

# SITE INFORMATION SHEET TEMPLATE

## in support of a formal proposal to nominate a site for inclusion in the IOSEA Marine Turtle Site Network

The completed Information Sheet is intended to be submitted to the IOSEA Secretariat, through the national IOSEA Focal Point. As the contents will serve as the primary basis for evaluation of site nominations, responses should be as comprehensive as possible.

### 1. Date of submission

15/08/2014 – Final revision 11/03/2015

### 2. (DD/MM/YYYY):

*The date on which the Site Information Sheet was completed.*

### 3. Name and address of compiler(s), if not the IOSEA Focal Point

*Name and contact information (including affiliation) for the individual(s) who prepared this information sheet, for formal submission through the national IOSEA Focal Point.*

Name:	Himansu S Das, Edwin Mark Grandcourt, Ayesha Yousef Al Blooshi and Shaikha Salem Al Dhaheri	
Functional Title:	Terrestrial and Marine Biodiversity Sector	
Organization:	Environment Agency - Abu Dhabi	
Address:	PO Box 45553, UAE	
Email:	hsdas@ead.ae	Tel. / Fax: +97126934654

### 4. Country: *The name of the country in which the site is located.*

United Arab Emirates (UAE)

### 5. Name of site: *The name of the site (alternative names should be given in brackets).*

Bu Tinah Shoal

### 6. Geographical coordinates

*The geographical coordinates (latitude and longitude) of the **approximate centre** of the site, expressed in 'decimal degrees'. For example, the location of the IOSEA Secretariat in Bangkok is 13.763483°, 100.508157°. If the site consists of two or more discrete units, the coordinates of the centres of each of these units should be given. (Add any additional coordinates in a separate annex.)*

**Decimal  
Degrees**

N53.078

,

E24.609

### 6. General location

*Describe the general location of the site. This should include the site's distance (in a straight line) and compass bearing from the nearest significant administrative centre, town or city. The human population of the listed centre and its administrative region should also be stated. (See also the information requested under point 24: Site Map)*

The Bu Tinah Shoal is located in the Western Region of Abu Dhabi, UAE within an established marine protected area - the UNESCO designated Marawah Marine Biosphere Reserve. At a distance of almost 130km from Abu Dhabi, the shoal can be accessed easily from the coastal towns of Al Mirfa and Jebel Dhana. The shoal has a small island also called Bu Tinah, which is uninhabited except for a field station that accommodates field staff of the Marawah Marine Biosphere Reserve. The Bu Tinah Shoal and its surrounding waters constitute a core zone within the biosphere reserve within which human activities are limited.

*In the remainder of this document, the codes that appear in square brackets alongside each of the titles below refer to sections of a separate document describing the evaluation criteria, which will be informed by the proponents' submission. **Proponents are encouraged to consult the Evaluation Criteria document** <sup>1</sup> **for more explanation of the rationale behind each criterion and of the detailed information to be used for evaluation purposes.***

## 7. Area [N3]

*The approximate surface area of the site to be included in the network (in hectares or square kilometers). If the site is an island, indicate also the total surface area of the coastline directly relevant to turtle conservation. Area should correspond to the map provided under point 24.)*

The dimensions of the shoal are 20km x 20km. The total surface area of the proposed site is 400km<sup>2</sup>

## 8. Physical features of the site [EB1- 4, S5, S6, N1]

*Describe the principal physical characteristics of the site, including the marine turtle habitat types occurring at the site. List the ecosystem types included in the site (nesting beach, foraging habitat, reproductive habitat and migratory habitat) and the approximate area in hectares (or km<sup>2</sup>) of each habitat type included. Indicate whether the site's physical attributes are shared by other sites in the country, or are exceptional/unique.*

The oceanographic conditions of the Southern Arabian Gulf make it an extremely hostile environment for organisms to thrive. The ability of flora and fauna to grow well under harsh environmental conditions (high temperature, high salinity, high evapo-transpiration and no freshwater inflow) is what makes this shoal unique. Although the islands and shoals of the southern gulf experience similar conditions, Bu Tinah Shoal is a distinctive example because of the surrounding environment and marine life as well as the terrestrial fauna and flora. Despite extreme temperatures and salinities, habitats such as coral reefs, seagrass meadows and mangroves survive, allowing several avian and marine organisms to live there, including migratory and endangered species such as sea turtles and dugongs (Miller, 1989; Nasser, 2014).

