KAUST
Beacon Development
المنـــارة للتطـــوير

Red Sea Global

Adaptive Coastal Development Management: Red Sea Turtles

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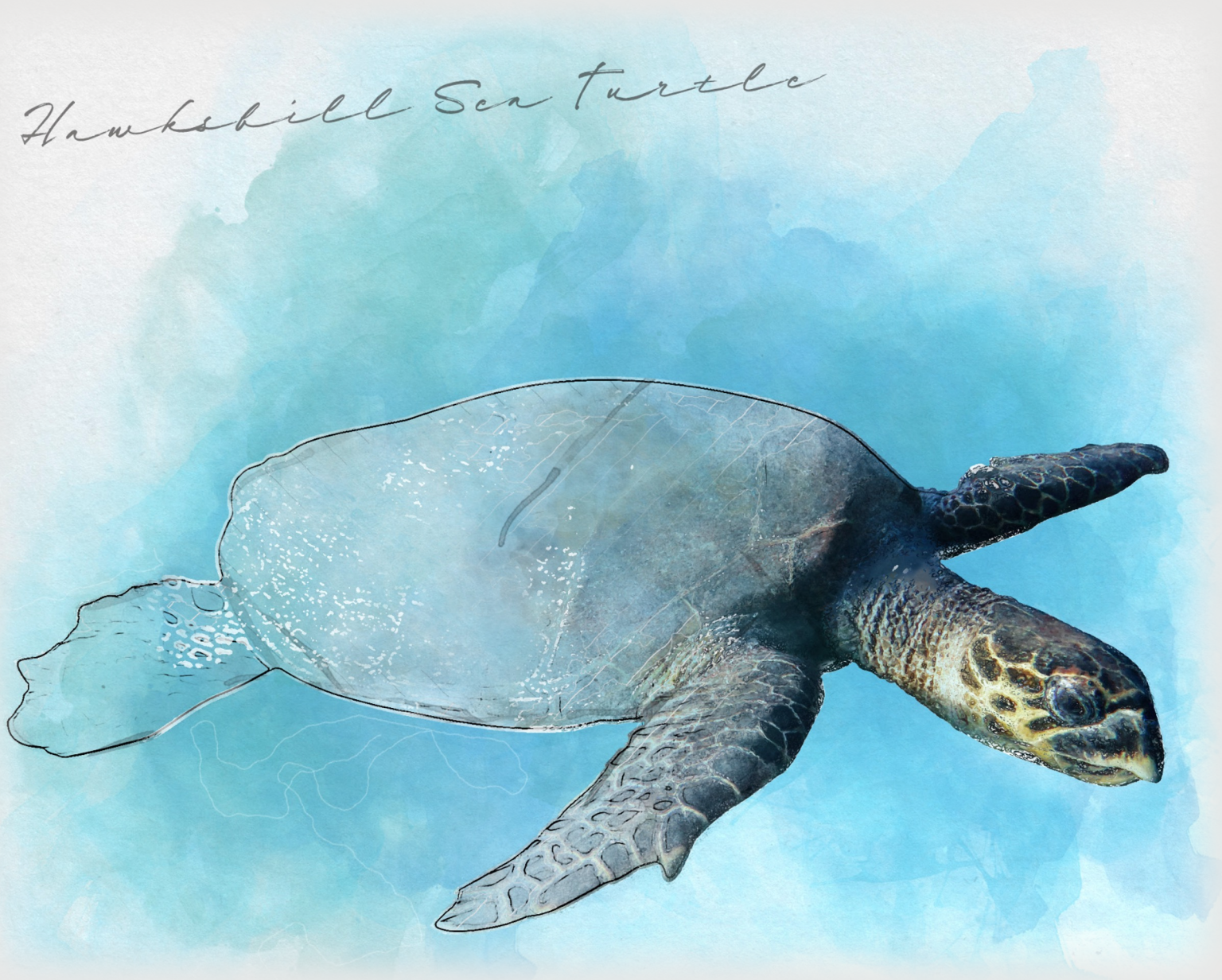
01

