

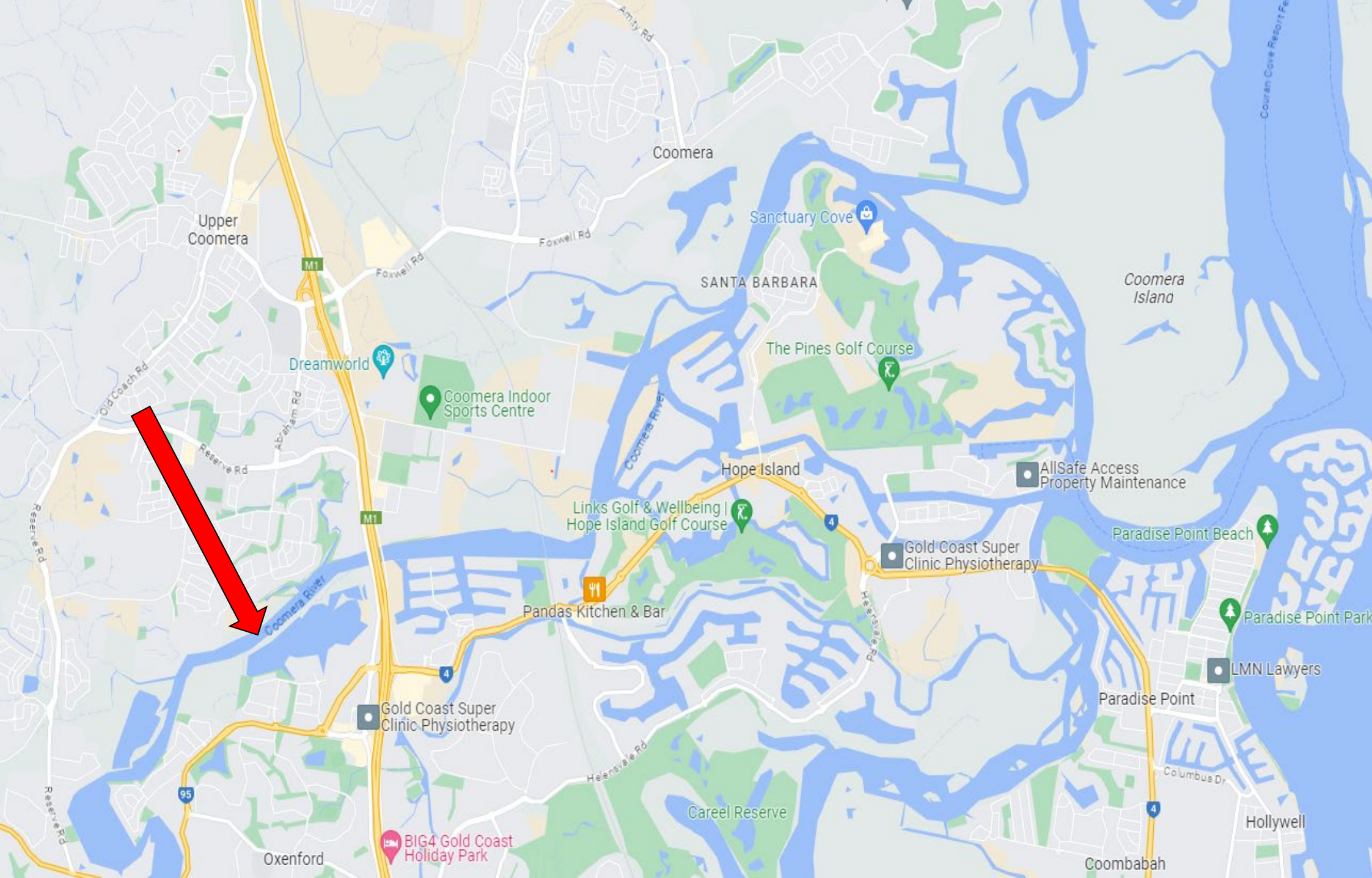


Building Stable Estuarine Foreshores using nature-based solutions

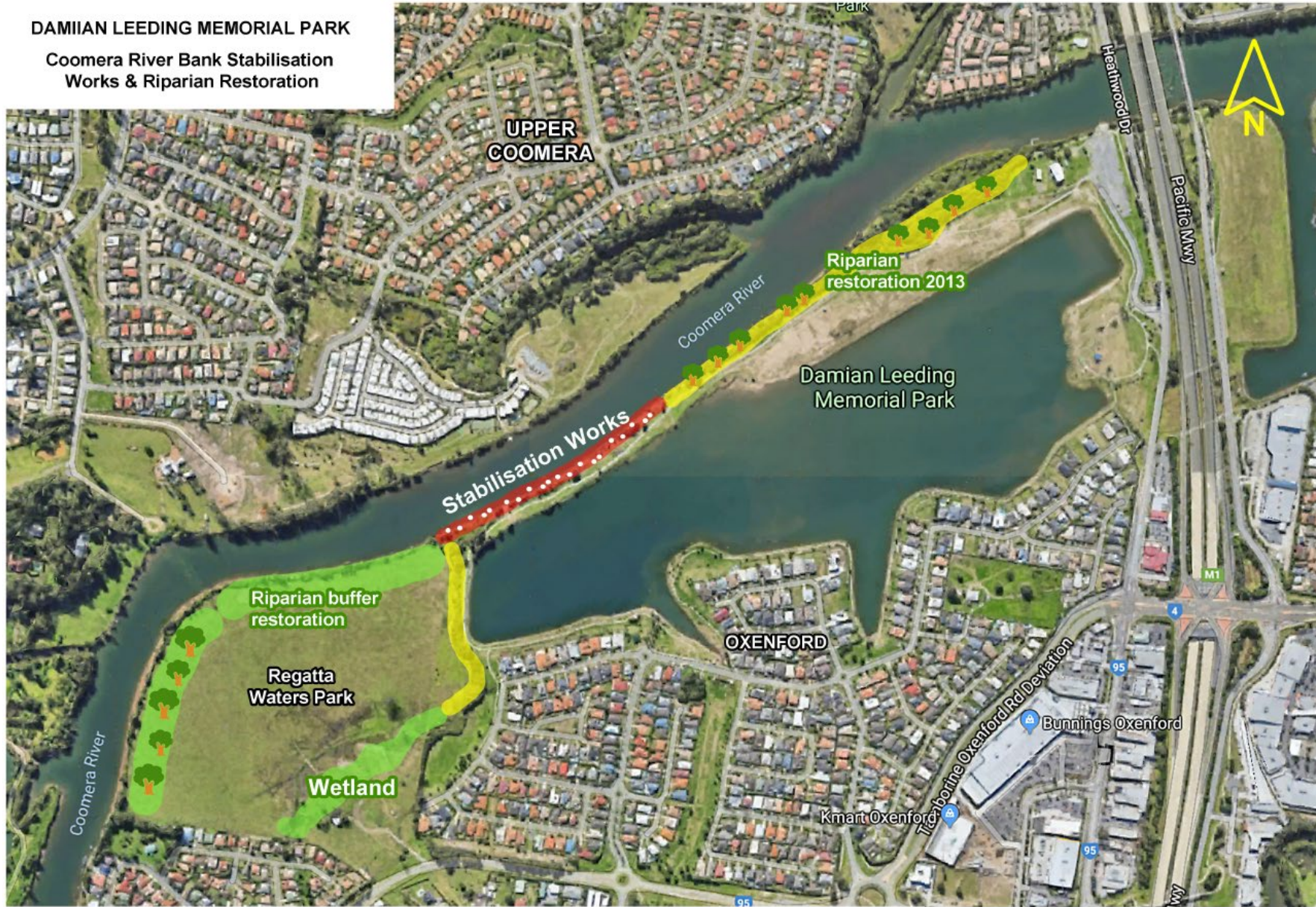
Damian Leeding Foreshore Stabilisation Project

- ❖ Location
- ❖ Video
- ❖ How did we get to the design?
- ❖ Internal approval process and funding
- ❖ Monitoring program
- ❖ Performance review
- ❖ Next project





DAMIAN LEEDING MEMORIAL PARK
Coomera River Bank Stabilisation
Works & Riparian Restoration





Project objectives



- ❖ Stabilise the river bank and protect a natural asset
- ❖ Create a safe City park for residents
- ❖ Use natural materials *
- ❖ Reduce sediment being washed into the river
- ❖ Improve the riparian area and overall ecological health of the Coomera River

