City of Rockingham

Safety Bay/Shoalwater Coastal Management Study Summary

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where the coast comes to life

Context

The City has over 37Km of coastline with north, west and south facing beaches. The coast caters for a range of benefits such as recreational, conservation, tourism and commercial services and activities.

The coastal section between Causeway and Waikiki foreshore is a highly dynamic area with both accretion and erosion hotspots like Tern Bank and Mersey Point respectively. This section of the coast also caters for many of the recreational boating facilities in the City, including Point Peron, Carlisle Street, Bent Street and Donald Drive boat ramps. The pond is very popular for multiple recreational uses including swimming, wind and kite surfing.

Considering the high coastal dynamics of the area this section required an assessment of the coastal dynamics and current management practices to develop management recommendations. The Safety Bay Shoalwater Coastal Management Study (study) is intended to inform the development of the 'Community Plan Strategy – Coastal Facilities Strategy' (Strategy).

The scope of the study is to develop a strategic approach to coastal management for the study area (Figure 1) for the next 10 years with due consideration of coastal processes and risk over the next 30 years including the Coastal Hazard Risk Management and Adaptation Plan (CHRMAP). The recommendations are grouped by short term (1 to 3 years) and medium term (4 to 10 years) actions. The timing of the study was also selected to enable input in the Safety Bay Shoalwater Master Plan process.

The study area was divided into six sectors to reflect the natural sediment movement cells.

The study had the following key objectives:

- Identify possible locations for additional boat launching facilities (in the study area)
- Identify most effective coastal management strategies
- Develop sound strategic approach to coastal management for the next 10 years to 2030
- Assess coastal management options by undertaking following Multi-Criteria Analysis (MCA)
    - Technical feasibility (performance, safety)
    - Economic viability (Operating expenditure, Capital expenditure, Net Present Value for the study period)
    - Social and environmental desirability (impact, regulation, public acceptance, independence of operations)

It has considered the following for each sector.

- sediment transport in the sediment cells (coastal sand movement)
- Impact of climate change (in 10 years to 2030, in 30 years to 2050)
- Impact of future sediment transport and activity on Tern Bank, the pond and the Bent Street boat ramp
- Current and future demand for boat launching facilities
- Effectiveness of current coastal protection and coastal infrastructure management