Project Setting and Ecological Context

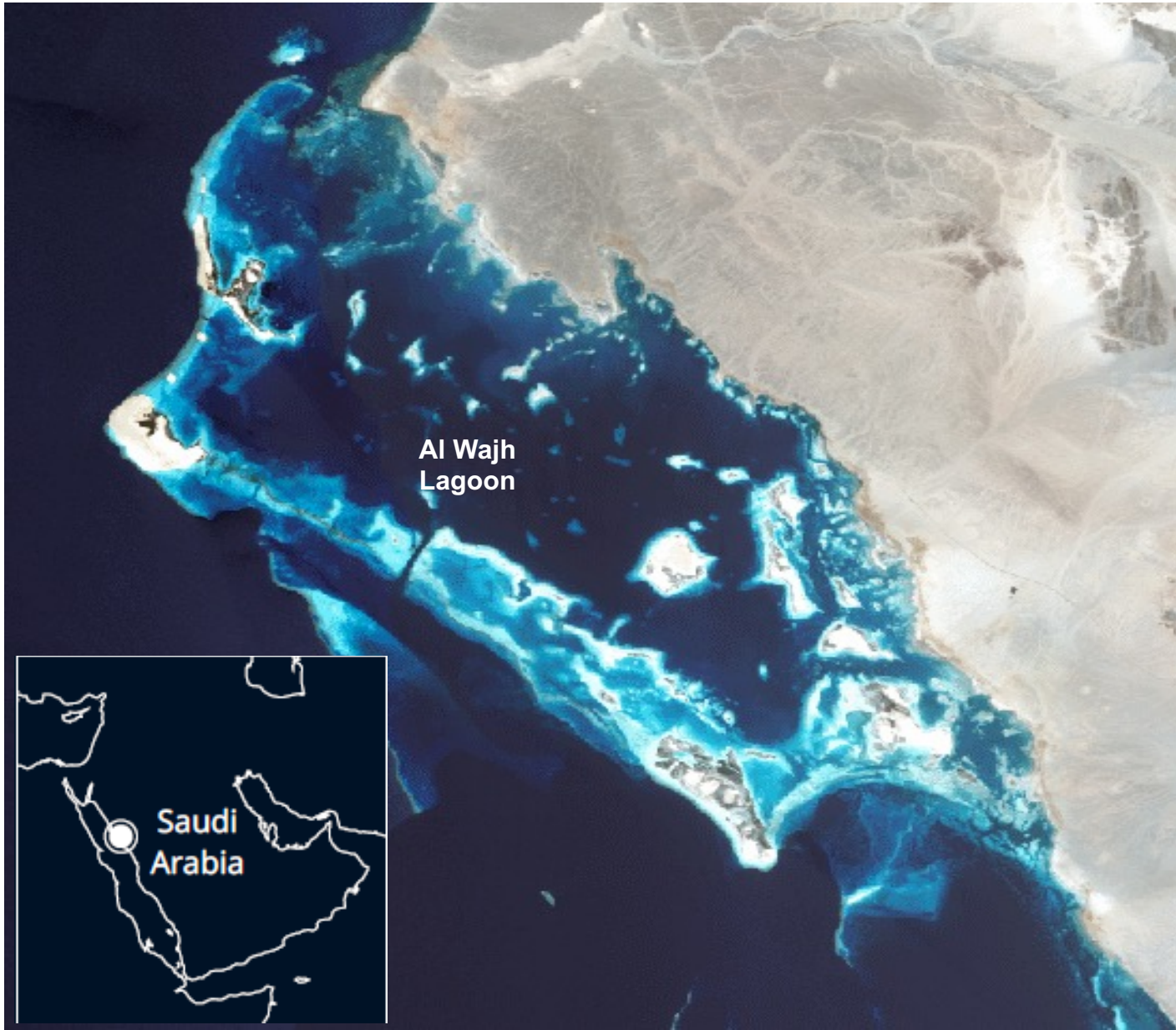


- **Red Sea Global (RSG) -** Saudi development company with the aim to deliver high quality tourism projects in support of Vision 2030 with a goal of delivering sustainable, regenerative tourism

- **KBD -** Established in 2017 as KAUST's environmental consulting arm delivering international standard environmental support within KSA

The Red Sea (TRS) Project

- Luxury tourism and residential facilities across an archipelago of 92 islands
- RSG has targeted development of 7 of the largest islands in the lagoon and 24 of the smaller islands
- The ecosystem is ecologically sensitive, high value marine and coastal habitats
- The lagoon supports regionally significant aggregations of nesting turtles



