



# Biodiversity Action Plan for EGA's UAE Operations

February 2025



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## ES.1 Executive Summary

Biodiversity is the foundation of life on Earth, essential for sustaining human society by providing critical ecosystem services such as food, clean water, climate regulation, and natural resources. Its preservation is also paramount, not only for its intrinsic value, but as it helps fight climate change through carbon storage and plays a key role in mitigating the impact of natural hazards such as coastal erosion (seagrass beds, coral reefs and mangrove forests acting as effective barriers). Ultimately, biodiversity underpins economic resilience, public health, and social well-being. Globally, efforts are intensifying to halt biodiversity loss, with key mechanisms such as the United Nations' Sustainable Development Goals (SDGs) and the Convention on Biological Diversity (CBD) and its recent Global Biodiversity Framework (GBF) driving ambitious targets and developing targeted funding methods to restore ecosystems, protect habitats and species, and ensure natural systems continue to thrive for future generations. Halting the decline of biodiversity and restoring nature are therefore crucial to a sustainable and equitable future.

This Biodiversity Action Plan (BAP), drawing from and aligning with the International Finance Corporation (IFC) and the Aluminium Stewardship Initiative (ASI) Performance Standard Version 3, provides a terrestrial and marine biodiversity baseline, critical habitat assessment, consideration of potential impacts and proposed mitigation efforts and opportunities for biodiversity enhancements for Emirate Global Aluminium (EGA) operational facilities in the United Arab Emirates (UAE). A biodiversity baseline for UAE operations has been established by undertaking a desktop analysis of existing data and carrying out marine and terrestrial surveys at EGA facilities at Al Taweelah (Abu Dhabi) and Jebel Ali (Dubai).

At Al Taweelah, the biodiversity baseline has identified critical habitats in the immediate vicinity of the main EGA facility including coral reefs, mangroves and seagrass beds. Importantly, the facility is a few kilometres from the Al Ghanadah Basin, the location of the Ras Ghanadah MPA (Marine Protected Area), an internationally recognised IUCN (International Union for Conservation of Nature) Management Category IV protected site established in 2017. In addition to biodiverse habitats, Al Taweelah hosts vulnerable species such as Dugongs (IUCN -VU), spotted with calves during recent surveys ~3km north of the EGA wharf, endangered Green Turtles (IUCN – EN) and critically endangered (IUCN – CR) Hawksbill Turtles. Water quality is good in terms of dissolved oxygen and pH (both key indicators). Sediment quality parameters mostly meet regulatory guideline limits (ADS 18/23, 2017; US National Oceanographic and Atmospheric Administration (NOAA)). The Bauxite Residue Storage Area (BRSA) site inland is largely surrounded by rolling dunes and aeolian desert sands; lithified rocks/lithification are also evident with topography decreasing in a westerly direction.

The data from survey locations at Jebel Ali have confirmed marine habitats are of poor ecological interest and do not appear to support any substantial abundance or diversity of species. Drop-Down Videos (DDV) conducted during Phase 2 surveys have confirmed the nearshore immediately adjacent to the EGA facility is largely composed of unconsolidated bottom habitat, dominated by filamentous algae with no seagrasses present. In addition, no corals were observed during the recent surveys including at the breakwaters. Despite the absence of seagrass beds as sources of food, Green Turtles – likely stressed and disorientated in the very busy shipping area at Jebel Ali - have been recorded trapped at the EGA intake facility with some individuals requiring attention at the Dubai Turtle Rescue Centre. Water quality met key requirements in terms of dissolved oxygen and pH and sediment quality results indicated 2-3 metals exceed either or both NOAA or ADS 18/23 (2017) guideline limits, reflecting a 5-year long trend previously recorded at Jebel Ali. Although these metals, chromium, copper, and nickel, are known to bioaccumulate in invertebrates, fish, and algae, this needs to be taken into the context of a very disturbed environment due to many industrial and port facilities. Bioaccumulation of these metals may

potentially cause toxic effects such as impaired growth, and disrupted tissue and organ function (Mbandzi-Phorego *et al*, 2024; García-Medina *et al*, 2022; Alizada *et al*, 2020). Previous terrestrial investigations and the recent NEA site reconnaissance have confirmed areas of biodiversity interest at the EGA's golf course which presents high diversity of terrestrial species including several migratory bird species, abundant pollinating invertebrates and the presence of a roosting bat colony.

The critical habitat assessment has confirmed Al Taweelah not only hosts critical habitats and vulnerable, endangered and critically endangered species but, crucially, has highlighted the importance of connectivity amongst marine habitats whereby a range of cross-ecosystem interactions ensures one ecosystem creates favourable conditions for the maintenance of its neighbouring ecosystems. Coral reefs, for instance, by dissipating wave and current energy, provide calm environments for seagrass and mangroves to develop, which in return stabilize the very environment required by coral reefs to thrive.

Potential impacts to biodiversity features associated with EGA facilities at Taweelah include:

- Bioaccumulation of pollutants, e.g., aluminium, in the marine environment affecting critical habitats/species,
- Wind-blown bauxite emissions from offloading activities impacting coral reefs, seagrass beds and Hawksbill Turtle Beach,
- Wind-blown emissions at BRSA affecting terrestrial fauna,
- Enhanced fluoride concentrations recorded in nearby mangroves (also potentially reaching the more extensive mangrove habitats north-east of the facility),
- Noise and light effects on Hawksbill Turtle Beach (nesting area for IUCN Critically Endangered species).

The intake channel at Taweelah has the potential for *both* adverse effects (entrapment) and positive impacts (development of biodiverse environment via the entry of juvenile marine organisms).

At the BRSA site specifically, potential impacts to fauna include increased noise from transport, rehandling and compaction of bauxite residue, disturbance due to artificial lighting, and risk of injury or death of animals from accidental vehicle strike.

The only biodiversity feature potentially affected by EGA facilities at Jebel Ali is the Green Turtle, an endangered species under IUCN, which has been recorded trapped and injured in the chlorination tanks.

Recognising the potential for EGA activities to impact biodiversity, this BAP proposes a series of targeted actions to mitigate negative effects and position EGA as a net positive contributor to biodiversity in the UAE (Table ES1).

This BAP also considers potential opportunities including alignment and/or collaboration with existing and/or planned initiatives addressing major challenges such as the effects of climate change on coral reefs across the UAE and exploiting the carbon storage capacity of seagrass beds and mangroves.

This document includes an introduction highlighting EGA's operations, a brief synopsis of Nautica Environmental Associates LLC, the authors of this BAP, the purpose and objectives of the BAP, and the legal regulatory framework in the UAE. Chapter 2, the Biodiversity Baseline, includes the methodology used, a desktop review

of existing data and results of surveys undertaken for this BAP. A critical habitat assessment at both locations is set out in chapter 3 and potential biodiversity impacts associated with EGA are detailed in chapter 4. A suite of opportunities and specific biodiversity actions for consideration by EGA are presented in chapters 5 and 6, respectively. BAP evaluation is presented in chapter 7.

Table ES1: Action Planning			
Subject	ID	Action	Monitoring/Resourcing
<b>Turtles</b>	T-Tu1	Protection of Hawksbill Turtle Nesting Beach at Al Taweelah to include:  Design and arrange installation of suitable protection measures to avoid potential damage to turtle nests from uncontrolled pedestrian / vehicular access or predation from feral animals during nesting/hatching season.  Train nearby security staff on the importance of the nesting beach and implement appropriate restrictions during nesting & hatching season.	EGA and/or support staff to conduct daily monitoring during nesting/hatching season to identify nests, install protection measures, ensure nest sites are free of debris. Should include relevant expertise to be able to identify nests and nesting activity.
	T-Tu2	Beach Clean-ups prior to and during the nesting/hatching season.	Group campaign prior to the nesting season, then daily monitoring during the nesting/hatching season.
	T-Tu3	Improved Beach light pollution management.	Light pollution survey undertaken by either EGA staff or external specialist.
	T-Tu4	Comparative analysis of successful nesting/hatching between years to identify potential opportunities for improvement.	EGA staff Possible engagement with external specialist to help set up systems.
	T-Tu5	Develop and implement a protocol for the monitoring of the AT intake channel during hatching season for Hawksbill Turtles.	EGA staff Possible engagement with external specialist to help set up systems.
	J-Tu1	Short-term: daily basis checks of chlorination basin during Green Turtle seasonal presence. Investigate reasons for entrapment and mitigation options for intake.	EGA staff Possible engagement of sub-contracted specialist party to aid in investigations and suitable mitigation options. Continued liaison and engagement with Jebel Ali Turtle Sanctuary
<b>Mangroves</b>	T-M1	Monitoring health of mangrove in areas to the north east associated with Ras Ghanada. To include sediment analysis.	EGA staff Possible engagement with external specialist to help set up systems and review results. Engagement with specialist laboratory for analysis.
<b>Corals</b>	T-C1	Al Taweelah establishment of coral regeneration locations aligned with the Environment Agency Abu Dhabi Coral regeneration programme.	EGA staff Engagement with Environment Agency Abu Dhabi. Support specialist dive team, vessel and equipment to enable translocation and regular monitoring to confirm success. Additional relocation may be required according to need.
<b>Seagrass</b>	T-Sg1	Regular seagrass monitoring to understand associated fish populations using stereo baited remote underwater video units (BRUV)	EGA staff Support specialist dive team, vessel and equipment to set up BRUV units and assist with analysis of data.
	T-Sg2	Seagrass monitoring to provide data on long term health of local seagrass, using quadrat and Seagrasswatch.net protocols.	EGA staff Support specialist dive team, vessel and equipment to enable SCUBA and transect methods (approximately 6 x 25m transects).
<b>EGA Golf Course</b>	J-G1	Enhancement of existing features with additional native flora.	EGA staff Local supplier of native flora and additional training for landscaping teams.

	J-G2	Bird / Bat Nesting boxes set up with remote camera feed.	EGA staff One-time installation with occasional maintenance and cleaning.
<b>Sediment Quality and Bioaccumulation</b>	T-S <sup>d</sup> 1	Expansion of sediment quality monitoring to cover critical habitats and additional collection of biota tissue samples to assess for bioaccumulation.	EGA staff Support specialist dive team, vessel and equipment as well as specialist laboratory for analysis. Engagement with specialist laboratory for analysis. Possible engagement with external specialist to help set up systems and review results.
<p>T = Al Taweelah / JA = Jebel Ali / HT = Hawksbill Turtle / GT = Green Turtle / MPA = Marine Protected Area / EAD = Environment Agency - Abu Dhabi</p>			



## ES.2 List of Acronyms and Abbreviations

Table ES2: List of Acronyms and Abbreviations	
<b>ADQCC</b>	Abu Dhabi Quality and Conformity Council
<b>ADS</b>	Abu Dhabi Specification
<b>AMSO</b>	Arabian Marine Species Observer course
<b>AOI</b>	Area of Influence
<b>ASI</b>	Aluminium Stewardship Initiative
<b>ATA</b>	Al Taweelah Alumina
<b>ATS</b>	Al Taweelah Smelter
<b>BAP</b>	Biodiversity Action Plan
<b>BRSA</b>	Bauxite Residue Storage Area
<b>BRUV</b>	Baited Remote Underwater Video
<b>BWMC</b>	International Convention for the Control and Management of Ships' Ballast Water and Sediments
<b>CBD</b>	Convention on Biological Diversity
<b>CITES</b>	Convention on International Trade in Endangered Species
<b>CMS</b>	Convention on the Conservation of Migratory Species of Wild Animals
<b>CR</b>	Critically Endangered
<b>DD</b>	Data Deficient
<b>DDV</b>	Drop-Down Videos
<b>DMT</b>	Department of Municipalities and Transport
<b>DUBAL</b>	Dubai Aluminium
<b>EAD</b>	Environment Agency Abu Dhabi
<b>EGA</b>	Emirates Global Aluminium
<b>EIA</b>	Environmental Impact Assessment
<b>EMAL</b>	Emirates Aluminium
<b>EMS</b>	Environmental Management System
<b>EN</b>	Endangered
<b>ESIAs</b>	Environmental Impact Assessment and Social Assessment
<b>GBF</b>	Global Biodiversity Framework
<b>GBF</b>	Kunming-Montreal Global Biodiversity Framework
<b>GCC</b>	Gulf Cooperation Council
<b>GMS</b>	Global System for Mobile Communications network

Table ES2: List of Acronyms and Abbreviations

<b>HAB</b>	Harmful Algal Blooms
<b>HSSEQ</b>	Health, Safety, Sustainability, Environment, Quality
<b>IAS</b>	Invasive Alien Species
<b>IFC</b>	International Finance Corporation
<b>ISO</b>	International Standard Organisation
<b>IUCN</b>	International Union for Conservation of Nature
<b>IUCN ROWA</b>	IUCN Regional Office of West Asia
<b>KBA</b>	Key Biodiversity Areas
<b>KEZAD</b>	Khalifa Economic Zones Abu Dhabi
<b>LC</b>	Least Concern
<b>MOCCEAE</b>	UAE Ministry of Climate Change and Environment
<b>MOU</b>	Memorandum of Understanding
<b>MPA</b>	Marine Protected Area
<b>MSP</b>	Marine Spatial Plans
<b>NCRI</b>	National Coral Reef Institute
<b>NE</b>	Not Evaluated
<b>NIBIO</b>	Norwegian Institute of Bioeconomy Research
<b>NISSAP</b>	National Invasive Species Strategy and Action Plan
<b>NL</b>	Not Listed
<b>NOAA</b>	National Oceanographic Atmospheric Administration (USA)
<b>NT</b>	Near Threatened
<b>OEMP</b>	Operational Environmental and Management Plan
<b>OESMP</b>	Operation, Environment, Social Management Plan
<b>PER</b>	Preliminary Environmental Assessments
<b>PS</b>	Performance Standard
<b>QR</b>	Quarterly/Biannual Environmental Reports
<b>REL</b>	Relocations of Fauna efforts
<b>ROPME</b>	Regional Convention for Cooperation on the Protection of the Marine Environment
<b>SCENR</b>	Supreme Council of the Environment and Natural Reserves
<b>SDG</b>	Sustainable Development Goals
<b>SEA</b>	Strategic Environmental Assessment
<b>TMP</b>	Turtle Monitoring Plan

Table ES2: List of Acronyms and Abbreviations

<b>WB</b>	World Bank
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## ES.3 Definition of Terms

Table ES3: Definition of Terms

<b>Area of Influence</b>	The geographic region or areas where EGA's activities, development projects, or environmental management actions have a direct, indirect or cumulative impact on biodiversity.
<b>Bauxite</b>	A sedimentary rock primarily composed of aluminum minerals, used as the main source of aluminum. Its extraction can lead to significant environmental impacts, including habitat destruction and land degradation, which may require conservation and restoration efforts.
<b>Bioaccumulation</b>	Bioaccumulation is the gradual accumulation of substances, such as pesticides or other chemicals, in an organism.
<b>Biodiversity</b>	Biodiversity - short for biological diversity - means the diversity of life in all its forms - the diversity of species, of genetic variations within one species, and of ecosystems. The importance of biological diversity to human society and well-being is hard to overstate. An estimated 40 per cent of the global economy is based on biological products and processes. Farmers, especially those living in areas of low agricultural productivity, depend heavily on the genetic diversity of the environment.
<b>Biodiversity Baseline</b>	A comprehensive assessment of the current state of biodiversity in a specific area, including the species, ecosystems, and ecological processes present. It serves as a reference point for measuring the effectiveness of conservation actions and monitoring changes over time
<b>Carbon Storage</b>	The process of capturing and storing carbon, primarily in natural ecosystems like forests, soils, wetlands, and oceans, to prevent it from being released into the atmosphere. This helps mitigate climate change by reducing the amount of carbon dioxide (CO <sub>2</sub> ) in the air. Preserving or enhancing carbon storage can also support ecosystem health and biodiversity conservation.
<b>Coastal Erosion</b>	The process by which coastlines are eroded or worn away due to the action of waves, currents, tides, and human activities. It can lead to the loss of habitat for wildlife, reduced coastal protection, and increased vulnerability to storms. Addressing coastal erosion may involve measures like habitat restoration, sustainable coastal management, and the protection of coastal ecosystems to preserve biodiversity.
<b>Critical Habitat</b>	Specific areas that are crucial for the survival and recovery of threatened or endangered species, or for the maintenance of biodiversity. These habitats are vital because they provide the necessary conditions for species to live, reproduce, and thrive.
<b>Ecosystem</b>	Ecosystems are self-regulating communities of plants and animals interacting with each other and with their non-living environment - forests, wetlands, mountains, lakes, rivers, deserts and agricultural landscapes. Ecosystems are vulnerable to interference as pressure on one component can upset the entire balance.
<b>Flora</b>	All plants found in a given area.
<b>Fauna</b>	All animals found in a given area.
<b>Habitat</b>	A place or type of site where an organism or population naturally occur.
<b>Infauna</b>	Aquatic animals that live buried within the substrate of the seabed, such as sand, mud, or sediment. They include species like worms, clams, and other benthic organisms. Their protection play a crucial role in ecosystem health, such as by maintaining sediment structure, recycling nutrients, and supporting food webs.

Table ES3: Definition of Terms

<b>Invasive Alien Species (IAS)</b>	A species occurring in an area outside of its historically known natural range because of intentional or accidental dispersal by human activities (also known as an exotic or introduced species).
<b>Invertebrates</b>	Animals that lack a backbone or spinal column, including groups such as insects, mollusks, crustaceans, arachnids, and worms. Invertebrates play vital roles in ecosystems, such as pollination, decomposition, and serving as a food source for other animals. Conserving invertebrate populations is essential due to their significant ecological functions and contributions to overall biodiversity.
<b>IUCN Red List</b>	The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e., those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e., are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened if not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).
<b>Lithified</b>	The process by which loose sediment is compacted and cemented over time to form solid rock, such as sandstone or limestone. In the context of a biodiversity action plan, lithification may be relevant when addressing habitat formation, as lithified rocks can provide important habitats for certain species, particularly in coastal or marine environments.
<b>Migratory</b>	Refers to species that regularly move from one location to another, typically in response to seasonal changes in food availability, breeding conditions, or climate. Migratory species, such as birds, fish, and some mammals, often travel long distances between breeding and feeding grounds.
<b>Pelagic</b>	Refers to organisms that live in the open ocean, away from the coast or the sea floor. Pelagic species, such as fish, mammals, and plankton, inhabit the water column and are typically found in deep or surface waters. Protecting pelagic ecosystems is important due to their role in marine food webs and their vulnerability to issues like overfishing and pollution.
<b>Restoration</b>	The process of returning a degraded or altered ecosystem to a more natural or functional state, often by reintroducing native species, improving habitat quality, or rehabilitating environmental conditions. It aims to repair ecosystems damaged by human activities or natural events, thereby enhancing biodiversity, ecosystem services, and resilience.
<b>Sabkha</b>	A coastal or inland flat, salty, and often arid area that is periodically flooded with seawater or groundwater, leading to the accumulation of salts and minerals. Sabkhas are characterized by their unique ecological conditions and can support specialised plant and animal species and their role as a buffer against coastal erosion.
<b>Species</b>	A group of organisms capable of interbreeding freely with each other but not with members of other species.
<b>Study Area</b>	This area is selected for collecting baseline data for detailed investigations to better understand the existing biodiversity, the status of species and habitats, and the potential impacts of human activities or development projects.

Table ES3: Definition of Terms

<b>Threatened Species</b>	A technical classification referring to a species that is likely to become endangered within the foreseeable future, throughout all or a significant portion of its range.
<b>Translocation</b>	The intentional capture, transport, movement and release of species or habitat components from one area to another.
<b>Vertebrates</b>	Animals that possess a backbone or spinal column, including mammals, birds, reptiles, amphibians, and fish. Vertebrates are a key group in biodiversity, often serving as top predators, prey, or important ecological indicators.

# 1.0 Introduction

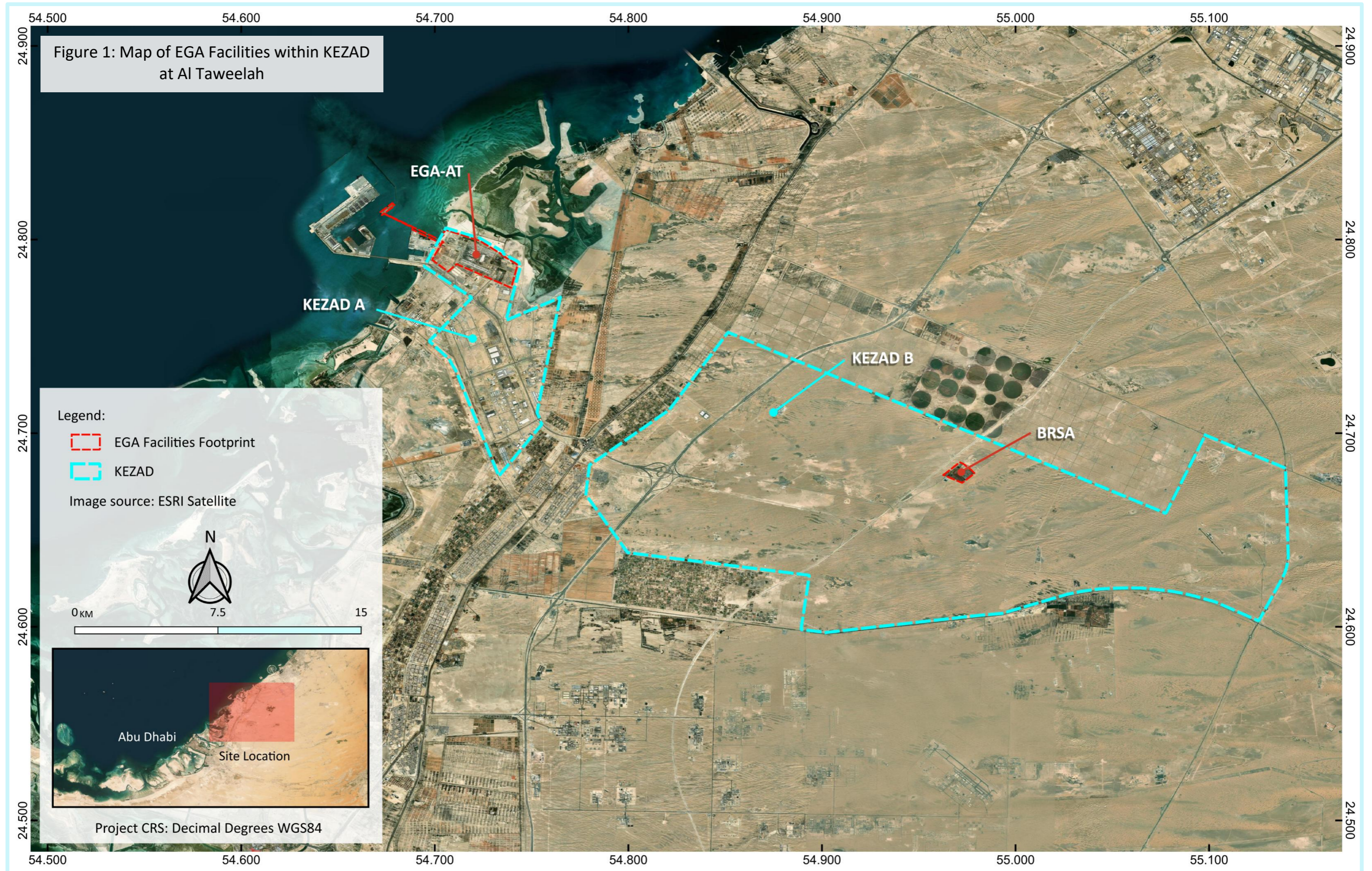
## 1.1 EGA Operations

Emirates Global Aluminium (EGA) was formed in 2014 through the merger of Emirates Aluminium (EMAL, Al Taweelah, Abu Dhabi) and Dubai Aluminium (DUBAL, Jebel Ali, Dubai). Headquartered in the UAE, EGA is owned equally by Mubadala Investment Company of Abu Dhabi and Investment Corporation of Dubai. EGA operates two smelters in the UAE, one in Abu Dhabi and one in Dubai. Each smelter includes anode production facilities, cast house natural gas power plants, and desalination facilities. Each smelter is also connected to the grid, enabling access to solar energy. The EGA alumina refinery is based at the Abu Dhabi facility. EGA directly employs over 6,000 people.

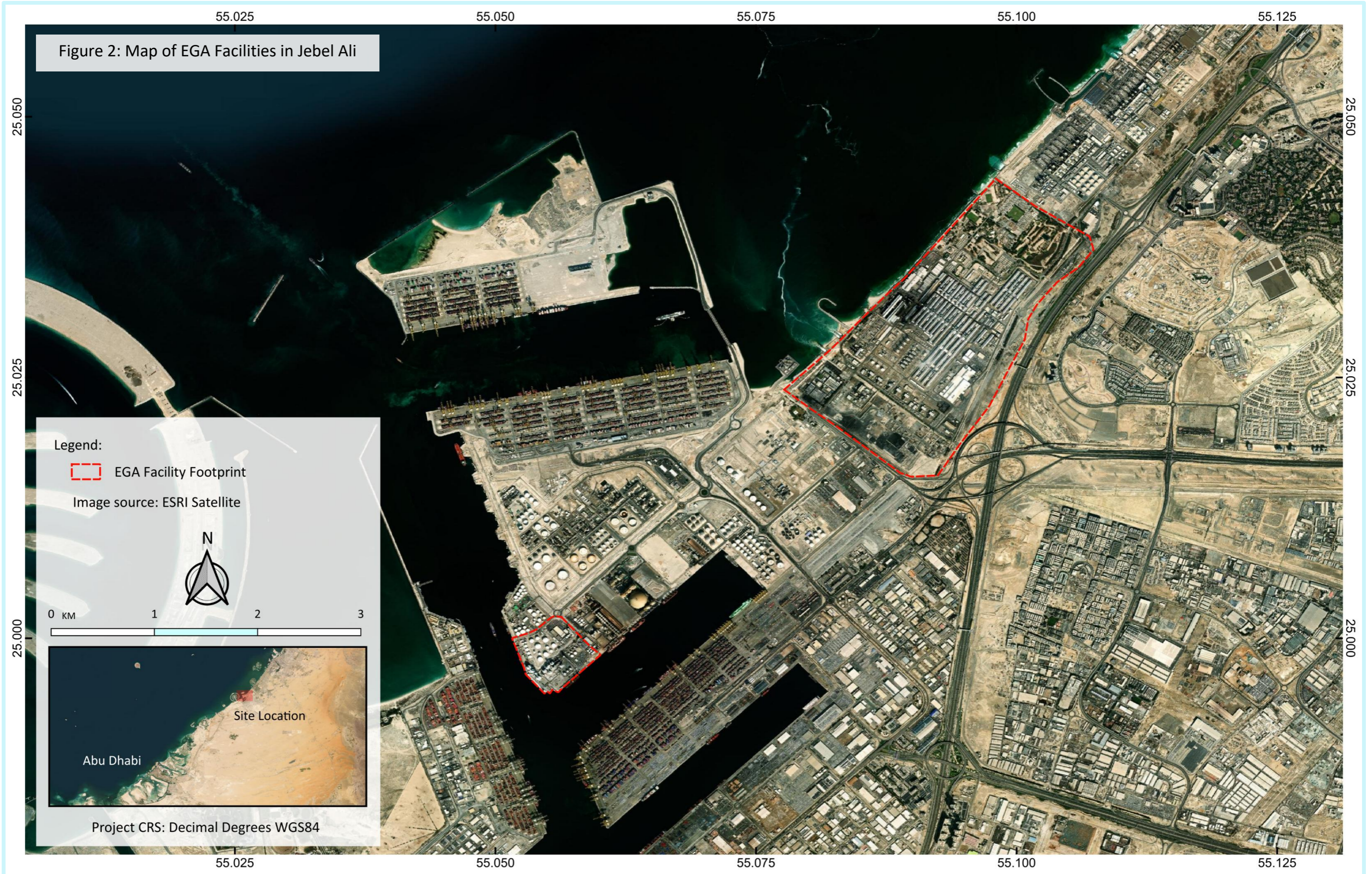
As shown in Figure 1, EGA's Al Taweelah operations and the BRSA are in the Khalifa Economic Zones Abu Dhabi (KEZAD) Area A and B, respectively. KEZAD is located almost equidistantly between the Emirates of Abu Dhabi and Dubai and can be accessed from the E11 Highway connecting the two Emirates. While the KEZAD is dedicated predominantly for industrial and commercial activities, it also includes limited community services and retail zoning. Most of the KEZAD plots are yet to be occupied by industrial facilities although some light industry is already present.

The EGA smelter site at Al Taweelah, encompassing an area of about 6 km<sup>2</sup> (including the ~1 km<sup>2</sup> BRSA), is located in close proximity to the Khalifa Port coastal area, in the immediate vicinity of the Ras Ghanadah Marine Protected Area (MPA) (<https://www.protectedplanet.net/555622079>). According to the Environment Agency Abu Dhabi (EAD), the management authority for this MPA, critical habitats found in this protected area consist of coral reefs, mangroves and seagrass meadows. The BRSA site on the other hand is operational and is surrounded by rolling dunes and aeolian desert sands with topography decreasing in a westerly direction. The KEZAD B is mostly undeveloped, however it is allocated for commercial and industrial use, and supports services and amenities such as workforce, residential communities, and retail use.

EGA's Jebel Ali Facility is located to the south of the city of Dubai, adjacent to Jebel Ali Port encompassing an area of approximately 1.7 km<sup>2</sup>. The facility first began production in 1979 with a capacity of 135,000 tonnes of aluminium per year and has grown to current production values of over 1 million tonnes per year. The site currently comprises 1,577 reduction cells in seven potlines, 12 casting stations, a 2,350MW power plant and a 30 MGD capacity desalination plant. Figure 2 shows the EGA facility at Jebel Ali.







## 1.2 Collaboration with Biodiversity Experts for this BAP

This BAP has been developed on behalf of EGA, by Nautica Environmental Consultants (NEA), an environmental consultancy based in Abu Dhabi with almost 30 years' experience in undertaking ESIA (Environmental Impact Assessment and Social Assessment) and SEAs (Strategic Environmental Assessment), developing and implementing complex monitoring plans, designing and undertaking marine and terrestrial surveys for a wide range of clients in the Gulf and the Red Sea. NEA have worked for the oil and gas sector, coastal developers, public and private entities and regulators.

NEA staff include marine scientists and environmental managers with over 30 years' experience in the region working on numerous large-scale project ESIA (ports, airports, oil and gas facilities, coastal developments), monitoring projects (Baraka Nuclear Power Plant), Biodiversity Action Plans and Marine Spatial Plans (MSP), advising environmental regulators in the UAE and the region (SCENR (Qatar), MEWA (KSA), working in partnership with international bodies (UN agencies, EU), undertaking due diligence required by finance bodies (WB/IFC, EBRD), and private companies. NEA benefits from a well-trained and dynamic group of terrestrial and marine ecologists, laboratory technicians, public awareness experts as well as a team of highly skilled boat operators.

## 1.3 Purpose of the BAP

A Biodiversity Action Plan (BAP) is an internationally recognised systematic approach to biodiversity management which addresses threatened species and habitats, designed to protect and restore biological systems. The original impetus for these plans derives from the 1992 Convention on Biological Diversity (CBD). As of 2023, 196 countries have ratified the CBD (<https://www.cbd.int>) including the UAE (10 May 2000).

The principal elements of a BAP typically include (a) preparing inventories of biological information for selected species or habitats; (b) assessing the conservation status of species within specified ecosystems; (c) consideration of risk/impact/condition; (d) creation of targets for conservation and restoration; and (e) establishing timelines and institutional partnerships for implementing the BAP. A BAP therefore gives an overview of species and habitat in a particular area, identifies threats and sets out steps to be taken to protect and improve the area to preserve and enhance its biodiversity for the future. Importantly, a BAP is a valuable way of targeting conservation at a local level.

Moreover, BAPs should be regularly reviewed and updated as new information arises, project implementation progresses, and conservation context changes over time. BAP revisions vary depending on the circumstances, as an indication and guide, minor revisions are typically undertaken over 6-8 months, with more significant developments/revisions over up to 2 years.

This BAP benefits from the EAD Habitat Classification Map available for Al Taweelah undertaken in 2020, that developed for Jebel Ali in September/October 2024, existing baseline data secured from a range of sources (dated between 2007 and 2023 and listed in Table 3) and results from the most recent terrestrial and marine surveys conducted by NEA in the period between July and October 2024.

Specific actions detailed in this BAP will include, but not be limited to, those recommended to protect and/or enhance existing biodiversity (both marine and terrestrial), those aimed at introducing additional biodiversity (both species and habitats), arrangements to enhance connectivity between existing (or additional) habitats, proposed monitoring that goes above and beyond that already in place at the time of writing. Crucially, the

actions detailed in this plan will refer to the mitigation hierarchy steps introduced in section 6 of this report. Importantly, this BAP also recommends active engagement with conservation bodies including regulators, civil society group, research/academic facilities in the UAE and other private entities.

