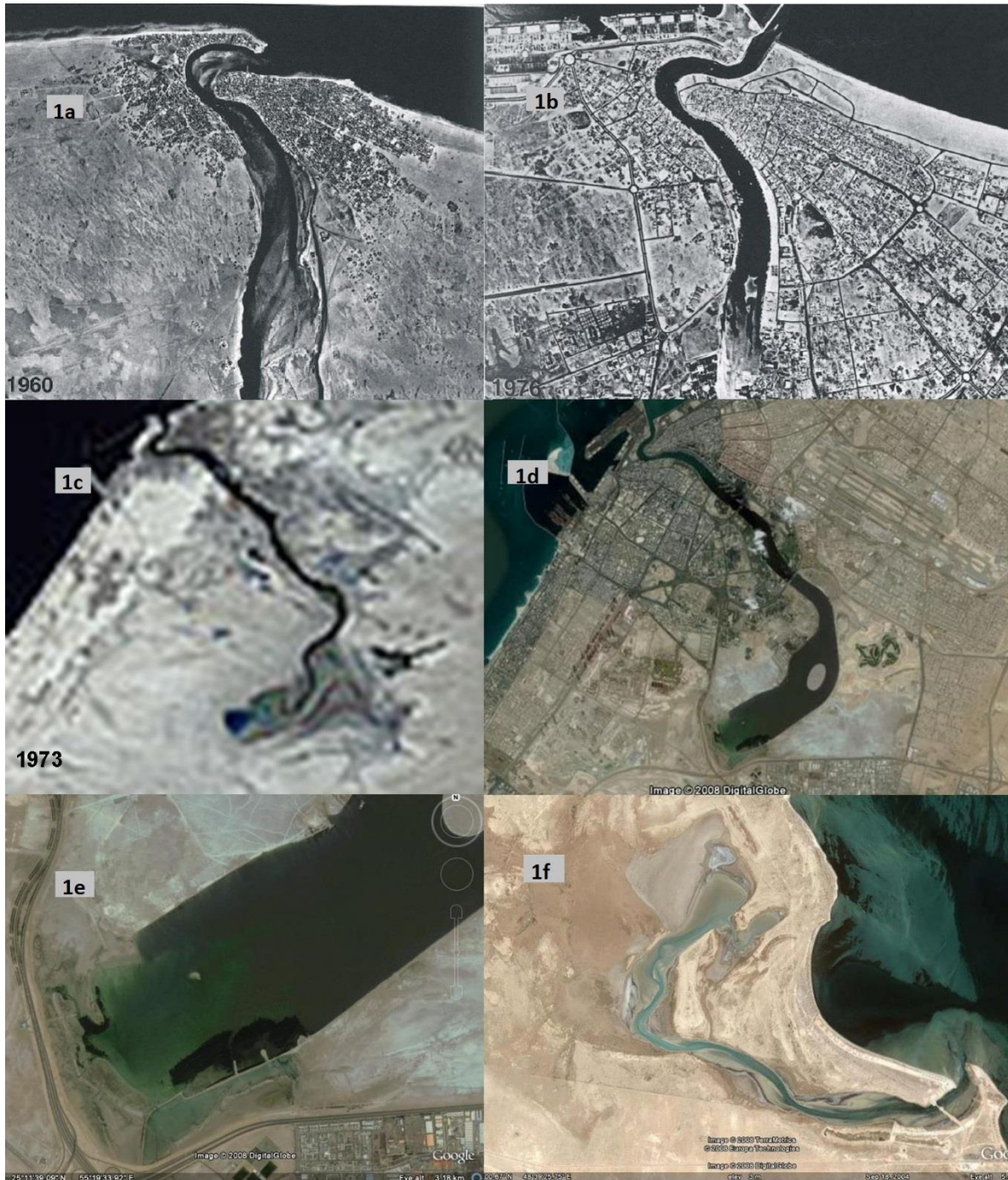


Figure 3. The entrance to Dubai Creek in 1960 (1a) showing extensive areas of shallow water and sand shoals that have largely been lost to dredging and infilling by 1976 (1b). The wide intertidal area at the head of Dubai creek in 1973 (1c) has been narrowed by the early 1990s (1d). The upper end of Dubai Creek (1e) still has natural habitat although dredging has occurred within the boundary of the RAKWS prior to its designation (Note the lagoon in the lower left of the sanctuary protected by berms with its water level controlled by a sluice gate). A similar sized creek in Saudi Arabia (1f) provides a useful visual comparison for the original condition of Dubai Creek with extensive shoals along the entire length of the creek ending in a broad shallow embayment with intertidal flats (compare with 1d).

The mangrove areas are vegetated with *Avicennia marina* originating from 45,000 seedlings planted from 1991 to 1994 and progressively expanding to now cover approximately 50 ha of formerly intertidal flat. The health of the mangroves is believed to have been positively affected by the seasonal discharge of freshwater from the Al Awir Sewage Treatment Plant (STP) into the system over the years⁴.

Prior to completion and operation of Dubai Water Canal, the creek was a confined waterbody receiving exogenous nutrient input from storm water drainage and treated sewage effluent (TSE) from the Al Awir STP. Environmental Impact Assessments (EIA) prepared for developments surrounding RAKWS are consistent in reporting dissolved oxygen (DO) at the bottom of Dubai Creek well below DM's Water Quality Objectives (DMWQO: not less than 5 mg/L or 90% saturation) while bio-chemical oxygen demand (BOD₅) meet or is at slightly elevated levels to the DMWQO (10 mg/L). Marked declines are reported in DO and turbidity with increasing depth between the surface and near-substrate.

Similarly, Dubai Creek water nutrient levels exceed DMWQO compliance standards (2.0 mg/L for total nitrogen, 0.5 mg/L for nitrate-nitrogen, 0.1 mg/L for ammonia-nitrogen, and 0.05 mg/L for phosphate-phosphorus) for both surface and near-substrate waters. Observed reductions in summer nutrient levels in Dubai Creek, although still exceeding DMWQOs, have been attributed to reduced loadings of TSE resulting from high demand for green area irrigation water elsewhere in the city. Nutrient levels at the upper end are higher than the lower end of the creek due to a limited flushing rate of 10% monthly, trapping and confining nutrient rich TSE discharge waters. The extensive dredging operations significantly increased the water volume in the inland parts of Dubai Creek impacting the normal flushing of a natural tidal creek.

Water nutrient levels in RAKWS reported in the numerous EIAs generally meet or slightly exceed DMWQOs. However, quarterly water quality sampling undertaken by DM between 2006 and 2015 typically exceeded DMWQOs for nitrate-nitrogen, total nitrogen, and phosphate-phosphorus⁵. The phytoplankton community structure and diversity in both Dubai Creek and RAKWS are dominated by cyanobacteria; and the presence of cyanobacteria *Limnothrix* sp. as the dominant phytoplankton species indicates a highly stressed, eutrophic environment.

Although heavy metals (As, Cd, Cu, Pb, Ni, Zn, Hg, and Se) in Dubai Creek sediments are in compliance with Dutch Contaminated Lands Standards, the high levels of Cr, Cu, and Zn are

⁴ CH2M 2015. Project R999/5, Dubai Water Canal Project, Completion of Business Bay Outstanding Works. Scoping Report Ref. no 2015011/11/H104048 ver. 1. Halcrow International Partnership. Dubai, United Arab Emirates.

⁵ WKC Environment Consultancy. 2015. Table 4-40. Ras al Khor Wildlife Sanctuary Phase 1 Winter Baseline Survey Report. Report Reference J4015 R001. December 2015. In: Mott MacDonald. 2016. Dubai Creek Harbour Environmental Impact Assessment (EIA) Report. Volume 2 – Additional Studies. Rev 02 – December 2016. Document Reference (MML-364814-ENV-RPT-001-2). Dubai, United Arab Emirates

likely associated with the Jadaf Ship Yard operations. Current high values of total ammonia nitrogen recorded in the sediments of Dubai Creek and RAKWS indicate a high level of anthropogenic impact which is likely to be toxic to many sessile benthic infauna.

Sub-tidal substrates of inner Dubai Creek are hypoxic, poorly consolidated, organic-rich muddy-sand overlain with varying amounts of a thin, white patchy matrix-layer composed of bacteria, fungi, and microorganism. Sub-tidal macro-benthic invertebrate fauna is absent and attributed to a combination of hypoxia and high salinity caused by poor flushing rates and high organic and nutrient loadings. Hypoxia conditions permit anaerobic sulphate-reducing bacteria to thrive and these release sulphide which is toxic to many aerobic organisms and sessile benthic invertebrates.

The coastal intertidal sites along Dubai Creek outside of RAKWS support a low diversity and density of infauna that is dominated by *Capitella* polychaete worms indicating harsh environmental conditions and high levels of organic pollution. The macro-benthic intertidal fauna within RAKWS is more diverse with significantly higher densities dominated by annelids including Nereidae (*Tylonereis bogoyawlenskyi*, *Simplisetia erythraeensis*, cf. *Nereis falcaria*), Capitellidae and other polychaete spp.; gastropod mollusks (mainly *Pirenella conica* as well as *Dosinia alta* in the lower intertidal area) and brachyuran crabs (mainly *Scopimera crabricauda* and *Ilyoplax frater*). Typical mangrove species include *Amphibalanus amphitrite* and *Planaxis sulcatus* on the stems and pneumatophores, the brachyuran crab *Metopograpsus messor*, and polychaetes.

In summary, numerous EIAs arrive at the same conclusion that sampling "... generally indicates poor water and sediment quality in Dubai Creek and RAKWS, with phytoplankton communities dominated by pollution tolerant cyanobacteria, zooplankton with moderately high secondary productivity levels but low biodiversity, very low fish biodiversity, infaunal benthic communities either absent or extremely impoverished, with only the RAKWS supporting moderately biodiverse macro-invertebrate communities, dominated by capitellid polychaetes indicating harsh, eutrophic conditions."⁶

⁶ Innovation Delta Environmental (IDE) Consultants, Dubai. 2015. Environmental Baseline Studies for Business Bay, Dubai Creek and Ras Al Khor Wildlife Sanctuary. Final Report. pp. 83.

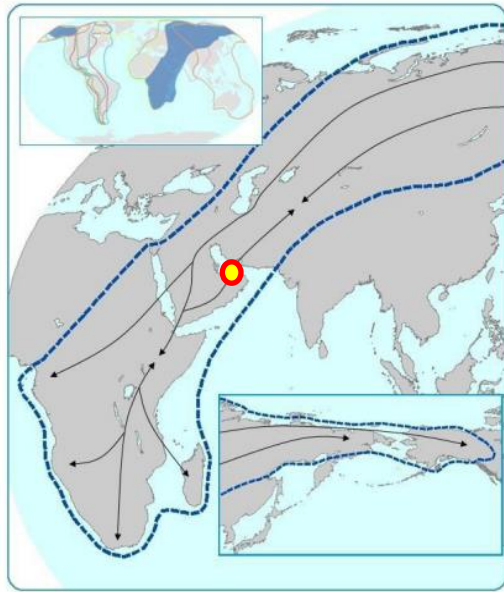


Figure 4. East African–West Asian Flyway

However, the invertebrate fauna within the intertidal zone is still able to support a large number of resident and migrating birds. A good summary of the importance of the RAKWS to birds is provided in Mott MacDonald (2016)⁷. Located along the East African – West Asian Flyway (Fig. 4) it is estimated that some three billion migrating birds utilise the Arabian Peninsula each year as a stopover between Africa, Asia, and Europe. Birdlife International identifies RAKWS as the most important mudflat area in the UAE supporting a more varied assemblage of waterbird species at higher densities than other sites within the coastal zone. Among the 185 species recorded at RAKWS, at least nine species of waterbirds occur in numbers that exceed their respective 1% regional or flyway population, five

breeding species are among those breeding in the UAE that account for greater than 1% of the global breeding population, and 18 species ranging from critically endangered to near threatened have been recorded at the site.

2.3 Development Projects Adjacent to RAKWS

In the last 40 years, the Dubai Creek has become one of the busiest in terms of commercial activities in the region. Commercial establishments have developed along the banks of the Creek and these have provided for Dubai’s economic growth. These projects are in support of the strategic goal of the Emirate of Dubai in attaining its vision as stipulated in its Dubai Strategic Plan 2021. This states that:

“Environmental Elements are Clean, Healthy and Sustainable: Dubai enjoys a clean and healthy environment in all its elements and ensures its sustainability in the long-term, and in line with the world’s best practices”.

UAE’s Federal Law No. 24 on the Protection and Development of the Environment has as an objective “Compliance with international and regional agreements ratified or approved by the State regarding environmental protection, control of pollution and conservation of natural resources.” Furthermore, Local Law No. 11 (2003) on the Establishment of Protected Areas in the Emirate of Dubai is a progressive piece of legislation. It prohibits any activities or procedures, which may destroy, damage or deteriorate the natural environment, damage wildlife, marine flora and fauna or affect the aesthetic standard in protected areas; and supercedes any

⁷ Mott MacDonald. 2016. Dubai Creek Harbour. Environmental Impact Assessment (EIA) Report. Volume 2 – Additional Studies. July 2016. Document No. MML-364814-ENV-RPT-001-1. Section 5.1.2.2. Pages 58-63.

legislation that contradicts rules established under this law (Article 13). Article 11 states Nature Reserves (NR), e.g. RAKWS, are established in the Emirate based on Local Order No. 2 (1998). It further prohibits public or private bodies under Article 8 from performing any activity or behaviour in the **vicinity of the NR or surrounding** [*RAM highlight – provides authority to regulate activities in the RAKWS buffer zone*] that would damage the environment or have a negative impact on its wildlife, marine life, plant species or its natural beauty. In particular, the following human activities are not allowed:

- Hunting, transportation or harming of any living organism;
- Extraction of any organism, rock or soils from the NR that would change its topographic characteristics;
- Destruction of geological or geographical constituents or the regions considered habitats for animal, plant or bird species and their multiplication;
- Introduction of any foreign animal species into NR;
- Contamination of soil, water or air;
- Setup of any construction or structures or paved roads or vehicle translocation, agricultural, industrial or trade activity without Dubai Municipality authorization; and
- Any other activity that would hinder nature imbalance in NR.

Article 5 mandates DM the role of supervising NRs and their management. The municipality Director General is authorised to issue decisions and constitute a Managing Council to supervise and manage NRs; and the council should appoint members with high technical expertise. Specific duties and role of DM (Article 6) include:

- a) Drafting policies, strategies and plans for their implementation;
- b) Monitoring environmental ecosystems;
- c) Preparation and implementation of programs to organize work plans in NRs;
- d) Setup of necessary structure and installations for the preservation of NR and to encourage ecotourism;
- e) Preparation of regulations to protect nature in the NR to ensure animal, plant, birdlife, natural resources, underground water and biodiversity conservation;
- f) Preparation of terms and conditions needed for performing investments inside the NR provided it does not oppose the conservation of natural life;
- g) Determine entry fees for visitors;
- h) Adopt necessary measures to obtain public, regional and international organization recognition directly involved with NR, exchange of information and expert knowledge on matters relating to conservation of NRS;
- i) Subcontracting consultants and establishing specialised committees on conducting research and studies to promote NR, and monitor ecosystems and limit organisms to a specific location; and
- j) Other roles in the context of the NR objectives.

In accordance with Federal Law No. 24, Dubai Local Order 61/191 and requirements by Dubai Municipality Environmental Protection and Studies Section (DM-EPSS), developments impacting the Ramsar Site are subject to an Environmental Impact Assessment (EIA). This is in line with Ramsar Resolutions VII.16⁸ and X.17⁹.

The Environment Department is the relevant government authority which regulates and enforces the environmental regulations applicable in Dubai. Five sections fall under the Environment Department: Environmental Planning and Studies Section (EPSS), Coastal Zone & Waterways Management Section (CWMS), Environmental Control Section (ECS), Natural Resources Conservation Section (NRCS), and the Environmental and Awareness Section (EAS). The key task of implementing the EIA system is assigned to EPSS; and management of RAKWS is assigned to NRCS.

Early correspondence from Dubai Municipality to Ramsar's Secretary General (da. 11 March 2006) during the accession process of UAE to the Ramsar Convention noted changes occurring in the buffer zone with low intensity housing and health services and construction of new canals as part of the Business Bay development. In 2013, Mohd Abdul Rahman Hassan [Head, Marine Environment & Wildlife Section (currently NRCS)] submitted a notification as per Article 3.2 to the Ramsar Secretariat (Asia-Oceania Region) and Report¹⁰ on possible changes to the ecological character of the RAKWS in response to the opening of the Business Bay Canal and expansion of the mangrove community onto the intertidal flats. The Report requested review and feedback by the STRP which initiated discussions on a RAM between the Secretariat and the UAE.

For the purposes of this RAM, three mega projects immediately adjacent to the RAKWS (Fig. 5) were the focus for evaluation. These are 1) the Dubai Water Canal (R999) 2); the Dubai Creek Harbor development on the eastern part of the Creek; and 3) the Dubai Healthcare City II at the northern part of the Creek. Other developments to be additionally considered included 1) Meydan Developments; 2) Dubai Culture Village Development; 3) Festival City Expansion and Golf Residence; and 4) Dubai Design City.

⁸ http://www.ramsar.org/sites/default/files/documents/library/key_res_vii.16e.pdf Accessed: 15 July 2017

⁹ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_x_17_e.pdf Accessed: 15 July 2017

¹⁰ Dubai Municipality. 2013. Ras Al Khor Wildlife Sanctuary, Emirate of Dubai, United Arab Emirates. Report. The Business Bay Canal Project and Mangrove Management in the RAKWS. Environment Department, Marine Environment and Wildlife Section.

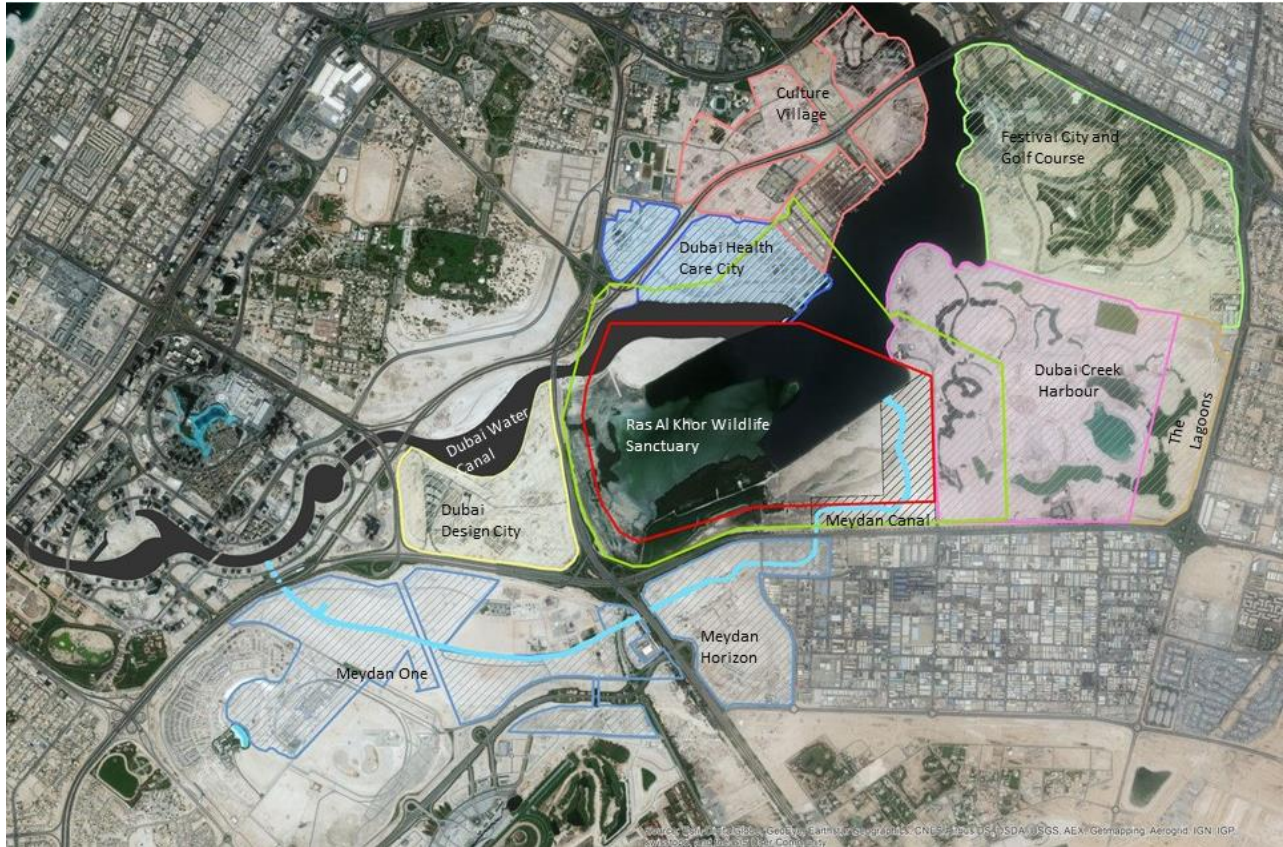


Figure 5. Ras Al Khor Wildlife Sanctuary (RAKWS) surrounded by buffer zone (highlighted in green) and development projects being implemented or developed. The boundaries of the RAKWS and Buffer were drawn using WGS84 Dubai Local Transverse Mercator Coordinate System and co-ordinates obtained from the RAKWS Ramsar Information Sheet 2009-2012 version site map (<https://rsis.ramsar.org/RISapp/files/1955/pictures/AE1715map.pdf>). Meydan LLC Planning Parcel 413-106 was digitized following the property boundary fence. Development projects were digitized by referring to images and drawings in Environmental Assessment Reports and on-line documentation.

2.4 Reporting on Changes to Ecological Character

In acceding to the Ramsar Convention on Wetlands as Contracting Parties, national governments are agreeing to “...the conservation, management and wise use of wetlands...” as described in Convention Text¹¹ and the Recommendations and Resolutions of the Conference of the Contracting Parties. Under Articles 2.1 and 3.1, Contracting Parties must designate Ramsar Sites and formulate and implement planning so as to promote their conservation (i.e., maintain their ecological character), as well as the wise use of all wetlands. Further, if the ecological character of any Ramsar Site in its territory has changed, is changing or is likely to change in its territory, the Contracting Party through the national Administrative Authority shall (Article 3.2) arrange to inform the Ramsar Secretariat without delay.

¹¹ http://www.ramsar.org/sites/default/files/documents/library/scan_certified_e.pdf Accessed: 15 July 2017

Change in ecological character is defined in paragraph 19 of Resolution IX.1 Annex A¹² as “[f]or the purposes of implementation of Article 3.2, change in ecological character is the human-induced adverse alteration of any ecosystem component, process, and/or ecosystem benefit/service”. The inclusion of specific reference to Article 3.2 of the Convention text within the definition is designed to clarify the maintenance obligation for the ecological character of listed Wetlands of International Importance (Ramsar Sites) under Article 3.2, and to note that such change concerns only adverse change caused by the actions of people and excludes natural evolutionary change occurring in wetlands and also excludes positive human-induced change (Resolution VI.1¹³).

Ramsar Handbook 19¹⁴ compiles guidance adopted by Contracting Parties on procedures and responses with respect to notification under Article 3.2 regarding human-induced change in ecological character. The framework included in the Handbook employs flowcharts to assist in detecting whether change in wetland ecological character is natural and positive or negative and human-induced thereby triggering Article 3.2 reporting.

A response by a Contracting Party to an Article 3.2 notification can be a request to the Ramsar Secretariat to undertake a Ramsar Advisory Mission (see below) and/or have the site included in the Montreux Record established under Recommendations IV.8¹⁵ and V.4¹⁶. The former instructed “the Convention Bureau [Secretariat], in consultation with the Contracting Party concerned, to maintain a record of Ramsar sites where . . . changes in ecological character have occurred, are occurring or are likely to occur, and to distinguish between sites where preventive or remedial action has not as yet been identified, and those where the Contracting Party has indicated its intention to take preventive or remedial action or has already initiated such action.” The latter recommendation further determined that its purpose, among others, should be to identify priority sites for positive national and international conservation attention, and instructed the Ramsar Convention Secretariat to maintain the Record as part of the Ramsar Sites Database.

The Montreux Record is the principle tool of the Convention for highlighting Ramsar Sites, upon notification under Article 3.2, that are in need of priority national and international conservation attention. It is NOT an acknowledgment of management failure, or a means to criticize a Contracting Party. Rather, including a Ramsar site on the Montreux Record is acknowledged (Resolution VIII.8, paragraph 21)¹⁷ to be voluntary and a useful procedure available to a

¹² http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_ix_01_annexa_e.pdf Accessed: 15 July 2017

¹³ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_vi.01e.pdf Accessed: 15 July 2017

¹⁴ <http://www.ramsar.org/sites/default/files/documents/pdf/lib/hbk4-19.pdf> Accessed: 15 July 2017

¹⁵ http://www.ramsar.org/sites/default/files/documents/library/key_rec_4.08e.pdf Accessed 15 July 2017

¹⁶ <http://www.ramsar.org/document/resolution-54-the-record-of-ramsar-sites-where-changes-in-ecological-character-have> Accessed 15 July 2017

¹⁷ <http://www.ramsar.org/document/resolution-viii8-assessing-and-reporting-the-status-and-trends-of-wetlands-and->

Contracting Party where:

- demonstrating national commitment to resolve the adverse changes would assist in their resolution;
- highlighting particularly serious cases would be beneficial at national and/or international level;
- positive national and international conservation attention would benefit the site; and/or
- inclusion on the Record would provide guidance in the allocation of resources under financial mechanisms.