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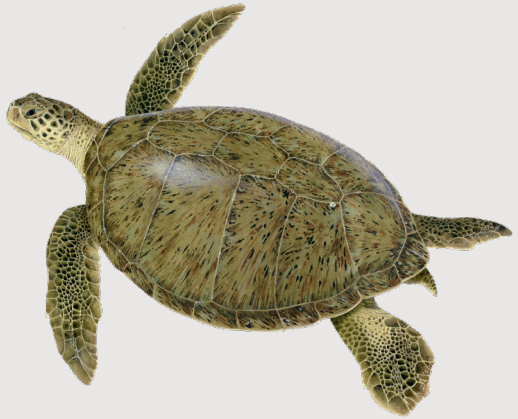
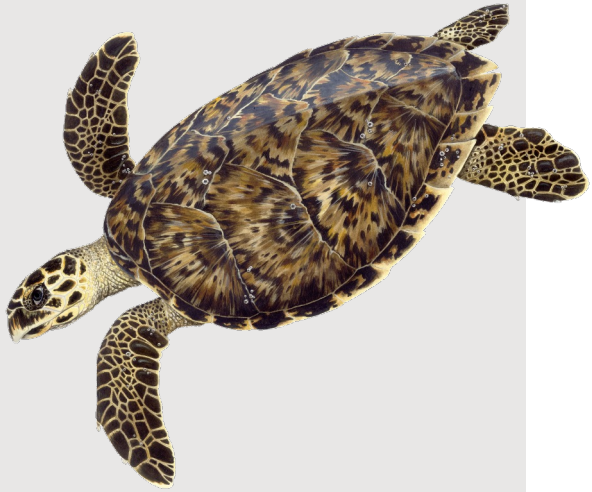
Turtles in the Red Sea