The Arabian Gulf is a unique environment that experiences very high salinities. This phenomenon is a result of very high rates of evaporation in the Gulf with limited freshwater input and limited circulation from the Arabian Sea. Other than rainfall, the only source of freshwater comes from Shatt al – Arab, which carries waters from the Tigris, Euphrates and Karun rivers and this only makes up for 28% of the water lost due to evaporation. Additionally, due to the fact that the Arabian Gulf is a semi-enclosed sea, opening only at the narrow Straits of Hormuz, this limits flushing and circulation between the Arabian Sea and Indian Ocean (Sheppard et al., 2009). Thus, organisms that survive here need to be adapted to salinity stresses that are above the global averages.

The Bu Tinah Shoal supports a high density of foraging green and hawksbill turtles; and hawksbills nest on the island of Bu Tinah between April and June every year. The nesting beach is 1 km long. The shoal encompasses several shallow water marine habitats that support a number of other marine species. The habitats include fringing and patch reef (15km<sup>2</sup>), macro-algae and seagrass (45km<sup>2</sup>), hard and unconsolidated bottom (340km<sup>2</sup>).

<sup>1</sup> Criteria for the Evaluation of Nominations to the Network of Sites of Importance for Marine Turtles in the Indian Ocean – South-East Asia Region, IOSEA Marine Turtle MoU Secretariat. <http://ioseaturtles.org/sitenetwork-evaluation.php>

## 9. Ecological resources [EB1- 4, S5, S6, N1]

Describe the ecological resources at the site, including marine turtles and other noteworthy biodiversity. Describe the marine turtle species / management units occurring at the site, if they are known. Where possible, provide an abundance estimate for each marine turtle species/management unit (e.g. in terms of average number of turtles nesting annually or foraging). Evaluation Criteria EB1a and EB1b offer guidance on how to describe the relative importance of a site frequented by one or more marine turtle species. Indicate whether the site's ecological resources are shared by other sites in the country or are exceptional/unique.

The shallow sea around Bu Tinah is characterized by the presence of extensive coral reefs, seaweed beds and seagrass meadows as well as healthy mangrove stands. These habitats support a significant spectrum of marine life including seabirds and migratory waders, a large population of globally endangered turtles (hawksbill and green), dugongs, and commercially important fishes, in addition to many species of invertebrates including crustaceans, molluscs (gastropods and bivalves) and echinoderms (brittle star, sea cucumber and sea urchin).

Coral reefs around the island are extensive and mainly consist of hard corals (*Platygyra lamellina*, *Porites nodifera* and *Porites harrisoni*). Corals at Bu Tinah are special because they survive in a very warm and saline environment. They are subjected to temperatures above their optimal range and suggested tolerance levels, which makes them a living laboratory for climate change studies.

Three species of seagrass (*Halodule uninervis*, *Halophila ovalis* and *Halophila stipulacea*) and at least 21 species of marine algae (predominantly *Harmophysa* sp., *Sargassum* sp. and *Padina* sp.) occur around Bu Tinah. These meadows provide food for a variety of marine wildlife including globally threatened sea turtles and dugongs, and shelter several marine invertebrates (EAD, 2013).

A natural mangrove forest habitat represented by *Avicennia marina* occurs along the backwaters of Bu Tinah. Due to regular inundation, the mangroves are mature, reaching an average height of 5 metres. The mangroves support a variety of wildlife including shoreline birds, fish and fish larvae, and crustaceans.

Dugongs are frequently sighted around the Island of Bu Tinah. Abu Dhabi hosts the second largest dugong population outside of Australia, of which 30% occur in the waters surrounding Bu Tinah. Extensive seagrass meadows and a largely undisturbed environment in the area have created a natural sanctuary for the dugongs (EAD, 2014a).

Indo-Pacific humpbacked dolphin (*Sousa chinensis*), common bottlenose dolphin (*Tursiops truncatus*) and Arabian common dolphin (*Delphinus tropicalis*) occur within the shoal. Humpback dolphins are observed close to the island, and common dolphins occur at the periphery towards the deeper waters, while bottlenose dolphins are common within the shoal.