This BAP has been developed to demonstrate alignment of EGA's activities associated with biodiversity management with international best practice, drawing from and aligning with (a) International Finance Corporation (IFC) Performance Standard (PS) 6 guidance and (b) the Aluminium Stewardship Initiative's Performance Standard Version 3, <https://aluminium-stewardship.org/wp-content/uploads/2022/05/ASI-Performance-Standard-V3-May2022-2.pdf>, which defines environmental, social and governance principles and criteria, and addresses a broad range of sustainability issues in the aluminium value chain. These mechanisms are defined in more detail elsewhere in this document.

## 1.4 BAP Objectives

The principal objectives of this BAP include the following:

- Review of existing biodiversity baseline information and legislative/policy framework applicable to EGA's facilities in the UAE.
- Develop a revised biodiversity baseline based on Phase 1 and Phase 2 surveys
- Identification of priorities and actions for biodiversity conservation based on the Critical Habitat Assessment.
- Identification of a list of opportunities aimed at improving overall biodiversity conservation.
- Identification of a specific set of actions, timelines, and responsibilities to avoid, mitigate and compensate potential impacts associated with each facility.
- List evaluation requirements to enable the success of the BAP to be assessed.

In addition, reference should be made to existing or planned initiatives and mechanisms in the UAE with specific regional and or national biodiversity goals and targets. Examples of these are detailed in section 5 and could be afforded consideration by EGA to develop collaboration and or alignment with a view to enhancing the management of key biodiversity assets for the benefit of not only those biodiversity features within the EGA facilities but, given the motility and interconnectedness of marine and coastal habitats, those found across the UAE.

Moreover, the actions in this BAP have been developed to ensure the systematic implementation of the mitigation hierarchy, a widely used tool that guides users towards limiting as far as possible the negative impacts on biodiversity from projects, both under development, and operational as in the case of the EGA facilities. The mitigation hierarchy is therefore a framework for managing risks and potential impacts related to biodiversity and ecosystem services and is used when implementing projects, to provide a logical and effective approach to protecting and conserving biodiversity and maintaining important ecosystem services. It is a tool to aid in the sustainable management of living, natural resources, which provides a mechanism for making explicit decisions that balance conservation needs with development priorities. Ultimately, the hierarchy emphasises best-practice for avoiding and minimising any negative impacts, and then restoring sites no longer used by a project, before finally considering offsetting residual impacts. Following the hierarchy is therefore crucial for operational projects like the facilities at EGA aiming to achieve no overall negative impact on biodiversity or, on balance, a net gain – also referred to as no net loss and the net positive approach, respectively.

## 1.5 EGA's Commitment to Biodiversity

EGA is committed to enhancing biodiversity and ecosystem health. The company intends therefore to protect, restore, and renew biodiversity and support ecosystem health wherever it operates, with the goal of pursuing nature positive outcomes and leaving nature in a better state than it found it.

## 1.6 Legal and Other Requirements

The following international laws and conventions have been signed and ratified by the UAE. When applicable to this BAP, they are referred to accordingly.

### 1.6.1 International Conventions

#### Convention on the Conservation of Migratory Species of Wild Animals (2015)

As an environmental treaty under the aegis of the United Nations Environment Programme, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) provides a global platform for the conservation and sustainable use of migratory animals and their habitats. CMS brings together the countries through which migratory animals pass and lays legal foundation for internationally coordinated conservation measures throughout a migratory range.

The UAE office is home to two CMS international agreements with potential relevance to the EGA BAP: the Dugong Memorandum of Understanding (MOU) (<https://www.cms.int/en/legalinstrument/Dugong-mou>) and the Raptors MOU (<https://www.cms.int/raptors/en>). These have successfully implemented several initiatives to protect Dugongs, migratory birds of prey and other threatened migratory species. Their scope of work has been varied and included developing specific scientific tools to better study endangered animals, supporting grassroots initiatives in least developed countries, and facilitating adoption of strategic species protection policies at high-level international fora.

In addition, strategies developed by the UAE with potential relevance to the EGA BAP include the National Plan of Action for the Conservation of Marine turtles UAE (<https://www.cms.int/iosea-turtles/en/news/uae-launches-national-plan-conservation-marine-turtles>), and the UAE National Plan of Action for the Conservation and management of sharks (<https://www.cms.int/en/publication/united-arab-emirates-national-plan-action-conservation-and-management-sharks>). The former has direct implications given 2 species of marine turtles are found in the immediate vicinity of the EGA facilities and the latter given their presence – at various life stages depending on species – in the seagrass habitats found at the Al Taweelah site.

#### UN (Rio) Convention on Biological Diversity (2000)

One of the key agreements adopted at Rio was the Convention on Biological Diversity (CBD) which, ratified by the majority of the world's governments, sets out commitments for maintaining the world's ecological underpinnings. The Convention established three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources.

Of relevance to this BAP, the threat posed by invasive alien species (IAS) to the country's biodiversity is addressed via the recently developed National Invasive Species Strategy & Action Plan (2022-2026) (<https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/environment-and->

[energy/the-uae-national-invasive-species-strategy-and-action-plan](#)). This highly important issue is covered in more detail in section 4.

### Convention on Conservation of Wildlife and its Natural Habitats in GCC Countries (2003)

This Convention is reportedly the first legal instrument binding the six member States of the Gulf Cooperation Council (GCC) to coordinate their activities toward the conservation of wildlife and natural habitats. Parties to this Convention agree to undertake development and implementation of policies and activities for the purposes of wildlife and natural habitat conservation, rehabilitation and ensuring sustainable exploitation thereof. This Convention provides the following Appendices listing the wildlife species requiring conservation:

- Appendix I – To be Protected Flora Species
- Appendix II – To be Protected Fauna Species
- Appendix III – Animal Species Threatened with Extinction

The critical habitat assessment undertaken for this BAP and detailed in chapter 3 includes the list of species covered under this Convention.

### Regional Organisation for the Protection of the marine environment (ROPME) (1979)

ROPME, defined in the Kuwait Regional Convention for cooperation on the protection of the marine environment from pollution, was established to implement the Convention and its Protocols. The Convention is the basic legal instrument binding the eight States of the Region (including the UAE) to coordinate their activities towards protection of their common marine environment.

Two of the 5 protocols have direct relevance to this BAP: *protocol for the protection of the marine environment against pollution from land-based sources* and *the protocol concerning the conservation of biological diversity and the establishment of protected areas*.

### Convention on Biological Diversity Global Biodiversity Framework (2030)

The Parties to the Convention on Biological Diversity (CBD) adopted the Kunming-Montreal Global Biodiversity Framework (GBF) on 19 December 2022, replacing the CBD's Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets. The first draft of the framework aims to guide actions worldwide through 2030, to preserve and protect nature and its essential services to people.

The framework sets out an ambitious plan to implement broad-based actions to bring about a transformation in society's relationship with biodiversity, ensuring that by 2050 the shared vision of 'living in harmony with nature' is fulfilled.

The GBF comprises 4 goals and 23 targets. Goals include halting "*human-induced extinction*" of known threatened species and reducing the rate and risk of extinction of all species "*tenfold*" by 2050, the sustainable use and management of biodiversity to ensure that "*nature's contributions to people . . . are valued, maintained and enhanced,*" for the benefit of present and future generations by 2050.

Targets include those aimed at 'planning and managing all areas to reduce biodiversity loss', 'restore 30% of all degraded ecosystems', 'conserve 30% of land, waters and seas', 'halt species extinction, protect genetic diversity, and manage human-wildlife conflicts' and 'reduce pollution to levels that are not harmful to biodiversity'.

The UAE Ministry of Climate Change and Environment (MOCCA, see below) is currently updating the National Biodiversity Strategy and its Action Plan in line with international guidelines and, importantly, the Global Biodiversity Framework.

## 1.6.2 Regulatory Framework

### Federal Legislation

Federal Law No. 24 of 1999 for the Protection and Development of the Environment was the first and most comprehensive federal environmental law in the UAE. This law includes the overall goal to conserve biological diversity in the UAE and the exploitation of such resources with consideration for present and future generations through:

- The control of all forms of pollution and avoidance of any immediate or long-term harmful effects resulting from industrial, economic or agricultural development;
- The conservation of natural resources and biological diversity;
- Protection and conservation of the quality and natural balance of the environment, human health and the health of other living creatures from environmentally harmful activities; and
- Compliance with international and regional agreements ratified or approved by the State regarding environmental protection, control of pollution and conservation of natural resources.

In addition, Federal Law No. 24 of 1999 contains several environmental principles and standards as part of its Executive Order, which was issued by the Cabinet under Ministerial Decree No. 37 of 2001 including the following regulations:

- Regulation concerning Environmental Impact Assessment of Projects.
- Regulation concerning Protection of the Marine Environment.

Other Federal Laws also applicable to biodiversity conservation include:

- Federal Law No. 11 of 2002 for 'Regulation and Control the International Trade in Species of Wild Fauna & Flora'.
- Decree by Law No, (9) of 1983 regulating the hunting of birds and animals.

## 1.6.3 Emirate Level Legislation

The Environment Agency of Abu Dhabi (EAD) is the statutory authority responsible for the implementation of Federal Law 24 within the emirate of Abu Dhabi. The EAD was established in 2005 under Law 16 of 2005 Pertaining to the Reorganisation of the Abu Dhabi Environment Agency to replace the Environmental Research and Wildlife Development Agency (ERWDA). This law identifies EAD as the statutory authority responsible for the protection of the natural environment and wildlife in the emirate, execution of environmental studies, monitoring, and creating social awareness.

Although the permit to operate issued by EAD for the EGA Abu Dhabi facilities does not include specific requirements in relation to the biodiversity and conservation of wildlife, precise guidance provided by EAD under the "Abu Dhabi Emirate Habitat Classification & Protection Guideline" is included in the permit itself.

Dubai Municipality (DM) is the statutory authority responsible for the implementation of Federal Law 24 within the emirate of Dubai. The Environment Department of DM comprises several sections and sub-sections, tasked with various aspects of environmental governance and include the following legislations applicable to Dubai Emirate:

- Local Order No. 61/1991, issued to protect the environment of the Emirate of Dubai and to enforce high environmental standards and safe health practices;
- Local Order No. 2 of 1998, issued to protect the habitats and species of two protected areas: (1) Ras al Khor Wildlife Sanctuary, and (2) Jebel Ali Wildlife Sanctuary.

### National Policy

The Ministry of Climate Change and Environment (MOCCA) is in the process of updating the National Biodiversity Strategy and its Action Plan. It has held workshops in 2023 and 2024 with a view to agreeing an overall vision and updated mission of the national strategy and the strategic directions for biodiversity by 2031, along with other strategic indicators.

For context, the UAE's previous National Biodiversity Strategy (2014-2021) incorporated 5 strategic guidelines and 21 national targets (formulated in line with the UAE Vision 2021, Aichi Biodiversity Targets and Sustainable Development Goals). Principal areas of focus included:

- Mainstreaming biodiversity in all economic and social sectors.
- Reinforcement of knowledge sharing and capacity building for upgrading and addressing biodiversity management.
- Improvement of biodiversity status through habitat protection, genetic diversity and restoration of degraded ecosystems.
- Reducing pressure on marine and terrestrial biodiversity.
- Enhancing regional and international cooperation on biodiversity cross-cutting issues.

### 1.6.4 International Guidelines

This BAP has been developed to demonstrate alignment of EGA's activities associated with biodiversity management with international best practice, drawing from and aligning with the International Finance Corporation (IFC) and the Aluminium Stewardship Initiative (ASI) Performance Standard Version 3.

IFC Performance Standard 6 (PS6) recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The objectives of PS6 are therefore to protect and conserve biodiversity and habitats, encourage the implementation of the mitigation hierarchy, and promote sustainable management of living natural resources. Guidelines on sustainable development prepared by the IFC are largely recognised as international best practice associated with the assessment and mitigation of environmental and social aspects.

According to PS6 Guidance Note 91 (GN91), a Biodiversity Action Plan (BAP) is required for projects located in or in the immediate vicinity of critical habitat and is recommended for high-risk projects in natural habitats, i.e., those which are likely to cause significant negative impacts.

The ASI Performance Standard Version 3 (<https://aluminium-stewardship.org/wp-content/uploads/2024/05/ASI-Performance-Standard-Guidance-V3.2.pdf>) defines 62 environmental, social and governance principles and criteria, with the aim of addressing sustainability issues in the aluminium value chain.

The Principle behind the Performance Standard's Criterion 8, Biodiversity and Ecosystem Services, states that 'the entity shall manage its biodiversity and ecosystem services impacts in accordance with the Biodiversity Mitigation Hierarchy to protect ecosystems, habitats and species'. More specifically:

### **Criterion 8.1 Biodiversity and Ecosystem Services Risk and Impact Assessment.**

#### **The Entity shall:**

- Assess the risk to and potential impacts on Biodiversity and Ecosystem Services from the land use and activities within the Entity's Area of Influence.
- In situations where the Entity contributes to, or is likely to impact Ecosystem Services, undertake a systematic review, in Consultation with and, where possible, with the participation of Affected Populations and Organisations, to identify Priority Ecosystem Services that are relevant to Affected Populations and Organisations.

#### **Application:**

Criterion 8.1(b) is Not Applicable when the risks and potential impacts identified in 8.1(a) are assessed and documented as low. This Criterion is applicable under this BAP for Biodiversity only.

### **Criterion 8.2 Biodiversity Management.**

#### **The Entity shall:**

- Implement a Biodiversity Action Plan with time-bound targets to address Material risks and impacts to Biodiversity and Ecosystem Services, identified through Criterion 8.1, and monitor its effectiveness.
- Ensure that the Biodiversity Action Plan is designed by a Qualified Specialist, in accordance with the Biodiversity Mitigation Hierarchy and with an ambition to achieve no net loss.
- Ensure that the Biodiversity Action Plan is developed in Consultation with and, where possible, with the participation of Affected Populations and Organisations.
- Review the Biodiversity Action Plan, and associated targets at least every 5 years.
- Review the Biodiversity Action Plan and associated targets on any changes to the Business that alter Material Biodiversity risk(s) or where assessment indicates changes to risk.
- Review the Biodiversity Action plan and associated targets on any indication of a control gap.
- Publicly disclose the latest version of the Biodiversity Action plan and associated targets and share with Affected Populations and Organisations.

#### **Application:**

This Criterion is Not Applicable when the risks and potential impacts identified in 8.1(a) are assessed and documented as low. This Criterion is applicable under this BAP.



### Criterion 8.3 Management of Priority Ecosystem Services.

**The Entity shall:**

- Where an Entity depends on Priority Ecosystem Services, implement measures that increase the resource efficiency of operations.
- Where Priority Ecosystem Services of relevance to Affected Populations and Organisations are identified through Criterion 8.1, and the source of impacts are:
- Under the Entity's direct management Control, use the Biodiversity Mitigation Hierarchy to maintain access to, and the value and functionality of such Ecosystem Services.
- Not under the Entity's direct management Control, work with other parties or within the scope of influence to mitigate impacts on Priority Ecosystem Services.

**Application:**

This Criterion is Not Applicable when no Priority Ecosystem Services are identified in 8.1(b). This Criterion is not applicable under this BAP.

### Criterion 8.4 Alien Species.

**The Entity shall:** Proactively prevent accidental or deliberate introduction of Alien Species that could have material adverse impacts on Biodiversity and Ecosystem Services.

**Application:** This Criterion applies to the Al Taweelah and Jebel Ali facilities and is applicable for these locations under this BAP.

### Criterion 8.5 Commitment to “No Go” in World Heritage Properties.

**The Entity shall:**

- Not explore or develop New Projects or make Major Changes in World Heritage Properties.
- Take all possible steps to ensure that existing operations in World Heritage Properties, as well as existing operations in World Heritage properties, as well as existing and future operations adjacent to World Heritage Properties, are not incompatible with the outstanding universal value for which these properties are listed and do not put the integrity of these properties at risk.

**Application:**

This Criterion applies to all Facilities. This Criterion is not applicable to this BAP as there are no World Heritage sites at either Al Taweelah or Jebel Ali EGA facilities.

### Criterion 8.6 Protected Areas.

**The Entity shall:**

- Identify Protected Areas within its Area of Influence.
- Comply with any regulations, covenants, and legal requirements attributed to these Protected Areas.
- Implement management plans, developed in collaboration with the relevant Protected Area management authorities and, where possible, with the participation of Affected Populations and Organisations, to ensure the Entity's activities and Facilities do not adversely impact the integrity of the special values for which the areas identified in 8.6a were designated for protection and/or the declarations of Indigenous Peoples.

- Publicly disclose the management plans in a manner accessible and understood by Affected Populations and Organisations.
- This BAP should be seen as the key document for inclusion in EGA's approach to biodiversity that ensures not just compliance with the ASI requirements but how EGA in the UAE addresses biodiversity conservation so as to minimise the industry's impacts whilst implementing effective measures for enhancing biodiversity.

**Application:** This Criterion is applicable to this BAP.

## 2.0 Biodiversity Baseline

### 2.1 Methodology

It is important to note at this stage that the methodology highlighted here and attached in the more detailed Annex A has been developed in accordance with the EAD Abu Dhabi Emirate Habitat Classification and Protection Guideline (2017). This Guideline helps identify critical habitats (CH) and is modelled on the IFC PS6 which defines CH as ecosystems of high biodiversity value which may be characterised as:

- Habitats of importance to species that are classified as critically endangered or endangered and habitats of significant importance to endemic and/or restricted-range species.
- Habitats that provide value to significant concentrations of globally or regionally important migratory species and/or congregatory species populations.
- Habitats that are highly threatened and/or unique ecosystems.
- Habitats that are associated with important evolutionary processes

The methodology for this BAP includes, at both sites, the definition of a Study Area and Area of Influence (AOI), a desktop review and preliminary field investigations (Phase 1) and more detailed surveys (Phase 2).

It is important at this stage to distinguish between Study Area and Area of Influence (AOI) in the context of this BAP as this will set the scene for this Plan's process and its various stages detailed in this report.

The Study Area refers to the geographical area described by previous investigations (EIAs, PER, BAPs) as well as publicly available reports by UAE regulators and reputable organisations such as WWF-UAE. At Al Taweelah, this Area includes the Ras Ghanadah MPA, the Khalifa Offshore Port, extensive mangrove forests and offshore fringing reefs, and the BRSA site inland. At Jebel Ali, this Area includes the port, breakwaters and other industrial facilities. The Study Areas provide therefore the broader context in terms of man made facilities already present at Al Taweelah and Jebel Ali and the biodiversity features therein.

The Area of Influence (AOI), in contrast, refers to specific areas within the Study Areas where EGA facilities can potentially affect those biodiversity features highlighted in the Study Area. The AOI is therefore directly associated with the main purpose of this BAP, i.e., to protect and conserve biodiversity within EGA's facilities, achieve no net biodiversity loss as a result of EGA's operations and implement biodiversity enhancements where practicable in order to achieve an overall net gain.

At Taweelah, as shown in Figure 3, the AOI covers 4 locations. The 2 marine locations, to the east and west of the main EGA facility, may be affected by elevated wind blown bauxite from offloading activities, potentially impacting nearby reefs and seagrass beds, and the Hawksbill Turtle Beach, i.e., critical habitats and species as detailed in the critical habitat assessment in this report. These locations may also be affected by effluent discharged at the outfall as well as entrapment of marine organisms at the intake facility. The inland area in the vicinity of the Palace hosts mangroves and numerous species of fauna including gazelles (IUCN – VU) observed in past investigations and the recent NEA surveys. This area is affected by high levels of fluorides which, at 59 to 2670 mg F/kg measured on the leaves of a few species of trees including mangroves, and air HF measurements exceeding 1 µg HF/m<sup>3</sup> from 2020 onwards (Nibio, 2024). These values are higher than those recommended by some regulatory bodies such as the US EPA Committee on Biological Effects of Atmospheric Pollutants or international organisations such as the WHO. Although such concentrations appear, visually at

least, well tolerated by tree species, concerns have however been raised on the potential indirect effects to soils and consequent implications to overall habitat functionality of habitats such as mangroves (Prabhu *et al*, 2023).

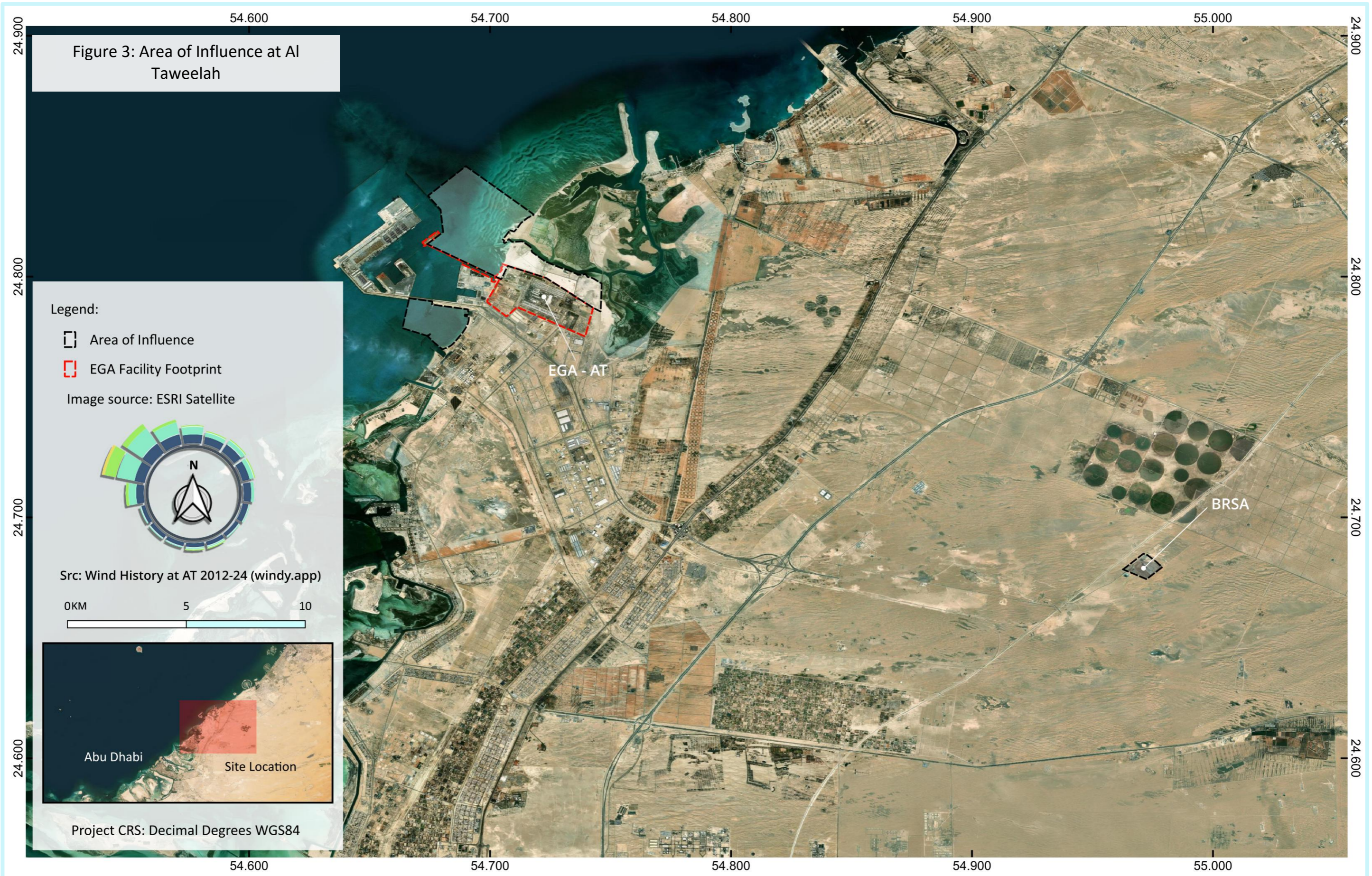
It is important to note however, that the broader area at Taweelah, including the AOI detailed above, given the multitude of other man made infrastructure present, is clearly affected by the numerous non-EGA operations, all likely to contribute to synergistic effects to the environment as a whole. This has been borne in mind when developing specific actions detailed in section 6 below and ultimately when looking at additional opportunities for protecting and managing biodiversity which may involve other local, national and regional players (section 5).

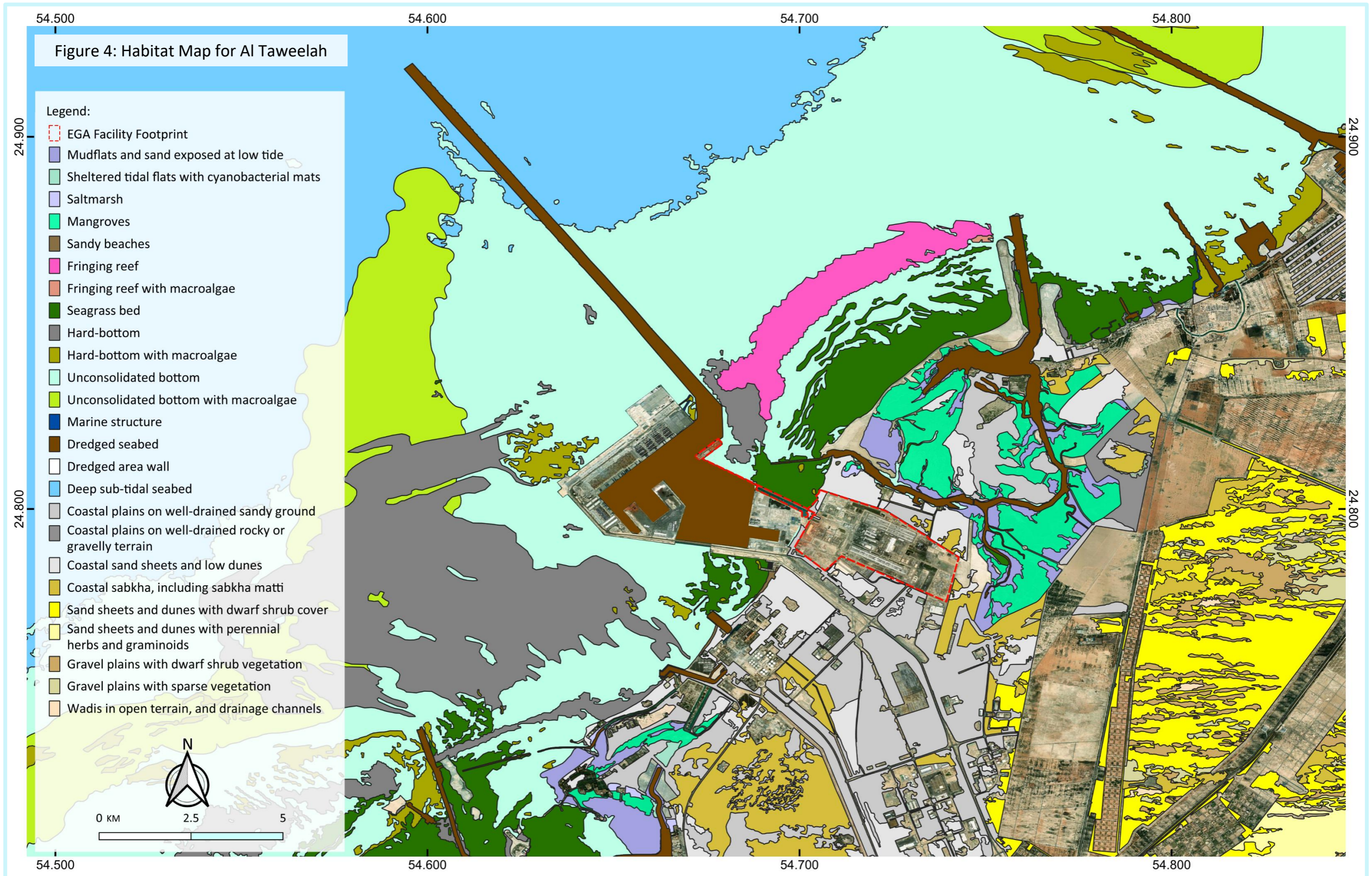
The terrestrial location at the BRSA facility, although subject to the potential for wind blown residue to affect a number of terrestrial fauna recorded in the vicinity of the BRSA facility (gazelles (IUCN – VU), Spiny Tailed Lizards (IUCN – VU), Wonder Geckos, bats and several species of birds), has not shown any colouration due to bauxite (previous reports and recent surveys). The AOI therefore covers the EGA footprint only as shown in Figure 3.

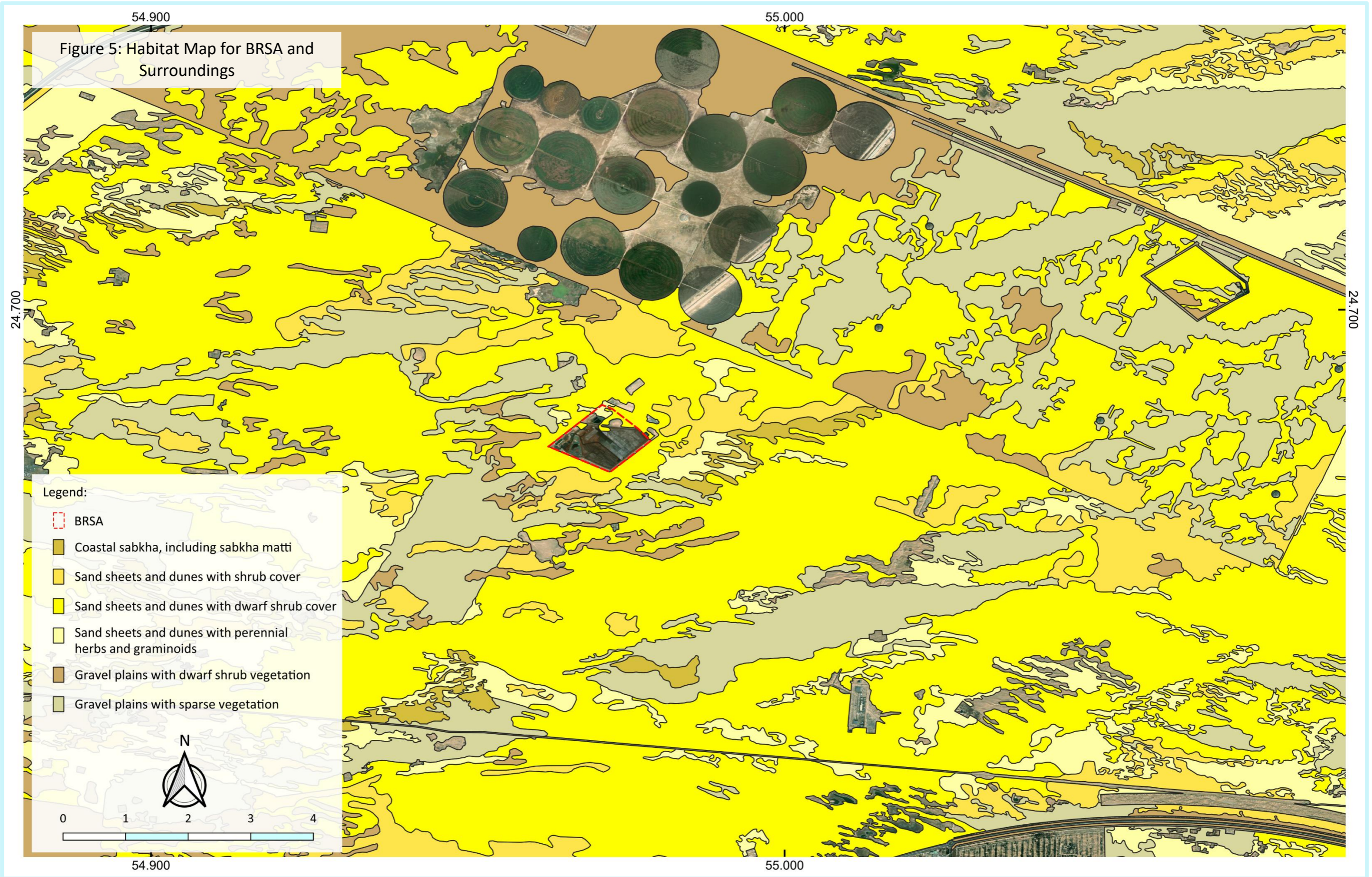
At Jebel Ali, as shown in Figure 6, the AOI covers the marine area immediately adjacent to the EGA facility. The key biodiversity feature here is the Green Turtle (*Chelonia mydas*, IUCN EN); individuals have been observed in this AOI – likely stressed and disorientated given the different activities in the area concerned - and importantly within the EGA intake facility. As in the case of Taweelah, this area is also clearly influenced by a number of different operations in addition to the outfall and intake of the EGA facility. This has been borne in mind when developing specific actions in section 6 below and ultimately when looking at additional opportunities for protecting and managing biodiversity which may involve other local, national and regional players.

