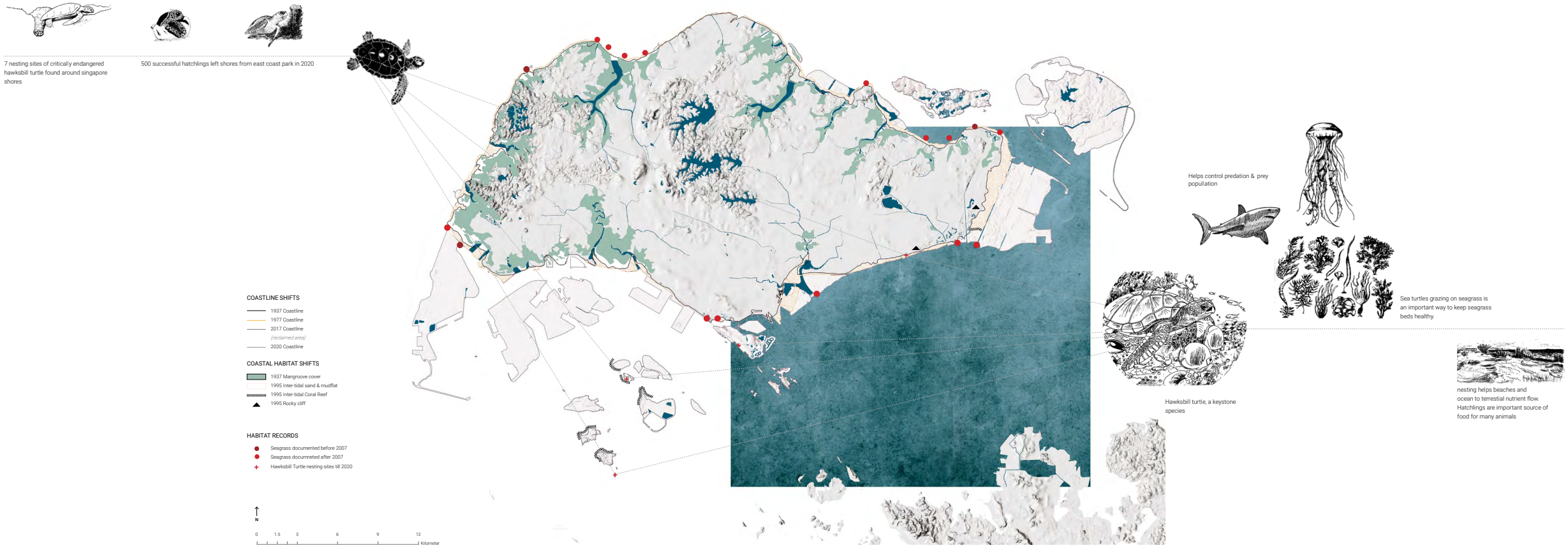
SUPPORT SINK

Uplifting nature's carbon cycle



To revive sea turtles and safeguard their existence, it is required to protect and restore habitat that supports their life. Seagrass meadows being one of such critical coastal ecosystems that helps not only harbor the keystone species but also help sequest carbon at considerably higher rate compared to terrestrial vegetation, focus is to choose existing seagrass meadow patch at East Coast Park and try to extend and restore existing seagrass meadow patches.

1950 1960

East coast in 1960s

1970

Land reclaimation and Initial plans & development of ECP. Soon after opening, it became Singapore's most visited urban park and continues to be so till now

