



City of Gold Coast

Coomera River Foreshore Stabilisation

Case Study

Summary

The Coomera River Foreshore Stabilisation project aims to stabilise the foreshores of four (4) Public parks along the Coomera River estuary using innovative nature-based solutions that will provide long-term resilience to the foreshore as well as improve the aquatic habitat, water quality, and overall ecosystem functionality.

Project Overview

Several flood events over the last 10 years have led to active erosion in certain parts of the Coomera River estuary. The natural riverbanks of four public parks are experiencing ongoing loss of foreshore land and riparian vegetation.

The Coomera River estuary still contains good mangrove habitat and the City is committed to protect and enhance the natural assets (public parks) and the environmental values of the Coomera River in accordance with the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*.

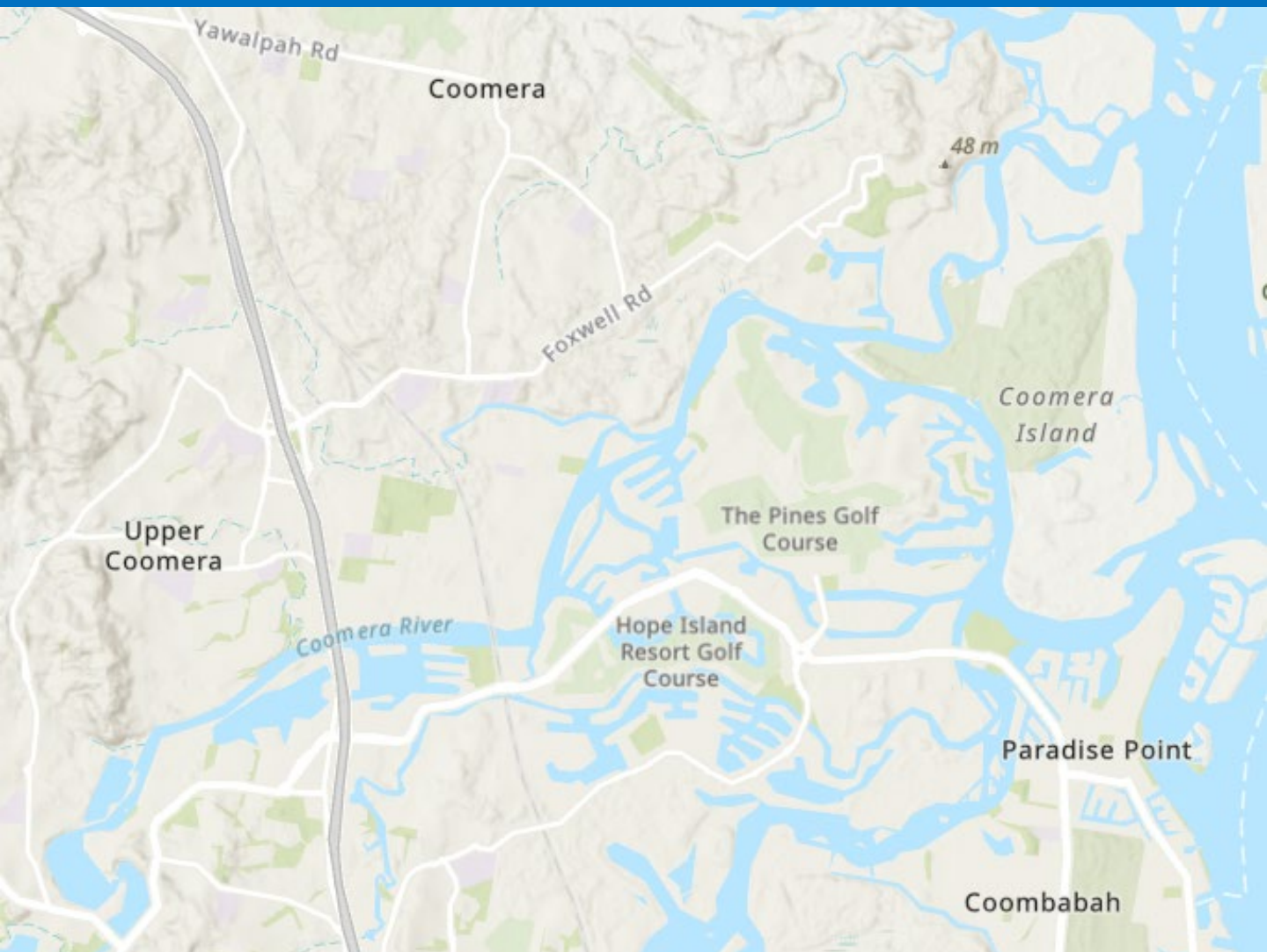


In February 2022 the CoGC commissioned Riparian Engineering Pty Ltd to undertake the planning phase of the Coomera River Foreshore Stabilisation.

