

K EVR SPECIES ASSESSMENT

This appendix outlines the potential occurrence of endangered, vulnerable or rare (EVR) and listed migratory and/or marine species as identified during desktop survey NPI (Northern Pipeline Interconnector) Stage 2.

The species covered in this appendix are protected under one or both of the following:

- the *Environment Protection and Biodiversity Act 1999* (Cwlth) (the EPBC Act); and
- the *Nature Conservation Act 1992* (Qld) (the NCA)

Potential impacts for relevant listed species are dealt with briefly in this appendix, with a comprehensive discussion of impacts provided at Appendix D and Section 3 of the EIS.

For the purposes of database searches to identify species and communities potentially impacted by the project, the study area is defined by the following coordinates:

- Latitude: 26° 22' 19.92" S, 26° 45' 15.48" S
- Longitude: 152° 52' 4.8" E, 153° 3' 4.09" E.

K.1 Terrestrial Flora

EVR flora species likely to occur in the study area were identified by searching the EPBC Online Protected Matters search tool (DEWHA) and Wildlife Online database (EPA). These results were cross-referenced with records held by HERBRECS (Queensland Herbarium) and the review of RE mapping to define target areas for more detailed field investigation.

Figures K.1A to K.1D show the NPI Stage 2 corridor with RE types and HERBRECS records (since 1980) for EVR flora species within 3 km of the alignment. These figures also include a number of records identified by a qualified botanist during Stage 2 flora surveys. These figures were used to determine the closest known records of each EVR flora species to the proposed corridor.

Table K.1 provides information for each of the species identified during the desktop study, including:

- listings under State and Commonwealth legislation;
- ecology and habitat;
- potential/confirmed habitat; and
- potential impacts.

Table K.2 lists a number of declared weed species which were identified during flora survey and locally noteworthy species in the regions traversed by the pipeline.

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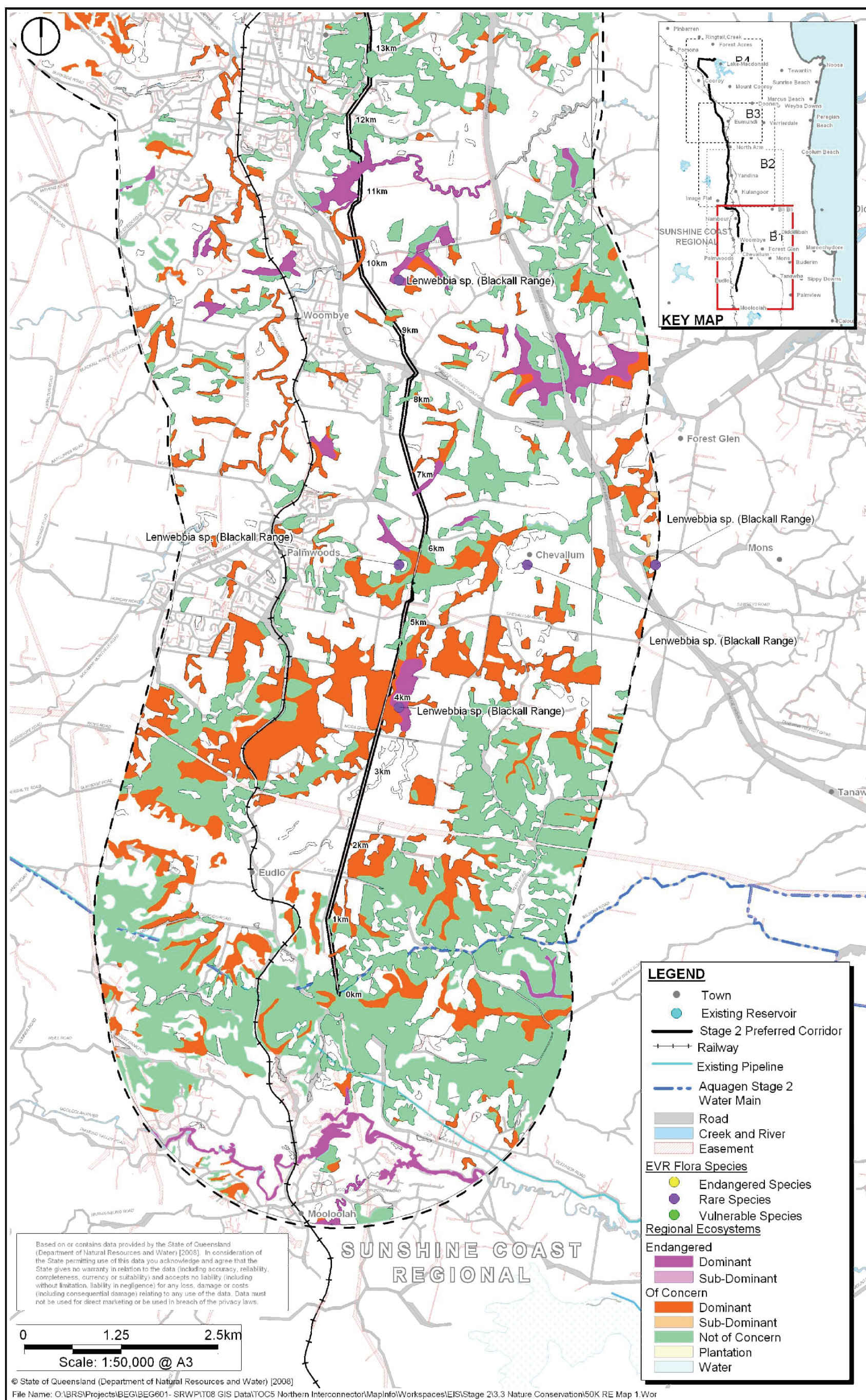


