

EXECUTIVE SUMMARY



TOWN of

EAST FREMANTLE

March 2024

DRAFT FINAL COASTAL HAZARD RISK MANAGEMENT AND ADAPTATION PLAN

INTRODUCTION

The Town of East Fremantle (the Town) is undertaking a CHRMAP project to develop a greater understanding of its river areas and support its future estuarine coastal management and planning decisions.

A Draft CHRMAP has been developed in consultation with a technical Steering Committee and the community. The Draft CHRMAP identifies estuarine coastal hazards and provides a framework for adaptation to guide decision making in the short to medium term (next 10-20 years) and provides management and adaptation strategies to mitigate hazard in future planning periods (next 100 years).

BACKGROUND

The Town, in conjunction with the State Government, initiated a project to develop a CHRMAP in 2021, to identify key assets along the river foreshore and measures to be taken to preserve them against the impact of coastal hazards.

Consultants Baird and Associates (in association with element) were appointed to carry out the study for the area comprising of approximately 3km of foreshore between Petra Street to the north-east and East Street to the south. The foreshore has interactions with many landmarks and recreational features including the John Tonkin Reserve, Swan Yacht Club, East Fremantle Yacht Club, several outdoor sporting grounds, hospitality venues and several boating moorings and jetties.

To help the Town guide the development of the CHRMAP, a Steering Committee was established including representatives from the Department of Planning, Lands and Heritage; Department of Biodiversity, Conservation and Attractions; and Department of Transport. This Steering Committee has overseen development of all previous draft chapters of the CHRMAP.

The Town also established a Community and Business Reference Group (CBRG) to help guide and provide advice around key milestones of the project. The members of the CBRG act as conduits between the community and the project team, helping to share important information and knowledge.

CONSULTATION

A Community and Stakeholder Engagement Plan was prepared to ensure that the community and stakeholders were effectively and actively involved in the CHRMAP preparation. Delivery of this was partially affected by the Covid-19 outbreak however, a range of activities have been delivered including information sessions, workshops, a survey and meetings with the CBRG.

The Steering Committee has overseen development of all previous draft chapters of the CHRMAP and the CBRG has been engaged at various times during the project development.

The Draft CHRMAP is now at stage where the Town can pass on information to the community and seek comments through this public advertising period.

SUMMARY

The following is provided as a summary of the Draft CHRMAP:

Shoreline Management Units

The CHRMAP study area is considered in three distinct shoreline management units (SMU) termed:

1. Walled Zone – East Street to Niergarup Reserve (Leeuwin Boat Ramp)
2. Reclaimed Zone – Niergarup Reserve (Leeuwin Boat Ramp) to W Wayman Reserve eastern end
3. Natural Zone – W Wayman Reserve to Petra Street



Coastal Hazard Assessment

A Coastal Hazard Assessment (CHA) was completed according to State Planning Policy which provides mapping of coastal hazard to assess the impact of erosion and inundation on coastal assets in current and future planning periods in the CHRMAP. The planning timeframes examined in the hazard assessment 2025, 2035, 2050, 2075 and 2125. Sea level rise allowance is applied across the planning timeframes based on projection of +1.05m increase in sea level by the year 2125.

Mapping of the coastal erosion hazard across the planning timeframes is presented with existing control structures maintained to their present function and with structures removed. Flood mapping associated with the extreme 500-yr return period storm is also shown.

Risk Assessment and Treatment

Coastal asset types through the study area have been identified in the general categories of Social, Economic, Environmental and Heritage and Culture assets. Stakeholder views captured through the community engagement activities have been used to define the coastal asset function, service and values.

The risk assessment framework for the project has been based on Western Australian Planning Commission (WAPC) guidelines and considers the impact to coastal assets in the shoreline areas based on the projected coastal hazard in the present and future timeframes. The framework assesses likelihood and consequence of coastal hazard impacts and considers the adaptive capacity of the respective coastal assets.

The level of coastal hazard risk for the coastal assets through the study area is generally low for the present day, however this risk is projected to increase associated with sea level rise in future years.