Two species of sea turtles, green and hawksbills, are predominant in Abu Dhabi waters. Incidental sightings, trawler by-catch from international waters and historical records of stranded turtles show that species such as loggerhead, olive ridley and leatherbacks, though rare, are sighted occasionally (Miller et al., 2004, EMEG Annual Report, 2012, EAD, 2014b).

Every year, hawksbill turtles come to nest on Bu Tinah Island. Annual monitoring on the sandy beaches of the island reveals that it is a medium-density (9 to 16 nests with an average of 11 nests per year) nesting beach for these IUCN critically endangered species. In addition, a very high number of foraging (green and hawksbill) turtles (estimated at 810, aerial survey of marine wildlife - winter 2014) are observed in the island's coastal waters (EAD, 2014a). Although Bu Tinah Shoal and other off-shore islands of UAE host a low number of nesting hawksbill turtles, the value of the Bu Tinah Shoal and the surrounding area is its use as a foraging area for both green and hawksbill turtles (Miller et al., 2004). Recent satellite telemetry work has shown that the off-shore areas of UAE provide significant foraging for both species (Pilcher et al., 2014). Conventional flipper tags from green turtles tagged in Ras al Hadd in Oman and Karachi in Pakistan have been recovered off Bu Tinah, which emphasizes the regional importance of Bu Tinah as a foraging ground. A recent study by EWS-WWF (EWS-WWF, 2013) has also emphasized the importance of Bu Tinah Shoal as a foraging site for both green and hawksbill turtles in the Gulf. Several studies undertaken in the region (Miller et al., 2004, Das, 2007, Pilcher et al., 2014) in the last decade stress the importance of Bu Tinah Shoal as a site for conservation for its rich biodiversity.

Bu Tinah Shoal harbours large numbers of bird species especially sea birds that are present mainly during the winter months due to the availability of abundant food in shallow waters of the shoal. It is

an important wintering and stopover site for migratory water birds, a breeding site for the Ospreys (*Pandion haliaetus*), Western-reef Heron (*Egretta gularis*), Bridled Tern (*Onychoprion anaethetus*), White-cheeked Tern (*Sterna repressa*) and Greater Flamingo (*Phoenicopterus roseus*), and a roost site for the Socotra Cormorant (*Phalacrocorax nigrogularis*) supporting about 20,000-25,000 roosting birds.

Fish that are encountered in and around Bu Tinah all year round include Orange spotted grouper (*Epinephelus coioides*), Spangled emperor (*Lethrinus nebulosus*) and Sordid sweetlips (*Plectorhinchus sordidus*). Being part of the core area of the UNESCO-designated Marawah Marine Biosphere Reserve, the proposed site is a no-take-zone where any form of fishing is strictly prohibited.

Bu Tinah is within the core zone of UNESCO-designated Marawah Marine Biosphere Reserve and is free from anthropogenic impacts.

## 10. Cultural importance [S1]

*Describe the cultural / religious / spiritual importance of the site (e.g. in terms of historical associations, spiritual traditions, religious significance etc.), as well as non-consumptive traditional beliefs/practices, in relation to marine turtles. If possible, provide references to published/unpublished historical or other accounts, which may give an indication of relative importance in a national context.*

Bu Tinah Shoal was an important traditional fishing area for local populations living on the surrounding islands and mainland coast. Currently, Bu Tinah Shoal is within the core zone of the UNESCO-designated Marawah Marine Biosphere Reserve and fishing is strictly prohibited. However, local people fish around Bu Tinah Shoal (outside the core zone) using traditional gear, which is safe for marine megafauna, namely sea turtles, dugongs and dolphins.

## 11. Jurisdiction [G1]

*The name of the government authority with: (a) territorial jurisdiction over the site, e.g. state/province, region or municipality etc.; and the name/description of the authority with (b) functional jurisdiction for conservation purposes, e.g., Department of Environment, Department of Fisheries, traditional owners, etc.*

Bu Tinah Shoal comes under the administrative control of Abu Dhabi Emirate (Western Region Development Council). Since the area is part of the core zone of the Marawah Marine Biosphere Reserve (MMBR), the Environment Agency - Abu Dhabi is responsible for implementing conservation and management actions to safeguard habitats and species within the shoal, in particular, and the MMBR, in general. The Environment Agency - Abu Dhabi is the environmental regulator for the Emirate of Abu Dhabi and has a mandate, which includes the management of all living resources. The guidelines applying to the Marawah Marine Biosphere Reserve are attached for reference (EAD, 2008).

