



South Pine River Shoreline Erosion Management Plan

Summary Report

South Pine River Study Area

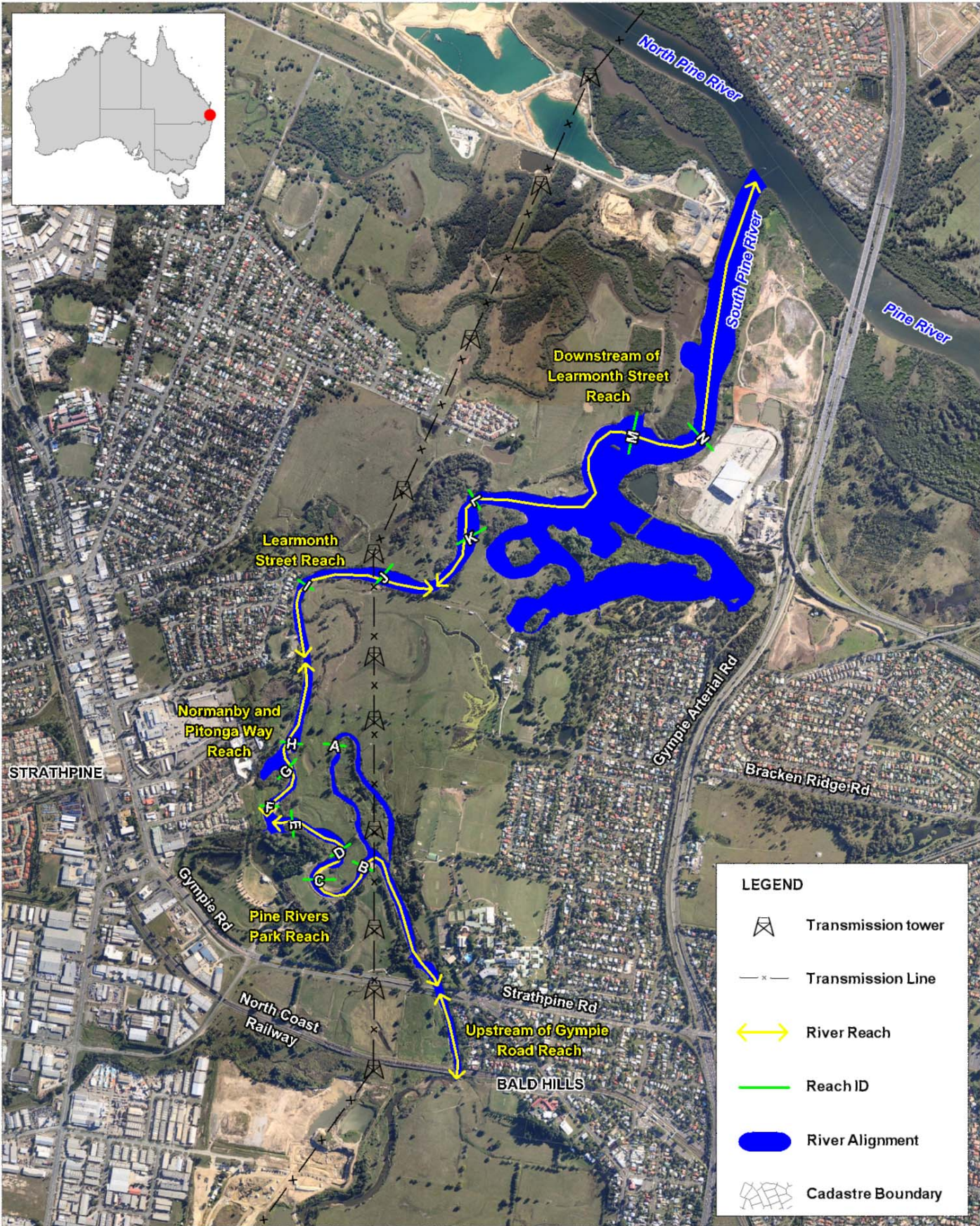


Figure 1

South Pine River Shoreline Erosion Management Plan Summary Report

The South Pine River Shoreline Erosion Management Plan (SPRSEMP) aims to manage the risk of river bank erosion along the tidal reach of the South Pine River. The Study has been undertaken in two stages:

Stage 1 – The legislative framework, geomorphological processes, and generic management considerations.

