

2 Overarching Management Strategy

The Queensland Government's Coastal Management Plan promotes the conservation of natural physical processes along Queensland shorelines. In the context of the South Pine River, this translates to allowing the river to migrate naturally where feasible. However, some existing development adjacent to the river bank requires protection, and some development will require protection in future. Therefore, there is a limit to the amount of natural migration that can be tolerated. To meet the ideal of encouraging natural processes to occur within the constraints of an unnatural (developed) environment, this SEMP has developed an overarching management strategy. The strategy is structured on the following components:

1. Migration Zone

The portion of the study area in which the South Pine River could migrate without disturbing existing development has been estimated. Bank erosion beyond the bounds of this zone cannot be tolerated, as the integrity of existing development would be compromised. The type of development that has been considered in defining the limits of this zone includes the following:

- Council owned park assets and values, such as: lakes, woodlands, internal roads, parking areas, concrete walkways, play grounds and stages;
- Sealed public roads;
- Private development, such as dwellings and commercial and industrial buildings;
- Sports and recreation facilities;
- Offline gravel extraction pits; and
- Gravel extraction facilities.

It is recognised that this zone includes undeveloped land that may be developed in the future. It is not the intention of this SEMP to stifle future development. Therefore, the boundary of this zone should evolve to account for future development. The migration zone shown in Figure 2-1 is a snapshot under current catchment conditions, in which natural sediment transport processes are promoted.

Where development approval within this zone is sought, consideration should be given to the proximity of the proposed development to the river bank. A bank erosion buffer, i.e. undeveloped land between the proposed development and river bank, should be included in the development proposal layout to facilitate management of river bank erosion. This buffer should consider the erosion protection zone widths discussed below (see Table 2-1).

As the river bank approaches the outer boundary of the Migration Zone, bank erosion will begin to threaten existing development and it will become necessary to mitigate bank erosion through installation of engineered erosion protection systems. This plan considers erosion protection to be implemented in two stages:

2. Soft Erosion Protection Zone

This form of system generally relies on vegetation to restrain bank erosion. Other components may include bank re-profiling to create a more stable river bank, geotextiles to provide short to medium term erosion protection prior to vegetation establishment and armouring of the bank toe using natural materials such as logs. 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. This SPRSEMP supports the provision of soft erosion protection systems within the Soft Erosion Protection Zone shown in Figure 2-1. The widths of the zones are based on the current erosion risk (see Figure 5-14 in Stage 1 report; BMT WBM, 2014). Where the boundary of the migration zone is far from the river bank a conservative (extreme risk) approach has been adopted to account for the unknown future erosion risk of the bank. The width of the zone varies between 20m for a low risk and 60m for an extreme risk.

3. Hard Erosion Protection Zone

This form of system is resorted to when the river has migrated to within close proximity of existing development. 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. This SPRSEMP supports the provision of hard erosion protection systems within the Hard Erosion Protection Zone shown in Figure 2-1. The widths of the zones are based on the current erosion risk (see Figure 5-14 in Stage 1 report; BMT WBM, 2014). Where the boundary of the migration zone is far from the river bank a conservative (extreme risk) approach has been adopted to account for the unknown future erosion risk of the bank. The width of the zone varies between 10m for a low risk and 20m for an extreme risk. Since the integrity of the transmission towers is critical, hard erosion protection zones have been set at 60m in the vicinity of the transmission towers – this is equivalent to the soft erosion protection zone widths in extreme erosion risk areas.

The erosion protection zones are intended to mark those areas where the SPRSEMP tolerates engineered erosion protection. When the river bank migrates to within these zones, implementation of the erosion protection measures is at the discretion of the affected parties. The boundaries of the zones are indicative only, and consideration will need to be given to aspects such as:

- Changes in development along the river bank;
- Changes in the river bank alignment and erosion risk; and
- Continuity/linkage with proximate erosion protection systems.

