PART 05 APPENDICES

5.1 Full Line Supermarket Matrix

POTTSVILLE VILLAGE SUPERMARKET LOCATION MATRIX

Site	Land Area			Traffic				
	Site <4 000m²	Floor Plate 2000-2500m²	Future Expansion	Car Parking (130-160 spaces)	Customer Vehicle Access	Infrastructure Implication	Delivery Access	Public Transport
POTTSVILLE VILLAGE OPTIONS								
Site F 	+10 000m²	✓ Yes	✓ Yes	80 North Loop Rd 30 on-street 60 basement **TOTAL - 170**	Access to adjoining at grade car parking via North Loop Road.	1. Form North Loop Road (East) 2. Investigate and potentially form North Loop Road (West) 3. Upgraded intersection at Coronation Street including right hand turning bay.	Via North Loop Road.	Within walking distance to existings bus stops and bus services.
Weighting								
Site A 	8 196m²	✓ Yes	✓ Yes if basement car park	120 on site 80 basement 30 on-street **TOTAL - 230**	Access from both Elizabeth Street and potential extension of Phillip Street (to provide through connection to Overall Drive) to on-site at-grade and basement car parks.	1. Requires completion of Phillip Street 2. Access off Tweed Coast Rd including additional roundabout at intersection of Phillip Street and Overall Drive.	Trucks access off Tweed Coast Rd, into Phillip Street, then reverse into loading bay.	Within walking distance to existings bus stops and bus services.
Weighting								
Site C 	3138m²	✓ Yes	✗ No	80 North Loop Rd 30 on-street 60 basement **TOTAL - 170**	Access to adjoining at grade and basement car parking via North Loop Road.	1. Form North Loop Rd 2. Upgraded intersection at Coronation Avenue including right hand turning bay.	Via North Loop Road	Within walking distance to existings bus stops and bus services.
Weighting								
Site D 	4002m²	✓ Yes	✗ No	80 North Loop Rd 30 on-street 60 basement **TOTAL - 170**	Access to adjoining at grade and basement car parking via North Loop Road.	1. Form North Loop Road 2. Upgraded intersection at Coronation Avenue including right hand turning bay.	Via North Loop Road	Within walking distance to existings bus stops and bus services.
Weighting								
Site E 	4412m²	✓ Yes	✗ No	80 North Loop Rd 30 on-street 60 basement **TOTAL - 170**	Access to adjoining at grade and basement car parking via North Loop Road.	1. Form North Loop Road (East) 2. Investigate and potentially form North Loop Road (West) 3. Upgraded intersection at Coronation Street including right hand turning bay.	Access from North Loop Road. Potential access directly from Coronation Avenue, however this scenario is not preferred.	Within walking distance to existings bus stops and bus services.
Weighting								

Village Centre					Environmental Impact				Ownership/ Availability
Contributes to Village Business Primacy?	Coronation Avenue Impact	Visual Impact	Pedestrian Amenity	Vehicle Pedestrian Conflict	Native Vegetation & Biodiversity	Landforming	Reuse of Land	Amenity/Social / Community Impact	
Central location, strengthens village business primacy and promotes positive relationships between anchor use and smaller businesses along Coronation Avenue.	Within 200m walking distance to Coronation Avenue. Integrity of the street scale and character defining fine grain of shop frontages along Coronation Avenue upheld.	One block back from Coronation St frontage however corner of site would be visually connected to Coronation St. Built form and visual impact(incl. signage) considered as part of any development proposal.	Extend pedestrian realm to site from Coronation Avenue, North Loop Road carpark and sports precinct/Pottsville Oval	Potential conflict when pedestrians traversing between the supermarket and the North Loop Road carpark.	Removal of some native vegetation required to accommodate North Loop Road and supermarket footprint. Part of the site within 40m from the top of Cudgera Creek bank. Comprehensive flora and fauna survey to identify potential impacts will be required Opportunity for offset/ compensatory plantings.	Predominately flat site. Potentially flood liable. Provisions of Development Design Specification D7 - Stormwater Quality within Tweed DCP Section A5 to be addressed.	Much of the site is cleared. Native vegetation, including Riparian Zone surrounds site.	Potential amenity impacts on adjoining properties (fronting Coronation Avenue) will need to be considered.	1 Owner Crown Land Requires amendment to Tweed Local Environmental Plan Crown Land have approached Council with a redevelopment proposition over the site indicating a willingness to pursue a development scenario immediately. Short to medium term.
Central location, strengthens village business primacy and promotes positive relationships between anchor use and smaller businesses along Coronation Avenue.	Within 200m walking distance to Coronation Avenue. Integrity of the street scale and character defining fine grain of shop frontages along Coronation Avenue upheld.	Site visible across Market Park from Tweed Coast Road. Market park serve as landscaped visual buffer. Built form and visual impact(incl. signage) considered as part of any development proposal.	Extend pedestrian realm & active retail edge along Phillip Street. Positively address the interface with Market Park.	Site planning and design to minimise potential conflict particularly around thresholds to car parking & delivery areas.	Removal of some trees on site to accommodate supermarket footprint, car park and pedestrian and vehicular access. Norfolk Island Pines, Eucalyptus species across the site.	The site slopes from west (high) to east (low), as such some landforming required if excavating a basement car park.	Site currently used as community centre (old school site). Buildings are relatively old and will be increasingly difficult to maintain and meet functional requirements.	Historic ties of the Pottsville community to the old school buildings and site. Community facilities are to be provided within the development proposal, or suitable avenues explored for their relocation of elsewhere within the village centre Site currently in community use rather	Council Northern Rivers Area Health Service Requires amendment to Tweed Local Environmental Plan Short to medium term option.
Central location, strengthens village business primacy and promotes positive relationships between anchor use and smaller businesses along Coronation Avenue.	Occupying an entire block could undermine fine grain retail frontage. Specifc design treatments required to positively contribute to the urban design of Coronation Avenue.	Consider visual impact of large supermarket frontage to Coronation Avenue. Facade and signage to Coronation Avenue should acknowledge scale and fine grain shopfront character.	Form pedestrian edge to North Loop Road carpark providing legible safe pedestrian access. Provide through block north-south pedestrian link from carpark to Coronation Avenue.	Pedestrian circulation within North Loop Road carpark needs to be considered as part of the carpark design.	Removal of some trees to accommodate North Loop Road. Opportunity for offset/ compensatory plantings.	Relatively flat site. Excavation required if basement car parking included in site design.	Currently occupied by small dwelling onverted to real estate office, and Pottsville Mall which currently is underperforming.	Site redevelopment would be consistent with surrounding land use objectives and would strengthen the Coronation Avenue business primacy. Contributes towards the increased retail and commercial level of service for Pottsville residents.	3 separate owners Requires consolidation of sites and owners intent. Pottsville Mall currently under-performing from a retail / commercial point of view. Good short to medium term option.
Central location, strengthens village business primacy and promotes positive relationships between anchor use and smaller businesses along Coronation Avenue.	Occupying an entire block could undermine fine grain retail frontage. Specifc design treatments required to positively contribute to the urban design of Coronation Avenue.	Consider visual impact of large supermarket frontage to Coronation Avenue. Facade and signage to Coronation Avenue should acknowledge scale and fine grain shopfront character.	Form pedestrian edge to both North Loop Road frontages providing legible safe pedestrian access. Provide through block north-south pedestrian link from carpark to Coronation Avenue..	Pedestrian circulation within North Loop Road car park needs to be considered as part of the carpark design.	Removal of some trees to accommodate North Loop Road. Opportunity for offset/ compensatory plantings.	Relatively flat site, no significant earth works required.	Currently IGA supermarket, opportunity to expand to full line on-site. Would require site redesign and loss of smaller retail units into larger supermarket floorplate.	Site redevelopment would be consistent with surrounding land use objectives and would strengthen the Coronation Avenue business primacy. Contributes towards the increased retail and commercial level of service for Pottsville residents.	3 separate owners Requires consolidation of sites and owners intent. Recent completiton (2008) of the IGA supermarket and smaller retail units fronting Coronation Avenue could preclude redevelopment of site in the short term.
Central location, strengthens village business primacy and promotes positive relationships between anchor use and smaller businesses along Coronation Avenue.	Occupying an entire block could undermine fine grain retail frontage. Given the periphery location to the retail core, the potential impacts are considered reduced to other Coronation Avenue options.	Consider visual impact of large supermarket frontage to Coronation Avenue. Facade and signage to Coronation Avenue should acknowledge scale and fine grain shopfront character	Form pedestrian edge to both North Loop Road and Coronation Avenue frontages providing legible safe pedestrian access.	Potential conflict when pedestrians traversing between the supermarket and the North Loop Road carpark..	Removal of some native vegetation required to accommodate North Loop Road and supermarket footprint. Comprehensive flora and fauna survey to identify potential impacts will be required Opportunity for offset/ compensatory plantings.	Relatively flat site, no significant earthworks required.	Currently occupied by Anglican Church, and 4 detached residential dwellings which would need to be acquired.	Displaced residents and Church / Parishners.	5 separate owners Requires consolidation of sites and owners intent. Commercial negotiation may require alternative site for Church.

POTTSVILLE VILLAGE SUPERMARKET LOCATION MATRIX

Site	Land Area			Traffic				
	Site <4 000m²	Floor Plate 2000-2500m²	Future Expansion	Car Parking (130-160 spaces)	Customer Vehicle Access	Infrastructure Implication	Delivery Access	Public Transport
POTTSVILLE VILLAGE OPTIONS								
Site B 	4266m²	✓ Yes	✗ No	80 North Loop Rd 30 on-street 60 basement **TOTAL - 170**	Access to adjoining at grade and basement car parking via North Loop Road.	1. Form North Loop Road 2. Upgraded intersection at Coronation Avenue including right hand turning bay. 3. Pedestrian threshold across Coronation Avenue providing strong link between car park and supermarket. 4. Rear access lane between Phillip & Elizabeth Street, investigate the need to complete Phillip St access to Tweed Coast Rd.	Rear access lane off Elizabeth Street.	Within walking distance to existings bus stops and bus services.
Weighting								
Site G 	+10 000m²	✓ Yes	✓ Yes	+170 adjoining **TOTAL - 170**	Access to adjoining at grade car parking via Elizabeth Street.	1. Form new road Charles St, parrallel to Anne St 2. Upgraded intersection at Coronation Avenue including right hand turning bay. Will result in increased traffic flows through predominantly residential streets.	Via Elizabeth and newly formed Charles Street	Greater walking distance to existings bus stops and bus services than other village centre options, however still considered practical.
Weighting								
OUT OF VILLAGE OPTIONS								
Pottsville Waters 	8000m²	✓ Yes	✗ No	80 adjoining 30 on-street 60 basement **TOTAL - 170**	Access to adjoining at grade car parking via Overall Drive.	1. Overall Drive intersection upgrade with right hand turn bay 2. Car park access from Royal Drive. Increased traffic flows along Overall Dr	Via Overall Drive	Within walking distance to existings bus stops and bus services.
Weighting								
Sea Breeze Estate 	4002m²	✓ Yes	✗ No	Potenial for >130 **TOTAL - +130**	Access to adjoining at grade car parking via Seabreeze Boulevarde.	Access and egress from Seabreeze Boulevarde may require roundabout.	Via Seabreeze Boulevarde.	Not presently serviced by public transport. Existing bus services not considered to be within accepted walking distance.
Weighting								

Village Centre					Environmental Impact				Ownership/ Availability
Contributes to Village Business Primacy?	Coronation St Impact	Visual Impact	Pedestrian Amenity	Vehicle Pedestrian Conflict	Native Vegetation & Biodiversity	Landforming	Reuse of Land	Amenity/Social / Community Impact	
Central location, strengthens village business primacy and promotes positive relationships between anchor use and smaller businesses along Coronation Avenue.	Occupying an entire block could undermine fine grain retail frontage. Specifc design treatments required to positively contribute to the urban design of Coronation Avenue.	Consider visual impact of large supermarket frontage to Coronation Avenue. Facade and signage to Coronation Avenue should acknowledge scale and fine grain shopfront character.	Requires pedestrian threshold across Coronation Avenue	New pedestrian threshold and increased pedestrian movements (with shopping trolleys) would increase traffic stoppage significantly.	Removal of some trees to accommodate North Loop Road. Opportunity for offset/ compensatory plantings.	Slightly sloping site (South to North) Landforming required if excavating a basement car park	Site currently under utilised as 4 units, bait shop, bottle shop and detached dwelling.	Displaced residents. Bait shop, whilst the building condition is average, and will be increasingly difficult to maintain and meet future functional requirements, it is perceived to contribute to the 'quaint coastal character' of Coronation Avenue	4 separate owners Requires consolidation of sites and owners intent.
Minor dislocation from Coronation Avenue, however still considered to contribute to the village business primacy.	Within 350m walking distance to Coronation Avenue. Integrity of the street scale and character defining fine grain of shop frontages along Coronation Avenue upheld.	Largely greenfield site, not within any signicant existing view corridors and vistas. Built form and visual impact considered as part of any development proposal.	Largely car oriented option as removed from centralised village centre car parking areas.	Site planning and design to minimise potential conflict particularly around thresholds to car parking & delivery areas.	Whilst predominantly a cleared site, there is significant native vegetation to the west of the site. Comprehensive flora and fauna survey to identify potential impacts will be required	Relatively flat and cleared site.	Currently occupied by the Catholic Church.	Displaced Church and parishioners.	1 Owner Catholic Church Require owners intent. Commercial negotiation may require alternative site for Church.
Out of town site, detracts from village business primacy by relocating important retail anchor.	Results in loss of symbiotic relationship between smaller businesses and larger anchor use within village centre.	Highly visible travelling along Overall Drive. Built form and visual impact considered as part of any development proposal. Opportunity to become a lively neighbourhood hub.	Site redesign increase through site permeability. Good pedestrian accessability for Pottsville Waters and many Black Rocks Estate residents.	Site planning and design to minimise potential conflict particularly around thresholds to car parking & delivery areas.	Most of the site has been developed. Opportunity to introduce some vegetation/planting to new public domain areas.	Relatively flat site. Potential excavation for some basement carparking.	Currently a mini-market, tavern and 4 speciality stores (bakery, chemist, video, pool shop), compatible consistent landuse, therefore redevelopment a compatible consistent use.	Increased intensity of retail use therefore more vehicle and delivery truck movements to and from the site than currently experiencing. Residential landuses surround.	3 separate owners
Out of town site, detracts from village business primacy by relocating important retail anchor.	Results in loss of symbiotic relationship between smaller businesses and larger anchor use within village centre.	Site highly visible from western approach. Design methods to be explored to minimise the visual impact , particularly from the western approach given the locality character identified within the Code (i.e. Rural approaches, green breaks, coastal vernacular)	Greenfield site, design would need to address pedestrian amenity, and quality of public domain.	Greenfield site, design would need to address pedestrian / vehcile circulation.	Predominately cleared site.	Sloping site, however generally flat in the Northwestern corner.	Green field site currently surrounded by predominantly low-density resdiential buildings.	Potential amenity impacts (noise, vehicle movements, operating hours, light spill to adjoining residential uses.	1 development consortium Metricon