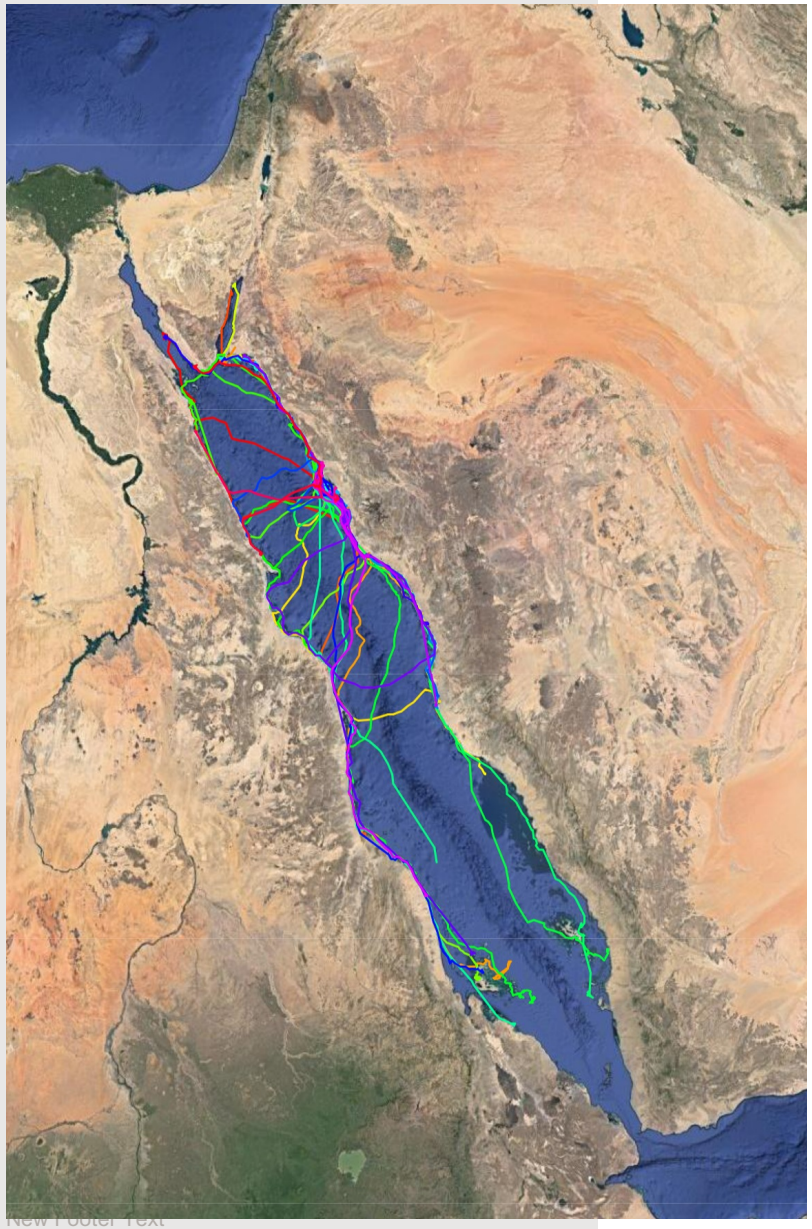
Turtles in the Red Sea





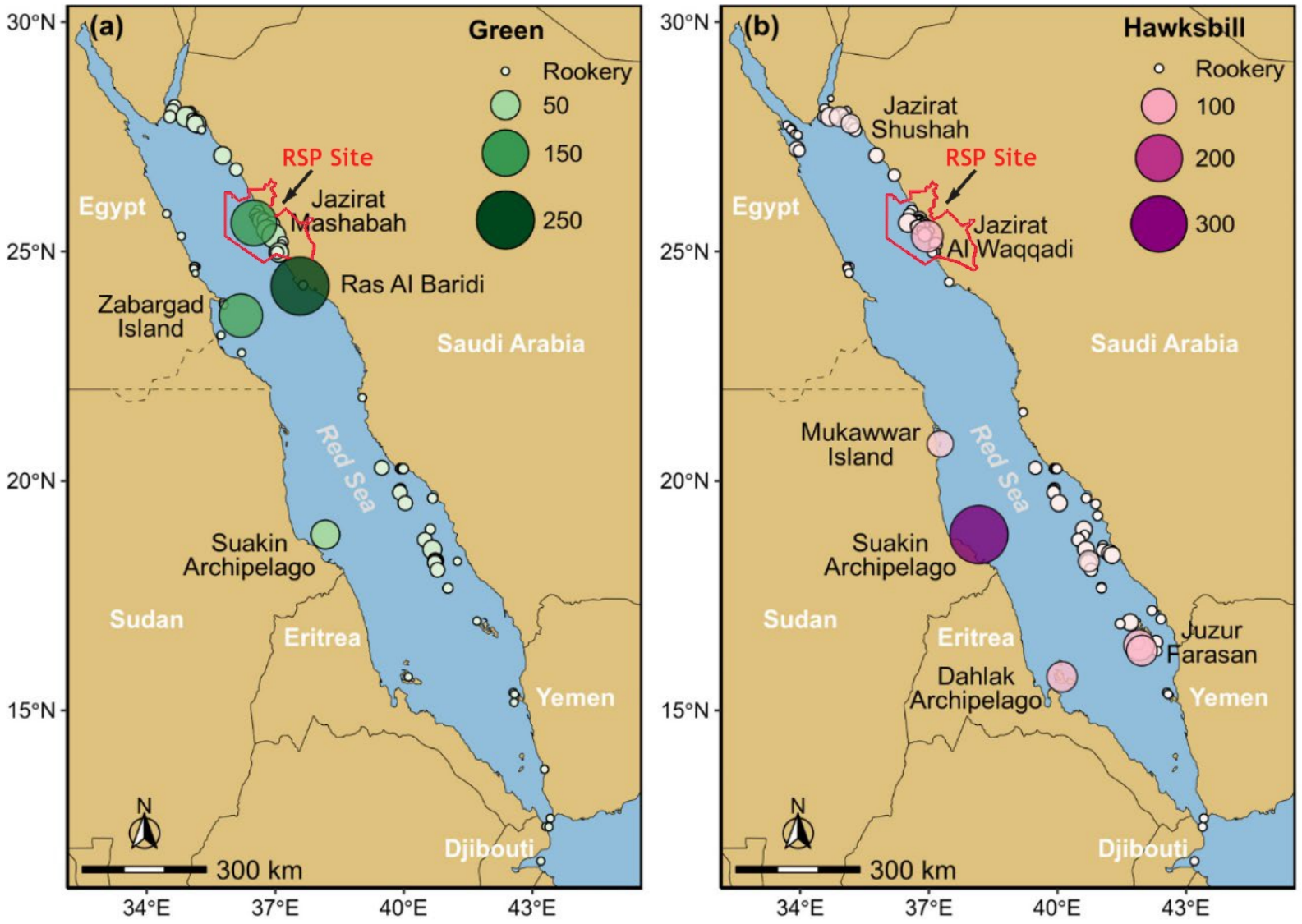
- Of the five species of turtle recorded in the Red Sea, two are commonly recorded at TRS.
- Hawksbill turtles are globally listed as Critically Endangered on the IUCN Red List of Threatened Species
- Green turtle is listed as globally Endangered
- No regional designations

Turtles in the Red Sea



- **Mobility** - Highly mobile migratory species, and are subsequently exposed to multiple threats
- **Site Fidelity** - Exhibit strong fidelity to breeding and nesting sites
- **Vulnerability** - The concentration of nesting sea turtles and vulnerability of adults, eggs and hatchlings at nesting sites means these areas are a focus for conservation and management
- **Data Deficient** - Movement and population ecology across the Red Sea remains understudied