Figure K.1A RE TYPES AND PROTECTED FLORA LOCATIONS

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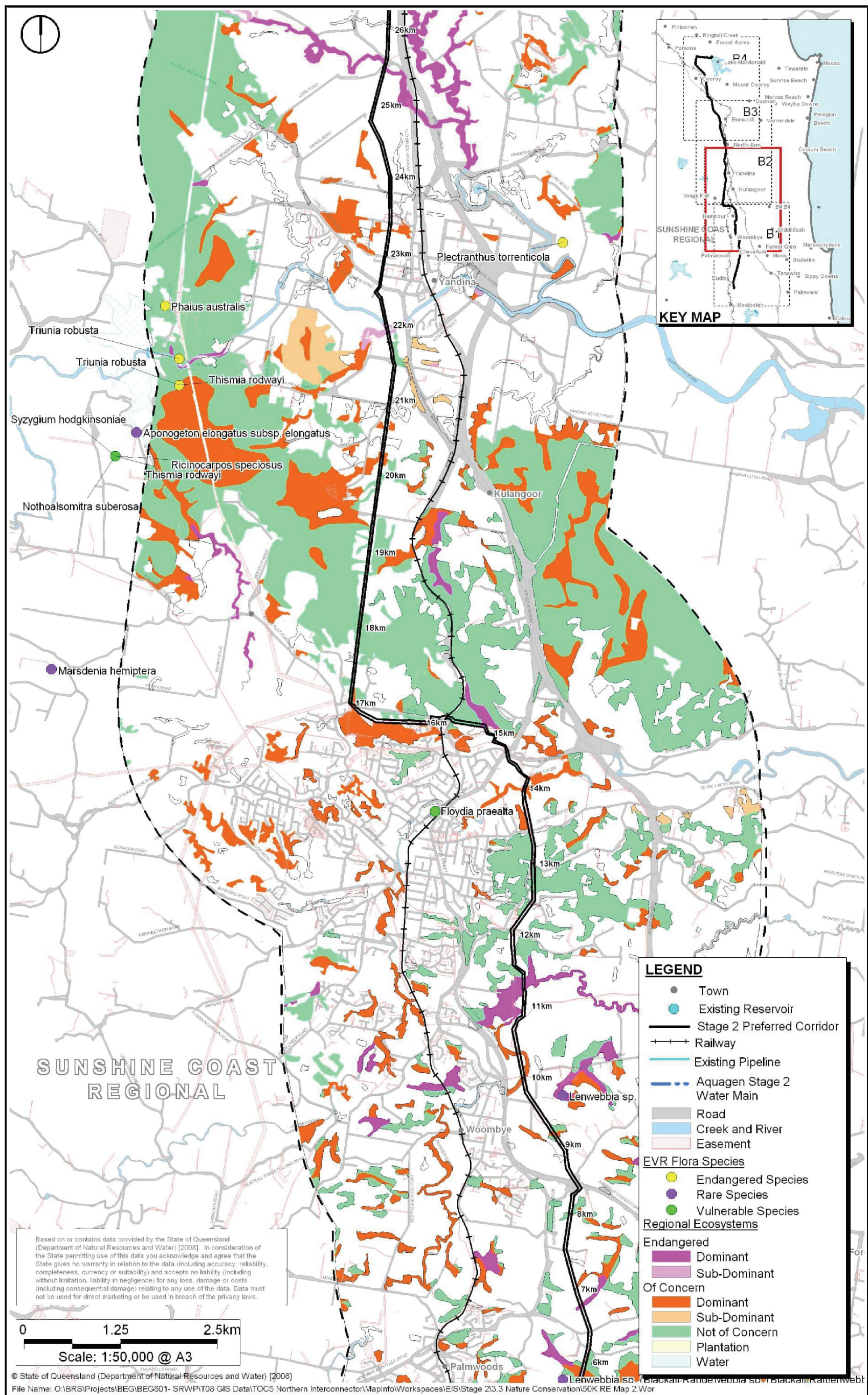