POTTSVILLE VILLAGE SUPERMARKET LOCATION MATRIX

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	Site <4 000m²	Floor Plate 2000-2500m²	Future Expansion	Car Parking (130-160 spaces)	Customer Vehicle Access	Infrastructure Implication	Delivery Access	Public Transport
POTTSVILLE VILLAGE OPTIONS								
Pottsville Employment Lands 	<4000m²	✓ Yes	✓ Yes	Potenial for >130 **TOTAL - +130**	Access to adjoining at grade car parking via Pottsville Mooball Road.	1. Upgrade of intersetion of Cudgera Creek Road and Pottsville-Mooball Road. 2. Upgrade Mooball-Pottsville Road to handle increased vehicle movements.	Pottsville-Mooball Road, Cudgera Creek Road.	Public transport will be a consideration with the fututre potential release of the Pottsville Employment Lands.
Weight								
Dunloe Park 	<4000m²	✓ Yes	✓ Yes	Potenial for >130 **TOTAL - +130**	Access to adjoining at grade car parking via Pottsville Mooball Road or Kellehers Road	1. Potential upgrade of intersetion of Cudgera Creek Road and Pottsville-Mooball Road. 2. Potential upgrade Mooball-Pottsville Road to handle increased vehicle movements. 3. Potential upgrade Tweed Coast Road/Overall Drive to handle increased vehicle movements.	Pottsville-Mooball Road, Cudgera Creek Road.	Public transport will be a consideration with the fututre potential release of the Dunloe Park Release Area.
Weighting								

Village Centre					Environmental Impact				Ownership/ Availability
Contributes to Village Business Primacy?	Coronation St Impact	Visual Impact	Pedestrian Amenity	Vehicle Pedestrian Conflict	Native Vegetation & Biodiversity	Landforming	Reuse of Land	Amenity/Social / Community Impact	
Out of town site, detracts from village business primacy by relocating important retail anchor.	Results in loss of symbiotic relationship between smaller businesses and larger anchor use within village centre.	Greenfield site. Potential supermarket site not yet identified.	Greenfield site, design would need to address pedestrian amenity, and quality of public domain.	Greenfield site, design would need to address pedestrian / vehcile circulation.	Comprehensive flora and fauna survey to identify potential impacts will be required	Greenfield site. Potential supermarket site not yet identified	Greenfield site currently in rural land use. No existing infrastructure or support services surrounding.	Distance and isolation from Pottsville Village and existing residential areas would substantially increase car movements.	1 development consortium Heritage Pacific
Out of town site, detracts from village business primacy by relocating important retail anchor.	Results in loss of symbiotic relationship between smaller businesses and larger anchor use within village centre.	Greenfield site. Potential supermarket site not yet identified.	Greenfield site, design would need to address pedestrian amenity, and quality of public domain.	Greenfield site, design would need to address pedestrian / vehcile circulation.	Comprehensive flora and fauna survey to identify potential impacts will be required	Greenfield site. Potential supermarket site not yet identified	Greenfield site currently in rural land use. No existing infrastructure or support services surrounding.	Distance and isolation from Pottsville Village and existing residential areas would substantially increase car movements.	2 seperate landowners

Overview	CNR PHILLIP AND CORONATION OPPOSITE MARKET PARK The corner of Coronation Ave and Phillip St holds significant development opportunity to link the existing retail uses along Phillip Street into Coronation Ave. The corner site is visually prominent from the Coast Rd and as such any future design needs to address this 'gateway' positioning whilst also addressing the Memorial Oval to the North, the Market Park to the east as well as the Coronation Ave elevation and ground floor interface. This 3 storey mixed use scenario combines 3 retail units on the ground floor including a larger tenancy (500m^2) for use as a bar/restaurant use with allowance for a beer garden or alfresco dining area at ground level. The upper level could accommodate either an extension of restaurant or bar uses, or alternatively as commercial floorspace.		
		Compliance	**Comment**
Use	Mixed use (Retail, Pub, Restaurant, Commercial, Residential)	✓ Yes	Complies
Height	2/3 Storeys	✓ Yes	Complies
FSR	1.6:1	✓ Yes	Complies
Site Area	1254sqm		
Building Area	2000 sqm (not including basement)		
Basement	1 Level 25 cars spaces required: ■ 10 commercial ■ 5 residential ■ 10 retail	✓ Yes 25 car spaces accommodated in basement	
Ground Level	TOTAL 900 sqm ■ 3 retail units 550 sqm ■ 1 large tenancy pub/restaurant 400sqm ■ carpark entry ~ upper level entry/lobby		
Level 01	TOTAL 650 sqm ■ Commercial Floorspace		
Level 02	TOTAL 450 sqm ■ 4 Residential Units		

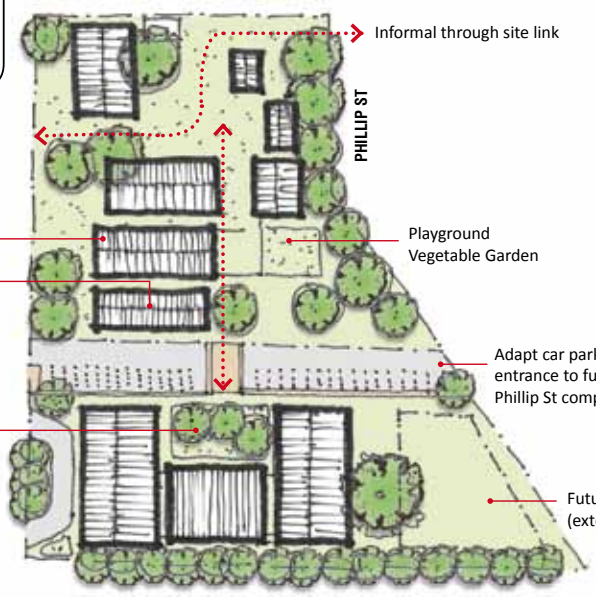
DEVELOPMENT SCENARIO - MIXED USE CORNER OF CORONATION & PHILLIP STREET
RETAIL, RESTAURANT/PUB, COMMERCIAL, RESIDENTIAL

Overview	CNR PHILLIP AND CORONATION OPPOSITE OVAL This 3 storey mixed use development scenario combines 8 retail units on the ground floor with 10 residential units above in a double storey 'maisonette' configuration. The maisonette configuration results in each unit having access to the landscaped podium as well as increasing natural ventilation and natural light opportunities and views towards the estuary. Another key feature is the elevated common landscaped terrace which services to decrease the overall mass and form of the building as well as increasing the airflow around and through the building, whilst providing occupants with an additional area landscaped amenity and recreation.		
		Compliance	**Comment**
Use	Mixed use (Retail, Restaurant, Commercial, Residential)	✓ Yes	Complies
Height	2/3 Storeys	✓ Yes	Complies
FSR	1.75:1	✓ Yes	Complies
Site Area	1250 sqm		
Building Area	2170 sqm (not including basement)		
Basement	1 Level 25 cars spaces required: ■ 10 commercial ■ 5 residential ■ 10 retail	✓ Yes 25 car spaces accommodated in basement	
Ground Level	TOTAL 970 sqm ■ 8 retail units ■ 1 large tenancy 200sqm ■ carpark entry ~ upper level entry/lobby		
Level 01	TOTAL 700 sqm ■ 6 Residential Units		
Level 02	TOTAL 500 sqm ■ 4 Residential Units		

DEVELOPMENT SCENARIO - MIXED USE CORNER OF CORONATION & PHILLIP STREET
RETAIL, RESTAURANT, COMMERCIAL, RESIDENTIAL

Overview	COMMUNITY & NCAHS LANDS SITE Opportunity exists for the redevelopment of the Pottsville Beach Neighbourhood Centre site and adjoining NCAHS site to more adequately accommodate the vast range of existing services for future need. Additional program which could be considered over the site includes a library, a child care centre and additional community meeting rooms. The purpose built facility has the potential to provide an important social and community hub. The site is well connected to the Market Park and Pottsville Oval community and sports precinct strengthening the character defining green link. It is imperative that the existing pedestrian cross site links are maintained in any future development schemes over these two sites. The redevelopment has the opportunity to be a defining collection of public buildings (incorporating the old school building), an important social, community and cultural hub whilst embodying new technologies and key environmental sensibilities including passive heating and cooling, water harvesting and reuse and solar collection.		
		Compliance	**Comment**
Use	Pottsville Beach Neighbourhood Centre, Northern Rivers Area Health	✓ Yes	Complies
Height	1/2 Storeys	✓ Yes	Complies
FSR	N/A	✓ Yes	Complies
Site Area	8196sqm		
Building Area	3700 sqm		
NRAHS	TOTAL 1000 sqm ■ Foyer, consultation suites, training rooms and facilities, amenities	✓ Yes	
Neighbourhood Centre	TOTAL 1000 sqm ■ Foyer, staff rooms & facilities, centrelink, counselling rooms, IT facilities, community outreach facilities, mens shed, play/ mothers group, meeting rooms, consultation suites, training rooms and facilities, amenities.		
Library	TOTAL 1500 sqm ■ Book Shelves & catalogue; reading rooms; education/classrooms; IT & internet facilities; staff rooms & kitchenette, amenities.		
Community gardens & Playground	TOTAL 200 sqm		

Neighbourhood Centre - A collection of small buildings in a park like setting. Buildings currently at capacity and unable to cope with future increase service demand.



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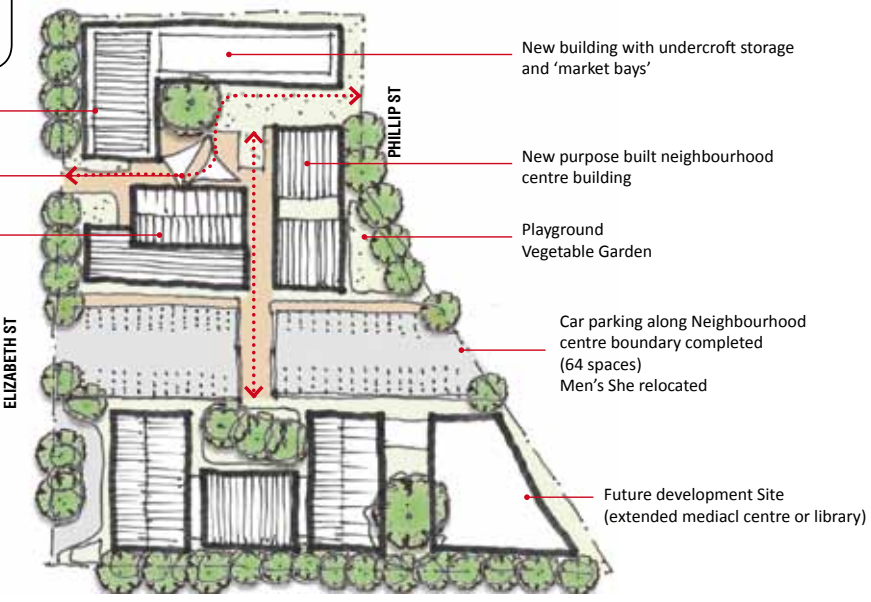
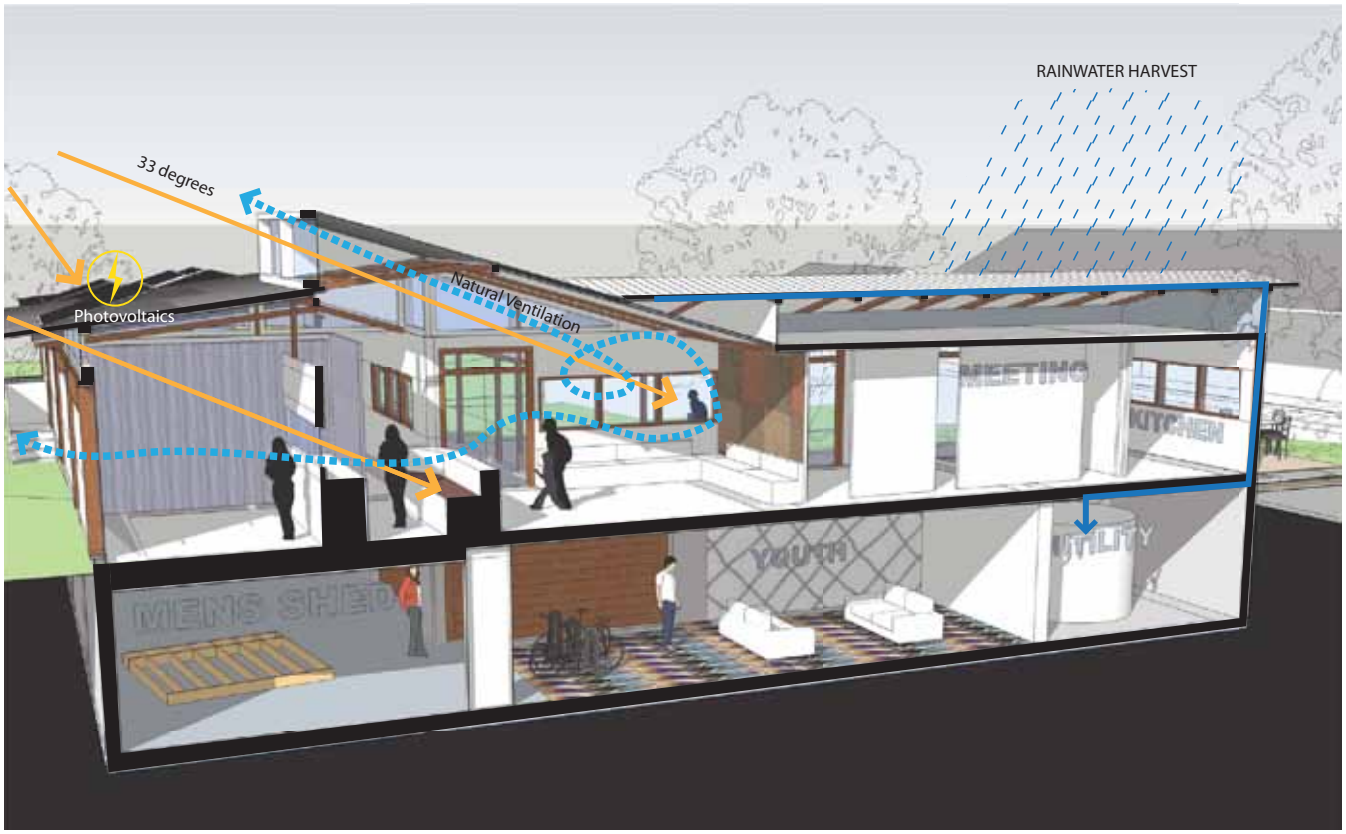
Neighbourhood Centre - Future scheme identifies a number of new buildings to meet growing demand whilst retaining the pedestrian orientated scale, landscaping and circulation through the site.