Residual risk and priority assets for risk treatment are presented in the report for each SMU and summarised as follows:

1. **Walled Zone:** The continuous shoreline protection along the shoreline of the Walled Zone is assumed to be maintained in future years and assumed to continue to provide erosion protection afforded to the coastal assets presently. The Marine Education boatshed is rated as Highly vulnerable in 2035 and Extreme in the 2075 period. The risk from inundation for the Carpark at the Dome Café is rated as Highly vulnerable by 2050. Riverside Road is rated as Highly vulnerable by 2125.
2. **Reclaimed Zone:** The areas of focus are the natural shorelines without any current erosion protection. This includes the beach at Niergarup Reserve, Norm McKenzie and W Wayman Reserve foreshore reserves and coastal pathways which are all rated as Highly vulnerable to erosion in 2035. The 8 Knots Tavern is rated at Highly vulnerable to inundation in 2035 and Extreme in 2050. The buildings of the Navy cadets, Cool Beans café and Rowing Club are all rated as Highly Vulnerable to inundation in 2075. Riverside Road is rated as Highly vulnerable to inundation in 2075. There are six carparks around the area which are rated as Highly vulnerable from 2075 onwards. At the 2075 to 2125 planning timeframe the sea level rise projections of +0.5m to +1.05m lead to many assets becoming Highly vulnerable or Extremely vulnerable.
3. **Natural Zone:** The foreshore, beach and stairs at the base of Jerrat Drive are rated as Highly vulnerable to erosion by 2035. For inundation the buildings at the Sea Scouts and East Fremantle Yacht Club and the lower carpark areas at the East Fremantle Yacht Club are rated Highly vulnerable in 2075

Swan Canning Development Control Area

The Swan and Canning Rivers Management Act 2006 (SCRM Act) makes provision for the protection of the Swan and Canning Rivers to ensure ecological values and community benefits are maintained. Under the SCRM Act, the Swan Canning Development Control Area (DCA) has been established which covers the land and waters adjacent the Swan River in the study area. The DBCA, SRT, WAPC and State and local governments are responsible for the effective planning and management of land use and development within, abutting and affecting the waters and associated land within the DCA, at all stages of the planning process.

The DCA covers the majority of the shoreline area affected by coastal hazard in the study area, with the DBCA the key decision maker for development in this vicinity. A discussion with representatives from the DBCA regarding adaptation approaches was undertaken which provided the following guidance:

1. Walled Zone:

- Maintaining shoreline revetments and riverwalls to ensure the protection of Riverside Road and raising the height at shoreline in response to future sea level rise needs to be done in balance with the viability of the road over the long term. In this CHRMAP, maintaining the current extent of river walls to provide protection to the foreshore and Riverside Road has been adopted.
- Under projected sea level rise the inundation hazard for Riverside Road will increase in extreme events in the future. At present the risk is manageable. At the time when sea level rise of approximately 0.5m to 1m above the present-day level is realised (projected to be in the 2075 to 2125 period) the risk management will be more difficult (expensive). The coastal hazard risk to Riverside Drive and the foreshore area will be reviewed in future revisions of the CHRMAP.

2. Reclaimed Zone

- there is presently 'hard engineering' river walls and revetments that offer protection; however, it is not a given that this type of foreshore edge treatment will continue to be used in the future. As the infrastructure ages in the shoreline areas there will need to be consideration and discussion on what is appropriate in terms of replacement. The intention will be to deliver an outcome that satisfies the community need whilst being environmentally sensitive. For the Reclaimed Zone, using fill in the foreshore areas to address inundation risk is not supported. There may be nature-based options or engineering alternatives that are yet to emerge that could provide the right solution.
- In future there may be a point where it becomes too difficult and expensive to provide protection to the shoreline areas from erosion and inundation hazard (with rising sea level) and planning the process of Managed Retreat may be required. A future scenario could be to retreat the foreshore areas back to Riverside Road and use this as the interface to the shoreline, due to the land levels being generally higher from this section landward.
- For the foreseeable future the Leeuwin Barracks site will remain under the ownership of the Department of Defence. Any changes to the use of the site with regard to residential development would need to consider the coastal hazard from the CHRMAP.

3. Natural Zone

- For the Jerrat Drive escarpment section of foreshore, this is highly regarded as a key coastal asset for the Community as a site of recreation and environmental importance. Further understanding of the processes driving changes in this area is required – assessment of the present state of the foreshore (vegetation cover, habitat, drainage, underscoring at the shoreline and tree loss) and development and update to the existing foreshore management plan to guide future actions is considered a priority of the CHRMAP.

For areas outside of the DCA, the Town would be responsible for planning controls to manage coastal hazard risk. The CHRMAP recommends the use of Local Structure Plans, a Special Control Area (SCA) within the local planning scheme (LPS 3) and a CHRMAP Local Planning Policy (LPP). The Town has minimal statutory planning control over property within the study area however, has an advisory and strategic role which can be guided by LPP.

Multi- criteria Analysis

A multi-criteria analysis (MCA) of adaptation options and an economic analysis of assets in the reclaimed Zone was completed to support decision making. The MCA incorporates community and stakeholder feedback gained through the engagement process. The outcomes inform selection of adaptation pathways in future planning periods for each of the SMU.