The derivation of the erosion protection zones is outlined in Table 2-1. The widths of the zones have been determined by considering:

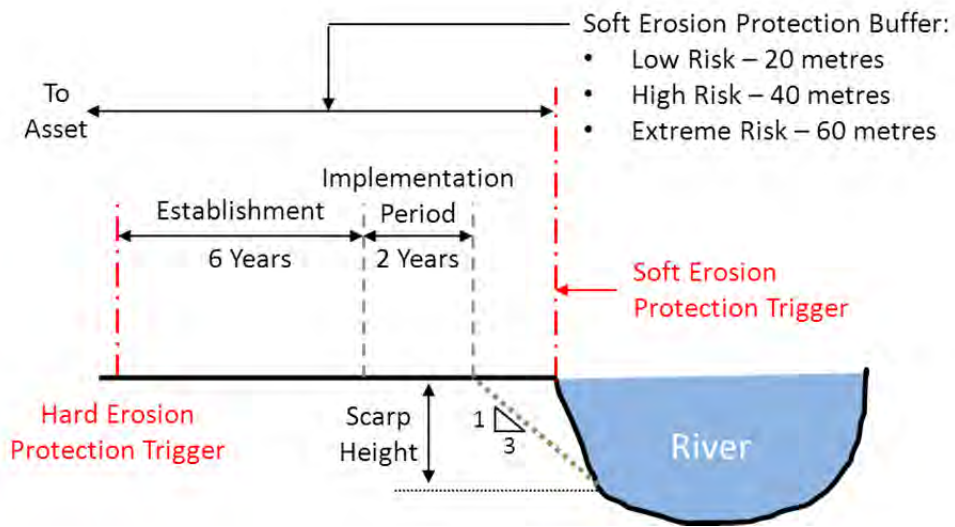
- Typical rates of erosion as measured during stage 1 (BMT WBM, 2014);
- Suitable stable bank slopes and typical vertical scarp heights;
- Time taken to implement the erosion protection system (e.g. undertake design and obtain approvals);
- In the case of soft erosion protection, the time taken for plants to establish; and

- In the case of hard erosion protection, a margin of safety and allowance for maintenance access.

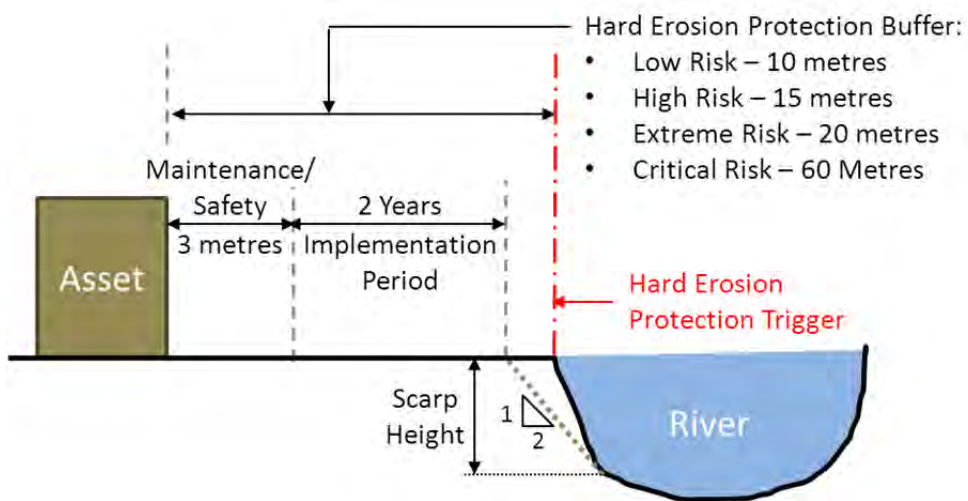
Table 2-1 Erosion Protection Buffer Widths

Low Erosion Risk	High Erosion Risk	Extreme Erosion Risk	Critical Erosion Risk
Description:			
Stable banks that are often vegetated and show no signs of erosion. Associated with sediment deposition zones and inside river bends.	Lower rates of erosion with some bank slumping.	Exhibiting active bank slumping, often with clean vertical scarps and recent vegetation loss. Associated with outside river bends.	Where failure of the river bank can damage critical public infrastructure and endanger the public; such as transmission towers.