FUTURE EXPANSION

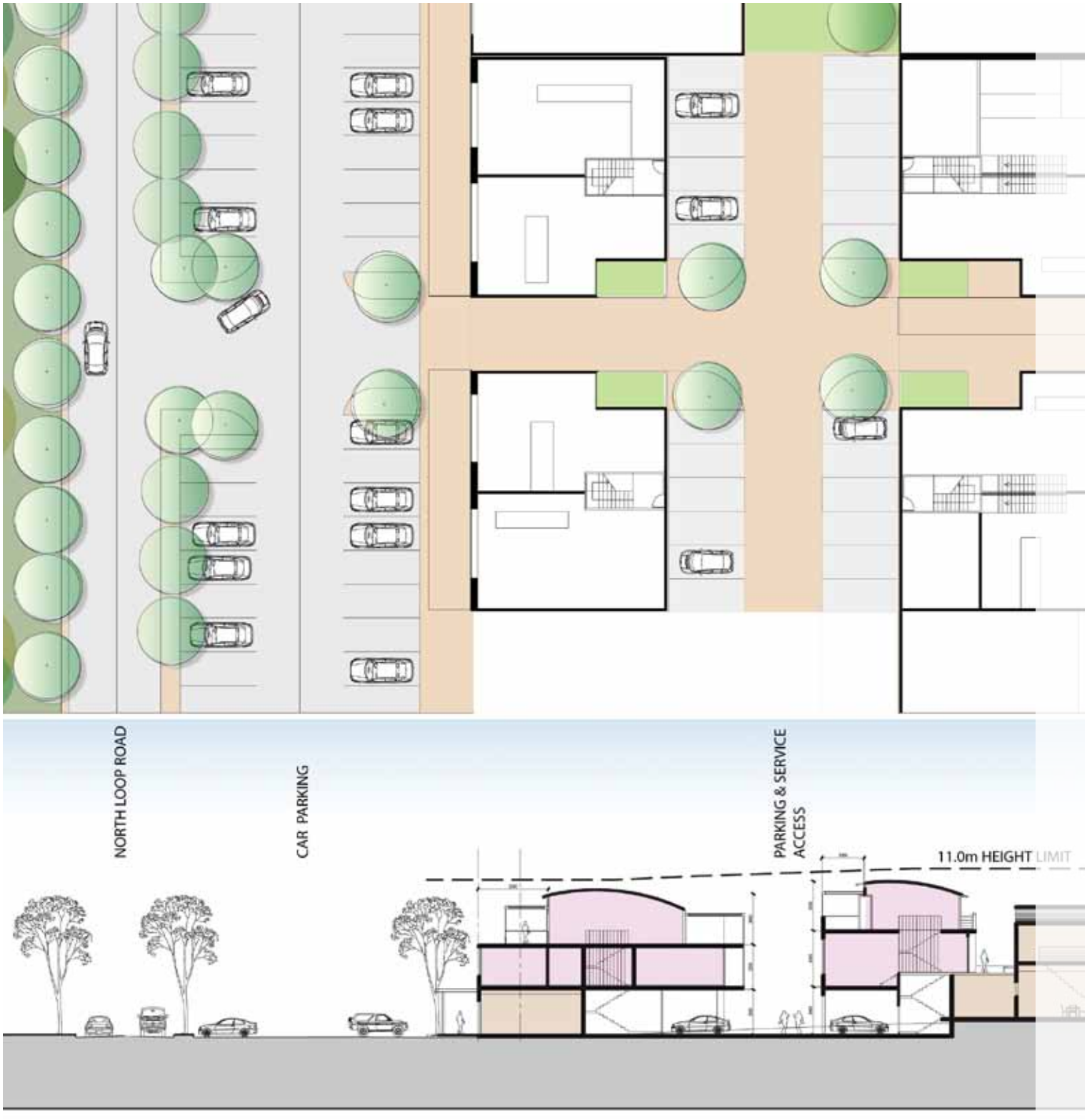
DEVELOPMENT SCENARIO - OLD SCHOOL SITE & ADJOINING NRAHS LAND
LIBRARY, NEIGHBOURHOOD CENTRE, AREA HEALTH, LIBRARY

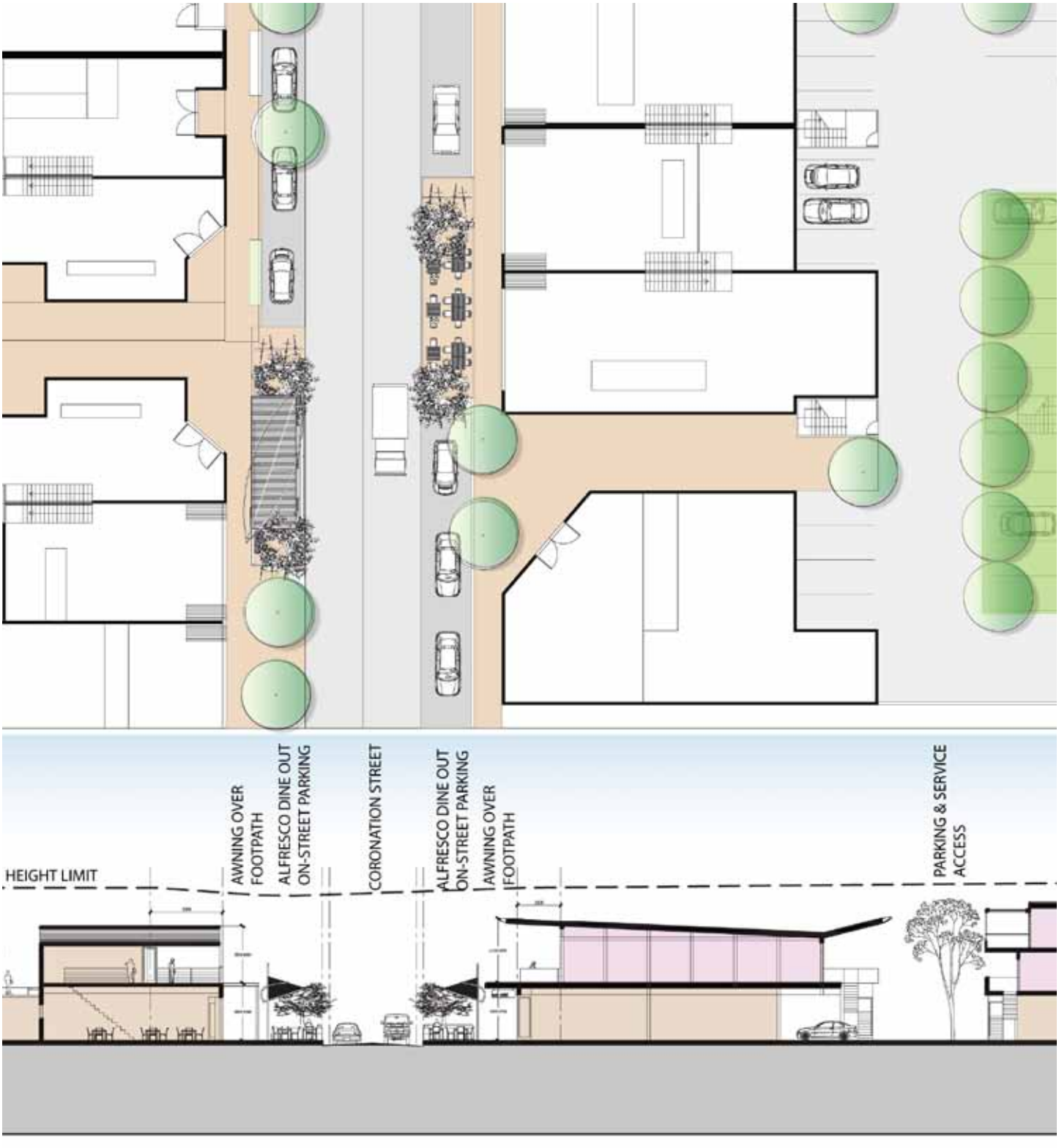


DEVELOPMENT SCENARIO - CONCEPT NEW ADMINISTRATION BUILDING FOR POTTSVILLE BEACH NEIGHBOURHOOD CENTRE

Overview	TYPICAL CORONATION ST INFILL DEVELOPMENT A typical 2/3 storey mixed use scenario combines retail units on the ground floor with food/ beverage/restaurant/speciality store uses working in concert with the street build out areas. The upper level could accommodate either a level of commercial floorspace or residential accommodation. The 1st floor includes a recessed balcony which serves to provide shaded outdoor amenity whilst layering and articulating the elevation. Loading bay and car parking would be accessed off either a rear lane or shared access handle. It is imperative that the scale of the buildings reflects the Pottsville Coastal Village Character. This is achieved by relatively narrow shop fronts, awnings or shading over the footpath, integration of street planting into building design, complimentary signage and building material choice.		
		Compliance	**Comment**
Use	Mixed use (Retail, Commercial, Residential)	✓ Yes	Complies
Height	2/3 Storeys	✓ Yes	Complies
FSR	1.75:1	✓ Yes	Complies
Site Area	1050sqm		
Building Area	1840 sqm (not including basement)		
Basement	1 Level 12 cars spaces required: ■ 4 commercial ■ 4 residential ■ 4 retail	✓ Yes 6 car spaces accommodated in basement, 6 car space contribution	
Ground Level	TOTAL 860 sqm ■ 4 retail units 215 sqm; OR ■ 2 large tenancy pub/restaurant 400sqm ■ carpark entry ~ upper level entry/lobby		
Level 01	TOTAL 700 sqm ■ 200sqm retail/restaurant balcony ■ Commercial Floorspace; or ■ 4 residential units lower levels		
Level 02	TOTAL 210 sqm ■ 4 residential Units upper levels		

DEVELOPMENT SCENARIO - CORONATION ST MIXED USE IN-FILL DEVELOPMENT
RETAIL, ALFRESCO DINING, COMMERCIAL & OR RESIDENTIAL ABOVE


NORTH LOOP ROAD
CAR PARKING
PARKING & SERVICE ACCESS
11.0m HEIGHT LIMIT



DEVELOPMENT SCENARIO - CORONATION ST MIXED USE IN-FILL DEVELOPMENT
RETAIL, ALFRESCO DINING, COMMERCIAL & OR RESIDENTIAL ABOVE

Overview	TENNIS COURT SITE The existing tennis courts site has the potential to be redeveloped as a sports and community focused precinct. Potential new uses include a sporting club house with ancillary change rooms, storage, meeting rooms and kiosk; a multi- purpose community hall which can be adapted for indoor sports such as basketball and volley ball; and a linear building which has an embedded flexibility to be subdivided, expanded and contracted for a range of community needs such as youth drop in centre, child care, adult education, gym, yoga and pilates rooms as examples. The collection of buildings address Pottsville Oval whilst enclosing a new public landscaped forecourt or skate bowl. This collection of buildings and new complimentary sports and community uses within this location will contribute to an increased use of Pottsville Oval.		
		Compliance	**Comment**
Use	Sports Club, Community hall, gym, youth drop-in, yoga/pilates rooms.	✓ Yes	Complies
Height	1/2 Storeys	✓ Yes	Complies
FSR	0.6:1	✓ Yes	Complies
Site Area	4500sqm		
Building Area	2700 sqm		
Sports Club	TOTAL 900 sqm ■ Change rooms ■ Meeting Room ■ Kitchen / Kiosk ■ Equipment storage	✓ Yes	
Community Hall	TOTAL 500 sqm ■ meeting facilities ■ indoor sports (basketball, volleyball)		
Multi-Purpose	TOTAL 1200 sqm ■ Youth drop In; Child care; Yoga / pilates; Gym		
Public Domain	TOTAL 1900 sqm ■ Hard & soft landscaping, furniture, lighting, signage ■ Skate bowl ■ Bocce court; Childrens play equipment		

DEVELOPMENT SCENARIO - TENNIS COURT SITE ADJOINING POTTSVILLE OVAL
SPORTS CLUBHOUSE, COMMUNITY HALL, GYM, YOUTH FACILITIES


8
6
7
5
3
2
1

1. *Vehicular access from north loop rd & car park to round about*
2. *Shaded park, seating, lighting, water bubblers, lighting*
3. *Pedestrian threshold crossing linking oval with market park*
4. *Shared zone; paved parking, bollards*
5. *Public Space; water feature, shade signage, lighting, seating, bike parking, bubblers*
6. *Market park; temporary shade structures, utility outlets*
7. *Recessed corner, seating, alfresco dining*
8. *Pedestrian / cycle path to community centre / library & Formailised nose-in parking*