The economic analysis in the Reclaimed Zone evaluates impacts from inundation hazard associated with projected sea level rise, using the value of assets to assist in understanding the economic costs of a Managed Retreat approach. The results provide a preliminary estimate of the magnitude of the economic cost of sea level rise and

timing of asset loss within the Reclaimed Zone. The total undiscounted cost of sea level rise on the Reclaimed Zone is conservatively estimated at \$46.2 million.

The economic analysis has been used to inform selection of adaptation pathways in future planning periods for each of the SMU. The pathways and triggers are provided across the planning timeframes present to 2035, 2035 to 2050, 2050 to 2075 and 2075 to 2125.

Summary of Adaptation Approaches and Recommendations

The recommendations in the CHRMAP include:

- Avoid development on land within the erosion hazard area over the 100-year planning period.
- Accommodate coastal hazard risk from inundation to commercial and habitable buildings through improved building design and the use of planning controls (minimum floor levels).
- Accommodate coastal hazard risk to infrastructure in the foreshore areas until such time that a managed retreat pathway may be required, as a result of sea level rise.
- Protect foreshore area and assets landward in the Walled Zone from erosion through maintaining present riverwalls and revetments.
- Accommodate flood risk to Riverside Road through periodic incremental raising of the road level in accordance with the rate of sea level rise and general road upgrade / maintenance schedule.
- Implement nature-based solutions to provide resilience to shorelines including Niergarup Reserve, Jerrat Drive foreshore, John Tonkin Reserve, supported through grant funding and local volunteer groups.
- For the Reclaimed Zone, the short to medium term adaptation pathway is to maintain existing erosion protection along the foreshore areas through traditional 'hard engineering' methods currently in place - river walls, revetments and detached groynes. Examine alternative methods of protection that can be achieved through other 'soft engineering' methods (eg Nature Based Solutions) and look for opportunities to implement as part of the asset replacement lifecycle.
- For the Reclaimed Zone the long-term adaptation pathway is expected to require a managed retreat approach, triggered by the difficulty and cost of mitigating inundation hazard with projected sea level rise of 1.05m in the 100-yr planning period. This scenario is driven by future sea level rise where the current foreshore areas are inundated regularly in the general tides and it is too difficult and/or expensive to maintain the current extent of the foreshore. There is a general presumption against using fill in the foreshore areas to address inundation risk.
- A future scenario of Managed Retreat of the foreshore area and associated infrastructure along the Reclaimed Zone should consider retreat to the area landward of Riverside Road. This decision is contingent on the future of the Leeuwin Barracks site and potential for land being made available.
- If there is a future change in the land use at the Leeuwin Barracks site to redevelop the location for residential and commercial property, then this would need to address the risk from erosion and inundation across the 100-years planning timeframe through planning-based approaches.
- For the shoreline area at the base of the Jerrat Drive escarpment use of nature-based solutions to increase resilience of the shoreline area.
- Update foreshore management plans for the Town's foreshore areas. Foreshore management plans can be a key tool for communication and engagement with the community as they include detailed planning for community places and facilities. They provide a strategy to deliver the recommendations of this CHRMAP for foreshore reserves throughout the Town.

Long Term Pathways

Long term adaptation pathways for the key at risk assets are identified in each of the SMU in terms of Avoid, Planned or Managed Retreat, Accommodate, Protect, No Regrets, and Do Nothing. Sea level rise plays a key role in triggering actions on the adaptation pathways.

Short Term

Short-term CHRMAP implementation actions over the period to 2035 include recommendations for:

- Planning Actions;
- Annual Monitoring Program;
- Additional Technical Studies; and
- Adaptation Actions in Shoreline Areas.

Budget

The implementation budget over the 12-year period from 2024 to 2035 is estimated at approximately \$596,000.

Budget estimates for the short-term implementation actions for the period over the first 5-years 2024 to 2028 inclusive is estimated at \$427,500. This is comprised of annual monitoring, technical studies and planning studies and funding for nature-based adaptation approaches. The remainder of the spending to 2035 is to cover the cost of annual monitoring, complete the additional technical / planning studies recommended including two reviews of the CHRMAP (2028, 2033) and undertake nature-based work in the shoreline areas. All figures quoted are order of magnitude estimates and are excluding GST.

The CHRMAP identifies grant funding options that can support the funding of coastal management activities. These funding mechanisms generally require a co-funded approach whereby 50% of the funding is to be matched.

NEXT STEPS

Council will consider endorsement of the Draft CHRMAP following the advertising period, in the light of any submissions received.