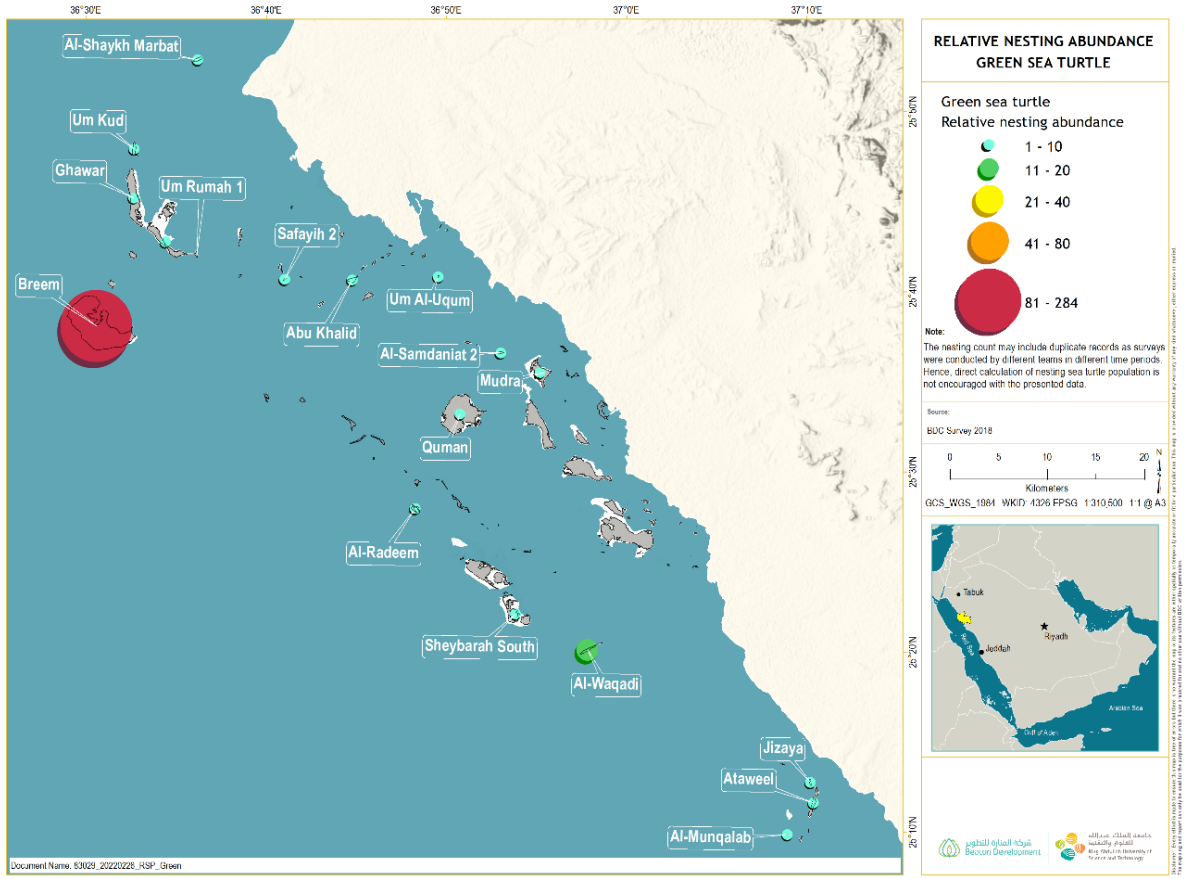
Distribution and Estimated Abundance of Nesting Females