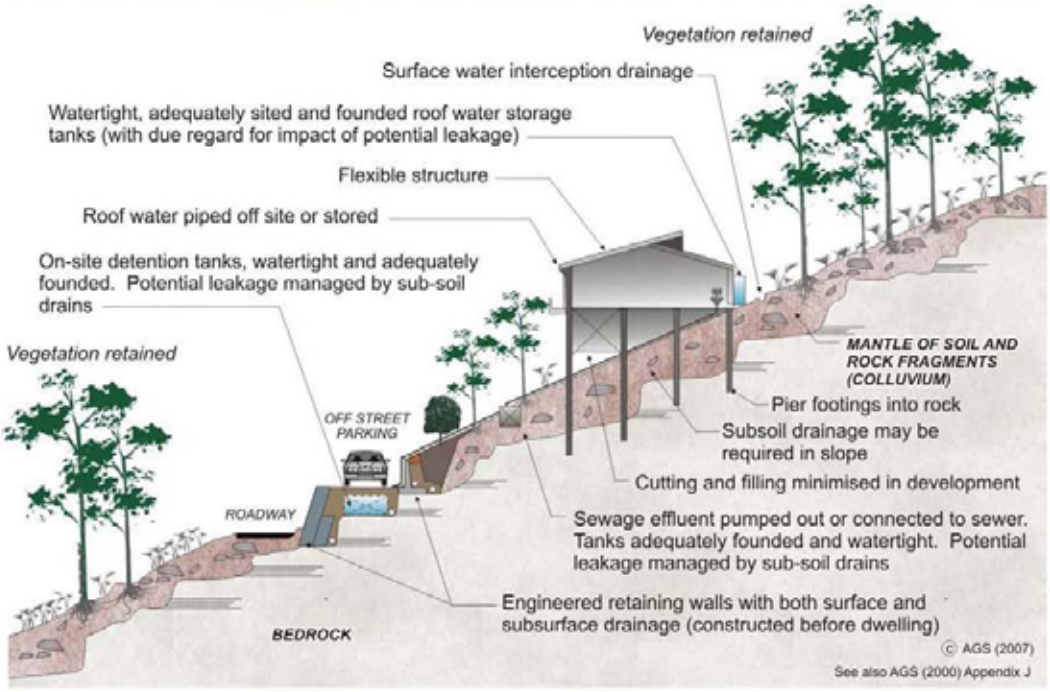
GATEWAY CORNER PUBLIC DOMAIN

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

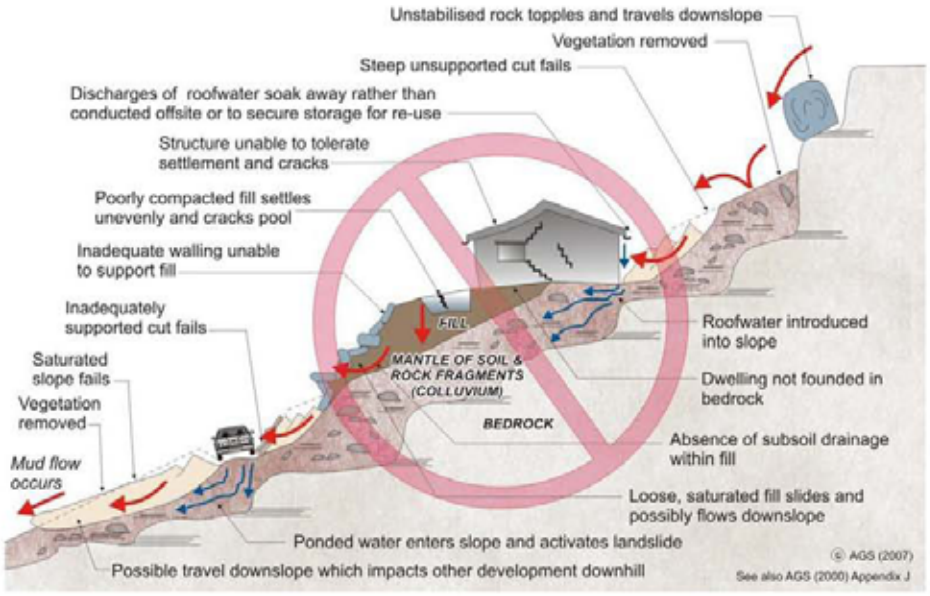
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

Native Flora for Planting at Koala Beach

(Prepared by John Turnbull – TSC Bushland Officer, June 2008)

Flora Species for Urban Gardens

Koala Beach can be divided into two broad vegetation communities;

1) Swamp sclerophyll areas which are located at lower elevations and are typified by Broad-leaved Paperbark and Swamp Oak forests. These communities occur adjacent to Sugar Glider Drive and lower sections of Sassafras Drive and Muskheart Circuit and;
2) Wet sclerophyll eucalypt forests on the low hills above the floodplain including Blackbutt (*Eucalyptus pilularis*) and Brushbox (*Lophostemon confertus*) open forests.

To guide landholders in the selection of appropriate species for use in suburban gardens consideration needs to be given to the slope, aspect, drainage and soil characteristics of their site as well as any existing onsite vegetation that may provide shade, shelter or competition for planted species.

South- and east-facing slopes tend to be more protected, cooler, moister and more likely to support rainforest and moisture loving species, while hill tops and north- or west-facing slopes which are more exposed to the sun and drying winds are more likely to support sclerophyll or hardier rainforest species. Low-lying areas will favour species that can tolerate prolonged water inundation or periodically wet soils.

Consideration should also be given the time that you will have to tend the garden, whether supplementary water will be required, what type of garden you are trying to create, e.g. low maintenance, bird-attracting, bush tucker, scented, etc. In addition the mature size of any species planted needs to be considered to avoid having to remove plants in the longer term; smaller, fast-growing and short-lived species can be inter-planted with slower growing or larger species as an interim measure.

Listed below is a small selection of locally endemic native species that would be suitable for planting at Koala Beach, reputable local nurseries should also be able to provide advice on what to plant where.

Common Name	Scientific Name	Habitat	Habit
Tall Shrubs – Small Trees (5-15m)			
Broad-leaved Lilly Pilly	*Acmena hemilampra*	Occurs in STRf & LRf; hardy in full-sun and adaptable to a range of free-draining soils	Commonly a **5-12m** bushy coastal shrub/tree (can grow to 30m); Flaky, often fissured bark, bark on twigs smooth, becoming slightly flaky with age; attractive white fruits and decorative foliage.
Red Ash	*Alphitonia excelsa*	Natural colonizer of a range of situations from warmer Rf, OF and dry woodland, often in sheltered gullies or on steep slopes of the coast and inland; Planted as hardy cover spp due to rapid growth, potential cabinet timber.	Mostly **15-20m**, some to 35m; Open crown with silver-backed leaves, buds and young stems grey to golden-brown hairy.
Rough-leaved Elm	*Aphananthe philippinensis*	In STRf and DRf, often along streams or on alluvial flats; fruits desirable to birds; appealing tree which adapts to cold and dry	Shrub or tree **8-20m**+, depending upon water availability; Dense, handsome foliage and compact tight crown with

Common Name	Scientific Name	Habitat	Habit
		sites; hardy when established.	sandpaper rough leaves.
Broad-leaved Native Gardenia	*Atractocarpus benthamianus*	Grows in STRf, WTRf and tall sclerophyll forest, north from Forster to Nambour, Qld.	Tall shrub or small tree to **c. 8m** high, young shoots pubescent; Leaves opposite or in whorls of 3 or 4; flowers white, fragrant
Grey Myrtle	*Backhousia myrtifolia*	In warmer rainforest, often close to streams and other sheltered sites; In open situations foliage is dense to the ground; Profuse flowering, hardy to cool conditions, can be slow growing at first.	**3-7m** with finely scaly bark
Weeping Bottlebrush	*Callistemon viminalis*	Common along stream banks and watercourses; often rocky areas; adaptable to full sun, most soil types and conditions, may be frost tender when young; bird attractive	Bushy **8-12m** high or smaller; bark dark, furrowed; branches generally arching/weeping covered in silky hairs when young
Brown Kurrajong	*Commersonia bartramia*	In warmer rainforest, its margins and clearings on the coast and ranges; Important regeneration able to handle exposure; with fast growth rate, while filtered shade does not inhibit plants developing beneath; Frost sensitive when very young but generally very hardy.	**7-8m** tall; Pale trunk and horizontally layered branches are attractive especially when in flower;
Forest Maple	*Cryptocarya rigida*	From coastal STRf and WTRf, especially on their margins, and in tall eucalypt forest; north from Ourimbah area.	Shrub to small tree **6-15m**
Tuckeroo	*Cupaniopsis anacardioides*	In LRf and scrub near the sea and along estuaries; Handsome small to medium shade tree or dense shrub when more exposed, seed attractive to birds; Hardy and adaptable.	To **10m**, often smaller in isolated or exposed sites; new growth shortly pubescent and pink.
Orange Boxwood	*Denhamia celastroides*	Grows in most types of rainforest and margins with wet sclerophyll forest; tolerant of moderate frosts and full sun, prefers some shade may be slow growing	Shrub or small tree to **7m** high; branchlets striate.
Corkwood	*Duboisia myoporoides*	In high-rainfall areas and on margins of STRf, WTRf, LRf and DRf and in regrowth; Hardy, fast growing and suitable for regeneration plots	**6-10m** shrubby tree, can reach 20 m high; Bark thick and corky, showy flowers.
Blueberry Ash	*Elaeocarpus reticulatus*	Mostly in gullies or along watercourses in marginal Rf areas, moist open forests	**2-3m** shrub to **6-8m** small tree; attractive small flowers followed by blue fruits; very

Common Name	Scientific Name	Habitat	Habit
		and adjacent to the ocean; From sea-level to the ranges	hardy, tolerate frost, salt air, poor soil, wind, full sun and periodic dryness.
Red Olive Plum	*Elaeodendron australe (Cassine australis)*	Along the coast and ranges in coastal, inland and depauperate rainforests; Adaptable, bushy to the ground and excellent screen.	To **8m** high, dioecious; stiff, leathery leaves are dark green and glossy with toothed or scalloped margins; bright-orange-red fruit occur in clusters and hang for several months.
Guioa	*Guioa semiglauca*	Grows in warmer rainforest from the coast to the ranges, often in regrowth; versatile, fast-growing and bird attracting, useful in regeneration plots. Hardy	**6-10m**, taller on fertile sites; Common pioneer spp., may produce several trunks or branch low down; Bark smooth, grey to dark grey, often ± blotched with lichen; New growth pubescent and adult foliage distinctly grey-green on underside.
Native Frangipani	*Hymenosporum flavum*	Grows in or near rainforest or WSf on fertile soils, north from Grose Valley (near Sydney) and inland to the Liverpool Ra.	Tall shrub or small tree, **8-12m** rarely to 20 m high, occasionally partly deciduous; fragrant flowers in spring.
Foambark	*Jagera pseudorhus*	Occurs in warmer rainforests, WSf and their margins, on stream and creek banks on basaltic and alluvial soils; Full-sun and mild frost are tolerated	**5-10m** in open and up to 15m in forest, often smaller in open; Umbrella shaped crown and distinctive ferny foliage which apricot-pink flushes, most parts densely rusty-hairy.
Red Kamala	*Mallotus philippensis*	Grows on margins and within warmer rainforest; chiefly north from the Hunter R.; tough in full sun and depleted soil, useful regeneration spp.	Tree to **10m** high, fruits covered in red granular material used in dying;
Muttonwood	*Myrsine variabilis (Rapanea variabilis)*	Grows on margins and within warmer rainforest; tough in full sun and depleted soil, useful regeneration spp.	Tree to **10m** high.
Large-leaved Mock-olive	*Notelaea longifolia*	From Lismore to Cape York; hardy in dry and low fertility sites; useful regeneration spp to attract native bees and flies.	To c.**8-9m** high, often with a dense crown of leathery leaves; branchlets grey or brown, usually with conspicuous white lenticels.
Scrub Turpentine	*Rhodamnia rubescens*	In STRf, WTRf, LRf, DRf and sclerophyll ecotone, common in margins and regrowth; Fruit provides valuable food source for frugivorous birds; Hardy in a wide range of soil types, habitats and temperature ranges	To **10m** high, occasionally taller; Bark reddish brown, rough, scaly and fissured; young stems densely hairy, leaves hairy underneath.
Scentless Rosewood	*Synoum glandulosum*	Widespread in warmer rainforest, north from Milton.	Small tree **to 7m** high, with brown scaly bark, new growth pubescent.
Brush Cherry	*Syzygium australe*	In Rf along the E coast, almost always next to	From **3-30m**, dependent upon site, usually <10m in

Common Name	Scientific Name	Habitat	Habit
		creeks; Excellent ornamental with dense crown, shade or screen tree Adapts to most soils, full sun and some frost; may suffer from psyllid attack.	the open; with attractive flowers and fruits, new growth is reddish.
Blue Lilly Pilly	*Syzygium oleosum*	Grows in LRF, STRF, WTRf and moist open forests from Wollongong to NE Qld; Often appears as regrowth; Adaptable to soils, fast-growing,	To **10m**; In full sun has dense, ground-hugging foliage with frequent bronze flushes of growth, with flaky bark, purple fleshy fruits and attractive foliage and form.
Water Gum	*Tristaniopsis laurina*	Grows near creeks in and around Rf and WSf; Widespread along coast and ranges; Handsome tree for screen or fill-in beneath taller spp; Handles cold, medium frost, wet soil, low fertility and full sun.	**5-10m** high but may grow to 20m; Usually shrubby tree with smooth, pale bark shedding in strips, leaves redden during cold weather
Tree Heath	*Trochocarpa laurina*	Grows in wet sclerophyll forest, warm-temperate rainforest to 800 m alt. and littoral rainforest, north from Bermagui.	Compact shrub to crooked tree to **13m** high often shorter, glabrous; bark grey to brownish black, corky, finely fissured to platy.
Shrubs (<6m)			
Narrow-leaved Gardenia	*Atractocarpus chartaceus*	Grows in STRf and DRf, north from Richmond R. to Gladstone, Qld	Shrub to **c. 3m** high, ± pubescent.; Leaves opposite or in whorls of 3; flowers white, fragrant
Coffee Bush	*Breynia oblongifolia*	Widespread in or near warmer rainforest, also in moist areas in woodland and eucalypt forest.	Shrub to **3m** high
Broad-leaved Palm Lilly	*Cordyline petiolaris*	In warmer rainforest and WSf from coastal lowlands and ranges, north from the Nambucca River to SW of Gladstone, Qld.	Shrub to **5m** high, often sprawling and branched.
Red fruited Palm Lilly	*Cordyline rubra*	Coastal lowlands and ranges; north from Lismore to about Bundaberg. In warmer rainforest and wet sclerophyll forest.	Shrub to **4m**; sometimes branched.
Narrow-leaved Palm Lilly	*Cordyline stricta*	On coastal lowlands and ranges north from near Bilpin (lower Blue Mtns).	Shrub to **5m** high, sometimes sprawling and branched towards base.
Glossy Laurel	*Cryptocarya laevigata*	Rf understorey shrub	To **5m** tall, Dense, dark green, glossy foliage; hardy, bushy from young age with attractive red fruits.
Copper Laurel	*Eupomatia laurina*	Widespread in or near warmer rainforest and moist eucalypt forest on the coast and lower ranges; suits a shady site.	Loose, arching shrub **2-5m**, branchlets often black.
Hovea	*Hovea acutifolia*	Grows on rainforest margins or in WSf or other damp sheltered sites.	Slender shrub to **c. 4m** high; stems and branches with a dense covering of