Stage 2 – Promoted shoreline management strategies.

The SPRSEMP has been developed to provide advice and direction for the future protection and management of the river bank from erosion within the study area.

The project area extends from approximately 200m upstream

of the North Coast Railway Crossing to the confluence with the Pine River, and includes:

- Pine Rivers Park
- Normanby and Pitonga Way
- Learmonth Street Community

These locations are shown on Figure 1.

The lower reach of the South Pine River bounds Strathpine on its western bank (within the jurisdiction of Moreton Bay Regional Council) and the suburb of Bald Hills on its eastern bank (within the jurisdiction of Brisbane City Council). It drains into the Pine River at the confluence between the North and South Pine

Rivers, relatively close to the Pine River entrance at Morton Bay. The lower reach of the South Pine River is tidally influenced and predisposed to active geomorphological processes.

In some locations, bank erosion threatens public and private assets on the river banks.

Moreton Bay Regional Council is committed to managing its waterways and increasing the health and resilience of waterways and coastal areas. Considered management is required to ensure social, ecological and economic values are protected, maintained and where possible enhanced.



Geomorphic Processes and Trajectories

Bank erosion in the South Pine River is influenced by the daily rise and fall of river levels caused by the tide, freshwater river flow and large infrequent events like ocean storm surges and freshwater floods.

It is likely that the natural erosive processes in the South Pine River have been accelerated by:

- Gravel extraction
- Urban development
- Vegetation clearance

A photographic survey was used to assess the current state of the river bank within the study area.

A series of historical aerial photographs extending back to 1958 was used to analyse erosion rates and trajectories.

This data was further supported by comparing topographic survey information between 2009 and 2013 (see Figure 2).