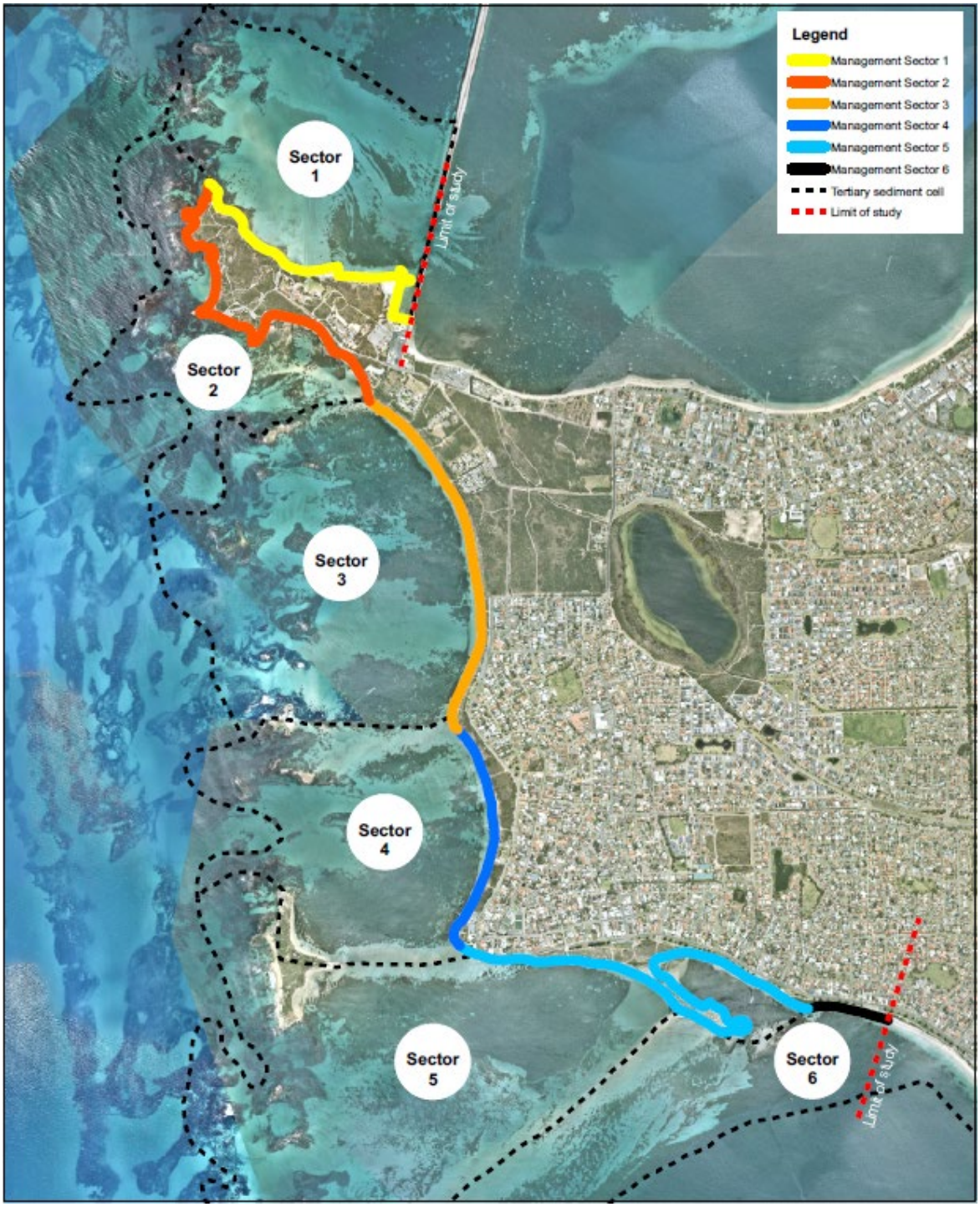

Figure 1: *Study area with six sectors*

Coastal Management

Sector 1

The challenges in the sector are:

- Accretion at the sand trap
- Limited capacity of the sand trap, requiring frequent excavation and management of excavated sand to maintain safe navigability
- Erosion on the west side of the sand trap

- Management of harbour navigational depth
- High demand for recreational boating

The following options were considered and analysed for sector 1 and the recommended option is option 3, for implementation in the short term.

- Option 1 - Status quo
- Option 2 – Status quo plus added groyne
- Option 3 – Status quo plus added groyne and shift the existing spur groyne northward

Figure 2: *Recommended option for Sector 1 – shift spur groyne northward with added groyne*

Sector 2

The key challenge in the sector is the significant and consistent erosion on the south western coast. Though the sector is managed by the Department of Biodiversity, Conservation and Attractions (DBCA) the erosion have flow on impacts on the City's coastline.
The following options were considered and analysed for sector 2 and the recommended option is option 4, for implementation in the short term.

- Option 1 - Status quo - Ad hoc nourishment
- Option 2 - Nourishment - Truck from Point Peron sand trap and place
- Option 3 - Nourishment - Slurry pump at Point Peron sand trap + temporary pipe
- Option 4 - Nourishment - Slurry pump at Point Peron sand trap + permanent pipe

Figure 3: *Recommended option for Sector 2 – beach renourishment with permanent pipe from Point Peron sand trap*

Sector 3

The City do not currently undertake coastal management within Sector 3. Due to the relative stability of the shoreline within this Sector, no management options have been defined within the planning horizon of this study.

Sector 4

The key challenge in the sector is the significant erosion at Mersey Point.
The following options were considered and analysed for sector 4 and the recommended option is option 1, for implementation in the short term.

- Option 1 - Status quo that includes the construction of the proposed seawall
- Option 2 - Renourish beach in front of seawall
- Option 3 - Renourish and contain beach in front of seawall

It was considered that construction of the seawall can result in losing the beach in front. Renourishment to maintain the beach in front of the seawall is likely to be ineffective and is not recommended.

Sector 5

This is the most dynamic section of the study area with significant accretion (green colour in Figure 4) at Tern Bank eastern end and erosion (red colour in Figure 4) at the western end with the potential of compromising the stability of the Tern Bank.
The following options were considered and analysed for sector 5 and the recommended option is option 2, for implementation in the medium term. It is highlighted that if no maintenance excavation is undertaken, Tern Bank will keep moving towards the shore, ultimately closing the pond.
Closure of the pond will have significant negative implications for current recreational, conservation and tourism activities in the area. Closure of the pond is not considered a viable outcome as it is contrary to Council position as adopted by the Safety Bay Shoalwater Master Plan.