Parameters:

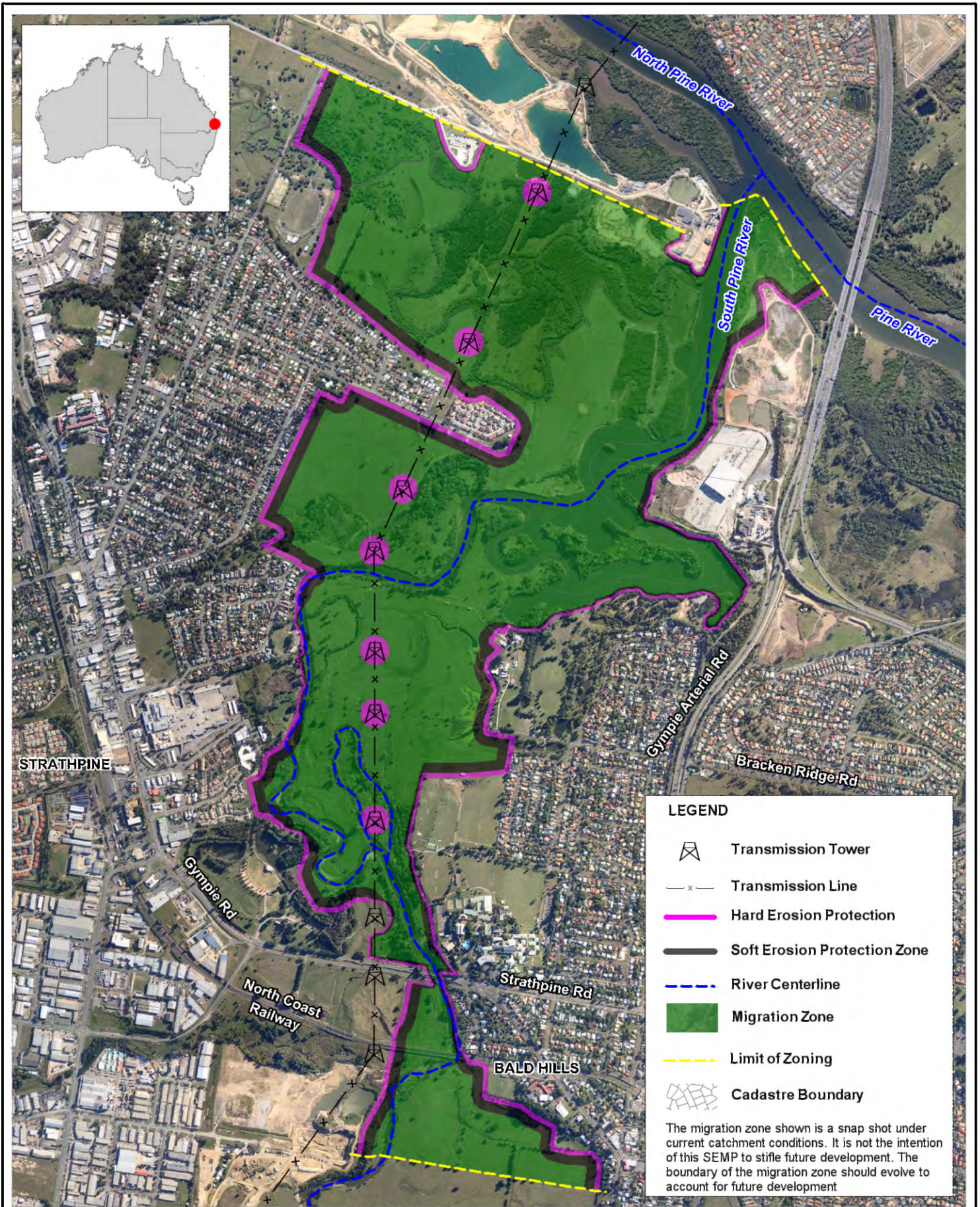


Generalised Soft Erosion Protection



Generalised Hard Erosion Protection Profile

Low Erosion Risk	High Erosion Risk	Extreme Erosion Risk	Critical Erosion Risk
Erosion Rate: 1 metres per year Scarp Height: 0.5 metres	Erosion Rate: 2 metres per year Scarp Height: 2 metres	Erosion Rate: 3.5 metres per year Scarp Height: 3.5 metres	Not used
Erosion Protection Buffers (from edge of asset):			
Hard Erosion Protection: 10 metres Soft Erosion Protection: 20 metres	Hard Erosion Protection: 15 metres Soft Erosion Protection: 40 metres	Hard Erosion Protection: 20 metres Soft Erosion Protection: 60 metres	Hard Erosion Protection Buffer: 60m



Title:
**South Pine River Shoreline Erosion Management Plan
 Overarching Management Strategy**