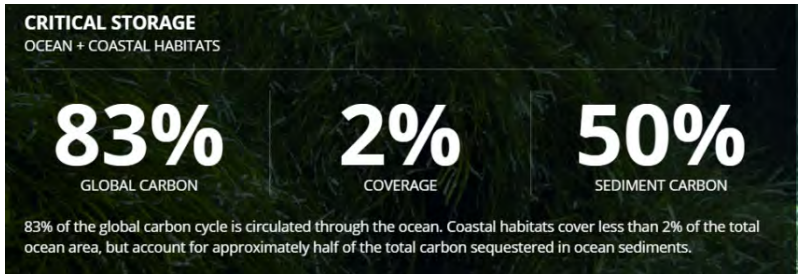
1980 1990 2000

Enhancement and zone based distribution

2010 2020

Rejuvenation & recreation

Coastal ecosystems



Blue carbon is the carbon stored in coastal and marine ecosystems. Coastal ecosystems are carbon sequester and store more carbon per unit area than terrestrial forest. However, if the coastal ecosystems are damaged or degraded, their carbon sink capacity is lost and the carbon stored is released, resulting in emissions of Carbon dioxide (CO2) that contribute to Climate change.

Source: https://www.nrdc.org/stories/keystone-species-101

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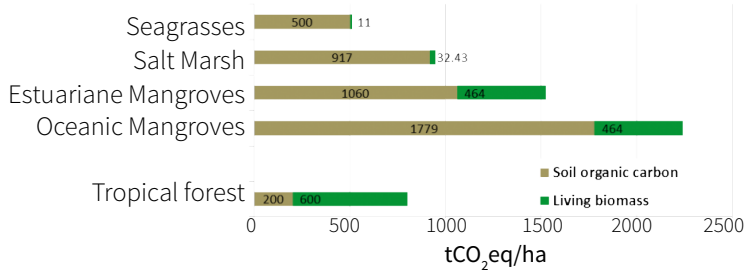
Keystone species

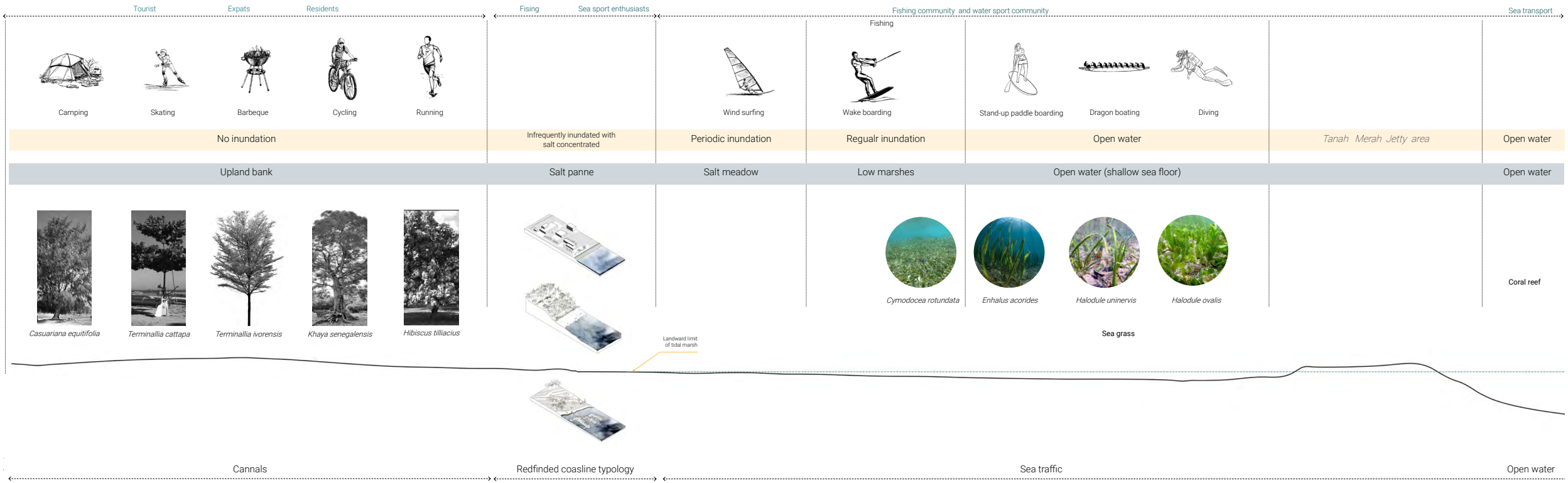


A keystone species can be either organism from plant, animal, bacteria or fungi family, which act as a glue that holds a habitat together. It may not be the largest of plentiful species in an ecological community, but if removed, it sets off a chain of events that turns entire structure and biodiversity of the habitat and alter it drastically. Keystone species plays pivotal role in how ecosystem functions.