- Option 1 - Status quo
- Option 2 - Stabilise Tern Bank with terminal groyne and sand trap management (local)
- Option 3 - Stabilise Tern Bank with seawall and terminal groyne and sand management (local)
- Option 4 - Tern Bank natural progression with realigned channel parallel to coast nearshore
- Option 5 - Carlisle Street upgrade by allowing Bent Street to close

Figure 4: *Accretion and erosion at sector 5*

Figure 5: *Recommended option for Sector 5 – Stabilise Tern Bank with terminal groyne and sand trap management (local)*

The recommended option involves the construction of approximately 200m length of geotextile sand container (GSC) seawall at the head of Tern Bank and a 50m length of terminal GSC groyne which runs parallel to the current navigation channel. However, it was noted that further study including sediment movement modelling is required to be undertaken prior to finalizing the details for this option.

Sector 6

The key challenge in the sector is demand for recreational boating and lack of formal concrete boat launching facility.
The following options were considered and analysed for sector 6 and the recommended option is option 1, for implementation in the short term.

- Option 1 - Status quo - Keep Bent Street operational and maintain the current level of service at Donald Drive
- Option 2 - Close Bent Street facilities and Upgrade Donald Drive facility

Future boat launching facilities

Several possible locations and configurations for additional boat launching facilities within the study area have been assessed, including:

- Consideration for boat launching facility development with and without major protective structures
- Review of Point Peron, Carlisle Street, Bent Street and Donald Drive boat launching facilities
- Systematic multi-criteria assessment of technical feasibility, economic viability and environmental and social desirability.

It is noted that construction of new boat launching facility that meets current Australian Standard and provides sufficient parking facility can cost in the range of $10M due to the requirement for breakwater construction. As a result, it is recommended to consider additional boat launching facilities in the following locations:

- Cape Peron North - Spur Groyne adjacent the Point Peron Boat Launching Facility be shifted northward to enable additional boat ramps to be constructed to the north of the existing facilities. The proposal is in addition to the two new boat ramps being constructed in 2019/20.
- Safety Bay - Bent Street boat ramp and associated facilities be upgraded within 4-10 years subsequent to stabilising the head of the Tern Bank with a geotextile sand container (GSC) groyne and seawall. Ongoing maintenance will be required at the newly created sand trap on Tern Bank.

Although major development such as Carlisle Street or Donald Drive are not recommended at this stage, they certainly offer valuable options to consider in the future out of the study period horizon as demand increases.

Consultation

Consultation with the Community

Considering the technical nature of the Study, no community consultation has been undertaken as part of the development of the Study, however, it is proposed to share the outcome of the Study with the community in the following community information sessions:

Date: 10 March 2020

Venue and Time: Gary Holland Community Centre, Rockingham; 2:00pm to 3:30pm

Safety Bay Yacht Club, Safety Bay; 4:00 to 6:00 PM

The full report and a summary version of the Study outcome will be available in the City's website after the information sessions.

Active community engagement will be undertaken as part of the development of the Community Plan Strategy - Coastal Facilities Strategy in 2020/21.

Consultation with Government Agencies

The following agencies were consulted as part of the Study. The agencies were divided into two groups; primary and secondary stakeholders.

Primary Stakeholders

- Department of Transport (DoT)
- Department of Biodiversity, Conservation and Attractions (DBCA)

Secondary stakeholders (Research agencies)

- Commonwealth Scientific and Industrial Research Organisations (CSIRO)
- Western Australian Marine Science Institution (WAMSI)
- University of Western Australia (UWA)
- Curtin University of Technology
- Murdoch University
- Edith Cowan University (ECU) - School of Science

The primary stakeholders will be further consulted as part of the development of the Strategy.

Comments and next steps

The Safety Bay Shoalwater Coastal Management Study was undertaken to assist with the development of a strategic approach to costal management for the next 10 years.

The study investigated the coastal processes and evaluated current coastal management activities and provided recommendations for future management of the coast. The study also reviewed the existing boating facilities within the area and explored the opportunity for future extension and development.

While the study provided strong technical base for developing the strategy, the community will play a key role in the development of the Community Plan Strategy - Coastal Facilities Strategy. Community Plan Strategy - Coastal Facilities Strategy will be developed in 2020/21.