## 12. Management authority [G1]

*Name, address and contact details of the body responsible for the direct local conservation and management of the site.*

The Environment Agency – Abu Dhabi is the organization responsible for the management of the Marawah Marine Biosphere Reserve. Bu Tinah Shoal is in the core zone of the reserve. The section which is directly responsible for management is:

Terrestrial and Marine Biodiversity Section,  
Environment Agency - Abu Dhabi,  
PO Box 45553,  
Abu Dhabi,  
UAE

### 13. Current protected status and governance framework [G1, S4]

*Describe any applicable legislation / regulations (or traditional laws / norms) relevant to the protection / conservation of marine turtles and their habitats at this site, and comment on their effectiveness. Include details of how any incompatible human activities and/or uses of land and sea at the site are prohibited or mitigated.*

*Mention any nationally relevant protected area status, international conservation designations and, in the case of transboundary sites, bilateral or multilateral conservation measures which pertain to all or part of the site. If a protected area or reserve has been established (at a national/regional level), give the date of its establishment and size. If only a part of the site is included within a protected area, the area of marine turtle habitat that is protected should be noted.*

*International designations may include sites listed under the UNESCO/World Heritage Convention, Man and Biosphere Reserve Network, Ramsar Convention, other site conservation networks, etc. Where appropriate, list the IUCN (1994) protected areas management category(ies) that apply to the site.*

There are several laws/ regulations/decrees and MoUs to protect this unique site for foraging turtles. Federal Laws 23 and 24 (1999) protect all turtle species and associated habitats. Emiri decree no. 18 on the establishment of Marawah Marine Biosphere Reserve provides protection to all species and their critical habitats within the designated boundary of the reserve. Upon designation by UNESCO, the Environment Agency – Abu Dhabi developed a Biosphere Reserve Management Plan, following international best practice.

The UAE is a signatory to the IOSEA Marine Turtle MoU and UNEP CMS Dugong MoU. Actions in the Conservation and Management Plan of the MoUs are being implemented by the Environment Agency – Abu Dhabi and other government and non-government agencies in the UAE. These actions include conservation of species (for example foraging and migrating turtles) and their critical habitats.

Besides having Federal Laws 23 and 24 (1999) to protect wild fauna and their natural habitats, the UAE is a signatory to several international and regional conventions on biodiversity including CITES, CBD, the IOSEA Marine Turtle MoU and the UNEP CMS Dugong MoU and has been implementing the conservation actions under the conventions to safeguard the country's biodiversity. Bu Tinah Shoal is known both in the region and worldwide for its foraging turtle and dugong populations.

### 14. Land/sea tenure/ownership [G1]

*Provide details of ownership of the site and ownership of immediate surrounding areas (e.g., state, provincial, private, etc.) which may have a bearing on the conservation of the site. Describe any local or customary law relevant to the land / sea tenure, and explain any terms that have a special meaning in the country or region concerned.*

Bu Tinah Shoal is under State ownership (Emirate of Abu Dhabi) and within the Marawah Marine Biosphere Reserve. Management of the site is the responsibility of the Environment Agency - Abu Dhabi.

### 15. Socio-economic values and land/ocean uses and activities within the vicinity of the site [EB4, G5, S2, S5, S6]

*Describe, in general terms, the principal social and economic values of the site, including human activities and land uses (past, current and planned) within the vicinity of the site (e.g., agriculture, fishing, resource extraction, grazing, water supply, urban/industrial development, tourism, outdoor recreation, education and scientific research), irrespective of whether or not they are considered to directly impact the conservation of marine turtles. Some indication of the relative importance of each form of land use should be given, whenever possible.*

The site, being located in the core zone of a biosphere reserve, is used only for education and scientific research. There are no other human activities within the area.

Fishing is conducted in the surrounding areas outside of the core no-take zone and there is an oil and gas processing facility at Mubarras Island, 25km to the east of the shoal. There are three hotels on Sir Baniyas Island, which is located 50km to the south-west, which have associated touristic activities such as recreational fishing, scuba diving and sailing.