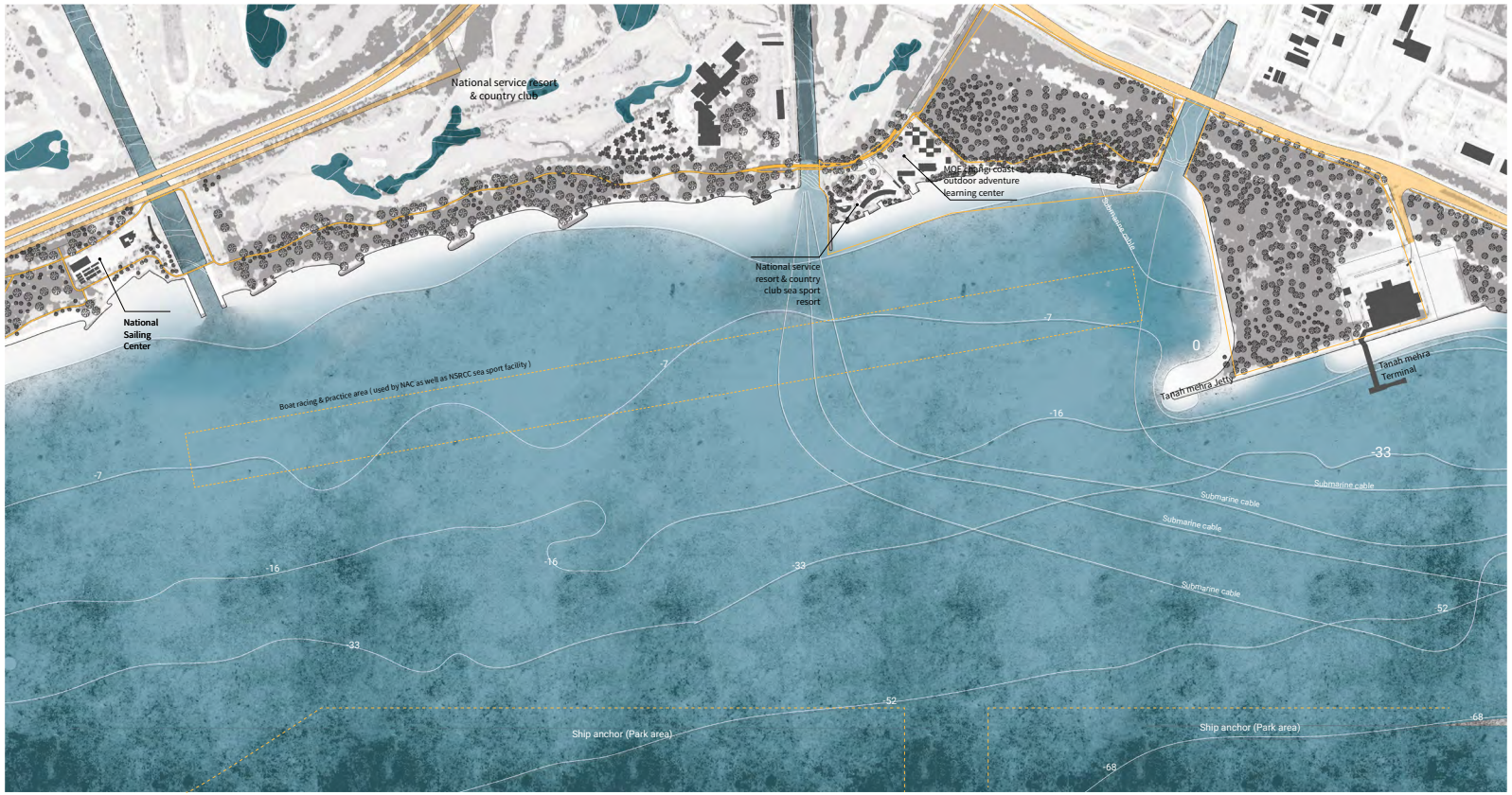
Source: https://www.nrdc.org/stories/keystone-species-101