Figure:
2-1

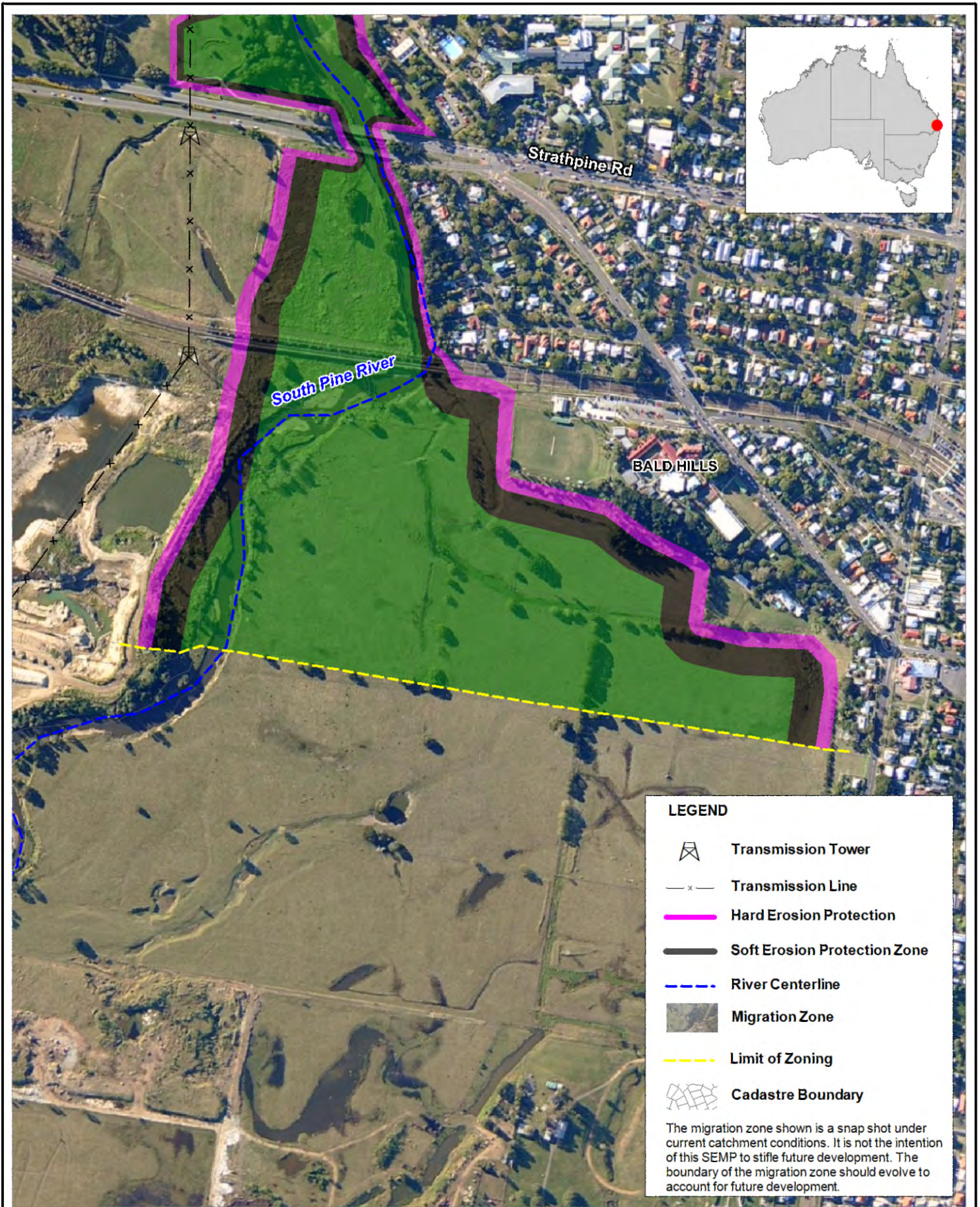
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0 400 800m
 Approx. Scale