In the follow-up of listing on the Record, Contracting Parties are requested to provide a report to the Convention [Secretariat] on the conservation status and extent to which the ecological character of the Site has been restored or maintained within the framework of the triennial National Reports. A wetland will be removed from the Montreux Record based on the request of the Contracting Party and after consideration of advice and/or comment from Ramsar's Scientific and Technical Review Panel (STRP) (see Annex 4 for case study on Chilika Lake Ramsar Site). The final decision will be made by the Contracting Party.

Contracting Parties have adopted guidelines for operation of the Record (Resolution VI.1 – Annex)¹⁸ and a questionnaire to assist a Contracting Party determine when the inclusion or removal of a listed Site should occur (Resolution XII.6 – Annex 1)¹⁹

The RAKWS Ramsar Site is not listed in the Montreux Record.

3.0 OBJECTIVES OF THE RAMSAR ADVISORY MISSION

The RAM undertaken between 13-17 May 2017 (see Itinerary – Annex 2) had the following objectives;

- To review the documents of the above mentioned mega projects provided through the Ministry of Climate Change and Environment with keen consideration of the other developments.
- To evaluate how successful the existing SEA/EIA process has been in considering cumulative impacts and make observations/recommendations regarding the developments around RAKWS Ramsar Site.

[the](#) Accessed 15 July 2017

¹⁸ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_vi.01e.pdf Accessed 15 July 2017

¹⁹ http://www.ramsar.org/sites/default/files/documents/library/cop12_res06_ramsar_list_e.pdf Accessed 15 July 2017

- To make a field-visit to Dubai Creek and the RAKWS and facilitate a forum to discuss issues with identified developers and relevant stakeholders, competent authorities, and the Steering Committee members (Annex 2).
- Identify key biotic and abiotic parameters, main indicators to any future change in the ecological characters and conservation targets approaches in order to maintain the ecological characters of the RAKWS.
- Develop the Steering Committee TOR.
- Provide other recommendations for the long-term conservation and wise use of RAKWS in view of the present and future developments along Dubai Creek which may impact the site.

This report based on the RAM team's findings has been prepared for UAE's Ramsar Administrative Authority and includes recommendations to:

- the Administrative Authority on implications for the wise use of wetlands under the obligations of the Ramsar Convention.
- Dubai Municipality on means to improve the conservation and wise use of the RAKWS and its buffer zone.
- the proponents of the known development projects surrounding RAKWS on effective strategies for avoiding, mitigating or compensating the impacts from their projects on the RAKWS and which are in line with the obligations under the Ramsar Convention;

A RAM team was established composed of specialists in different aspects of wetland wise use and conservation, environmental impact assessments, the management and restoration of wetlands, and hydrology. The team members were:

- Robert McInnes, Managing Director of RM Wetlands & Environment Ltd, an expert in the wise use of wetlands and related uses, a representative on the Ramsar Scientific and Technical Review Panel and with over ten years' involvement in RAKWS;
- Randy Milton, Manager of Ecosystems and Habitats Program, Government of Nova Scotia (Canada), an expert in review of environmental impact assessments and the wise use of wetlands, past member of the Ramsar Scientific and Technical Review Panel, and previous experience with RAKWS;
- Keith Wilson, Innovation Delta Environmental (IDE), an ecologist and wetland specialist, former Director of the Dubai-based Emirates Marine Environmental Group, who has ten years' experience gained in the UAE as an environmental manager and marine ecological consultant; and
- Lew Young, Senior Regional Advisor for Asia-Oceania, Ramsar Convention Secretariat.

4.0 REVIEW OF EIA'S AND SITE MEETINGS WITH DEVELOPERS / PROJECT CONSULTANTS

A review of recent environmental impact assessments was undertaken in order to evaluate how successful the existing SEA/EIA processes have been in protecting the RAKWS and maintaining its ecological character. The evaluation focused on the principle developments either contiguous to the RAKWS boundary or in very near proximity. The review was based on documents provided by the proponents of the development. All the developments were at different stages, from still seeking consents to post-construction.

Meetings were held with the developers in order to understand better both the nature of the development and the EIA process. Meetings were held with representatives of the following developments (Annex 3):

- Dubai Creek Canal (CH2M)
- Dubai Creek Harbour Development
- Dubai Healthcare City II Developments
- Meydan Developments
- Festival City Expansion and Golf Residence Development
- Dubai Culture Village

In addition to meeting with the developers, meetings were also held with government officials from the Ministry of Climate Change and the Environment and Dubai Municipality. The objective of the meetings was to understand the EIA process from both the perspective of a developer and a regulator.

4.1 Dubai Creek Harbour Development

The Dubai Creek Harbour (DCH) project is a masterplanned mixed use development project located immediately to the east of RAKWS²⁰. The Project Site is on land formerly allocated to 'The Lagoons' Project, which was suspended in 2008 and subsequently permanently cancelled. The Project Owner 'The Lagoons LLC', is a joint venture between Emaar Properties PJSC and Dubai Holdings. The joint venture was officially launched in October 2014 with plans to develop the 557 hectare site between 2016 and beyond 2030. A strip of land (approximately 110 ha) to the east of the project site and bounded by Nadd Al Hamar Road is under the control of Dubai Properties Group and is due for development in 2017 and beyond. No EIA was received by the RAM team for the development under the control of Dubai Properties Group.

²⁰ Mott MacDonald 2016. Dubai Creek Harbour: Environmental Impact Assessment Report, Volume 1 – Main Report: Rev02 07 December 2016. MML-364814-ENV-RPT-001-2.

The development and launch of the initial phases of development, including the observation tower, are planned to take place up to 2020, to coincide with Dubai Expo 2020. The Project includes development of circa 10 million m² Gross Floor Area (GFA) of mixed-use development, including tourism and hospitality, cultural, commercial, retail, residential, marina, and public realm land uses, and associated utilities and infrastructure. It is proposed that, at a height in excess of 830 m, the observation tower will be the centre piece and iconic development at the heart of the DCH project. Construction on the tower commenced in 2016.

Several elements are included in the overall development, comprising:

- Removal of above and below ground structures, utilities and other features, and site grading/levelling;
- Decommissioning of artificial lagoons, and associated backfilling, civil engineering and water management;
- Relocation of an existing Treated Sewage Effluent (TSE) overflow pipeline and outfall, and an existing stormwater rising main and outfall;
- Coastal development works to modify the current coastline and reinstate a channel and island, and development and operation of a marina;
- Construction and operation of temporary and permanent roads, above and below ground car parks, and utilities buildings and infrastructure (district cooling, sewerage, gas, electricity, water, telecoms, etc.);
- Construction and operation of phased high, medium and low rise, mixed-use buildings (residential, cultural, public, commercial, and retail) and associated public realm and facilities, including artificial canals and water features (not connected to Creek or groundwater); and
- Development of construction phase logistics areas, concrete batching plants and other construction facilities, including on site labour welfare facilities and labour accommodation.

Revision 21 of the concept masterplan was submitted to DM in January 2016 and approved in March 2016. Following numerous revisions of the overall masterplan, the final EIA document was submitted in December 2016. The masterplan included in this submission has three distinct district zones: the Waterfront, the Core and the Parklands. These three zones are further sub-divided into nine districts (Fig. 6).

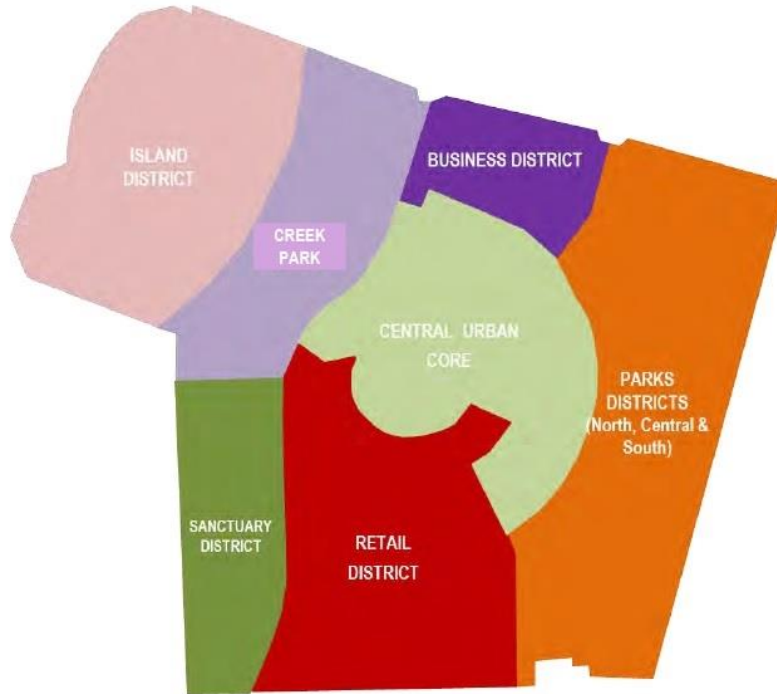


Figure 6. DCH masterplan districts.

The EIA report produced by Mott MacDonald represents a substantial piece of work and one that improves greatly the understanding of the dynamics of the RAKWS and also the wetland habitats found within the project site. Original baseline data were collected on a variety of ecological receptors germane to assessing potential change in the ecological character of the Ramsar Site and the project site. A relatively comprehensive desk study was completed but it is noted that not all data requested from DM was received.

The evaluation clearly demonstrates that the human-made wetlands on the project site are sensitive ecological receptors that need to be considered fully in the EIA process. This is good practice when considering the wise use of all wetlands and not just focusing on protected or designated sites. The ecological reports presented in Volume 2 of the EIA clearly identify the value of the *Phragmites australis* reedbeds fringing the lagoons as being considerably high and recommends that they are retained *in situ*, as advocated by Ramsar through the avoid-mitigate-compensate sequence described in Resolution XI.9 (2012)²¹. However, whilst a decision has been made to not retain these *in situ*, for instance through design modifications to avoid wetland loss, actions are described to mitigate and compensate for the loss of the human-made wetlands, and particularly the *Phragmites australis* reedbeds within the project site. Whilst final designs on the compensatory habitats are not presented in the EIA reports, and therefore further comment on the long-term viability of these habitats is precluded, the RAM team witnessed the attempts being made on the ground to ensure the successful translocation and establishment of these wetlands in the future.

²¹ <http://www.ramsar.org/sites/default/files/documents/library/cop11-res09-e.pdf> Accessed 24 July 2017

The following synthesis focusses on the assessment of impacts on the ecological character of the RAKWS and whether the approach implemented was robust and commensurate with guidance adopted by the Parties to the Ramsar Convention. Again, the starting point for consideration is the avoid-mitigate-compensate framework and the principle of maintaining the ecological character of the Ramsar Site.

The EIA actively adopts the language of understanding impacts in the context of alteration of the ecological character of the wetland. This is a very positive element of the EIA and consistent with the guidance for Ramsar Sites. However, at no point is a comprehensive description of the ecological character of the Ramsar Site presented. Reference is clearly made to the four designation criteria for which the site qualifies. But an evaluation of these criteria is limited in the main volume of the EIA to one criterion (Criterion 2). The supporting reports provided in Volume 2 of the EIA also provide information that indicates that the site still qualifies under all four of the original designation criteria. The evaluation of the different habitats within the Ramsar Site fails to explain how their quality has been evaluated but clearly demonstrates that the majority of the habitats are considered to be high (in terms of their sensitivity). Similarly, despite a limited evaluation of the designating criteria, the Ramsar Site is evaluated as high (in terms of sensitivity) for birds. Wider descriptions of other ecosystem components, processes, and particularly the ecosystem services provided by the site, all of which comprise the ecological character of the wetland (Resolution IX.1 Annex A)²² are limited.

Given the description of the site, especially the high sensitivity and the fact that it still qualifies as a Ramsar Site, it seems incongruous that under the assessment of cumulative impacts the current condition is described as ‘degraded, Ramsar designation ‘at risk’, condition status rated ‘poor’’. Limited evidence is provided in the description of the RAKWS Ramsar Site to substantiate this overall evaluation. Undoubtedly there are factors adversely affecting the site’s ecological character (these have been formally acknowledged in the RIS in 2012) but the claims that the overall condition is ‘poor’ and that the designation status is at risk are not clearly justified or substantiated. If this is the case, the need to ensure that every attempt has been made to avoid any impacts gains prominence as the sensitivity of the receptor is increased.

The summary of the intra-project cumulative impacts suggests that this poor status will become ‘very poor’ in the future with or without the project. The justification for this assumption is that the DCH project will have an adverse impact on the RAKWS and the impact of adjacent developments, particularly the Meydan Canal, will adversely impact the Ramsar Site. However, the authors admit that this is a rapid, qualitative assessment which assumes that all other development projects considered will have the same residual impact and significance as the DCH project. In order to offset the residual impacts the DCH project proposes compensation

²² http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_ix_01_annexa_e.pdf Accessed: 24 July 2017

measures, however, there is an assumption that the other projects would not propose any compensation.

Ramsar Resolution VII.24²³ clearly states that Contracting Parties should take all practicable measures for compensating any loss of wetland functions, attributes and values, both in quality and surface area, caused by human activities. Resolution XI.9²⁴ further states that any such action should be *ex situ* and appropriate to offset the residual impacts. A range of compensation measures are proposed in the EIA report to offset the impacts to the Ramsar Site and other wetlands. These are:

- Providing logistical and/or financial support for the conservation and monitoring of RAKWS, including:
 - Preparation of a management plan.
 - Increasing patrolling and fencing improvements.
 - Restoring degraded areas.
 - Monitoring and researching the mangroves and threatened fauna.
 - Implementing awareness and education programmes.
- Create new intertidal habitats within RAKWS. Two options are provided:
 - Option A – Re-profiling of the south-eastern part of RAKWS to create intertidal habitat. This is to represent compensation for the loss of the lagoon habitats on the project site and not compensation for impacts on RAKWS.
 - Option B – Lowering the sandbank in the north-west part of RAKWS to create intertidal habitat.
- Create new ecological functioning lagoons. Two further options are provided:
 - Option C – Creation of new lagoons on the project site to compensate for the loss of the TSE lagoons and associated reedbeds.
 - Option D – Creation of new lagoons off-site or enhancement of existing off-site wetlands within close proximity of RAKWS.

The suitability of the proposed compensatory measures has been examined against both the predicted residual impacts and their ability to satisfy the guidance provided in Resolution XI.9²⁵. The residual impacts identified in the EIA are:

- Net loss of wetland habitat resulting from the remediation of the existing lagoons:

²³ http://www.ramsar.org/sites/default/files/documents/library/key_res_vii.24e.pdf Accessed 24 July 2017

²⁴ <http://www.ramsar.org/sites/default/files/documents/library/cop11-res09-e.pdf> Accessed 24 July 2017

²⁵ Op cit.

- Threats to wildlife within RAKWS due to habitat loss, pollution of soil and water, noise, disturbance, increase in predatory species, increase of invasive species, which is considered to have a moderate adverse residual effect

In addition, the cumulative impact assessment has concluded that the following impacts will result at RAKWS:

- Disturbance from concurrent construction activities between development projects;
- Disturbance from unauthorised helicopter flights within and near RAKWS;
- Disturbance from boating traffic within and near RAKWS;
- Disturbance from concurrent firework displays

With regards to the wetlands within the project site, the creation of new lagoons and reedbeds (Option C above) is considered appropriate compensation on the condition that the final design and long-term management are adequate. A well-designed and maintained reedbed and lagoon complex could not only achieve, or improve upon no net loss but, if considered as integral to the wider development, it could provide a range of other beneficial services to the residents and visitors to the area.

The residual impacts of the development of DCH on RAKWS Ramsar Site, either in isolation or in combination with neighboring developments, relate to stochastic and chronic disturbance, increases in predation, threats from invasive species and increased pollution risk. These have been assessed in the EIA as being significant. However, there is no evidence presented indicating that there would be any direct loss of habitat. Ramsar Resolutions 5.1²⁶ and VII.24²⁷ respectively make the points that “Contracting Parties will aim to meet their commitments under the Convention through the following actions: . . . restore degraded wetlands and compensate for lost wetlands” (under a heading of Wetlands of International Importance), and that Contracting Parties are urged to “take all practicable measures for compensating any loss of wetland functions, attributes and values, both in quality and surface area, caused by human activities”. Therefore the emphasis of compensation should be on addressing the resulting change in ecological character.

Resolution XI.9²⁸ considers that any compensatory actions should usually be *ex situ*. The resolution also poses the following questions for consideration for the development and implementation of compensation measures:

²⁶ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_5.1e.pdf Accessed 24 July 2017

²⁷ http://www.ramsar.org/sites/default/files/documents/library/key_res_vii.24e.pdf Accessed 24 July 2017

²⁸ <http://www.ramsar.org/sites/default/files/documents/library/cop11-res09-e.pdf> Accessed 24 July 2017

- i. Is the compensation type-for-type?
- ii. Is the compensation function-for-function, component-for-component, or area-for-area?
- iii. Where should compensation be located?
- iv. How can compensation be achieved?
- v. How can long-term compensation be implemented?
- vi. Are the costs and risks associated with effective compensation considered to be too high?

The compensation proposed in the EIA has not been tested against these questions or explicitly assessed with regards to the viability of *in situ* versus *ex situ* measures. Furthermore, the EIA report does not make a recommendation on the most suitable or robust compensation measure to address the residual impacts. The approach presented is to:

- Provide unspecified financial or logistical support for *in situ* activities within RAKWS Ramsar Site.
- Engage with DM at some unspecified future point to determine the viability of *in situ* habitat restoration.
- Explore the potential to create *ex situ* wetlands.

None of these measures is definitive. They are also not time-bound. Consequently, it is not possible to assess whether these measures provide suitable compensation. This is considered a serious oversight and does not provide the confidence that the residual impacts will be addressed in the long-term.

In principle, option (iii) provides the approach that most closely complies with the guidance provided in Resolution XI.9²⁹. However, the information presented lacks definition and only represents a potential rather than an actual solution. There is also low confidence that any such compensation measures would be delivered in advance of negative impacts as recommended in Resolution XI.9³⁰.

The two *in situ* proposals (i and ii) could provide a degree of compensation but arguably the measures described in (i) should already be addressed by the Contracting Party in meeting their obligations. The principle of the “developer pays”, as advocated in (i), is consistent with adopted Ramsar guidance (see Ramsar Wise Use Handbook 3, 4th Edition³¹) so such an approach would be considered appropriate if the fee paid was considered adequate to facilitate activities that would sufficiently address the residual impacts. The outline proposals presented in (ii) would need to adopt a risk-based approach to ensure that the changes in the ecological character that would result would both compensate for the residual impacts and also not result in a further negative change in

²⁹ Op. cit.

³⁰ Op. cit.

³¹ <http://www.ramsar.org/sites/default/files/documents/pdf/lib/hbk4-03.pdf> Accessed 24 July 2017

the ecological character of the site. Given that many of the residual impacts relate to disturbance, careful consideration would need to be applied as to how the restored/created wetlands habitats would not be subject to exactly the same levels of disturbance and other threats (pollution, invasive species and predators) as the existing habitats. No consideration of this matter is presented in the EIA.

In addition to the concerns raised regarding the appropriateness of the compensation measures for addressing the residual changes to the ecological character of the Ramsar Site, the EIA report also raises several other concerns.

The definition of the Ramsar Site is at times ambiguous. The site is referred to in different ways and there is occasional reference to the 'core zone'. It is not clear what the 'core zone' represents. Additionally, the 'buffer zone' is referred to in several sections of the EIA report however there is no description of the buffer zone or any guidance as to the suitability of developments within it. Several maps are presented in the EIA Main Report and the technical reports in Volume 2. However, there is no map showing the definitive boundaries of the protected areas, namely the Ramsar Site, Important Bird Area and Wildlife Sanctuary. Furthermore, there are several interpretations of the boundary of RAKWS presented in the various maps. Whilst the EIA Main Report Volume 1 has a clear map showing the boundary of the Ramsar Site and the buffer zone (drawing number MMD-364814-ENV-DR-001-0007) the different interpretations presented in the supporting technical reports undermines their utility and also their pedigree when assessing potential impacts to the Ramsar Site.

A Wetland Vulnerability Assessment (WVA) has been produced as part of the EIA process and to address a specific request in response to the SoW from DM for "the inclusion of the ... information to the EIA report". Therefore, the submission of a WVA is considered to represent a component of the EIA process and not simply an addendum that is considered in isolation. This is supported by text in the WVA which states that the "WVA will be used to inform the "supporting EIA". A rationale is presented that suggests that completion of the WVA in a timely manner would have caused unacceptable delays to the EIA process and subsequently the overall development. A key element in this assumption is the requirement for sufficient data to be made available in order to complete the WVA. However, the approach adopted in the WVA follows that of Stratford et al. (2011)³². In Stratford et al. (2011) it clearly states that "in order that the method can be applied more widely, guidance is included on the data requirements of the method for [other] sites". Furthermore, the approach indicates that there are different levels of data collection (high-medium-low) possible and that the approach can be modified to address these. Therefore the

³² Stratford, C.J., M.C. Acreman, H.G. Rees. 2011. A simple method for assessing the vulnerability of wetland ecosystems. *Hydrological Sciences Journal* 56: 1485-1500. [Available at: <http://www.tandfonline.com/doi/pdf/10.1080/02626667.2011.630669> Accessed 24 July 2017]

assumption that there would be a delay in the overall timeline of the development process due to data collection needs is not considered to be valid.

The information presented in the WVA is of good quality and provides a robust consideration of the ecological character of RAKWS and the wetlands of the project site. Arguably, the WVA provides a more robust assessment of the vulnerability of the wetlands than the EIA report does. If this report had been completed in a timely manner as an integral component within the overall EIA process then the EIA would have been more robust. However, the final WVA should be considered as an exemplar for future developments to follow.

The overall EIA process for DCH fails to consider the impact, either positive or negative, of the proposed visitor centre at RAKWS, despite acknowledging its potential development in the EIA main report. Consequently, how this would impact on the compensation proposal to restore/create habitats is not considered. Additionally, the impact on traffic movements and access to and from Ras Al Khor Road of a visitor centre that may attract in excess of 250,000 visitors per annum has not been considered. Furthermore, the traffic assessment makes proposals, including significant highway widening along Ras Al Khor Road, that will impinge not just into the buffer zone and the area proposed for the visitor centre, but into the Ramsar Site. This impact has not been assessed at all and is major oversight.

4.2 Dubai Water Canal Development

The R999 Dubai Water Canal Project formed an open navigable channel stretching from the coast at Al Ras, along Dubai Creek, past Deira, Al Jaddaf and Business Bay, to the shores of Jumeirah. The development has a number of continuing objectives³³ beyond providing employment to expatriates and Emirate nationals during construction to include:

- an east-west circular transportation route within Dubai via the use of water taxis and ferries;
- providing real-estate near water for residential and commercial development that is highly sought after by investors;
- boosting tourism by introducing more retail and restaurants thereby enhancing the urban experience and attracting visitors from around the world; and
- helping to improve the water quality of the creek by increasing its flushing rate.

The Canal was constructed over a number of years beginning in the mid-2000s prior to designation of RAKWS as a Ramsar Site but after its declaration as a protected area. The R999 Project was developed in phases, and excavation of the Canal lagoons within the buffer and boundary of RAKWS occurred between 2006 and 2010 with opening to the Creek in February

³³ CH2M 2015. Project R999/5, Dubai Water Canal Project, Completion of Business Bay Outstanding Works. Scoping Report Ref. no 2015011/11/H104048 ver. 1. Halcrow International Partnership. Dubai, United Arab Emirates.

2014³⁴; operational completion of the Dubai Water Canal occurred in November 2016 (Fig. 7). Excavation of the canal converted terrestrial to aquatic habitat, directly impacting approximately 26 ha and 42 ha of the RAKWS and buffer zone respectively. There is no record of compensation for this impact, or the mitigative measures implemented.



Figure 7. Prior to excavation of Dubai Water Canal (3 March 2000)³⁵ on right and completed canal on left within boundary of RAKWS and buffer zone.

In 2014 Halcrow International Partnership, A CH2M HILL Company (referred to hereafter as CH2M) as part of a Joint Venture with Parsons International (referred to hereafter as Parsons), was commissioned by the Road and Transportation Authority (RTA) to undertake an EIA for the R999 project, including previous phases. This report was submitted to the DM Environmental Planning and Studies Section (EPSS) in October 2014 and Environmental Clearance (No. 035/2014) was received on 21 October 2014. The EIA assessed operational impacts of a completed navigable canal, focusing on three key locations that included RAKWS. Because the design and construction works associated with the Business Bay Lagoons were still under consideration, an addendum to the EIA³⁶ was completed in 2015 to further assess baseline environmental conditions prior to removal of the bunds and release of hypersaline water contained in the lagoons. These results did not modify conclusions reached in previous assessments with respect to water and sediment quality in RAKWS or Dubai Creek.

³⁴ CH2M. 2016. R999/5 Dubai Water Canal. Completion of Business Bay Outstanding Works. EIA Addendum Report, Rev. 2. CH2M, Halcrow International Partnership. Dubai, United Arab Emirates.

³⁵ Dome HSE Consulting. 2016. Dubai Healthcare City Phase II Development. Environmental Impact Assessment (EIA) Report. May 2016. Dubai, United Arab Emirates.

³⁶ Innovation Delta Environmental (IDE) Consultants, Dubai. 2015. Environmental Baseline Studies for Business Bay, Dubai Creek and Ras Al Khor Wildlife Sanctuary. R-999/5 Dubai Water Canal Project. Final Report. July 28, 2015. Dubai, United Arab Emirates.