Common Name	Scientific Name	Habitat	Habit
			grey to rusty, curled and crinkled hairs intermixed with longer, straight hairs.
Olive Tea-tree	*Leptospermum liversidgei*	In low-lying sandy and peaty swamp coastal heath; does well in most soils that don't dry out readily and tolerates waterlogging; Sunny or semi-shaded sites suit.	To **4m** high, bark close, younger stems with a short pubescence and foliage lemon-scented;
Wild May	*Leptospermum polygalifolium*	From sandy soils, common in moist sites and along watercourses; Reliable in a range of soils and conditions, variable in form, often used for screening or windbreak; Hardy and tolerates extended wet or dry periods.	**1-6m x 1-3m**; spreading, silky-hairy new growth, sometimes bronze;
A Tea-tree	*Leptospermum whitei*	Grows in heath in sandy, swampy coastal soils; adaptable to soils; will not tolerate drying out, tolerates full sun to semi-shade, damaged by heavy frosts.	**2-6m** high with fibrous flaking bark in reddish-brown layers, younger stems pubescent;
Narrow-leaved Orangebark	*Maytenus silvestris*	In DRf, vine thickets, open forest and moist eucalypt forest, north from Camden and the Illawarra region.	Shrub to **4.5m** high; narrow, toothed leaves and bright orange fruit with black seeds and orange surround.
White Dogwood	*Ozothamnus diosmifolius*	Grows on margins of rainforest and in heath in a variety of soils, often on ridges; widespread, north from Eden district.	Much-branched, erect shrub **to 5m** high, **usually c. 2m** high; branches with short rough hairy covering.
Narrow-leaved Geebung	*Persoonia linearis*	In sclerophyll forest or woodland on various soils; south from the Macleay R. catchment.	Erect shrub or small bushy tree **2-6m** with flaky bark, young branchlets moderately to densely hairy.
Orange Thorn	*Pittosporum multiflorum (Citriobatus mulitflorus)*	Grows in or near rainforest or wet sclerophyll forest, on shales or well-drained volcanic soils; provides roost site for small birds.	Rigid, much-branched **1–3m** high, sometimes straggly shrub, branches bearing numerous slender spines; stems brittle.
Rough-fruited Pittosporum	*Pittosporum revolutum*	Grows in Rf, WSf, chiefly in coastal districts; very hardy in a range of situations, including full sun and light frost	Shrub to **c. 3m** high depending upon exposure, up to 8m in Rf
Hairy Psychotria	*Psychotria loniceroides*	Grows in LRf, warmer rainforest and wet sclerophyll forest; widespread, north from Bega district.	Shrub or small tree to **c. 5m** high, usually shorter.
Banana Bush	*Tabernaemontana pandacaqui*	Grows in warmer rainforest and wet sclerophyll forest, north from Manning R.	Shrub to **3m** high, glabrous; fragrant white flowers and attractive yellow, banana-shaped fruit, seeds surrounded by red pulp
Poison Peach	*Trema tomentosa var.*	Widespread in regrowth	Shrub or small tree **3-6m**

Common Name	Scientific Name	Habitat	Habit
	viridis (T. aspera)	and margins of rainforest, in moist sclerophyll forest and in open rocky areas.	tall, young branches pubescent; small black fruits attractive to parrots.
Veiny Wilkiea	*Wilkiea heugeliana*	In all rainforest except CTRf; widespread on the coast and ranges, north from the Beecroft Peninsula to SE Qld; hardy in sun or shade and most soils with adequate drainage.	Bushy shrub to **6m**; attractive black fruits on yellow receptacle; stiff leaves with toothed margin.
Palms and Cycads			
Bangalow Palm	*Archontophoenix cunninghamiana*	In STRf and LRf, mostly beside creeks and on wet alluvial flats, often in groves; Hardy to full sun, tolerates some cold; best planted enmasse.	**20–25m** tall and 25 cm diameter, enlarged at the base.
Shining Burrawang	*Lepidozamia peroffskyana*	In hilly country, in WSf and edges of STRf and WTRf; north from the Manning R. to Nambour, Qld. Sometimes cultivated as an ornamental, slow growing.	Thick trunk **0.5–7m** high, usually less than 3m; compound leaves 2–3 m long on mature plants; leaflets up to 200 x 10-30cm long thick and glossy; male and female cones on separate plants
Walking Stick Palm	*Linospadix monostachya*	In STRf, WTRf and occasionally CTRf, from Bulahdelah to Gympie; The stems have been used to make walking sticks. The small knob at the base of the stem being carved to form a handle.	Single stemmed palm, stems mostly **1.3–2m high,** occasionally to 5 m high, 2–3 cm diameter; Leaves divided, 50–130 cm long; flowers on a simple pendulous spike, 1–1.5 m long; bright red fruits.
Cabbage-tree Palm	*Livistona australis*	Widespread in coastal districts commonly in colonies; Grows in moist sclerophyll forest, along stream banks and often in swampy sites, and on margins of rainforest; require some early protection but hardy once established, tolerate some drying out, light frosts.	**20-30m** high (occasionally more), up to 50 cm diam., marked with annular scars and furrows;
Pineapple Zamia	*Macrozamia lucida*	In WSf and edges of STRf and WTRf north from Pottsville to Nambour, Qld; slow growing.	Unbranched palm-like shrub, stem mostly subterranean to **10–20 cm diam**eter, or more; Leaves mostly 2–15 in the crown, 80–110 cm long; male and female cones on separate plants.
Twiners/Scramblers			
Wombat Berry	*Eustrephus latifolius*	Grows in sclerophyll forest, woodland, heath and on margins of Rf; widespread, from coastal districts and inland.	Vine with **stems to 6m** long, sometimes much branched; yellow fruit capsule opens to reveal glossy black seeds.
Scrambling Lilly	*Geitonoplesium cymosum*	Grows in or near Rf, in sclerophyll forest and woodland, widespread in	Vine with **stems to 8m** long; fruit a black globose berry.

Common Name	Scientific Name	Habitat	Habit
		coastal districts and also on the ranges.	
Purple Coral Pea	*Hardenbergia violacea*	Widespread in a variety of habitats.	Climbing or prostrate, glabrous sub-shrub; stems often to **2 m** long.
Climbing Guinea Flower	*Hibbertia scandens*	Occurs in moist sclerophyll forests, heaths and littoral forests.	Climber/sprawler with stems to **4m** long.
Morinda	*Morinda jasminoides*	Grows in rainforest and sclerophyll forest, often in gullies; widespread.	Woody climber or scrambling shrub, ± glabrous; fruit an irregularly shaped orange fleshy head.
Groundcovers/Clumpers			
Native Ginger	*Alpinia caerulea*	Widespread in coastal rainforest; attractive arching stems and blue fruits.	Perennial herb with stems to **3m** high.
Midgen Berry	*Austromyrtus dulcis*	Grows in heath or dry sclerophyll forest on sandy soils along coast.	Semi-prostrate spreading shrub, up to **0.5m** high, with finely flaky bark; young shoots densely hairy.
Gristle Fern	*Blechnum cartilagineum*	Widespread hardy fern found in open forest and rainforest.	Fronds erect, clustered, all ± similar, pinnate, usually **50–100cm** long, often pink when young, pale green and ± harsh when mature, segments usually alternate.
River Lily	*Crinum pedunculatum*	From shady, moist conditions under a canopy to exposed beach fronts, swamps and along stream banks; Hardy to sun, shade, poor drainage, saline influence, frost and indifferent soil.	Clumping plant with stout, sometimes branching pseudo stem to **45cm** high; fragrant flowers carried on ends of stems
Blue Flax Lilly	*Dianella caerulea*	Grows in heath to sclerophyll forest.	Perennial tufted, solitary herb to **0.5m** high.
Tall Saw-sedge	*Gahnia clarkei*	Grows on creek banks and near swampy areas in coastal districts, extending inland; attracts threatened Varied Sword-grass Brown butterflies.	Tuft forming sedge with stout stems, **2-2.5m** high, “cutting edged" leaves and golden brown flower plumes followed by reddish brown fruit.
Mat Rush	*Lomandra hystrix*	Grows amongst rocks in Rf streams, often as dense colonies; hardy but needs ample water initially, adaptable to full sun, shade, frost and variable soils; excellent stream-bank erosion inhibiter.	**1m** bushy clumps.
Long-leaved Mat-rush	*Lomandra longifolia*	From inland areas to the coast; Needs free-drainage but adaptable to most soils and locations provided they receive some sunshine, hardy to most frosts; very variable spp so select local variants for planting.	**1m+** clumps; tussocks form an important refuge for many fauna spp.
Kangaroo Grass	*Themeda australis*	Widespread in a variety of habitats.	Tufted perennial grass to **1.2m** high; often tinted red.

Common Name	Scientific Name	Habitat	Habit
Grass Tree	*Xanthorrhoea johnsonii*	Usually grows in sclerophyll forest and heath in well-drained sites; north from Singleton, widespread.	Trunk **0.1–5m** high; stem and crown usually 1; young leaves in spreading upright tuft; old leaves often strongly reflexed.
Threatened Species			
Beach Acronychia	*Acronychia imperforata*	Grows in lowland rainforest, usually near the coast in LRf; excellent for regeneration; May prove difficult to purchase as hard to propagate.	From **2-15m** dependent upon site conditions, salt exposure, etc., commonly **6-10m**; Maintains an attractive lightly-leaved crown, frequently holding decorative fruits.
Toothed-leaved Palm Lily	*Cordyline congesta*	On coastal lowlands.	Shrub to **3m** high, sparsely branched; with toothed margins and clusters of orange-red fruits
Long-leaved Tuckeroo	*Cupaniopsis newmanni*	In and on the margin of WTRf and STRf from Mullumbimby to Beenleigh, also Kin Kin, Qld.	Attractive shrub to small tree **3-8m**, young shoots rusty, hairy; slender trunked, rarely branching; leaves compound with up to 24 leaflets
Rough-shelled Bush Nut	*Macadamia tetraphylla*	In STRf; Usually near the coast, confined chiefly to the Tweed and Richmond Rivers and to Mt. Tamborine.	Small to medium-sized tree **8-15m** and often as broad; new growth reddish, attractive chains of flowers.
Stinking Cryptocarya	*Cryptocarya foetida*	In LRf and occasionally STRf, usually on sandy soils, mature trees known to occur on basalt.	**Small to medium sized tree**; young growth hairy, soon becoming glabrous; flowers sometimes with an offensive odour.
Davidson's Plum	*Davidsonia pruriens* var. *jerseyana*	Confined to STRf and WSf at low altitudes in coastal areas.	Small, slender tree **to 6-8m** may be unbranched or form a clump of stems; new growth pink, hairy; blue-black ovoid fruit make excellent jam.
Sweet Myrtle	*Gossia fragrantissima* (*Austromyrtus fragrantissima*)	In DRf, STRf and riverine Rf of coastal districts from Lismore to Currumbin Creek.	**Shrub or small tree,** bark rough, flaky or fissured; fragrant flowers and small orange to red fruits.
Fine-leaved Tuckeroo	*Lepiderema pulchella*	In riverine, LSTRf and LRf from Brunswick River to Tallebudgera Ck.	Small tree **6-10m**, new growth pink to pale green and limp, hardening to dark green; orange fruits develop in December.

Abbreviations

OF - Open Forest
Rf - Rainforest
DRf - Dry rainforest
LRF - Littoral rainforest
WTRf - Warm Temperate rainforest
STRf - Sub-Tropical rainforest
LSTRf - Lowland Sub-Tropical rainforest
WSf - Wet Sclerophyll forest

Feed species for local threatened fauna

Koala (*Phascolarctos cinereus*)

These species are large canopy trees that are unlikely to be suitable for use in residential blocks but could be utilised in public reserve areas, on larger blocks or along roadsides where appropriate. Local Koalas may also browse on or roost in other species.

Common Name	Scientific Name	Habitat
Grey Gum	*Eucalyptus propinqua*	Lower to mid slopes as part of wet sclerophyll assemblage
Tallowwood	*Eucalyptus microcorys*	Lower to upper slopes as part of wet sclerophyll assemblage
Forest Red Gum	*Eucalyptus tereticornis*	Alluvial flats and lower to mid slopes on fertile soils
Swamp Mahogany	*Eucalyptus robusta*	Low lying, swampy or periodically inundated areas

Glossy Black Cockatoo (*Calyptorhynchus lathami*)

Glossy blacks feed on the seeds of a range of She-oaks (*Casuarina* and *Allocasuarina*) and are dependant upon large hollow bearing eucalypts for nesting sites. The most appropriate species for domestic gardens are:

Common Name	Scientific Name	Habitat	Habit
Forest Oak	*Allocasuarina torulosa*	Upper slopes as understorey species in wet and dry open to tall open sclerophyll forest. Generally on higher-nutrient soils and in moister situations than *A. littoralis*.	Slender tree up to 10m, usually dioecious (male and female flowers on different plants).
Black She-oak	*Allocasuarina littoralis*	In sclerophyll woodland or tall heath, on sandy on poor soils; coast and adjoining tablelands.	Tree 5–15 m high, usually dioecious.

Common Blossom Bat (*Syconycteris australis*)

Blossom bats roost in rainforest species and preferentially forage on Coast Banksia (*Banksia integrifolia*), they also utilise other flowering sclerophyll species some of which may be too large for domestic gardens, including Swamp Mahogany, Forest Red Gum, Pink Bloodwood (*Corymbia intermedia*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*). Suitable feed species for suburban gardens include:

Common Name	Scientific Name	Habitat	Habit
Coast Banksia	*Banksia integrifolia*	Widespread in coastal sites and near ranges, common on consolidated sand dunes and along tidal inlets in woodland	5–25m high, according to exposure. Leaves whorled, margins entire with occasional short teeth, lower surface white-shortly hairy
Swamp Banksia	*Banksia robur*	In woodland and heath in sandy ± permanently damp sites on the coast	Shrub with several stems arising from a lignotuber, usually 1–2 m high; branchlets rusty-tomentose
Fern-leaved Banksia	*Banksia oblongifolia*	In dry sclerophyll forest to heath; widespread on the coast	Several-stemmed shrub to 3 m high with lignotuber; bark reddish to grey-brown
Wallum Banksia	*Banksia aemula*	From low sclerophyll woodland or tall shrubland (wallum) on consolidated sand dunes, also on sandy flats which are sometimes seasonally waterlogged	Bushy shrub robust tree to 8 m high; bark warty
Old Man Banksia	*Banksia serrata*	Usually in dry sclerophyll	Shrub or tree, to 16 m high in

Common Name	Scientific Name	Habitat	Habit
		forest or woodland on sandstone or consolidated sand dunes, on the coast	favourable habitats, sometimes a shrub to 3 m in coastal sites high; bark warty
Heath-leaved Banksia	*Banksia ericifolia*	From heath, dry sclerophyll forest and woodland, widespread on the coast and ranges	Tall bushy shrub or small tree to 6 m high, single-stemmed at base
Wallum Bottlebrush	*Callistemon pachyphyllus*	Grows in moist ground in Wallum heath and hind dunes	Dense straggling shrub to 1.5 m high
Willow Bottlebrush	*Callistemon salignus*	Mostly grows in low-lying river flats and damp creeks, rarely in dry areas	Large shrub or small tree 3–10 m high; bark papery and peeling

Common Planigale (*Planigale maculata*)

Common Planigales are tiny marsupials with a body length of about 8 cm and a tail as long again. They differ from the common house mouse in having a long, pointed snout and large rounded ears. The head has a flattened appearance. Their fur is grey-brown above, sometimes with tiny white spots, and paler below (DECC 2008). Planting of specific flora species in suburban gardens is unlikely to provide useful habitat for planigales where adjacent bushland areas are in good condition. Planigales are also unlikely to nest in residential buildings.

They inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water. They are active at night and during the day shelter in saucer-shaped nests built in crevices, hollow logs, beneath bark or under rocks. They are fierce carnivorous hunters and agile climbers, preying on insects and small vertebrates, some nearly their own size. They breed from October to January when females build a nest lined with grass, eucalypt leaves or shredded bark (DECC 2008).