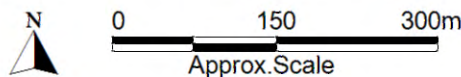


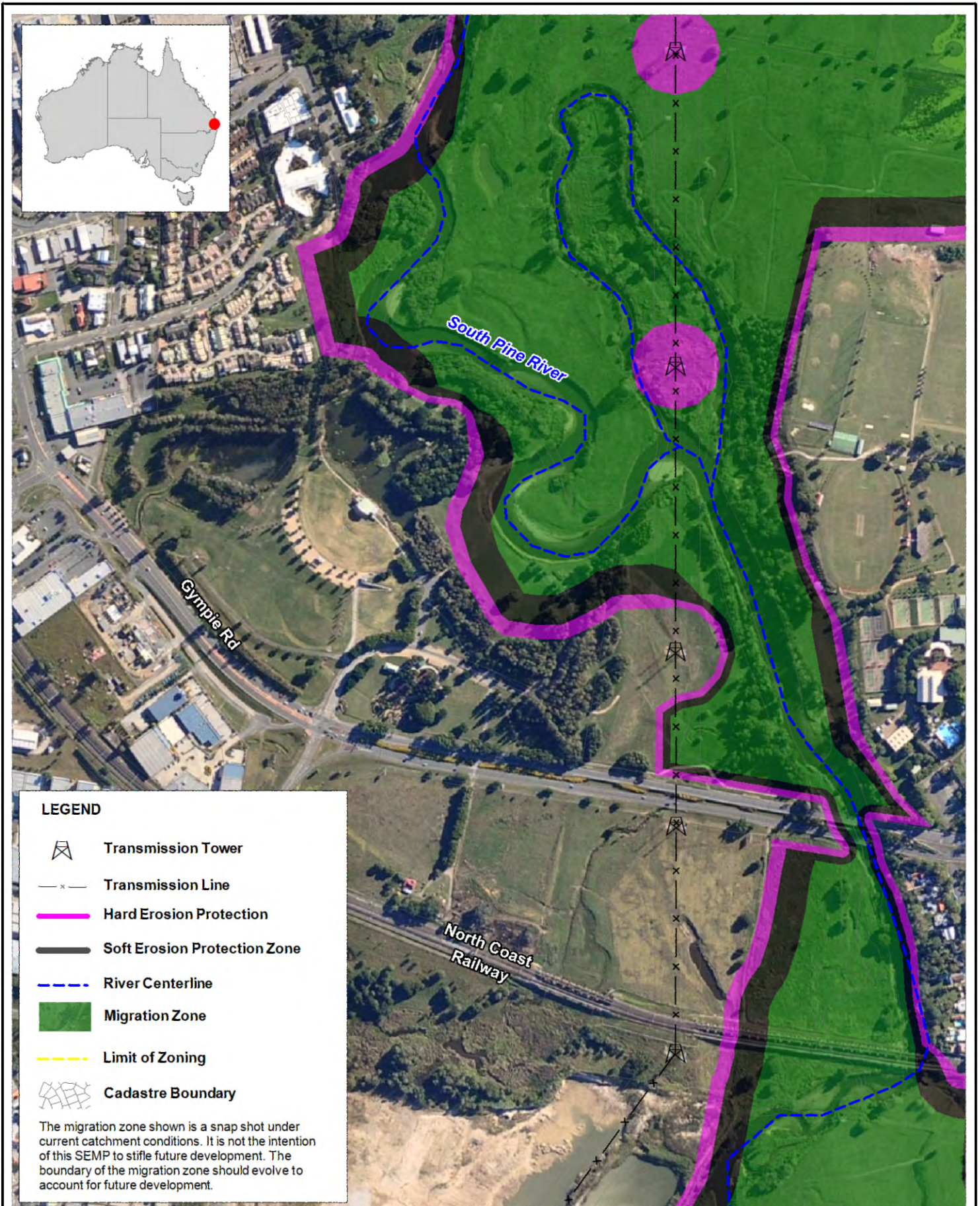
Title:
**South Pine River Shoreline Erosion Management Plan
 Overarching Management Strategy - Upstream of Gympie Road**

Figure:
2-1-1

Rev:
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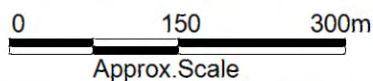