The most significant change to Dubai Creek is the completion and operation of the Dubai Water Canal. Although the 2014 EIA for the R999 Project was not available to the RAM team, modelling information provided for the Dubai Creek Harbour EIA³⁷ was available to assess the pre- and post effects to Dubai Creek's hydrodynamics and water quality. DHI was commissioned by Emaar Properties PJSC to apply their 3-dimensional MIKE3 FM (Flexible Mesh) Dubai Creek Model on hydrodynamic and water quality conditions using 2014-2015 monitoring data as the baseline, including the temporal reclamation of the channel area associated with Dubai Creek Harbour and the February 2014 connection of the first part of the Dubai Water Canal to the Creek. Figure 8 shows the predicted changes in the flow dynamics with the opening of the Dubai Water Canal, resulting in increased flushing and estimated 20% reduction in retention times inside the Creek. Discussions with the CH2M Consultants on the R999-5 project (14 May 2017) noted the creek flushes quicker in winter with the increase in the output from the Al Awir STP to the Creek (less TSE diverted to land irrigation). Water quality is not improved (Table 1) and DMWQOs will continue to be exceeded unless there is a significant reduction in the TSE nutrient load to the Creek. DM's Coastal Zone and Waterways Management Section staff (15 May 2017) noted the long-term strategy is to have zero discharge to the creek to improve overall water quality and recognition of the intrinsic value of the treated water. The RAM team note zero discharge of TSE may however lead to a reduction in the invertebrate productivity of the tidal flats, and potentially negatively affect the trophic structure of RAKWS.

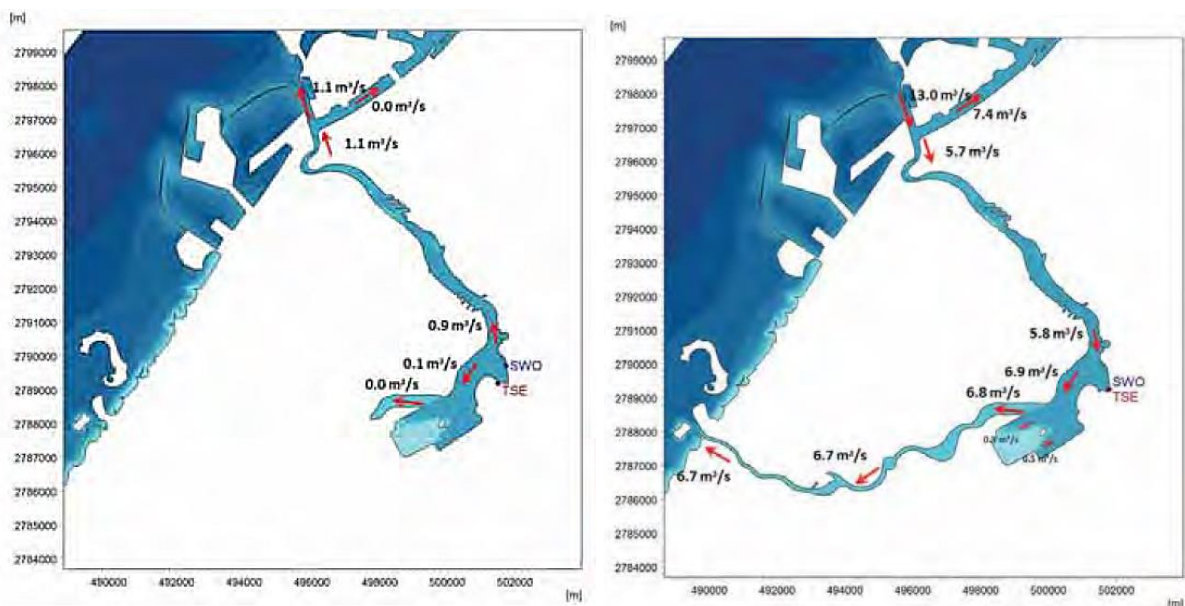


Figure 8. Net flow conditions in Dubai Creek pre (left) and post (right) construction of the Dubai Water Canal (From: figure 6-15 (left) and 6-58 (right), Chapter 3, Mott MacDonald 2016³⁸)

Table 1. Summary of predicted water quality results post construction and operation of the Dubai Water Canal for

³⁷ DHI. 2016. Chapter 03 Dubai Creek Harbour hydrodynamic and water quality modelling. In: Mott MacDonald. 2016. Dubai Creek Harbour Environmental Impact Assessment (EIA) Report. Volume 2 – Additional Studies. Rev 02 – December 2016. Document Reference (MML-364814-ENV-RPT-001-2). Dubai, United Arab Emirates.

³⁸ Op cit.

RAKWS and Dubai Creek using DHI's 3-dimensional Dubai Creek model calibrated with 2014-2015 monitoring data. Red text indicates values that exceed DM Water Quality Objectives for total nitrogen, nitrate-nitrogen, ammonia-nitrogen, phosphate-phosphorus, dissolved oxygen, and BOD₅. [adapted from Tables 6-6 (page 85) and 6-7 (page 86), Chapter 3, Mott MacDonald 2016³⁹]

Case	RAKW Sanctuary						Dubai Creek (Jaddaf Station)					
	Minimum		Mean		Maximum		Minimum		Mean		Maximum	
	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre
Surface Salinity (psu)	25.8	26.8	38.6	38.3	41.6	41.5	27.2	28.1	38.2	38.4	41.5	41.7
Bottom Salinity (psu)	36.7	36.8	39.6	39.6	41.8	41.6	37.1	37.1	39.8	39.7	41.7	41.6
Surface Temperature (°C)	19.7	19.8	29.3	29.2	37.8	37.6	20.0	19.7	29.1	29.2	37.1	37.3
Bottom Temperature (°C)	20.6	20.8	28.8	28.8	36.3	35.9	21.4	21.3	28.8	28.9	35.7	35.6
Surface chlorophyll-a (mg/l)	0.018	0.015	0.058	0.056	0.155	0.202	0.011	0.017	0.056	0.063	0.160	0.168
Bottom chlorophyll-a (mg/l)	0.000	0.000	0.020	0.016	0.076	0.072	0.000	0.000	0.009	0.015	0.034	0.046
Surface NH ₃ -N (mg/l)	0.00	0.00	0.69	1.08	2.35	3.25	0.00	0.00	0.93	0.82	2.73	2.25
Bottom NH ₃ -N (mg/l)	0.43	0.42	1.20	1.38	2.98	3.58	0.27	0.29	1.06	0.97	3.00	3.20
Surface NO ₃ -N (mg/l)	0.00	0.00	0.68	0.80	1.70	1.86	0.00	0.00	0.73	0.78	1.75	1.85
Bottom NO ₃ -N (mg/l)	0.01	0.00	0.50	0.50	1.67	1.68	0.01	0.00	0.38	0.46	1.55	1.66
Surface PO ₄ -P (mg/l)	0.02	0.03	0.21	0.27	0.43	0.59	0.03	0.03	0.24	0.24	0.52	0.46
Bottom PO ₄ -P (mg/l)	0.08	0.08	0.24	0.26	0.41	0.50	0.05	0.06	0.20	0.20	0.41	0.44
Surface Diss. Oxygen (mg/l)	3.2	2.5	11.3	9.5	34.0	25.2	2.9	3.0	10.8	11.1	30.5	25.2
Bottom Diss. Oxygen (mg/l)	0.0	-0.1	1.6	1.2	9.1	8.8	0.1	0.1	1.4	1.7	4.5	5.9
Surface Total N (mg/l)	0.4	0.9	2.2	2.8	5.1	6.7	0.6	0.8	2.5	2.5	5.8	5.0
Bottom Total N (mg/l)	1.1	1.0	2.4	2.5	3.8	4.4	0.8	0.7	2.0	2.0	3.7	4.0
Surface Total P (mg/l)	0.1	0.1	0.3	0.4	0.6	0.8	0.1	0.1	0.3	0.3	0.7	0.6
Bottom Total P (mg/l)	0.1	0.1	0.3	0.3	0.5	0.6	0.1	0.1	0.3	0.3	0.5	0.5
Secchi Depth (m)	0.5	0.4	1.1	1.1	2.0	2.0	0.5	0.5	1.1	1.1	2.0	1.9
Surface BOD ₅ (mg/l)	3.8	3.5	7.5	7.8	18.5	20.4	3.5	3.8	7.1	7.5	15.8	17.1
Bottom BOD ₅ (mg/l)	2.7	2.6	6.0	5.8	14.6	15.7	2.1	2.1	4.5	4.8	8.6	9.8

Additional modelling associated with the development of Dubai Creek Harbour, including re-opening of the channel area and relocation of the Al Awir TSE outfall, is reported to have negligible impact. Predicted changes are due to connection of the Dubai Water Canal to the sea. With all scenarios, there is a 1-2 cm reduction in the water level amplitude in the inner Creek. The effect of this reduction on the inundation pattern of the tidal flats and response of the invertebrate community in RAKWS is unknown. There is a commitment by the contractor for monitoring to be carried out at RAKWS during implementation and for several years following connection of the canal to the sea but monitoring of the duration and inundation pattern of tidal flats is not included. DM's Coastal Zones & Waterways Management Section staff confirmed that ongoing data collection by DM will be applied to assess the hydrodynamic model and water quality predictions. In addition, there has been extensive quantification of sediment quality

³⁹ Op. cit.

throughout the Creek but not within RAKWS.

The limited sediment and invertebrate sampling undertaken for the EIA baseline environmental studies do not provide sufficient resolution to assess changes in sediment and invertebrate response to varying depths and duration of inundation of the tidal flats. A stratified random sampling regime that extends the length and width of the flats is required to assess whether changes in water level amplitude and flow dynamics with connection of the canal to the sea will have a measureable effect on invertebrate community structure and abundance and associated avian foraging distribution and abundance.

Through the review of EIAs and discussions with project consultants and DM ministry staff, a notable gap is the lack of a marine traffic impact assessment with the opening of the canal to the sea. The RTA is promoting the use of the canal as a transportation route, and marinas and private moorings are being included in the developments for both transport and recreation purposes. Accompanying increased boat and water taxi traffic is the potential for increased levels of debris overtopping the boom due to wake action and entering the RAKWS, disturbance to foraging birds, and illegal physical entry by disembarking at the canal edge. An assessment of the cumulative impacts of these activities should have been clearly presented in the EIA for the Dubai Water Canal development.

4.3 Dubai Healthcare City II Development

Dubai Healthcare City (DHC) is an established freezone, created in 2002, that is under the control and management of the Dubai Healthcare City Authority (DHCA) and its regulatory arm the Dubai Healthcare City – Regulatory (DHCR). DHC Phase 1, focusing on healthcare & education, was constructed in Oud Metha, which is just over 3 km to the north of RAKWS. In 2005 DHC Phase II was conceptualized and an initial masterplan developed for two land plots, separated by the Al Khail Road, located adjacent to RAKWS immediately to the north, involving a total land area of 175 ha. Hitherto, development has been delayed and limited to underground utilities and road networks, but in May 2016 Parsons submitted an EIA Report (ED15.13_Rev2) to DM for revised full development involving the construction of healthcare and wellness, residential, commercial, hospitality, and community facilities, with a GFA totaling 1,623,360m². At the same time in May 2016 Parsons and their sub-consultant Dome, submitted a separate Wetland Vulnerability Assessment Report (WVAR), in view of the close proximity of the proposed DHC Phase II to the RAKWS, and in fulfilment of a requirement of the Natural Resources Conservation Section of DM (DM-NRCS). It is these two documents that are briefly reviewed here complemented by additional information provided by consultants, contractors and on-site inspections conducted during the RAM visit on 14 May 2017.



Figure 9a (left): Map extracted from the DHC Phase 2 Wetland Vulnerability Assessment Report, Parsons, May 2016. Figure 9b (right): Quay walls and promenade, Dubai Healthcare City, north of RAKWS, 14 May 2017.

A significant proportion of the DHC Phase II lies within the designated RAKWS Buffer Zone (see Fig. 9a) and the Project lies about 200 m from the northern boundary of the core RAKWS boundary. The quay walls and promenade at the southern boundary of the Project, immediately adjacent to the Creek, were built by another developer and have recently been completed (see Fig. 9b).

The WVAR methodology adopted was broadly in accordance with Ramsar Handbook 13: *Inventory, assessment and monitoring of wetlands*. However, it did not consider the ecological character of the RAKWS in the same degree of detail as for the one produced for the DCH project. The WVAR identified the principal potential impacts as light and noise pollution on RAKWS terrestrial fauna and birds, both rated as ‘high impact’, and the potential for avian collision with buildings, also rated as ‘high impact’. The majority of buildings within the Buffer Zone will be between 6 and 7 storeys high and a maximum of 11 storeys. The masterplan involves a stepped approach with low rise (G+2) adjacent to the promenade rising to G+5 storeys within the Buffer Zone and G+11 storeys outside the Buffer Zone (see Fig. 10). According to the on-site contractor these height restrictions have been incorporated into Dubai Land Registry’s Affection Plans.

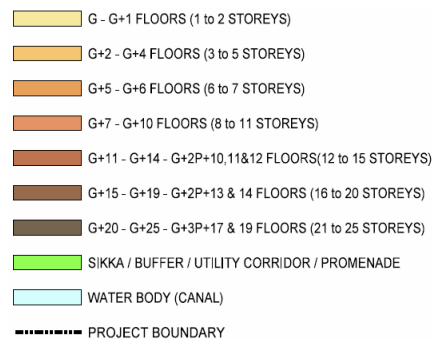


Figure 10. DHC Phase II building height plot assignments plan. Source: *DHC EIA*, Parsons, May 2016.

The WVAR study did not conduct any field work but was limited to a review of existing data (an approach at odds with the limitations expressed in the DCH EIA). Extensive field work studies, both terrestrial and marine, were conducted as part of the DHC Phase II EIA but there were no specific studies of daily and seasonal avian movements throughout the Project site or adjacent Creek, other than incidental sightings made during site visits, which documented very few birds using the site. Moreover, the WVAR did not make reference to any previous avian studies other than the UAE ebird database of birds recorded at RAKWS. It is apparent that there is very limited information available for bird movements in Dubai Creek. The designation of a Buffer Zone to the north of RAKWS and the adoption of building height restrictions in the Buffer Zone has nevertheless helped to plan and mitigate for potential detrimental impact of avian collisions with high rise buildings.

In mitigation for the potential ‘high risk’ impacts identified, the WVAR recommended that smart infrastructure design should be incorporated in conjunction with Dubai green building design standards 303.01 *Exterior Light Pollution and Controls*. The latter require that, *inter alia*, all light is shielded to avoid any illumination of the night sky and all light is directed or reflected downwards. With respect to the use of highly reflective glass, which has been suggested to increase bird collisions, the WVAR recommended that less reflective and dull glass be utilized in order to help reduce the likelihood of collision as well as reducing the amount of light reflected from the building. Regarding noise the WVAR noted the importance of compliance with the DM-EPSS Technical Guide Number (9): *Requirements for the reduction of construction and demolition noise* (2011), particularly during the construction phase.

The EIA concluded that the DHC Phase 2 development is not expected to result in any significant environmental impacts during the construction or the operational phases but noted the requirement to control temporary construction impacts identified in the EIA by the implementation of a set of proposed control measures in a Construction Environmental Management Plan (CEMP), which would be further developed by the contractor.

Apart from the aforementioned lack of any bird movement studies in and adjacent to the DHC Phase II Project area to fill data gaps the EIA and WVAR were comprehensive and thorough, although no formal and comprehensive stakeholder consultations were undertaken. The building height restrictions applied within the Buffer Zone sets a good example for the development of Planning Guidelines for the RAKWS. No such guidelines have been firmly adopted for the Buffer Zone to the east and south of the RAKWS, where developers’ proposals have yet to be finalised. It should also be noted that the Buffer Zone boundary to the west and south of the Ramsar site is very limited in extent and does not extend past the multiple lane highways bordering the sanctuary.

4.4 Meydan Developments

The Meydan developments (refer to Fig. 5) considered in this review include Meydan One, Meydan Horizon, and Meydan Canal established as a freezone under the control and management of Meydan Group LLC. Meydan One is located within Mohammed Bin Rashid Al Maktoum (MBR) City, adjacent to the Al Khail Road along the southern side of Dubai Water Canal covering an approximate area of 3.67 km². Meydan Horizon (180 ha) lies immediately south of the Ras Al Khor Highway and is bounded to the east by the Industrial Estate and west by Meydan One. Meydan Canal is approximately 90 ha within the buffer (23 ha) and boundary of RAKWS (67 ha). An EIA for Meydan One was provided to the RAM team to review prior to our meeting with the company and planners on 15 May 2017 at which time the other two developments were also discussed. During this meeting, reference was made to previous EIAs and consultancies examining the implications of their development to the RAKWS. Developments proposed by Meydan LLC were well advanced in 2008 immediately prior to the global recession that curtailed their construction.

The Ramsar Secretariat provided as additional background to the RAM team a report (26 August 2008) prepared for the Ramsar Deputy Secretary General (DSG) and the Chair of Ramsar's STRP by a team of STRP members acting as independent consultants to Teo A. Khing Design Consultants Sdn. Bhd. (TAK - Dubai Branch). A condition required by RAKWS's management authority was any development plan impacting the Ramsar Site for review and approval by DM must also have "Ramsar Approval". The STRP consultants were not acting in the capacity of an officially sanctioned RAM, but rather as "advisors" reviewing the landscape concept design for the Meydan Creek Canal, planned infrastructure and wetland restoration of the project site, and implications of the development to the Ramsar Site designation. This was in response to the issues raised by the DSG to the Chairman of Meydan LLC in his correspondence (da. 23 July 2008) replying to an earlier (June 2008) assessment that concluded the development "...was on balance either neutral or possibly beneficial to the site due in part to proposed mitigation activities that include restoration of degraded and infilled wetlands and the development of a wetland education and research center." These issues were:

- i. "in line with the Convention's guidance on wetland management and restoration, ensuring that appropriate and adequate management planning and monitoring processes are put in place, particularly so as to ensure that the restoration work on degraded wetlands delivers its stated objectives and desired state: i.e. that the negative change in ecological character of the site is indeed reversed";
- ii. "ensuring that the development and location of the proposed wetland education/tourism/research facilities do not in turn lead to further damage to the ecological character of the Ramsar site, notably by ensuring sensitive siting and

development so as to minimise any impact on, and disturbance to, those features of the site for which it is recognised as internationally important, and in so doing ensuring that there is an appropriate balance between the ecotourism, research and education components of the developments”; and

iii. “ensuring that water quantity and quality issues of water entering the site are appropriately addressed as a component of any restoration programme”.

The consultancy included meetings with representatives of Meydan LLC, TAK, Dome International LLC (environmental consultants for TAK), Dubai Municipality Environment Department, UAE Federal Environmental Agency, and Wildlife Protection Office. Individual and joint meetings focused on the issues identified in the Secretariat's correspondence including Ramsar notification, development of a site management plan, addressing cumulative impacts, and the two existing proposals for education/research centers. The consultancy cautiously concluded that by undertaking clearly defined and achievable rehabilitation objectives for wetlands throughout the RAKWS (not just Planning parcel 413-106) as compensation for the human-induced change in ecological character, the proponent's Meydan Creek development would be considered as exhibiting beneficial human induced change in ecological character. This conclusion was influenced by the significant softening of the ecopark infrastructure originally proposed to accompany the canal in favor of rehabilitation, research and education. Included in the report were recommendations requiring collaborative action by Meydan LLC, DM and UAE's Ramsar Administrative Authority to address issues raised in the DSG's letter to the Chairman of Meydan LLC.

The three Meydan developments presented to the RAM team are a significant departure from the development reviewed by the independent STRP members in 2008. Furthermore, the consultancy work conducted in 2008 was not a formal Ramsar Advisory Mission and any attempts to present it as such would be considered inappropriate under Ramsar procedures. This was officially recognized by DM in their response to Meydan (da. 18 August 20018; Ref: 812/02/02/1/814409) by stating “We indeed appreciated the meetings with the Independent Consultants nominated by RAMSAR, but we would like to emphasize that they are not Ramsar Official delegates. In this respect, their opinions and suggestions are **not the Official opinion** [emphasis within correspondence] of the Ramsar Secretariat, although we may consider IF their opinion serves DM's vision.”

4.4.1 Meydan One

Meydan One (Fig. 5) is a mixed-use land development project comprising residential and commercial buildings, schools, mosques, healthcare facilities and open spaces. Designed for a residential population of 82,500, floor heights of buildings vary from approximately G+3 floors to

G+40 floors. Developed around four individually themed projects, key features include a residential tower exceeding 700 m and a large mall with a water park and the world's largest water fountain and longest indoor ski slope. Although an artificial canal proposed by the RTA of Dubai will transect the development, its design and construction is not part of the project and thus out of scope of the EIA. However, the canal is an important recreational feature within the development and is expected to eventually receive storm water runoff.

Meydan One lies within 600 m of RAKWS but outside its buffer zone. The residential tower (Dubai One) is 750 m from the southern edge of the RAKWS and building heights gradually decrease towards the edge of the development site. The EIA concludes there is potential for minor temporary effects to RAKWS during construction affecting water quality and noise impacts that are mitigatable. However, contrary to the consultant's conclusion that the operation of Meydan One will have no impact to migratory birds, the RAM team considers insufficient information was collected to justify this conclusion. RAKWS is an important foraging and stop-over area for migratory birds using the East African-West Asian Flyway (Fig. 4). The consultants did not undertake bird flight studies to assess the risk of an increase in bird strikes through direct impacts with multi-story buildings constructed along foraging flightlines or passage flyways. Passage migratory birds typically travel at night and are at increased risk to striking high buildings as nighttime lights can confuse and disorient birds potentially leading to significant mortality events⁴⁰. During the day birds get disoriented by glass windows that reflect the sky or nearby plants. Although the risk to daytime foraging flights can be assessed through visual observation, radar systems are required to monitor, estimate, and assign heights to individual or flocks of night passage migrants⁴¹.

4.4.2 Meydan Horizon

Meydan Horizon (Figs. 5 and 11) is a proposed mixed-use development for over 72,000 residents immediately south of RAKWS to be accessed via the Dubai-Al Ain and Ras Al Khor Highways. A key feature of the development is the 2 km long canal that will connect with the Meydan One canal and proposed Meydan Canal through the RAKWS. The view of the RAKWS from the residential buildings lining the Ras Al Khor Highway is part of the development's promotion⁴². Although there is no EIA to review, there is a potential detrimental impact of avian collisions with high rise buildings for both foraging and passage migrants. In addition, the multi-story buildings have the potential to reflect sunlight into the RAKWS damaging vegetation and affecting recreational and educational opportunities associated with the proposed Ras Al Khor Visitor Center. Although the proposed development lies outside the RAKWS buffer zone, a WVAR that adopts methodology in accordance with Ramsar Handbook 13: *Inventory, assessment and monitoring*

⁴⁰ <http://www.terrain.org/articles/15/kousky.htm> Accessed: 15 July 2017.

⁴¹ <http://bmcecol.biomedcentral.com/articles/10.1186/1472-6785-10-22> Accessed: 15 July 2017

⁴² <http://www.meydan.ae/meydan-master/horizons.html> Accessed 15 July 2017

of wetlands⁴³ should be required within the development's EIA TOR.



Figure 11. Conceptual plan for the proposed Meydan Horizon development. (<http://ae7.com/project/meydan-horizon/> Accessed: 15 July 2017)

4.4.3 Meydan Canal

Meydan Canal is proposed to transit Meydan LLC Planning Parcel 413-106 lying within the boundary of RAKWS and its buffer zone (Fig.2). Although remaining within the RAKWS, ownership of Parcel 413-106 was transferred to Meydan LLC in May 2007 to allow for the construction of the canal. This parcel transfer to Meydan LLC raises three issues for consideration. Firstly, the canal development will potentially have an impact on the Ramsar Site, and resolutions adopted by the COP also consider offsite human-induced impacts that can adversely affect the ecological character. Therefore, irrespective of land ownership, due process with regards to avoid-mitigate-compensate needs to be followed for any proximal development. Furthermore, proposed developments adjacent to the canal that were presented to the RAM Team (Fig. 12) would seem to be in contravention of our interpretation of the current application of articles of laws for protecting the site that were passed before the land was transferred (see below).

Secondly, there is a procedural matter that needs to be considered and addressed regarding the formal map of the Ramsar Site that accompanied the finalized RIS submission (dated 2012 that appears on the Ramsar Sites Information Service) showing the position of the site boundary and

⁴³ <http://www.ramsar.org/sites/default/files/documents/pdf/lib/hbk4-13.pdf> Accessed 15 July 2017

buffer. Not showing on the map is the land transferred to Meydan LLC prior to its designation. Land within the boundary of a Ramsar Site can be under multiple ownerships so a change of ownership does not have to precipitate a change in designation status for the inclusion.

Thirdly as reported in section 2.1, RAKWS was established in 1985 and officially declared a protected area on March 1, 1998 [Local Order No. (2) 1998] before transfer of the parcel to Meydan LLC. The protected status of the sanctuary, as decreed under Federal Law No. 24 (1999) for the Protection & Development of the Environment (chapter VI) and Local Order No. 61 (1991) has the objective of protecting the wetland from increased urban pressure and habitat degradation. Furthermore, Local Law No. 11 of 2003 on the Establishment of Protected Areas in the Emirate of Dubai prohibits any activities or procedures, which may destroy, damage or deteriorate the natural environment, damage wildlife, marine flora and fauna or affect the aesthetic standard in protected areas, which of course includes RAKWS (Article 8 of Law 11 includes: 'any activity or behaviour in the vicinity of the NR or surrounding' so the Buffer Zone is included). Thus, the timing of the declaration of the Ramsar Site (29 August 2007) in relation to the transefer of Parcel 413-106 is irrelevant as DM has the power to limit development under Local Law No. 11 of 2003 in both the core and buffer zone.