To assist the survival of this species at Koala Beach a number of strategies are being implemented by Council in conjunction with the Koala Beach Wildlife Habitat Management Committee including, fox and feral cat control, protection of surrounding bushland through weed management to ensure adequate understorey diversity, maintenance of appropriate fire regimes to retain leaf litter and hollow logs, retention of adequate ground cover, especially near waterways, and protection from further development or clearing.

Residents can help this species to survive by controlling cane toads when encountered, avoid 'tidying' areas of bushland adjacent to their property, and contacting Council Officers if positive identification is required prior to rodent control where some uncertainty exists as to the target rodent's identification.

Further Information Sources

Flora

Threatened Species of the Upper North Coast of New South Wales: Flora, NSW National Parks & Wildlife Service 2002a, NSW National Parks and Wildlife Service, Coffs Harbour, NSW.

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Flora Websites

Royal Botanic Gardens Sydney – photos, line drawings, etc

http://plantnet.rbgsyd.nsw.gov.au/search/florasearch.htm

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The Australian Museum Complete Book of Australian Mammals, 1983, (ed. Ronald Strahan), Angus and Robertson.

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The Slater Field Guide to Australian Birds, Peter, Pat and Raoul Slater, 1989, Landsdowne Publishing Pty Ltd, Australia.

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http://www.austmus.gov.au/

Frogs Australia Network

http://www.frogsaustralia.net.au/frogs/display.cfm?frog_id=172

Australian Water birds

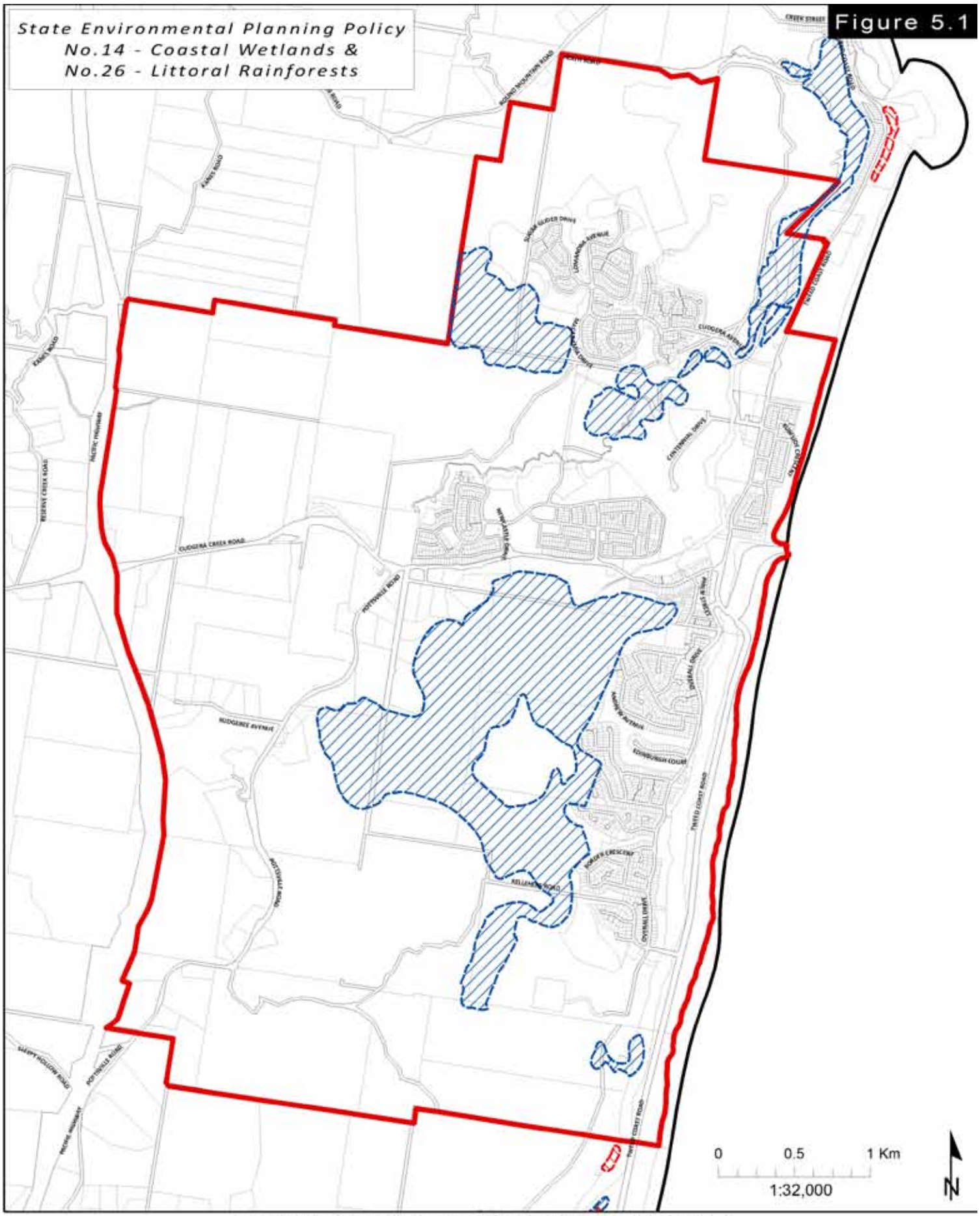
http://www.environment.gov.au/biodiversity/migratory/waterbirds/wetbrds.html

APPENDIX 5.5 POTTSVILLE CONSTRAINTS MAPPING

5.5.1 SEPP 14 Wetlands & SEPP 26 Littoral Rainforest
5.5.2 Flood Planning Areas
5.5.3 Bush Fire Prone Land
5.5.4 Acid Sulfate Soil
5.5.5 Broad Vegetation Communities
5.5.6 Ecological Sensitivity
5.5.7 Ecological Status

State Environmental Planning Policy No.14 - Coastal Wetlands & No.26 - Littoral Rainforests

Figure 5.1



State Environmental Planning Policies

Land to which this Plan applies

SEPP 14 - Coastal Wetlands

SEPP 26 - Littoral Rainforests

Filename: z:\\esri\planning\projects\pottsville locality\mxd\sepp14 and 26.mxd

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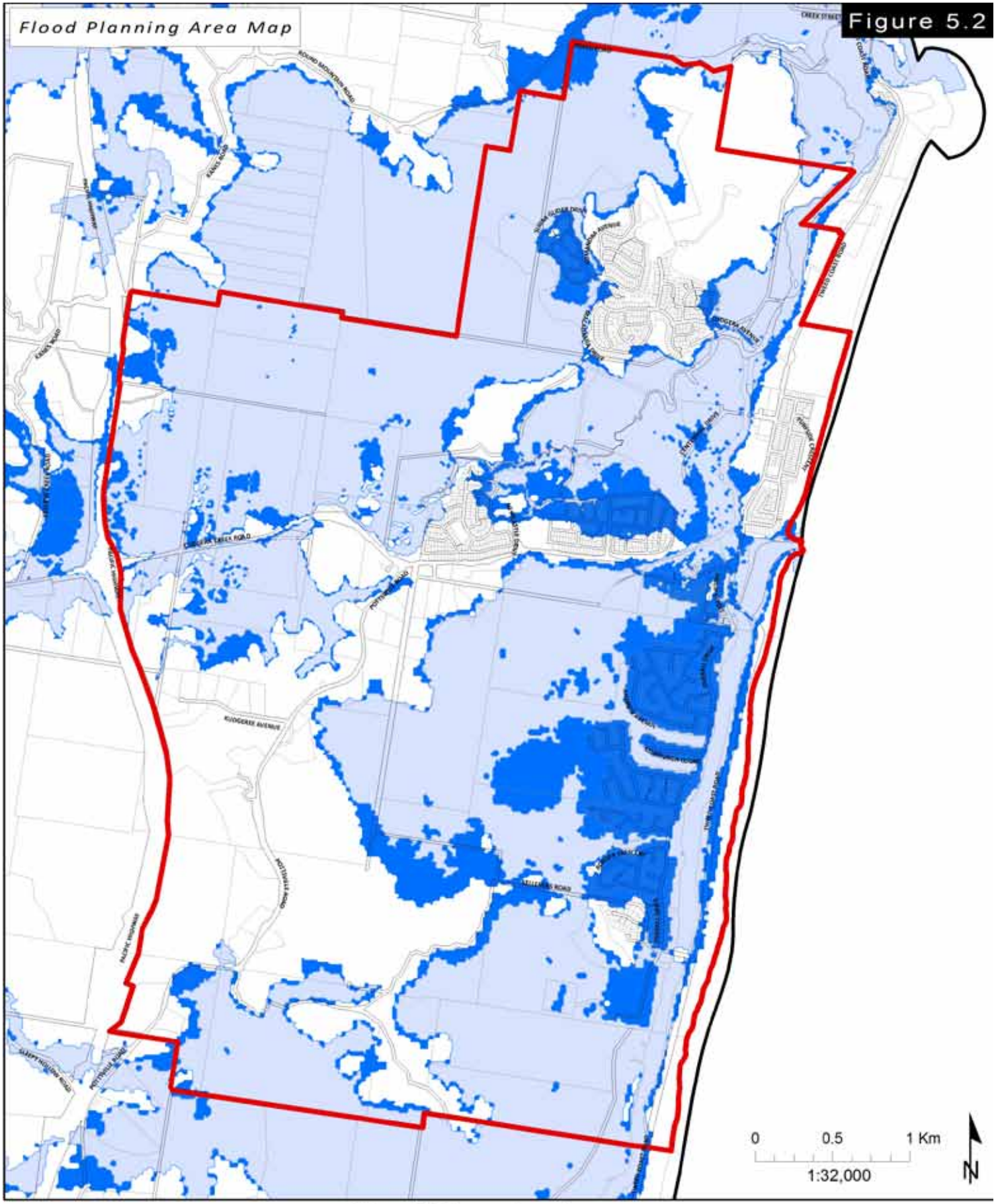
Figure 5.2

Flood Planning Area Map



Flood Planning Areas

Land to which this Plan applies

Flood Planning Area

Level of Probable Maximum Flood

Flood mapping is approximate only and is of limited resolution. Flood Liable land is not limited to areas marked on the map, as not all watercourses and overland flow paths may have been considered. Some locations may require additional survey and/or flood studies to determine the extent of flood liable land

Filename: z:\\esri\planning\projects\pottsville locality\mxd\flood planning area.mxd

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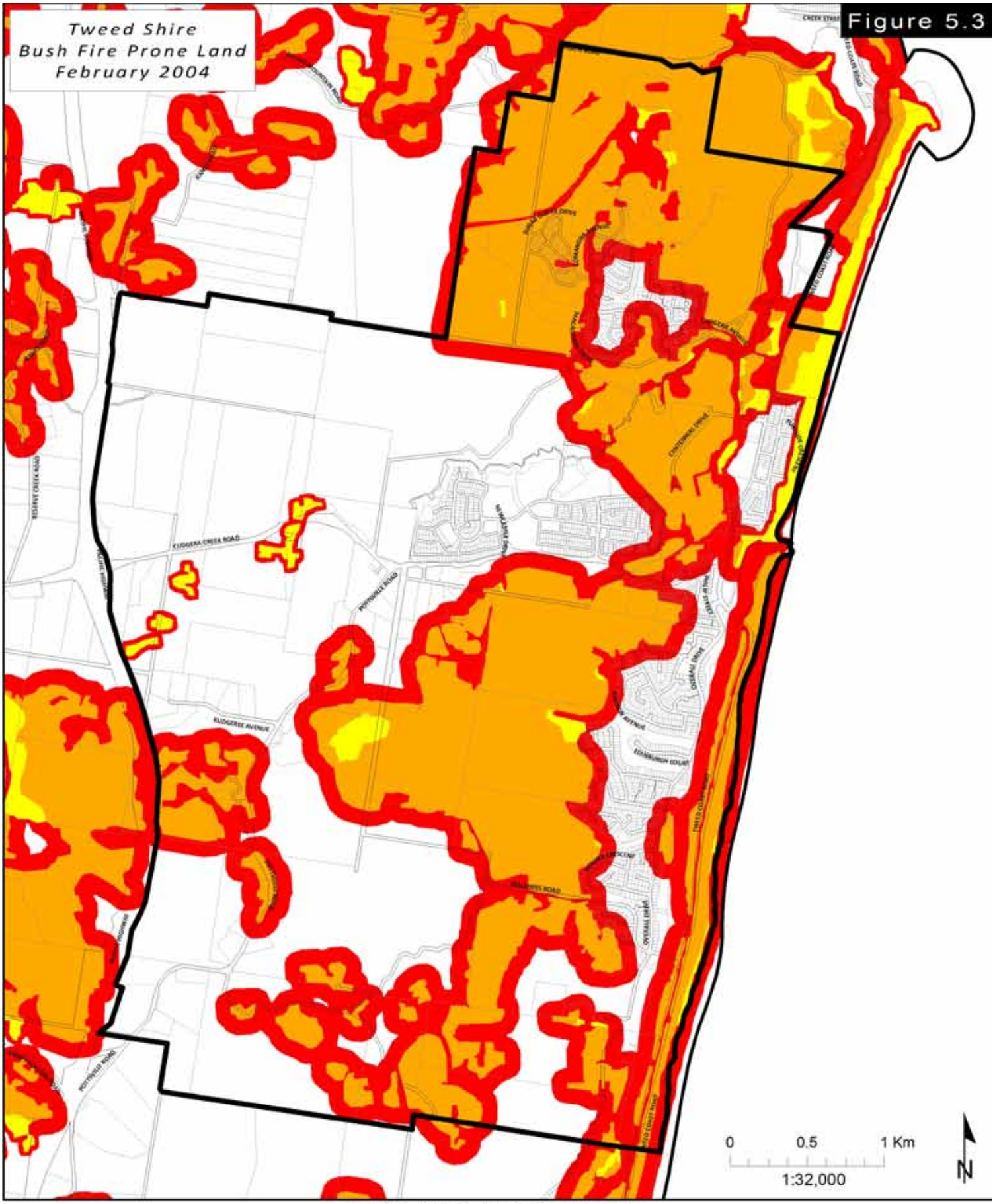
Figure 5.3

Tweed Shire Bush Fire Prone Land February 2004



Bush Fire Prone Land

- Land to which this Plan applies
- Bush Fire Prone Land – Vegetation Category 1
- Bush Fire Prone Land – Vegetation Category 2
- Bush Fire Prone Land – Buffer Zones – 100m and 30m

The Bush fire Prone Land Map was prepared in conjunction with the Tweed Bush Fire Regulation Committee in accordance with guidelines produced by the NSW Rural Fire Service - Guideline Bush Fire Prone Land Mapping (August 2002). It should be read in conjuction with the Bush Fire Prone Land Report.