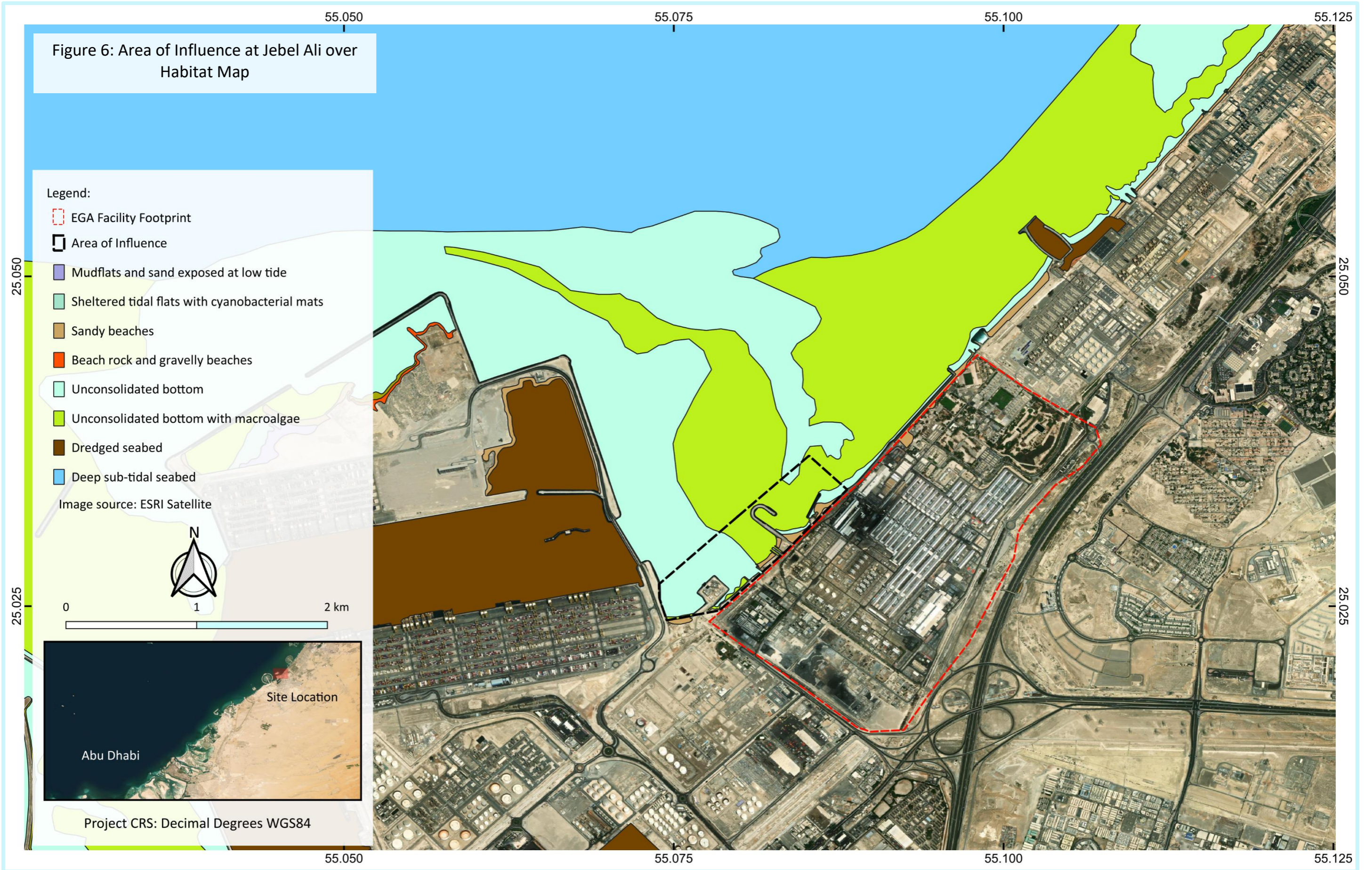
In terms of specific field survey based investigations, Phase 1 has established the requirements for baseline evaluations through a desktop review of existing data including EIAs (Environmental Impact Assessments) undertaken at Al Taweelah and Jebel Ali, marine environmental reports, EGA Environment Monthly Reports, researching publicly available domains, the 2020 EAD Habitat Classification Map for Al Taweelah (Figure 4 below), the development of a habitat map for the Jebel Ali facility operation, and preliminary field investigations to establish requirements for more detailed surveys to be undertaken during Phase 2. A full list of the documentation reviewed is outlined in Table 3 below.

Phase 2 surveys involved more detailed investigations (marine and terrestrial surveys undertaken by NEA) to both validate and expand on existing environmental datasets, to be able to optimally develop the BAP for both EGA facility operations.











## 2.1.1 Desktop Review

A review of existing literature and reports listed in Table 3 has been undertaken as part of the BAP development process. Documents reviewed included a range of published peer-reviewed papers, academic journals, reports by international organisations (UN, EU, World Bank) and conservation bodies (IUCN, WWF), and these are included in the references. In addition, Environmental Impact Assessments (EIA) and Preliminary Environmental Assessments (PER), preliminary Biodiversity Action Plans (BAP), Quarterly/Biannual Environmental Reports (QR) and Relocations of Fauna efforts (REL) were also reviewed and a brief summary of these is provided below.

NEA have also consulted relevant websites including those under the umbrella of IUCN, WWF-UAE, IBAT (Integrated Biodiversity Assessment Tool), Protected Planet, as well as those detailing formal international mechanisms (IFC), and, importantly, the Aluminium Stewardship Initiative (ASI) of which EGA is a member.

The EIAs and PER provided comprehensive baseline data for a wide range of environmental topics for the areas concerned by the EGA facilities at Al Taweelah and Jebel Ali. They are however somewhat dated (2007 to 2016) and focused largely on the successful management of the most relevant impacts typically associated with aluminium industry facilities such as air emissions (also as related to greenhouse gases (GHG) and implications on climate change), dust, noise and discharges into the marine environment.

A Biodiversity Action Plan for EGA's activities at Al Taweelah (2023) was developed as a supporting document to the EGA Operational Environmental and Social Management Plan (OESMP) 2018 for smelting, casting and other auxiliary operations and Operational Environmental and Management Plan (OEMP) 2017 for the refinery and BRSA and was intended to demonstrate alignment of EGA's activities associated with biodiversity management with international best practice. It provided an analysis of the impacts associated with the EGA facilities (noise, dust, air emissions, discharges, etc) but with limited actions/measures aimed specifically at biodiversity conservation including requirements for habitat management, potential for impacts to critically endangered species, consideration of critical habitats or opportunities for biodiversity enhancements. Measures included relate largely to marine turtle management. Importantly, the BAP referred to the need for improved data availability and how an 'updated baseline would be useful to establish ecological condition against which future impacts and improvements can be measured'. NEA surveys have therefore ensured EGA have been provided with an updated baseline and have focussed on identifying IUCN critically endangered, endangered, and vulnerable species within EGA facilities with the aim of developing a suite of new actions aimed at their conservation.

A Biodiversity Action Plan for EGA Operations for the Jebel Ali facility (2021) provided a terrestrial and marine biodiversity baseline, critical habitat assessment, consideration of necessary mitigation efforts and opportunities for enhancements at EGA's Jebel Ali Facility. Importantly, the BAP identified offshore marine habitats as being of poor ecological interest, with very limited abundance and diversity of species. Terrestrial habitats, on the other hand, were surprisingly diverse with several dozen species of native shrubs, herbs and grass species, and high abundance of invertebrates were recorded, many pollinating the native herbs and shrubs. Furthermore, the presence of a roosting bat colony on site was promising, as bats are sensitive indicator species often monitored to ascertain the level of environmental quality of an area. Lastly, the report highlighted several potential avenues for future exploration for potential future survey effort and improvements projects.

In essence, both BAPs highlighted the key requirement for alignment of EGA's activities associated with biodiversity management with international best practice.

Quarterly reports referred to EGA's compliance with air emissions, marine discharges, noise and dust impacts and their updates on environmental incidents, research efforts and development/extension of EGA facilities are summarised there. There was no information on biodiversity conservation or specific management measures associated with habitats and species.

The desktop review has therefore provided insights into areas in the immediate vicinity of EGA's facilities that are of potential biodiversity interest, highlighting critical or sensitive habitats and fauna of global or local conservation significance. Crucially, this information in turn helped define study areas for the Phase 1 surveys. Hence, the locations for marine sampling and underwater videos at Al Taweelah were therefore determined based on the 2020 EAD Habitat Classification Map, which identified the presence and distribution of habitats in the Emirate of Abu Dhabi, as well as the 2016 EMAL EIA, the 2023 EGA Al Taweelah Expansion Project PER, and monitoring studies conducted by NEA since 2020. On the other hand, the selection of Phase 1 marine survey sites at Jebel Ali (sampling and underwater videos) was informed by the 2020 H-Block Project EIAR, which revealed the presence of sparse seagrass beds in the vicinity of the JAFZA Port breakwaters.

As suggested earlier, the findings from the Phase 1 marine surveys determined the scope and site selection for the Phase 2 surveys at Al Taweelah which included SCUBA based efforts to ground truth the presence and distribution of habitats against the EAD Habitat Classification Map. This exercise also allowed for the identification of marine fauna and flora.

At Jebel Ali, a habitat map was generated by NEA based on satellite imagery which provided insights on potential areas to survey for Phase 2. DDVs were subsequently utilised to validate the existing conditions of the habitat against the Jebel Ali habitat map.

The Phase 1 terrestrial efforts comprised site reconnaissance at EGA facilities at both Al Taweelah (including the BRSA site) and Jebel Ali, in order to identify areas of high biodiversity. Accordingly, terrestrial survey equipment and observation points (i.e. camera traps, vantage points, Anabats) were deployed during the Phase 2 terrestrial surveys.

### Key Biodiversity Areas (KBAs) in the UAE

A comprehensive review of the Key Biodiversity Areas (KBA) in the UAE was undertaken by the IUCN Regional Office of West Asia (IUCN ROWA) for the Ministry of Climate Change and Environment (MOCCA) (El-Moghrabi *et al*, 2023). The global standard for the identification of KBAs (IUCN, 2022) was followed to identify the sites of global importance for biodiversity in the UAE. A list of nine (9) Areas was identified in the country.

Although the Ras Ghanadah MPA, in the immediate vicinity of EGA facilities at Al Taweelah, is not included in this list, it is worth mentioning that, according to the global criteria, all identified KBAs are considered critical sites for globally threatened and range-restricted species. Crucially, this KBA Report includes Dugongs and, importantly, states that 'it is crucial to emphasise the journey does not end with the declaration of KBAs, and it is of utmost importance to ensure the protection of these globally significant and unique sites and the conservation of the species for which they were identified'. Hence, given Abu Dhabi hosts the second largest population of Dugongs after Australia and the species survival is dependent on healthy seagrass beds, a critical habitat widely found in proximity of the Al Taweelah EGA facility, this BAP highlights initiatives which focus on the conservation and sustainable management of both seagrass beds and, indirectly, Dugongs such as the Dugong and Seagrass Conservation Project (<https://www.Dugongconservation.org>). These instruments should be seen as important and relevant opportunities for involvement by EGA.

Table 1: List of Documents / Reports for Review

Year	Document Name
2007	EMAL EIA Final Report (Jun 2007)
2008	DUBAL EIA Volume 1 Main Report (Feb 2008)
2008	EMAL Fauna Translocation - Final Report (Mar 2008)
2010	ATS Operations Quarterly Env. Report (Jul-Sep 2010)
2014	Project Shaheen EIA (June 2014 Rev 02)
2016	ATA BRSA Reptile Relocation Report
2016	EMAL EIA Full Report
2019	HydroQual Dubal Ecological Tech Memo January 2019_Rev0
2019	HydroQual Dubal Ecological Tech Memo March 2019 Rev0
2019	HydroQual Dubal Ecological Tech Memo July 2019 Rev1
2019	HydroQual Dubal Ecological Tech Memo Sept 2019 Rev0
2019	HydroQual Dubal Ecological Tech Memo Nov 2019 Rev01
2020	HydroQual Dubal Ecological Tech Memo May 2020 Rev0
2020	HydroQual Dubal Ecological Tech Memo Sept 2020 Rev0
2020	HydroQual Dubal Ecological Tech Memo Nov 2020 Rev0
2020	HydroQual EGA Eco 2020 Yearly Report Rev0
2020	NEA MN628-02-0520-1.1 EGA Marine Monitoring 02
2020	NEA MN628-1019-1.2 EGA Marine Monitoring 01
2020	ATA EAD environment report (Q2 2020)
2020	EIAR EGA H-Block Project CCGT and SWRO
2021	HydroQual Dubal Ecological Tech Memo March2021 Rev0
2021	HydroQual Dubal Ecological Tech Memo May2019 Rev0
2021	HydroQual Dubal Ecological Tech Memo Jan 2021 Rev0
2021	NEA N628-03-0521-1.3 EGA Marine Monitoring 03
2021	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report July 260821 R003
2021	WKC Seabed and Marine Ecological Monitoring Full Report May 2021
2021	JA BAP (SUS.GEN.01)
2022	NEA N628-0722-04-1.3 EGA Marine Monitoring Report 04
2022	WKC J21081 Annual Review 22 EGA DUBAI Marine Monitoring Ecology Report REV02
2022	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report November 301222
2022	WKC J21081 July 22 EGA DUBAI Marine Monitoring Ecology Report 100822
2022	WKC J21081 Sept 22 EGA DUBAI Marine Monitoring Ecology Report 311022

Table 1: List of Documents / Reports for Review

Year	Document Name
2023	NEA N628-0623-05-1.2 EGA Marine Monitoring Report 05
2023	NEA N822-0524-06-1.2 EGA Marine Monitoring Report 06
2023	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report January 2023 Rev2
2023	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report July 310823
2023	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report June 2023
2023	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report March 280423
2023	WKC J21081 EGA DUBAI Marine Monitoring Ecology Report SEP 2023
2023	ATS Overall Plant Drawing (R03 Feb 2023)
2023	AT and ATA BAP (SUS.GEN.01) FINAL
2023	J22109 EGA Al Taweelah Expansion Project PER
2024	NEA N822-0324-INPL-1.0 EGA Infauna and Plankton Analysis Report
2024	NEA N822-0524-PL-1.2 EGA 1.2 JA Plankton Analysis Report
2024	NEA N822-0624-IN-1.1 EGA Infauna Analysis Report
2024	NEA N822-0624-INPL-1.2 EGA Analysis Report
2024	NEA N822-0624-MAR-1.2 EGA Jebel Ali Report
2024	ATS Quarterly (Jan-Mar 2024) Operations Environmental & Construction Report
2024	EAD ATA Quarterly Report (Jan-Mar 2024)
2024	NIBIO Report on the Impact of fluoride emissions on local vegetation at Al Taweelah and Jebel Ali

## Public Sources Reviewed

[IUCN Red List of Threatened Species](#)<sup>1</sup>

[Key Biodiversity Areas \(IUCN\)](#)<sup>2</sup>

[Birdlife International](#)<sup>3</sup>

[Protected Planet.net \(World Database of Protected Areas\)](#)<sup>4</sup>

[IBAT \(Integrated Biodiversity Assessment Tool\)](#)<sup>5</sup>

## Table Key:

NEA = Nautica Environmental Associates  
 EGA = Emirates Global Aluminium  
 EAD = Environmental Agency – Abu Dhabi  
 ATA = Al Taweelah Alumina  
 ATS = Al Taweelah Smelter  
 BAP = Biodiversity Action Plan  
 EIA = Environmental Impact Assessment  
 DUBAL= Dubai Aluminium

Table 1: List of Documents / Reports for Review

Year	Document Name
PER = Preliminary Environmental Review	
EMAL = Emirates Aluminium	
IUCN = International Union for Conservation of Nature	
WKC = Ward Karlson Consulting	
1	IUCN Red List for UAE was consulted and the status of species relevant to this BAP referred to where necessary.
2	The results from the recent review of KBA in the UAE have been summarised in this BAP.
3	Relevant information from BirdLife has been consulted given the presence of both resident and migratory species within EGA facilities.
4	Information on Ras Ghanadah MPA, located in the immediate vicinity of the AT EGA facility has been consulted and included where required.
5	The world's most authoritative biodiversity data repository has been consulted for the most up to date information on protected areas, IUCN Red List and Key Biodiversity Areas (KBA).

## 2.1.2 NEA Surveys

Field surveys have been conducted to verify and update desktop research findings. As indicated earlier, Phase 1 involved preliminary investigations to guide and inform a more detailed, targeted approach in Phase 2 (Table 4).

Table 2: Linkage between the desktop assessment, and Phase 1 and 2 surveys

AI Taweelah	Desktop Assessment	Phase 1	Phase 2
<b>Marine</b>	<p>Documents and reports reviewed (Table 3) provided insights into the historical biodiversity context around EGA's facilities, highlighting areas of potential biodiversity interest. This includes the marine environment in the immediate vicinity of EGA facilities, the BRSA and the palace immediately adjacent to EGA in AI Taweelah.</p> <p>EAD 2020 Habitat Classification Map was reviewed.</p>	<p>Locations for sampling and underwater video deployment were informed by the desktop assessment. Samples were taken at areas of interest identified in previous reports (the shared outfall, intake) to determine water and sediment quality. Underwater videos were undertaken at marine areas classified as sensitive/critical habitats through the 2020 EAD Habitat Classification Map.</p>	<p>Specific sites of interest for SCUBA based dive transects were selected based on confirmation of the presence of these habitats through the DDV surveys in Phase 1.</p>
<b>Terrestrial</b>	<p>Documents and reports reviewed (Table 3) provided insights into the historical biodiversity context around EGA's facilities, highlighting areas of potential biodiversity interest.</p> <p>Satellite and aerial imagery from Google Earth, and EAD 2020 Habitat Classification Map were reviewed.</p>	<p>Site reconnaissance was conducted to verify the presence of habitats of interest from the habitat map (e.g. Sand Sheets and Dunes with Dwarf Shrubs in BRSA) and other areas of fauna activities based on satellite and aerial imagery from Google Earth during the desktop review.</p>	<p>The locations for fauna observation and the deployment of terrestrial equipment were selected based on findings from the Phase 1 site reconnaissance such as the presence of animal tracks, scat, etc.</p>
Jebel Ali	Desktop Assessment	Phase 1	Phase 2
<b>Marine</b>	<p>Documents and reports reviewed (Table 3) provided insights into the historical biodiversity context around EGA's facilities, highlighting areas of potential biodiversity interest. This includes the marine environment in the immediate vicinity of EGA facilities, and the EGA golf</p>	<p>Locations for sampling and underwater video deployment were informed by the desktop assessment. Samples were taken at areas of interest identified in previous reports (the shared outfall, intake) to determine water and sediment quality. Underwater videos were undertaken at marine areas</p>	<p>Jebel Ali Habitat Map was developed following Phase 1 and showed the potential presence of seagrass habitats. Underwater cameras were deployed to validate this.</p>

Table 2: Linkage between the desktop assessment, and Phase 1 and 2 surveys

	course at the Jebel Ali facility.	identified through findings in previous reports (e.g. the presence of seagrass identified in a previous EIA report [EGA H Block Project Jebel Ali EIA, 2019] needed to be confirmed through DDV surveys)	
<b>Terrestrial</b>	Documents and reports reviewed (Table 3) provided insights into the historical biodiversity context around EGA's facilities, highlighting areas of potential biodiversity interest.  Satellite and aerial imagery from Google Earth, and the habitat map developed for Jebel Ali were reviewed.	Site reconnaissance was conducted to verify the presence of habitats of interest and other areas of fauna activities based on satellite and aerial imagery from Google Earth and previous EIAs and BAPs during the desktop review.	Locations for deploying terrestrial survey equipment and identifying terrestrial fauna were selected based on findings during the site reconnaissance in Phase 1, such as the presence of animal tracks, scat, etc.

A detailed explanation of both phases, the rationale for inclusion of marine and terrestrial features and water and sediment quality parameters and the technical methodologies for the field surveys proposed can be found in Annex A. Figures 7 to 14 in the survey section below show the locations of surveys undertaken at both EGA sites.

Marine survey locations for Phase 1 were selected to cover the range and spatial spread of habitats at Al Taweelah and Jebel Ali that are known based on desktop review, previous surveys conducted by NEA and habitat classification maps. These surveys involved the deployment of Drop-Down Videos (DDV) at both sites, fish census, studies on infauna communities, phytoplankton and zooplankton communities and marine megafauna observations as well as comprehensive assessment of water and sediment quality parameters.

Phase 2 ground truthing of the existing habitats was undertaken with SCUBA based methods such as transects and quadrats at the Al Taweelah site and was based on the Phase 1 DDV survey. At the Jebel Ali site the habitat map was developed using satellite imagery, offering insights into survey areas of potential interest for Phase 2. Given the diving restrictions related to health and safety, and marine traffic at the site, DDVs were used to validate the current habitat conditions against the Jebel Ali habitat map.

The Phase 2 terrestrial survey locations (Al Taweelah and Jebel Ali) were selected following the site reconnaissance in Phase 1; parameters recorded included bats, other mammals, reptiles, and avifauna. The Phase 2 surveys included the deployment of terrestrial equipment, and diurnal and nocturnal surveys at the survey locations selected based on Phase 1. Techniques included vantage points (avifauna), camera traps and bat recording units (Anabat).

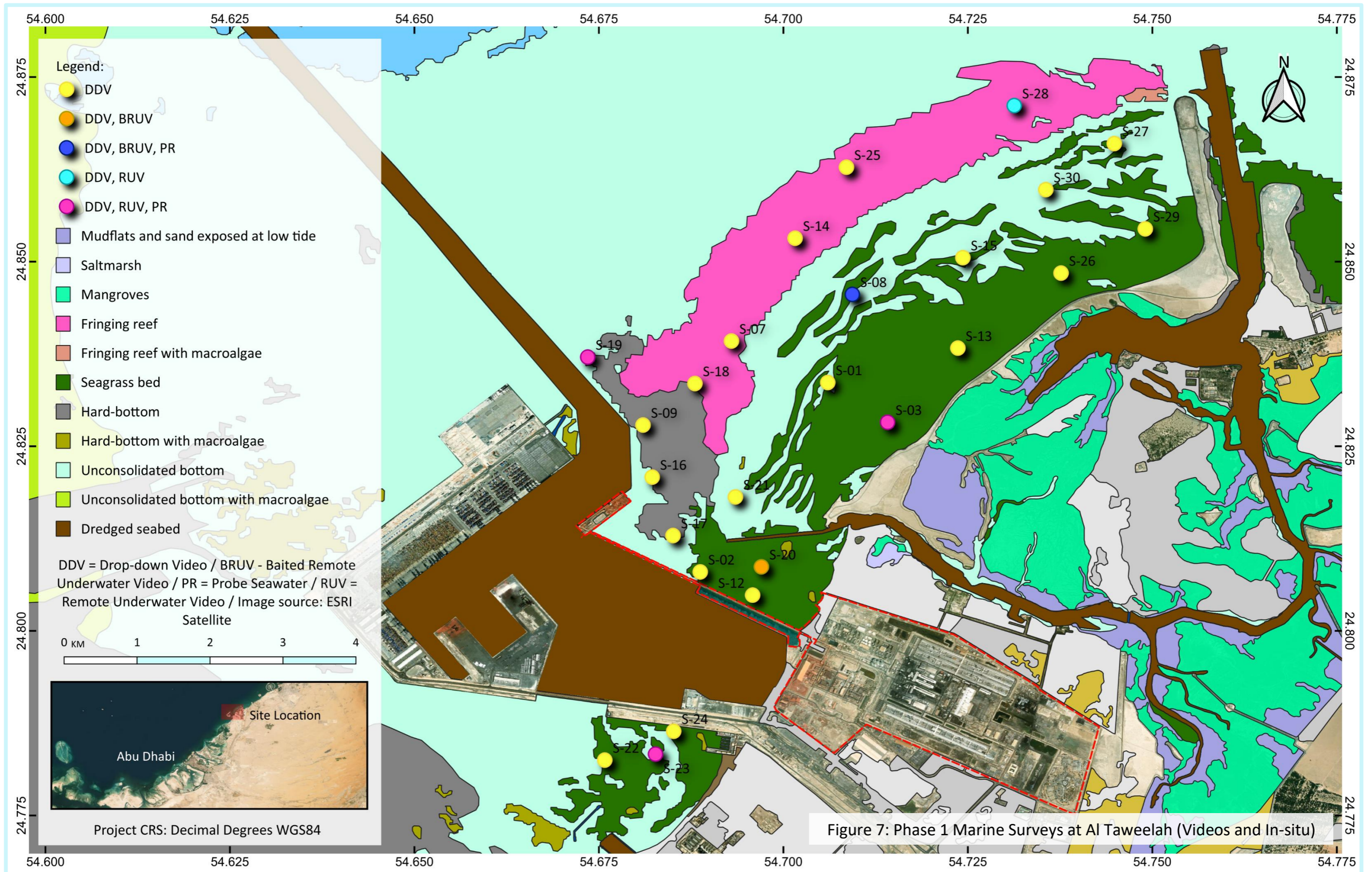
With regards to habitat mapping, NEA have utilised the existing 2020 EAD Habitat Classification Map for the Emirate of Abu Dhabi by using higher resolution imagery. Of note, the BRSA facility habitat map, given its

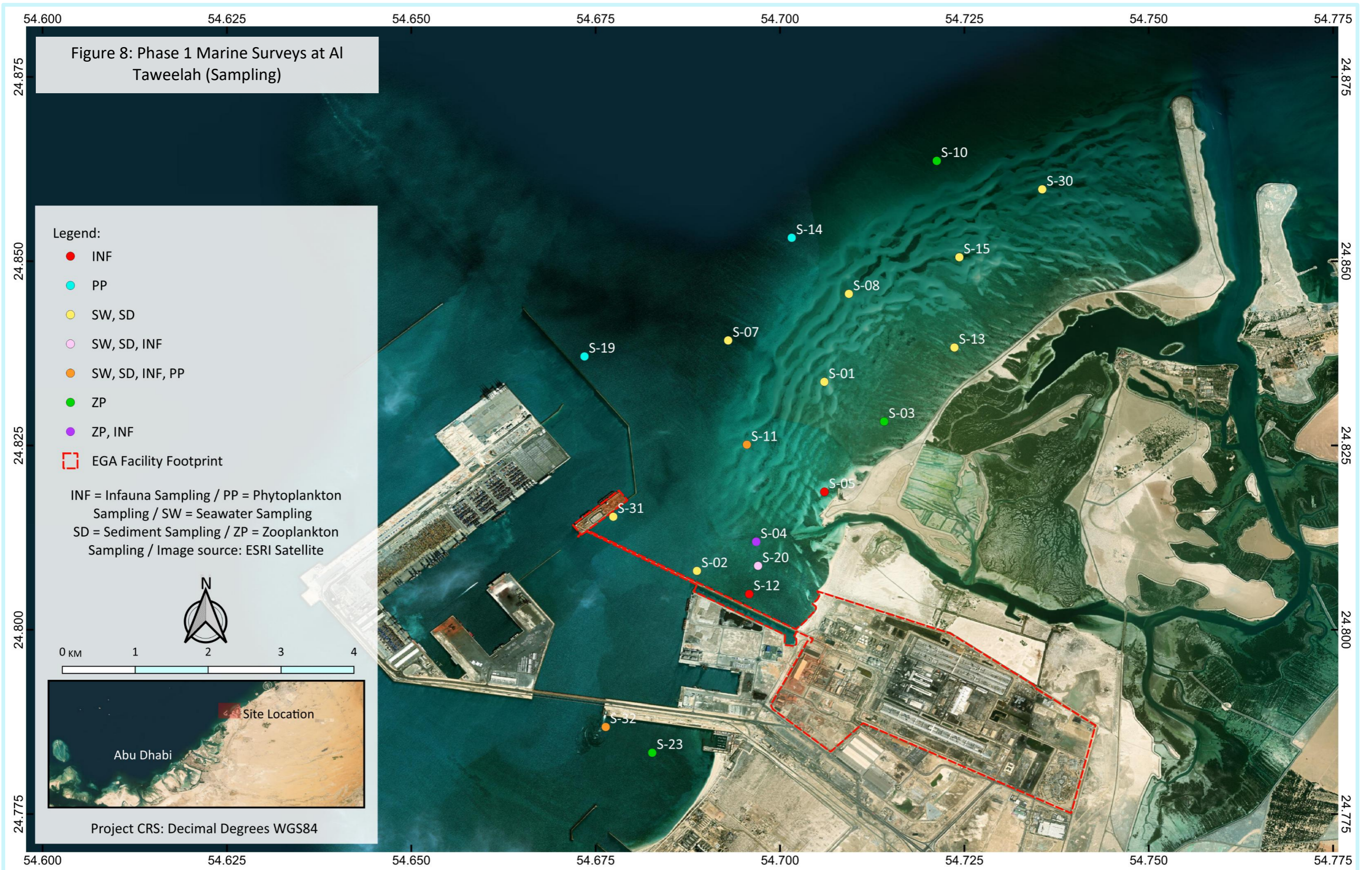
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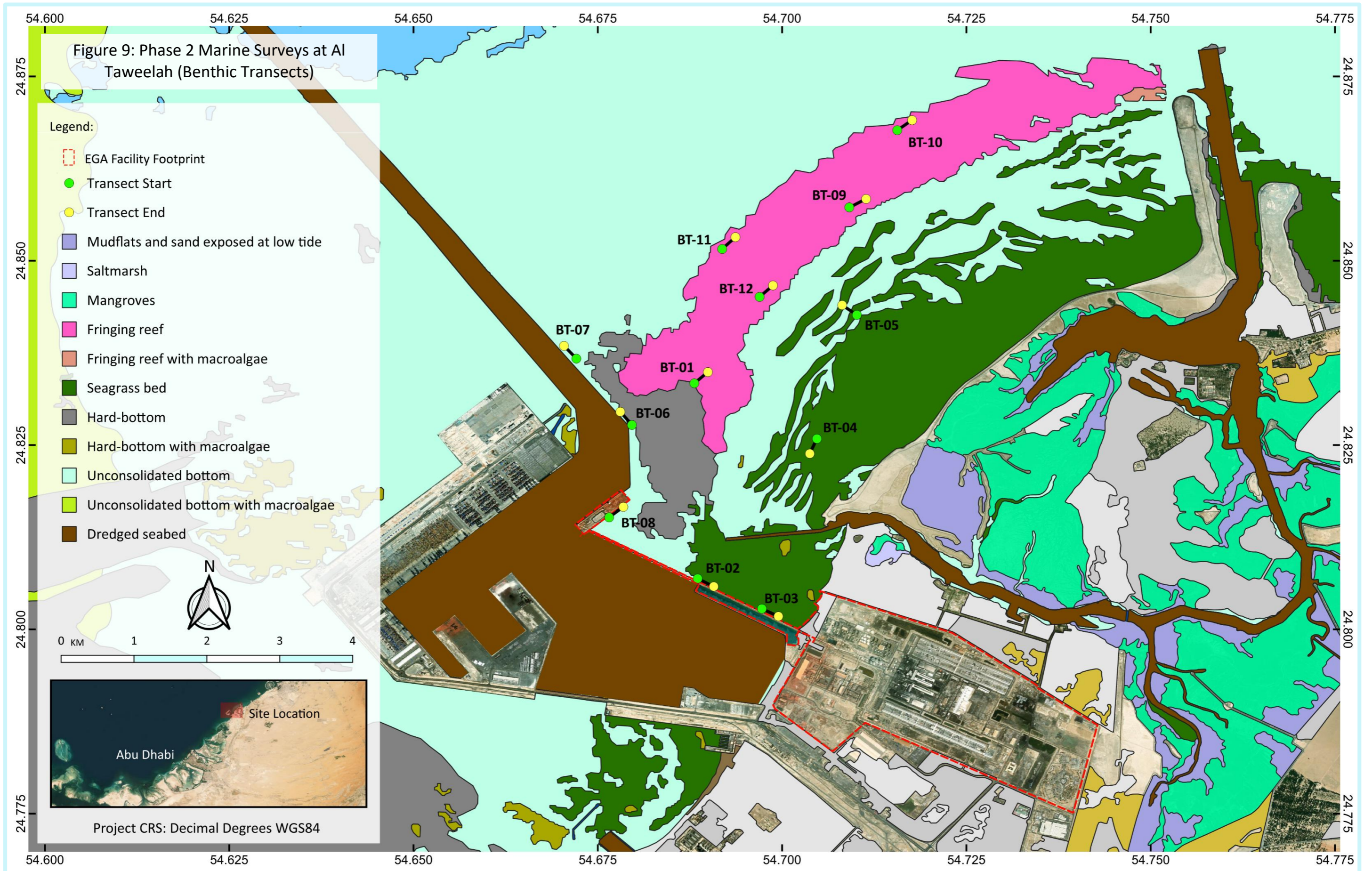
characteristics, i.e., storage for bauxite residue storage, etc. and the information gathered via the document review, included areas that may have been affected by dust deposition, particulate matter and other air emissions, including in the immediate vicinity of the BRSA itself and, potentially, the agricultural land at the Al Maha Forest to the north of the facility. The habitat maps for Al Taweelah and the BRSA sites are shown in Figures 4 and 5, respectively.