Arguably, the Ramsar designation was granted to RAKWS in the full knowledge that the site was protected under Local Law No. 11 of 2003; and under Dubai's Local Law No. 11 of 2003 Meydan cannot: "setup of any constructions or structures or paved roads or vehicle translocation, agricultural industrial or trade activity without Dubai Municipality authorization". However, the option does exist under Article 3 of Local Law No. 11 (2003) for the ruler of the Emirate of Dubai to change the borders and area of protected lands based upon the recommendation of the municipality. Furthermore, Article 66 of Federal Law No. 24 (1999) permits activities in the area surrounding a protected area with the approval of the competent authority.

It is recognized in the Annex of Resoluton VIII.14 (para 62)⁴⁴ that zonation is not mutually exclusive to the 'core/buffer zonation approach' but can occur within a site to recognize existing or planned multiple uses of a Ramsar site (e.g. visitor centers). However, the management objectives within each zone need to be complementary and mutually supportive to separate and minimize conflicting activities while "...ensuring that legitimate land uses can continue with minimal conflict". Limited development may be acceptable with appropriate mitigation and compensation for residual impacts. Any development must however be considered with impacts to the adjoining developments and the mitigative measures they have put in place. Establishing permissible activities within each zone is a critical part of a site management planning exercise (see section 8).

The proposed Master Plan for Meydan Canal identifies a mixed-use development of residential units bordering the canal and staggered in height to provide a view of the RAKWS, with public

⁴⁴ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_14_e.pdf Accessed 26 July 2017

service and park facilities bounding upon the Dubai Creek Harbour development (Fig. 12). The proposals discussed with the RAM team indicated that a canal will connect via a tunnel under the Ras Al Khor Highway to enable flushing of the Horizon and Meydan One canals.



Figure 12. Proposed Master Plan for Meydan Canal mixed use development within the boundary of Ras Al Khor Wildlife Sanctuary.

The development of Meydan Canal as the extension connecting Meydan One and Meydan Horizon canals to Dubai Creek is a human-induced impact to the RAKWS. A decision to approve or reject the development in whole or in-part is within the mandate of the responsible government authority. The option to invoke Article 2.5 and revoke the sites designation or restrict its boundaries as a matter of “urgent national interest” was not a topic of discussion with either Meydan LLC or government officials.

Were the UAE to invoke its right under Article 2.5 to delete or restrict the boundary of the RAKWS Ramsar Site in the case of urgent national interest, the Contracting Party would be expected to take into account the matters described in the Annex to Resolution VIII.20⁴⁵. If, after consideration of all of these matters and all other options have been weighed, a deletion or restriction of the boundary of RAKWS Ramsar Site is still contemplated the procedures for such an action should follow the

⁴⁵ <http://www.ramsar.org/document/resolution-viii20-general-guidance-for-interpreting-urgent-national-interests-under-article>. Annex, paragraph 3. Accessed 30 July 2017.

terms of Article 8.2 (b), (d) and (e): i.e. for the Secretariat to forward notification of such an alteration to the List to all Contracting Parties; to arrange for the matter to be discussed at the next Conference of the Contracting Parties; and to make known to the Contracting Party concerned the recommendations of the Conference in respect of such alterations⁴⁶.

A decision on the canal's construction should be made only after full consideration of Ramsar Convention Articles and guidance provided through Convention Resolutions with respect to site management planning (Resolution VIII.14⁴⁷) and the mitigative sequence in responding to threats to wetland ecological character (see Box 1, Resolution XI.9⁴⁸). Avoidance of impact is the default position and Ramsar has identified decision criteria for consideration to evaluate whether avoidance is a realistic response to a likely change in the ecological character of a wetland:

- Is the site unique and/or does it provide valuable irreplaceable ecosystem services / benefits?
- Have other localities been examined for the proposed activity or is the proposed activity wetland-dependent?
- Have design modifications been considered to avoid wetland losses?
- Have the economic values of lost or altered ecosystem services been considered in the project cost-benefit analysis?
- What are the costs and efficacy of mitigation / compensation measures if the proposed activity is implemented?
- Have both direct and indirect impacts on the wetland been considered?
- Have cumulative or in-combination impacts on the wetland been considered?
- Has an assessment been made of all the risks and benefits associated with the project?

If, following a risk-based approach to understand fully the implications of any possible change in ecological character, the decision is made that the risks are acceptable, then appropriate proactive mitigation and compensation should be undertaken.

Resolution XI.9 par. 48⁴⁹ further states “If, however, irreversible ecological character changes have occurred or will occur as the result of activities on-or off-site, and yet no decision is taken to amend or de-List the designated area...., the Convention text does not expressly require compensation, other than the general terms of Resolution VII.24⁵⁰. Nevertheless, in such cases, Resolution IX.6⁵¹

⁴⁶ <http://www.ramsar.org/document/resolution-ix6-guidance-for-addressing-ramsar-sites-or-parts-of-sites-which-no-longer-meet>. Annex, paragraph 17. Accessed 30 July 2017.

⁴⁷ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_14_e.pdf Accessed 26 July 2017

⁴⁸ <http://www.ramsar.org/document/resolution-xi9-an-integrated-framework-and-guidelines-for-avoiding-mitigating-and> Accessed: 15 July 2017

⁴⁹ Op. cit.

⁵⁰ <http://www.ramsar.org/document/resolution-vii24-compensation-for-lost-wetland-habitats-and-other-functions> Accessed: 15 July 2017

⁵¹ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_ix_06_e.pdf refer to para 14 and 15.

calls upon Contracting Parties to make “at least equivalent compensation” when there is unavoidable loss of ecological character at a Ramsar site.” If the development is approved in-whole or in-part, determination of whether the impact is adverse, neutral or beneficial (see Section 6) can only be assessed with complete understanding of the extent of permitted development, mitigative actions applied, and compensation involving restoration of degraded or lost wetland within the Ramsar Site.

4.5 Festival City Expansion and Golf Residence Development

Festival City is a large residential, business and entertainment development spanning some 3.8 km of water frontage on the eastern bank of the Dubai Creek, positioned less than 2 km northeast of the RAKWS between Business Bay Bridge and the Dubai Creek Harbour development. Construction by the developer Al Futtain Carillion commenced in 2003.

The development initially featured a large marina complex but the marina failed commercially and was closed and replaced in December 2016 by a claimed: ‘World’s largest Vegas-style multimedia, laser, fire and water extravaganza’ involving multiple shows given each evening. The laser and pyrotechnic displays are centred in the marina area but incorporate the facades of two adjacent high rise hotel complexes. The shows have a high potential to disturb avian movements to and from the RAKWS. The RAM team members were not made aware of any avian studies conducted to assess the impacts of the multimedia displays and shows on the RAKWS and associated movements of birds.

The Al Badia Golf Residence development at Festival City was taken over by The InterContinental Hotels Group in 2009 and there are plans, currently on-hold, to construct additional hotels at the site. The management of the golf course currently involves the extraction of high volumes of Creek Water which, after passing through the extensive lake system, is discharged back to the Dubai Creek. While it is likely that the discharged, recycled water will improve Creek water quality in terms of ammoniacal nitrogen, which is known to be poor at the abstraction location due to TSE discharges to the Creek and free ammonia is known to be frequently below DMWQOs, the development of high levels of phytoplankton and the increase in salinity through evaporation in the golf course lakes complex has the potential to exacerbate poor water quality in the Creek. In addition, the daily dawn and late afternoon watering of green areas combined with the extensive use of fertilizers and pesticides have the potential to introduce a high range of persistent pollutants through the discharge of recycled lake water to Dubai Creek in a location where it is poorly flushed. The developer stated that no water quality data had been requested by DM but water quality data was nevertheless collected on a regular basis. The water quality data should be reviewed and golf course management practices optimized to minimize any deleterious impacts to

the Dubai Creek and neighbouring RAKWS. Measures to reduce potential impacts of fertilizers and pesticides should be incorporated into the site's Operational Environmental Management Plan.

4.6 Dubai Culture Village Development

The Dubai Culture Village (CV) is a multi-purpose development project consisting of six phases covering an area of 24 km² in the Al Jaddaf area along Al Khail Road and bounded by the Al Wasl Sport Club and Dubai Health Care City. The area lies outside the RAKWS Buffer zone except for the south-west corner of the section planned for Phase 3 development. Phase 1, covering an area of 3.7 km², is currently under construction and comprises a harbour complex, cultural and exhibition centres, in addition to residential and commercial districts, including several high-rise hotel and residential buildings up to 80 storeys high. Residential units facing the water have a premium value of 20-30%. The CV – Phase 1 lies adjacent to the Creek on the opposite west bank approximately 2.3 km from the RAKWS. The harbour complex of waterways incorporates two large marinas that will generate a significant amount of boat traffic, travelling to and from the development past the RAKWS, along the recently opened Dubai Water Canal.

Phase 2 is an overall mixed use development of 3.2 km² in the Al Jadaf shipyard along the shore of Dubai Creek approximately 1.7 km north-east of the RAKWS boundary. Construction of Phase 2 had not yet begun during the RAM team's visit. An objective of Phase 2 is to develop a waterfront destination that "...provides high quality residential communities, tourism and entertainment". The waterfront area is identified as Zone C in the development's EIA, and the design shown for residential and commercial units is still conceptual to be designed by a "theming Consultant" at a later date. Potential impacts to RAKWS and its wildlife were not included in the EIA's Scope of Work.

The RAM team members were not made aware of any avian or boat traffic studies to assess potential impacts, either in isolation or cumulative, on the RAKWS from this development.

4.7 Dubai Design District

Dubai Design District (d3) is a free-zone business park to foster the growth of the United Arab Emirates design, fashion and luxury industry. The 1.76 km² development will incorporate Smart City Information and Communication Technology (ICT) as it is developed in three phases immediately west of the RAKWS and north of Meydan One. Phase 1 is currently under development with 11 buildings completed, and Phases 2 and 3 are under development. The District's facilities will include design institutes, residential, hospitality, retail and office spaces. The development will include a Creek-side esplanade with international and boutique hotel and a "pop-up shop" area.

The Dubai Design District was not included in the scope of the project. However, the RAM team interpreted the charge "To evaluate how successful the existing SEA/EIA process has been in considering cumulative impacts and make observations/recommendations regarding the developments around RAKWS Ramsar site " as providing the scope to consider additional projects that could adversely impact upon the ecological character of the site. Although an EIA for the Dubai Design District was not available to the RAM team for its review, the development's location was deemed by the team to be adjacent to a sensitive ecological receptor and potentially impact the Ramsar Site. We can realistically anticipate the development will place a premium on waterfront developments that will potentially include, multi-story buildings, marinas and increased boat traffic along Dubai Water Canal. Further, and similar to both Health Care City and Dubai Creek Harbour developments, light pollution generated by the development may lead to disorientation or building collision by avian species at night while attempting to forage on RAKWS's intertidal flats a short 100 m across the highway. A condition to include in a scope of work to inform the EIAs in Phases 2 and 3 is a requirement to undertake a Wetland Vulnerability Assessment on RAKWS as an adjacent sensitive ecological receptor even though it lies just outside the Buffer Zone.

4.8 The Lagoons Development – Dubai Properties Group

The original Lagoons project was a major development planned by Sama Dubai (formerly Dubai International Properties) and extensive ground works to form seven islands (seven pearls) were undertaken between 2006 and the cessation of works in 2008, when the entire project was placed on hold. The original seven pearls 'Lagoons' project was cancelled and much of the land transferred to the new Dubai Creek Harbour project developer. However, a strip of land adjacent to the Nadd al Hamar Road (62), was retained within a revised 'Lagoons' project area. The new Lagoons project EIA was undertaken by Tebodin Middle East Ltd., contracted by Parsons, and completed in November 2016. The revised Lagoons project is now being developed by Dubai Properties Group, as a joint venture of Dubai Holdings and Emaar.

The EIA was comprehensive and identified and assessed all the potential environmental issues associated with the proposed development of the site. It highlighted that within the site there is an extensive lagoon system containing water with high salinity (70.4 ppt) and high nutrient status exceeding DM WQOs for nitrate and phosphate. The EIA briefly discussed options for disposal, either directly to the Creek or to the sewerage system, subject to DM approval, but made no recommendations for treatment or handling. Brief avian field studies were conducted on site in summer but as with other EIAs in the area no night time radar studies showing daily and annual migratory movements across the site were completed.

Bird-friendly building design will be implemented and will follow the recommendations and assessment process of the United States Green Building Council 'LEED Pilot Credit Library –

Pilot Credit 55: Bird Collision Deterrence'. This will include a completed Bird Collision Threat Rating spread sheet for each building.

4.9 Ras Al Khor Visitor's Center

Ras Al Khor's proposed Visitor's Center was also not included in the scope of the project but the RAM team was aware of the proposed development and concluded it could potentially adversely impact upon the ecological character of the Ramsar Site. An EIA was conducted by DM for the proposed Visitor Centre at RAKWS and a draft report produced in December 2013. DM contend that this draft is to be revised by the Wildfowl & Wetlands Trust Consulting (WWT). However, this claim is disputed by WWT as they have no formal obligation or contract to undertake this work (correspondence between R. McInnes and WWT, da. 11 Oct. 2017). Evidence has come to light since conducting the Mission that the responsibility for finalizing the EIA did not lie with WWT but rather with Dynamic Engineering Consultant DEC, the main contractor. Irrespective of who is contracted to produce the final EIA documentation, it is the responsibility of the project proponent to ensure that this is undertaken in an appropriate manner.

The draft EIA reviewed assesses the impact of a single multi-level building. However, the final design or size of the building is not specified in the EIA report. Therefore, the EIA focusses on a rectangular plot of land measuring 200 by 279.95m "situated on the line dividing the buffer zone and the core zone". The assumption is that at least some of the development will be within the Ramsar Site. Our review of the EIA assists in identifying issues that must be addressed by the EIA before the Visitor Center can be assessed as to whether it is a negative, neutral, or positive change to the site's ecological character.

The overall quality of the EIA report is considered low. Any future revision should make reference to guidance adopted by Ramsar on EIA and SEA⁵²; and then there should be a demonstrable adherence to these documents. The description of the development is very limited and makes no reference to any other associated facilities such as hides, car parking, walkways, external buildings or facilities. All of these facilities would be expected to accompany a wetland visitor centre (see Ramsar Secretariat (2014) *Handbook on the Best Practices for Planning, Design and Operation of Wetland Education Centres*)⁵³. Therefore, it is difficult to have a high degree of confidence in the overall assessment as the entire development is not being considered.

The EIA needs to take a comprehensive review of the impacts of development from both within and outside the site. This includes a), the development of the site for visitors (centre and outdoor facilities) b), the management and restoration of the habitats and biodiversity and c), the urban developments surrounding the site:

⁵² <http://www.ramsar.org/sites/default/files/documents/pdf/lib/hbk4-16.pdf> Accessed 27 July 2017

⁵³ http://www.ramsar.org/sites/default/files/documents/library/2014wec-hb_en_lr.pdf Accessed 27 July 2017

a) Visitor facilities

- The concept plan states that a ‘stand-alone visitor centre’ will be constructed and states that ‘there is no plan for auxiliary outdoor structures as yet’. It is also proposed in that this situation will remain until the concept of boardwalks, outdoor facilities etc. is finalised. However, the building and external spaces cannot be separated as one influences the other and vice versa. The EIA should focus on undertaking a comprehensive assessment of the impacts of the overall facility. It is inappropriate to conduct an EIA in a piecemeal fashion. If funding is an issue then this should be stated up front and a phased approach to the development should be proposed.

b) Habitat and biodiversity

- In the objectives reference is made to enhancing the ecological character of the Ramsar Site. However, nowhere in the EIA report is there a detailed presentation of the Ecological character or reference to data held in the RIS (there is a passing summary on p.9). Therefore it is impossible to substantiate this claim.

c) Impacts from surrounding urban developments

- There must be a review of the other current and proposed developments around RAK Ramsar Site and the cumulative impacts of these and the wetland visitor centre needs assessment.

There is an over-riding or tacit assumption that the visitor centre is a positive development with regards to the management of RAKWS Ramsar Site. However, despite this assumption there remains the need to demonstrate that the development will not generate a human-induced negative change to the ecological character of the Ramsar Site. There is very poor definition of the various receptors or the ecological character of the Ramsar Site. The use of embedded mitigation is not clear throughout. There is no definition of residual impacts or consideration of the need for compensation. There is no consideration of cumulative impacts that the development of a visitor centre might have with regard to the wider development programme around the Creek.

4.10 Main Conclusions from EIA Reviews and Consultations

Information compiled in the body of the EIAs and their Annexes clearly indicate the Ramsar Site still qualifies under all four of the original designation criterion and its status as a Wetland of International Importance is not currently at risk. There are however internal and external factors adversely affecting the site’s ecological character and several of these have been formally acknowledged in RAKWS’s RIS in 2012.

The Convention encourages effective management planning for maintaining the ecological character of internationally important wetlands. However, there is no single overall plan to guide development and restoration activities within the RAKWS as well as consider activities that occur outside the wetland but which may cause adverse change to the ecological character of

the Ramsar Site. A monitoring program is an important tool to provide management authorities with relevant information to assess and adapt activities to meet performance metrics. A management Steering Committee currently exists for the RAKWS but does not presently have a named individual to act as Chair and the Committee. It has not met for an extended period and needs to be re-energized with new appointments from a broad base of relevant stakeholders committed to a management planning process and developing and implementing a management plan.

Masterplans included in the EIAs and displayed to the RAM, once realized, completely encircle the RAKWS leading to a cumulatively increased risk of bird strikes through direct impacts with multi-story buildings constructed along foraging flightlines or passage flyways. This risk will be compounded by the buildings' reflective surfaces, glass windows, and night lighting. The extent of this risk, particularly to birds flying at night, is not known as an assessment has been limited to flight observations during daylight hours. Nighttime radar studies should be undertaken at multiple sites within the municipality to record timing and duration of passage migrants, local movements, and altitude response under different weather conditions.

Laser and pyrotechnic displays have a high potential to disturb avian movements to and from the RAKWS. The RAM team members were not made aware of any avian studies conducted to assess the impacts of the multimedia displays and shows on the RAKWS and associated movements of birds

The construction of the Dubai Water Canal had a direct measureable impact with the conversion from sabkha of 26 ha and 42 ha of the RAKWS and buffer zone respectively to canal. This conversion within the boundary of RAKWS was not accompanied with compensation.

A notable gap is a cumulative marine traffic impact assessment with the opening of the Dubai Water Canal to the sea on the RAKWS. The RTA is promoting the use of the canal as a transportation route, and marinas are being included in the developments for both transport and recreation purposes. The Gulf News, for example, reported on 31 March 2017 "The RTA, together with Emaar, would soon operate abras and organise recreational tours around the flamingo reserve at Ras Al Khor Wildlife Sanctuary, the official added"⁵⁴. Accompanying increased boat and water taxi traffic is the potential for increased levels of debris overtopping the boom due to wake action and entering the RAKWS, disturbance to foraging birds, and illegal entry by disembarking at the canal edge. The Marine Traffic Boundary is currently unmarked and boat traffic is able to access up to the boom barrier within the boundary of the RAKWS.

During the RAM, team members noted helicopter flights over the RAKWS and were informed of the construction of helicopter pads in some of the developments. As development proceeds, it is

⁵⁴ <http://m.gulfnews.com/1.2003588> Accessed 26 July 2017

expected the number and frequency of overflights will increase for business and recreation (e.g. sight seeing and observing birds in RAKWS). Birds respond to aircraft visually and audibly and exhibit a range of responses manifest as Alert Disturbance, which is the point at which the bird changes its behaviour, and the more extreme Flight Disturbance, which is the point at which the bird moves away. Possibly due to louder engines and rotor vibration, helicopters are typically viewed as the most disturbing aircraft type to birds and on average at higher altitudes than fixed wing aircraft. The distance birds respond to overflights is not consistent between studies and likely depends on multiple factors including species, flock size, topographical features, habituation and seasonality.⁵⁵ Developing criteria for protection of sensitive areas against disturbance by aircraft is thus preferably based upon site specific studies to determine species responses at various overflight heights. However, in the absence of such study, a cautious approach is often indicated and overflights below 500 m above ground level are restricted to reduce the risk of disturbance to birds.

The opening of Dubai Water Canal is predicted to result in a 1-2 cm reduction in the water level amplitude in the inner Creek. Moreover, Dubai Water Canal is not expected to result in any improvement to water or sediment quality in Dubai Creek or RAKWS without a significant reduction in TSE nutrient loading, regardless of where the outfall is relocated in the Creek. Achieving zero TSE discharge to the Creek will improve overall water quality but the RAM team suggest this may have a measureable effect on macrobenthic intertidal fauna. The reservoir of total ammonia nitrogen in RAKWS's sediment is currently high and reported to be likely toxic to many sessile benthic infauna. The contractor for Dubai Water Canal has committed to environmental monitoring in RAKWS but, critically, monitoring of the duration and inundation pattern of tidal flats is not included. Changes in water level amplitude and flow dynamics with opening of the canal can have a measureable effect on RAKWS's intertidal flat and mangrove invertebrate community structure and abundance and associated avian foraging distribution and abundance. Moreover, the limited sediment and invertebrate sampling undertaken for the EIA baseline environmental studies does not provide sufficient resolution to assess changes in sediment and invertebrate response to varying depths and duration of inundation of the tidal flats, nor changes in water quality.

The proposed construction of Meydan Canal as the extension connecting the Meydan One and Meydan Horizon canals to Dubai Creek is a human-induced impact to the RAKWS triggering Article 3.2 of the Convention. Protected as a nature reserve under Local Order No. 2 (1998) which was enhanced through Local Order No 11 (2003), a decision by DM on whether to permit the activity is complicated by the transfer to Meydan LLC of Parcel 413-106 in May 2007 to allow for the construction of the canal several months before its designation as a Ramsar Site. A risk-based approach applying Ramsar guidance needs to be applied to the decision process to

⁵⁵ Hoang, T. 2013. A literature review of the effects of aircraft disturbances on seabirds, shorebirds and marine mammals. Presented to NOAA, Greater Farallones National Marine Sanctuary and The Seabird Protection Network. <http://seabirdprotectionnetwork.org/wp-content/uploads/2017/01/Aircraft-disturbance-literature-review.pdf> Accessed 3 August 2017

determine if the impact can be avoided, or whether a change in ecological character is adverse, neutral, or beneficial following mitigation and compensation of residual impacts.

The Ras Al Khor Visitor's Center is a human-induced impact to the RAKWS triggering Article 3.2 of the Convention. The final location, design of the facility and construction methods must be confirmed since without this basic information, the EIA process is fundamentally flawed. Moreover, the EIA does not consider all the facilities that would be expected to accompany a wetland visitor centre. It is inappropriate to conduct an EIA in a piecemeal fashion. If funding is an issue then this should be stated up front and a phased approach to the development should be proposed. The EIA needs to take a comprehensive review of the impacts of development from both within and outside the site. This includes a), the development of the site for visitors (centre and outdoor facilities) b), the management and restoration of the habitats and biodiversity and c), the urban developments surrounding the site. In addition, the sustainability of the centre should not only consider the environmental aspects but also the financial aspects (i.e. whether the centre will be able to pay for itself) and more importantly, whether the centre will be attractive enough that people will want to come. This can be found from conducting an appropriate visitor survey beforehand to understand their expectations of the centre. The development of a wetland visitor centre should be considered as an opportunity to show-case best practice in environmental management. The issues and recommendations highlighted in the *Handbook on the Best Practices for the Planning, Design and Operation of Wetland Education Centres*⁵⁶ should be fully embraced within this opportunity. Annex 5 provides a case study on development of the International Wetland Park and Visitor Centre (Hong Kong) as mitigation for wetland loss at the Mai Po Inner Deep Bay Ramsar Site.

4.11 Policy Level Challenges

The UAE and Emirate of Dubai have a variety of laws, local orders, regulations and technical guidance that have the potential to deliver wetland wise use and avoid negative human-induced changes to the ecological character of the RAKWS Ramsar Site. Despite this, internal and external factors adversely affecting the site's ecological character discussed above could be avoided or further mitigated with additional guidance for developers and regulators.

4.11.1 National Wetland Policy

The RAKWS and Ramsar Site is accorded protection under both federal and Emirate legislation. However, a national wetland policy provides a significant opportunity to jointly establish the priorities and mechanisms to enhance awareness of wetland resources in a nation. With the multiple interests within the RAKWS a national wetland policy may provide a mechanism for bringing key stakeholders together and ensuring common goals and processes are implemented.

⁵⁶ http://www.ramsar.org/sites/default/files/documents/library/2014wec-hb_en_lr.pdf Accessed 27 July 2017

Furthermore, a national policy is a mechanism often used to ensure that site management is supported through appropriate environmental impact assessment (EIA) as well as strategic environmental assessment (SEA). While EIAs are well suited to examine site or project specific impacts, a SEA for the RAKWS site and surrounding land could provide the necessary information to address cumulative impacts and provide considerable guidance for future management decisions in the face of multiple pressures on the RAKWS. Developing specific planning guidance for developments that have the potential to impact on RAKWS will help DM use language aligned with Ramsar resolutions and guidance, e.g. ‘ecological character’, in setting SOWs.