Coir logs 2010



Rock gabions 2014



Rock fillets 2013





Solution - Mimic nature

- **Large Red Gums Fall into the River - Providing Estuarine Habitat Structure**
- **Increased Hydraulic Boundary Roughness and Aquatic Habitat Structure in the Eroded Area**
- **Hydraulic Boundary Roughness Deflects the Hydraulic Energy Away from the Eroded Area back Towards the Channel Thalweg**
- **The Hardwood Logs Become Embedded in the River Bed, and provide Shear Strength and Resistance to Bed Erosion**
- **Mangrove Sp. Colonise in the newly Eroded Area**

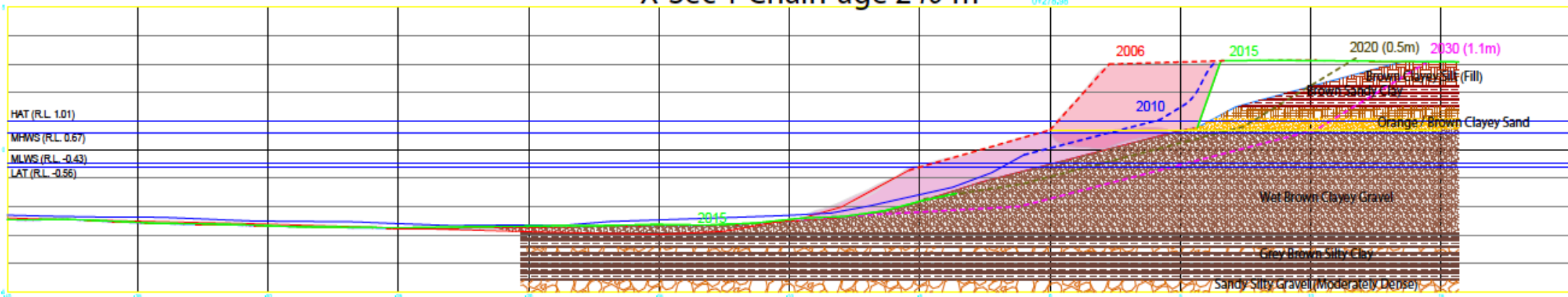
Erosion Assessment

- Bathymetry, Elevation & Vegetation Surveys were undertaken since 2006
- Consultant found the Channel Thalweg was Migrating and Eroding the Foreshore Bank, in Response to a Series of Major Flood Events in the Coomera River between 2006 to 2015 (Hydraulic Impact)
- Foreshore was then Subject to Significant Erosion
- Loss of Mangrove and Terrestrial Habitat
- Loss of Public Park