EAST COAST PARK

Present condition & slated future of shrinking inter-tidal habitat



East Coast is completely built on reclaimed land and the coastline and coastline conditions vary from sandy shore to rocky rubble boulder wall. Heavy pollution from urban run-off as well as plastic pollution is one of the threats affecting seagrass health. With sea-level rise and future land reclamation plans, the question is how to shape coastline for better future that not only serves urban expansion but also consider coastline habitat.

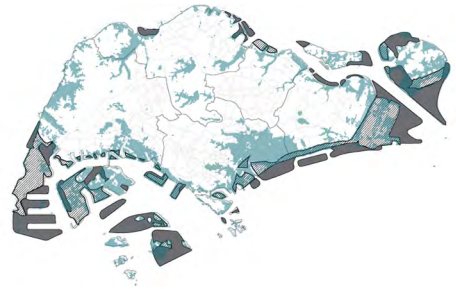


Sea level rise projections

Exsiting green spaces & urban fabric

2 degree warming projection

4 degree warming projection



HIGH FLOOD RISK AREAS

- High flood risk area (2050)
- Future reclaimation
- Reclaimed land

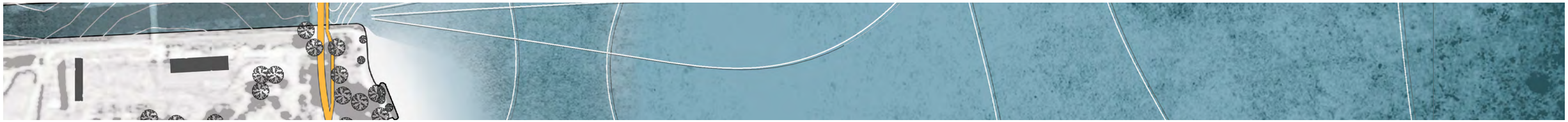
LEGENDS

- Land
- Sandy shore
- Inland water
- Sea traffic
- Being reclaimed
- Future land reclaimation