4.11.2 Boundary of RAKWS

The RAKWS boundary and buffer zone was defined by the Local Order No. 2 (1998) as shown in Figure 13⁵⁷. The area of the RAKWS is regularly reported as 620 ha in both the RIS and the EIAs. However, the RAM is requesting clarification on the area and boundary of the site as applying the co-ordinates provided in the RIS and the WGS84 Dubai Local Transverse Mercator Coordinate System suggests the Ramsar Site is 588 ha. Furthermore, there are several interpretations of the boundary of RAKWS presented in various maps of the EIAs and supporting technical reports, along with use of undefined terms such as ‘core area’, which undermines their utility and also their pedigree when assessing potential impacts to the Ramsar Site.

4.11.3 Buffer Zone of RAKWS

Buffer zones play an important role in the conservation of sites of ecological importance by surrounding and shielding the site from the direct impact of human activities. Buffer zones have been defined as:

*“Areas peripheral to a specific protected area, where restrictions on resource use and special development measures are undertaken in order to enhance the conservation value of the protected area.”*⁵⁸

The concept of "buffer zones" grew out from UNESCO's Man and the Biosphere Programme in 1971 and the establishment of UNESCO's Man and the Biosphere Reserves. These often had a central core zone surrounded by a buffer zone and then by a transition zone. Often, resource use within buffer zones is restricted through legislation, policies or other means. In 2002, the Ramsar Convention through the Annex in Resolution VIII.14⁵⁹ concerning *New Guidelines for management planning for Ramsar sites and other wetlands*, discussed the establishment of buffer zones around Ramsar Sites (see Annex 5). In accordance with the Annex to Resolution VIII.14 a

⁵⁷ Dubai Municipality. 2013. Environmental Impact Assessment Report Ras Al Khor Wildlife Sanctuary Visitor Center and Marine Museum. Environment Department, Environmental Planning and Studies Section and Marine Environment and Wildlife Section. December 2013.

⁵⁸ <http://www.biodiversitya-z.org/content/buffer-zones.pdf> Accessed 12 June 2017

⁵⁹ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_14_e.pdf Accessed 26 July 2017

buffer zone was described with the designation of RAKWS as a Ramsar Site which gives substance to the intent of DM's Local Law No. 11 (2003) (see above).

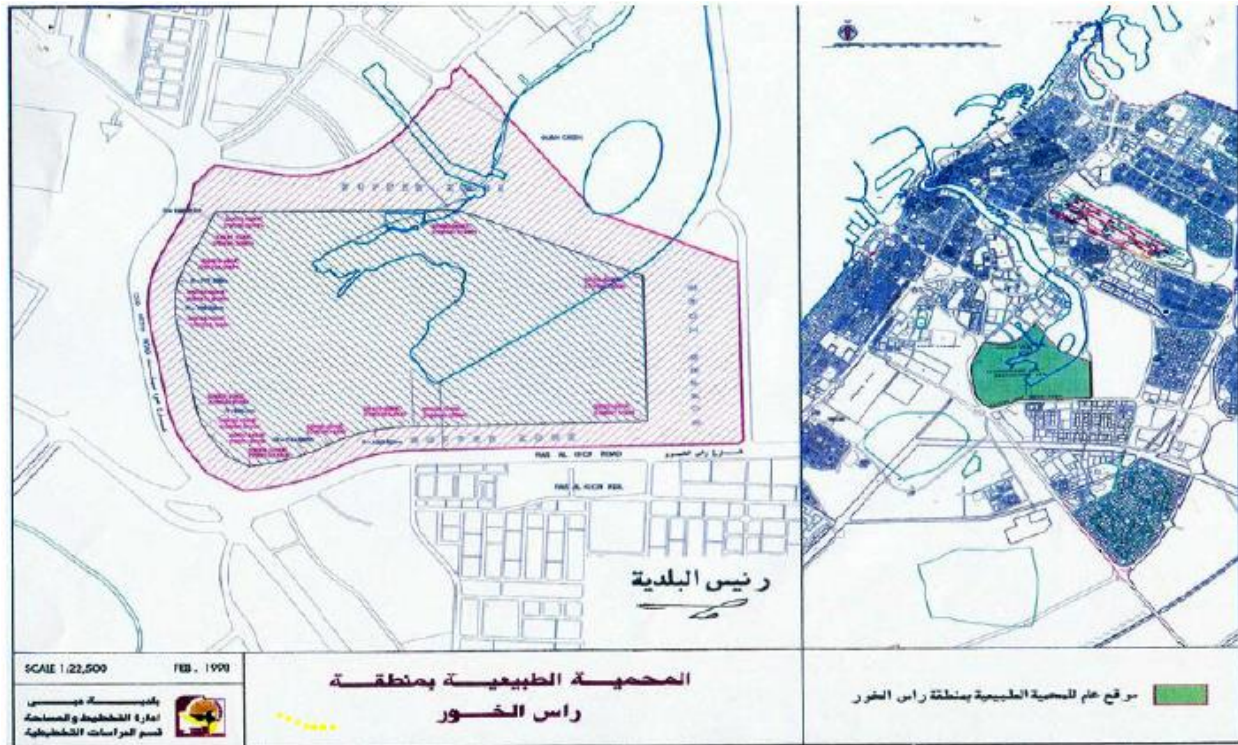


Figure 13. The boundaries of the Ras Al Khor Wildlife Sanctuary (blue) and buffer zone (red) as described by Emirate of Dubai Local Order No. 2 (1998).

As noted in Section 2.3, the Ramsar Secretariat was informed in 2006 that developments were proposed in the Buffer Zone. Figure 14 identifies the area associated with each of the three developments. Ownership of land within the Buffer zone for the Dubai Creek Harbour development (140 ha) was transferred in 2015 from the former Lagoons development initiated in 2006. In 2003 Dubai Health Care City was granted its 110 ha and Meydan LLC was granted Parcel 413-106 on 1 May 2007 of which 23 and 67 ha were in the Buffer and Ramsar site respectively.

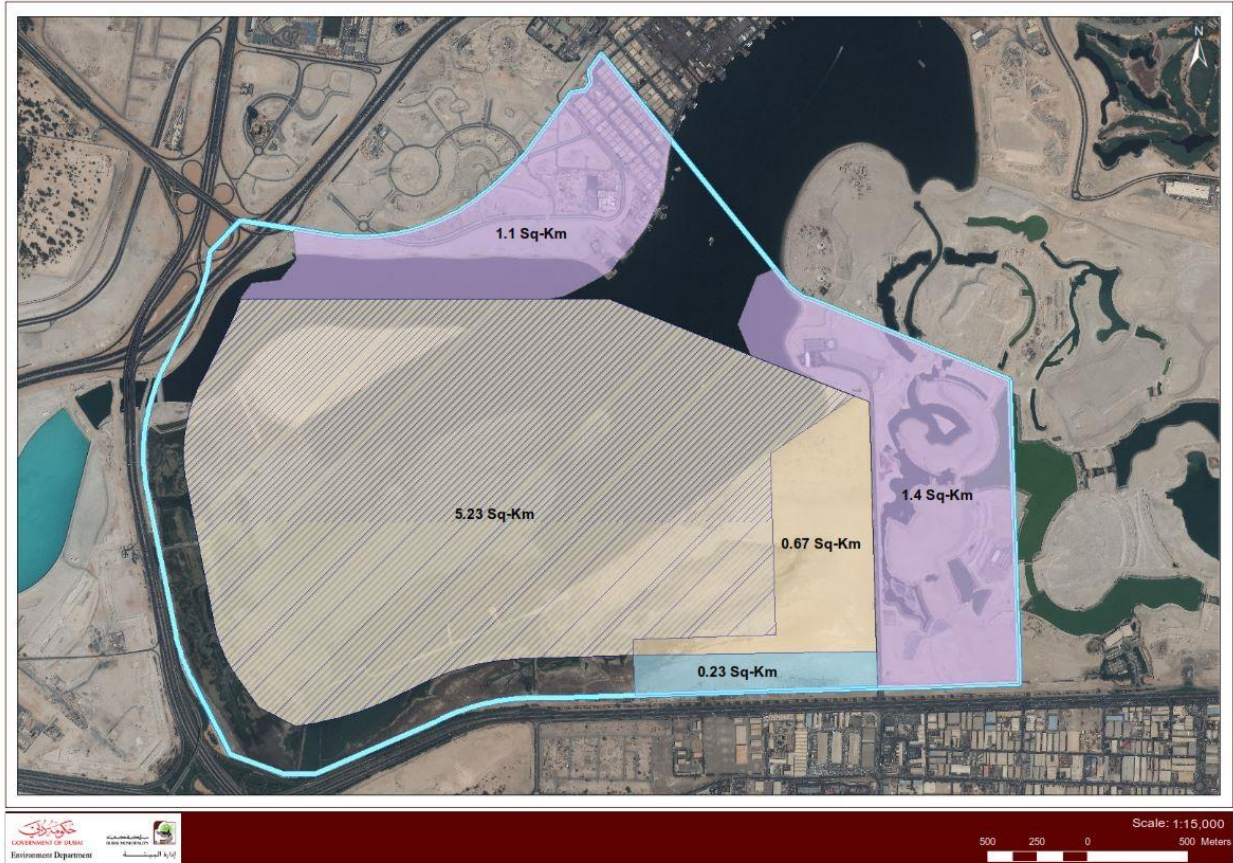


Figure 14. Developments in the Buffer Zone of RAKWS Ramsar Site: Dubai Creek Harbour – 140 ha; Dubai Health Care City – 110 ha; Meydan Canal – 23 ha. The boundary of RAKWS Ramsar Site includes the diagonal yellow hatching (533 ha) and solid yellow (67 ha) of Parcel 413-106.

Although a buffer zone was established for RAKWS, there are no accompanying regulations, policies or guidelines established under Emirate of Dubai Local Law No 11 (2003) to guide developers on permissible activities and infrastructure within the buffer zone. Building height restrictions and lighting guidelines voluntarily applied by Dubai Healthcare City within the Buffer Zone overlapping their development sets a good example for the development of Planning Guidelines for the RAKWS Buffer Zone. However, development within Dubai Healthcare City is at least 200 m from the core boundary of RAKWS while other developments, e.g. Dubai Creek Harbour and Meydan Canal abut the boundary of the Ramsar Site. Furthermore, the Buffer Zone boundary to the west and south of the Ramsar Site is very limited in extent and does not extend past the multiple lane highways bordering the sanctuary. Developments outside this narrow buffer zone have concluded they have limited or no impact to the resources within the RAKWS although building locations, heights and lighting can potentially have a significant effect on resident and migratory birds.

How the Buffer Zone was determined is not known. However, a review of the narrow extent of the Buffer Zone to the west and south of the RAKWS should be undertaken following the guidance

provided in paragraphs 56 through 65 of the Annex to Resolution VIII.14⁶⁰ (see Annex 5) with full involvement of stakeholders. A full and detailed rationale explaining the basis for establishing and delineating the buffer zone is particularly important when establishing the limits of buffer zones and the guidelines or restrictions that are to be applied. Annex 6 provides a case study of a Ramsar Site within a highly urbanized environment that demonstrates the process and rationale for establishing a Buffer Zone as a mechanism to maintain the site's ecological character.

4.11.4 Wetland Vulnerability Assessments

There is ambiguity in the use of Wetland Vulnerability Assessments and also the methodology applied. The reliance on Stratford et al. (2011)⁶¹ is misplaced as this was developed primarily as an assessment tool designed to assist in overcoming problems associated with limited data and resources. Given the scale and magnitude of developments proposed around Dubai Creek it is inconceivable that limited data and resources should be an obstacle to overcome. Moreover, if a WVA is included in the SOW issued by DM, the WVA must necessarily be used to inform an EIA; and thus represents an important component of the EIA process and not simply an addendum that is considered in isolation. Greater clarity is required by DM on when they request WVAs and how they see the results being used.

4.11.5 Dubai Municipality Planning Guidance

The Environment Department in Dubai Municipality is committed to applying its environmental legislation and standards for the protection of the environment, the conservation of natural resources, and Coastal Zone Management & Canals. A key mechanism to support this effort is through Technical Guideline No 1 for EIAs on "...any proposed or planned expansion or modification of any existing project, development, activity or establishment."⁶² Specific requirements and procedures to be followed for land development, infrastructure, utilities, mining and related projects are provided under EPSS Technical Guideline No. 2.⁶³ that identifies protected areas for conservation of national or international importance as a highly sensitive receptor. The guidance for assessment of environmental impacts is generic but may be subject to more specifics in the EIA Terms of Reference. The EIAs reviewed by the RAM varied in how they assessed possible human-induced changes to the Ramsar Site's ecological character and whether they would

⁶⁰ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_14_e.pdf Accessed 26 July 2017

⁶¹ Stratford, C.J., M.C. Acreman, H.G. Rees. 2011. A simple method for assessing the vulnerability of wetland ecosystems. *Hydrological Sciences Journal* 56: 1485-1500. [Available at: <http://www.tandfonline.com/doi/pdf/10.1080/02626667.2011.630669> Accessed 24 July 2017]

⁶² <http://login.dm.gov.ae/wps/wcm/connect/6b8310a3-fb31-4890-9dd2-31d6c0ccbec8/TG1+-2017+.pdf?MOD=AJPERES> Accessed 15 July 2017

⁶³ <http://login.dm.gov.ae/wps/wcm/connect/95e0a171-af1d-4ba5-8ea7-3d3685859a58/TG2+-2017.pdf?MOD=AJPERES> Accessed 15 July 2017

be adverse, neutral or beneficial. Providing additional guidance that is specific to RAKWS and other future Ramsar Sites as highly sensitive receptors will assist developers apply a standard framework for wetland vulnerability assessment and for regulators to evaluate the impacts. A standard framework has the following elements:

1. establishing present status and recent trends: description of the wetland (biophysical and social), the present and recent pressures that exist, and the present condition collected through contemporary scientific means;
2. determining the wetland's sensitivity and adaptive capacity to multiple pressures: description of the pressures on the wetland and the development of plausible future changes in order to assess the sensitivity and adaptive capacity of the wetland to multiple pressures;
3. developing response: determining the likely impacts of these changes on the wetland and the desired outcomes for it, as well as the response that must be developed and implemented given its sensitivity and resilience; and
4. monitoring and adaptive management: determining the necessary steps to ensure the path to the desired outcomes.⁶⁴

4.11.6 Data and information sharing

The progressive developments around RAKWS and the accompanying EIA processes have generated a substantial amount of empirical data. Furthermore, DM also collect a variety of ecological and wider environmental data. During the consultation process, the RAM team was made aware that there was a reluctance for data to be freely shared among different stakeholders. The reasons for this were not clear. However, every attempt should be made to facilitate data sharing in a transparent and equitable manner so that all stakeholders understand the ecological character of the Ramsar Site and assessments of potential human-induced negative change can be undertaken in a robust manner. A forward approach would be for one of the sections with DM's Environment Department to house a publically accessible database for all monitoring data collected, and this section also have the responsibility for updating the database and responding to data requests. An annual State of the Environment Report for RAKWS and Dubai Creek based on the monitoring data would be very useful to developers and regulators.

4.11.7 Understanding the efficacy of financial compensation

The use of financial instruments, as with any form of compensation, should not be used in such a manner as to circumvent the avoidance of impacts to wetlands, and the preference to compensate for wetland loss with wetlands of a similar type and in the same local water catchment, addressing both the areal extent and functional performance⁶⁵. Such 'in-lieu fee

⁶⁴ http://www.ramsar.org/sites/default/files/documents/pdf/lib/lib_rtr05.pdf Accessed 15 July 2017

⁶⁵ Ramsar Resolution Xi.9, 2012, An integrated framework and guidelines for avoiding, mitigating and compensating for wetland losses.

mitigation' is effectively a form of third party mitigation where a permittee (the developer in this case) writes a cheque to a third party (for instance DM) and then is relieved from its compensatory mitigation obligations; with the responsibility for the mitigation shifting to the in-lieu administrator⁶⁶. In such a scenario the failure of any compensation would not be the responsibility of the permittee but the administrator.

Any form of in-lieu fee mitigation would need to follow best practice. For instance, the Virginia Aquatic Resources Restoration Trust Fund administered by the Nature Conservancy in Virginia, USA, is widely considered an effective program. However, the fund does not focus on a single site, rather it uses the accumulated in-lieu fees to restore wetlands at a high ratio (2.3:1 acres for non-tidal and 9:1 for tidal wetlands such as RAKWS). Such a scenario is not considered feasible within RAKWS and the proposals advocated in the DCH EIA fall well short of such a best-practice approach.

Another concern raised with regards to in-lieu fee mitigation programs is that not all the money allocated by the permittee is used by the third party for effective compensation. Similarly, Gardner (2011)⁶⁶ highlights further flaws in the application of in-lieu fee mitigation, including an example from Louisville Zoo where a wetland was destroyed to make way for a wetland educational exhibit, by stating that “subsidizing an educational exhibit through wetland destruction would seem to send a mixed message”. Consequently, if a financial compensation package, or an in-lieu fee mitigation approach, pursued, the Contracting Party, and particularly DM as the potential administrator of such an approach, would need to clearly demonstrate the funds received would deliver an outcome in line with, or exceeding, best practice.

5.0 STAKEHOLDER FORUM – IDENTIFYING CHALLENGES AND ACTIONS

A stakeholder forum was held in Zabeel Park on Wednesday 17th May. The forum was attended by stakeholders from a variety of institutions and representing a diversity of views on RAKWS. A full list of the attendees is provided in Annex 7. The principle objectives of the stakeholder forum were to update the participants on the main findings to date of the RAM, to summarize the challenges facing the site, to conduct a strengths-weaknesses-opportunities-threats (SWOT) analysis and to identify and discuss key actions required to ensure the maintenance of the ecological character of RAKWS.

⁶⁶ Gardner, R. C. 2011. *Lawyers, Swamps, & Money: U.S. Wetland Law, Policy, and Politics*. Island Press.

5.1 Participant Views of RAKWS Importance to Themselves and Dubai

In an attempt to understand better the importance of RAKWS the participants were requested to note down their two most important answers to the following questions:

- Why is Ras Al Khor Wildlife Sanctuary important for you?
- Why is Ras Al Khor Wildlife Sanctuary important to the people of Dubai?

The results of the two questions were merged. Filters were applied to remove prepositions, pronouns, connectives etc. The tenses of each statement were standardized (treasured to treasure, for instance) and the word count was limited to the top 32 most frequently occurring words. The information was processed using an on-line ‘word cloud’ generator (<http://www.wordle.net>) to produce the following image.



The word cloud demonstrates the emphasis placed on their articulation of the importance of RAKWS by the participants. Of repeated importance are words such as ‘birds’, ‘city’, ‘place’, ‘nature’ and ‘natural’. However, also of note are words such as ‘unique’, ‘education’, ‘environment’ and ‘provides’. The word cloud exercise demonstrates that, to the participants, RAKWS is important for birds, is an important place for the city and is a unique natural educational site within Dubai.

5.2 SWOT Analysis

A SWOT analysis is a structured planning method that aims to identify the key internal and external factors that are favorable and unfavorable to achieving a specified objective. SWOT analysis groups information into key factors; and their identification is important to inform subsequent steps in planning to achieve the objective:

- Internal factors – the strengths and weaknesses internal to realizing the objective
- External factors – opportunities and threats external to realizing the objective

Through a group exercise positive forces that work together and potential problems that need to be recognized and possibly addressed are identified and discussed.

RAKWS is the UAE’s first designated Ramsar Site and “flagship” that will be profiled to the Ramsar community during the 13th Conference of the Parties (COP) to be held in the Emirate of Dubai in October 2018. As such, it is to be portrayed as a “...unique case of successful environmental conservation amidst a bustling economic boom [and]...an epitome of the Emirate’s conservation efforts and an important landmark in the city”. The realization of this vision was the recognized but unstated objective of the exercise.

Participants were distributed into four groups composed of representatives of each of the stakeholders in the forum. Members of the RAM facilitated discussion and a member of the group recorded the points raised. Outcomes from the groups are provided in Annex 8. Table 2 summarizes the internal factors that generally reflect groupings under human resources, location and physical resources, and existing processes and legislative implementation. External factors identify local, national, or international events, funding support, and changes to the physical environment and infrastructure.

Table 2. Summary of SWOT analysis by participants in the RAKWS and Ramsar Site forum held in Zabeel Park on 17 May 2017.

INTERNAL FACTORS	
Strengths	Weaknesses
<ul style="list-style-type: none"> • Ramsar Site and legislated national and local protection • Unique within Emirate and recognized by His Highness as important place • Strategically located within Dubai, easily accessible for tourism, education and environmental awareness, and relaxation • Diversity of habitats supporting the highest concentration of coastal birds and waders in UAE • Largest mangrove stand in Emirate of Dubai and a source of pride 	<ul style="list-style-type: none"> • No collective vision for RAKWS’s protection and management between government and developers • Poor communication and sharing of data among government and developers • High level of disturbance and intensive development around perimeter and within buffer zone • Management Committee inactive and site lacks a management plan • Insufficient staffing levels and no stable financing for site management

EXTERNAL FACTORS

Opportunities	Threats
<ul style="list-style-type: none"> ● International recognition at Ramsar COP 13 (October 2018) and EXPO 2020 ● Engaging Tourism Sector and Developers to promote and financially support through innovative approaches ● World class Centre of Excellence for arid zone wetland research promoting education and research at secondary and tertiary levels ● World class visitor center for education and environmental awareness ● Habitat enhancement and restoration within RAKWS increasing intertidal habitat ● 	<ul style="list-style-type: none"> ● Encroachment and rapid pace of development increasing pressure on RAKWS resources and infrastructure ● Loss of support from Developers due to uncertainty and lack of direction on permissible activities within the boundary of RAKWS and Buffer zone ● Increased risks to birds due to building, glass sheathing, and lighting in surrounding developments ● Increased risk from invasive and feral species to habitats and wildlife ● Loss of intertidal habitat with continued expansion of mangrove ● Increased maritime and air traffic disturbance to birds and habitat

5.3 Identifying Actions

Recognition of the weaknesses and threats is a first step in developing a set of strategies or Action Plan that builds upon the strengths and opportunities. Participants in the forum identified their priority actions from the SWOT analysis.

- Immediately re-activate the existing Technical Advisory Committee (TAC) for RAKWS by adding appropriate stakeholders, led by DM, to include but not necessarily limited to Ministry of Environment and Climate Change, Ministry of Education and other pertinent Ministries, Developers, technical and environmental planning/legislation experts, tourism sector, EWS-WWF, Dubai Aviation Authority, Dubai Road and Transport Authority, and Dubai Maritime Authority. TAC to meet quarterly to track progress on plans and identify new tasks/studies;
- Comprehensive stakeholder consultations to be completed, including all relevant local and national government departments and sections, Dubai Civil Aviation Authority, developers and consultants, and the Tourism Sector to help inform the preparation of a RAKWS management plan. These consultations should be completed by March 2018;
- Prioritise the production of a comprehensive RAKWS Management Plan to be completed by August/September prior to COP 13. It is noted that a one-year consultancy study had been awarded to Earth Link & Advanced Resources Development (ELARD) for the completion of baseline studies and the production of management plans for seven designated wildlife protected areas in Dubai but not RAKWS; and
- Develop guidelines for the buffer zone.

6.0 RAMSAR CONVENTION AND IMPACTS TO DESIGNATED SITES: Adverse, Neutral or Beneficial Human-Induced Change in Ecological Character

6.1 Overview

The obligations of Contracting Parties under Articles 2.1 and 3.1⁶⁷ of the Convention text are that Contracting Parties should designate Ramsar Sites and implement planning so as to promote their conservation (i.e., maintain their ecological character). Resolution VIII.8⁶⁸ further elaborated this as the Parties committed themselves to maintain or restore the ecological character of their Ramsar sites. Further under Article 4.4 there is a call to apply management to improve waterbird habitat on wetlands where it is appropriate to do so.

The Ramsar Convention recognizes that wetland restoration and/or rehabilitation programs can lead to favourable human-induced changes in ecological character⁶⁹ and are a key aspect of wetland management interventions⁷⁰. Further under Article 4.4 there is a call to apply management to improve waterbird habitat on wetlands where it is appropriate to do so. Resolution VII.24⁷¹ can complement the above whereby Contracting Parties can compensate for the loss or degradation of wetlands, including listed sites, in cases of change resulting in loss of wetland ecosystem components, processes and services, but not leading to considerations of boundary restriction or deletion. The RAKWS as noted above has been negatively impacted and degraded because of previous and ongoing activities both on and off-site.

The development of the Visitor's Center and Meydan Canal as the extension connecting Meydan One and Meydan Horizon canals to Dubai Creek are human-induced impacts to the RAKWS. However Contracting Parties have indicated that compensation for the loss or degradation of wetlands, including listed sites, should be applied in cases of change resulting in loss of wetland ecosystem components, processes and services, but not leading to considerations of boundary restriction or deletion (Resolution VII.24)⁷².

Within the mitigative sequence standard for EIAs, if avoidance is not an option, the proponent attempts to mitigate the impacts through actions which minimize undesirable impacts and compensates for lost functions. The success of these actions will determine whether there is an adverse, neutral or beneficial change in ecological character.

⁶⁷ http://www.ramsar.org/sites/default/files/documents/library/scan_certified_e.pdf Accessed: 15 July 2017

⁶⁸ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_08_e.pdf Accessed: 15 July 2017

⁶⁹ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_vi.01e.pdf Annex, para 2.8.
Accessed :15 July 2017

⁷⁰ <http://www.ramsar.org/document/resolution-viii14-new-guidelines-for-management-planning-for-ramsar-sites-and-other> para 14 and Annex, para 43 (iii), 99 and 100 Accessed 15 July 2017

⁷¹ http://www.ramsar.org/sites/default/files/documents/library/key_res_vii.24e.pdf Accessed: 15 July 2017

⁷² Op. cit.