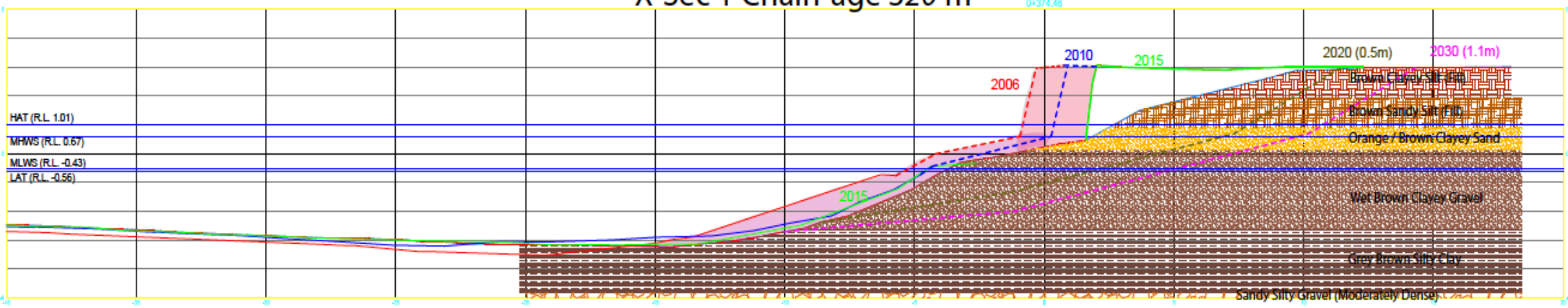


Survey comparison in 2015

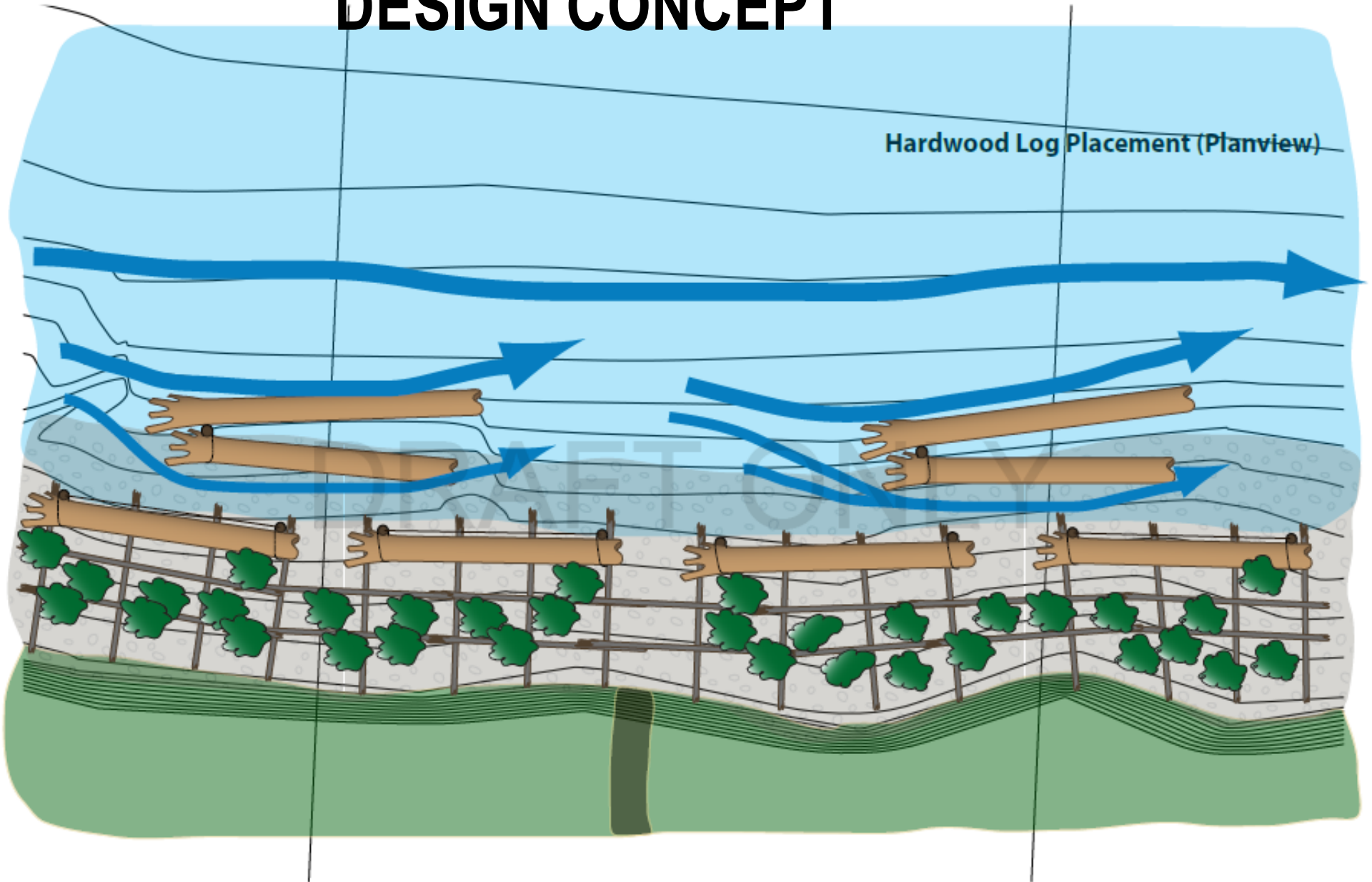
X-Sec 1 Chain-age 240 m



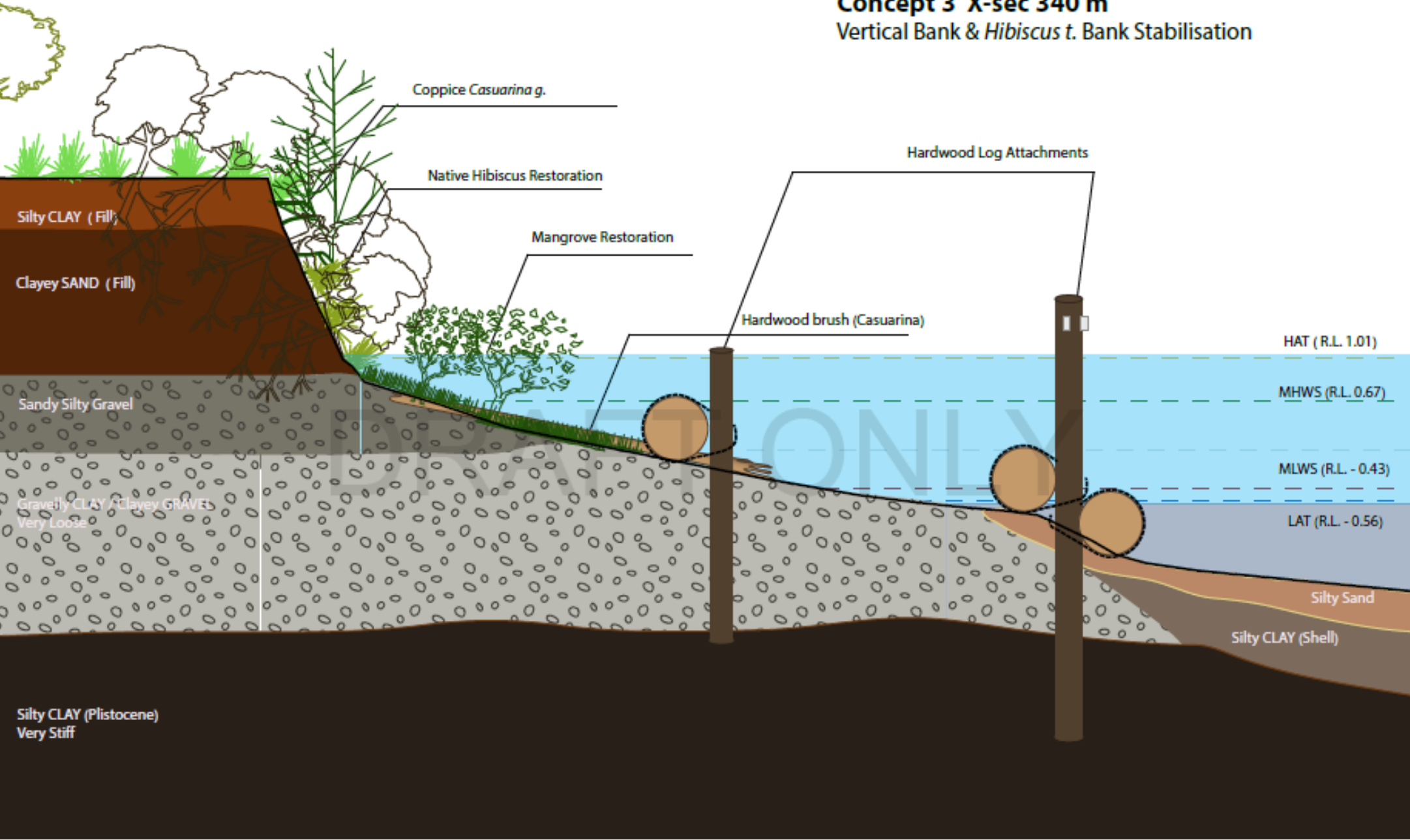
X-Sec 1 Chain-age 320 m



DESIGN CONCEPT



Concept 3 X-sec 340 m Vertical Bank & *Hibiscus t.* Bank Stabilisation



Internal Stakeholder process

RISK

- **Concerns of tree logs floating away in floods**
- **Motorway (M1) bridge immediately downstream**
- **Flood height increase**

Mitigate

- **Over engineered the design**
- **More geotechnical bores in the river bed**
- **Safety in Design**
- **Detailed Risk Assessment**

Council Plans & Strategies

- Obligation under the Environmental Protection (Water) Policy 2009 to achieve EV and WQO
- Water Strategy was under development
 - action - *Restore and stabilise a minimum of 2 km of riverbank using best-practice techniques*
- Corporate City Plan 2022
 - We look after the city's natural areas and waterways
 - Our City is resilient to natural hazards
- Coastal Adaptation Plan (CAP) 2022
 - Improve natural coastal processes and aquatic habitats
 - Natural and 'soft' solutions over hard engineering solutions
- Our Natural City (ONC) 2022