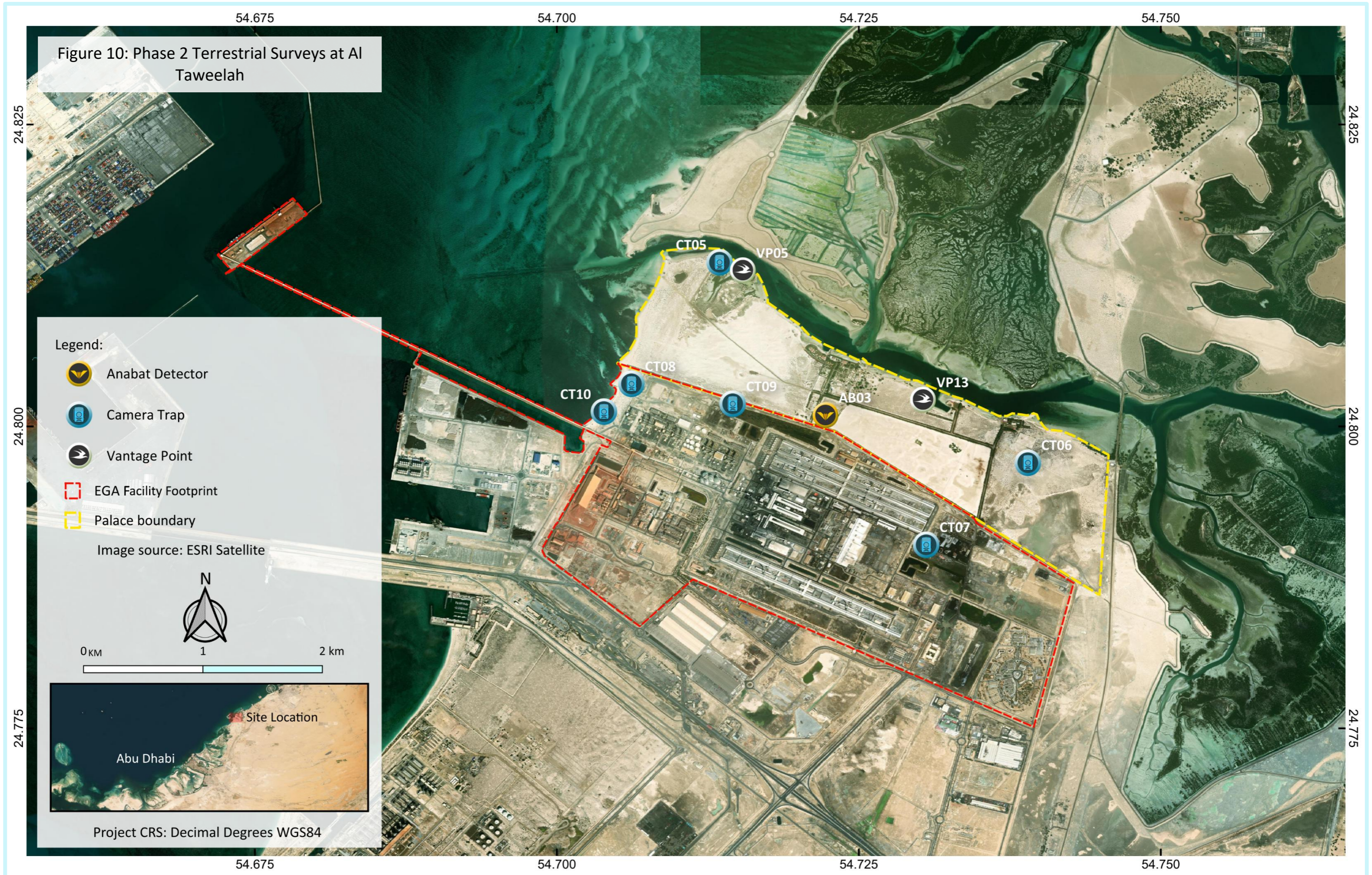
For the site at Jebel Ali, where much of the marine and terrestrial environment has been altered by man-made infrastructure and activities over the past 20 years, a habitat map has been developed by NEA specifically for this BAP using satellite imagery as none were available (see Figure 19).











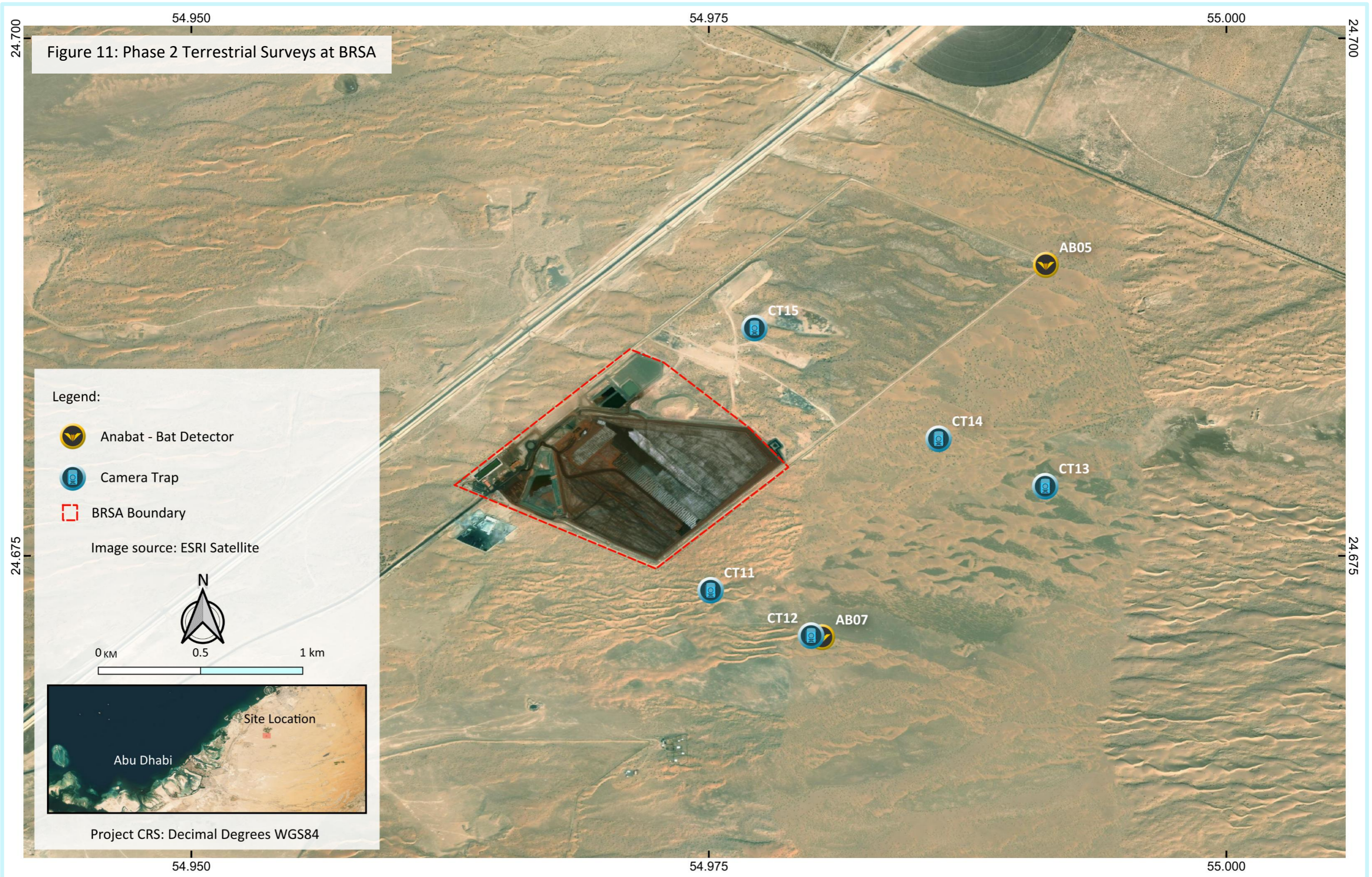
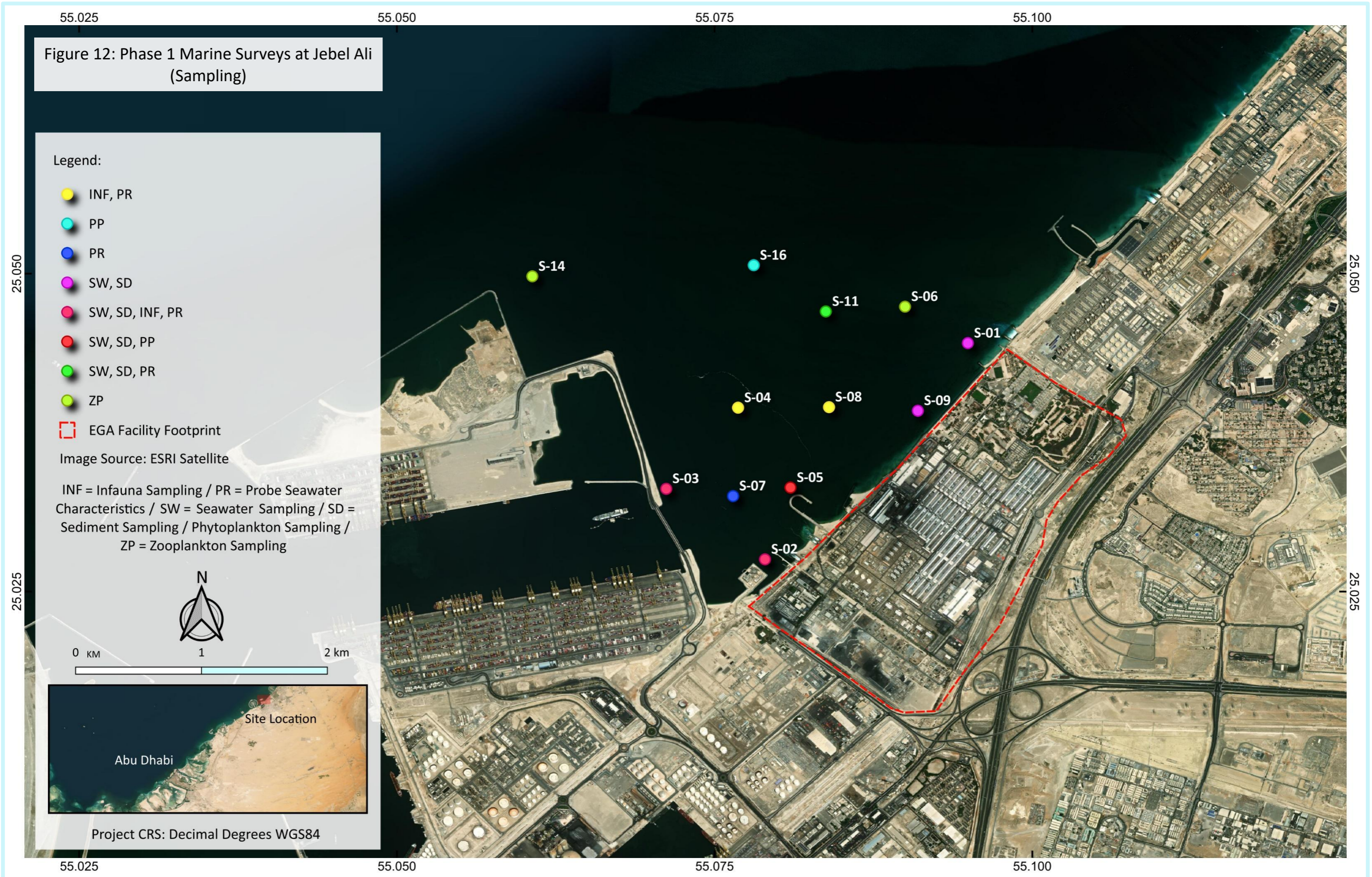
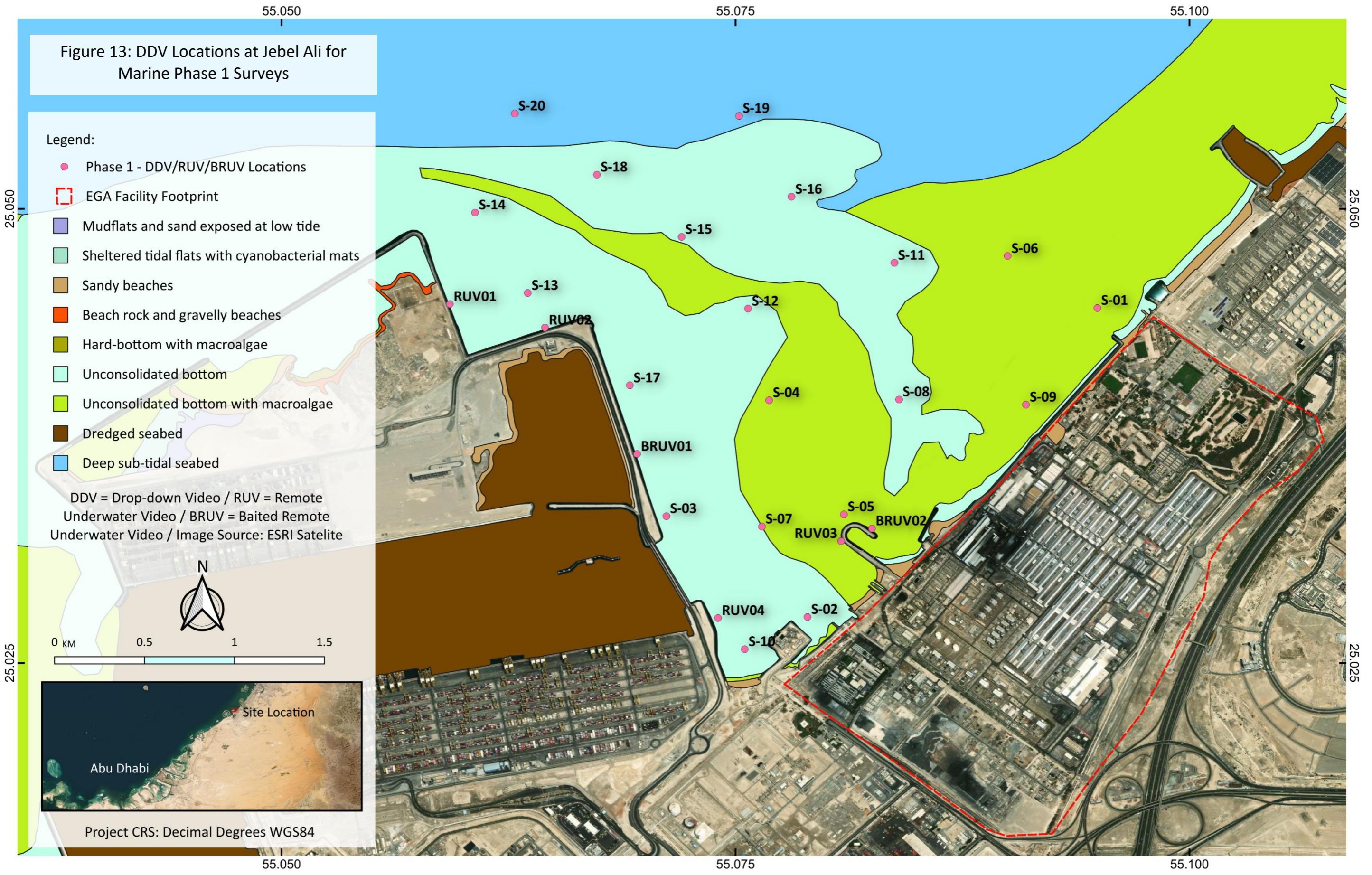
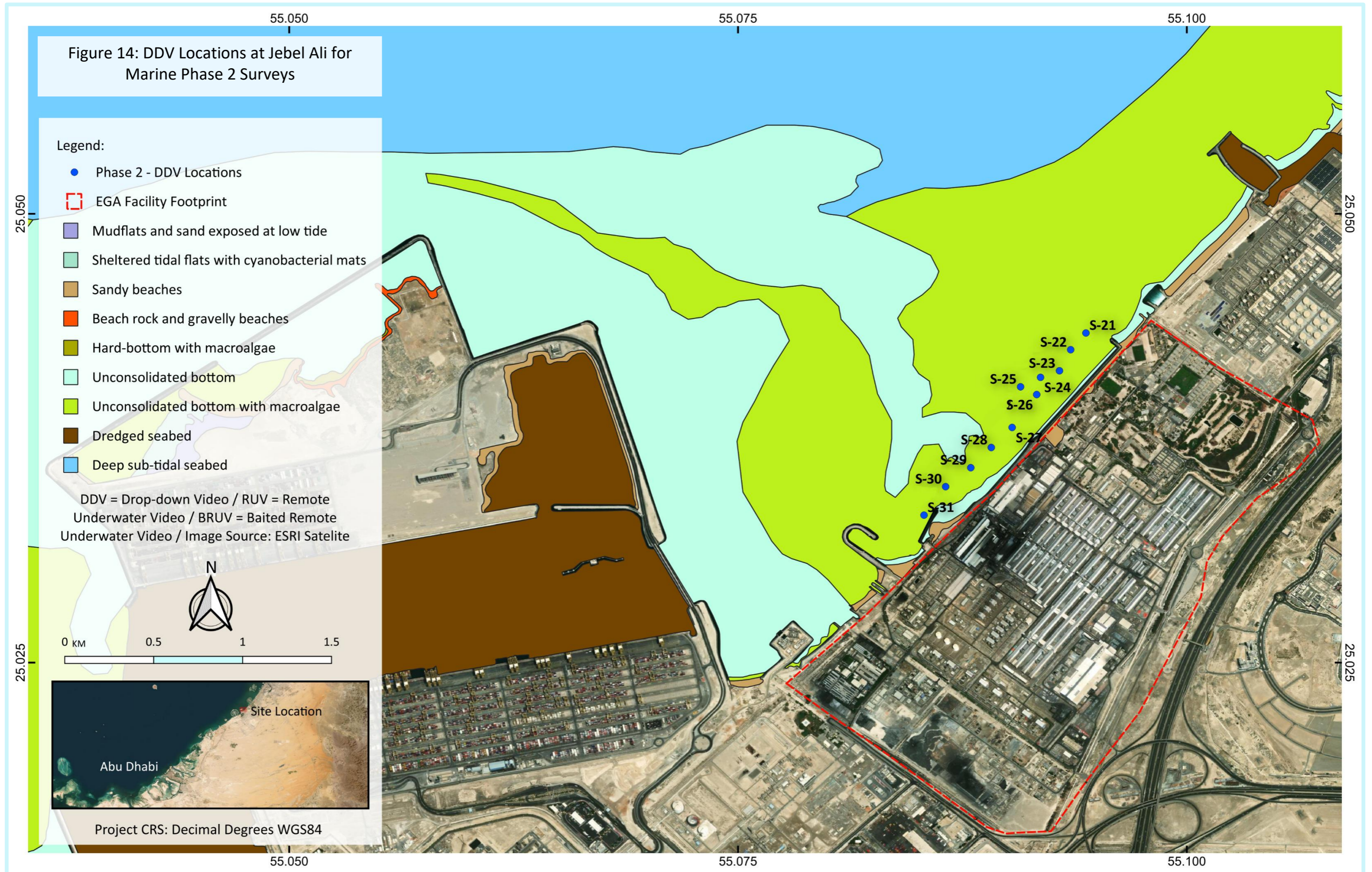


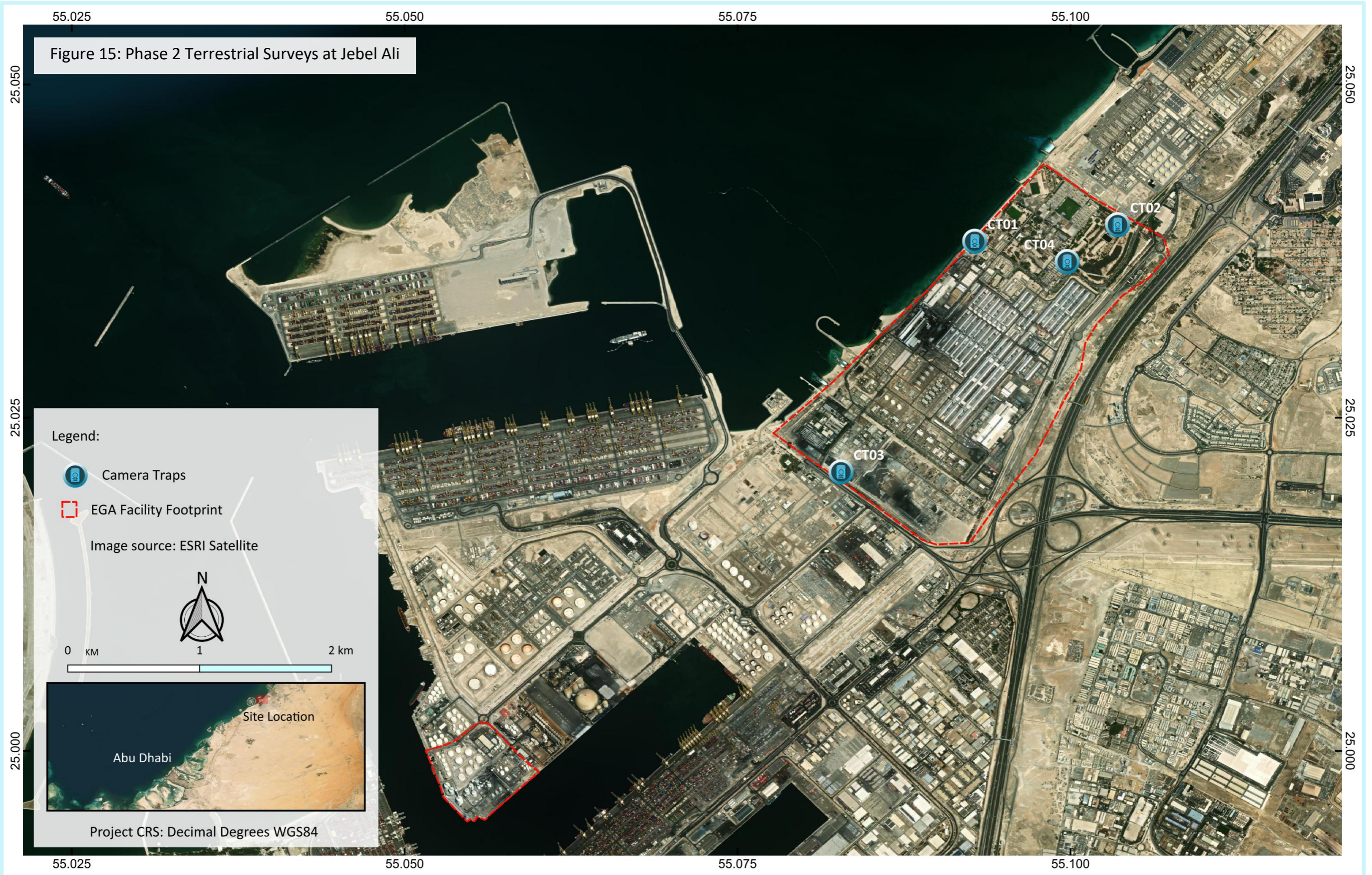
Figure 12: Phase 1 Marine Surveys at Jebel Ali (Sampling)











## 2.2 Results

This section is an amalgamation of the findings sourced from the documentation reviewed during the desktop assessment and the outcomes of the 2024 NEA surveys.

### ECO Regions and Biodiversity Hotspots

The UAE has 2 distinct ecoregions: an eastern mountain region with a sub-montane zone of outwash plains characterised by *Acacia* trees (*Acacia tortilis*), and a western desert region divided into a coastal belt and inland desert and scrub characterised by Ghaf trees (*Prosopis cineraria*). The UAE supports up to 450-500 indigenous and naturalised species with many demonstrating specialised adaptation to salt tolerance, high temperatures and water stress (WWF Ecoregion data, 2019).

Importantly, the Arabian Peninsula serves as a staging post between Africa and Asia for migratory bird species, and the many lagoons, mud flats, khors and mangrove stands found along the Arabian Gulf and the Gulf of Oman provide ideal nesting and feeding sites. Coastal sites along the west coast of the UAE also provide diversity hotspots and areas of ecological significance in the form of mangrove forests, coral reefs, seagrass beds and intertidal areas.

### 2.2.1 Al Taweelah

#### Protected and Nature Conservation Areas

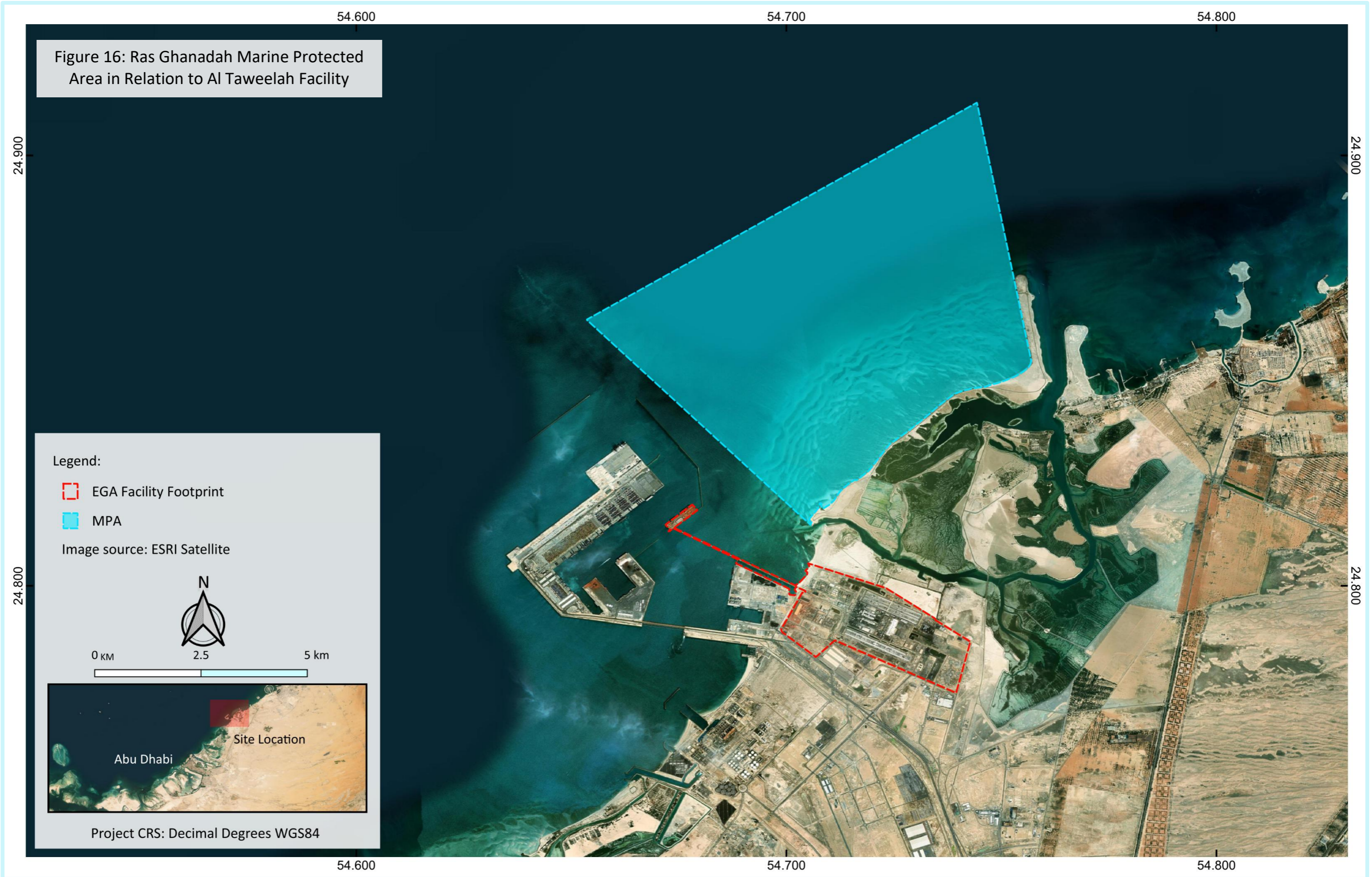
The KEZAD area is situated on the western coast of the UAE where climate is characterised by high temperatures, high relative humidity and low mean monthly rainfall (less than 20mm), typical of this ecoregion (NCM, 2021).

Al Taweelah features a diversity of marine habitats, including seagrass beds, artificial structures such as breakwaters and pontoons, and hard bottom areas with macroalgal growth. Additionally, the area supports fringing and patch reefs, which are considered sensitive receptors and provides important habitat for a wide range of marine species. One of the key ecological features of Al Taweelah is the proximity to the Ras Ghanadah MPA, which further enhances its biodiversity value. The marine environment has undergone significant change due to extensive dredging and reclamation activities in recent years which are known to have caused considerable negative effects to the surrounding marine environment.

With regard to the MPA, a study commissioned in April 2008 by the Environment Agency of Abu Dhabi (EAD) was conducted with support from the Emirates Wildlife Society and the World Wildlife Fund for Nature. This investigation identified that the Ras Ghanadah MPA coral reefs are amongst the most important on the entire UAE Arabian Gulf coastline, supporting a diverse reef habitat comprising of species not seen anywhere else in the Gulf ([https://wwfeu.awsassets.panda.org/downloads/coral\\_reef\\_management\\_plan.pdf](https://wwfeu.awsassets.panda.org/downloads/coral_reef_management_plan.pdf)). The area also supports dense seagrass beds home to some of the most valuable ecosystems of the UAE. The location of the Ras Ghanadah MPA in relation to Al Taweelah EGA operations is illustrated in Figure 16 below. The protected area is designated as an IUCN Category IV, under the management of EAD (<https://www.protectedplanet.net/555622079>). For context, the MPA, established in 2017, is known to host almost all confirmed species of hard corals in the southern Gulf, is a crucial nursery and spawning area for all known species of reef fish in the Emirate of Abu Dhabi, provides foraging and nesting for two species of marine turtles, is home to 5 species of marine mammals including 3 species of dolphins and Dugongs, and many of the migratory bird species of the

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Emirate are recorded here. ([www.ead.gov.ae/-/media/Project/EAD/EAD/ Documents/Resources/RAS\\_GHNA DA Factsheet ENG.pdf](http://www.ead.gov.ae/-/media/Project/EAD/EAD/ Documents/Resources/RAS_GHNA DA_Factsheet_ENG.pdf)).



## **Marine Habitats**

### **Seagrass**

Seagrass meadows are crucial nursery areas for marine organisms such as fish, molluscs (including oyster pearls), crustaceans, marine turtles (especially Green Turtles) and Dugongs. Seagrass beds stabilise sediment, reduce coastal erosion, and provide oxygen to sediments, supporting benthic infauna. Seagrasses also enhance water quality by stabilising pollutants and excess nutrients, while releasing oxygen. Additionally, they account for over 10% of the ocean's total carbon storage (<https://www.wwf.org.uk/what-we-do/planting-hope-how-seagrass-can-tackle-climate-change>); (<https://www.epa.gov/sciencematters/epa-scientists-study-carbonstoring-power-seagrass-fight-climate-change>).

In 2007, surveys conducted by SNC-Lavalin identified seagrass beds located off most of the coastline of Al Taweelah. An EIA undertaken in 2016 reported that seagrass meadows in the vicinity appeared healthy, as determined from high leaf density, verdant leaf appearance and lack of necrotic patches and that since 2008 there have been no significant movements of seagrass meadows, loss of density or any visible changes in the plant health. In 2023, these seagrass beds remained clearly visible from the shoreline.

The 2020 Habitat Classification Map referred to above reflects previous findings and confirms the extensive seagrass beds distributed along the entire shoreline and shallow waters at Taweelah including the entire extent of the EGA facility. The NEA surveys have confirmed the extent and health of seagrass beds adjacent to the EGA facility.

### **Coral Reefs**

Coral reefs in the UAE play a key role in the support of marine biodiversity, providing spawning and nursery areas for various marine fauna, including many commercially important fish species. In several surveys undertaken in 2007, 2016 and 2017 dense areas of coral habitat approximately 1km to the east of the EGA wharf area were identified. The Habitat Classification Map above and NEA survey results are therefore consistent with these findings confirming large expanses of fringing reefs stretching in excess of 10 km to the northeast of the EGA facility.

The 2016 EIA, for example, noted that instances of coral mortality since 2008 can largely be attributed to above average sea temperatures recorded in 2010 and 2012 (also observed elsewhere in the Gulf region). Moreover, high sea surface temperatures (>35-36C) have been measured with increasing frequency and for longer periods (>10 days) over the past 10 years with significant and more lengthy episodes of bleaching and consequent coral mortality throughout the UAE, including at the Al Taweelah site. The implications on coral reefs associated with such thermal trends have been detailed in a study conducted by EAD and NYU, which determined that between the summer of 2017 and the spring of 2018 almost three-quarters of the Abu Dhabi Emirate coral reef habitat was lost to bleaching-related mortality (Burt & Paparella, 2019). Data from other parts of the Emirate of Abu Dhabi and elsewhere in the Arabian Gulf also indicate temperatures have been as high as 38.0C (Pers. Comm. Prof. J. Burt, Middle Eastern Marine Science network (MEMS)).

### **Mangroves**

Mangrove forests enrich coastal waters, protect coastlines, aid nutrient recycling and support coastal fisheries, provide refuge for migratory birds and play an important part in carbon sequestration and storage, possibly five times as high as in tropical forests (Choudary *et al*, 2024). Two mangrove areas have been recorded in proximity to the KEZAD area, namely Ras Hanjurah (approximately 10km to the southwest) and Ras Ghanadah

(approximately 2km to the northeast). The larger Ras Ghanadah mangrove covers approximately 1,348 ha and is particularly important as it is the only known site in the UAE in which two mangrove species (*Avicennia marina* and *Rhizophora mucronata*) are found to occur (Halcrow, 2008). The Habitat Classification Map above reiterates the extent of mangroves highlighted above. IUCN Conservation status is LC (Least Concern) for both species.