6.2 Proposed Meydan Canal

The RAKWS is an actively managed Ramsar site since its designation, and its RIS briefly outlines a program to address habitat management issues present at the time of designation. DM is currently developing a Master Plan for the site which includes restoration of wetlands and CEPA activities coordinated through a planned visitor center. It is important to note this Ramsar Site is located at the head of a highly modified coastal inlet, and is continuing to be influenced by a host of off-site activities including nutrient enrichment and high density development. The criterion for its designation does not include Criterion 1 - "...a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region". The criteria for its designation are amenable to wetland management interventions to maintain critical ecological functions identified at the time of its designation.

The proposed Meydan Canal Development includes several components which need to be assessed as to whether they complement the purpose of the designation of the Ramsar Site and align with the long-term goals of DM as manager of the Ramsar Site. Meydan LLC's development occurs in the south-east quadrant of the RAKWS. The area has limited vegetative cover and its wetlands have been negatively impacted by deposition of dredge spoils from Dubai Creek altering the hydrology and natural habitat. It is not a principle foraging area for waterbirds; and although the area may be used as a roosting location by non-foraging birds, other suitable locations do exist within the RAKWS. Limited use is made of the area by feeding raptors.

The construction of the canal is being identified as necessary infrastructure to support the Meydan One and Meydan Horizon developments in realizing Dubai's vision to "establish the city as Middle East's capital of commerce, leisure and comfortable living"⁷³. However, the infrastructure associated with the development is a change in land-use from the designated primary purpose of the RAKWS as wildlife habitat. Such a change in land-use which allows or facilitates development (e.g. residential) is an avoidable impact and not justified in the current Ramsar approach. Although the site is heavily impacted and degraded, this would lead to a permanent loss of wildlife habitat and change in ecological character with no future option of wetland restoration. This is analogous to the situation under Article 2.5 in which deletion or boundary restriction should not be considered to be acceptable under the Convention, when such deletion or restriction is being proposed in order to permit or facilitate future developments or other land use change in that area which is not justified as in the "urgent national interests". However, this needs to be balanced against the benefits that may accrue to the ecological character of RAKWS with a well-developed and comprehensive mitigation and compensation program.

⁷³ AECOM Middle East Limited. 2016. Meydan One Environmental Impact Assessment. DXB-MEY-CIV-REP-Y16_0007-0. 27 November 2016. Dubai, United Arab Emirates.

At issue is the maintenance of the ecological character of the site to meet the criteria upon which the site was nominated for inclusion in the List of Wetlands of International Importance. The rehabilitation of wetlands is encouraged but there is a perception that development of nontraditional commercial activities (e.g. tourism versus agriculture) is not compatible with the intent of a Ramsar site. Perception and evidence of beneficial outcomes need to be addressed. Assuming at a minimum that construction of the canal will be approved within Meydan LLC Planning Parcel 413-106, the opportunity is available at the RAKWS for the Dubai Municipality and the UAE to demonstrate world leadership in the management of their flagship Ramsar Site. By undertaking the rehabilitation of wetlands throughout the RAKWS as compensation for the human-induced change in ecological character, the proponent's Meydan Canal Development would be considered as exhibiting neutral or beneficial human induced change in the site's overall ecological character. However, it will be necessary to ensure that the rehabilitation objectives are well presented and achievable and the developments do not intrude on this.

6.3 Ras Al Khor Visitor's Centre

Wetland visitor centres can contribute greatly to CEPA programmes and the Ramsar Convention strongly encourages the establishment of education centres at Ramsar Sites⁷⁴. However, the potentially positive outcomes that such centres can achieve still require due process to be followed. In the Ramsar Convention's *Handbook on Best Practices for the Planning, Design and Operation of Wetland Education Centres* it articulates this issue by posing the important question, "... how can the safeguards be established which protect the experience so that the centre can operate without degrading the very wildlife that it seeks to conserve, promote and utilise to convey learning messages?".

Within DM such safeguards are firmly in place through the environmental impact assessment process as per Article 4 of the Federal Law No 24 of 1999 that requires that, "... the Agency, in coordination with the Competent Authorities and Concerned Parties shall undertake the evaluation of environmental impact of the project, and no project or establishment shall start the activity before obtaining the license aforementioned including environment impact assessment." With regards to the Ras Al Khor Visitor's Centre this process has not been concluded to a satisfactory standard and therefore the risk of adverse human-induced change to the ecological character of the Ramsar Site remains. It is necessary to ensure that the EIA process is rigorously concluded prior to construction, development and operation of the visitor centre so that any positive outcomes are not compromised by residuals impacts arising from a failure to adhere to the necessary statutory processes.

⁷⁴ <https://www.ramsar.org/news/handbook-on-best-practices-for-the-design-and-operation-of-wetland-education-centres>. Accessed 15 January 2018.

7.0 NATIONAL POLICY FOR WETLANDS

It is recommended that further attention is directed towards ensuring that the management objectives and processes for RAKWS fit within the relevant national policies and that these are used to propel the management and the procurement of resources and engagement of relevant stakeholders. The Ramsar Convention through its Scientific and Technical Review Panel (STRP) has produced a large amount of technical guidance for wetland management through the publication of Handbooks for the Wise Use of Wetlands⁷⁵. Much of this guidance is relevant when considering the management of the RAKWS.

Ramsar's Handbook 2 on National Wetland Policies⁷⁶ provides guidance on the development and implementation of national policies for wetland management. A national wetland policy provides a significant opportunity to jointly establish the priorities and mechanisms to enhance awareness of wetland resources in a nation. With the multiple interests within the RAKWS a national wetland policy may provide a mechanism for bringing key stakeholders together and ensuring common goals and processes are implemented.

Regardless of whether a national wetland policy is prepared there are a number of actions that could best be addressed at a national level. Contracting Parties can promote the wise use of wetlands without waiting until national wetland policies have been developed by identifying the issues that require the most urgent attention and taking appropriate actions. As the development of comprehensive national wetland policies can take time it is emphasized that the absence of a policy should not be used to delay agreed urgent management tasks.

The Handbook for wetland policies provides guidance on how to develop a national wetland policy through a number of steps. These cover the following topics, although not all steps may be equally appropriate in all countries:

- Establishing a lead agency
- Considerations for a National Wetland Committee
- National issues statement and background paper
- Defining wetlands at a national level
- Defining stakeholders
- Initiating national consultations
- Implementing national and local wetland policy workshops
- Creating a wetland policy writing team
- Ensuring political support for the next steps
- Time scales

⁷⁵ <http://www.ramsar.org/resources/ramsar-handbooks> Accessed 15 July 2017

⁷⁶ <http://www.ramsar.org/sites/default/files/documents/library/hbk4-02.pdf> Accessed 15 July 2017

- Completing consultations and preparing additional drafts of the policy
- Developing a Cabinet Memorandum
- Government endorsement and approval, announcement

It is further recommended that the national policy is used to ensure that site management is supported through appropriate environmental impact assessment (EIA) as well as strategic environmental assessment (SEA). Whilst EIAs have been undertaken for proposed developments within and surrounding RAKWS, a SEA has not been undertaken. This is an important consideration and one that could provide considerable guidance for the future management of RAKWS.

SEA is the formalised, systematic and comprehensive process of evaluating the environmental effects of a policy, plan or program and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making. It provides a structured process of analysing the economic, social and ecological impacts of programs, plans and policies and of identifying alternative economic incentives for conserving and wisely or sustainably using wetlands. SEA differs from EIA in that it is applied to policies, plans and programs rather than to projects. It addresses a number of the shortcomings of EIA in that it is capable of 1) addressing the cumulative impacts of projects; 2) addressing the issue of induced impacts (where one project stimulates other development); 3) address synergistic impacts (where the impact of several projects exceeds the sum of the individual project impacts); and 4) address global impacts such as climate change, sea level rise and biodiversity loss.

A SEA for the RAKWS site and surrounding land could provide the necessary information to address and to make management decisions in the face of multiple pressures on the RAKWS, and to specifically consider the cumulative pressures. The wetland is located within a rapidly developing urban landscape with developments reaching its boundaries and purportedly crossing these. Regardless of the mechanism for assessing these issues it is important that multiple and cumulative pressure within and around the wetland are assessed and responses incorporated into a suitable management planning mechanism. It is likely that national legislation or other instruments will be available or needed to support and ensure such strategic analyses. Handbook 16⁷⁷ provides information on impact assessment, including SEA.

8.0 SITE MANAGEMENT: RAS AL KHOR WILDLIFE SANCTUARY

The Convention encourages effective management planning for maintaining the ecological

⁷⁷ <http://www.ramsar.org/sites/default/files/documents/library/hbk4-02.pdf> Accessed 15 July 2017

character of internationally important wetlands⁷⁸. The designation of a wetland as internationally important is seen as the starting point for securing the maintenance of its ecological character. The implementation of an effective management plan or process involving all activities and all stakeholders is seen as necessary to ensure this occurs. Staff with responsibility for managing a Ramsar Site should also be aware and keep themselves updated about developments and events around the Site that may have negative impacts on the Site, they shouldn't just focus on what is inside the boundary of the Site and ignore what is happening outside

A key recommendation is for Dubai Municipality to complete and implement a management plan for the RAKWS and that this plan provide a coordination mechanism (e.g. a Steering Committee) for all management activities, including monitoring and reporting on all activities within the wetland. All development and restoration activities within the RAKWS should be covered by a single overall plan regardless of who is charged with undertaking these activities. The plan should also consider and remain aware of activities that occur outside the wetland but which may cause adverse change to the ecological character of the wetland.

The most important functions of a wetland management planning process and a management plan are to:

- identify the objectives for site management;
- identify the factors that affect, or may affect, the important features;
- resolve conflicts;
- define the monitoring requirements;
- identify, describe and maintain the management required to achieve the objectives;
- obtain resources;
- enable communication within and between sites and all stakeholders;
- demonstrate that management is effective and efficient; and
- ensure compliance with local, national, and international policies.

It is recommended that Dubai Municipality and UAE federal Ministry of Climate Change and Environment, being the Ramsar Administrative Authority, consider the guidance to ensure they are aware of best practices outlined by the Convention. Adherence to the guidance could be most useful when considering the policy and management issues for the RAKWS and when reporting to the Convention. It is further recommended that the administrative and management authorities discuss further with the Secretariat of the Convention the steps that are in place and being planned to ensure a strategic approach to managing RAKWS is developed with the realisation that it will take time and effort for all appropriate steps to be established and operational.

⁷⁸ <http://www.ramsar.org/sites/default/files/documents/pdf/lib/hbk4-18.pdf> Accessed 15 July 2017

In developing and implementing a management regime for the RAKWS it may be necessary or useful to nest the management plan within an appropriate national wetland policy or policies with links to other relevant national policies and environmental mechanisms. Attention should be given to supporting the strategic value of the RAKWS within wider biodiversity and/or conservation policies and the application of other environmental legislation, such as that governing environmental assessment. It is recognized that some management decisions will need to be made before all suitable policies and management planning is undertaken. This is an unavoidable situation and should not delay necessary management decisions.

8.1 Steering Committee

The management of the RAKWS and Ramsar Site is the responsibility of the Natural Resources Conservation Section of DM's Environment Department. A 90 ha property identified as Parcel 413-106 located in the south-east quadrant of the RAKWS is however under the ownership of Meydan LLC. The implications to the management of RAKWS were not clear to RAM team members, particularly in the divergent objectives for infrastructure (canal and residential development) in the parcel by Medyan LLC and restoration and education infrastructure associated with the Visitor's Center by Dubai Municipality.

Previous Ramsar Strategic Plans have advocated that cross-sectoral site management committees should be in place for Ramsar Sites, involving relevant government agencies, citizens and local communities, and other stakeholders, including the business sector as appropriate. It has also been recommended that a mechanism for dispute settlement is also included within the remit of the management committee.

A management Steering Committee currently exists for the RAKWS but has not met for an extended period and needs to be re-energized with new appointments committed to a management planning process and developing a management plan. The management planning process should only be as large or complex as the site requires, but should be as inclusive as possible. Appropriate incentives to ensure stakeholder participation may be needed. Stakeholder interests can have considerable implications for site management, and can place significant obligations on managers. Public interest must be taken into account and wetland managers must recognize that other people may have different, and sometimes opposing, interests in the site. Where possible these interests should be safeguarded, but this must not be to the detriment of the ecological character of the site.

Consultation and negotiation should be about presenting ideas or proposals for discussion and seeking views about specific issues. A structured planning process should generate ideas and proposals. Before any consultation, managers must know what they are attempting to achieve,

and should define those areas that are open to negotiation. The Management Plan should be regarded as a public document, and all stakeholders given access to the plan.

8.2 Terms of Reference for the future operation of the RAKWS Management Steering Committee.

There are many different ways to define the roles and responsibilities associated with a steering committee that fits for purpose within the local context. Annex 9 provides information on the terms of reference established at other Ramsar Sites across the world. Some commonalities that can assist in crafting a Terms of Reference for a Ras Al Khor Wildlife Sanctuary and Ramsar Site are:

- Defining a Vision for the Committee - e.g. Ras Al Khor Wildlife Sanctuary and Ramsar Site will be a world class site that is a show-case best practice in environmental management for the integration of conservation, education, recreation, tourism and research
- Establishing committee structure - Work under the overall guidance and supervision of the Marine Environment and Wildlife Section of Dubai Municipality Environment Department and be comprised of representatives of key stakeholder groups
- Legal responsibility - Committee will ensure compliance with relevant local, national and international legislation, policies and best practice
- Community engagement - Committee will undertake community consultation that is effective and equitable.
- Management planning responsibility – the Committee will provide direction on the preparation of a Ramsar Site Management Plan drawing upon guidance provided in Ramsar Handbook 18 *Managing Wetlands*⁷⁹
- Implementation responsibility - Committee will be responsible for coordinating specific aspects of themes of the management plan including:
 - Annual action plans
 - Hiring of staff for programme implementation as per need
 - Preparing project investment proposals
 - Coordinating monitoring and evaluation of implementation, including integrated reporting against targets, and
 - Reviewing Management Plan progress and preparing progress report to be submitted bi-annually to Marine Environment and Wildlife Section of Dubai Municipality Environment Department and the United Arab Emirates Ramsar Administrative Authority

⁷⁹ <http://www.ramsar.org/sites/default/files/documents/pdf/lib/hbk4-18.pdf> Accessed 15 July 2017

8.3 Management Planning

The management planning process provides the mechanism to achieve agreement between the managers, owners, occupiers and other stakeholders to ensure the biological diversity, productivity and ecosystem services supported by wetlands is used wisely. It should cover all activities on a site whether these are addressed by different agencies or procedures.

The management plan is part of a dynamic and continuing management planning process. The plan should be kept under review and adjusted to take into account the monitoring process, changing priorities, and emerging issues.

The establishment and implementation of a management plan for a Ramsar site is part of an integrated planning process to:

- determine the objectives of site management;
- identify and describe the management actions required to achieve the objectives;
- determine the factors that affect, or may affect, the various site features;
- define monitoring requirements for detecting changes in ecological character and for measuring the effectiveness of management;
- demonstrate that management is effective and efficient and maintain continuity of effective management;
- resolve any conflicts of interest;
- obtain resources for management implementation;
- enable communication within and between sites, organizations and stakeholders; and
- ensure compliance with local, national and international policies.

Where possible management planning should not be restricted to the defined site boundary, but should also take into account the wider context of planning and management, notably in the basin or coastal zone within which the site is located. It is important to ensure that the site planning takes into account the external natural and human-induced factors and their influence on the site, and also to ensure that the management objectives for a site are taken into account in the wider planning processes.

Management planning must be regarded as a continuous, long-term process. It is important to recognize that a management plan will grow as information becomes available. Planning should begin by producing a minimal plan that meets, as far as resources allow, the requirements of the site and of the organization responsible. The planning process is adaptable and dynamic. It is essential that the plan changes, or evolves, to meet changing features, factors and priorities, both within and outside the site.

In order to safeguard sites and their features, managers must adopt a flexible approach that will allow them to respond to the legitimate interests of others, adapt to the ever- changing political climate, accommodate uncertain and variable resources, and survive the vagaries of the natural world.

The management planning process and management plan should cover the entire site. However, where a wetland site is composed of more than one discrete sub-site separated by areas of other land use (for example, discrete wetlands along the floodplain of a major river), separate management plans for each sub-site may be appropriate. Individual sub-site plans must fit under the umbrella of an overview plan that should be prepared before those for the sub-sites.

Where the wetland is very large, it may be helpful to divide the site for management planning purposes into several contiguous zones or regions, and to develop separate management plans for each of these zones, again under the umbrella of an overall plan prepared in advance. If an overall plan is not available, it may be prudent to proceed with individual plans with attention being provided to the connections to the wider site.

8.4 Monitoring

A monitoring program is an important tool to provide management authorities with relevant information to assess and adapt activities to meet performance metrics. It is recommended that the development of the visitor center, other infrastructure and restoration activities be preceded by a rigorous baseline inventory that will allow the authorities to measure the effects of the development on the ecological character of the site. The information collected should be retrospective rather than predictive. While predictive assessments are often undertaken in an EIA a retrospective approach aims to assess *actual* disturbances or alterations of various projects or management practices as they apply to biodiversity and biological integrity. The baseline inventory and assessment will be used to select outcome and output performance indicators for the long-term monitoring program. Information that should be collected as part of the baseline wetland inventory for RAKWS is provided in Annex 10.

Before determining the extent of new inventory required, it is an important first step to compile and assess as much relevant existing data and information as readily available. This part of the assessment should establish what data and information exists both within and outside the Ramsar Site (e.g. Dubai Creek), and obtain access for those with responsibility of the management of RAKWS to relevant data for monitoring purposes. Baseline wetland inventory provides the basis for guiding the development of appropriate assessment and monitoring. Scientific, long-term monitoring and research which relies upon detailed and thorough sampling can measure change over time and produce more statistically rigorous results.

An environmental monitoring program that accompanies the development and restoration program within RAKWS must be scientifically based, long-term, and hypothesis driven focusing on: a) the water regime; b) the water quality; and c) changes to the habitats.

These three areas have been selected based upon an assessment of the risks and predicted responses to developments identified in the EIA, and those project- related and cumulative impacts identified in the focused review of the implications of within and adjacent urban, residential and industrial development to the Ramsar Site.

Special attention must be paid to changes at a biological community level, which may occur even when habitat conditions remain the same. This is the case with fast-spreading pioneer species adapted to the post-disturbance ecological conditions, which replace naturally occurring species. The fact the RAKWS is a highly-modified site experiencing on-going direct management reduces the concern the system may become more species- rich compared to its ecological history. Furthermore, the decision to actively manage to increase the numbers and breeding activity of the Greater Flamingo, and maintain the planted mangrove forest, has already weighed the question of whether new species are considered more desirable than those that made up the original ecological system. However, there still is the objective to prevent the introduction of exotic species to the site.

Monitoring can be focused on two objectives: the ‘ecological character’ or the environmental ‘outcomes’ of managing the site (e.g. amount of area restored to intertidal wetland); and/or the ‘outputs’ of the of the management interventions (e.g. regulation of water level in the flamingo lagoon). Outputs are short term surrogates for how well a site is being managed. Outcomes are longer term (more than three years) measures of the actual wetland environment we are trying to conserve/restore. The monitoring should be able to monitor both outcomes and outputs. It is thus important that for both ‘outputs’ and ‘outcomes’, a list of performance indicators, linked to the objectives, be prepared as part of the management plan before the work starts, so that at the time of review, progress towards achieving the objectives can be ascertained.

Performance indicators should be selected with the following in mind:

- these are characteristics, qualities or properties of a feature that are inherent and inseparable from that feature;
- should be indicators of the general condition of a feature, and should be informative about something other than themselves;
- should be quantifiable and measurable; and
- should provide an economical method for obtaining the evidence required to enable the current condition of a feature to be determined.

Performance indicators are bound by certain specified limits which represent thresholds for action and should trigger an appropriate response. These specified limits define the degree to which the value of a performance indicator is permitted to fluctuate without creating any cause for concern.

Limits for performance indicators related to ecological features must be developed keeping in mind the natural dynamics and cyclic change in populations and communities, and their carrying capacity limits. Some of these indicators may fall in the category of ‘early warning indicators’.

Outcome indicators should be based on the ‘ecological character’ and special features of a site, such as populations of threatened species or number of migrants staging and ‘wintering at the site’. Indicators should be selected that can be readily measured in the same way at specific intervals. Output indicators should focus on key data that the site management authority may need to readily collect and relate to key management objectives and users. These indicators may include those related to management interventions in relation to the scale of the problem, such as the volume and regularity of saline water input to the lagoon.

With the collection of data it is necessary to establish a data management system and a specimen curating system to:

- Establish clear protocols for collecting, recording and storing data, including archiving in electronic or hardcopy formats.
- Ensure adequate specimen curating. This should enable future users to determine the source of the data, and its accuracy and reliability, and to access reference collections.
- At this stage it is also necessary to identify suitable data analysis methods. All data analysis should be done by rigorous and tested methods and all information documented. The data management system should support, rather than constrain, the data analysis.
- A meta-database should be used to: a) record information about the inventory datasets; and b) outline details of data custodianship and access by other users. Use existing international standards (refer to the Ramsar Wetland Inventory Framework – Resolution VIII.6).

9.0 RAS AL KHOR COMMUNICATION, CAPACITY BUILDING, EDUCATION, PARTICIPATION AND AWARENESS (CEPA)

Ras al Khor has been subject to many changes over the years and while many of those changes have diminished the habitat values, it has continued to benefit the people of Dubai

whilst at the same time, provide habitat for wildlife, especially waterbirds. While it has significant management issues, it is a credit to those individuals and organisations with an interest or a responsibility for its management that RAKWS still provides important ecological services.

However, it is clear that with the current pace of development in Dubai, it will become increasingly difficult to defend the needs of the wetland and protect the wetland against impacts from the scale of development surrounding it and encroaching upon it. Building greater appreciation for its values among the community in Dubai, including decision makers, the private sector, the general public etc, is critical in order to secure a future for RAKWS as a viable wetland. Likewise building the capacity to manage the wetland under these adverse conditions is equally critical. Both of these objectives could be met through the development of well-designed CEPA facilities and programmes that benefit and involve stakeholders at multiple scales.

Within a few years, RAKWS will be surrounded with a greater density of residential, commercial and business activities. The increase will be accompanied by a demand for increased amenities, education and recreational opportunities. Modern interpretative facilities and infrastructure designed in a way that complement the wetlands will most certainly provide a local attraction that can educate as well as engage the public.

9.1 Building a Future Leadership Role in Wetland Management

It is clear to the RAM team that there are some excellent opportunities that could meet the objectives of a diverse group of stakeholders. In addition, there are some new aspects that might be added to further enhance new public facilities for RAKWS.

The present interest and willingness from the private sector to invest in the RAKWS provides an excellent opportunity to build understanding in the development industry regarding conservation objectives. Likewise, there is an excellent opportunity to demonstrate a Government/Private sector/non-government partnership in the operation of the Visitor Center's education and awareness programs and the management of the RAKWS.

There is also a good opportunity to build commitment towards joint investment to develop a leading-edge demonstration of what can be done through restoration, incorporating sustainable building design, wetland management and monitoring, and integrated education and training programs with a role for the site but also a regional focus.

The development of a complementary research facility could certainly contribute to the significant management challenges for the Site. Discussions during the visit also raised the

concept of a training centre as another complementary facility. A training centre would integrate well with an education facility and could support capacity-building in wetland management for the region. A training facility could:

1. produce trainees who could support on-going management activities at the site level;
2. build capacity and expertise in the region for wetland management alongside development and wetland management in arid regions the region; and
3. link with existing education institutions operating in Dubai and other emirates in UAE.
4. provide a working exemplar for wetlands in arid regions which experience intense development pressures.

10.0 ACTION PLAN

It is considered best practice to develop the actions and recommendations arising from a RAM into an action plan. The following actions are drawn from the various processes conducted during the RAM including the stakeholder workshop, wider consultations and the synthesis of the EIAs.

- Immediately re-activate the existing Technical Advisory Committee (TAC) for RAKWS by adding appropriate stakeholders, led by DM, to include but not necessarily limited to Ministry of Climate Change and Environment, Ministry of Education and other pertinent Ministries, Emirate of Dubai's Wildlife Protection Office, Developers, technical and environmental planning/legislation experts, tourism sector, Dubai Aviation Authority, Dubai Road and Transport Authority, and Dubai Maritime Authority. TAC to meet quarterly to track progress on plans and identify new tasks/studies;
- Comprehensive stakeholder consultations to be completed, including all relevant local and national government departments and sections, Dubai Department of Tourism and Commerce Marketing, Dubai Civil Aviation Authority, Dubai Natural History Group, Emirates Wildlife Society in association with WWF, developers and consultants, and to help inform the preparation of a RAKWS management plan. These consultations should be completed by March 2018;
- Prioritise the production of a comprehensive RAKWS Management Plan that includes identification of restoration and enhancement opportunities which can be delivered through compensatory approaches where appropriate, to be completed by August/September 2013 prior to COP 13 in October 2018;

- Undertake a review of the Buffer Zone boundary and develop guidelines for the buffer following the guidance provided in paragraphs 56 through 65 of the Annex to Resolution VIII.14⁸⁰ (see Annex 4) with full involvement of stakeholders by August/September 2018 prior to Ramsar COP 13 in October 2018; and.
- To consider and review progress on the overall recommendations of the RAM.