Figure K.1B RE TYPES AND PROTECTED FLORA LOCATIONS

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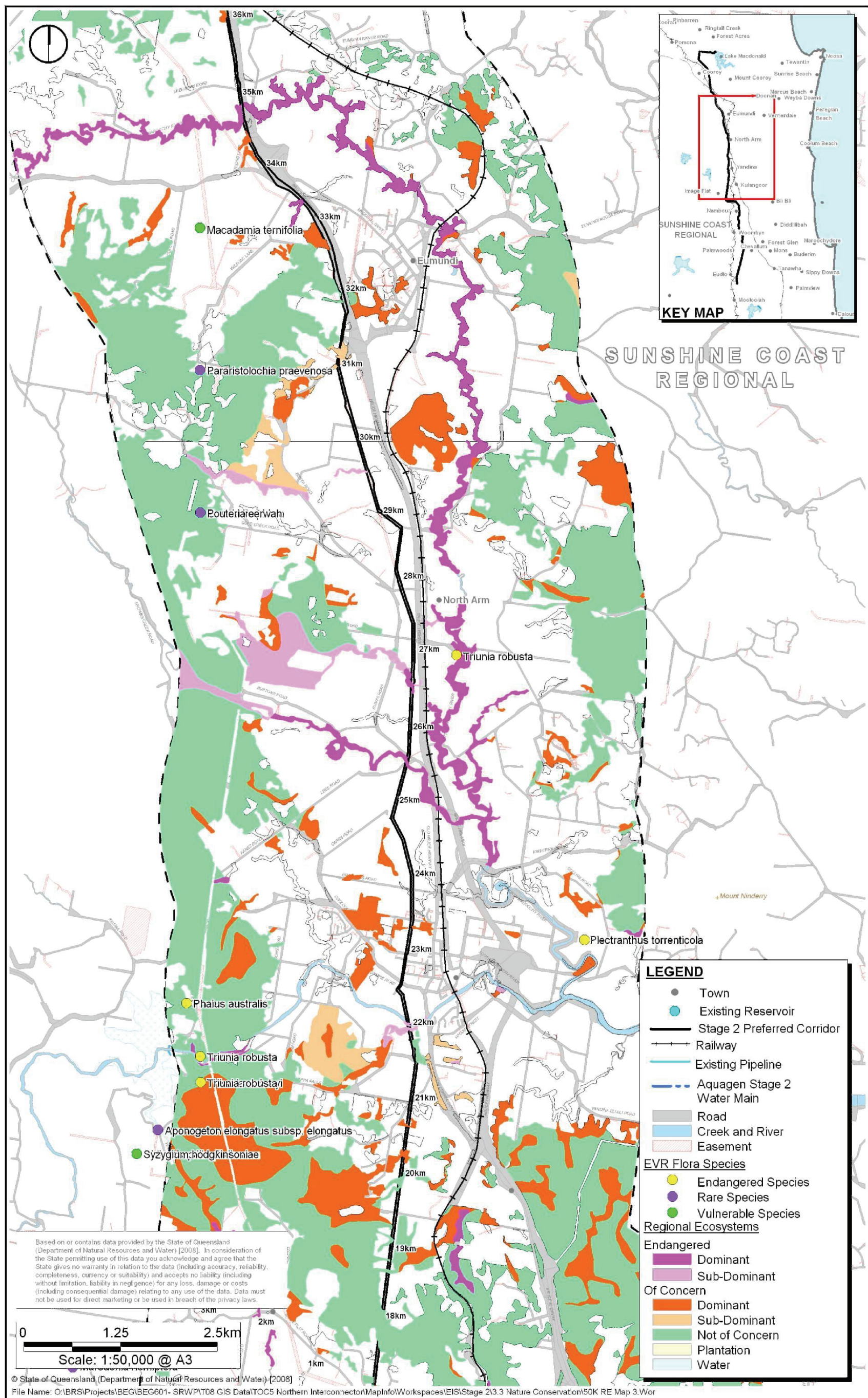