## **Marine Species**

### **Benthic infauna**

Data presented by SNC-Lavalin in 2007 identified that prior to the operation of the Al Taweelah outfall discharge, infauna populations were typical of those found in the region with species diversity greatest in shallow subtidal sands. The diversity and abundance found in seagrass beds was found to be comparatively lower. Detailed data on benthic infauna from NEA surveys are included in Annex C.

### **Plankton**

Data from the 2016 EIA indicated that 126 phytoplankton species were collected within the Al Taweelah area, dominated by diatoms, particularly *Rhizosolenia styliformis*. Forty-nine species of zooplankton were collected and found to be dominated by copepods. Diversity and abundance of phytoplankton and zooplankton were greatest around the Al Taweelah shore when compared to offshore waters. A detailed report on phytoplankton and zooplankton communities sampled during NEA surveys is included in Annex C.

### **Cetaceans**

Occasional sightings of Dugongs (*Dugong dugon*; IUCN VU) have been reported by EGA staff off the coast of the EGA facility at Al Taweelah as well as during the recent surveys undertaken by NEA. Dugongs are an herbivorous mammal likely to be visiting the shallower waters in and around Al Taweelah to forage from the associated seagrass beds.

Dolphins associated with coastlines of the Arabian Gulf include the Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*; IUCN NT), Indo-Pacific Humpback Dolphin (*Sousa plumbea*; IUCN VU) and Long-beaked Common Dolphin (*Delphinus capensis*; IUCN LC). Likely population and distribution across the coastline of Al Taweelah is currently unknown. Dolphins may reside in the area or only visit occasionally, as the shallower waters and coral reefs are likely to provide good foraging opportunities. Figure 17 shows the marine mammal sightings from the latest NEA surveys.

### **Coral Reefs**

In terms of species diversity, a 2017 study identified a total of thirty-one species of hard corals, the most common being *Porites lutea*, *Anomastrea irregularis*, *Siderastrea savignyana* and *Favia* sp. Conservation status under IUCN is Least Concern (LC), VU (Vulnerable) and LC, respectively.

Surveys undertaken between August and October 2024 have confirmed widespread coral communities at the Al Taweelah site. Importantly, these corals are typically found attached to hard, rocky surfaces, such as the rock armour used in the breakwater structure. Detailed data on species diversity and overall cover and health are provided in Annex B.

Scleractinian (reef building) corals recorded during these surveys showed evidence of some mortality and signs of bleaching across the community along the breakwater at EGA facilities. Corals are highly sensitive to environmental stresses, including elevated water temperatures and increased sedimentation. For optimal survival, corals require abundant light, low turbidity, and effective hydrodynamic flushing.

The species recorded during the NEA surveys are listed in Table 3 below.

Common Name	Scientific Name	Local IUCN	Global IUCN	GCC Convention
Hard coral	<i>Cyphastrea</i> sp.	NL	NL	NL
Hard coral	<i>Favia</i> sp.	NL	NL	NL
Hard coral	<i>Favites</i> sp.	NL	NL	NL
Crust coral	<i>Leptastrea</i> sp.	NL	NL	NL
Hard coral	<i>Platygyra</i> sp.	NL	NL	NL
Stony coral	<i>Porites</i> sp.	NL	NL	NL
Stony coral	Possibly <i>Montipora</i> sp.	NL	NL	NL
African Pillow Coral	<i>Siderastrea savignyana</i>	NL	LC	NL
Hard coral	<i>Turbinaria</i> sp.	NL	NL	NL

Table Key:

- LC = Least Concern; NL = Not Listed

## Marine Birds

The EIA conducted in 2016 summarised past survey efforts and identified that bird species associated with Ras Ghanadah are largely comprised of Lesser Sand Plover (*Charadrius mongolus*) with some Dunlin (*Calidris alpina*) and Socotra Comorant (*Phalacrocorax nigrogularis*). Bird surveys have been undertaken at Al Taweelah sites and data are outlined in Table 4 below.

Common Name	Scientific Name	Local IUCN	Global IUCN
Dunlin	<i>Calidris alpina</i>	LC	LC
Kentish Plover	<i>Anarhynchus alexandrinus</i>	LC	LC
Osprey	<i>Pandion haliaetus</i>	LC	VU
Western Reef Heron	<i>Egretta gularis</i>	LC	LC
Whimbrel	<i>Numenius phaeopus</i>	LC	NT

Table Key:

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NT = Near Threatened / EN = Endangered / NL = Not Listed
- <sup>1</sup> = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- <sup>2</sup> = Regional IUCN status is taken from UAE National Red List of Birds (MOCCA 2021)

## Marine Flora

The 2016 EIA reported a total of 3 species of seagrass recorded off the coast of Al Taweelah, *Halodule uninervis*, *Halophila ovalis* and *Halophila stipulacea*, all listed as Least Concern (LC) by IUCN.

Surveys undertaken between August and October 2024 confirm the presence of seagrass meadows. Two of the three seagrass species known to inhabit the Gulf were observed at Al Taweelah: *Halodule uninervis* and *Halophila ovalis*. Their distribution was primarily concentrated near the shoreline, although sparse patches of *H. ovalis* were also found in areas with a mix of hard bottom, rubble structures, and unconsolidated substrates. In general, the seagrass meadows observed were in a fair condition, with minor signs of stress visible. Detailed survey findings are outlined in Annex B.

Seagrass beds are of significant conservation value, not only providing a highly productive habitat but also offering structural complexity that supports a wide variety of floral and faunal species. These habitats are crucial as they provide both refuge and food for numerous species, including vulnerable and endangered species like the Dugong (*Dugong dugon*) and Green Turtle (*Chelonia mydas*), as well as commercially important fish species, all of which were sighted during the survey.

The survey also identified a diverse range of other floral species, including micro-species such as 'turf' algae, which grow on exposed hard surfaces, and algae on shells and leaves/stems of various animals and plants. Additionally, dark brown diatomaceous mats and filamentous algae were observed at most sites, which are often indicative of environmental stress. Table 5 provides a list of identified flora species across all survey locations, along with their conservation status.

Table 5: Marine Flora Species Sightings at Al Taweelah

Common Name	Scientific Name	Local IUCN	Global IUCN	GCC Convention
Leather Mudweed	<i>Avrainvillea amadelpha</i>	NL	NL	NL
Filamentous algae	<i>Chaetomorpha</i> spp.	NL	NL	NL
Filamentous algae	<i>Cladophora nitellopsis</i>	NL	NL	NL
Narrowleaf Seagrass	<i>Halodule uninervis</i>	NL	LC	NL
Spoon Seagrass	<i>Halophila ovalis</i>	NL	LC	NL
Calcareous seaweed	<i>Lithophyllum kotschyannum</i>	NL	NL	NL
Calcareous seaweed	<i>Lithothamnium</i> sp.	NL	NL	NL
Leafy Rolled-blade Algae	<i>Padina boergesenii</i>	NL	NL	NL

Table Key:

- LC = Least Concern / NL = Not Listed

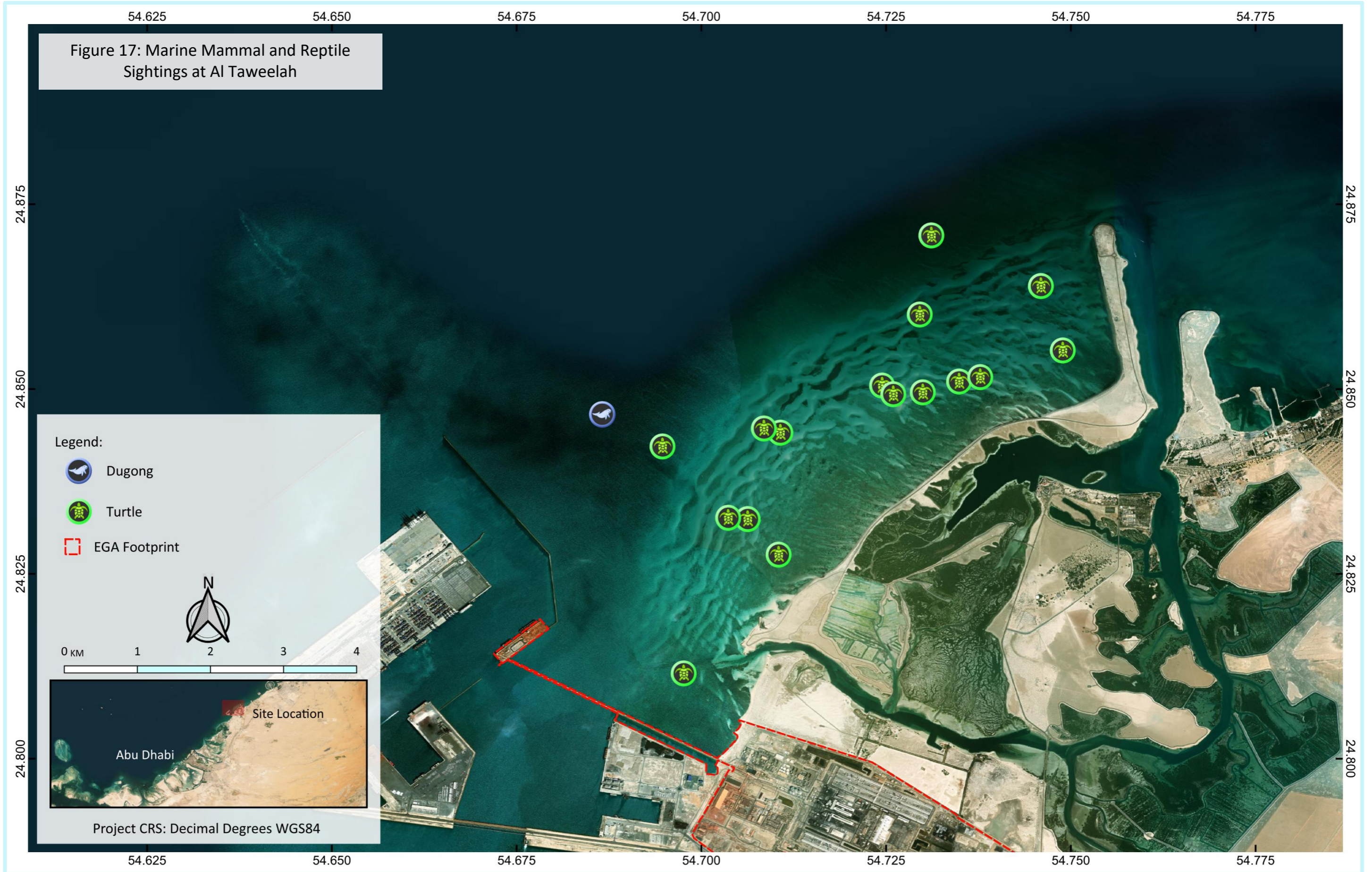


## Marine Reptiles

Numerous reports have confirmed the presence of both Green Turtles (*Chelonia mydas*; IUCN EN) and Hawksbill Turtles (*Eretmochelys imbricata*; IUCN CR) off the coastline of Al Taweelah. There are no available records to suggest that Green Turtles nest in the vicinity of the EGA facility, however seagrass meadows in the area are likely to provide feeding opportunities. There is well substantiated evidence on the other hand that Hawksbills do nest on the beach area adjacent to EGA's power generation facilities (referred to as Hawksbill Turtle Beach). The company has collated data on successful nests of Hawksbill Turtles since 2011 which are shown in Table 23 below.

The 2024 surveys recently undertaken along the EGA coastal areas confirm the presence of green turtles particularly in the seagrass meadows. At least 20 turtles were sighted in total, with ~10 of those confirmed as green turtles. Figure 17 shows turtle sightings during the latest surveys.

There are no records of sea snakes in and around the Al Taweelah coastline, however areas of coral are known to provide suitable areas for foraging and refuge.



## Fish

Past survey efforts have identified as many as 44 fish species from the nearshore environment of Al Taweelah with gobies (*Cryptocentrus* sp. and *Amblygobius* sp.) being the most abundant. Key species identified thought to be in decline include the Orange-spotted Grouper (*Epinephelus coioides*) and Blotched Fantail Ray (*Taeniura meyeni*). Both fish species are reliant upon mangroves and coral reefs habitats as critical to their lifecycle. Since EGA Al Taweelah became operational, a total of 11 fish species have been identified (all within the sea water intake reservoir).

During the NEA survey period of the Al Taweelah area, several species of fish were recorded, including several commercially important ones observed at the sites. Most notably, the Narrow-barred Spanish Mackerel (*Scomberomorus commerson*), listed as both Vulnerable (VU) regionally and Near Threatened (NT) globally on IUCN Red List. Another common resident species sighted is the Orange-spotted Grouper (*Epinephelus coioides*) known locally as 'hammour', regionally listed as VU. This is due to its high commercial value within the Gulf as a staple food source. Another equally valued species seen was the Haffara Seabream (*Rhabdosargus haffara*), regionally listed as VU and prized as a local food source.

Two other resident demersal species were also sighted, the Indo-pacific Sergeant (*Abudefduf vaigiensis*) and the Black-spotted Butterflyfish (*Chaetodon nigropunctatus*), both listed as VU locally. These species, while less commercially coveted regionally, are still commonly seen surrounding reef structures and predominantly caught as bycatch within the Gulf, leading to reduced populations. Fish species recorded during the survey are shown in Table 6.

Common Name	Scientific Name	IUCN (L)	IUCN (G)	GCC Con
Indo-Pacific Sergeant	<i>Abudefduf vaigiensis</i>	VU	LC	NL
Doublebar Seabream	<i>Acanthopagrus bifasciatus</i>	LC	LC	NL
Yellowfin Seabream	<i>Acanthopagrus latus</i>	NE	DD	NL
Shrimp Goby	<i>Amblyeleotris</i> sp.	NL	NL	NL
Tailspot Goby	<i>Amblygobius albimaculatus</i>	LC	LC	NL
Orange-spotted Trevally	<i>Carangoides bajad</i>	LC	LC	NL
Trevally	<i>Carangoides</i> sp.	NL	NL	NL
Trevally	<i>Caranx</i> sp.	NL	NL	NL
Black-spotted Butterflyfish	<i>Chaetodon nigropunctatus</i>	VU	LC	NL
Filamentous Blenny	<i>Cirripectes filamentosus</i>	LC	LC	NL
Luther's Shrimpgoby	<i>Cryptocentrus lutheri</i>	LC	LC	NL
Goby	<i>Cryptocentrus</i> sp.	NL	NL	NL
Orange-spotted Grouper	<i>Epinephelus coioides</i>	VU	LC	NL
Strongspine Silver-biddy	<i>Gerres longirostris</i>	LC	LC	NL
Common Silver-biddy	<i>Gerres oyena</i>	LC	LC	NL

Table 6: Marine Fish and Elasmobranch Species Sightings at Al Taweelah

Common Name	Scientific Name	IUCN (L)	IUCN (G)	GCC Con
Silver-biddy	<i>Gerres</i> sp.	NL	NL	NL
Gulf herring	<i>Herklotsichthys lossei</i>	DD	LC	NL
Herring	<i>Herklotsichthys</i> sp.	NL	NL	NL
Stingray	<i>Himantura</i> sp.	NL	NL	NL
Ornate Goby	<i>Istigobius ornatus</i>	LC	LC	NL
Pinkear Emperor	<i>Lethrinus lentjan</i>	LC	LC	NL
Spangled Emperor	<i>Lethrinus nebulosus</i>	LC	LC	NL
Emperor	<i>Lethrinus</i> sp.	NL	NL	NL
Slender Emperor	<i>Lethrinus variegatus</i>	NE	LC	NL
Blackspot Snapper	<i>Lutjanus ehrenbergii</i>	LC	LC	NL
Dory Snapper	<i>Lutjanus fulviflamma</i>	LC	LC	NL
Snapper	<i>Lutjanus</i> sp.	NL	NL	NL
Silver Moony	<i>Monodactylus argenteus</i>	DD	LC	NL
Pearly Goatfish	<i>Parupeneus margaritatus</i>	LC	LC	NL
Teira Batfish	<i>Platax teira</i>	LC	LC	NL
Blackspotted Thicklip	<i>Plectorhinchus gaterinus</i>	LC	LC	NL
Minstrel Sweetlips	<i>Plectorhinchus schotaf</i>	NE	LC	NL
Sordid Rubberlip	<i>Plectorhinchus sordidus</i>	LC	LC	NL
Arabian Angelfish	<i>Pomacanthus asfur</i>	NE	LC	NL
Yellowbar Angelfish	<i>Pomacanthus maculosus</i>	LC	LC	NL
Arabian Damselfish	<i>Pomacentrus arabicus</i>	NE	LC	NL
Damselfish	<i>Pomacentrus</i> sp.	NL	NL	NL
Persian Dottyback (dark morph)	<i>Pseudochromis persicus</i>	LC	LC	NL
Haffara Seabream	<i>Rhabdosargus haffara</i>	NT	LC	NL
Arabian Monocle Bream	<i>Scolopsis ghaman</i>	LC	LC	NL
Blackstreak Monocle Bream	<i>Scolopsis taeniata</i>	LC	LC	NL
Talang Queenfish	<i>Scomberoides commersonianus</i>	LC	LC	NL
Narrow-barred Spanish Mackerel	<i>Scomberomorus commerson</i>	VU	NT	NL
Rivulated Rabbitfish	<i>Siganus rivulatus</i>	DD	LC	NL
Small-scaled Terapon	<i>Terapon puta</i>	LC	NE	NL
Gulf Goby	<i>Valenciennea persica</i>	LC	LC	NL

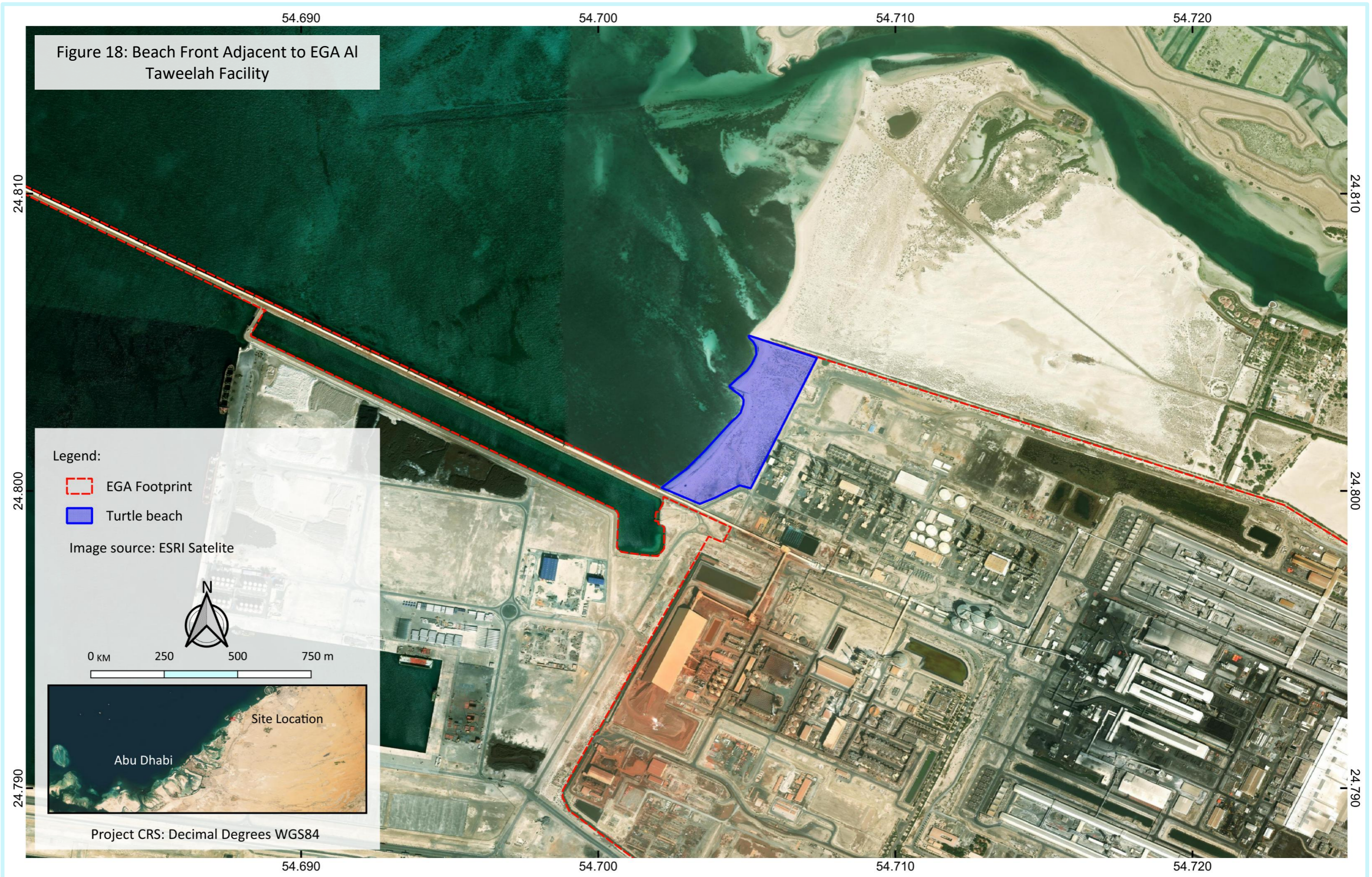
Table 6: Marine Fish and Elasmobranch Species Sightings at Al Taweelah

Common Name	Scientific Name	IUCN (L)	IUCN (G)	GCC Con
Table Key:				
<ul style="list-style-type: none"> <li>(L) – Local / (G) = Global</li> <li>NT = Near Threatened / VU = Vulnerable / LC = Least Concern / NL = Not Listed / NE = Not Evaluated DD = Data Deficient</li> </ul>				

## ***Terrestrial Habitats***

According to the preliminary BAP undertaken at Al Taweelah in 2023, and the ecological survey data reported in the 2016 EIA, prior to the establishment of the EGA facility at Al Taweelah, more than 900 terrestrial fauna, including the Wonder Gecko (*Teratoscincus scincus*), an IUCN CR species, were successfully identified, tracked, captured in the range of habitats present at the time (foredunes, hypersaline sabkha, intermediate sabkha) and safely relocated to alternative habitable locations approved by EAD.

As far as the main EGA facility at Al Taweelah is concerned, approximately 100 m<sup>2</sup> of undisturbed beachfront remains adjacent to this facility (Figure 18) which has been confirmed as nesting ground for Hawksbill Turtles (*Eretmochelys imbricata*). Areas of beachfront above the high tide line are dominated by patches of *Zygophyllum qatarense*. Vegetative debris (predominantly sea grass and macroalgae) is present along the foreshore.



As reported in the EIAs prepared by SNC-Lavalin (2007) and Halcrow (2008), respectively, as part of the approvals sought and obtained from EAD for the establishment and development of EMAL, prior to the establishment of the BRSA facility, the dominant habitats comprised sand dunes with sand sheets and/or alluvial plains, lithified sand sheets – a habitat of significant conservation value within the Emirate of Abu Dhabi, recorded throughout the north-west portion of this site, and Sabkha Matti and/or rocky exposures.

Data from the recent terrestrial surveys confirm that sand sheets, lithified rocks, and alluvial plains still largely comprise the area surrounding the BRSA.

### Terrestrial Flora and Fauna

Previous surveys undertaken for the EMAL EIA (2016) have confirmed there are no tree species at Al Taweelah and that flora species observed on site, *Cyperus conglomeratus* (Cyperaceae), *Phragmites australis* (Poaceae), *Sporobolous ioclados* (Boraginaceae), *Heliotropium bacciferum* (Chenopodiaceae), *Suaeda vermiculata* (Amaranthaceae), and *Zygophyllum qatarense* (Zygophyllaceae), are considered common in the UAE and are afforded minimal conservation value.

The 2016 EMAL EIA reported that prior to the establishment of EGA's Al Taweelah facility, surveys for terrestrial fauna conducted in 2007 identified mammals, herpetofauna (amphibians and reptiles) and avian (bird) populations that permanently or seasonally inhabit the area. As indicated earlier, an EAD approved relocation project was undertaken at EGA's Al Taweelah facility.

Previously identified mammal and bird species across the entire Al Taweelah location include the Arabian Red Fox (*Vulpes vulpes*), the Arabian Gazelle (*Gazella arabica*) and the Chestnut-bellied Sandgrouse (*Pterocles exustus*). Results from NEA surveys confirm the presence of these species and more as listed in Table 7 below. Three species classified as Vulnerable were recorded during the survey, Arabian Oryx, Arabian Gazelle, and Arabian Sand Gazelle. These species are designated as Vulnerable, both globally and locally. All three antelope species are found within the Palace grounds immediately adjacent to EGA, where they receive dedicated care. The Arabian Oryx, specifically, is kept within a fenced area to ensure its safety and well-being, highlighting conservation efforts focused on protecting and sustaining this vulnerable species.

Table 7: Mammal species recorded in Al Taweelah

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Arabian Gazelle	<i>Gazella arabica</i>	VU	VU
Arabian Oryx	<i>Oryx leucoryx</i>	VU	VU
Arabian Red Fox	<i>Vulpes vulpes arabica</i>	LC	LC
Arabian Sand Gazelle	<i>Gazella marica</i>	VU	VU
Cape Hare	<i>Lepus capensis</i>	LC	LC
Feral Cat	<i>Felis catus</i>	LC	LC

Table Key:

- RLS = Red List Status / G = Global / N = National / LC = Least Concern / VU = Vulnerable
- <sup>1</sup> = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- <sup>2</sup> = Regional IUCN status is taken from the Abu Dhabi RED List of Species

Similarly, previous investigations which focused on avifauna (birds) identified a few bird species at Al Taweelah as shown in Table 8. These species tend to colonise habitats affected by human activity and are common regionally. The global population of all these species is robust, with populations increasing due to an increase in urban development and agricultural areas.

Table 8: Identified Bird Species at Al Taweelah			
Common Name	Scientific Name	IUCN Category	GCC Convention
Little Egret	<i>Egretta garzetta</i>	Least Concern	Appendix III
Red-wattled Lapwing	<i>Vanellus indicus</i>	Least Concern	No Listed
Grey Plover	<i>Pluvialis squatarola</i>	Least Concern	No Listed
Kentish Plover	<i>Charadrius alexandrinus</i>	Least Concern	No Listed
Lesser Sand Plover	<i>Charadrius mongolus</i>	Least Concern	No Listed
Caspian Tern	<i>Hydroprogne caspia</i>	Least Concern	No Listed
Feral Pigeon	<i>Columba livia</i>	Least Concern	No Listed
Collared Dove	<i>Streptopelia decaocto</i>	Least Concern	No Listed
Laughing Dove	<i>Spilopelia senegalensis</i>	Least Concern	No Listed
Turkestan Shrike	<i>Lanius phoenicuroides</i>	Least Concern	No Listed
Crested Lark	<i>Galerida cristata</i>	Least Concern	No Listed
Isabelline Wheatear	<i>Oenanthe isabellina</i>	Least Concern	No Listed
Northern Wheatear	<i>Oenanthe oenanthe</i>	Least Concern	No Listed
House Sparrow	<i>Passer domesticus</i>	Least Concern	No Listed
Table Key:			
<ul style="list-style-type: none"> <li>IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council</li> </ul>			

All 24 bird species sighted during NEA's recent surveys are classified as Globally - Least Concern in terms of their conservation status (Table 9). The Whimbrel and Osprey are designated as species of conservation concern according to the UAE National Red List, with the Whimbrel classified as Near Threatened and the Osprey as Vulnerable at the local level. These classifications reflect specific challenges these species face within the UAE, such as habitat pressures, limited nesting sites, and potential disturbances in coastal and marine environments, which are crucial for their survival. Their elevated conservation status emphasises the need for targeted conservation efforts and habitat protection to support these species and mitigate the risks that could lead to further population decline. The Common Sandpiper is classified as Endangered locally according to the UAE Red List, primarily due to its exceptionally low population within the country. This classification highlights the species' vulnerability in the UAE.



**Table 9: Birds species recorded in AI Taweelah during NEA surveys**

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Arabian Green Bee-eater	<i>Merops cyanophrys</i>	LC	LC
Common House Martin	<i>Delichon urbicum</i>	LC	LC
Common Moorhen	<i>Gallinula chloropus</i>	LC	LC
Common Sandpiper	<i>Actitis hypoleucos</i>	LC	EN
Crested Lark	<i>Galerida cristata</i>	LC	LC
Dunlin	<i>Calidris alpina</i>	LC	LC
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	LC	LC
Feral Pigeons	<i>Columba livia</i>	LC	LC
Great Grey Shrike	<i>Lanius excubitor</i>	LC	LC
Grey Francolin	<i>Francolinus pondicerianus</i>	LC	LC
House Crow	<i>Corvus splendens</i>	LC	LC
House Sparrow	<i>Passer domesticus</i>	LC	LC
Indian Roller	<i>Coracias benghalensis</i>	LC	LC
Isabelline Shrike	<i>Lanius isabellinus</i>	LC	NL
Kentish Plover	<i>Anarhynchus alexandrinus</i>	LC	LC
Laughing Dove	<i>Spilopelia senegalensis</i>	LC	LC
Little Grebe	<i>Tachybaptus ruficollis</i>	LC	LC
Osprey	<i>Pandion haliaetus</i>	LC	VU
Pied Wheatear	<i>Oenanthe pleschanka</i>	LC	LC
Purple Heron	<i>Ardea purpurea</i>	LC	NL
Squacco Heron	<i>Ardeola ralloides</i>	LC	NL
Western Reef Heron	<i>Egretta gularis</i>	LC	LC
Whimbrel	<i>Numenius phaeopus</i>	LC	NT
White Wagtail	<i>Motacilla alba</i>	LC	LC

**Table Key:**

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NT = Near Threatened / EN = Endangered / NL = Not Listed
- <sup>1</sup> = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- <sup>2</sup> = Regional IUCN status is taken from UAE National Red List of Birds (MOCCA 2021)

With regards to the BRSA site and as reported in the 2014 Project Shaheen EIA, the area showed signs of anthropogenic disturbance prior to the development of the facility including excavation, fencing, off-road driving and hunting. There was also evidence that large portions of the site were used for grazing by domestic camels.

Table 10: Terrestrial Flora Species Sightings at BRSA during EIA 2014			
Family	Scientific Name	IUCN Category	GCC Convention
Arecaceae	<i>Phoenix dactylifera</i>	Not Listed	Not Listed
Cyperaceae	<i>Cyperus conglomeratus</i>	Not Listed	Not Listed
Chenopodiaceae	<i>Cornulaca monochantha</i>	Not Listed	Not Listed
	<i>Haloxylon salicornicum</i>	Not Listed	Not Listed
Mimosaceae	<i>Prosopis cineraria</i>	Not Listed	Not Listed
Rhamnaceae	<i>Ziziphus spina-christi</i>	Least Concern	Not Listed
Zygophyllaceae	<i>Fagonia ovalifolia</i>	Not Listed	Not Listed
Table Key:			
<ul style="list-style-type: none"> <li>IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council</li> </ul>			

As far as mammals, birds and reptiles are concerned, although pre-facility surveys had recorded five mammals (including bats), seven bird and six reptile species, as shown in Tables 11, 13 and 15 below, results from 2024 surveys have confirmed the presence of Arabian Red Fox and Arabian Gazelle (*Gazella arabica*), with the latter now classified as its own species split from the previously reported Mountain Gazelle (*Gazella gazella*).

Table 11: Terrestrial Mammal Species Sightings at BRSA during EIA 2014			
Common Name	Scientific Name	IUCN Category	GCC Convention
Cheesman's Gerbil	<i>Gerbillus cheesmani</i>	Not Listed	Not Listed
Sind Serotine	<i>Eptesicus nasutus</i>	Not Listed	Not Listed
Kuhl's Pipistrelle	<i>Pipistrellus kuhlii</i>	Least Concern	Not Listed
Desert Hare	<i>Lepus capensis</i>	Least Concern	Appendix III
Mountain Gazelle	<i>Gazella gazella</i>	Endangered	Appendix II
Arabian Red Fox	<i>Vulpes vulpes arabica</i>	Least Concern	Appendix III
Table Key:			
<ul style="list-style-type: none"> <li>IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council</li> </ul>			

NEA surveys at the BRSA site recorded six mammal species as listed below (Table 12). Cheesman's Gerbil burrows were commonly observed throughout the site, where they were notably abundant. The habitat in this area is highly suitable for the species, with expansive sand dunes and lithified rocks providing ideal conditions for burrowing and shelter. Additionally, the vegetation cover at the site is quite healthy, offering sufficient food sources and further contributing to the favourable living conditions for this species.

Table 12: All mammal species recorded at the BRSA

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Arabian Camel	<i>Camelus dromedarius</i>	LC	NL
Arabian Gazelle	<i>Gazella arabica</i>	VU	VU
Arabian Red Fox	<i>Vulpes vulpes arabica</i>	LC	LC
Cape Hare	<i>Lepus capensis</i>	LC	LC
Cheesman's Gerbil	<i>Gerbillus cheesmani</i>	LC	LC
Feral Cat	<i>Felis catus</i>	LC	LC

## Table Key:

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NL = Not Listed
- 1 = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- 2 = Regional IUCN status is taken from the Abu Dhabi RED List of Species

Table 13: Terrestrial Bird Species Sightings at BRSA during EIA 2014

Common Name	Scientific Name	IUCN Category	GCC Convention
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	Least Concern	Not Listed
Laughing Dove	<i>Spilopelia senegalensis</i>	Least Concern	Not Listed
Little Owl	<i>Athene noctua</i>	Least Concern	Appendix III
Greater Hoopoe Lark	<i>Alaemon alaudipes</i>	Least Concern	Not Listed
Common House Martin	<i>Delichon urbicum</i>	Least Concern	Not Listed

## Table Key:

- IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council

All bird species documented at the BRSA site are categorised as Least Concern on both global and local conservation levels. This designation suggests these species are not currently exposed to major threats to their populations or habitats in these regions. Their presence here signifies a stable ecosystem that sustains avian biodiversity.