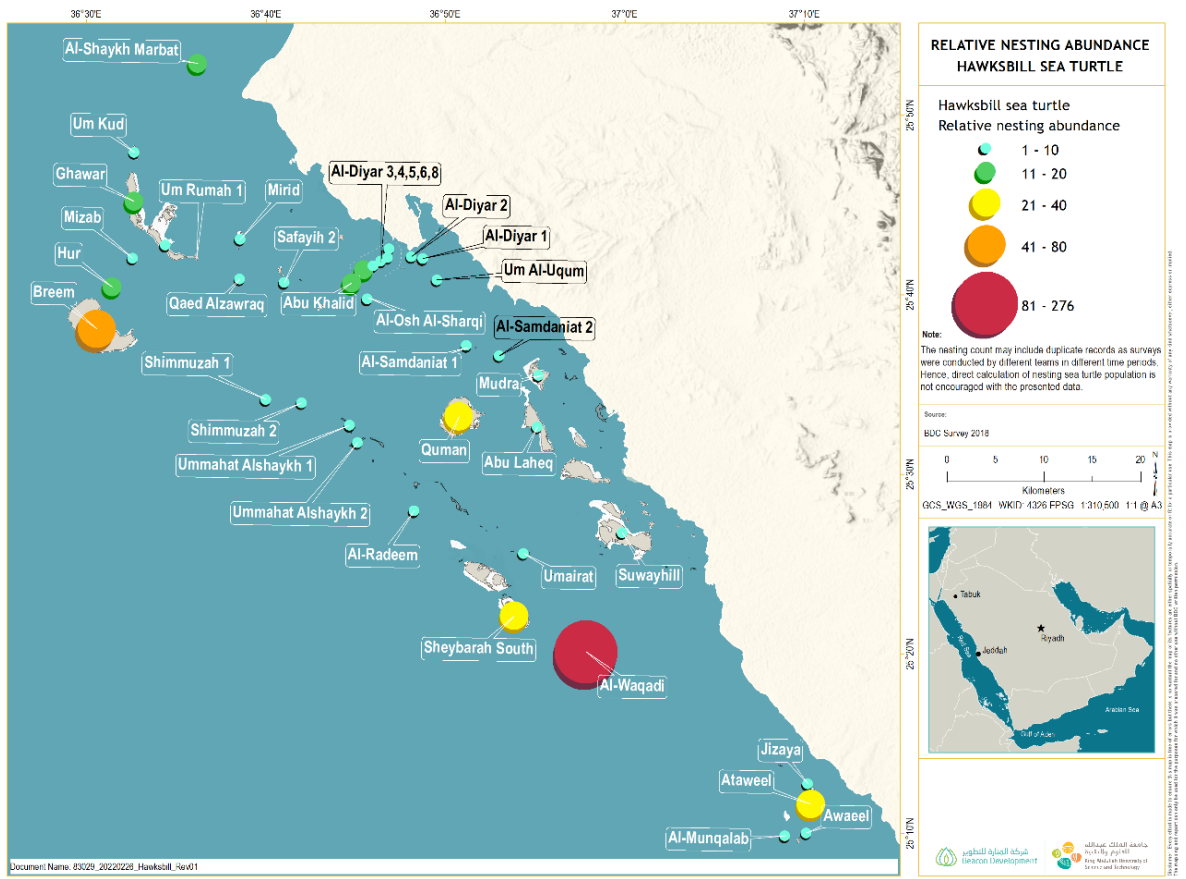
- Al Wajh Lagoon is recognized as one of the most important zones in the Red Sea for Green and Hawksbill turtle nesting

Shimada et al. (2021)

Green Nesting Sites



Hawksbill Nesting Sites

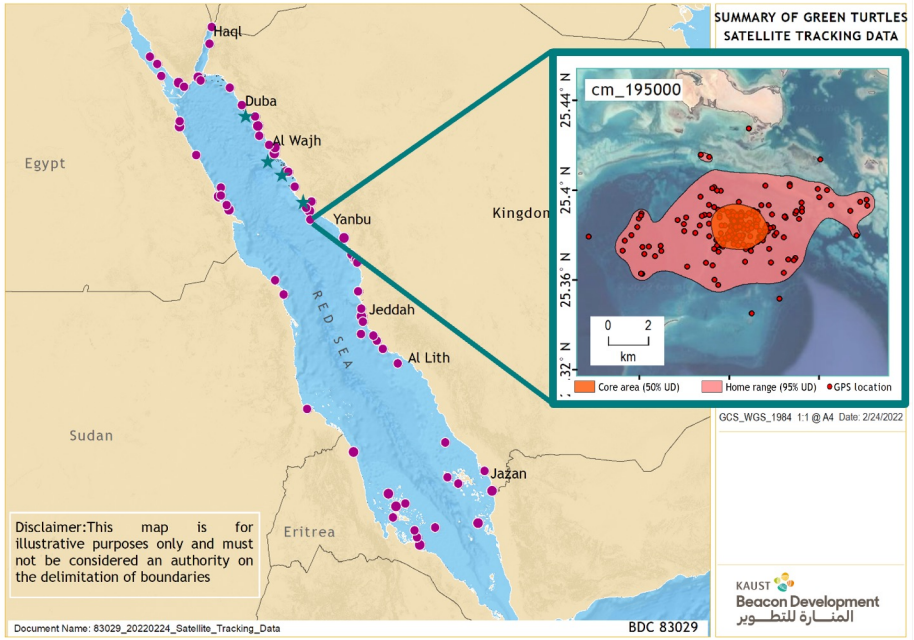


Many of the nesting sites occur on or near islands scheduled for development.