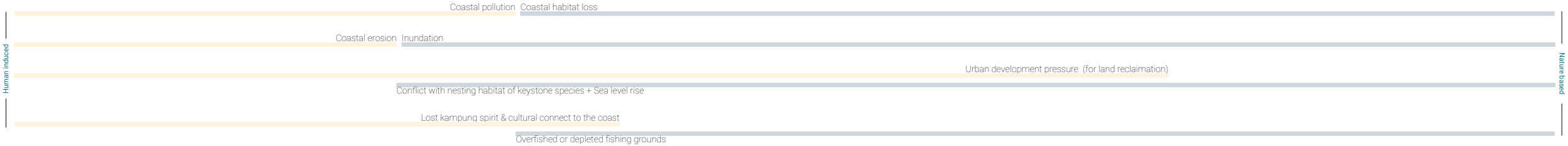
Issues and challenges

COASTAL DEFENCE & HABITAT RESTORATION

Embracing vulnerability and change



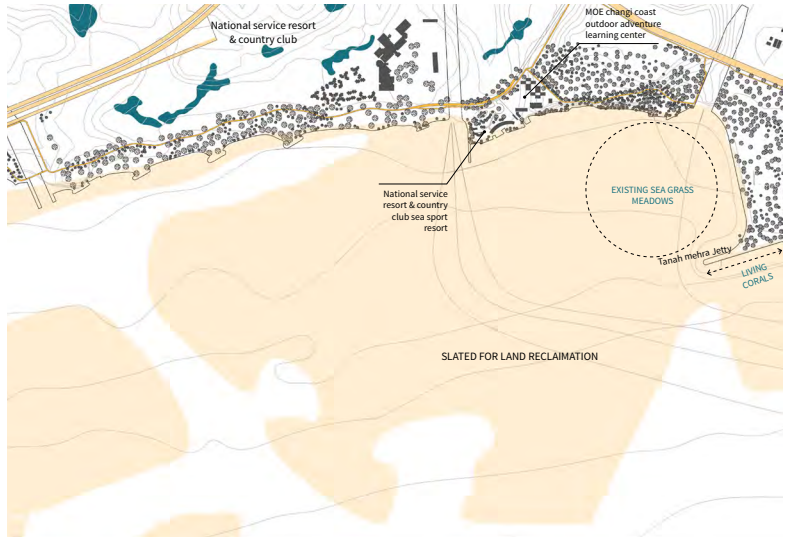
Issues arising due to present condition



East zone of East Coast park already has well developed sea sports clubs. Leveraging on existing sports facilities, vision is to focus on three major aspects to adhere the bond with coast :

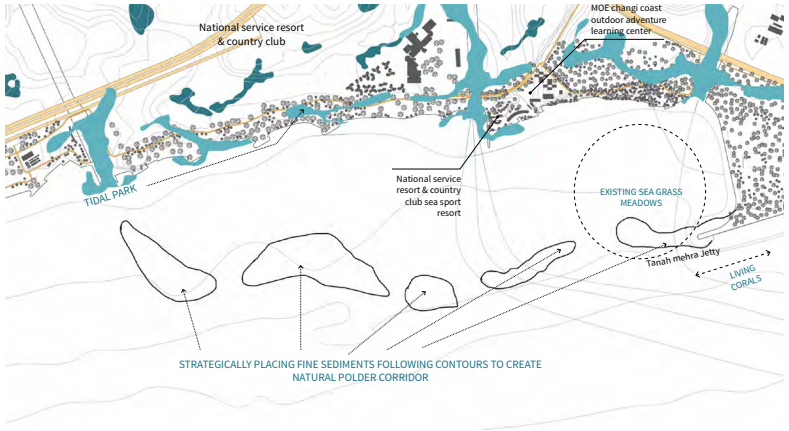
1. Restore Natural heritage – to create combined ecosystem habitat to harbor keystone species
2. Enhance sea sports – to tie the existing sea sports activity with ecological awareness aspects
3. Restore cultural heritage – to leverage on tourism aspects along with providing platform for intimate ways to connect with coast with kampung spirit!

Design Concept



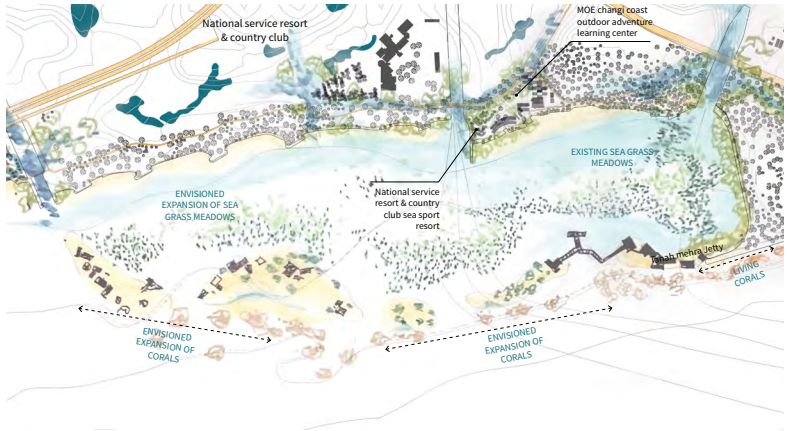
Slated land reclaimation for housing

Land recalimation has already begun, with the intention to protect east coast from inundation. The sea greadient being -30m might make it challenging and coastlier deal. Moreover, housing proposal might add to the already existing issues regarding sea level rise threat