11.0 RECOMMENDATIONS

National Government

It is highly recommended the United Arab Emirate (UAE) Ramsar Administrative Authority request the Ramsar Secretariat include the Ras Al Khor Wildlife Sanctuary (RAKWS) Ramsar Site in the Montreux Record. Considering the 13th Conference of Parties to the Ramsar Convention (Ramsar COP13) which will be hosted by the Emirate of Dubai in October 2018, the site's inclusion on the Montreux Record will be recognition of the Federal and Emirate governments' commitment to address the internal and external factors adversely affecting the site's ecological character and develop a world class site that is a show-case best practice in environmental management. In addition, the positive steps taken by the Emirate of Dubai would be a good example for the other Emirates who have designated Ramsar Sites.

It is recommended the UAE develop a national wetland policy to establish the priorities and mechanisms to enhance awareness of wetland resources.

It is recommended a Strategic Environmental Assessment analysing the economic, social and ecological impacts of programs, development plans and policies be undertaken on the conservation and wise use of RAKWS Ramsar Site.

Dubai Municipality

It is recommended the Technical Advisory Committee (TAC) for RAKWS Ramsar Site be reactivated with representative stakeholders, followed by comprehensive consultations to inform development of a RAKWS Ramsar Site Management Plan by August/September 2018 prior to Ramsar COP 13 in October 2018.

It is recommended there be formal clarification of the boundary of the RAKWS Ramsar Site and whether there have been any changes since the date of designation. Any change

⁸⁰ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_14_e.pdf Accessed 26 July 2017

or restriction to the boundary would need to demonstrate that it has adhered to Articles and Resolutions of the Convention.

It is recommended that a specific policy guidance document be developed for developers which reviews the existing Buffer Zone boundary and would describe permissible activities within the RAKWS Ramsar Site and its Buffer Zone with full involvement of stakeholders by August/September 2018 prior to Ramsar COP13.

It is recommended that a specific Technical Guidance document is developed and published in order to assess adverse change to human-induced impacts to the ecological character of the RAKWS Ramsar Site from development with full involvement of stakeholders by August/September 2018 prior to Ramsar COP13.

It is recommended there be an increased level of enforcement of the Maritime Traffic Boundary and a regulation restricting RAKWS Ramsar Site overflights to no less than 500 m above ground level be implemented.

It is recommended that DM initiate dialogue with the local education and tourism authorities as important stakeholders to thus assure that the programs and facilities that could be offered at the RAKWS Ramsar Site are designed in a way that allows seamless integration with the UAE education system and tourism programmes.

It is recommended that consultation with all parties be undertaken to establish and operate a set of education, research and training facilities and programmes that would best complement and support the on-going management of RAKWS Ramsar Site.

It is recommended that the development of the visitor center, other infrastructure and restoration activities be preceded by a rigorous EIA and baseline inventory that will allow the authorities to measure the effects of the development on the ecological character of the site.

It is recommended that effort be made to build on the current interest and willingness from the private sector to invest in enhancement and sustainable funding for the RAKWS Ramsar Site by fostering cooperation and open discussion on the management objectives for RAKWS Ramsar Site.

It is recommended that DM explore opportunities in line with Resolution XI.9 to proactively create, restore, and enhance wetlands as a means for providing wetland compensation to offset future unavoidable impacts that remain after mitigation measures.

12.0 ACKNOWLEDGEMENTS

The Ramsar Advisory Mission was undertaken at the invitation of the United Arab Emirates Ministry of Climate Change and Environment (MOCCA). The Mission team was accompanied by and received much support from Reem Abdulla Humood Al Mheiri (MOCCA) and Maral Chreiki (DM-NRCS). Many people from both agencies assisted with the Mission and we thank them for providing logistical support. We are particularly grateful to the representatives of developments adjacent to RAKWS (Annex 3) who willingly met with us and discussed their projects and the various stakeholders who contributed their inputs to the workshop on 17 May 2017. The Ramsar Secretariat and Mission team want to express their gratitude to Emaar Properties PJSC for their financial support of this Ramsar Advisory Mission.

ANNEX 1: Request form the United Arab Emirates Ministry of Climate Change and Environment to the Ramsar Secretariat requesting a Ramsar Advisory Mission for the Ras Al Khor Wildlife Sanctuary and Ramsar Site.



Your Excellency Ania Grobicki
Acting Secretary General
Ramsar Convention
Gland, Switzerland
Fax: +41 22 999 01 69

Greetings from the Ministry of Climate Change and Environment

Subject : Requesting for support for the Ramsar Advisory Mission to study the development projects surrounding the Ras Al Khor wetland in Dubai.

With reference to the subject title, the United Arab Emirates would like to request support from the Convention on Wetlands of International Importance (Ramsar) for a Ramsar Advisory Mission to be conducted for an environmental impact assessment on the different development projects on Ras Al Khor wetland, which has been a Ramsar certified internationally important wetland since 2007. We kindly request for Ramsar to nominate experts in this field who are familiar with the area. All documents relating to the development projects will be shared with the experts and all costs of the assessment will be covered.

Sincerely,
Eng. Mariam Mohammed Saeed Hareb
Assistant Undersecretary of Environmental Affairs & Nature Conservation Sector

ANNEX 2: Itinerary for the Ramsar Advisory Mission 13-17 May 2017, Dubai, United Arab Emirates

Date		Activity	Comment
Fri 12 May	pm	RAM Team arrives in Dubai	
Sat 13 May	am/ pm	RAM Team meets up to debrief each other on their desk review of the EIAs and to identify the key issues that need to be discussed at the various meetings.	The meeting of the RAM team will be done informally at their hotel.
Sun 14 May	am	Meeting at Ministry of Climate Change and Environment (MoCCE)	<ul style="list-style-type: none"> • MoCCE, Dubai Municipality (DM) and RAM Team to meet each other; • MoCCE and DM to introduce the background to the RAM and for the RAM Team to ask any further questions;
	pm	Field visit to the Ras Al Khor Ramsar Site (RAK) and the proposed development sites: <ul style="list-style-type: none"> • Dubai Water Canal • Dubai HealthCare City Phase II: • Dubai Creek Harbour Short visits will also be made to the other proposed development sites e.g. <ul style="list-style-type: none"> • Meydan Canal • Meydan One Development • Culture Village Development 	Organized by MoCCE and DM
Mon 15 May	am	RAM Team members meet with the developer and consultants of the Dubai Water Canal project and conduct more detailed site visit with them	Organized by MoCCE and the developer of the Dubai Water Canal project
	pm	RAM Team members meet with the developer and consultants of the Dubai Health Care City Phase II Project and conduct more detailed site visit with them	Organized by MoCCE and the developer of the Dubai Health Care City Phase II project
Tue 16 May	am	RAM Team members meet with the developer and consultants of the Dubai Creek Harbour project and conduct more detailed site visit with them	Organized by MoCCE and the developer of the Dubai Creek Harbour project

	pm	RAM team and MoCCE/DM to meet and synthesize information collected over the past couple of days, identify any gaps in the information and discuss possible scenarios for the way forward. The RAM Team will also prepare a presentation on their findings for the workshop the following day.	
Wed 17 May	am	<p>Workshop to discuss the outcome from the RAM involving:</p> <ul style="list-style-type: none"> • High level representative of Dubai Municipality • MoCCE/DM • Developer and consultants from the following projects: <ul style="list-style-type: none"> - Dubai Water Canal; - Dubai HealthCare City Phase II; - Dubai Creek Harbour; • RAM Team • Other relevant stakeholders, e.g. developer from other projects that may impact on Ras Al Khor, EWS-WWF, WWT etc 	<p>The RAM Team would present their findings from the visit that would include ways forward for:</p> <ul style="list-style-type: none"> • addressing the impacts from the proposed developments on the Ras Al Khor Ramsar Sites, and; • steps to improve the conservation of the Ras Al Khor Ramsar Site. <p>These findings would then be discussed by the participants at the workshop.</p>
	pm	<p>MoCCE/DM and RAM Team to hold final discussion on:</p> <ul style="list-style-type: none"> • the results of the RAM taking into account the discussions during the morning workshop; • the outline of the report that will be drafted as a result of the RAM. <p>The RAM Team would depart in the evening or the next day depending on the availability of their flights.</p>	

ANNEX 3: Representatives of developments adjacent to Ras Al Khor Wildlife Sanctuary and Ramsar site during meetings with the Ramsar Advisory Mission Team 14 – 16 May 2017.

Company	Employee
Dubai Culture Village - Dubai Properties group	56. Eng. Mahmoud Mohanna 57. Moneeb Rafique 58. Ben White
Dubai Healthcare City	59. Eng. Hazem Eldeweny
Meydan Group LLC	60. H.E. Mr. Saeed Humaid Al Tayer 61. Mohammad Al Khayat 62. Haydar Hassan 63. John Kim 64. Hugo Pipa 65. Gamil Sidhom,
Dubai Creek Canal - Road and Transport Authority (CH2M)	66. Zein Mocke 67. Robbie Smith
Dubai Creek Harbour	68. Adrian Bliss 69. Mihai Coroi 70. Robert Llewellyn-Smith
Festival City Expansion and Golf Residence Development - Al Futtaim Real Estate Group	71. Anna Durai

ANNEX 4: Lake Chilika Ramsar Site: Listing and Removal from the Montreux Record

The following is excerpted from the Ramsar Advisory Mission No. 50 on the removal of Chilika Lake Ramsar Site, India, from the Montreux Record⁸¹.

Description of Site

The Government of India became a Contracting Party to the Ramsar Convention on Wetlands on 1 February 1982. Chilika Lake, covering 116,500 ha, was listed as a Wetland of International Importance on 1 October 1981 on the basis of Ramsar Criteria 1, 2, 3, 5, and Criteria 7 and 8 were included when the Ramsar Information Sheet (RIS) was updated on 15 May 2001. The RIS highlights the importance of the Chilika Lake Ramsar Site for its biodiversity and its economic importance to the local people. The site is a biodiversity hotspot and supports a fishery resource for more than one million people. The biodiversity includes over a million migratory waterbirds, including shorebirds; more than 400 invertebrate species; and an assemblage of marine, brackish and freshwater species, as well as several rare, endangered and threatened species.

Listing of Site on Montreux Record

In June 1993, the Ministry of Environment and Forests, as the Administrative Authority for implementation of the Convention in India, requested that the Chilika Lake Ramsar Site be placed on the Montreux Record due to significant adverse change to the ecological character of the site. In Resolution 5.4 the Contracting Parties determined that the purpose of the Montreux Record “is to identify priority sites for positive national and international conservation attention”, and thus the intent of Recommendation 4.8 and Resolution 5.4 was that the Montreux Record would serve as a primary mechanism for Contracting Parties to fulfil their commitments under Article 3.2 of the Convention, and that its purpose should be to identify sites for positive national and international conservation attention.

The primary drivers for the change in the ecological character of the Chilika Lake Ramsar Site were population growth and catchment degradation, along with widespread poor awareness of the ecological processes that maintain the ecosystem and the products and functions that had hitherto been available to the local people. The resultant problems, which include increased siltation, weed infestation, hunting of birds, and pollution, posed a major threat to the sustainability of fisheries, wildlife and water quality of the lake. Overall, the general biodiversity and productivity, including that of economically valuable species in the lake, was under threat. Uncontrolled expansion of prawn aquaculture into the lake was expected to exacerbate this threat. Many of the identified problems were interconnected and could not readily be treated as separate entities in any management responses and interventions.

⁸¹ https://www.ramsar.org/sites/default/files/documents/library/ram50e_india_chilika.pdf

Actions taken leading to removal from Montreux Record

Management of Lake Chilika was invested in the Chilika Development Authority (CDA) in 1992 by the Government of Orissa in 1992 with the objective of restoring the degraded lake ecosystem of Chilika Lake. The principal objectives of the CDA are:

- i) to protect the lake ecosystem and its genetic biodiversity;
- ii) to survey, plan and prepare a proposal for integrated resource management in and around the lake;
- iii) to undertake multi-dimensional and multi-disciplinary development activities; and
- iv) to cooperate and collaborate with other institutions for development of the lake.

Management actions were undertaken by the CDA in direct response to the adverse changes in ecological character being observed in the lake. This work was supported by the Ministry of Environment and Forests (MoEF) of the Government of India and through a special grant from Ministry of Finance of the Government of India. Cooperation, collaboration and coordination of activities between the CDA and other institutions were successfully developed. In particular, there was a large degree of cooperation with governmental agencies and institutions for data collection and analysis as well as consultation with local communities (e.g. village cooperatives and self-help groups) in the catchment of the lake. The CDA was strongly supported by the South Asia Program of Wetlands International *inter alia* in formulation of action plans, documentation, and dissemination of information through publication of newsletters and brochures. The CDA developed an integrated approach to managing the lake which can be regarded as an excellent example of the whole ecosystem approach to management advocated by the Convention on Biological Diversity and in line with the Ramsar Convention's Wise Use concept.

Removal from the Montreux Record

A request to remove Chilika Lake from the Montreux Record was submitted to the Ramsar Bureau by the Ministry of Environment and Forests on 30 April 2001. The request was accompanied by formal submission of the Montreux Record Questionnaire, which outlined management actions that had been taken to improve the ecological character of the lake. In response to this formal request, a Ramsar Advisory Mission (RAM) was established to visit Chilika Lake in order to review the management actions undertaken and the reported improvements to the ecological character of the site and to prepare a report as a basis for consideration of removal of the site from the Montreux Record.

The RAM was undertaken 9-13 December 2001 with the following Terms of Reference:

- i) to examine the reports to the Bureau of improvements to the ecological character of the site through management actions undertaken to address each of the factors identified by the Contracting Party as adversely affecting the ecological character of the site,

specifically increasing siltation, shifting of the mouth of the lake and fall in salinity, weed infestation, aquaculture, and bird hunting and other impacts on migratory birds;

- ii) to review these management actions in the context of the overall management planning process being undertaken for the site; and
- iii) to include in the report of the RAM, as necessary, advice on appropriate adjustments to this management planning process so as to continue to maintain the ecological character of the site.

Based upon information supplied by relevant authorities, the RAM team found the management actions at Chilika Lake were sufficient for them to recommend removal of the site from the Montreux Record. It was a conclusion of the Mission that many major management steps had been widely debated, researched and implemented, and that this extensive consultative approach contributed significantly to the success of the management actions undertaken. However, it was the advice of the RAM that the removal of the site from the Montreux Record should be dependent on, and accompanied by, a commitment from the Government of India and the CDA to develop and implement an overall management planning document for the Ramsar site that: 1) clearly articulates widely agreed goals and objectives; 2) further encourages participatory planning, management and consultation with key stakeholders (including local communities); 3) continues education and public awareness programs, and; 4) continues extensive monitoring programs underway in the lake should be continued to ensure that the biological, chemical and physical features are maintained or improved in line with agreed objectives. The RAM team concluded with a recommendation that the Ramsar Convention should "...consider using Chilika Lake as an exemplary good-practice case study of the application of the various Ramsar guidelines, and the use of the Convention's tools and approaches, to address complex site and catchment management issues."

Post Script

At Ramsar COP 8 in 2002, the Chilika Development Authority received the Ramsar Award ⁸²for its impressive work and outstanding achievements in restoring the Chilika Lake Ramsar Site. As described in the official awarding "This restoration has been carried out based on the principles of wise use and integrated management, and with a major emphasis on the participation of the local population and their shared decision-making, as well as capacity building. Chilika Lake is a striking example of how restoration of the ecological characteristics of a site can result not only in increased biodiversity (plant and animal species, notably birds), but also in a spectacular increase in fish catches (including the reappearance of some economic species) and other socio-economic benefits to the local population

⁸² <https://www.ramsar.org/activities/award-2-2002>

ANNEX 5: Development of the International Wetland Park and Visitor Centre, Hong Kong in mitigation for wetland loss at the Mai Po Inner Deep Bay Ramsar Site.

Tin Shui Wai is a new town located immediately to the west of the Mai Po Inner Deep Bay Ramsar site in the northeast of Hong Kong. It has a population of ca. 300,000 people. The new town was constructed on a total area of ca. 4.9 km², which was formerly a wetland area of constructed ponds engaged in aquaculture of freshwater fish. Construction work for the town was initiated in 1989 by the private developer Tin Shui Wai Development Company owned by Cheung Kong Holdings and China Resources.

Located between the Tin Shui Wai urban development and the Mai Po Inner Deep Bay Ramsar site is the International Wetland Park and Visitor Centre, which serves as a buffer, within the Mai Po reserve zone, between the new town and the Mai Po wetland conservation area (WCA). The fish pond and wetland area now occupied by the Wetland Park and Visitor Centre was originally set aside as an ‘ecological mitigation area (EMA)’ in mitigation for wetland loss associated with the new town development at Tin Shui Wai. A Feasibility Study for the establishment of the International Wetland Park and Visitor Centre was initiated in 1998 commissioned by the Agriculture and Fisheries Department (now renamed as Agriculture, Fisheries and Conservation Department, AFCD) and the Hong Kong Tourists Association (now renamed as Hong Kong Tourism Board, HKTB). The findings of the study showed that it was feasible to develop a Wetland Park within the EMA without compromising its intended function as a mitigation area. The study also concluded that the proposed construction of the Wetland Park would also enhance the ecological function of the EMA and could be developed to provide a world-class conservation, education and tourism facility. Eight years later the Hong Kong Wetland Park was officially opened to the public in May 2006. The Wetland Park includes a 10,000 m² educational facility/visitor centre and a 60 ha wetland reserve lying adjacent to the Ramsar site, predominantly in the wetland buffer area (WBA) but also a small portion of the reserve lies within the WCA [[link](#)].

According to AFCD, who manages the Wetland Park about 490,000 people, including over 51,000 overseas tourists, visited the park in 2016 [[link](#)]. AFCD has been conducting habitat management at the Wetland Reserve since 2003 to enhance its ecological functions and ecological surveys undertaken at the Reserve have recorded > 250 bird species, > 50 dragonfly species, 10 amphibians and 29 reptiles demonstrating that with proper site design and management, the objectives of nature conservation, education and tourism can co-exist [[link](#)].

ANNEX 6: Buffer zone around Ramsar Sites

Buffer zones play an important role in the conservation of sites of ecological importance by surrounding and shielding the site from the direct impact of human activities. Often, resource use within buffer zones is restricted through legislation, policies or other means. Buffer zones have been defined as:

“Areas peripheral to a specific protected area, where restrictions on resource use and special development measures are undertaken in order to enhance the conservation value of the protected area.”⁸³

The concept of "buffer zones" grew out from UNESCO's Man and the Biosphere Programme in 1971 and the establishment of UNESCO's Man and the Biosphere Reserves. These often had a central core zone surrounded by a buffer zone and then by a transition zone.

In 2002, the Ramsar Convention through the Annex in Resolution VIII.14⁸⁴ concerning *New Guidelines for management planning for Ramsar sites and other wetlands*, discussed the establishment of buffer zones around Ramsar Sites. The relevant paragraphs from Resolution VIII.14 are shown below:

- i) When the Ramsar site itself does not include a buffer zone, it is generally appropriate for management planning purposes to identify and establish such buffer zone around the core wetland area defined within a Ramsar site or other wetland. The buffer zone should be that area surrounding the wetland within which land use activities may directly affect the ecological character of the wetland itself, and the objective for land use within the buffer zone should be one of sustainable use through ecosystem management, consistent with the maintenance of the ecological character of the wetland. When a wetland site is composed of discrete sub-sites, a buffer zone should be defined for each, including, where appropriate, all the area between the sub-sites.
- ii) The location of a buffer zone in relation to the core wetland area of a designated Ramsar site will vary depending upon what ecosystems are included within the site boundaries. Where the designated site is only the wetland itself, then for management purposes a buffer zone should be defined in the surrounding area outside the designated site. In contrast, where the site encompasses the wetland and its surroundings, the buffer zone should extend to the boundaries of the designated site, and then a 'core area', perhaps the wetland ecosystem itself, defined within the site.
- iii) The dependence of wetlands on water supply from outside the wetland means that for the purposes of wetland management planning the river basin or catchment area of the coastal zone should be viewed in effect as a buffer zone for the wetland, since water and land-use

⁸³ <http://www.biodiversity-a-z.org/content/buffer-zones.pdf> Accessed 12 June 2017

⁸⁴ http://www.ramsar.org/sites/default/files/documents/pdf/res/key_res_viii_14_e.pdf Accessed 26 July 2017

in these extended areas indirectly affect the ecological character of the wetland. However, particularly in the case of a wetland within a very large river basin, basin-scale or coastal zone management may be seen as a third, outer zone for management purposes, and a more limited buffer zone immediately surrounding the wetland may still be a necessary management planning tool.

- iv) The Biosphere Reserve zonation concept, in which the site may include up to three zones - core zone, buffer zone (for research and training) and transition zone (for sustainable use) - is potentially applicable to all Ramsar sites, and should be applied whenever feasible and appropriate. Its application is particularly important where a site is designated as both a Ramsar site and Biosphere Reserve, and here the relationship between the Ramsar site boundary and the zonation established for the Biosphere Reserve should be clearly established.
- v) Although many Ramsar sites are within protected areas, where the primary land-use within the site is wetland conservation, many are, like Biosphere Reserves, multiple use sites. In the latter, the management objectives for the use of the core wetland are broadly to ensure that the ecological character of the wetland is maintained or enhanced so as to continue to provide its values and functions for people's livelihoods and for biodiversity conservation.
- vi) Any zonation scheme should recognize the existing multiple uses of Ramsar sites and their surroundings, and ensure that management objectives for the core zone are designed primarily to maintain the ecological character of the wetland, as well as that those for any form of surrounding buffer zone are consistent with this maintenance of the ecological Ramsar COP8 Resolution VIII.14, page 19 character. Clear, separate but complementary and mutually supportive management objectives should be established for each zone.
- vii) Another approach to zonation, and one that is not mutually exclusive to the 'core/buffer zonation' approach, is that of establishing zonation for a particular use of a site. An example could be the use and development of a wetland for ecotourism. Here zonation would be used to establish in which parts of a site ecotourism access can occur, where ecotourism infrastructure should be placed (e.g., the sensitive siting of a visitor centre), and from which parts of a site ecotourism should be excluded owing to the sensitivity of those parts of the ecosystem to disturbance. Such zonation schemes will generally cut across the core and buffer zones.
- viii) The experience of the Man and the Biosphere Programme, under which zonation is recognized as an important part of the delimitation and management of Biosphere Reserves as multiple use sites, is that zonation plays an important role in minimizing user conflicts by separating potentially conflicting activities whilst ensuring that legitimate land uses can continue with minimal conflict.
- ix) The establishment of a zonation scheme should involve full stakeholder participation from the earliest stage, since it is in 'drawing the lines' between zones that many conflicts can

materialize. Establishing zonation and management objectives for each zone (and hence what activities should and should not be permitted within each zone) is an important part of the process of establishing a close involvement of local communities, indigenous peoples, and other stakeholders in the management of the wetland.

- x) Some general rules should be applied when establishing zones, regardless of their type and purpose:
1. zonation should be established with the full involvement of stakeholders, including local communities and indigenous peoples;
 2. a full and detailed rationale should be made to explain the basis for establishing and delineating zones, and this is particularly important when establishing the limits of buffer zones;
 3. a concise description of the functions and/or restrictions applied within each zone must be prepared as part of the management plan;
 4. zones should be identified with a unique and, if possible, meaningful code or name: but in some cases, a simple numerical code may be adequate;
 5. a map showing the boundaries of all zones must be prepared;
 6. where possible, zone boundaries should be easily recognizable and clearly identifiable on the ground: physical features (for example, fence lines and roads) provide the best boundaries, and boundaries based on dynamic features, such as rivers, mobile habitats, and soft coastlines, must be identified with some form of permanent marker; and
 7. on large, uniform sites, or in areas of homogeneous habitat crossed by a zone boundary, fixed permanent markers with locations mapped using a Global Positioning System (GPS) should be used.

ANNEX 7: Case study - Buffer zone around the Mai Po Inner Deep bay Ramsar Site, Hong Kong SAR, P.R. China.

In September 1995, the Government of the Hong Kong Special Administrative Region (HKSAR), PR China designated a 1,540 ha area of wetlands in the north-western New Territories as the Mai Po Inner Deep Bay Ramsar Site under the Ramsar Convention on Wetlands. The wetland consisted of inter-tidal mudflats, mangroves as well as traditionally managed shrimp (locally called ‘gei wai’) and fish ponds (Fig. 1). The Ramsar site serves as an important feeding and resting ground for wintering and migratory birds, including a number of globally threatened species (e.g. black-faced spoonbill, Saunders's gull and Nordmann's greenshank).