Careful management and development planning is required

Additional Studies – 2020 Onwards

Foraging grounds identified for 68 green turtles



Additional studies have been commissioned by RSG to inform conservation and development planning:

- Nesting beach surveys
- Satellite tracking of nesting females
- Study of impact of beach temperature on hatching success
- Arena lighting trials to determine hatchling response to light sources
- Development of design guidelines for mitiating lighting impacts

Current knowledge base allows us to understand where turtles go to nest, feed and move through the project site

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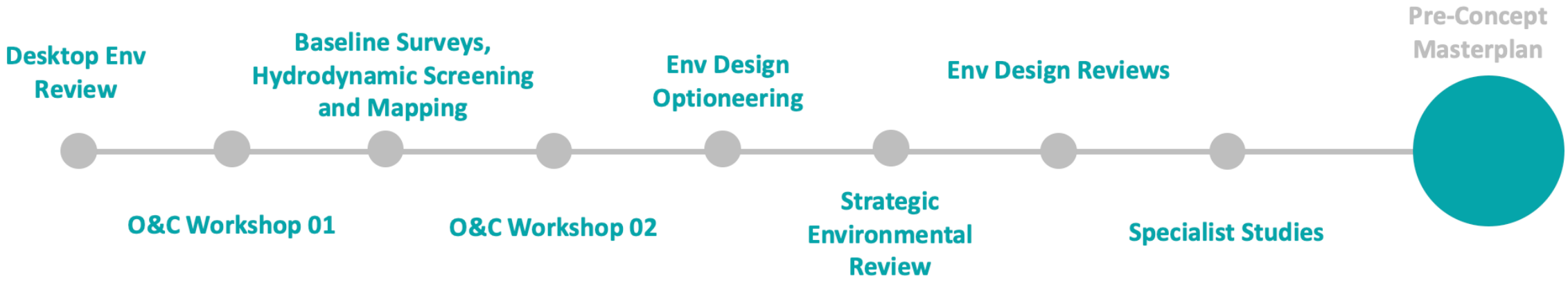
Adaptive Management Approach

Environmental Design Process - Interventions and Guidance

Feasibility / Pre-concept Studies



- From project inception, environmental sensitivities are identified and fed into the design development
- Capturing potential risks to turtle populations as early as possible in the design process is key
- Objective is to identify risks early and embed mitigation into design
- Guidance targets protection of known nesting beaches, associated vegetation and management of lighting

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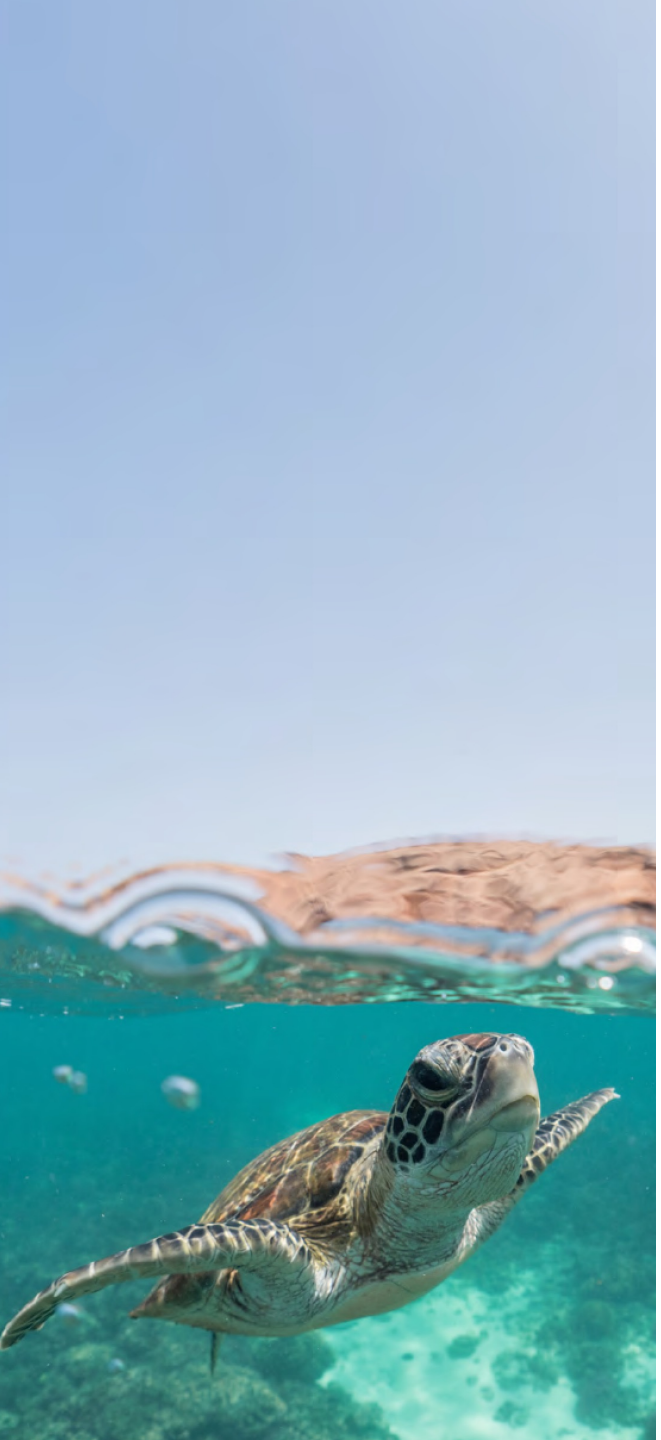
How Does This Work In Practice?