**16. Factors adversely affecting the site's overall ecological character, as well as threats to marine turtles and their habitat at the site [EB4, S2]**

*Describe the human and natural factors negatively affecting the ecological character of the site, both within and in the vicinity of the site. These may include existing, new or changing activities/uses, major development projects etc., which have had, are having, or may have a detrimental effect on the natural ecological character of the site. For all adverse and change factors reported, supply measurable/quantifiable information (if such data exist), as well as information on the scale, extent and trend of the change factor and its impact. For example, describe in terms of the percentage of coastline (or other area) modified/affected by a particular threat; for egg collection, describe in terms of number of nests, per species, per year. Mention also data-deficient threats, where a threat is known to be present but is not quantified. Collectively, this information should provide a basis for monitoring of ecological character of the site.*

There are no known human activities within the area. The island and surrounding waters including the shoal are managed under a biosphere reserve management plan. The area has been monitored by researchers since 2002 (aerial and field surveys). Natural stresses include high water temperatures, high salinity, high evapo-transpiration and low rainfall. Human activities in the vicinity (outside the shoal) relate to oil fields, seismic and other surveys for oil exploration and the movement of oil tankers. Fishers, using nets outside of the core area are a threat to marine turtles.

**17. Conservation and management interventions taken [G2, G3]**

*Describe conservation and management interventions already taken at the site to address threats. Note that some of this information may have been recorded in abbreviated form in the IOSEA Site Data Sheets, available online ([www.ioseaturtles.org/reporting](http://www.ioseaturtles.org/reporting)). Any application of coastal and marine spatial planning, or integrated coastal/marine zone management planning, involving or affecting the site should be noted.*

*Describe the management planning process for the site, including the state of implementation of any management plan that has been developed and approved for the site. Describe any other conservation measures taken at the site, such as restrictions on development, management practices beneficial to wildlife, closures of hunting, etc. (Note that information on any monitoring schemes and survey methods should be given under point 19, below.)*

*Where applicable, describe the involvement of local communities and indigenous people in the participatory management of the site, including co-management activities, surveillance and enforcement, and performance evaluation.*

Bu Tinah Shoal is within the Marawah Marine Biosphere Reserve and has a management plan that is implemented by the Environment Agency - Abu Dhabi. While research and monitoring are done by the agency, surveillance and enforcement are carried out by CICPA (Critical Infrastructure and Coastal Protection Authority) within the biosphere reserve including Bu Tinah Shoal. The Conservation and Management Plan (CMP) of the IOSEA Marine Turtle MoU and the Action Plan of the UNEP/CMS Dugong MoU are being implemented at the site. Human activities, including coastal developments, are restricted as per the Biosphere Management Plan (EAD, 2008)

Conservation of these species and protection of their habitats are part of the Environment Agency's five-year strategic plan.

**18. Conservation interventions proposed, but not yet implemented [G2, G3]**

*Provide details of any concrete conservation measures that have been proposed, or are in preparation, for the site, including any proposals for legislation, protection and management. Summarize the history of any longstanding proposals that have not yet been implemented, and differentiate between those proposals that have already been officially submitted to the appropriate government authorities and those which have not as yet received formal endorsement, e.g., recommendations in published reports and resolutions from specialist meetings. Also mention any management plan that is in preparation but has not yet been completed, approved or implemented.*

There are no pending conservation, legislation or management proposals for the site.

**19. Current / proposed scientific research and monitoring [G4]**

*Describe any current and/or proposed scientific research on marine turtles and their habitats, as well as information on any special facilities for research. In particular, describe past and current marine turtle monitoring activities at the site (e.g., tagging, satellite tracking, genetic sampling, nesting and foraging ground surveys, ongoing beach monitoring, etc.). Describe the survey methodology in sufficient detail to allow for an assessment of its efficacy. Indicate the number of years of continuous monitoring, and whether data have been used to estimate trends in the size of the management unit. Cite relevant published papers in support of the submission.*

The Environment Agency- Abu Dhabi has been monitoring marine wildlife and habitats under various research programmes since the year 2000. The programmes include species, namely sea turtles (green and hawksbill), dugong and dolphins; and their habitats.

Monitoring of these species and their habitats involves regular seasonal aerial surveys and field surveys to determine abundance and distribution of marine wildlife including dugongs and foraging marine turtles (by boat and vehicle along the coast) and has been continuing for over 13 years (Das, 2007, Das et al., 2013) The findings of these studies were instrumental in the establishment of several marine protected areas including the Marawah Marine Protected Area, which was later designated as a biosphere reserve by UNESCO. Besides, the research programmes revealed the abundance and distribution of several important species such as sea turtles and dugongs.