Table 14: All Birds species recorded at the BRSA during NEA surveys

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Arabian Green Bee-eater	<i>Merops cyanophrys</i>	LC	LC
Brown-necked Raven	<i>Corvus ruficollis</i>	LC	LC
Crested Lark	<i>Galerida cristata</i>	LC	LC
Greater Hoopoe Lark	<i>Alaemon alaudipes</i>	LC	LC
House Sparrow	<i>Passer domesticus</i>	LC	LC

Table 14: All Birds species recorded at the BRSA during NEA surveys

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Masked Shrike	<i>Lanius nubicus</i>	LC	NL

## Table Key:

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NT = Near Threatened / EN = Endangered / NL = Not Listed
- 1 = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- 2 = Regional IUCN status is taken from UAE National Red List of Birds (MOCCA 2021)

Table 15: Terrestrial Reptile Species Sightings at BRSA during EIA 2014

Common Name	Scientific Name	IUCN Category	GCC Convention
Arabian Toad-headed Agama	<i>Phrynocephalus arabicus</i>	Least Concern	Not Listed
Arabian Sand Gecko	<i>Stenodactylus arabicus</i>	Least Concern	Not Listed
Dune Sand Gecko	<i>Stenodactylus doriae</i>	Least Concern	Not Listed
Baluch Rock Gecko	<i>Bunopus tuberculatus</i>	Least Concern	Not Listed
Egyptian Spiny-tailed Lizard	<i>Uromastix aegyptia</i>	Vulnerable	Appendix III
Arabian Horned Viper	<i>Cerastes gasperettii</i>	Least Concern	Not Listed

Table Key: IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council

Three species of reptiles were recorded in total in the BRSA area during the NEA survey and are listed in Table 16, alphabetically by common name, scientific name, conservation status and specific survey areas where observed. Tracks of the Arabian Horned Viper were identified at the site and the finding highlights the presence of this elusive and potentially dangerous species within the area. This species, known for its distinctive tracks formed by sidewinding locomotion, is a significant indicator of the site's ecological diversity.

Table 16: Reptile species recorded at the BRSA site during NEA surveys

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Arabian Horned Viper	<i>Cerastes gasperettii</i>	LC	LC
Arabian Sand Skink	<i>Scincus mitranus</i>	LC	LC
Schmidt's Fringe toed Lizard	<i>Acanthodactylus schmidti</i>	LC	LC

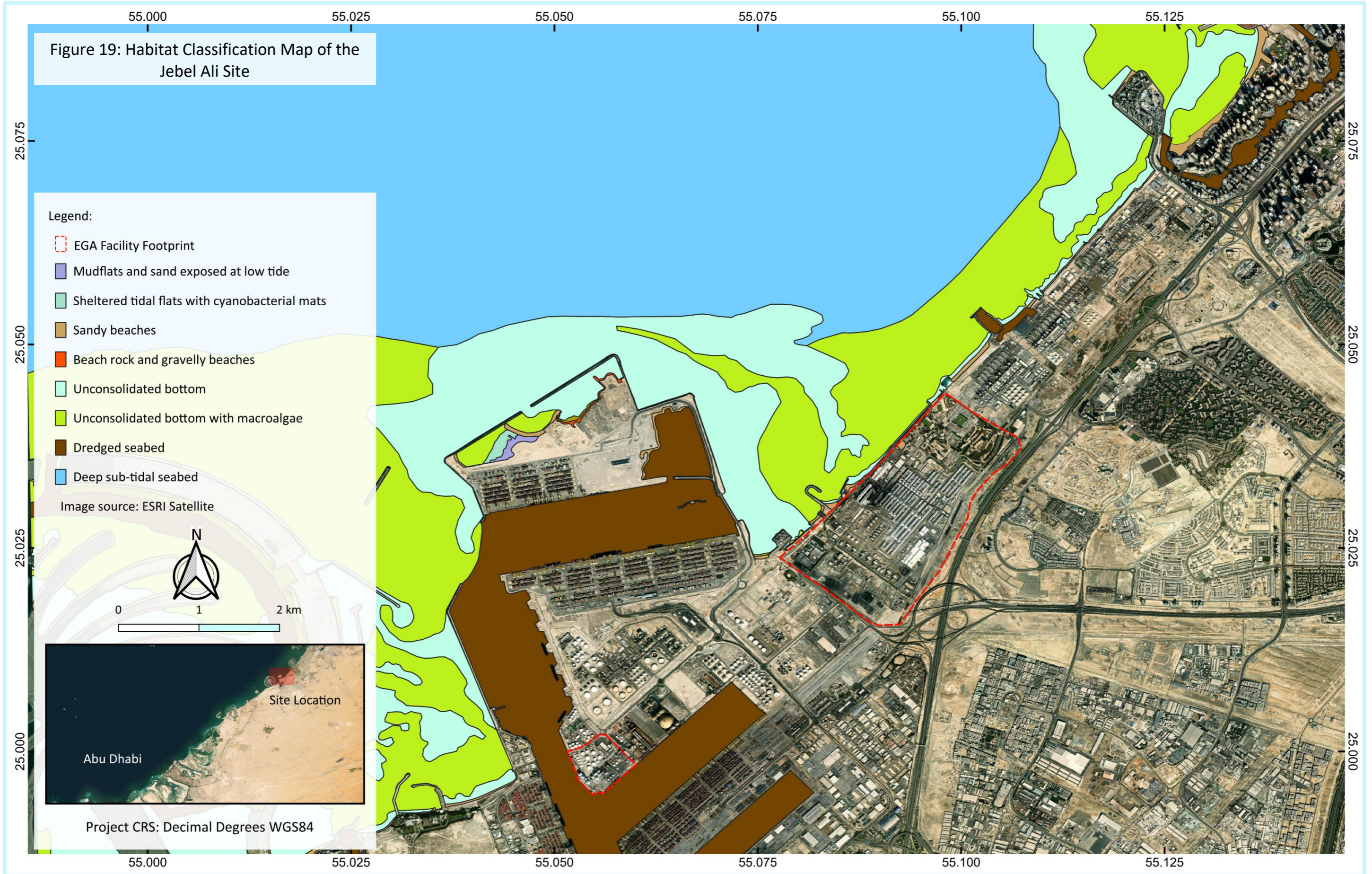
## Table Key:

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NL = Not Listed
- 1 = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- 2 = Regional IUCN status is taken from the Abu Dhabi RED List of Species

## 2.2.2 Jebel Ali

The Jebel Ali area is dedicated predominantly to industrial and commercial activities, however several community services and retail zoning can be found to the southeast of the site. Notably, the EGA facility is situated adjacent to both a large scale power production site run by Dubai's Electricity and Water Authority (DEWA) and the Jebel Ali industrial port. Previous EIAs undertaken in 2008 and 2020 describe the site as disturbed, with industrial activities ongoing. Although the area is generally described as industrialised and without terrestrial ecology of high value, parts of the EGA facility present some terrestrial features both in terms of flora and fauna

A baseline has been established from a review of existing relevant literature, relevant EIAs undertaken, marine environmental reports, EGA Environment Monthly Reports, researching publicly available domains; rapid field assessments and ground-truthing surveys carried out in August, September and October 2024 and a habitat map generated in October 2024 shown below in Figure 19. A full list of the documentation reviewed is outlined above in Table 3 and a detailed summary of findings of the surveys undertaken is included in Appendices B-C.



## Marine Habitats

The Habitat Map shown above indicates that Jebel Ali marine habitats are characterised by a mix of unconsolidated and hard substrates, with seasonal growth of macroalgae. The area is predominantly composed of fine, easily disturbed siltaceous sediments, likely a result of extensive dredging and other anthropogenic activities in the vicinity in recent years. Common microalgal species include turf algae and diatomaceous mats, which are typically found growing on either the sediment or hard substrates (epilithic), and occasionally on other biota (epiphytic). The presence of these species typically is indicative of environmental stress. In addition to the above, the area presents some open sandy beach and rocky outcrops perpendicular to the beach.

Ground truthing with the use of DDVs undertaken as part of the NEA Phase 2 surveys confirmed this near-shore area is overwhelmingly composed of unconsolidated bottom habitat, largely dominated by filamentous algae; no seagrasses were present at this site. This reflects findings in previous EIAs which indicated that the seagrass *Halodule uninervis* was recorded at only 2 locations out of 50 sampled sites in 2016, both over 2km away from the shoreline. Of note, no coral reefs, or other sensitive habitats were observed within the survey area during the NEA surveys.

## Marine Species

Incidental observations from the shoreline into the shallow waters include algae (green algae and turf algae mats), small shoals of fish (unidentifiable) and invertebrates (numerous shells of varying mollusc species and some jellyfish). In addition, only scattered macroalgae were observed and no other marine benthic habitat of significance was present.

## Marine Reptiles

Numerous reports have confirmed the presence of Green Turtles (*Chelonia mydas*; IUCN EN) immediately offshore of the EGA facilities and have also been sighted during the NEA surveys. Importantly, Green Turtles have been recorded trapped at the intake facilities by EGA staff.

## Fish

Throughout the survey, as shown in Table 17, a total of 19 species were recorded, with one commercially important and species observed, the commonly occurring Orange-spotted Grouper (*Epinephelus coioides*) known locally as 'hammour', regionally listed as VU, due to its high regional commercial value as a staple food source.

Comparatively, Jebel Ali showed significantly less biodiversity of fauna species (19) than Al Taweelah (47), including six commercially important species. This disproportion may be attributed to the generally poorer benthic substrate at Jebel Ali and a lack of rugosity preventing species from populating the area.

Table 17: Marine Fish Species Sightings at Jebel Ali

Common Name	Scientific Name	Local IUCN	Global IUCN	GCC Convention
Goldsilke Seabream	<i>Acanthopagrus berda</i>	NL	LC	NL
Two-bar Seabream	<i>Acanthopagrus bifasciatus</i>	LC	LC	NL
Yellowfin Seabream	<i>Acanthopagrus latus</i>	NE	DD	NL

Table 17: Marine Fish Species Sightings at Jebel Ali

Common Name	Scientific Name	Local IUCN	Global IUCN	GCC Convention
Orange-spotted Trevally	<i>Carangoides bajad</i>	LC	LC	NL
Orange-spotted Grouper	<i>Epinephelus coioides</i>	VU	LC	NL
Strongspine Silver-biddy	<i>Gerres longirostris</i>	LC	LC	NL
Common Silver-biddy	<i>Gerres oyena</i>	LC	LC	NL
Orange Striped Emperor	<i>Lethrinus obsoletus</i>	NL	LC	NL
Blackspot Snapper	<i>Lutjanus ehrenbergii</i>	LC	LC	NL
Dory Snapper	<i>Lutjanus fulviflamma</i>	LC	LC	NL
Pearly Goatfish	<i>Parupeneus margaritatus</i>	LC	LC	NL
Minstrel Sweetlips	<i>Plectorhinchus schotaf</i>	NL	LC	NL
Sweetlips	<i>Plectorhinchus</i> sp.	NL	NL	NL
Yellowbar Angelfish	<i>Pomacanthus maculosus</i>	LC	LC	NL
Sardines	<i>Sardinella</i> sp.	NL	NL	NL
Arabian Monocle Bream	<i>Scolopsis ghanam</i>	LC	LC	NL
Black-streaked Monocle Bream	<i>Scolopsis taeniata</i>	LC	LC	NL
Talang Queenfish	<i>Scomberoides commersonianus</i>	LC	LC	NL
Forktail Rabbitfish	<i>Siganus argenteus</i>	NL	LC	NL

Table Key:

- IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council
- VU = Vulnerable; LC = Least Concern; NL = Not Listed; NE = Not Evaluated; DD = Data Deficient

## Invertebrates

Additionally, only 3 invertebrate species were recorded across all sites with no notable exceptions. These species included the Blueblubber Jellyfish (*Catostylus mosaicus*), Cerithid gastropod (*Cerithium* sp.) and Hermit Crab (*Dardanus tinctor*). Such low diversity further suggests a lack of suitable substrate for invertebrates to thrive in.

Table 18: Marine - Other Invertebrates Species Sightings at Jebel Ali

Common Name	Scientific Name	Local IUCN	Global IUCN	GCC Convention
Blueblubber Jellyfish	<i>Catostylus mosaicus</i>	NL	NL	NL
Cerithid Gastropod	<i>Cerithium</i> spp.	NL	NL	NL
Hermit Crab	<i>Dardanus tinctor</i>	NL	NL	NL

Table Key:

- IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council / NL = Not Listed



## Marine flora

A similar trend was observed with floral species, with only two recorded, Green Macroalgae (*Caulerpa sertularioides*) and filamentous algae (*Chaetomorpha* spp.) compared to eight in Al Taweelah. This further highlights the significant difference in substrate complexity between the two locations.

Table 19: Marine Flora Species Sightings at Jebel Ali				
Common Name	Scientific Name	Local IUCN	Global IUCN	GCC Convention
Green Macroalgae	<i>Caulerpa sertularioides</i>	NL	NL	NL
Filamentous algae	<i>Chaetomorpha</i> spp.	NL	NL	NL

Table Key:

- IUCN = International Union for Conservation of Nature / GCC = Gulf Cooperation Council / NL = Not Listed

## Terrestrial Habitats

At the time of writing, the only area at the EGA Jebel Ali with biodiversity features of interest is the EGA Golf Course. This section summarises the findings in this area.

The microhabitats within the golf course include turf, extended reed beds, sand sheets with native vegetation (shrubs and herbs), stands of mature, landscaped and irrigated trees (mostly exotic, some native species), and man-made water bodies.

## Terrestrial Species

The Golf Course is an area with a wide range of flora and fauna. Aside from the native trees Ghaf (*Prosopis cineraria*) and Salt Cedar (*Tamarix aphylla*), the majority of trees within the golf course are non-native and have been cultivated including:

- Damas Tree (*Conocarpus lancifolius*)
- *Conocarpus erectus*
- Flame Tree (*Delonix Regia*)
- Fan Palm (Washingtonia)
- Neem Tree (*Azadirachta indica*)
- *Albizia lebbek*
- *Albizia julibrissin*
- Eucalyptus sp.
- Ficus sp.
- Casuarina sp.

There are also 43 species of shrubs, herbs and grasses.

In terms of fauna, Feral Cat and Feral Dog tracks were observed as were signs of the Arabian Red Fox (*Vulpes vulpes arabica*). Kuhl's Pipistrelle (*Pipistrellus kuhlii*) have been sighted in past investigations but not during the recent surveys. Based on habitat availability and regional distribution, Cape Hare (*Lepus capensis*) and Desert Hedgehog (*Paraechinus aethiopicus*) could possibly be present, although no sightings were made during the EIA associated surveys. It is likely that rodents such as House Mouse (*Mus musculus*) are present due to attraction to built-up structures and presence of residential waste. The potential presence of other native rodent species such as Cheeseman's Gerbil (*Gerbillus cheesmani*), Arabian Spiny Mouse (*Acomys dimidiatus*), and Sundevall's Jird (*Meriones crassus*) cannot be excluded.

During the NEA survey conducted in Jebel Ali, a total of four mammal species were recorded (Table 20). The Arabian Red Fox was captured on a camera trap, confirming its presence within the survey area. This species is also frequently observed in other locations, indicating its adaptability and widespread distribution. Its repeated sightings across various sites highlight its ability to thrive in diverse habitats.

The Cape Hare has been captured on a camera trap at the Jebel Ali site, providing further evidence of its presence in the area. This species, known for its agility and nocturnal habits, is typically found in arid environments and sand dunes.

Table 20: All mammal species recorded at Jebel Ali during NEA surveys				
Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>	JA
Arabian Camel	<i>Camelus dromedarius</i>	LC	NL	P
Arabian Red Fox	<i>Vulpes vulpes arabica</i>	LC	LC	P
Cape Hare	<i>Lepus capensis</i>	LC	LC	P
Feral Cat	<i>Felis catus</i>	LC	LC	P

Table Key:

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NL = Not Listed
- <sup>1</sup> = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- <sup>2</sup> = Regional IUCN status is taken from the Abu Dhabi RED List of Species

In terms of conservation status, potential, and confirmed species present, are listed as Least Concern on the IUCN Red List of Threatened Species.

There are reported to be 16 species of resident birds and 25 species of migratory birds. All species identified are categorized as Least Concern on the IUCN Red List of Threatened Species. All bird species recorded in the Jebel Ali are classified as Least Concern on both global and local conservation scales. This classification indicates that these species currently face no significant threats to their populations or habitats in this area. Their presence reflects a stable ecosystem that supports avian biodiversity. Birds observed during the NEA surveys are listed in table 21.

In addition, nocturnal surveying identified several species of gecko including the Rough-tailed Gecko (*Cyrtopodion scabrum*) and Heyden's Gecko (*Hemidactylus robustus*) both reported at the Golf Course.

Furthermore, it is possible that species of lizards and snakes such as fringe-toed lizards, *Malpolon*, and cat snakes are present but may have been hibernating at the time of the surveys. The presence of a high abundance of geckos (even with Feral Cat presence) indicates there is a vigorous invertebrate community from which to sustain the geckos. Similarly, it might be expected that snakes which prey on geckos are present as well. In terms of invertebrates, over 12 species have been recorded.

Table 21: All Birds species recorded at Jebel Ali during NEA surveys

Species	Scientific Name	RLS (G) <sup>1</sup>	RLS (N) <sup>2</sup>
Common Myna	<i>Acridotheres tristis</i>	LC	LC
Delicate Prinia	<i>Prinia lepida</i>	LC	LC
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	LC	LC
Feral Pigeons	<i>Columba livia</i>	LC	LC
Grey Francolin	<i>Francolinus pondicerianus</i>	LC	LC
House Crow	<i>Corvus splendens</i>	LC	LC
House Sparrow	<i>Passer domesticus</i>	LC	LC
Indian Roller	<i>Coracias benghalensis</i>	LC	LC
Laughing Dove	<i>Spilopelia senegalensis</i>	LC	LC
Red-wattled Lapwing	<i>Vanellus indicus</i>	LC	LC
Rose-ringed Parakeet	<i>Psittacula krameri</i>	LC	LC
White-eared Bulbul	<i>Pycnonotus leucotis</i>	LC	LC

Table Key:

- RLS = Red List Status / G = Global / N = National
- LC = Least Concern / VU = Vulnerable / NT = Near Threatened / EN = Endangered / NL = Not Listed
- <sup>1</sup> = Global IUCN status is taken from the IUCN Red List of Threatened Species <https://www.iucnredlist.org/>
- <sup>2</sup> = Regional IUCN status is taken from UAE National Red List of Birds (MOCCA 2021)

## 3.0 Critical Habitat Assessment

In order to prioritise appropriate efforts for the management of biodiversity across the EGA facilities, a critical habitat assessment (CHA) has been undertaken utilising IFC Performance Standard 6 guidelines and taking into consideration the intended outcomes of the GCC Wildlife Convention (<https://gcc-sg.org/en/MediaCenter/DigitalLibrary/Documents/1274593978.pdf>).

Part of IFC's Sustainability Framework, the Performance Standards provide clients such as EGA, guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way.

Biodiversity loss can result in critical reductions in the resources provided by the earth's ecosystems, which contribute to economic prosperity and human development. PS6, the Standard aimed at conserving and better managing biodiversity, recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and managing living natural resources adequately are fundamental to sustainable development.

Crucially, where biodiversity values of importance to conservation such as critical habitats and species are associated with a project site, as in the case of EGA, the preparation of a Biodiversity Action Plan provides a useful means to focus a project's mitigation and management strategy. The development of a BAP is in fact required by EGA under both its biodiversity policy and by the ASI, whose guidance EGA follows.

Under IFC PS6, critical habitat criteria are defined as follows and typically form the basis of any critical habitat assessment:

- Habitat of significant importance to Critically Endangered and/or Endangered species (IUCN classification) and/or species identified under the GCC Wildlife Convention applicable to the EGA facilities. The list of applicable species under the Convention is shown in Table 22 below.
- Habitat of significant importance to endemic and/or restricted-range species.
- Habitat supporting globally significant concentrations of migratory species and/or congregatory species.
- Highly threatened and/or unique ecosystems.
- Areas associated with key evolutionary processes.

Although PS6 requires that no activity be undertaken in such areas unless a suite of conditions can be demonstrated, this BAP is dealing with an operational site and therefore aiming to develop a set of actions that can enhance and or improve, rather than avoid during pre-construction, the existing biodiversity and in particular those habitats and/or species that are included in one or more of the criteria listed above.

The Wildlife Convention aims at conserving the ecosystems and wildlife of the GCC (Gulf Cooperation Council) countries, of which the UAE are a member, particularly the species threatened with extinction. Amongst its key outcomes are protecting and managing habitats and species against all environmental threats. This BAP has identified a number of species included in the Convention's list and these are detailed below in Table 22.

Table 22: List of species in Al Taweelah and Jebel Ali recorded from the desktop assessment and NEA surveys covered under the GCC Wildlife Convention

Al Taweelah			
Common name	Scientific name	Marine	Terrestrial
Osprey	<i>Pandion haliaetus</i>	✓	
Mountain Gazelle*	<i>Gazella gazella</i>		✓
Arabian Gazelle*	<i>Gazella arabica</i>		✓
Arabian Oryx	<i>Oryx leucoryx</i>		✓
Arabian Red Fox	<i>Vulpes vulpes arabica</i>		✓
Arabian Sand Gazelle*	<i>Gazella marica</i>		✓
Cape Hare	<i>Lepus capensis</i>		✓
Reef heron	<i>Egretta gularis</i>		✓
Egyptian Spiny-tailed Lizard	<i>Uromastyx aegyptia</i>		✓
Chestnut bellied Sandgrouse	<i>Pterocles exustus</i>		✓
Little Owl	<i>Athene noctua</i>		✓
Dugong	<i>Dugong dugon</i>	✓	
Hawksbill Turtle	<i>Eretmochelys imbricata</i>	✓	
Green Turtle	<i>Chelonia mydas</i>	✓	
Jebel Ali			
Cape Hare	<i>Lepus capensis</i>		✓
Arabian Red Fox	<i>Vulpes vulpes arabica</i>		✓
Egyptian Spiny-tailed Lizard	<i>Uromastyx aegyptia</i>		✓
Chestnut bellied Sandgrouse	<i>Pterocles exustus</i>		✓
Little Owl	<i>Athene noctua</i>		✓
Mountain Gazelle*	<i>Gazella gazella</i>		✓
Table Key:			
<ul style="list-style-type: none"> <li>* = Arabian Gazelle and Arabian Sand Gazelle were split taxonomically from Mountain Gazelle into their own species. Records of Mountain Gazelle comprise of old survey reports and should be regarded as Arabian Gazelle or Arabian Sand Gazelle.</li> </ul>			

### 3.1 Criteria considered for AI Taweelah

#### (i) Habitat of Significant Importance to Critically Endangered and/or Endangered species (IUCN classification) and/or Species Identified under the GCC Wildlife Convention

Endangered and Critically Endangered species are categorised by the IUCN where population size, geographical distribution or rate of decline or quantitative analysis identifies a high likelihood of extinction in the wild.

The data from past EIAs (2014 and 2016) reviewed as part of this BAP and information detailed in the desktop above, habitats and species sightings since the establishment of the facility, and the survey work undertaken by NEA, confirm that the AI Taweelah site hosts coral reefs and seagrass beds, habitats of significant importance to species categorised by IUCN as Vulnerable (VU) (Dugongs and Arabian Gazelle), Endangered (EN) (Green Turtles) and Critically Endangered (CR) (Hawksbill Turtle). Figure 20 shows these habitats and species as recorded at Taweelah.

Green Turtles (*Chelonia mydas*) are highly migratory and use a wide range of broadly separated localities and habitats during their lifetimes. Upon attaining sexual maturity Green Turtles commence breeding migrations between foraging grounds and nesting areas. Foraging grounds include inshore bays, lagoons and shallows with seagrass meadows as well as coral reefs where they feed on red, brown and green algae and use such areas as protection from predators and rough seas. Migrations are carried out by both males and females and may traverse oceanic zones, often spanning thousands of kilometres. Female turtles will return to the sandy beaches on which they were born to lay their eggs.

Green Turtles, like other sea turtle species, are particularly susceptible to population declines because of their vulnerability to anthropogenic impacts during all life-stages, from eggs to adults. Unfortunately, harvest of eggs and adults from nesting beaches and juveniles and adults from foraging grounds remains legal in several countries despite substantial population declines. Degradation of both nesting beach habitat and marine habitats also play a role in the decline of many Green Turtle stocks often associated with coastal development, sea defences and/or sand extractions.

As shown in Figure 20 below, Green Turtles have been sighted within the shallower waters adjacent to EGA's AI Taweelah facility including in the recent surveys. It is anticipated that these individuals are utilising the nearby seagrass meadows for foraging. Given absence of local population data, the significance of the seagrass habitats to Green Turtles in the area is unknown. In the absence of definitive data, the assumption should be in favour of the support of an endangered species, and consideration of the seagrass beds as an area of critical habitat.

As far as nesting is concerned, there are no known records of any Green Turtles having utilised the beaches in and around AI Taweelah as nesting sites. The tendency for natal homing of this species suggests that the beach area adjacent to AI Taweelah is unsuitable. Nevertheless, any monitoring effort should not exclude the possibility of encountering this species in the future.

Hawksbill Turtles (*Eretmochelys imbricata*) are also a migratory species that utilise wide ranges of geographically distributed habitats during their lifetimes. Unlike Green Turtles, Hawksbills are omnivorous and will feed on sea sponges, soft corals, jelly fish, seagrasses and algae. Hawksbills mate biannually in secluded

areas in the vicinity of nesting beaches. Female turtles will return to the sandy beaches on which they were born to lay their eggs.

Within the last 100 years, millions of Hawksbills have been killed for the tortoiseshell markets of Europe, the United States and Asia. The global plight of this species in the latter half of the 20th Century has been recognised by the inclusion of the species in the most threatened category of IUCN's Red List since 1968 and the listing of all Hawksbill populations on Appendix I of the Convention on International Trade in Endangered Species (CITES), since 1977. Unfortunately, harvest of eggs and adults from nesting beaches, and juveniles and adults from foraging grounds continues despite substantial population declines.

Hawksbills are typically associated with coral reefs, which are among the world's most endangered marine ecosystems due to global changes in climate and associated large scale bleaching events. In addition, tropical coastlines are rapidly being developed for tourism which often leads to destruction of nesting habitat. As shown in Figure 20 below, this species has been observed during the recent NEA surveys and, as reported in previous investigations (including EIAs), there is clear evidence it nests at the Hawksbill Turtle Beach, adjacent to EGA's power generation facilities, defining this beach a critical habitat. EGA have in fact collated data on successful nests of Hawksbill Turtles since 2011 as shown in table 23.

The Arabian Gazelle (*Gazella arabica*) occurs in deserts, semi-deserts, hills and mountains and coastal plains. It is an herbivore feeding on a variety of desert fauna in the Arabian Gulf with a reported preference for *Cyperus* sp. The global population in the wild is approximately no more than 7,000 individuals with major threats to the species being illegal hunting for meat and live capture for pets and private collections. There are no areas of notable gazelle habitat within the Al Taweelah facility however, adjacent landowners are known to keep and feed gazelles as part of their estate. They have been sighted at the beach area adjacent to the Al Taweelah facility, even though no notable habitat features specific to this species have been identified at this location. Although gazelle tracks were observed at the BRSA site during daytime and nighttime surveys in 2014, and no formal sightings since the establishment of this EGA facility, Arabian Gazelle at the BRSA site have been confirmed by camera trap footage in the recent surveys by NEA.

Dugongs (*Dugong dugon*) are found in warm coastal waters from the western Pacific Ocean to the eastern coast of Africa. Their historic range is believed to correspond to that of seagrasses from the *Potamogetonaceae* and *Hydrocharitaceae* families. The Dugong is the only herbivorous marine mammal with the species largely dependent on dense seagrass meadows such as those found in the emirate of Abu Dhabi including the site at Taweelah. Dugongs are semi-nomadic, often travelling long distances in search of food, but staying within a certain range their entire life. Large numbers often move together from one area to another. It is thought that these movements are caused by changes in seagrass availability. Dugong movements mostly occur within a localised area of seagrass beds, and animals in the same region show individualistic patterns of movement. Daily movement is affected by the tides. In areas where there is a large tidal range, Dugongs travel with the tide in order to access shallower feeding areas. Females give birth to live young after a gestation period of 13-15 months, usually to just 1 calf. Birth takes place in shallower coastal waters. The calf will nurse for 14-18 months but also will be able to feed on seagrass not long after birth.

Threats to this species are dependent on their associated range. In some parts of the world, Dugongs are actively hunted (both legally and illegally). Dugong numbers are also affected by boat strikes and incidental capture by fishing gear and nets. In addition, coastal developments and variations in chemistry/processes from

anthropogenic activity threaten availability of seagrass ecosystems, without which Dugongs are unable to survive.

There are no formal data available regarding Dugong activities within the shallow waters in the vicinity of EGA Al Taweelah other than occasional reports of sightings, including during the recent NEA surveys as highlighted above and shown in Figure 20. Nevertheless, the seagrass beds associated with Ras Ghanadah MPA and the shallow coastal waters adjacent to Al Taweelah (also shown in Figure 20) offer ample feeding grounds and have potential therefore to support a local population of Dugongs.

### **(ii) Habitat of Significant Importance to Endemic and/or Restricted-Range Species**

Endemic species are those that are unique to a defined geographic location. IFC's Performance Standard 6, defines restricted range for terrestrial vertebrates and plants as an extent of occurrence of 50,000km<sup>2</sup> or less, and for marine species as an extent of occurrence of 100,000km<sup>2</sup> or less.

Data reviewed as part of this BAP and sightings recorded since the establishment of the Al Taweelah and BRSA facilities, have not identified any restricted range species within the immediate vicinity of these facilities.

### **(iii) Globally Significant Concentrations of Species**

UAE provides important habitats for migratory birds such as areas of mangrove, mudflats, and other coastal areas during their migration from Europe and North Asia to Africa in the winter months in the northern hemisphere. There are however no habitats within or immediately adjacent to the Al Taweelah facilities that are likely to support congregations of migratory birds; the closest suitable habitat is the area of mangrove at Ras Ghanadah.



Table 23: Numbers of Hawksbill Turtle Nests Identified

Year	Number of nests Identified	Estimated Number of Hatchlings
2011	12	1300
2012	0	0
2013	28	2000
2014	11	1000
2015	8	600
2016	9	500
2017	15	800
2018	6	500
2019	5	640
2020	-	-
2021	4	512
2022	4	512
2023	7	217
2024	9	302

NB: It is important to note that despite difficulties in accurately assessing global population size of this species, a recent estimate released by WWF identified approximately 8,000 individuals remaining in the wild and more specifically only 5 populations worldwide with more than 1,000 females nesting annually. Although the low number of nests counts at the Al Taweelah site shown above might not at first appear noteworthy, when considered in the context of a global (declining) population, the area of beach nesting habitat adjacent to the Al Taweelah site may well be significant to the conservation of this species.

#### (iv) Highly Threatened and/or Unique Ecosystems

Ras Ghanadah MPA is one of the largest and most remarkable coral reefs in the UAE and its protection and the protection of animals living here, are a formal conservation priority in the UAE (see for example <https://www.moccae.gov.ae/en/open-data/ecotourism/ras-ghanadacoralreef.aspx>; [https://www.ead.gov.ae/media/Project/EAD/EAD/Documents/Resources/RAS\\_GHNADA\\_Factsheet\\_ENG.pdf](https://www.ead.gov.ae/media/Project/EAD/EAD/Documents/Resources/RAS_GHNADA_Factsheet_ENG.pdf)). Close to 40% of all Arabian Gulf coral species can be found at this MPA including the Table Coral (*Acropora downingi*) and massive Columnar Coral (*Porites harrisoni*). Along with these unique corals, the MPA is home to turtles, Dugongs, sea snakes, and a significant fish community both in terms of biomass and diversity.

For regional context it is crucial to note that coral reefs in the region are of significant and indeed increasing interest at a global level given (a) their long-standing location in the saltiest and hottest sea on the planet which has made them particularly tolerant to such stressors and, more importantly, (b) the frequency and duration of higher than normal sea surface temperatures which have caused widespread bleaching and mortality in the Gulf and notably in Abu Dhabi waters. Numerous studies in the past 15 or so years conducted by, amongst others,

WWF, EAD, NCRI, and most recently New York University at Abu Dhabi, have unanimously identified that the reefs at or in the vicinity of Ras Ghanadah support a diverse reef comprising species not seen anywhere else in the Arabian Gulf.

This MPA is therefore considered a highly threatened and/or unique ecosystem affected by cumulative effects associated with climate change and is given consideration in this BAP in the Action Planning section.