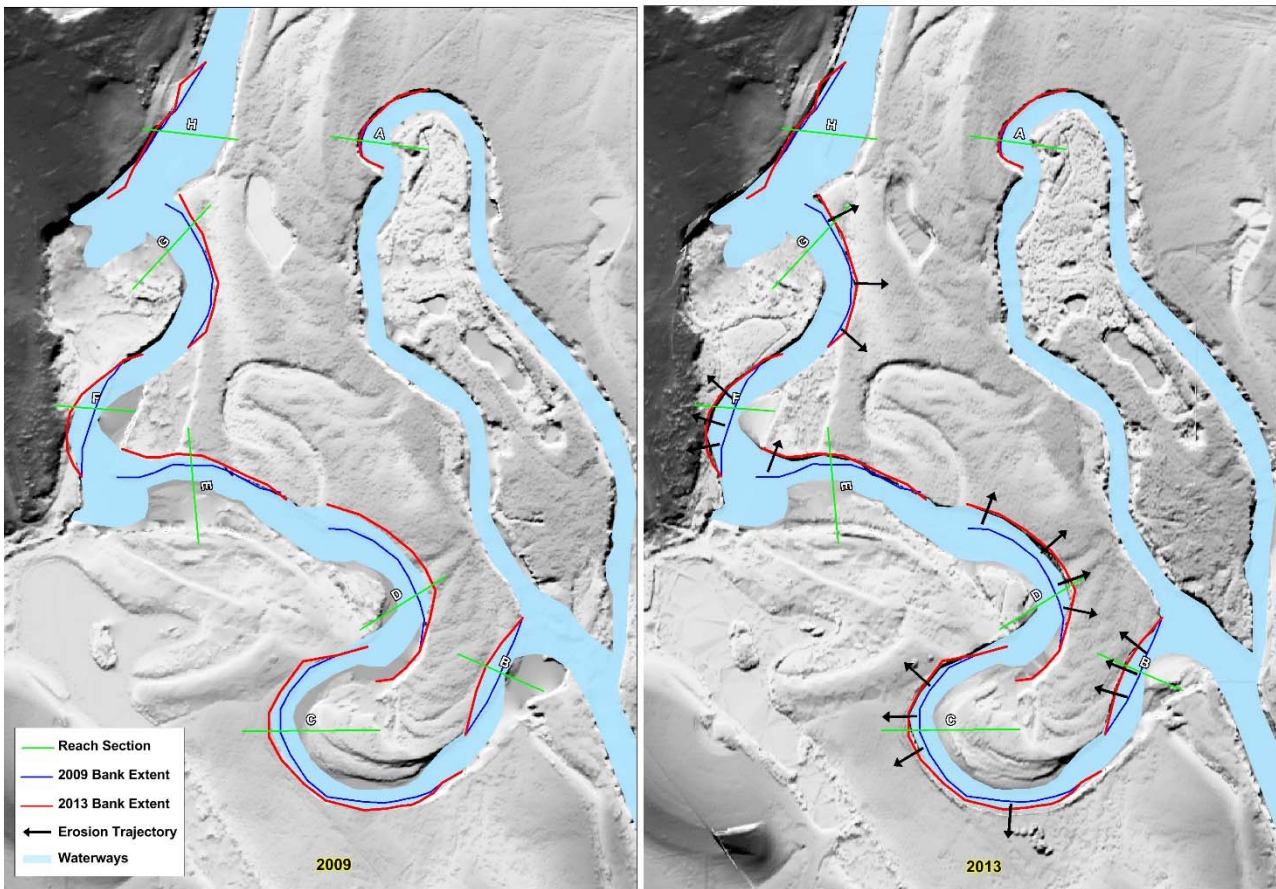


Figure 2

Legislative Framework and Technical Working Group

Proposed management options recommended within the SEMP must be consistent with the local government planning scheme of MBRC and Brisbane City Council (BCC) and comply with all relevant legislation (Commonwealth, State and local) and coastal and environmental planning instruments and policies.

The basis and control of management of the coast of Queensland is governed by the Coastal Protection and Management Act 1995 (Coastal Act). Under this Act, the Coastal Management Plan (CMP) is the

primary statutory planning instrument giving effect to the objectives of the Act.

Legislation and policies considered in this SEMP will require consideration of issues including, but not limited to:

- The use of erosion protection systems for property protection
- Protection of species listed under State and Commonwealth legislation and conservation of their habitat
- The maintenance of local biodiversity.

Legislation, regulation and policies that require consideration in the development of the SPRSEMP have been compiled based on those current at the time of writing.

Further consideration should be given to the requirements current at the time of implementing erosion management recommendations.

A Technical Working Group (TWG) was established to assist in the development of the SPRSEMP. The TWG met quarterly to discuss and provide feedback on the project and included representatives from:

- Queensland Department of Environment and Heritage Protection
- Queensland Department of Natural Resources and Mines
- Queensland Department of National Parks, Recreation, Sport and Racing
- Queensland Department of Agriculture, Fisheries and Forestry
- Queensland Department of Transport and Main Roads
- Moreton Bay Regional Council



Generic Management Options

Four management options have been canvassed across the study area. These are outlined below.

Do Nothing

While this option is often not desirable, it is an option to consider.

Monitor, Maintain and Defer

Under this option the existing erosion protection (if present) is maintained. River migration is

monitored and given a set tolerance for movement. When the river migrates beyond this tolerance, another management option is triggered.

Soft Engineering

This option employs 'soft' erosion protection techniques to protect the river bank. It includes bank re-profiling and revegetation, and may also include use of 'soft' engineered materials such as a geotextile

consisting of a woven mat, roll or bag of natural fibre or synthetic material.

Hard Engineering

This option considers installation of an engineered erosion protection system to hold the river bank alignment. This option may include rock filled gabion baskets (see Figure 3) or concrete retaining wall structures.

Overarching Management Strategy

The SPRSEMP has attempted to devise an overarching management plan that upholds the principle of allowing natural processes to take their course, but within the constraint that the study area is not in a natural condition anymore and intervention is required to prevent damage to development along the river banks.

The strategy is structured on the following components (see Figure 3):

Migration Zone

This zone covers an area in which the river could migrate

without disturbing existing development or Council assets. Bank erosion beyond the bounds of this zone cannot be tolerated, as the integrity of existing development or Council assets would be compromised. It is intended that this zone will evolve as further development occurs in future.