Foraging sea turtles and dugongs are monitored using helicopter aerial surveys (EAD, 2014a). Nesting turtles (assessed by beach monitoring of nesting beaches) are recorded between March and July. Hawksbill is the only species that nests in Bu Tinah. Several other research programmes that have been going on within the biosphere reserve are the “Mapping and characterization of Coastal Wetlands” and a “Coral reef monitoring programme”.

All the initiatives will continue as long-term programmes. Satellite tagging of post-nesting hawksbills was initiated in the UAE in 1999. The recently concluded “Gulf satellite tagging program” involving several range states within the Gulf region revealed important information on migration patterns of post-nesting hawksbills (Pilcher et al., 2014). The UAE was an active partner of this programme.

## **20. Current / proposed communication, education, and public awareness activities [S3]**

*Give details of any existing and/or planned site-based programmes, activities and facilities for communication, education and public awareness, including training. Comment on potential opportunities for future educational and outreach activities at the site.*

As part of communication, education and public awareness-raising programmes, stakeholder involvement, teacher training, field visits for students, field trips of media personnel and lectures and presentations have been carried out. The conservation/action plans of the IOSEA Marine Turtle MoU and the UNEP CMS Dugong MoU emphasize the importance of such activities and the UAE is committed to implementing those actions.

Events such as beach cleaning and launching awareness-raising campaigns in schools and public places are regular activities by various government and non-government agencies of the UAE. Use of social media, teacher training courses, the distribution of brochures, posters and presentations are the common media for spreading awareness followed in the UAE.

Beach cleaning (manually) is done three months prior to nesting of the turtles by the island managers and / or NGOs. Several education and awareness-raising programmes are conducted involving various stakeholders such as students, teachers, fishermen and island-dwellers within the Marawah Marine Biosphere Reserve including Bu Tinah Shoal.

## **21. Financial resources available for management of the site and other activities [G5]**

*Identify human and financial resources (including in-kind contributions) available to support immediate and near-term activities, as well as resources available to sustain site-based activities in the longer-term (e.g. in relation to monitoring, management interventions, surveillance and enforcement, and performance evaluation).*

An annual budget is available for the management of the biosphere reserve and protected areas. Besides funding for scientific research, resources for the monitoring of species and habitats are available from the government and some activities are sponsored by external donors under corporate social responsibility schemes. The commitment for the budget by the government is long-term as the activities fall under the approved strategic plan.

## 22. Additional resource needs at the site [G5]

Where specific needs are identified (e.g. skilled personnel, specialised training, facilities, field equipment etc.) indicate how marine turtle conservation activities are presently impaired on account of their unavailability (e.g. inability to carry out regular surveys, to conduct certain types of research, to monitor certain parts of the range etc.) This information may be useful for compiling a general picture of deficiencies and resource needs that could be presented to potential programme sponsors.

The study of foraging habitat, ecology and biology of foraging species is new in the region. Therefore, training and capacity-building will be required to provide information for conservation and management.

## 23. References [e.g. S1, G2, G4]

List key references relevant to marine turtle records and to the site, including management plans, major scientific reports, and bibliographies. When a large body of published material on the site is available, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies. Reprints or copies of the most important literature should be appended whenever possible. Provide website addresses of references where available.