#### **(v) Areas Associated with Key Evolutionary Processes**

Attributes of a region, such as its topography, geology, soil, temperature and vegetation and combinations of these variables can influence the evolutionary processes that give rise to regional configurations of species and ecological properties. There are no barriers to movement or landscape features within the vicinity that would give rise to genetically unique populations or subpopulations. However, crucially, as mentioned previously, although coral species typical of the Indo-Pacific region, which include those observed at Al Taweelah, represent a hardy subset of corals that have thus far been able to exist under demanding environmental conditions such as extreme temperature ranges and salinity fluctuations, they are now drastically threatened by the increasingly frequent and lengthy spikes in sea surface temperatures highlighted above.

As in the case of the previous criterion, given the increasing threat to the coral reefs of the UAE as a result of climate change, it is suggested here that this criterion is also met under this critical habitat assessment and that measures described in the Action Planning could play a part in tackling threats to those reefs in the AOI covered under this BAP.

### **3.2 Criteria considered for Jebel Ali**

#### **(i) Habitat of Significant Importance to Critically Endangered and/or Endangered species (IUCN classification) and/or Species Identified under the GCC Wildlife Convention**

Although the facility site does not have any habitat of significant importance to critically endangered or endangered species, Green Turtles (EN) have been observed in the past and during the recent surveys undertaken by NEA including in the EGA intake facility. Specific actions are therefore detailed in section 5, Action Planning.

#### **(ii) Habitat of Significant Importance to Endemic and/or Restricted-Range Species.**

Endemic species are those that are unique to a defined geographic location. IFC PS6 defines restricted range for terrestrial vertebrates as an extent of occurrence of 50,000km<sup>2</sup> or less, and for marine species as an extent of occurrence of 100,000km<sup>2</sup> or less.

The sole species identified at Jebel Ali considered a true endemic (restricted range) is the Socotra Cormorant (*Phalacrocorax nigrogularis*). This species is gregarious and breeds yearly in large colonies typically on offshore islands. Several breeding colonies across the UAE have been known to undergo complete collapse since the species was reported in the 1970s. While a stronghold remains in Siniyah Island off the emirate of Umm Al Quwain, the species is also under pressure from fishing line entanglement, direct persecution, and decline in fish availability. While about 10 Socotra Cormorants were observed within the project boundaries during the recent surveys, the facility site is not considered to form habitat of significant importance for this species.

### **(iii) Habitat Supporting Globally Significant Concentrations of Migratory Species and/or Congregatory species**

UAE provides important habitats for migratory birds. Many migratory species utilise areas of mangrove, mudflats, and other coastal areas during the migration from Europe and North Asia to Africa during the winter months in the northern hemisphere. A number of migratory species were recorded, both at the EGA golf course area as well as the coastal area. The Common Pochard is considered Vulnerable due to rapid population decline. It requires vegetated eutrophic swamps, marshes, and lakes with emergent fringing vegetation. The nest is a shallow cup in vegetation on the ground in shallow water. Conservation actions proposed for the global population include protection and maintenance of wetland habitat, and reduction in nutrient run-off from agricultural land.

However, given only one individual of the Common Pochard was sighted, plus a handful of other migrants, it is not considered that the habitat here supports globally significant concentrations of migratory/congregatory species.

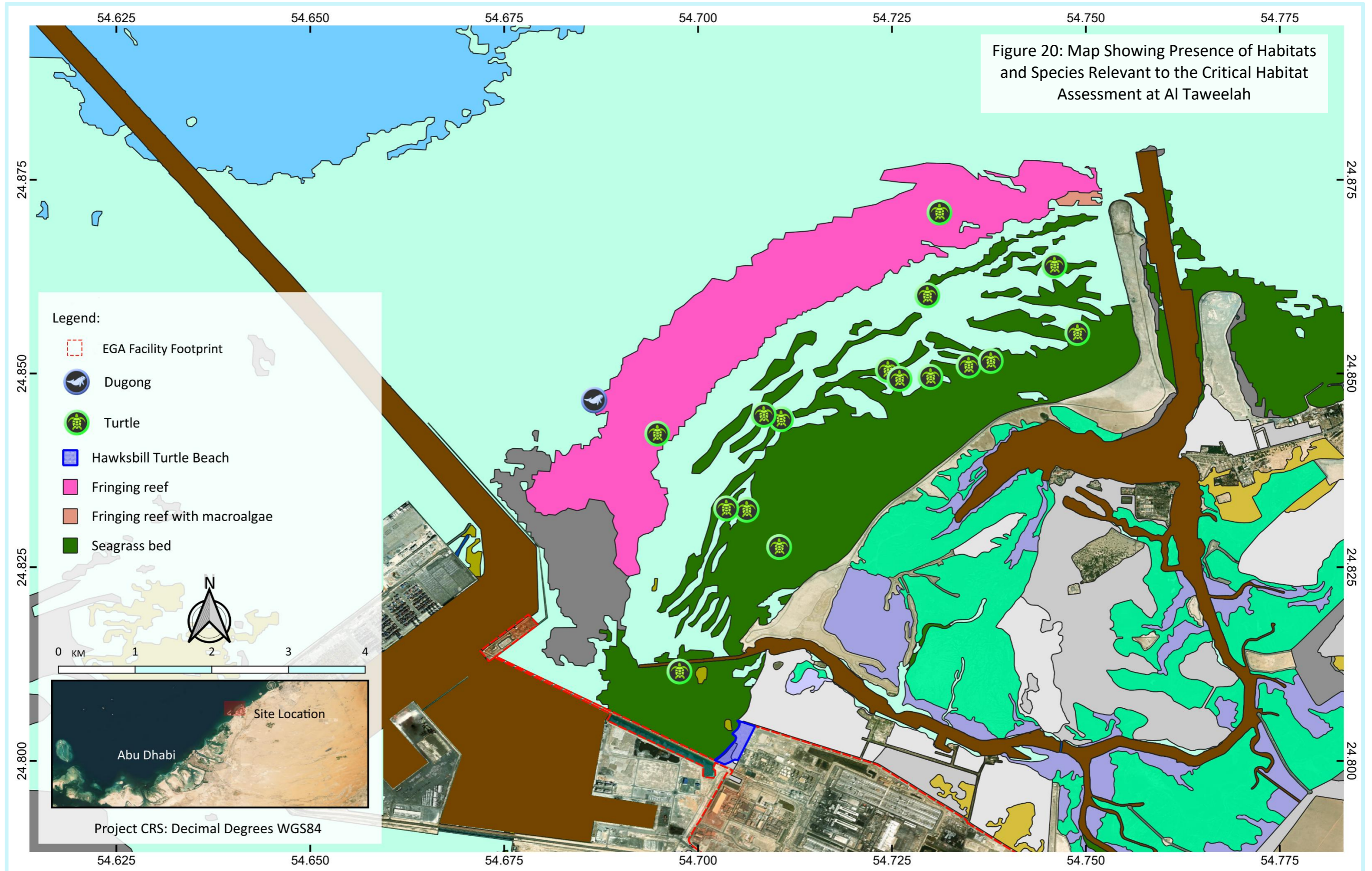
### **(iv) Highly Threatened and/or Unique Ecosystems.**

There are no known threatened or unique ecosystems within the immediate proximity to the facility.

### **(v) Areas Associated with Key Evolutionary Processes.**

Attributes of a region, such as its topography, geology, soil, temperature and vegetation and combinations of these variables can influence the evolutionary processes that give rise to regional configurations of species and ecological properties.

Although there are no known areas within the facility site which are proven to be associated with key evolutionary processes, given the facility grounds are relatively isolated and adjacent surroundings heavily industrialised for decades, it is possible there may be genetic variations present in species with high reproductive rates, such as geckos and invertebrates.



## 4.0 Potential Biodiversity Impacts

### 4.1 Al Taweelah

The following section highlights the main potential impacts to biodiversity associated with the EGA facilities at Al Taweelah assessed by NEA based on previous investigations and the recent surveys undertaken at the survey locations. This section is therefore instrumental in developing the suite of specific actions detailed in section 6 (Action Planning) which aim to mitigate impacts to biodiversity associated with EGA facilities.

#### Terrestrial impacts

Air emissions: potential adverse impacts associated with air emissions from EGA Al Taweelah (main pollutants of concern being HF, SO<sub>2</sub>, NO<sub>x</sub> and particulates) are considered negligible. A recent report by NIBIO (2024) however indicated that plants growing on-site at EGA's facilities had higher F concentrations on leaves than those off-site (an average of 4 to 15 times, depending on tree species, higher than values recommended by a range of bodies including the US EPA). In the context of this BAP, there is no data available on the accumulation of fluoride at the mangrove habitat to the NE of the facility which covers more than 1300 hectares of pristine mangrove forest and associated terrestrial and marine biodiversity. The action planning section refers therefore to the possibility of monitoring these mangrove habitats for fluoride deposition originating from the EGA facility at Al Taweelah.

Noise and light: although it is accepted that these are permanent features throughout EGA facilities and have therefore been considered long term inherent impacts, the effects associated with industrial noise and lighting at the refinery and smelter sites will likely adversely affect turtles at the Hawksbill Turtle Beach, a critical habitat hosting a CR species as detailed in the CHA above. The Action Planning section refers to specific measures that could be considered to mitigate these effects.

Although other fauna may be specifically affected by noise and light due to the EGA refinery and smelter facilities, this is considered inconsequential given the background levels of both noise and light due to other existing developments at KEZAD A.

Birds, resident breeding and migratory, near the sites are unlikely to be affected as they have a tendency to habituate to both noise and light or exhibit avoidance.

With regard to the BRSA site specifically, potential impacts include disturbance to animals from dust emissions and increased noise from transport, rehandling and compaction of bauxite residue but these are all considered low. Similarly, disturbance due to artificial lighting, potentially disrupting foraging behaviour, biological clocks and movement of animals, particularly nocturnal species may cause loss of fauna over time. Lastly, risk of injury or death of animals from accidental vehicle strike (further increased in areas of excessive noise and/or light which can inhibit the ability of some species (e.g., nocturnal) to identify and avert potential danger) is likely to persist. These impacts are however limited to the AOI, as defined earlier. Should the facility be expanded, further assessments of the above potential impacts will need to be undertaken and, if needed, site specific actions developed.

## Terrestrial Invasive Alien Species (IAS)

IAS are animals, plants, fungi and microorganisms entered and established in the environment from outside of their natural habitat. They reproduce rapidly, out-compete native species for food, water and space, and are one of the main causes of global biodiversity loss.

The UAE Ministry of Climate Change and the Environment (MOCCA) has developed a National Invasive Species Strategy and Action Plan (NISSAP) 2022-2026 that identifies pathways most likely to facilitate the introduction of alien species into the United Arab Emirates. These 'invasion pathways' are the actual or theoretical routes along which introduced species move during their early stages of invasion (which includes introduction, establishment or naturalisation, spread and then damage to biodiversity or human development).

The only identifiable risk related to EGA's operations regarding the potential introduction of terrestrial IAS stems from the import of plant material for landscaping, either as an IAS itself or as a carrier for other alien species.

Nautica has confirmed that EGA does not use any IAS for landscaping, with trees and shrubs being sourced from local nurseries. Additionally, it is important to note that EGA's landscaping is confined to an industrial setting rather than being part of any ecological restoration or wildland improvement effort.

Terrestrial surveys conducted in preparation for this BAP have found no evidence or occurrences of IAS in the terrestrial environment at Al Taweelah. Additionally, a desktop review has revealed no indications of past introductions or outbreaks of IAS at the site.

## Marine Impacts

**Water quality:** Although there is the potential for adverse impacts associated with discharge of thermal effluent, brine, storm water and wastewater and risk of accidental releases during operations and shipping, the surveys undertaken in June-October 2024 suggest that water quality remains within the regulatory thresholds (ADS, 2017) at Al Taweelah. Two locations showed elevated hydrocarbon concentrations in the Ras Ghanadah MPA, but these are believed to be likely due to shipping rather than associated with EGA facilities. As far as water temperature is concerned, data from KEZAD's continuous monitoring stations shows that elevated temperatures from the outfall mixes and reduces to ambient temperatures long before it reaches the nearest seagrass beds and coral reef critical habitats.

**Fugitive dusts:** risk exists of the introduction of fugitive dusts or accidental discharge to the marine environment associated with the lightering, handling, movement, and storage of materials at the wharf area. Whether any materials from the wharf area (such as Bauxite or Alumina, coke) have become associated with local marine sediments or are having any material impacts for local seagrass and coral habitats, critical habitats identified in the CHA earlier in this report, was not confirmed in previous investigations. Additional investigations may be required as part of future monitoring efforts and will be considered as part of the Sediment Quality and Bioaccumulation Action.

**Sediment quality:** results on sediment quality reflect compliance with local and national standards (MOCCA, ADS 18/23 2017), although high concentrations of aluminium (Al) were reported in the latest surveys at the outfall and near the wharf. Although no local or international standards for aluminium in sediments and seawater are currently available, this metal can bioaccumulate in invertebrates, fish, and algae, and exhibit toxic effects, such as hampering growth, and affecting tissue and organ function, when it bioaccumulates at high concentrations (Mbandzi-Phorego *et al*, 2024; García-Medina *et al*, 2022; Alizada *et al*, 2020). Additional

investigations may be required as part of future monitoring efforts and will be considered as part of the Sediment Quality and Bioaccumulation Action.

Hawksbill Turtles: the ~100 m<sup>2</sup> Hawksbill Turtle Beach located towards the northern border of the facility and a confirmed nesting site for this species, could be affected by a number of impacts which includes those directly linked to EGA activities and others due to external factors, but which may nonetheless require attention and are therefore considered in this BAP.

In addition to the light impact mentioned above under terrestrial impacts, artificial lighting may cause hatchlings to be innately drawn to areas of increased lighting (hatchlings may use moonlight reflected from the sea as a guide to the safety of the ocean). Artificial lighting near the shore can also result in hatchlings becoming disorientated and moving inland where they are susceptible to predation, dehydration or physical injury from anthropogenic activity. EGA personnel have identified instances in the past of hatchlings headed into the plant area from the beach.

There is also the potential from predation from feral species given that industrial areas inherently attract these by providing areas of shelter, freshwater, and food. It is not uncommon for feral animals to dig up and feed on the nests of reptiles, especially where the substrate is easy to excavate and surface visual/olfactory evidence of a nest is clear. Predators such as feral dogs, cats or foxes may also take hatchlings, especially if they have not reached the safety of the water by sunrise. Given that this species is critically endangered under IUCN, measures to enhance their conservation are considered in the relevant Action Planning section below.

Although not directly caused by EGA activities, marine debris and litter can nonetheless be present on the beach and form physical barriers to the movement of Hawksbill Turtles coming ashore to nest and to hatchlings trying to return to the ocean. This has been shown to cause some turtles to 'lay' eggs at sea with fatal consequences for the recruitment effort. There is also the risk of turtles (adults and/or hatchlings) becoming entangled in debris/litter. Lastly, plastics may be mistaken for food, with its ingestion leading to blockages in the digestive system and eventual mortality. Efforts to protect and enhance this critically important species detailed in the Action Planning may include measures to tackle this indirect impact.

Intake channel: NEA observations at the intake channel, ~1.7 km long and minimal in-channel flows (~ 3 cm/s), have revealed the potential for both adverse and positive impacts. The facility is fitted with bar screens to stop larger materials, flora and fauna from entering the channel, but the potential exists for smaller organisms, including juvenile turtles, to pass through screens. Hence, if juvenile turtles, not observed at the channel during the recent investigations, were to enter the channel, they would unlikely survive due to predation and lack of food. Furthermore, entrainment of smaller organisms, including fish eggs, larvae, and juvenile fish, can contribute to local population declines. In principle, the earliest life stages will perish and as those fish able to grow in size, become trapped in the channel, with fewer feeding opportunities, unable to exit via the bar screens. Although there have been no past reports of fish impingement or mortality associated with the channel and no known reported instances of fish recovered from waste bins receiving debris collected from intake screens, the broader implication of impacts to fish populations via mortality to eggs/larvae need to be addressed. Observations from the channel also suggest that the 1.7 km intake facility currently provides safe and controlled conditions for the development of juvenile fish with previous catch and release programmes recording Orange-spotted Grouper (*Epinephelus coioides*) of up to 8 kg. The presence of these top-end predators is a reliable indicator of a healthy marine ecosystem. Recent NEA surveys confirm the presence of fish at the intake facility but no details on fish species or numbers. This can be seen as an opportunity to determine what apparently

functional marine communities have developed in the channel. All Intake Channel related issues are detailed under Turtles Action Planning.

Ras Ghanadah MPA: the potential for direct impacts to this MPA, investigated by modelling as part of the 2016 EIA, identified minimal mixing zone with no potential adverse effects for coral or seagrass associated with the MPA. Similarly, modelling addressing reject brine from the onsite desalination, also discharged to sea typically resulting in elevated salinity levels, has identified that the associated mixing zone is restricted to within the port area, with no anticipated impacts at this MPA. Crucially, although discharges from the facility contain marginal levels of fluorides (<0.1 mg/L), sulphates (,300mg/L), and a lower pH (6 to 6.5 compared to 8.2 for the seawater inlet), when considered in the context of the qualities of natural seawater (measures of 1.4 mg/L of fluoride and 3,000 to 3,400 mg/L of sulphates), no associated impacts are anticipated.

### Marine Invasive Alien Species (IAS)

IAS can pose a significant threat to marine ecosystems, with shipping serving as a key pathway for their introduction into new environments. For context, the global annual cost of aquatic IAS has been conservatively estimated at US\$345 billion (Haubrock *et al.*, 2021).

In terms of biodiversity loss, IAS have been a major contributing factor in 60% of recorded global animal and plant extinctions and the sole driver in 16% of cases. At least 218 invasive species have been responsible for more than 1,200 local extinctions (IPBES, 2023). The issue has intensified with the expansion of global trade and shipping traffic, further exacerbated by the transition to steel-hulled vessels, which use water as ballast instead of solid materials.

Since 2017, all ships in international traffic have been required to manage their ballast water and sediments in accordance with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWMC). Under this convention, ships must maintain a ballast water management plan designed to minimise the introduction of alien species, carry a ballast water record book, and hold an international ballast water management certificate. Abu Dhabi Ports authorities have implemented specific guidelines on vessel discharge and maintenance, including ballast water management, requiring vessels to submit a ballast water declaration at least 48 hours before arrival and to obtain consent from the Harbour Master before discharging ballast water (Abu Dhabi Ports, 2019). Additionally, except in cases of safety-related necessity, ballast water discharge in port waters is prohibited unless compliant with BWMC or regional exchange requirements (Abu Dhabi Ports, 2013).

In addition, Objective 3.2 of the UAE's NISSAP focuses on establishing and maintaining an early detection and rapid response mechanism. This includes conducting specific surveys and monitoring at critical entry points such as ports and airports, as well as at sites of significant biodiversity importance. These efforts are designed to promptly identify and manage potential IAS threats, thereby safeguarding the UAE's ecological integrity. EGA contributes towards objective 3.2 of the UAE's NISSAP through annual marine monitoring at Al Taweelah.

A review of all past marine monitoring data, as well as the surveys conducted in preparation for this BAP, has found no evidence or occurrences of IAS in the marine environment adjacent to EGA's facilities in Al Taweelah, nor any indications of past introductions or outbreaks of IAS at the site.



## Pest Species

The presence of pest species, often an over-abundance of urban adapted species, particularly in birdlife, were observed during the NEA surveys including Feral Pigeons (*Columba livia*) and House Crow (*Corvus splendens*). Furthermore, Feral Cats were also recorded within the site. Feral Cats are avid hunters and can have negative impacts on native wildlife inclusive of small mammals, birds, and reptiles. No action was deemed necessary for pests in relation to protecting the identified biodiversity assets. However, the management of Feral Cat populations through Trap-Neuter-Release programmes as well as exploring opportunities to rehome, should be considered as a way to support prey populations.

## 4.2 Jebel Ali

The following section highlights the main potential impacts to biodiversity associated with the EGA facilities at Jebel Ali assessed by NEA and based on previous investigations and the recent surveys undertaken at the survey locations. This section is therefore instrumental in developing the suite of specific actions detailed in section 6 (Action Planning) which aim to mitigate impacts to biodiversity associated with EGA facilities.

### Terrestrial Impacts

Noise and light pollution arising from the facility's activities are cumulative with adjacent neighbouring plots (power plant, port, and other industrial facilities). The overall industrial zone has higher ambient light and noise pollution which has been ongoing for decades. While it may exclude shy species, the majority of terrestrial fauna can become habituated to these types of disturbances. Biodiversity present in the site have acclimated over time to these disturbances. No action was deemed necessary for noise or light pollution in relation to protecting the identified biodiversity assets.

Potential contamination is an ongoing risk that could arise from accidental spills of chemicals, fuels, or various industrial waste products. However, the facility operates under an Environmental Management System which adheres to best practice preventative training and plans, as long as strict emergency clean-up protocols and procedures are implemented. No action is considered necessary for contamination impacts in relation to protecting the identified biodiversity assets.

Littering, still common at the site as confirmed by the recent surveys, can pose several risks, including mortality from ingestion or entanglement. This can affect biodiversity assets identified, especially migratory and resident bird species. Furthermore, wind-blown litter entering the marine environment can travel exceptionally long distances (hundreds or thousands km) thousands of kilometres and could reach species of priority or threatened, such as sea birds and sea turtles, which are at high risk from ingestion and entanglement mortality. Waste management across the full facility is therefore considered a priority and is covered under the Environmental Management System.

### Terrestrial Invasive Alien Species (IAS)

The only identifiable risk related to EGA's operations regarding the potential introduction of terrestrial invasive alien species stems from the import of plant material for landscaping, particularly for the EGA Golf Course, either as an IAS itself or as a carrier for other alien species.

Nautica has confirmed that EGA does not use any IAS for landscaping, with trees and shrubs being sourced from local nurseries. Additionally, it is important to note that EGA's landscaping is confined to an industrial setting rather than being part of any ecological restoration or wildland improvement effort.

Terrestrial surveys conducted in preparation for this BAP have found no evidence or occurrences of IAS in the terrestrial environment at Jebel Ali. Additionally, a desktop review has revealed no indications of past introductions or outbreaks of IAS at the site.

### Marine Impacts

Although higher salinity, warmer temperatures, and increased nutrient loading presumed to occur from outfall discharge are typically associated with proliferation of Harmful Algal Blooms (HAB) and red tides, depleting oxygen and causing marine fauna die-off and bioconcentration of toxins in macro-fauna, there are no formal reports of red tide events. The recent NEA surveys did not observe any signs of red tides.

Ongoing facility operations are expected to have an insignificant impact from boating in comparison to the Jebel Ali Port located directly adjacent to the facility plot, the 9th busiest port terminal in the world. No action is therefore considered necessary for boating impacts in relation to protecting the identified biodiversity assets.

The key biodiversity asset potentially affected by EGA operations at Jebel Ali are Green Turtles, an endangered species under the CHA. The intake facility has been reported to lead to turtles becoming trapped in the chlorination tanks, often badly injured both physically and due to the high chlorine concentrations. NEA staff were not able to visit the intake facility but EGA reports a number of Green Turtles end up in the chlorination tanks and those that can be looked after, are taken to the Dubai Turtle Rescue facility. This species of turtle, classified as EN by IUCN, is considered a keystone species, in that it plays an important role in marine ecosystems and helps maintain the ocean's ecological balance. Green Turtles also play a part in strengthening productivity of seagrass beds, facilitate the role of seagrass meadows as crucial nursery grounds for many marine organisms and, within terrestrial ecosystems, they directly and indirectly impact vegetation growth, species distribution and the stability of sand dunes through their egg laying. Specific measures tailored for the conservation of this critical species are detailed in the Action Planning section below.

### Marine Invasive Alien Species (IAS)

Similar to Al Taweelah, shipping associated with Jebel Ali Ports are required to manage sediments and ballast water in accordance with the BWMC.

Marine surveys conducted in preparation for this BAP have found no evidence or occurrences of IAS in waters off the coast or the shorelines associated with EGA's Jebel Ali facilities. Additionally, a desktop review has revealed no indications of past introductions or outbreaks in these waters.

### Pest Species

Proliferation of pest species, an over-abundance of urban adapted species, particularly in birdlife, were observed during the recent surveys including Common Myna (*Acridotheres tristis*), Feral Pigeons (*Columba livia*), House Crow (*Corvus splendens*), Rose-ringed Parakeet (*Psittacula krameri*) and White-eared Bulbul (*Pycnonotus leucotis*). Furthermore, feral cats and dogs were also recorded occurring within the site. Management of Feral Cats has been discussed in the section on Al Taweelah above.

## 5.0 Opportunities

This section highlights a number of opportunities for consideration by EGA. As in the case of the specific actions detailed below, it is important to remind the reader that a BAP is a living document, and hence opportunities listed here, will also benefit from an adaptive management approach to be as applicable, effective and sustainable as possible.

The opportunities highlighted reflect the urgency with which numerous entities in the UAE, public, private, and academic, are increasingly involved in programmes that deal with increasingly threatened critical habitats and species and developing tools and mechanisms for their more effective conservation and sustainable management.

Although the suite of existing and/or planned programmes is considerable, a tentative list of opportunities for further consideration by EGA includes:

- The BAP should consider marine ecosystems more holistically by aligning with the Abu Dhabi Blue Carbon Demonstration Project and therefore contribute to building a greener Emirate through improved understanding of carbon storage and sequestration and coastal ecosystem services thereby contributing to climate change mitigation efforts ([www.gefbblueforests.org/project/united-arab-emirates](http://www.gefbblueforests.org/project/united-arab-emirates)). Seagrass beds and mangroves, both widely distributed at the Al Taweelah facility, are amongst the most efficient carbon sequestration storage habitats in the world and their conservation through actions detailed below could effectively contribute to the Abu Dhabi Project and, ultimately, to the UAE's goal Net Zero carbon emissions by 2050.
- Effective monitoring of coral reefs, still the most scientifically relevant and 'visible' marine habitat in the UAE, the Gulf and beyond, by New York Abu Dhabi Marine Biology Lab (<https://nyuad.nyu.edu/en/research/faculty-labs-and-projects/marine-biology-lab.html>) is looking at how hard coral species of the Emirate of Abu Dhabi, including those at Taweelah are developing coping mechanisms to deal with the increasing threats associated with climate change. Reefs, threatened worldwide by global warming, may render the UAE's heat tolerant species crucial in developing globally applicable solutions to conserving coral reef habitats. The coral reefs at Ras Ghanadah, considered the most diverse and extensive in the Gulf, and in the immediate vicinity of the EGA facility at Taweelah, offer therefore an opportunity for direct collaboration with NYUAD. EGA could, for example, implement some of the specific measures and research techniques applied elsewhere in the UAE at sites both within and outside the boundaries of the MPA. The Environment Agency of Abu Dhabi (EAD) leads the way across the Emirate in coral relocation efforts with encouraging results. EGA could collaborate with this initiative at key sites at Taweelah and in particular at sites where coral habitats have been shown to be affected by man-made infrastructure and the recent impacts due to enhanced sea temperatures. This would initially involve the establishment of a 'coral reef conservation unit' at EGA mandated with specific tasks for both the EAD led coral relocation effort and the NYUAD programme highlighted above.
- The BAP could, by working alongside the UAEWWF project 'Restoring Mangrove Ecosystems ([www.UAEmiratesnaturewwf.ae](http://www.UAEmiratesnaturewwf.ae))', support the implementation of a series of robust, holistic ecosystem-based approach restoration actions at carefully selected sites at Taweelah, to enhance the functioning of mangrove ecosystems and associated habitats, including mangrove planting and interventions to optimise climate, biodiversity and community benefits to enable natural regeneration. As with the Blue Carbon Demonstration project, this initiative would also contribute to the 2050 Net Zero targets.

- A seagrass habitat and Dugong specific conservation plan could be developed by EGA that ties in with the Convention on Migratory Species (CMS)/EAD partnership ([www.Dugongconservation.org/CMS Dugong MOU](http://www.Dugongconservation.org/CMS_Dugong_MOU)). The CMS/EAD initiative considers the promotion of internationally coordinated actions aimed at ensuring the long-term survival of Dugongs and the seagrass habitats on which they depend. Given that Abu Dhabi hosts the second largest population of Dugongs after Australia and that the species survival is dependent on healthy seagrass beds, a critical habitat, distributed widely in proximity of the EGA facility at Taweelah, there is an opportunity here that focuses on the conservation and sustainable management of both seagrass beds and Dugongs (<https://www.Dugongconservation.org/>). As is the case with the mangrove and seagrass projects above, this initiative too will indirectly contribute to the UAE's 2050 objectives in terms of the country's carbon emission and Net Zero target.

A recent, highly influential report has emphasised how it is increasingly recognised that nature is our most precious asset, that humanity has collectively mismanaged its global portfolio, and that our demands far exceed nature's capacity to supply goods and services we all rely on. They conclude, crucially, that we can no longer afford for nature to be absent from traditional accounting systems or ignored by economic decision makers (<https://www.cam.ac.uk/stories/dasguptareview>). Tools such as this BAP have the opportunity to ensure that EGA plays its part in a forward-thinking role in ensuring a more sustainable management of biodiversity. (<https://www.Dugongconservation.org/>).

## 6.0 Action Planning

Biodiversity action planning needs to focus on species and habitats with management requirements according to the associated condition, conservation status, potential impacts, and opportunities for meaningful positive outcomes for biodiversity. Priorities for this BAP have been ascertained from baseline data, including survey results and the critical habitat assessment detailed above.

The critical habitat assessment has identified a few habitats and species for which specific actions have been developed. This section includes, in table 24, a list of the main biodiversity features, e.g., coral reefs, and awareness actions for consideration under this BAP and a brief justification for their inclusion. The individual Action Sheets detailed below include detailed measures undertaken for these features, and awareness actions, with specific, measurable targets and indicators to monitor and ensure their successful implementation.

Each Action Sheet includes the biodiversity feature or other being considered, e.g., turtles, the specific *action* being recommended for implementation, the *target* detailing the specific results of the action, the *indicator* which details the success of the action (number of healthy turtles recorded), which mitigation measure (*activity*) is being addressed (e.g. avoidance), when the action will be undertaken (*Start/End*, i.e., time of the year or duration), *frequency* of the action undertaken (e.g. monthly) and the *monitoring* and *resourcing* requirements associated with a particular action.

The Mitigation Hierarchy highlighted below is a reminder of how this tool has been implemented and referred to in each Action Sheet detailed below. Hence, for each action, reference is made to which hierarchy step has been considered.