Filename: z:\\esri\planning\projects\pottsville locality\mxd\bush fire prone land.mxd

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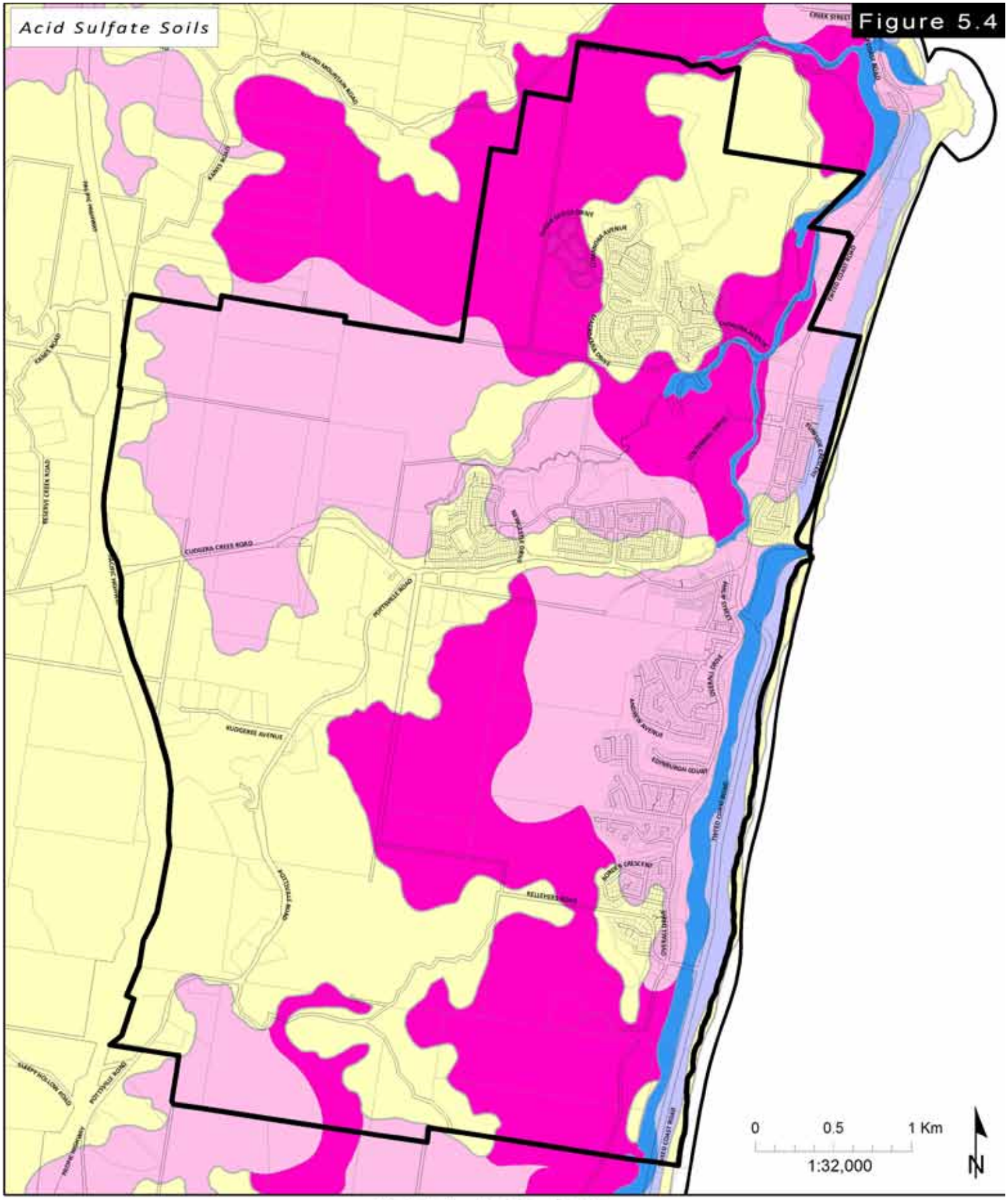
Figure 5.4



Acid Sulfate Soils

Land to which this Plan applies

Class 1 Any Works

Class 2 Works below the ground surface;
Works by which the watertable is likely to be lowered.

Class 3 Works beyond 1 metre below the natural ground surface;
Works by which the watertable is likely to be lowered beyond 1 metres below natural surface.

Class 4 Works beyond 2 metres below the natural ground surface;
Works by which the watertable is likely to be lowered beyond 2 metres below natural surface.

Class 5 Works within 500 metres of adjacent class 1, 2, 3 or 4 land which are likey to lower the watertable below 1 metre AHD in class 1, 2, 3 or 4 land.

Metadata Reference: http://canri.nsw.gov.au/nrdd/records/ANZNS0359100087.html

Filename: z:\\esri\planning\projects\pottsville locality\mxd\acid sulfate soils.mxd

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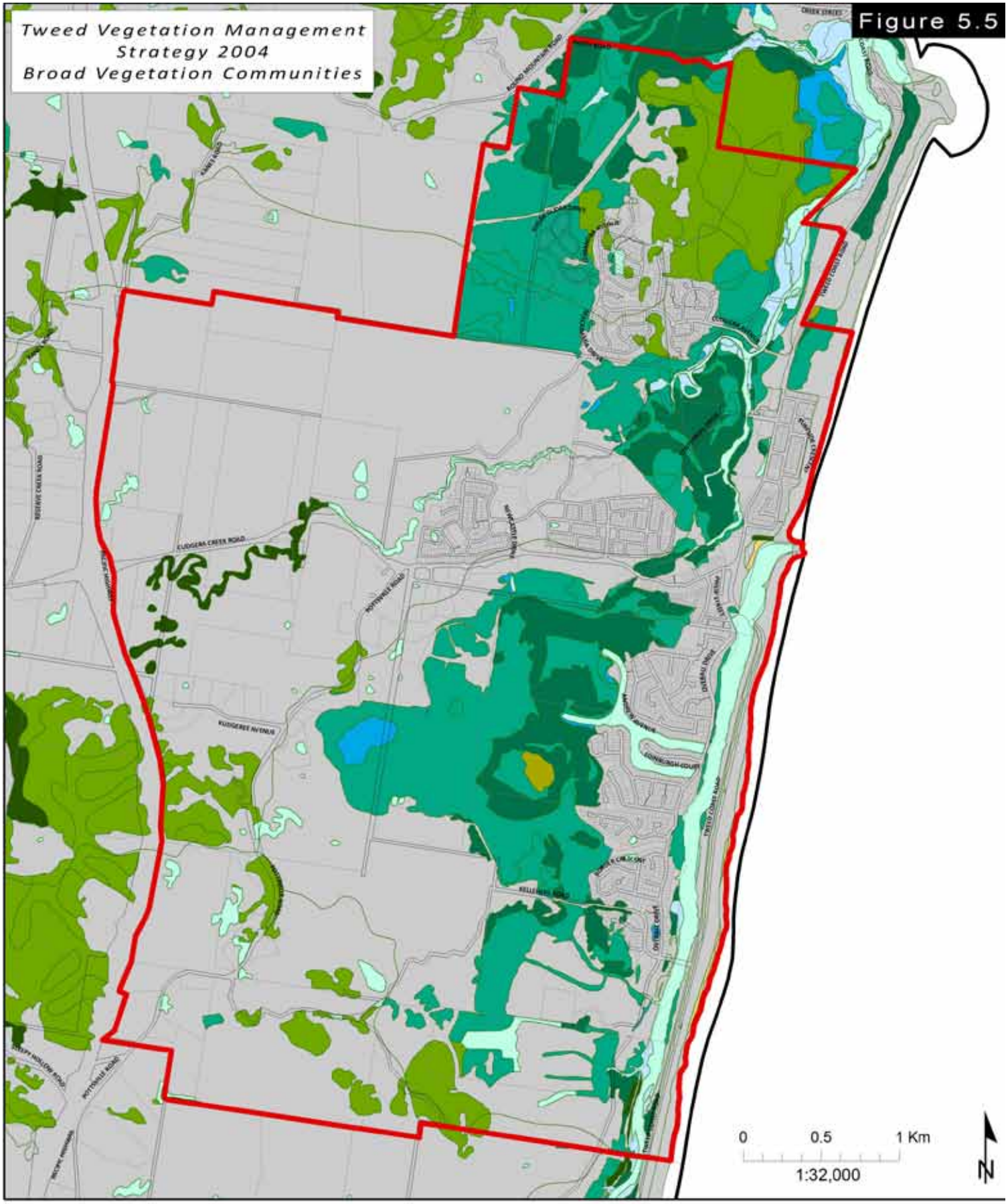
Figure 5.5

Tweed Vegetation Management Strategy 2004
Broad Vegetation Communities



Broad Vegetation Communities

Refer to the 'Tweed Vegetation Management Strategy 2004' Report.
Metadata Reference: http://canri.nsw.gov.au/nrdd/records/ANZNS1171000027.html

- Land to which this Plan applies
- Estuarine Complexes
- Foredune Complex
- Heathlands
- Highly Modified / Disturbed
- Melaleuca and Swamp She-oak Forests
- Miscellaneous Map Units
- Rainforest and Riparian Communities
- Sclerophyll Forests / Woodlands on Sand Substrates and Alluvium
- Sclerophyll Open Forests on Bedrock Substrates
- Sedgelands and Related Communities

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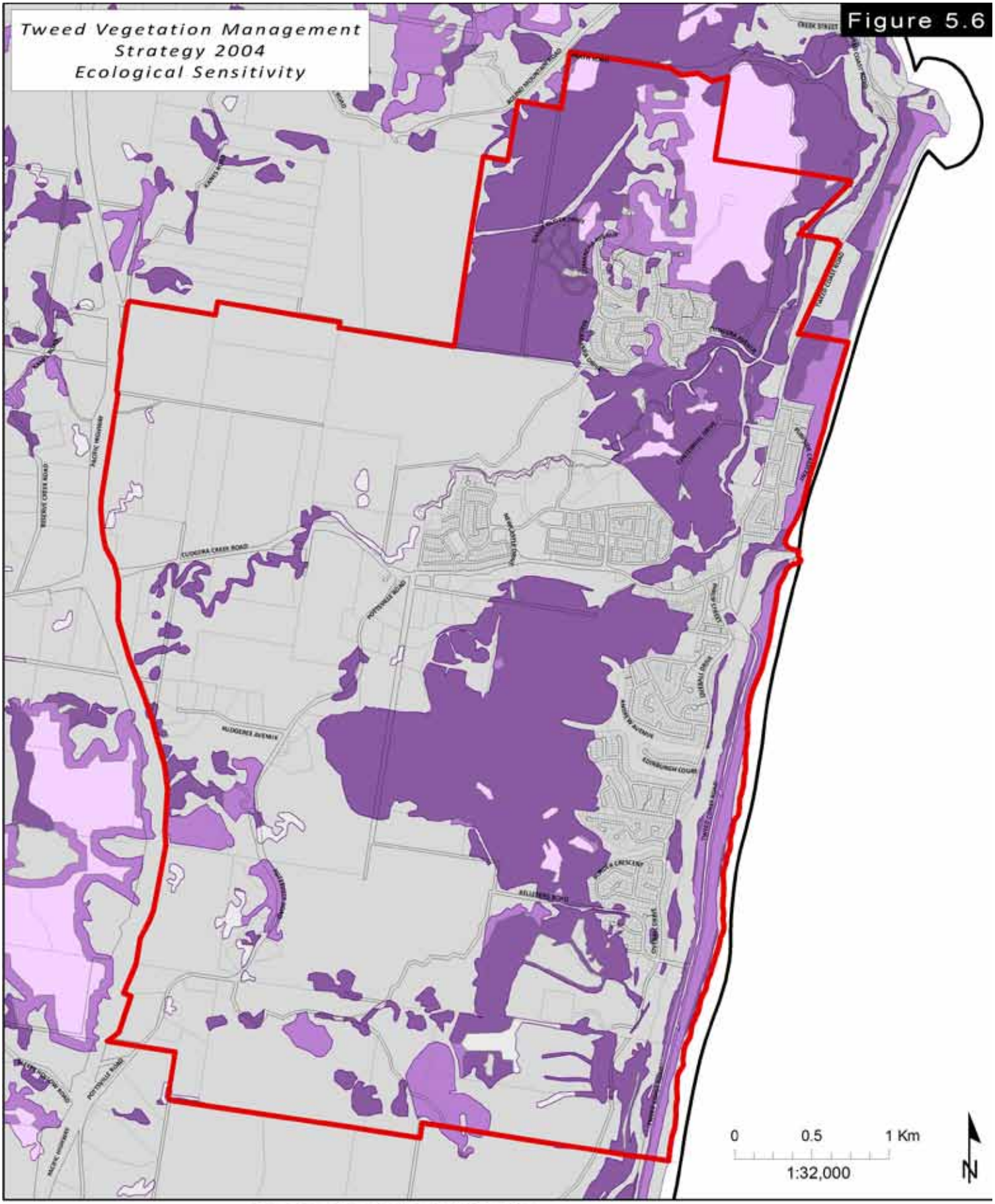
Figure 5.6

Tweed Vegetation Management Strategy 2004 Ecological Sensitivity



Ecological Sensitivity

Land to which this Plan applies

- High
- Moderate
- Low
- Not Classified
- Not Determined

Ecological Sensitivity: This measures those components that are sensitive to ecological degradation. Examples of highly sensitive areas might include; dunal vegetation, narrow corridors, small isolated bushland remnants, or areas adjacent to forest edges. Refer to the 'Tweed Vegetation Management Strategy 2004' Report, see table 3.6 for criteria.