Stratagically placing fine sediments to create nautral polder and introducing tidal park

Dredged material can have a beneficial application in the growth of ecosystems, including marshes and mangrove belts. Its strategic placement in shallow tidal environments can exploit waves and currents to disperse the material. Strategic spreading of dredged sediment has quantifiable benefits relative to the traditional approaches of disposing dredged material either just beyond a port's boundary, which has limited efficacy, or transporting it offshore, which removes sediment from the natural system.Along with it, introducing tidal park to defenece inundation as well as run-off pollution

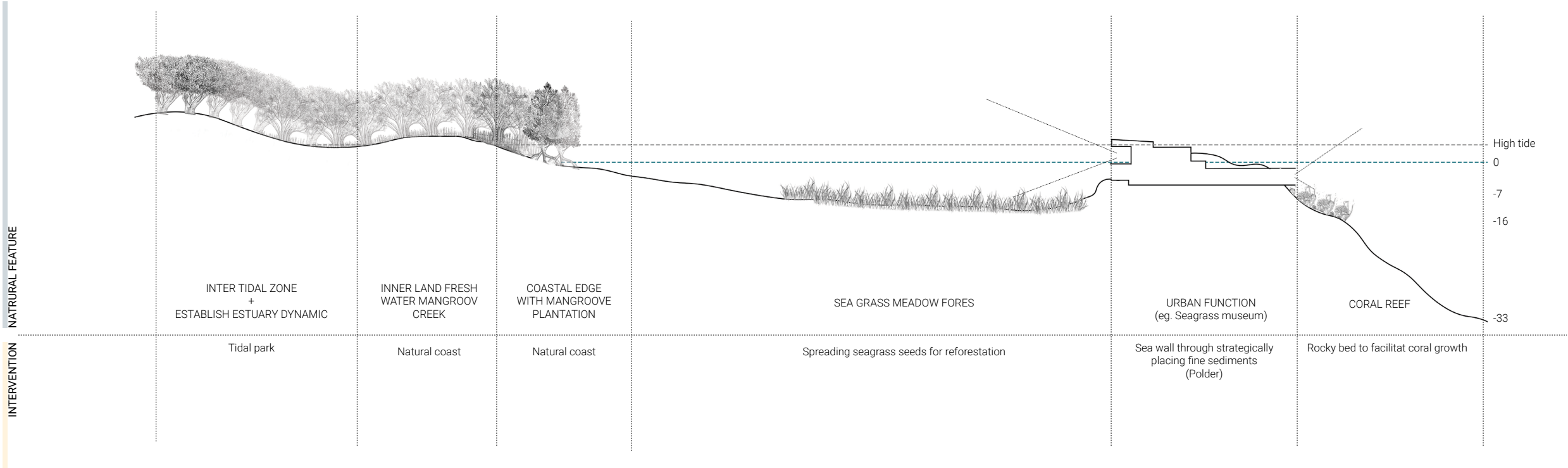


New proposal for East Coast - Landscape corridor restorting ecosystem connection

Landscape corridors create important conduits that protect existing habitats and support biodiversity. In areas where inland waterbodies have been artificially separated from coastal systems, restored connections can re-establish tidal influence, reconnect urban areas to nature, and facilitate the passage of fish and other species. These actions not only support biodiversity, but also help manage the transition from fresh to salt, simulating estuary conditions.