Table 24: Key Biodiversity Features Identified in this BAP

Feature	Justification Summary
Coral Reefs	<p>Coral reefs are an increasingly globally threatened critical habitat by a range of man-made activities. Reefs in the UAE are disproportionately affected by increasing frequency of high sea surface temperatures. Given their uniqueness in their tolerance mechanisms, they represent a living laboratory to develop survival methods potentially applicable world-wide.</p> <p>The Action Sheet below details measures specifically designed to restore and or enhance coral reef habitats located at or in the immediate vicinity at the Al Taweelah location as shown in the Habitat Classification Map in Figure 4. Coral species targeted by this Action are listed in Appendix B.</p>
Mangroves	<p>A threatened habitat globally, they provide shelter for a multitude of marine and terrestrial organisms, act as spawning and nursery grounds for a range of marine organisms. They act as highly effective barriers against coastal erosion, absorbing storm surge impacts during extreme weather events, and are a highly important carbon storage habitat. Crucially, they act as a carbon bank – capturing four/five times more carbon than rainforests and locking it deep in their roots or vaults, keeping the harmful gas from entering the atmosphere for millennia. Mangroves also help reverse the decline in fish stocks, improve water quality, contribute to our cultural identity and create opportunities for eco-tourism. Mangroves are also home to endangered species of turtles, seabirds, sharks and rays.</p> <p>In the UAE, mangroves are integral to its climate mitigation strategies and a key resource for achieving the Net Zero by 2050 goal. The Abu Dhabi Mangrove Initiative, an extension of the Blue Carbon Project referred to below, focuses on the importance of the mangroves' carbon sequestration properties and are seen by many as an effective tool in helping to turn the tide on climate change. Abu Dhabi is using its expertise on mangrove habitat and functionality to support the growth of mangrove habitats throughout the world.</p> <p>This BAP has identified potential impacts due to EGA's activities to those located a few kilometres to the east. The Action detailed below is focussed on monitoring the health of the substantial mangrove habitat located in the Ras Ghanadah MPA, home to over 1300ha of pristine mangrove habitat, the only part of the UAE in which two species of mangroves occur (<i>Avicenna marina</i> and <i>Rhizophora mucronata</i>).</p>
Seagrass	<p>Like mangroves, seagrass beds are highly threatened by coastal modifications, pollution; they provide shelter for a multitude of marine organisms, including sharks and rays, act as spawning and nursery grounds for a range of marine organisms. They are the main source of food for Green Turtles and Dugongs. They act as highly effective barriers against coastal erosion, are very effective sediment stabilisers and are a highly important carbon storage habitat.</p> <p>The Action Sheet below details measures specifically designed to restore and or enhance seagrass habitats, - at the Al Taweelah location. As indicated in the Habitat Map shown in Figure 4, there are extensive seagrass beds – <i>Halodule uninervis</i>, <i>Halophila ovalis</i> and <i>Halophila stipulacea</i> - along the entire shoreline adjacent to the EGA facility.</p> <p>It is important to mention here that actions designed to restore and or enhance seagrass habitats will, indirectly, benefit other species including some which are globally threatened such as sharks including Arabian Carpetshark (<i>Chiloscyllium</i></p>

Table 24: Key Biodiversity Features Identified in this BAP

Feature	Justification Summary
	<p><i>arabicum</i>), Blacktip Reef Shark (<i>Carcharhinus melanopterus</i>), Scalloped Hammerhead spp. Shark and Green Sawfish (<i>Pristis zijsron</i>) .</p> <p>Sharks play a crucial role in the marine food web as top predators. Threatened by overfishing, many species are now formally protected globally. In the UAE, Ministerial Resolution No. 43 of 2019 alleviates the pressure on sharks due to overfishing and habitat degradation. In addition to the seasonal ban, it imposes a permanent ban on fishing shark and ray species listed in CITES, CMS, and the Federal Law No. 23 of 1999 concerning the exploitation, protection, and development of living aquatic resources in the UAE and its amendments.</p> <p>The Action below detailing measures for seagrass habitats will benefit sharks.</p>
Marine Turtles	<p>Internationally, all marine turtles are facing an extremely high risk of extinction in the wild. Actions detailed below include specific measures for Green and Hawksbill Turtles.</p> <p>Green Turtles (IUCN: EN), known to inhabit the coastal waters of the UAE, have been observed off the coastline of Al Taweelah during the recent surveys, as they are likely to feed off the abundant seagrass beds there. In addition, they are known to have been trapped at the Jebel Ali EGA intake facilities.</p> <p>Hawksbill Turtles, recorded during previous EIAs and the recent surveys in the coastal waters adjacent to the EGA facility at Al Taweelah, are amongst the most critically endangered species of turtles under IUCN. Crucially, therefore the nesting beach adjacent to the Al Taweelah facility could prove significant in supporting survival of this species.</p>
Bats	<p>Bats are a vital part of native wildlife in many parts of the world. As top predators of common nocturnal insects, they are sensitive to changes in land use practices. The pressures they face - landscape change, agricultural intensification, development, and habitat fragmentation - are also relevant to many other wildlife species, making them excellent indicators of the wider health of where they live. They play an essential role in pest control, pollinating plants and dispersing seeds, therefore indirectly benefiting biodiversity.</p> <p>The species of bat recorded at the EGA Golf course, Kuhl's Pipistrelle (<i>Pipistrellus kuhlii</i>), is considered one of the most adaptable bat species and associates well humans.</p> <p>An EGA Golf Course wide Biodiversity Enhancement initiative is detailed below with specific measures aimed at both conserving and enhancing the population of bats.</p>
Birds	<p>The avifauna of the UAE is of interest for a multitude of reasons, belying the country's small size and inhospitably hot, arid environment. It is surprisingly varied and constantly evolving, in response to both anthropogenic landscape modifications and longer-term climatic changes. Lying at the juxtaposition of four great biogeographic realms, the bird communities of the UAE represent a melting pot of species, whilst its position on the edge of the great intercontinental stepping stone that is the Arabian Peninsula guarantees the biannual through passage of millions of birds of some 140 species, on journeys that span from Western Europe, the Siberian Arctic and Eastern China to India, Southern Africa, and all points between.</p> <p>The UAE is home to a surprisingly diverse range of birds that occur as breeders, migrants and winter visitors. Breeding species are mostly cosmopolitan or Saharo-Sindian in biogeographic origin. To survive the extreme climatic</p>

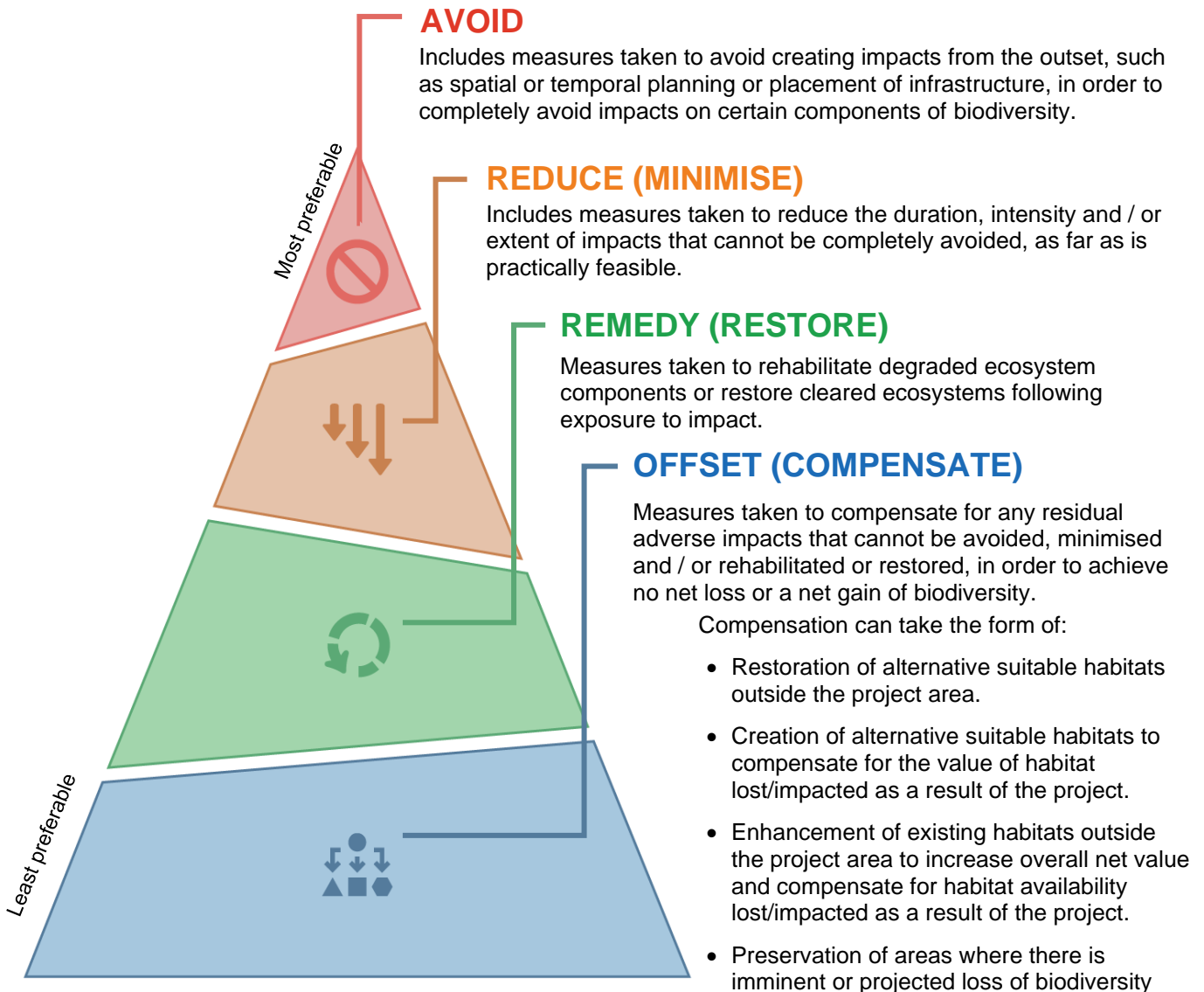
Table 24: Key Biodiversity Features Identified in this BAP

Feature	Justification Summary
	<p>conditions prevalent, birds show remarkable adaptations, both behavioural and physiological. Many of the migrants and winter visitors are actively studied and monitored in the UAE including at the EGA sites providing precious data on the biology of these species for the benefit of global biodiversity.</p> <p>Previous investigations have indicated the Golf Course area hosts 16 species of resident species and 25 species of migratory birds. Fewer species were observed during the current surveys due to the limited time available which only covered the summer and early autumn seasons. These are listed in Table 21.</p> <p>Although all species are considered of Least Concern under IUCN, their presence in this area reflects a stable ecosystem that supports a rich avian biodiversity, aligning with the current objectives of this BAP and the overall approach by the UAE which actively monitor these bird species for the benefit of regional and global biodiversity aspirations.</p> <p>Consequently, the EGA Golf Course wide Biodiversity Enhancement initiative is detailed below with specific measures aimed at both conserving and enhancing the population of birds at the Course.</p>
Fish and Elasmobranchs (Sharks and Rays)	<p>Fish are integral to Abu Dhabi's ecological, cultural, and economic framework. The emirate's marine biodiversity encompasses species that are ecologically essential, commercially significant, or endangered due to factors such as overfishing and habitat degradation.</p> <p>As key components of the marine food web, fish and elasmobranchs support critical ecosystems including coral reefs, seagrass beds, and mangroves. They play a pivotal role in maintaining ecological balance by regulating prey populations and facilitating nutrient cycling.</p>

The EGA specific Biodiversity and Waste Awareness Actions detailed in the Action Sheets below present specific measures tailored for the improved conservation and management of those habitats and species identified in this BAP.

The mitigation hierarchy is based on a series of essential, sequential, but iterative, steps taken throughout the project's life cycle, in order to limit any negative impacts on biodiversity as outlined in Figure 20 below.





**Figure 20: Levels in the Mitigation Hierarchy**

In addition to applying the mitigation hierarchy, EGA is actively identifying opportunities for biodiversity enhancements, aiming not only to avoid and minimise harm but also to contribute positively to the ecosystems the company interacts with.

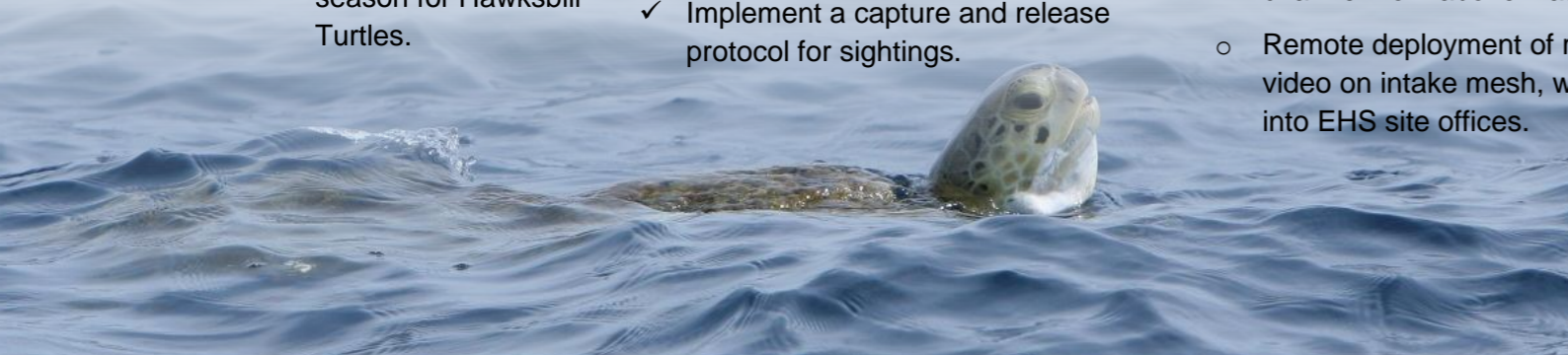
Progress on the actions outlined in this BAP will be regularly published to ensure transparency and accountability, allowing stakeholders to assess EGA’s performance in achieving the Plan’s objectives.

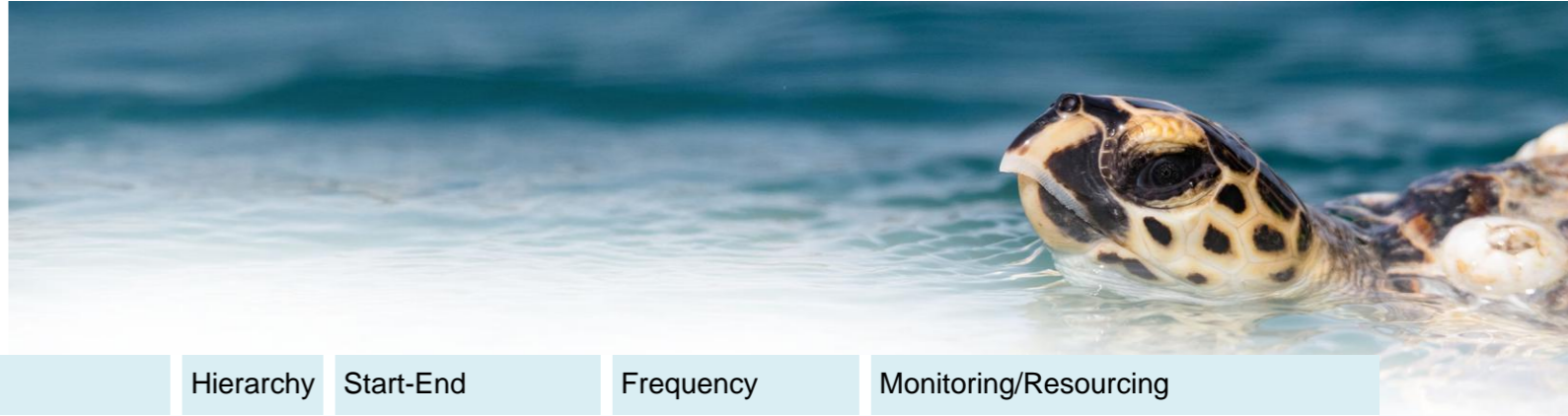


# Turtles (ID: T = Al Taweelah / J = Jebel Ali / Tu = Turtles)



ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
<b>T-Tu1</b>	Protection of Hawksbill Turtle nesting beach in Al Taweelah.	<ul style="list-style-type: none"> <li>✓ No unplanned access by vehicles or personnel.</li> <li>✓ Protection measures in place during nesting/hatching season to reduce risk of predation by feral species.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Appropriately worded signage in place and security staff trained.</li> <li>✓ Daily monitoring during nesting/hatching season to identify nests, install protection measures, ensure nesting sites are free of debris.</li> <li>✓ Security staff trained with appropriate access restrictions during nesting &amp; hatching season.</li> </ul>	AVOID	Pre- and during nesting and hatching periods each year.	Annual	EGA and/or support staff to conduct daily monitoring during nesting/hatching season to identify nests, install protection measures, ensure nesting sites are free of debris. Should include relevant expertise to be able to identify nests and nesting activity.
<b>T-Tu2</b>	Beach clean-ups.	<ul style="list-style-type: none"> <li>✓ Beach cleans ups to take place to negate risk of ingestion or entanglement by adults and/or juveniles from anthropogenic and/or natural debris washed ashore.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Records maintained of amount and type (Plastics, wood, etc.).</li> </ul>	AVOID	Pre- and during nesting and hatching periods each year.	Annual	Group campaign prior to the nesting season, then daily monitoring during the nesting/hatching season.
<b>T-Tu3</b>	Improved beach light and noise pollution management.	<ul style="list-style-type: none"> <li>✓ Minimise/negate disruption of nesting and/or hatching cycle through light pollution impacts.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Identify principal sources of light pollution and implement mitigation measures.</li> <li>✓ No hatchling mortality associated with disorientation from artificial lighting.</li> </ul>	AVOID	Pre- and during nesting and hatching periods each year,	Annual	Light pollution survey undertaken by either EGA staff or external specialist with mitigation designed accordingly for the nesting and hatching season.
<b>T-Tu4</b>	Comparative analysis of successful nesting/hatching between years to identify potential opportunities for improvement.	<ul style="list-style-type: none"> <li>✓ Record activity and nest locations throughout nesting season.</li> <li>✓ Protect hatchlings from risk of predation on beach and nearshore by daily monitoring of beach area.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Records maintained of nesting sites, with locations monitored daily during nesting season.</li> <li>✓ Records maintained of hatchling deaths or injuries from feral predator species or any other means.</li> </ul>	AVOID	On completion of hatching season.	Annual	EGA staff Possible engagement with external specialist to help set up systems.
<b>T-Tu5</b>	Develop and implement a protocol for the monitoring of the AT intake channel during hatching season for Hawksbill Turtles.	<ul style="list-style-type: none"> <li>✓ Avoid adult and/or juvenile turtle entrapment / disorientation and potential loss of adult and/or juveniles/hatchlings from entrapment in intake facility.</li> <li>✓ Implement a capture and release protocol for sightings.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Review options for mitigation, including:                             <ul style="list-style-type: none"> <li>○ Existing mesh and containment design and operation.</li> <li>○ Daily visual monitoring of intake channel from above-water.</li> <li>○ Remote deployment of real-time video on intake mesh, with live feed into EHS site offices.</li> </ul> </li> </ul>	AVOID	Continuous throughout hatching season.	Annual review	EGA staff Possible engagement with external specialist to help set up systems.





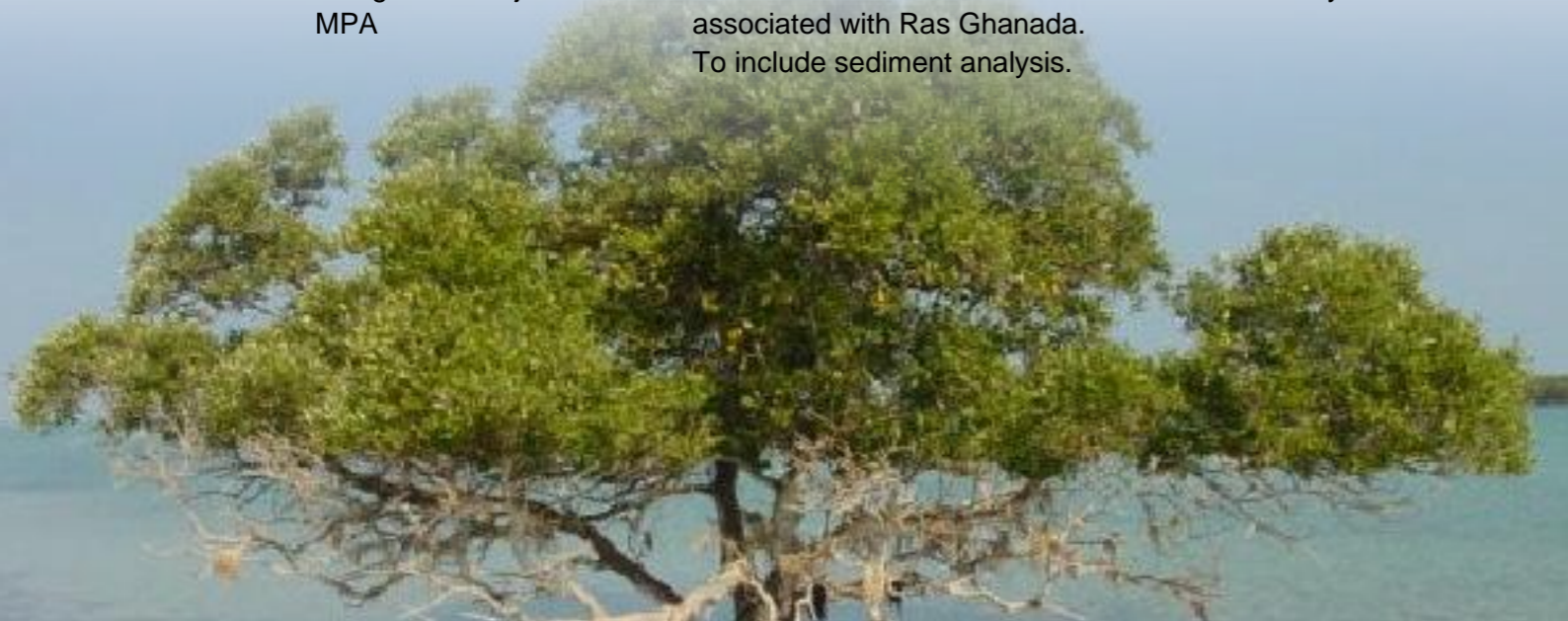
## Turtles (ID: T = Al Taweelah / J = Jebel Ali / Tu = Turtles)

ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
			<ul style="list-style-type: none"> <li>✓ Maintain records of entrapment and subsequent capture/release.</li> </ul>				
<b>J-Tu1</b>	<p>Investigate reasons for entrapment and mitigation options for intake.</p> <p>In the short term, on a daily basis, conduct checks of the chlorination basin during Green Turtle seasonal presence.</p>	<ul style="list-style-type: none"> <li>✓ Avoid adult and/or juvenile Green and Hawksbill Turtle entrapment / disorientation and potential loss of adults or juveniles associated with intake facility.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Review options for mitigation, including:                             <ul style="list-style-type: none"> <li>○ Existing mesh and containment design and operation</li> <li>○ Daily visual monitoring of intake mesh from above-water.</li> <li>○ Remote deployment of real-time video on intake mesh, with live feed into EHS site offices.</li> </ul> </li> <li>✓ Maintain records of entrapment and subsequent capture/release.</li> </ul>	AVOID	Investigation to commence 2025/26.	Dependant on mitigation options.	<p>EGA staff</p> <p>Possible engagement of sub-contracted specialist party to aid in investigations and suitable mitigation options.</p> <p>Continued liaison and engagement with Jebel Ali Turtle Sanctuary</p>



## Mangrove (ID: M = Mangrove / T = Al Taweelah)

ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
<b>T-M1</b>	Monitoring Health of Mangrove in adjacent MPA	<ul style="list-style-type: none"> <li>✓ Monitoring health of mangrove in areas to the north east associated with Ras Ghanada. To include sediment analysis.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Analytical results from accredited laboratory</li> </ul>	AVOID	To commence 2025/26	To be determined from preliminary findings	<p>EGA staff</p> <p>Possible engagement with external specialist to help set up systems and review results.</p> <p>Engagement with specialist laboratory for analysis.</p>





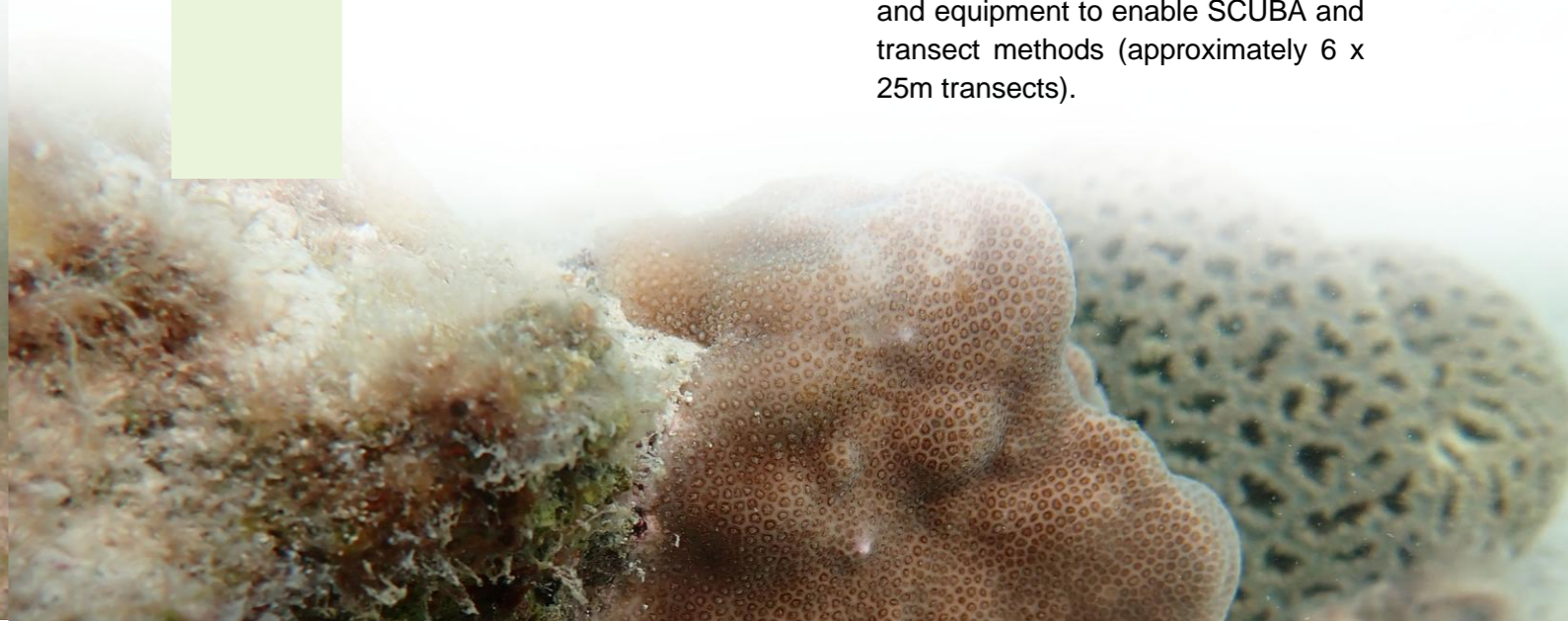
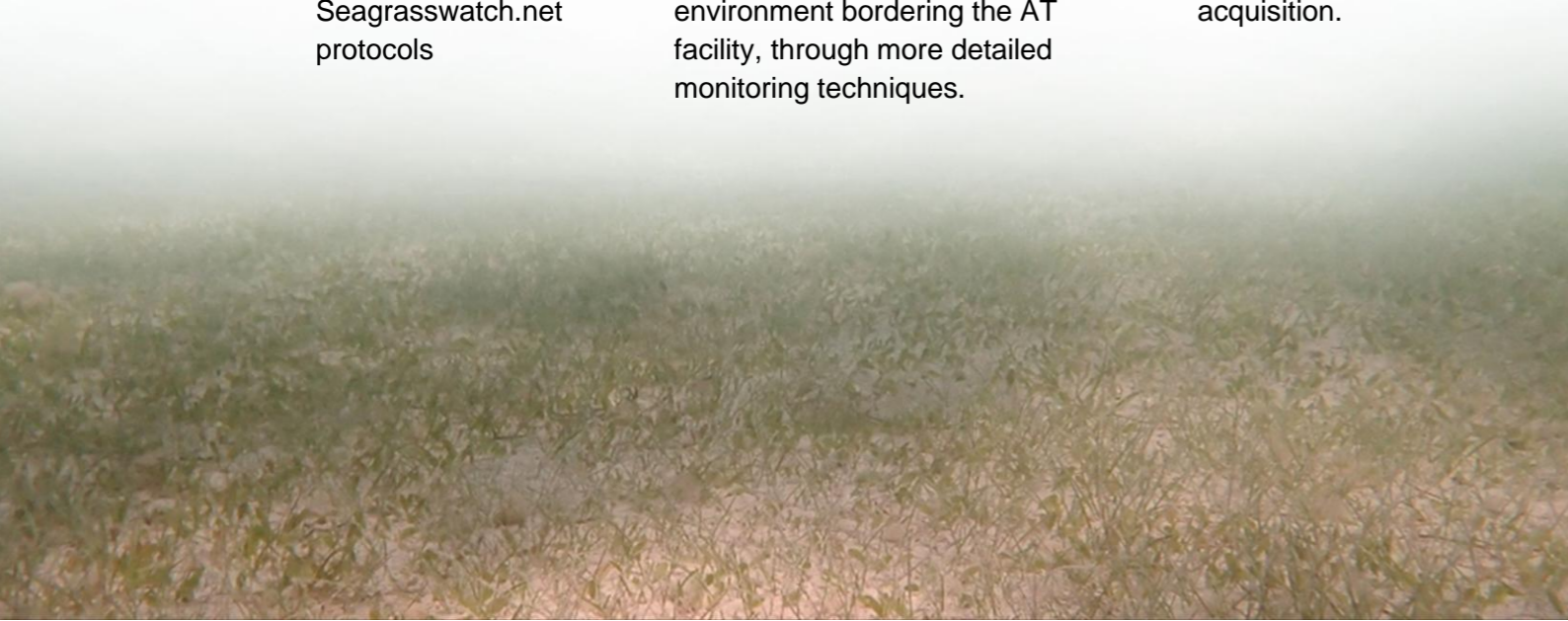
## Corals (ID: C = Coral / T = Al Taweelah)

ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
T-C1	Al Taweelah establishment of coral regeneration locations aligned with the Environment Agency Abu Dhabi Coral regeneration programme.	<ul style="list-style-type: none"> <li>✓ Translocate an agreed number of colonies over the next 3 years at a selection of sites.</li> <li>✓ Use of both artificial and natural structures including breakwaters and fringing/patch reefs.</li> <li>✓ Coral fragments from nurseries managed by EAD in the western region of the Emirate of Abu Dhabi.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Successful relocation and achievement of agreed patterns and rates of recruitment – in terms of number of colonies and their overall health.</li> </ul>	ENHANCE	2026 to 2029	Annual monitoring of success.	EGA staff Engagement with Environment Agency Abu Dhabi. Support specialist dive team, vessel and equipment to enable translocation and regular monitoring to confirm success. Additional relocation may be required according to need.



## Seagrass (ID: S<sup>g</sup> = Seagrass / T = Al Taweelah)

ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
T-S <sup>g</sup> 1	Seagrass monitoring using stereo baited remote underwater video units (BRUV)	<ul style="list-style-type: none"> <li>✓ Establish a more in-depth understanding of seagrass health in the marine environment bordering the AT facility, through monitoring of associate faunal communities, including elasmobranchs (sharks and rays) and fish.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Understanding of increase/decrease in seagrass and associated flora/fauna assemblages, highlighting Seagrass health and function.</li> </ul>	ENHANCE	2026	Annual	EGA staff Support specialist dive team, vessel and equipment to set up BRUV units and assist with analysis of data.
T-S <sup>g</sup> 2	Seagrass monitoring using quadrat and Seagrasswatch.net protocols	<ul style="list-style-type: none"> <li>✓ Establish a greater understanding of seagrass health in the marine environment bordering the AT facility, through more detailed monitoring techniques.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Understanding of increase/decrease in seagrass health through dataset acquisition.</li> </ul>	ENHANCE	2026	Annual	EGA staff Support specialist dive team, vessel and equipment to enable SCUBA and transect methods (approximately 6 x 25m transects).





## EGA Golf Course, Jebel Ali (ID: G = Golf Course / J = Jebel Ali)

ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
J-G1	Enhancement of existing features with additional native flora.	<ul style="list-style-type: none"> <li>✓ Review current status and enhance with native species to increase biodiversity of flora and fauna in Golf Course water body, ensuring that IAS such as Tilapia, Common Carp, and others listed in NISSAP are not introduced.</li> <li>✓ Generate greater awareness with EGA Club/Workforce.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Flora / fauna diversity and abundance checks.</li> <li>✓ Promulgation of Biodiversity ↑ to club users and workforce in general.</li> </ul>	ENHANCE	2026/27	Non-recurring	EGA staff  Local supplier of native flora and additional training for landscaping teams.
J-G2	Bird / Bat Nesting boxes set up in JA facility golf course with cameras that can provide live feed.	<ul style="list-style-type: none"> <li>✓ Increased usage of Golf course area by Avian / Bat activities.</li> <li>✓ Generate greater awareness with EGA.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Usage of bat/bird boxes after installation.</li> <li>✓ Camera feed available to EGA employees.</li> </ul>	ENHANCE	2026/27	Non-recurring	EGA staff  One-time installation with occasional maintenance and cleaning.



## Sediment Quality and Bioaccumulation (ID: S<sup>d</sup> = Sediments / T = Al Taweelah)

ID	Action	Target	Indicator	Hierarchy	Start-End	Frequency	Monitoring/Resourcing
T-S <sup>d</sup> 1	Expansion of sediment quality monitoring to cover critical habitats and additional collection of biota tissue samples to assess for bioaccumulation.	<ul style="list-style-type: none"> <li>✓ Evaluate potential spread of bauxite compounds in sediments (Acid Volatile Sulphide [AVS] and Simultaneously Extracted Metals [SEM]) and benthic or sessile fauna (e.g. fish, bivalves)</li> <li>✓ Ensure compliance with relevant thresholds.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Analytical results from ex-situ analysis.</li> </ul>	AVOID	2026/27	Annual	EGA staff  Support specialist dive team, vessel and equipment as well as specialist laboratory for analysis.  Engagement with specialist laboratory for analysis.  Possible engagement with external specialist to help set up systems and review results.



## 7.0 BAP Evaluation

As detailed in the ASI Performance Standard - Guidance document issued in July 2024 (<https://aluminium-stewardship.org/wp-content/uploads/2024/05/ASI-Performance-Standard-Guidance-V3.2.pdf>), under Section B, Environment, item 8.2 (Biodiversity Management) states that the Entity (EGA) shall:

- Implement a Biodiversity Action Plan with time-bound targets to address risks and impacts to Biodiversity and Ecosystem Services, identified through criterion 8.1 (Biodiversity and Ecosystem Services Risk and Impact Assessment), and monitor its effectiveness.
- Ensure that the Biodiversity Action Plan is designed by a Qualified Specialist, in accordance with the Biodiversity Mitigation Hierarchy and with an ambition to achieve no net loss.
- Ensure that the Biodiversity Action Plan is developed in Consultation with and, where possible, with the participation of Affected Populations and Organisations.
- Review the Biodiversity Action Plan and associated targets at least every 5 years.
- Review the Biodiversity Action Plan and associated targets on any changes to the Business that alter Material Biodiversity risk(s) or where assessment indicates changes to risk.
- Review the Biodiversity Action plan and associated targets on any indication of a control gap.
- Publicly disclose the latest version of the Biodiversity Action Plan and associated targets and share with Affected Populations and Organisations.

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