Soft Erosion Protection Zone

As the river bank encroaches toward development, intervention will be required in the form of erosion protection. Soft erosion protection is encouraged as a first step to protect the river bank as it

provides a more natural solution than hard erosion protection, providing a more aesthetic outlook and better environmental values.

Hard Erosion Protection Zone

This form of system is resorted to when the river has migrated to within close proximity to development or Council assets. Hard engineered systems can be installed on relatively steep bank slopes using structures that both stabilise and armour the river bank from the erosive forces of the river.

Overarching Management Strategy Map

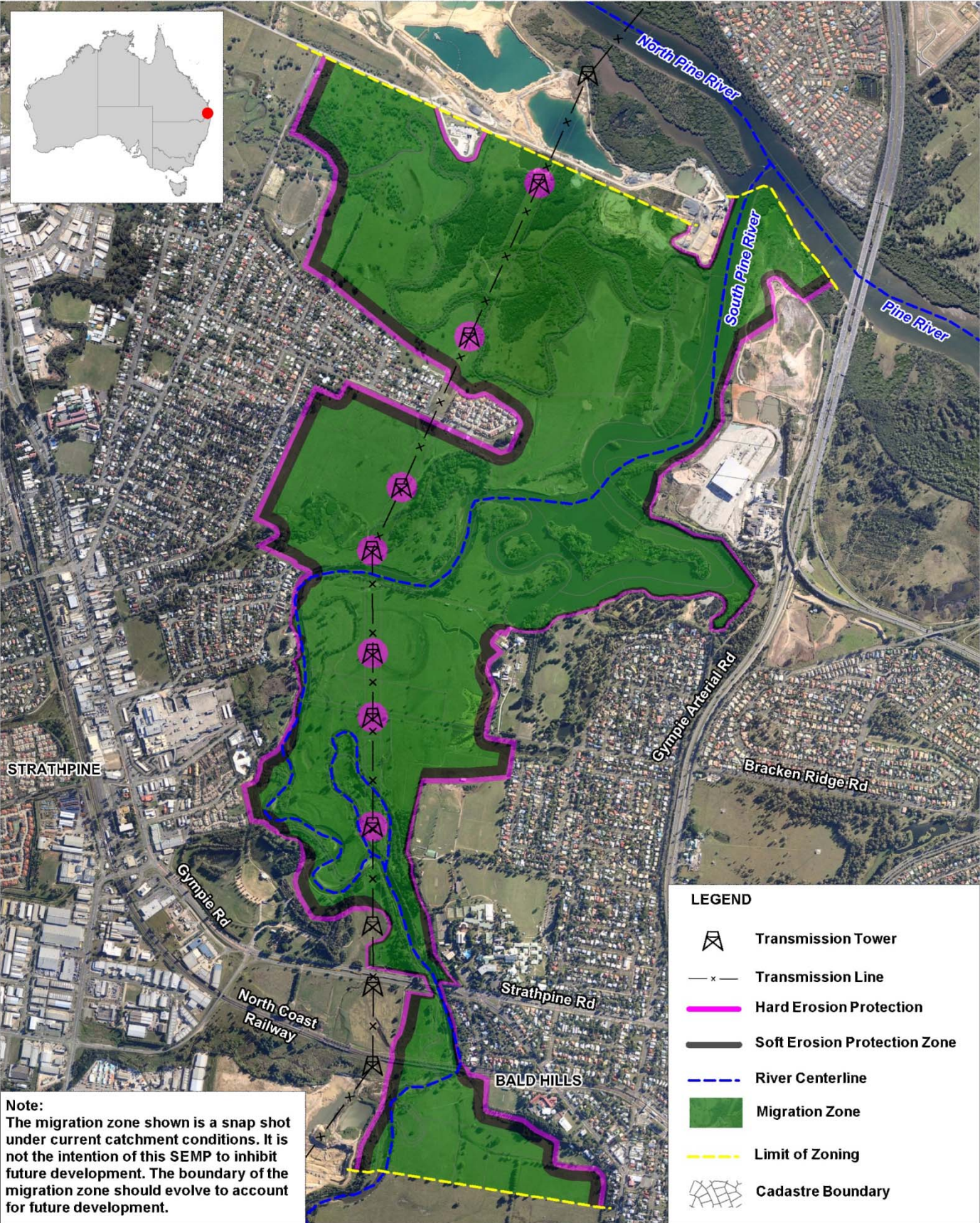


Figure 3

Pine Rivers Park Management Strategy

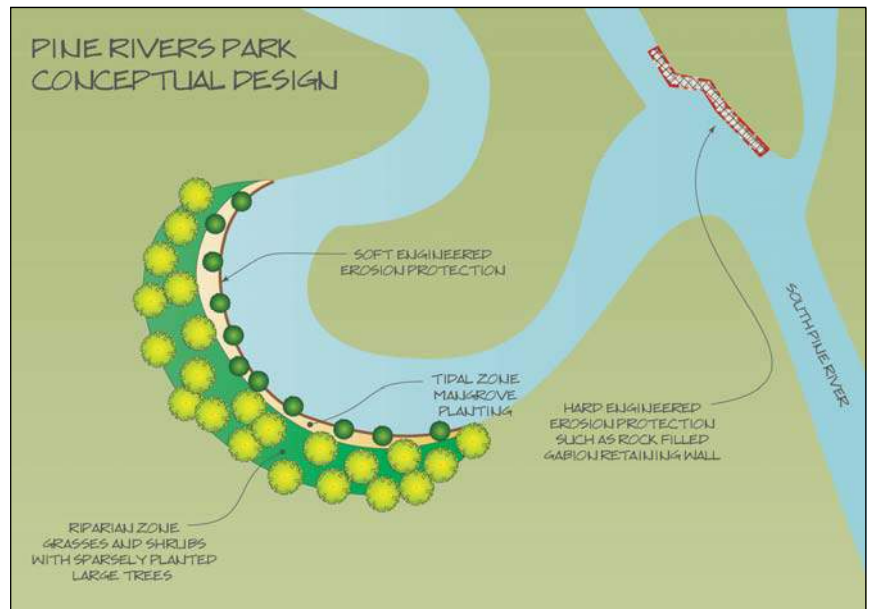
Pine Rivers Park assets have been damaged by bank erosion. This bank erosion will continue without intervention.

The current erosion threat is to open parkland on the bank of the river. Beyond this are woodlands, lakes and an amphitheatre.

These assets are highly valued, and have been utilised for setting the limits of the migration zone.



Eroded River Bank at Pine Rivers Park



Conceptual Layout for the Recommended Management Strategy at Pine Rivers Park

Option	Adopt	Reason
Option A – Do Nothing	✗	Results in loss of park area and damage to park infrastructure. My result in failure of transmission tower.
Option B – Monitor and Defer	✗	Further action has already been triggered – the river bank has triggered the soft erosion protection zone.