5 Year Monitoring Program

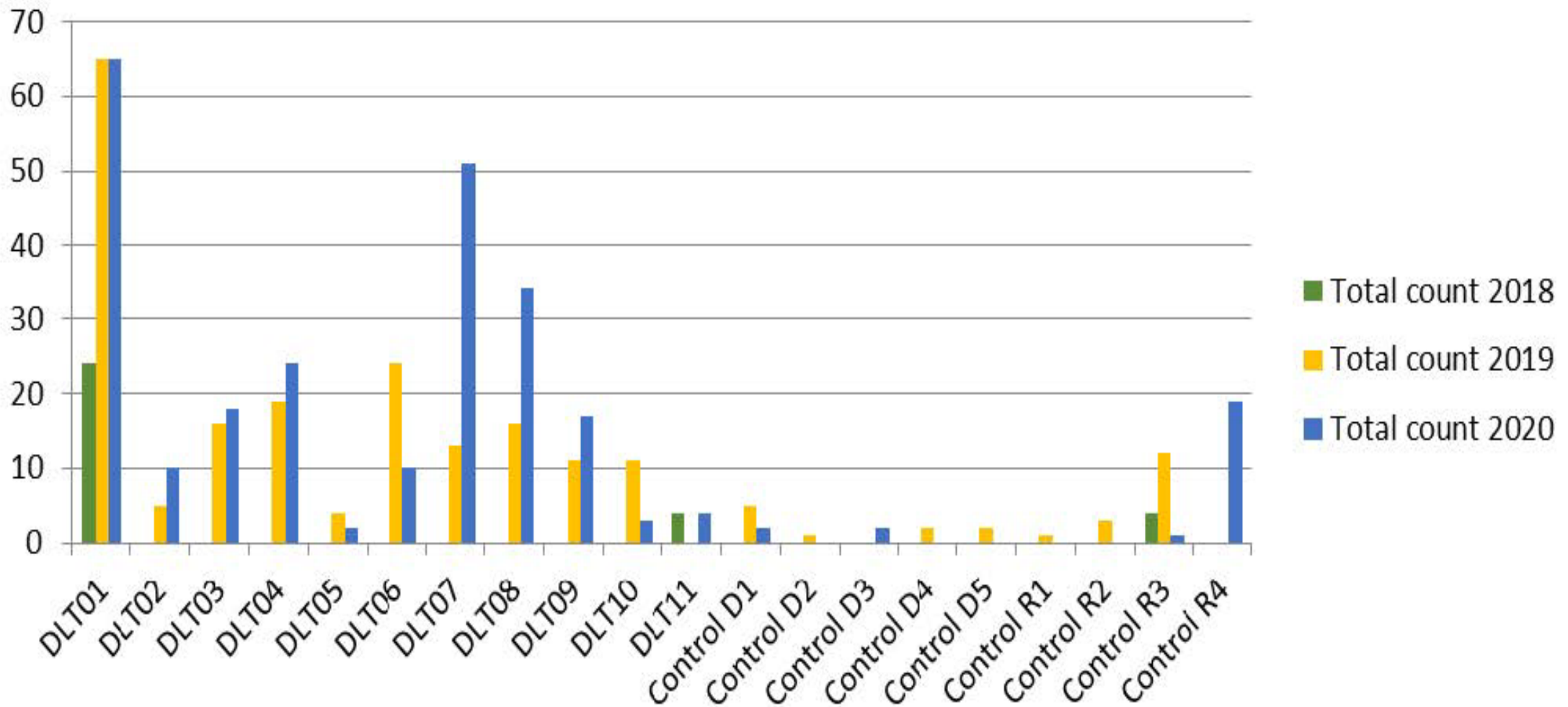
11 Treatment sites, 9 Control sites and 1 Reference



Objectives of monitoring

- Measure the overall success of the project
- Mangroves survey – species, height and density
- Measure the stability of the banks - profiles
- Sediment survey of the foreshore
- Record visual observations of associated fauna (crabs, fish, birds)
- Integrity of logs and piles (bi-annually for two years and after flood)

Mangrove count at Treatment sites and Control sites



Mangrove Survey



2019



2023

May 2020



Apr 2022



Performance review 2022

- ✓ Improves Estuarine Habitat Structure
- ✓ Increases Hydraulic Boundary Roughness
- ✓ Reduces Bed and Foreshore Erosion
- ✓ Facilitates the Recruitment of Mangroves
- ✓ No maintenance was required over last 4.5 years
- ✓ Control sites continue to erode, and mangrove habitat is poor
- ✓ Confidence in Naturalised Rehabilitation Projects to Achieve Ecological Desired Outcomes