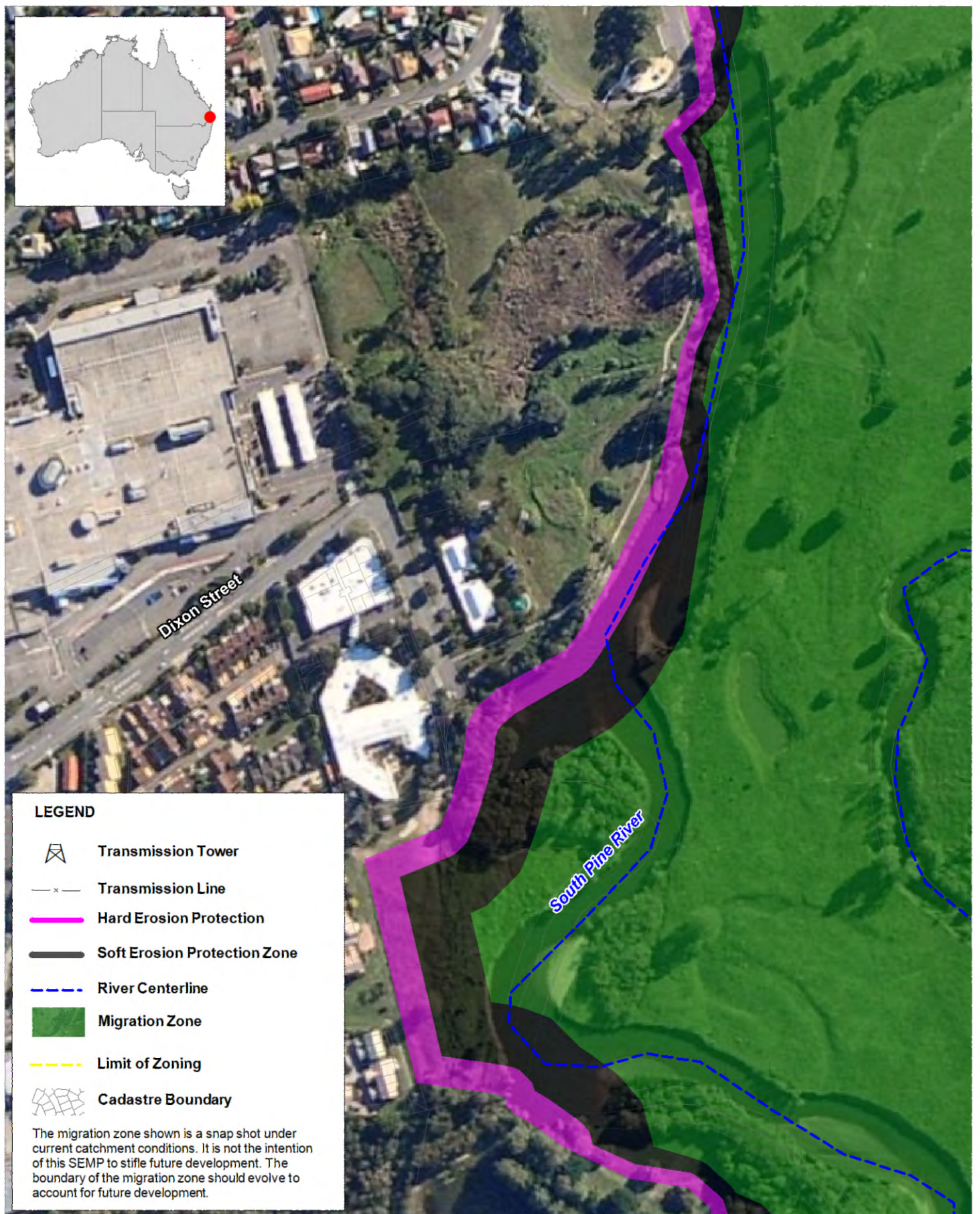
Title:
**South Pine River Shoreline Erosion Management Plan
 Overarching Management Strategy - Pine Rivers Park**

Figure:
2-1-2

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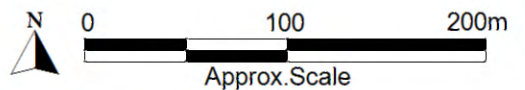
-  Transmission Tower
-  Transmission Line
-  Hard Erosion Protection
-  Soft Erosion Protection Zone
-  River Centerline
-  Migration Zone
-  Limit of Zoning
-  Cadastre Boundary