- Das, H.S. 2006. Sea Turtles of the United Arab Emirates. IOSEA Newsletter, pp1-12
- Das, H.S. 2007. Sea Turtles. In "Marine Environment and Resources of Abu Dhabi". Edited by. T.Z. AlAbdessalaam. Motivate Publishing. Pp.166-177.
- EAD. 2008. Marine Protected Areas. Guidelines for Monitoring Compliance and Surveillance. Unpublished document. 14 pages.
- EAD. 2009a. Bu Tinah Shoals. Campaign document for selection to 7 Natural Wonders of Nature. 5 pages.
- EAD 2009b. Bu Tinah Shoals. Campaign document for selection to 7 Natural Wonders of Nature. 7 pages.
- EAD. 2013a. Seagrass of Abu Dhabi Waters. Unpublished Annual Report of the Environment Agency Abu Dhabi. 10 pages.
- EAD. 2014a. Status of Dugongs in the UAE. Unpublished Annual Report of the Environment Agency Abu Dhabi. 14 pages.
- EAD. 2014. Status of Sea Turtles of Abu Dhabi. Unpublished Annual Report of the Environment Agency Abu Dhabi. 12 pages.
- EWS-WWF, 2013. Gulf Sea Turtle Tracking Project. 2013. Final Technical Report. 22 pages.
- Maps of distribution of sea turtles during aerial surveys (summer and winter) in Bu Tinah Shoal
- Map of sea turtle nesting location of Bu Tinah island
- Miller, J.D., Preen, A., Loughland, R.A., Youssef, A.M. and Darwisch, A.M. 2004. Marine turtles and sea snakes of Abu Dhabi Emirate In: Loughland, R.A., Al Muhairi, F.S., Fadel, S.S., Almeahdi, A.M. and Hellyer, P. (eds), Marine Atlas of Abu Dhabi. Emirates Heritage Club. 2004.
- Miller, J.D. 1989. Marine Turtles. Volume 1: An assessment of the conservation status of Marine Turtles in the Kingdom of Saudi Arabia. MEPA, Jeddah, KSA. 289p.
- Federal Law No. 23 (1999)
- Federal Law No. 24 (1999)
- Marine Protected Area Guidelines
- Brochures as part of education awareness materials
- PILCHER 2013 CITED IN THE TEXT NEEDS TO BE INCLUDED.
- Pilcher N.J., Marina Antonopoulou, Lisa Perry, Mohamed A. Abdel-Moati, Thabit Zahran Al Abdessalaam, Mohammad Albeldawi, Mehsin Al Ansi, Salman Fahad Al-Mohannadi, Nessrine Al Zahlawi, Robert Baldwin, Ahmed Chikhi, Himansu Sekhar Das, Shafeeq Hamza, Oliver J. Kerr, Ali Al Kiyumi, Asghar Mobaraki, Hana Saif Al Suwaidi, Ali Saqar Al Suweidi, Moaz Sawaf, Christophe Tourenq, James Williams. 2014. Identification of Important Sea Turtle Areas (ITAs) for hawksbill



turtles in the Arabian Region. Journal of Experimental Marine Biology and Ecology. Volume 460, November 2014, Pages 89-99.

Sheppard C, Al-Husiani M, Al-Jamali F, Al-Yamani F, Baldwin R, Bishop J, Benzoni F, Dutrieux E, Dulvy NK, Durvasula SR, Jones DA, Loughland R, Medio D, Nithyanandan M, Pilling GM, Polikarpov I, Price AR, Purkis S, Riegl B, Saburova M, Namin KS, Taylor O, Wilson S, Zainal K. 2009. The Gulf: a young sea in decline. Mar Pollut Bull. 2010 Jan; 60(1):13-38pp.

Marawah Marine Biosphere Reserve: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/arab-states/united-arab-emirates/marawah/>

MMBR, UNESCO: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/arab-states/>

## 24. Site map [N2, N3]

The most detailed and up-to-date map of the site available should be appended to the Site Information Sheet in digital and/or hardcopy format. The ideal site map will clearly show the area boundaries of the site, scale, latitude, longitude and compass bearing, administrative boundaries (e.g., province, district, etc.), and display basic topographical information, the distribution of the main site habitat types and notable hydrological features. It will also show major landmarks (towns, roads, etc.). Indications of land use activities are especially useful.

If applicable (and available), provide a zoning scheme to indicate areas where certain activities that might be incompatible with turtle conservation are permitted, buffer zones, and areas where such activities are not permitted (i.e. sanctuary areas).

The optimum scale for a map depends on the actual area of the site depicted. Generally the map should have a 1:25,000 or 1:50,000 scale for areas up to 10,000 ha; 1:100,000 scale for larger areas up to 100,000 ha; 1:250,000 for areas exceeding 100,000 ha. In simplest terms, the site should be depicted in some detail. For moderate to larger sites, it is often difficult to show detail on an A4 sheet at the desired scale, so generally a sheet larger than this is more appropriate. While an original map is not absolutely necessary, a very clear image is desirable. A map exhibiting the above attributes will be more suitable for scanning.