Option C – Soft Engineering	✓	Commensurate with park environment and erosion tolerance.
Option D – Hard Engineering	✓	To prevent failure of transmission tower.
Option E – Diversion	✗	Cannot fully predict the river response. Cost and other implementation constraints.
Option F – Reverse Breaching	✗	Uncertain outcome; potential high cost; requires ongoing maintenance; halts a current migration trend that will ultimately benefit the park.

Summary of Option Analysis at Pine Rivers Park

Pitonga and Normanby Way Management Strategy

Pitonga Way

Council's assets along Pitonga Way have been destroyed, and Council's land eroded away. However, a footpath linking Pine Rivers Park and Normanby Way would be a valuable public amenity which Council is seeking to reinstate. This SEMP supports the implementation of erosion protection to protect a future public pathway.

A portion of the river bank in this location falls within the Soft Erosion Protection Zone. As such, this SEMP supports the implementation of soft engineering erosion protection on private land to protect the Strathpine Village residential development located on Mecklem

Street. Such works would be superseded by erosion protection works to protect a future reinstated public pathway.

Normanby Way

The only noticeable erosion threat along Normanby Way has already been mitigated through implementation of a rock filled gabion basket retaining wall structure. This structure is considered suitable.

While portions of Normanby Way fall within the Soft Erosion Protection Zone, there is little immediate threat. As such, it is recommended to monitor erosion along Normanby Way.