Figure K.1C RE TYPES AND PROTECTED FLORA LOCATIONS

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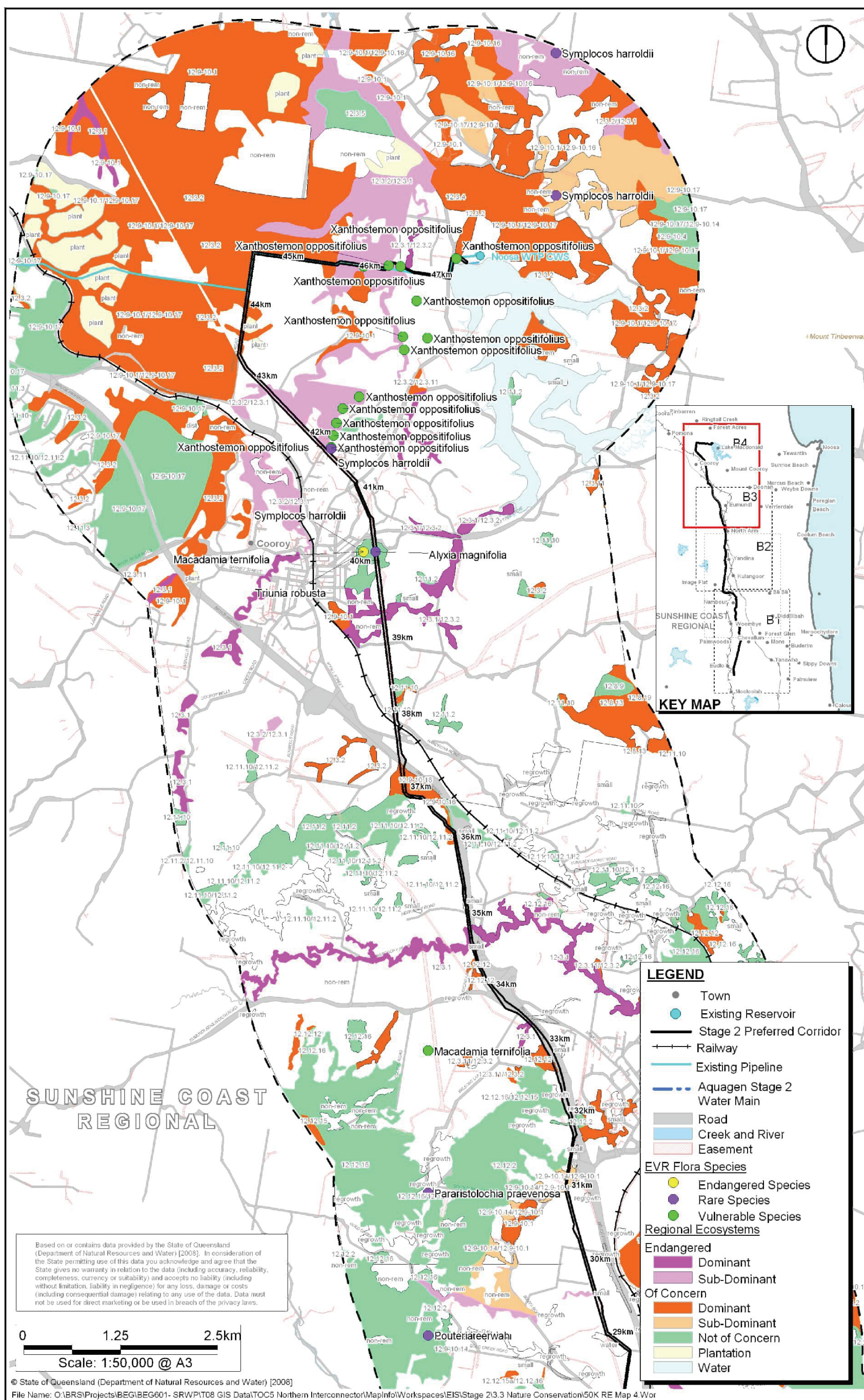