This project was funded by the QCoast₂₁₀₀ program.

Project Location

The Coomera River estuary is located on the northern Gold Coast and has been impacted by quarries, canal development, and marinas. It discharges into the Gold Coast Broadwater which is part of the Moreton Bay Marine Park.



Objectives

- Stabilise the river foreshore using nature-based techniques and lessons learned from the success of the 2018 Damian Leeding Foreshore Stabilisation Works, including cost effectiveness.
- Develop concept designs that mitigate foreshore erosion and improve mangrove habitat of the Coomera River Estuary.
- Use the QCoast₂₁₀₀ Minimum Standards and Guidelines for Queensland Governments 8 phase planning process for each foreshore location.



Drivers

- Community concern about erosion and loss of public park.
- Sediment impacts on water quality and downstream seagrass.
- The City is seeking to proactively enhance resilience to our natural assets at risk from coastal hazards along our tidal waterways (Coastal Adaptation Plan).
- The City has an obligation to protect and enhance the environmental values of the Coomera River in accordance with the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*.

The Gold Coast Water Strategy includes an action to stabilise at least 2km of estuarine foreshore using nature-based design.

The success of the 2018 Damian-Leeding stabilisation project encouraged the executive leaders to support the next stabilisation project!



Damian Leeding Foreshore 450 meters of stabilisation works

Innovative re-use of hardwood trees collected from development sites and road widening projects.

Review of previous stabilisation works showed:

- No maintenance was required over last 5 years.
- Improved hydraulic roughness was evident to deflect flows, boat and wave energy away from the bank.
- The slope of the riverbank is adjusting to be less steep and showed no further erosion.
- 300% increase in mangrove habitat.
- Downstream riverbanks without treatment continued to erode and mangrove habitat is poor.
- Recommendations: halving the number of structures will create the same benefits which will be a cost saving and visually have less piles.

Findings of Geomorphic and Coastal Erosion Assessment

Surveys, LiDAR and Aerials comparison of the riverbed and bank showed some areas of significant foreshore erosion up to 8 meters.

- Where there was no bed erosion there was no significant foreshore erosion*
- Continued foreshore retreat predicted with unknown coastal hazards and predicted sea level rise.*
- Coastal erosion and concept options were presented to stakeholders.*

Concept design development

- Stakeholder workshop included presentation of assessment; discussions led to draft of four concepts for each park.*
- Multi criteria assessment showed large hardwood structures are favoured design.*
- Next phase RPEQ design, tidal permit, community engagement and construction.*

Benefits of hardwood concept design

- Nature-based solution that allows and adapts to river dynamics such as floods, sediment movements and other coastal hazards.*
- The structures provide long-term resilience.*
- No maintenance or asset renewal, hardwood logs will become a stronghold in the riverbed.*
- Hardwood structures allow mangrove seedlings to establish.*
- Cost savings and flexibility in design.*
- Tree logs provide habitat for aquatic fauna and flora.*
- Re-use of trees for river habitat that otherwise would have been chipped.*

Lessons learned

- ✓ The Damian Leeding stabilisation 2018 was successful on all aspects.
- ✓ Learnings from the 2018 review were adopted in the concept development and will support the future development of a longer-term city-wide Foreshore Erosion Management Plan.
 - ✓ Dyneema® rope will be used to attach logs, it's safer than chain!
 - ✓ Space structures further apart, will provide same outcome and save \$
- ✓ Partnering and data sharing with Gold Coast Waterways Authority (GCWA) who undertake surveys for their dredging program in the Coomera River. Consideration of future foreshore nourishment programs developed in association with GCWA.



- This project supports decision making for the City's Landscape Development Guidelines.
- Treatment of marine piles stopped damage by Toredoworm. However, CoGC is searching for a more environmentally friendly treatment.