Rock Filled Gabion Retaining Wall on Normanby Way

Option	Adopt	Reason
Option A – Do Nothing	✘	Erosion will continue to extend in a westerly direction. This would limit the ability to protect any new linkage proposed between Pine Rivers Park and Normanby Way.
Option B – Monitor, Defer and Maintain	✔	Maintain existing erosion protection on Normanby Way, and monitor erosion along Normanby Way.
Option C – Soft Engineering	✔	From perspective of private property beyond Pitonga Way, the river bank is within the 'Soft Erosion Protection Zone'.
Option D – Hard Engineering	✘	There is no immediate threat to unprotected assets. This option may become suitable if triggered by approved future development, such as a new public pathway along the river front to reinstate Pitonga Way.

Summary of Option Analysis at Pitonga and Normanby Way

Learmonth Street Management Strategy

Bob Bell Park is located along a relatively straight section of river, and is exposed to relatively low erosive forcing on the bank. Much of the river bank along Bob Bell Park is lined with vegetation, which shelters the bank from erosion. The bank vegetation is cleared at a concrete boat ramp.

Further downstream, the river passes private dwellings on Learmonth Street. The private dwellings are on the outside bank of a river bend, and the bank is therefore susceptible to erosion.

situated in close proximity to the river. The private erosion protection appears to have functioned successfully, with little evidence of bank migration.

Private erosion protection systems have been installed by some owners of dwellings



Boat Ramp at Bob Bell Park



Private Erosion Protection at Learmonth Street

Option	Adopt	Reason
Option A – Do Nothing	✘	There is risk of damage to infrastructure if maintenance of existing erosion protection is not undertaken.
Option B – Monitor, Defer and Maintain	✔	Maintain existing natural erosion protection (mangroves) along Bob Bell Park and erosion protection along Learmonth Street.
Option C – Soft Engineering	✔	Encourage mangrove rehabilitation along pocket of bare bank at Bob Bell Park.
Option D – Hard Engineering	✔	The river bank is migrating towards a transmission tower. This migration trend should be halted to ensure the integrity of the transmission tower.

Summary of Option Analysis at Learmonth Street

Implementation Plan

The works proposed throughout the SPRSEMP study area are primarily intended to address existing river bank erosion trends and to protect Council assets and local values.

The Implementation Plan Table (below) presents a summary of the proposed management options, along with their priority for implementation.

The priority ranking is based on the consequence and

imminence of the threat, whereby:

- A high priority corresponds with an immediate threat to a high value asset, and implementation of this recommendation should commence in the next one to two years.
- A medium priority corresponds with either a lower value asset or less immediate threat and implementation of this

recommendation should be within the next three to five years (or sooner if bank erosion rates increase).

- A low priority corresponds with no immediate action required by Council, and implementation could be undertaken through ongoing maintenance and monitoring as required.

River Reach	Promoted Management Action	Assets/Values Under Threat	Cost Estimate	Priority	Responsibility	Approvals	Timescales
Pine Rivers Park – Park	Soft engineered erosion protection	Park infrastructure	\$300k to \$1.2 million	High	Moreton Bay Regional Council	Prescribed tidal works Owners consent	1-2 years
Pine Rivers Park – Transmission Tower	Rock filled gabion retaining wall	Transmission tower	\$200k	Medium	Energex	Prescribed tidal works Owners consent	3-5 years
Pitonga Way	Soft engineered erosion protection	Linear park and pathway; Private property	\$150k to \$600k	Medium	Moreton Bay Regional Council	None	N/A
Normanby Way	Monitor and maintain	Linear park and pathway	Low	Low	Moreton Bay Regional Council	None	Ongoing
Bob Bell Park	Monitor and mangrove rehabilitation	Park infrastructure (road)	\$120k	Medium	Moreton Bay Regional Council	Owners consent	3-5 years
Learmonth Street	Maintain	Private dwellings	N/A	N/A	Private owners	None	Ongoing
Learmonth Street Transmission Tower	Rock filled gabion retaining wall	Transmission tower	\$270k	High	Energex	Prescribed tidal works Owners consent	1-2 years

BMT WBM has a proven record in addressing today's engineering and environmental issues.

We aim to continue to enhance our services, capabilities and areas of application to meet the community's future development and environmental protection needs.



1 Number of BMT WBM offices in region

● BMT offices