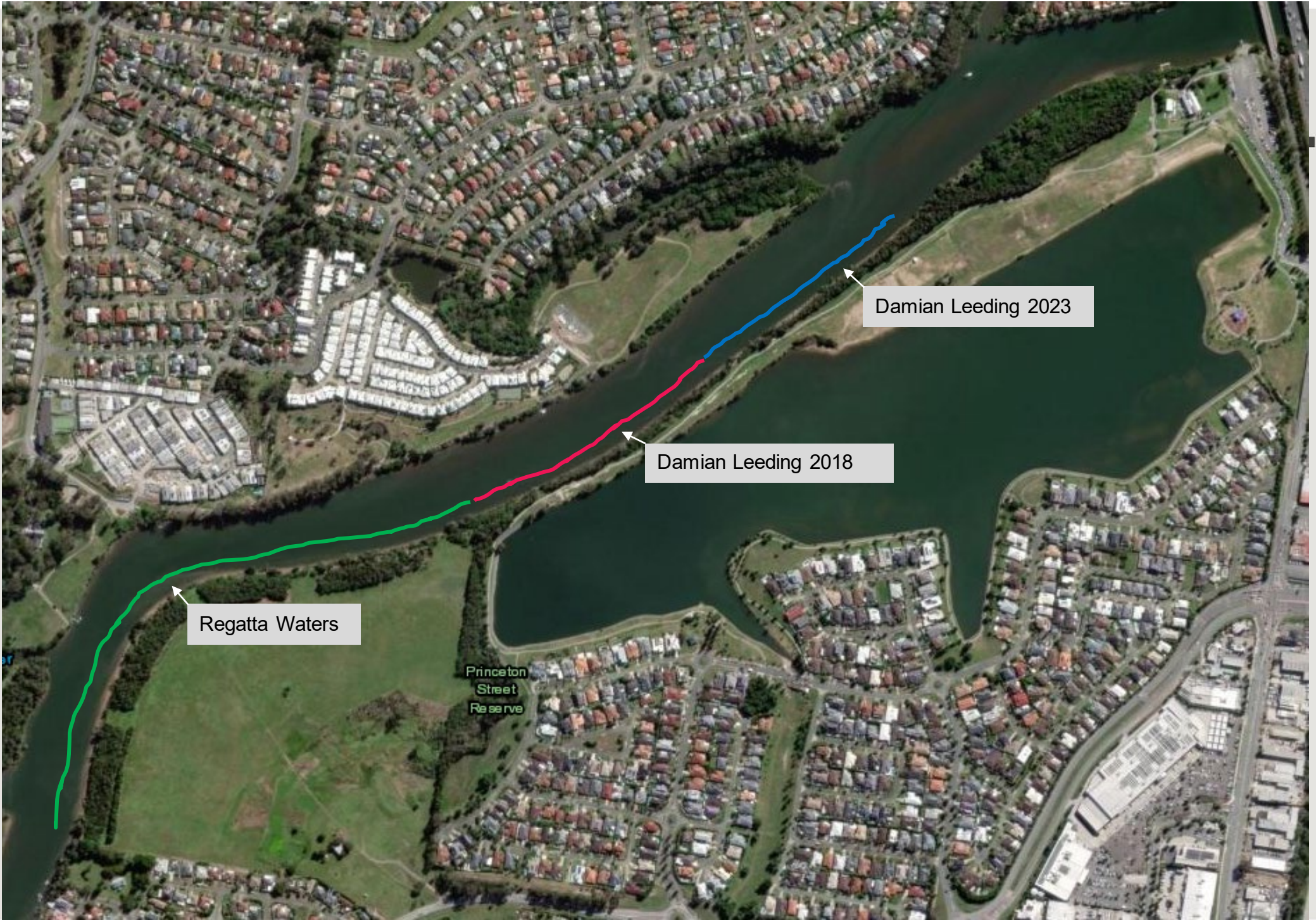
Lessons learned and recommendations

- ✓ Use dyneema rope instead of steel chain to tie down the logs
- ✓ Structures can be spaced further apart, which is cost savings of 60%

Control sites continue to erode, and mangrove habitat is poor

Chainage X 240m





Regatta Waters

Damian Leeding 2018

Damian Leeding 2023

Princeton
Street
Reserve

Contact details

PO Box 5042
Gold Coast MC
QLD 9729
P 1300 GOLDCOAST
E mail@goldcoast.qld.gov.au
W cityofgoldcoast.com.au