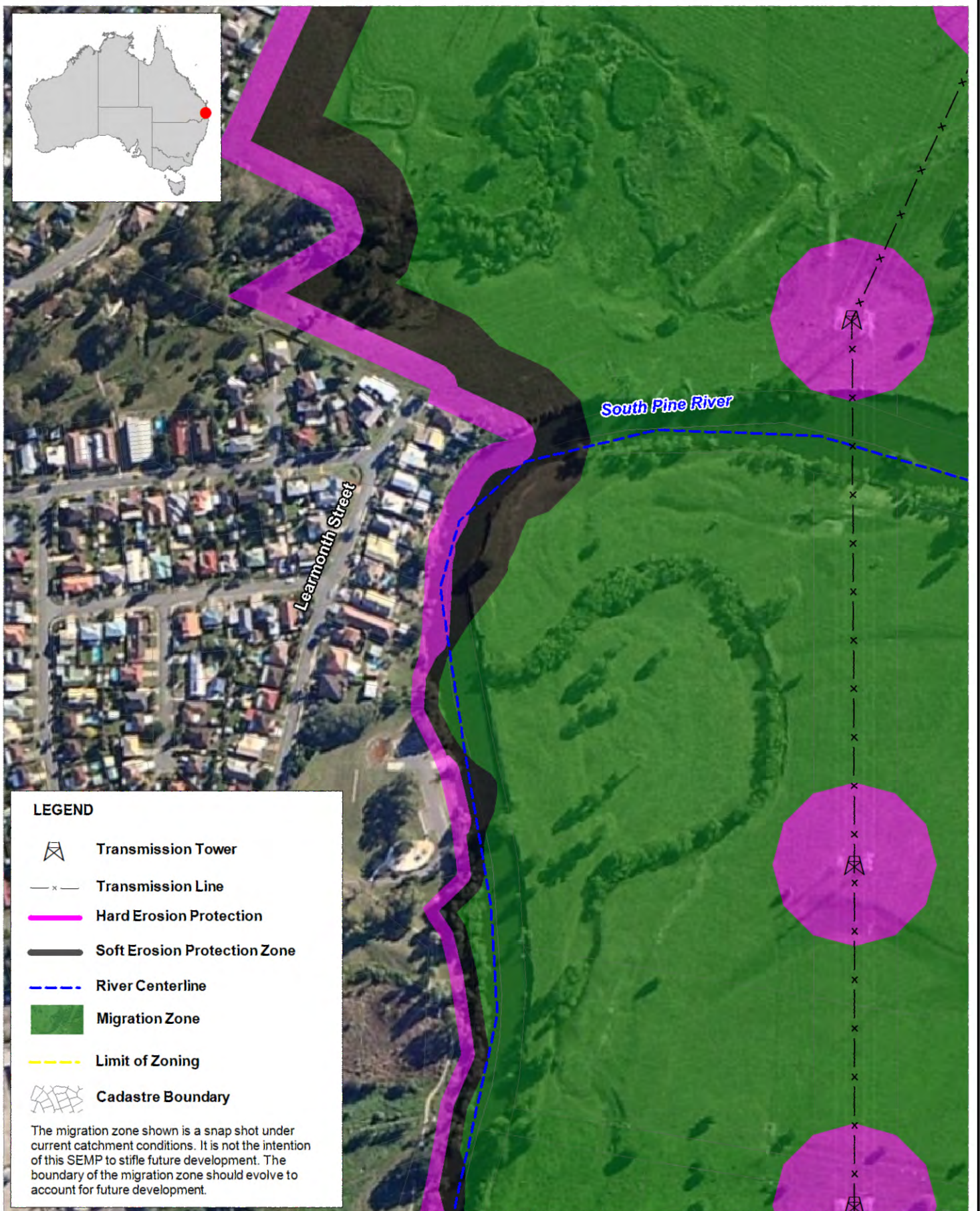
The migration zone shown is a snap shot under current catchment conditions. It is not the intention of this SEMP to stifle future development. The boundary of the migration zone should evolve to account for future development.

Title: **South Pine River Shoreline Erosion Management Plan
Overarching Management Strategy - Pitonga and Normanby Way**









Figure: **2-1-3** Rev: **A**

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LEGEND

-  Transmission Tower
-  Transmission Line
-  Hard Erosion Protection
-  Soft Erosion Protection Zone
-  River Centerline
-  Migration Zone
-  Limit of Zoning
-  Cadastre Boundary

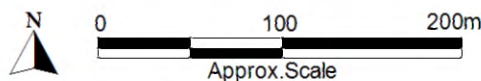
The migration zone shown is a snap shot under current catchment conditions. It is not the intention of this SEMP to stifle future development. The boundary of the migration zone should evolve to account for future development.