CONNECT & PROTECT

Redefining human engagement and emotional connect with coastal habitat



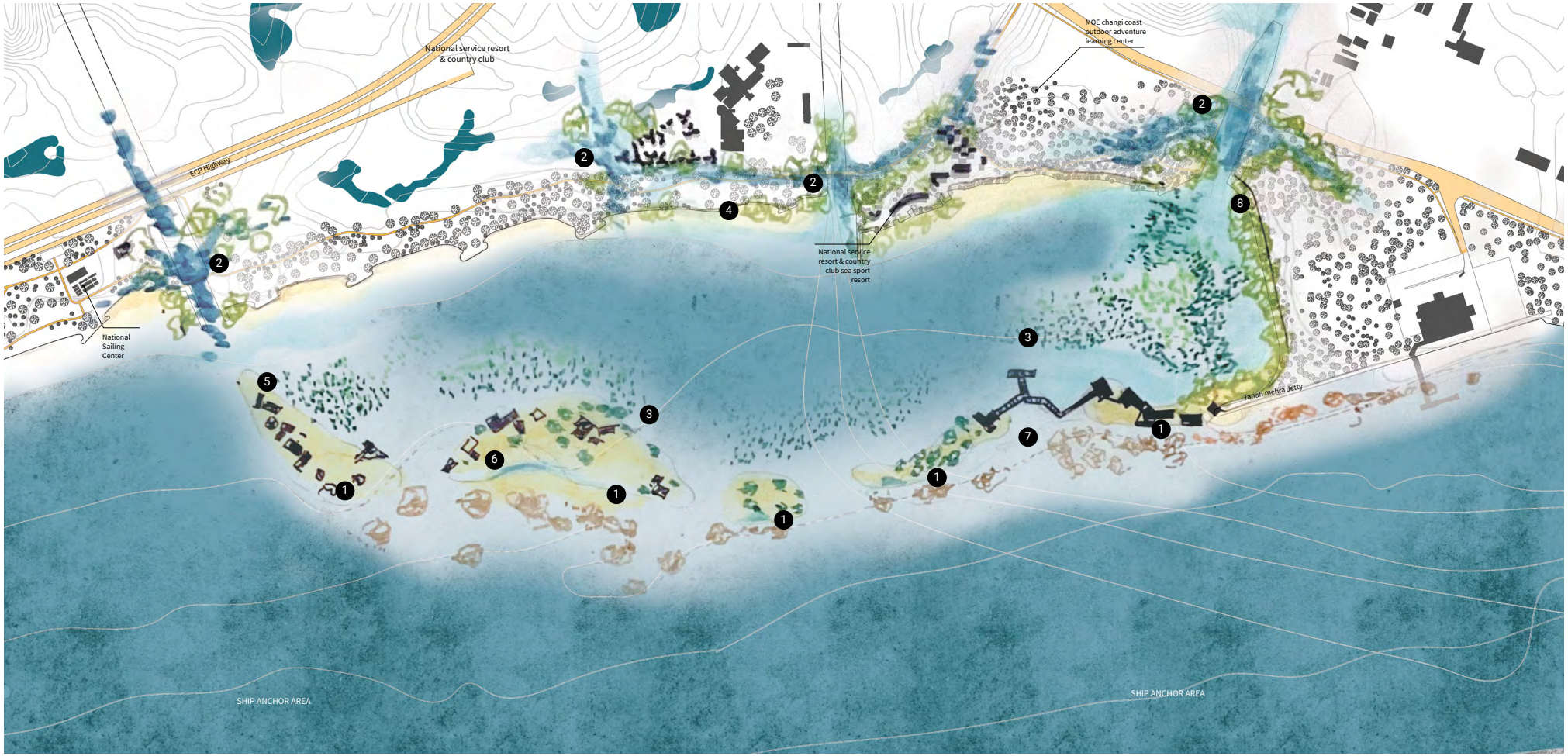
Landscape Strategy (Phasing)

1. Strategically placing fine sediments
2. Establishing tidal park

   Intention is to restore tidal dynamics and salinity gradient to facilitate healthy coastal habitat as well as defence against inundation
3. Facilitating seagrass plantation
4. Naturalize coast edge and estuary system

Possible Urban programs

5. Fishing village
6. Sea research facility
7. Under-water sea-grass museum
8. Inter-tidal mangrove trail and camping area



Human - nature design systmes matrix