Early Concept Design –No Environmental Input



Design Interventions

Design modifications that have been implemented include:

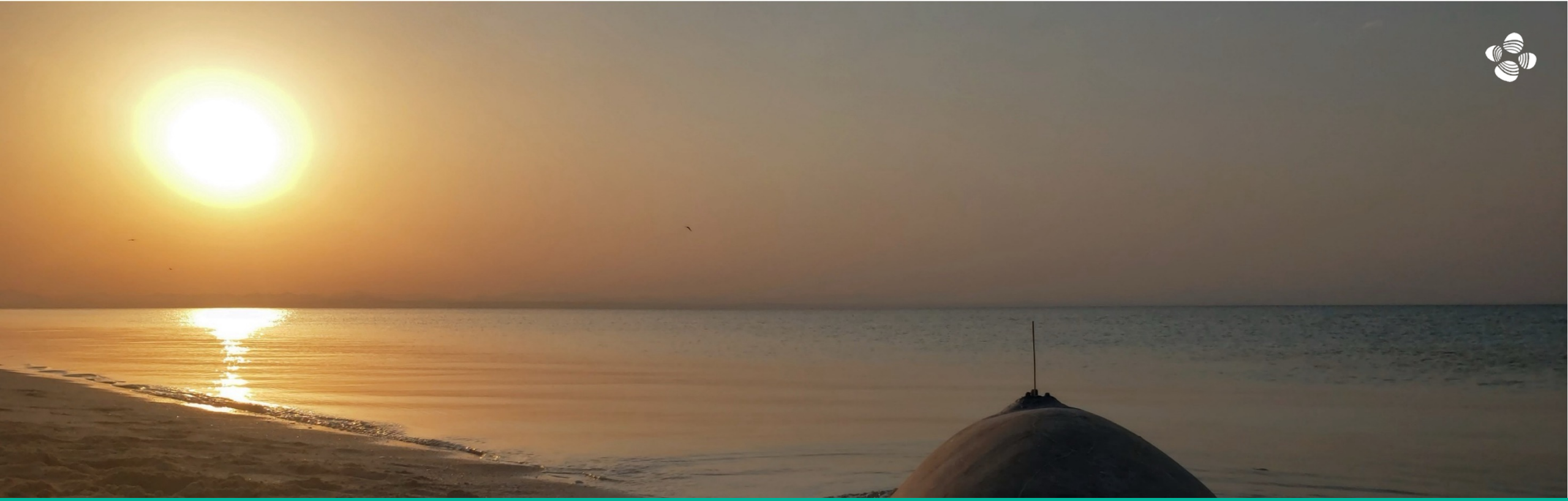
- Setbacks and physical screening;
- Onshore and offshore protection zones;
- Modification / reorientation of dredge channels; and
- Eliminating design components that present a significant risk to the integrity of beaches and key marine habitats

05

Recommendations For Future Management and Monitoring

Recommendations

- Continuation and expansion of beach monitoring programme
- On-going monitoring of operational assets
- Develop plans to inventory and protect foraging areas, and inter-nesting / migratory habitat
- Ensure lighting design strategies are developed from the start of the project design process
- Ensure artificial beaches are designed to mimic beaches that support large turtle rookeries



Questions & Discussion

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Let’s continue the conversation!

Post questions and comments in the IAIA24 app.

#iaia24

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