Metadata Reference: http://canri.nsw.gov.au/mrdd/records/ANZNS1171000027.html

Filename: z:\\esri\planning\projects\pottsville locality\mxd\ecological sensitivity.mxd

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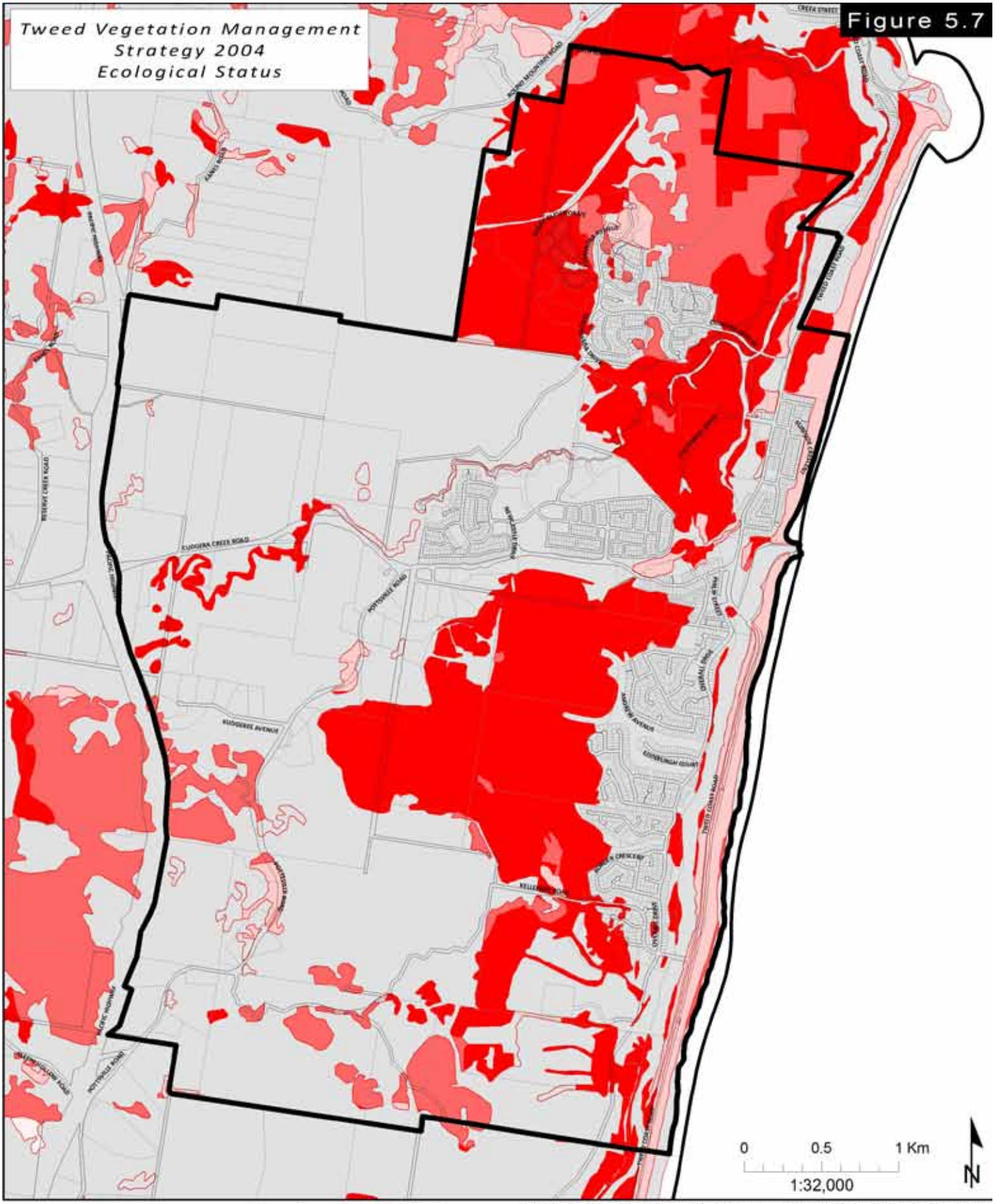
Tweed Vegetation Management Strategy 2004 Ecological Status

Figure 5.7



Ecological Status

Land to which this Plan applies

- Very High
- High
- Moderate
- Low
- Not Classified
- Not Determined

Ecological Status: This deals with attributes that contribute to the continued ecological functioning of a region, and in addition quantifies the regional status of ecosystems, communities and species. Areas of high Ecological Status might include areas where endangered communities or species are present, areas of critical habitat or high biodiversity, such as riparian areas or heathlands, significant corridors or simply large areas of forest. Refer to the 'Tweed Vegetation Management Strategy 2004' Report, see table 3.5 for criteria.

Metadata Reference: http://canri.nsw.gov.au/nrdd/records/ANZNS1171000027.html

Filename: z:\\esri\planning\projects\pottsville locality\mxd\ecological status.mxd

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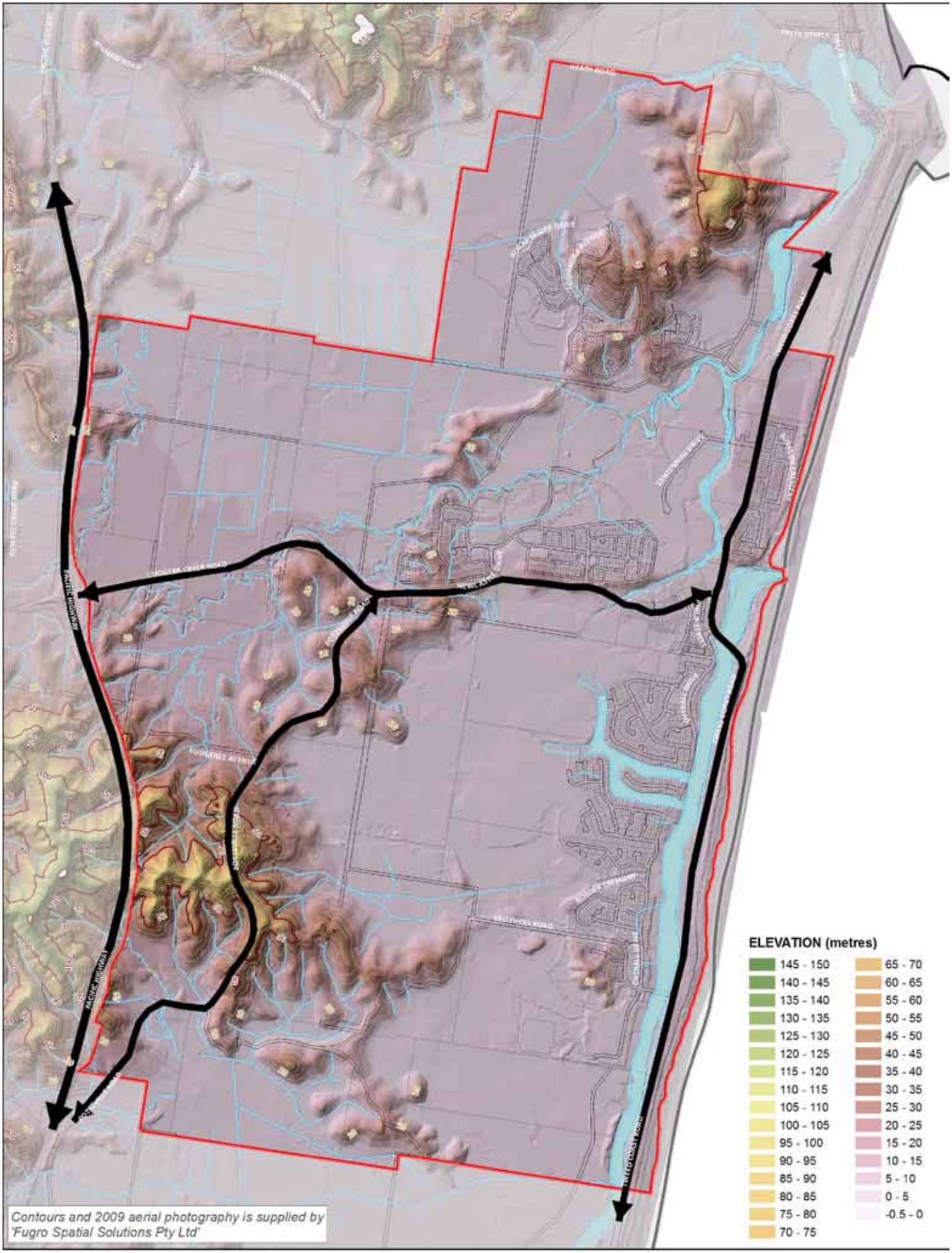


Topography and Hydrology

Land to which this plan applies

Key Linkage

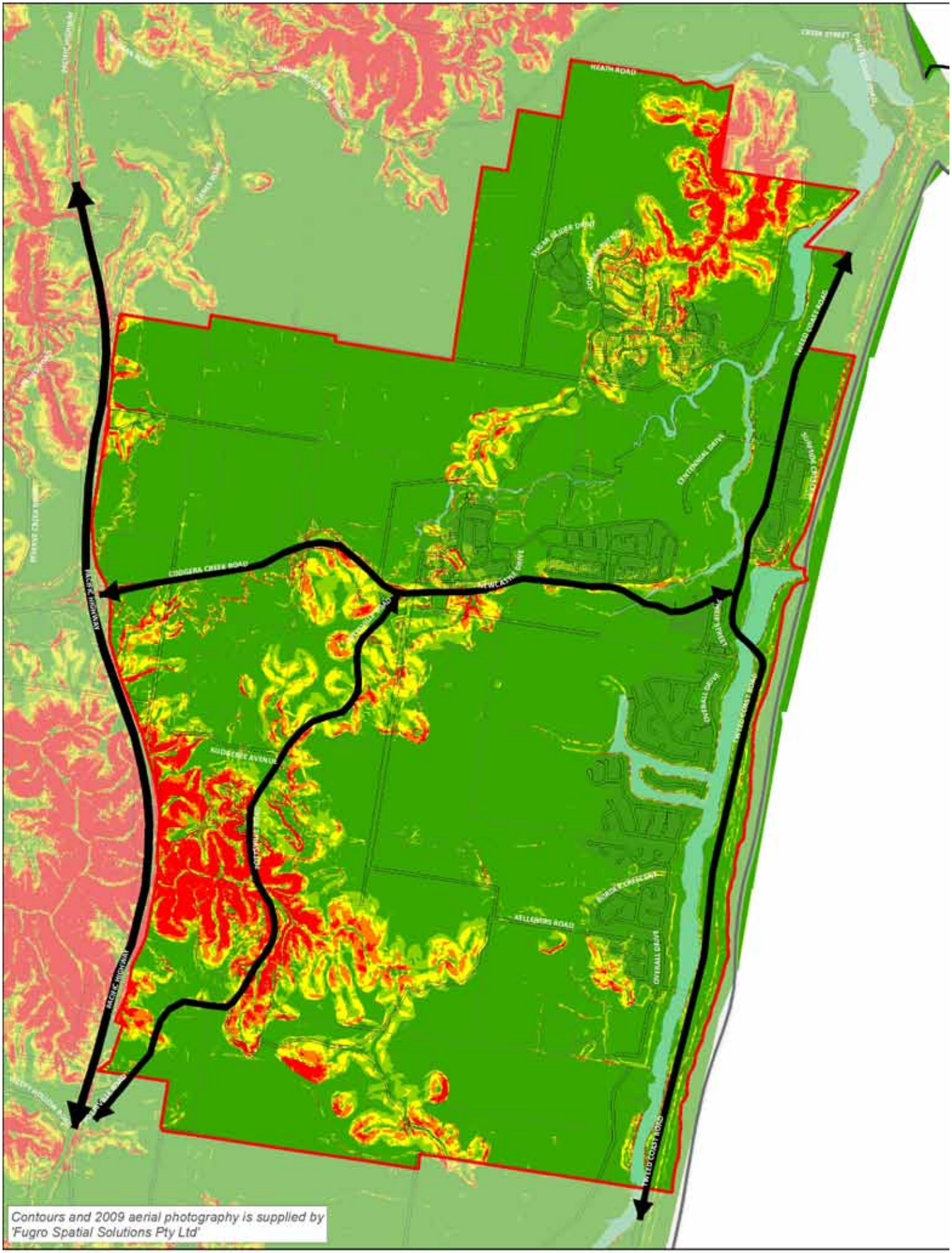
10 metre Contour

50 metre Contour

Hydrology

0 0.5 1 Km

N



Slope

Land to which this plan applies

Key Linkage

Slope (degrees)

- < 6°
- 6° - 10°
- 10° - 14°
- 14° - 18°
- > 18°

0 0.5 1 Km

N

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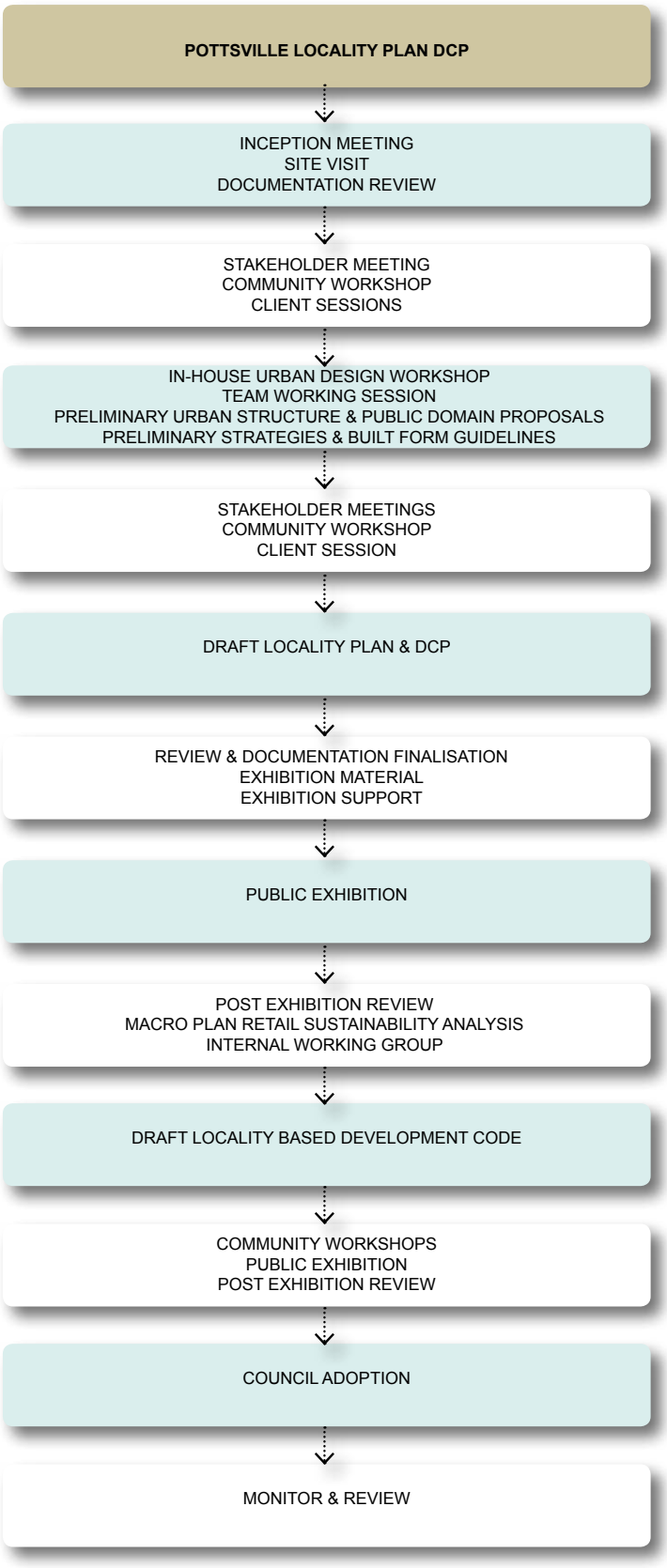
Code Preparation



The Pottsville Locality Based Development Code Process