Title:
**South Pine River Shoreline Erosion Management Plan
 Overarching Management Strategy - Learmonth Street**

Figure:
2-1-4

Rev:
A

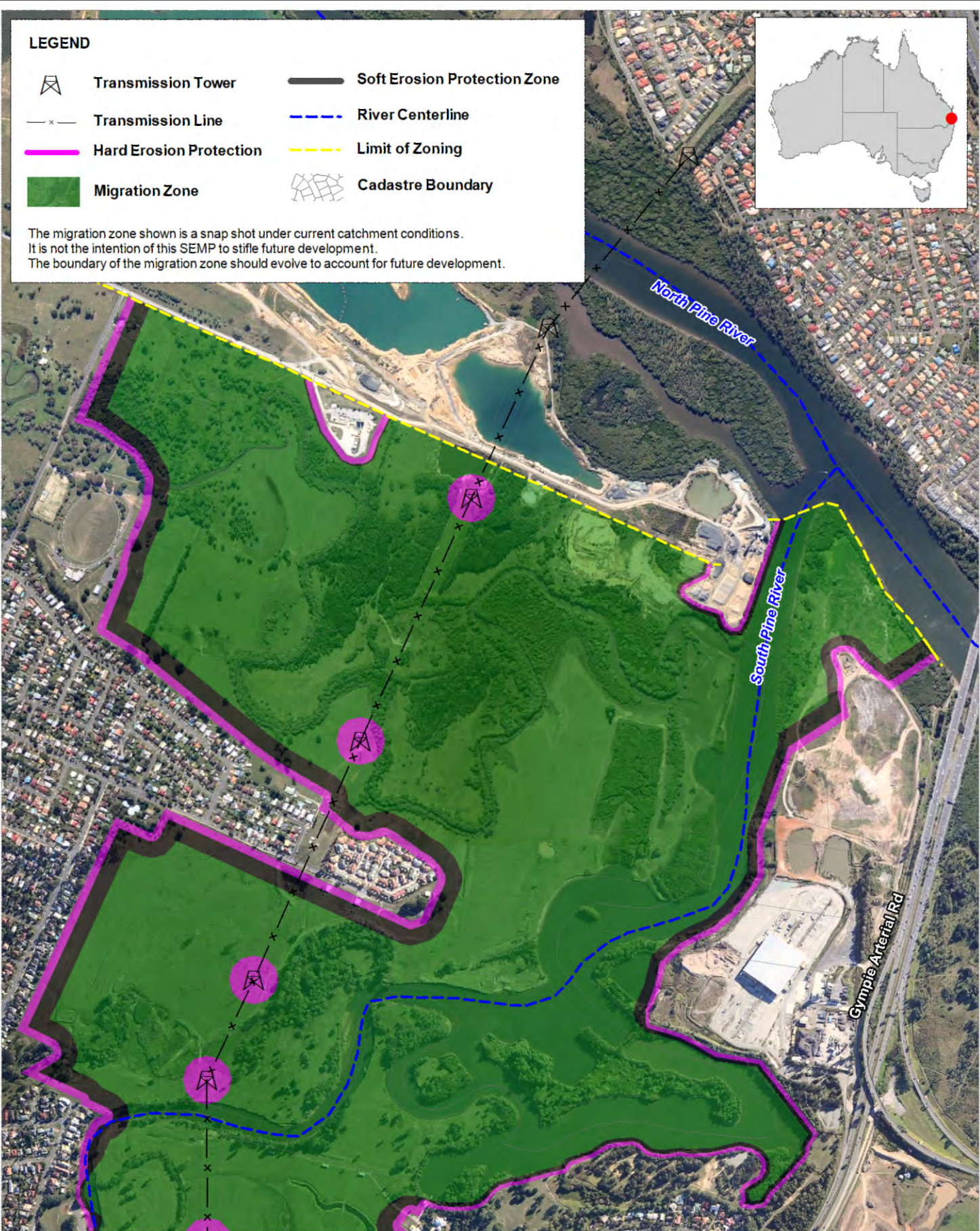
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LEGEND

-  Transmission Tower
-  Transmission Line
-  Hard Erosion Protection
-  Migration Zone
-  Soft Erosion Protection Zone
-  River Centerline
-  Limit of Zoning
-  Cadastre Boundary

The migration zone shown is a snap shot under current catchment conditions. It is not the intention of this SEMP to stifle future development. The boundary of the migration zone should evolve to account for future development.



Title:
South Pine River Shoreline Erosion Management Plan Overarching Management Strategy - Downstream of Learmonth Street

Figure:
2-1-5

Rev:
A

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