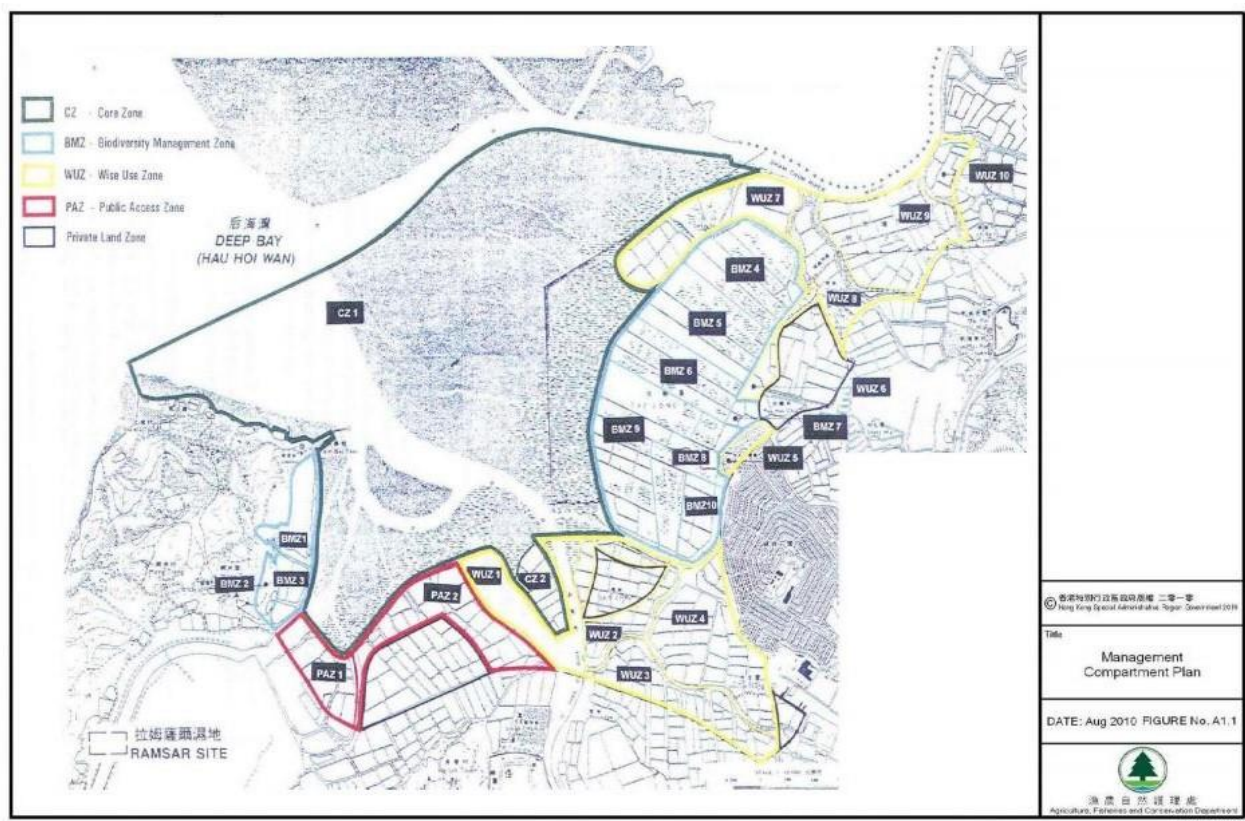


Figure. 1: Map showing the boundary of the Mai Po Inner Deep Bay Ramsar Site and the zoning within the Site [\[link\]](#)

Whilst the HKSAR’s Agriculture, Fisheries and Conservation Department (AFCD) has overall responsibility for the conservation of the Ramsar Site, it is supported by other government departments, such as the Environmental Protection Department (EPD) who conduct regular monitoring of water quality in Deep Bay and the rivers that flow into the Bay. The Town Planning Board (TPB), which is a statutory body of the [Hong Kong Government](#), is responsible for the systematic preparation of land use plans (Outline Zoning Plans [OZPs] and Development Permission Areas [DPAs]) to promote the health, safety, convenience and general welfare of the Hong Kong community [\[link\]](#). In the Mai Po and Deep Bay area, after a protracted consultation process, the TPB has designated several OZPs that include zones promoting conservation and

restricting development to prevent any adverse impacts on the wetland. Each plan is accompanied by planning guidelines in the form of a ‘Schedule of Notes’ that show, for a particular zone, the uses that are permitted.

In addition to planning controls the HKSAR has established a number of mechanisms to conserve the Ramsar Site. For example:

- AFCD has scheduled the core part of the Mai Po Marshes, mangroves and inter-tidal mudflat of Inner Deep Bay as a Restricted Area under the Wild Animals Protection Ordinance (Cap 170), so that access is limited to those with a special entry permit issued [\[link\]](#);
- AFCD is implementing a Conservation Strategy and Management Plan for the Ramsar Site which lays down a general framework for the conservation and wise use of the area [\[link\]](#);
- EPD has imposed a “Deep Bay Zero Discharge policy” which permits no net increase of pollutant loadings into Deep Bay Water Control Zone to protect the environmental resources of the Deep Bay catchment and water quality in Deep Bay.

In preparing and designating the OZPs for the Deep Bay and Mai Po area in northeast Hong Kong the TPB has:

- adopted a “*precautionary approach*” to conserving the ecological functions of the fish ponds in order to maintain the ecological integrity of the Deep Bay wetlands [\[link\]](#);
- adopted the principle of “*no-net-loss in wetland*”, in both area and function, when considering new proposals for development in the Ramsar Site [\[link\]](#);
- established two zones within the Deep Bay wetlands to support land use planning. These are:

- i. *Wetland Conservation Area (WCA)*: This area essentially includes all the landward part of the Ramsar wetland but also includes some additional fish ponds. The planning intention of the WCA is to conserve the ecological value of the fish pond wetlands at Deep Bay. New development within the WCA would not be allowed unless it is required to support the conservation of the ecological value of the area, to promote research and educational use, or is an essential infrastructural project with overriding public interest. Any such development would need to be supported by an EIA to demonstrate that there would be no net loss in wetland function and no deleterious impacts. Appropriate compensation would be required for any development involving wetland filling and mitigation measures against disturbance would be necessary. Compensation and mitigation would be imposed as part of the planning approval conditions.
- ii. *Wetland Buffer Area (WBA)*: This buffer area lies about 500m along the landward boundary of the WCA. The planning intention is to protect the ecological integrity of the fish ponds and other wetland within the WCA and prevent development that would have a negative off-site impact on the ecological value of fish ponds. Proposals for

development or redevelopment require an EIA that would need to show that any negative impacts could be mitigated and that the development would not cause any net increase in pollution load to Deep Bay. Some local and minor uses are however exempted from the requirement of ecological impact assessment.

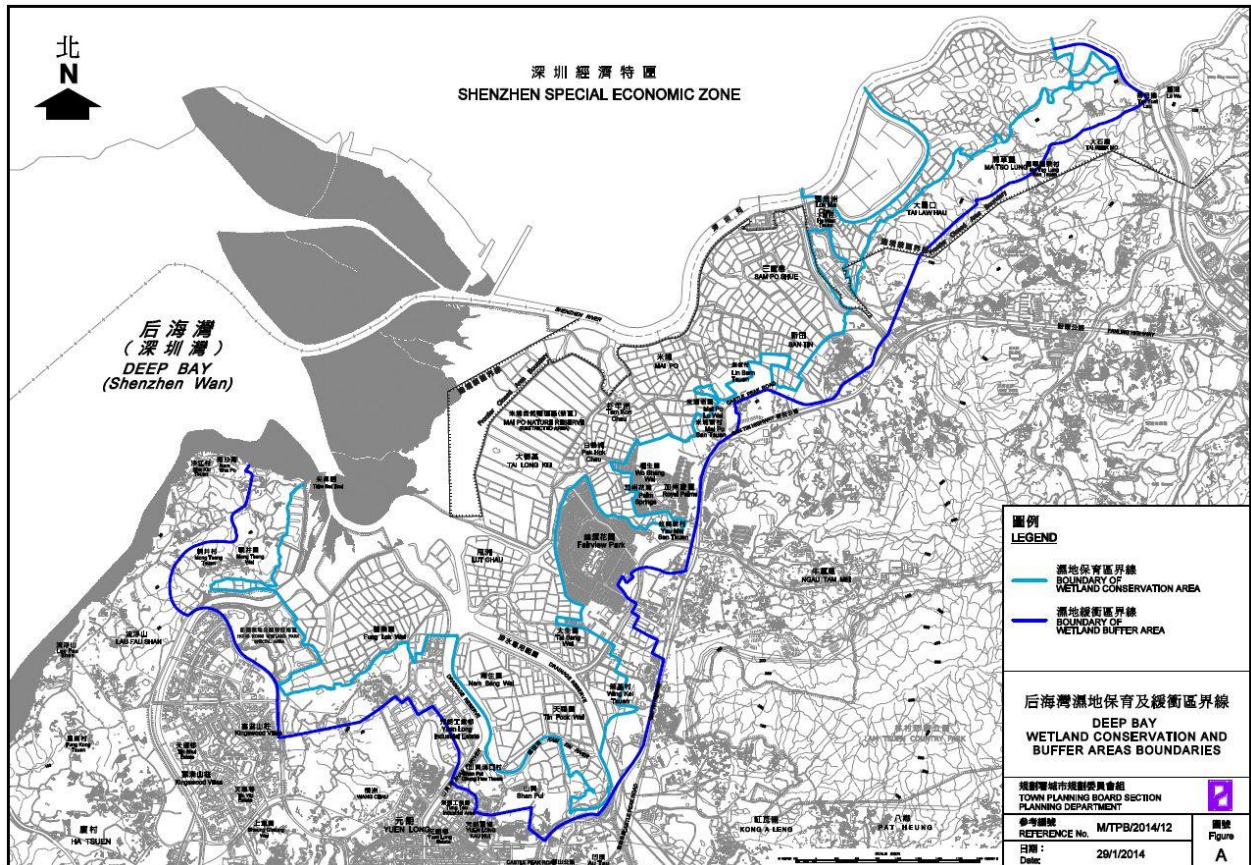


Fig. 2: Map showing the boundary of the Deep Bay buffer zones [link]

It should be noted that while the primary planning intention of the WCA is to conserve the ecological value of the fish ponds wetlands, the TPB may consider development within the WCA if there are strong planning justifications and positive measures to enhance the ecological functions of the existing fish ponds. This could be achieved under a *private-public partnership* (PPP) approach, which the TPB has promoted, that takes into account the precautionary principle and adopts the “no-net-loss in wetland” concept. This PPP approach would allow consideration of limited low-density private residential/recreational development at the landward fringe of the WCA in exchange for committed long-term conservation and management of the remaining ponds within the development site. Such development should involve minimum pond filling and be located as far away from the Deep Bay and/or adjoining to existing development site. An EIA on the project would need to be conducted with an acceptable and feasible wetland enhancement and management scheme to show that the development would not result in, or be able to fully compensate for, any loss of the total ecological function of the original ponds on the site and that the development’s impacts could be mitigated. The proposal should also include a mechanism to ensure that the long-term management of the wetland could be practically implemented and monitored.

ANNEX 8: Participants in the 17 May 2017 Ramsar Advisory Mission Workshop, Dubai, United Arab Emirates.



Dubai Municipality
Environment Department
البعثة الاستشارية لمعاهدة رامسار 2017
Ramsar Advisory Mission 2017
May 17, 2017

سجل الحضور
ATTENDANCE FORM



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ANNEX 9: Results of the Strengths, Weaknesses, Opportunités, Threats (SWOT) exercised conducted during the 17 May 2017 Ramsar Advisory Mission Workshop, Dubai, United Arab Emirates.

STRENGTHS

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none"> • Ramsar Site, nationally protected. Shield to maintain attention and care • Ramsar guidelines available • Strategic location • Tourism potential, great access, beautiful to look at • Unique within the Emirate with mudflat and mangroves • quiet place, away from busy work-life • Recognized by HH and departments as imp place • Accessible • Use views for development 	<ul style="list-style-type: none"> • Protected by legislation – international and local orders • Important for migratory and resident species • Unique in Dubai – only Ramsar site in Dubai, first Ramsar in the UAE • Largest mangrove stand in Dubai • Range of habitats – wetland, intertidal mudflats, mangroves, sabkha • Controlled access • Central, accessible location - raises profile • Connectivity to Creek • Government supports conservation • Educational value – ecotourism, • Attracts visitors • Availability of nutrients • Cultural heritage value • Climate resilience function 	<ul style="list-style-type: none"> • First Ramsar site designated within the UAE • Unique wildlife sanctuary in heart of urban Dubai • Only significant mangrove site in Dubai • The premier coastal & wetland bird site in Dubai • Tourism site; especially to view flamingos • Excellent site for education • Best site in UAE to support wintering great spotted eagles • Strategic location on the East Asia/East Africa Flyway supporting the highest concentration of migrant coastal birds and waders in UAE • Carbon sequestration • Improves air quality in urban setting • Social value as a destressing site • Water pollution amelioration 	<ul style="list-style-type: none"> • Recognized international Ramsar status • Diversified habitats in one location (450 spp of fauna and flora within 6.2sq km) • Serving as resting and feeding grounds for migratory birds • Cultural elements • Capacity to assimilate (partially) water pollution • Added value to neighbouring property developments

WEAKNESSES

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none"> • No active management committee • No regular fora to deal with issues • No clear guidelines for developers of permitted (allowable) activities within buffer • A development zone within the boundary of the site • Small parking area • Under-utilized by population of Dubai and low level of awareness • Insufficient staff and stable financing for site management • Poor communication between stakeholders and sharing of data • Insufficient access to TSE for wetland management and 	<ul style="list-style-type: none"> • High level of disturbance • Location attracting high development pressures due to water frontage • Lack of a clear management plan • Lack of and unclear policies and regulation – convention not ratified • Lack of implementation of Ramsar guidance • Elevated importance of mangroves, at the expense of mudflats • Lack of enforcement of regulation – better implementation required • Not universally known about (despite marketing campaigns) • Lack of co-operation between stakeholders (development, government,) • Lack of information sharing • No public transport connections • No fly zone not enforced (and location not shared) • Limited visitor centre infrastructure • Lack of local expertise and staffing (capacity) 	<ul style="list-style-type: none"> • Lack of tertiary institutions to undertake environmental studies and publish data • Need environmental direction and then planning guidelines can be put in place - need for joining up environmental conservation and planning guidelines • Lack of initiative to build capacity amongst decision makers • Lack of cooperation between government authority • Surrounded by development • Management committee not effective • Lack of collective vision • Lack of comprehensive baseline data • Lack of sharing of data, not on public domain 	<ul style="list-style-type: none"> • Compromised awareness of its value because of lack of public transport to the site • Lack of public awareness of its value • Insufficient legislation and/or enforcement to protect sanctuary • Lack of communication amongst pertinent (for its protection) competent authorities • Lack of comprehensive management plan • Surrounded by aspiring developers • Ineffective existing RAKWS Management Committee • Lack of collective vision (for its protection) between all parties with the potential to impact RAKWS • Lack of comprehensive baseline data covering integrated elements of its physical and biological characters • Lack of knowledge-sharing of existing data/information

OPPORTUNITIES

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none"> • Hop on hop off visitors to site via water taxis • Habitat restoration • Funds from developers for habitat restorations • TSE outlet from Al Awir TP to Dubai Creek in close proximity to site for wetland restoration • Center for arid zone wetland research • Already experienced > 90,000 visitors to the the hides • PR opportunity for developers in marketing • International recognition at COP13, world leadership on managing wetland in a highly urbanized setting 	<ul style="list-style-type: none"> • Flagship Ramsar site – to serve the whole region. Best practice. • Build world’s best visitor centre – could serve the whole region • Expand awareness and educational opportunities – ecosystem based • Increased visitor numbers (currently 90k) – predicted visitor numbers 250,000 a year. Capacity of 2 thousand (inside) + 1-2 thousand outside • Habitat creation/enhancement eg 90ha associated visitor centre, expand mudflats, • Potential availability of funding - leverage developer contributions, set up trust fund, • Improved governance - ratify convention, improved stakeholder participation and engagement, • Increase awareness and conservation action through the COP 13. Political support • Expo 2020 • Research potential • UAE Vision and Dubai Vision • Marketing and branding • CEPA – communication, education, participation and awareness and involve the local coummity • Develop management plan – include limited access areas (sensitive zonation) • Health and well-being opportunities • Linkages/synergies with other protected areas • Driver for policy and capacity building 	<ul style="list-style-type: none"> • To specify and ensure minimum treated sewage effluent (TSE) discharge to RAKWS/Creek to ensure sufficient organic loadings for wetland bird feeding purposes • Potential for Ministry of Climate Change & Environment (MoCCA) to encourage the production of planning guidelines for wildlife protection areas • Potential to create a wetland centre at RAKWS for education, research and tourism • MoCCA driven National Biodiversity Action Plan • Habitat loss mitigation programmes • Ramsar Convention of Parties (COP 2018) meeting to be held in Dubai in October 2018, that provides an opportunity to highlight the pressures on RAKWS and the need to have effective protection in place before the international meeting. • Potential to include local conservation issues in the local Emirati schools’ curriculum 	<ul style="list-style-type: none"> • Habitat enhancement • Potential to be developed as an iconic site fulfilling the sustainability elements of the vision of Dubai • Cooperation of all stakeholders in the common goal of protecting and enhancing RAKWS • Promoting education and research at secondary and tertiary level, research projects • Showcasing the sustainable developments at EXPO 2020, COP2018 • Bring in the Tourism Sector to support increasing awareness efforts • Promoting sustainability in maritime transport using solar-powered boats

THREATS

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none"> • Developers not clear about what they can and cannot do and thus potential to lose their support for the site • Overgrowth of mangroves (but can also be an opportunity) • Climate change, sea-level rise and loss of mudflats • Vulnerable to disturbance by developers and maritime traffic • Feral animals • Light pollution, WQ issues 	<ul style="list-style-type: none"> • Development encroachment and pace of development. Cumulative impacts • Lack of funding and wider resources • Increased pressure as a result of new developments (inc canal) - increased boat traffic • Lack of DM resources (labour, funding and empowerment) • Lack of co-ordination • Disturbance – internal and external. Include air traffic • Invasive species • Pollution – air, TSE, water, sediment • 6th Creek crossing • Lack of long term monitoring plan • Lack of management implementation 	<ul style="list-style-type: none"> • Poor water quality in the Creek • Excessive TSE inputs, often of poor standard from Al Awir STW (due to overloading) • Major planned developments impinging in and around RAKWS • Increasing boat traffic • Increasing air traffic especially low flying helicopters • Introduction of alien species • Red fox predation • Red tides • Progressive urbanisation • Climate change • Habitat loss 	<ul style="list-style-type: none"> • Rapid pace of encroachment (developers), e.g. helicopter flights over the RAKWS site (beyond physical boundaries of private land) • Loss of habitats and species • Shift in species diversity and composition (more tolerant ones surviving) • Increase in light intensity, noise levels, physical obstructions to the bird flight path, shiny glass building sites • Water/air pollution • Increasing maritime and air traffic volume, more waves entering the sanctuary • Invasive species both terrestrial and aquatic • Lack of cooperation between stakeholders with the same vision to protect RAKWS

ANNEX 10: Steering Committee Terms of Reference

The following provide information on the terms of reference established at other Ramsar Sites across the world. The examples demonstrate that there are many different ways to define the roles and responsibilities associated with a steering committee.

Beeshazar and Associated Lakes, Nepal

The Steering Committee is responsible for and expected to:

- i. Prepare operational plan of Bishhazar and associated lake and approve from the management board.
- ii. Implement approved programme activities
- iii. Work under the overall guidance and supervision of the BLMB.
- iv. Work closely with concerned Buffer Zone User Committees and other local stakeholders.
- v. Identify needs and organize provision of specific training or technical inputs where appropriate
- vi. Prepare and up-date progress report and submit to BLMB
- vii. Prepare financial and personnel guidelines of the committee
- viii. Hire staffs for programme implementation as per need
- ix. Raise and mobilize funds to implement plan.
- x. Strengthen coordination at all levels for planning and implementation

Western Port Ramsar Site Management Plan, Australia

A Ramsar Coordinating Committee comprising representatives of key stakeholder groups will be convened.

This integrated approach builds on previous and current collaboration practice in the region, evident most recently in the strong participation of delivery partners in the development of the Western Port Ramsar Site Management Plan. The Ramsar Coordinating Committee will be responsible for coordinating specific aspects of implementation within the themes of the Western Port Ramsar Site Management Plan. These responsibilities will include developing:

- annual action plans
- targeted investment proposals
- integrated delivery arrangements
- coordinated monitoring and evaluation of implementation, including integrated reporting against targets, and
- reviewing Management Plan progress bi-annually.

- Preparing project investment proposals

Riverland Ramsar Site, Australia

The Riverland Ramsar Site Management Plan Steering Committee membership consisted of landowner representatives (7) and a representative from the following organizations: Department of the Environment, Water, Heritage and the Arts (Australian Government), Department for Environment and Heritage (South Australian Government), Renmark Paringa District Council, The Department of Water, Land and Biodiversity Conservation (later became the South Australian Murray-Darling Basin Natural Resource Management Board), Renmark to the Border Local Action Planning Committee and River Murray Catchment Water Management Board.

The Riverland Ramsar Site Management Plan Steering Committee operated under the following terms of reference;

- Undertake community consultation that is effective and equitable.
- Define an appropriate Ramsar boundary that maintains the ecological integrity of the Ramsar Site and establishes community goodwill.
- To provide direction on the preparation of the Ramsar Management Plan in accordance with the Australian Ramsar Management Principles.

State of Jersey Ramsar Management Authority (responsible for four Ramsar Sites)

The objectives of the Management Authority are:

- To provide a strategic and inclusive approach to the development and publication of Ramsar Management Plans Jersey which will provide a range of benefits for multiple users and the natural, historic and cultural marine environment compatible with the established principles of the Ramsar Convention;
- To promote and foster an informed debate, and disseminate information, about the role of Ramsar sites in the management of the marine environment around Jersey;
- To seek ways of establishing consensus amongst stakeholders;
- To support the delivery of projects which are relevant to the purpose of the Authority;
- To ensure compliance with relevant local, national and international legislation, policies and best practice.

Responsibility of the Authority members are:

- To work together to deliver the objectives of the Authority;
- To update other members on relevant developments regularly;
- To report back from the meetings to their members/management/colleagues;
- To act as a point of contact and feedback on the Authority for organisations and

interested parties within their sector to ensure the widest possible stakeholder engagement;

- v. To provide expertise and guidance in their particular field;
- vi. To use only suitably experienced and briefed staff and representatives;
- vii. To operate within the confines of all relevant legislation;
- viii. To attend Authority meetings

Kota Kinabalu Wetlands, Malaysia

Sabah Wetlands Conservation Society (SWCS) took over the management of Kota Kinabalu Wetlands (KKW) from Likas Wetland Sanctuary Management Committee (LWSMC), with the objectives:

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

ANNEX 11: RAKWS Baseline wetland inventory and assessment.

The baseline inventory and assessment will be used to select outcome and output performance indicators for the long-term monitoring program. The following information should be collected as part of the baseline wetland inventory.

A. Changes to water regime

- i. Undertake a detailed baseline study to document the duration and extent of the availability of intertidal and shallow subtidal flats to foraging waterbirds (varies with size of bird and foraging behavior) and relate to slope. This should be done over daily tidal cycles that range from extreme lows to high. This will permit a prediction of impact of any change in base level of low water resulting from the construction of Dubai Water Canal and Meydan Canal, and allow a prediction of use of restored/created habitat
- ii. Related to above, develop a surface profile of intertidal and subtidal flats, mangrove areas, and constructed flamingo lagoon (south side of RAKWS);
- iii. Determine the variation in coverage (area and depth) of the sabkha and flamingo lagoon with different daily volume discharges from the pumping station.

B. Water quality

- i. Undertake an analysis of quantity and quality discharge from pumping station (as per DMWQO standards) – continuous recording using data loggers for volume, salinity, temperature, pH, percent dissolved oxygen saturation, turbidity, and conductivity; biweekly samples for BOD, total suspended solids, total dissolved solids, chlorine, nitrate, nitrite, ammonia, phosphates, total phosphorus, surfactants, e.coli, and total petroleum hydrocarbons; monthly samples for aluminum, arsenic, cadmium, chromium, copper, iron, mercury, selenium, and zinc;
- ii. Determine the variation in water quality (as per above) with extent (area and depth) as per A (iii) above;
- iii. Undertake an analyses of water quality in Dubai Creek near the entrance of the Dubai Water Canal and proposed entrance of the Meydan Canal, and mid-channel within the RAKWS (as per DMWQO standards) - continuous recording using data loggers at surface, mid- column and bottom (within 10 cm) for salinity, temperature, pH, percent dissolved oxygen saturation, turbidity, and conductivity; biweekly samples at surface, mid-column and bottom (within 10 cm) for chlorophyll-a, BOD, total suspended solids, total dissolved solids, chlorine, nitrate, nitrite, ammonia, phosphates, total phosphorus, surfactants, e.coli, and total petroleum hydrocarbons; monthly samples for aluminum, arsenic, cadmium, chromium, copper, iron, mercury, selenium, and zinc.
- iv. Examine the phytoplankton and zooplankton diversity and biomass biweekly near

the proposed entrance of the Meydan Canal, and mid-channel within the RAKWS at the surface, mid-column and bottom (within 10 cm).

v. Note: Additional discussion on timing of sampling with respect to tidal stage is required, i.e. high, mid or low tide periods or a combination.

C. Changes to Habitat

Undertake a detailed baseline to document extent, quantity, and use of habitat features:

1. Intertidal and lagoon flats:

- i. Spatial and temporal variability (within and between seasons) of burrowing invertebrate species abundance and diversity related to soil structure;
- ii. Spatial and temporal variability (within and between seasons) of invertebrate and algae species abundance and diversity within the water column
- iii. Spatial and temporal (within and between seasons and tidal cycle) distribution and abundance of foraging and roosting waterbirds by species;
- iv. Fish distribution and abundance – importance as nursery.

2. Mangrove forest:

- i. Accurate mapping of extent;
- ii. Use by waterbirds and fish (diversity and abundance) seasonally – quantify;
- iii. Structure of soils, nutrient and organic content;
- iv. Recording and understanding the cause and extent of die-back.

3. Sabkha:

- i. Vegetation mapping and relate to depth to groundwater and salinity;
- ii. Use by waterbirds and other fauna fish (diversity and abundance).

4. Dredge spoils:

- i. Extent within RAKWS, vegetation cover mapping, and use by wildlife (any unique invertebrates that may be lost if spoils removed?)

D. Human Usage:

- i. Assess the range of people that visit RAKWS and how they access the site and use the infrastructure.