Figure K.1D RE TYPES AND PROTECTED FLORA LOCATIONS

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Table K.1 Significant flora species occurring or potentially occurring within the NPI Stage 2 project area

Species	Status	Habitat and ecology	Potential habitat and potential impacts
<i>Acacia attenuata</i> Whipstick Wattle	Vulnerable (EPBC)	Occurs on flats, low rises and at the edge of wallum swamps. Also occurs in <i>Eucalyptus racemosa</i> woodlands (RE 12.9-10.14).	<i>Potential habitat:</i> No suitable habitat within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Alyxia magnifolia</i>	Rare (NCA)	Rainforest plant species. Small tree or shrub to 5m, mainly in coastal areas north of Brisbane.	<i>Confirmed habitat:</i> South of Cooroy Mountain Road <i>Potential Impacts:</i> This species was identified adjacent to cleared easement. No significant impacts are expected for this species.
<i>Bosistoa selwynii</i> Heart-leaved Bosistoa	Vulnerable (EPBC)	Occurs in riparian rainforest (RE 12.3.1) and Araucarian vine forest (RE 12.11.10 & RE 12.11.11).	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Bosistoa transversa</i> Three-leaved Bosistoa	Vulnerable (EPBC)	Occurs in riparian rainforest (RE 12.3.1) and Araucarian vine forest (RE 12.11.10 & RE 12.11.11).	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Bulbophyllum globuliforme</i> Miniature Moss-orchid	Vulnerable (EPBC)	Occurs in Araucarian vine forest (RE 12.11.10 & RE 12.11.11) on the upper branches of Hoop Pine.	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Cryptocarya foetida</i> Stinking Cryptocarya	Vulnerable (EPBC)	Occurs in simple notophyll vine forest and gully vine forest on igneous rocks (RE 12.12.1).	<i>Potential habitat:</i> Not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Eucalyptus conglomerata</i> Swamp Stringybark	Vulnerable (EPBC)	Occurs within Banksia woodland on coastal alluvial plains (RE 12.3.14).	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.1 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
<i>Floydia praealta</i> Possum Nut	Vulnerable (EPBC, NCA)	Occurs in riparian rainforest (RE 12.3.1) and Araucarian vine forest (RE 12.11.10 & RE 12.11.11).	<i>Potential habitat:</i> Known records from Nambour, although not within/adjacent to the corridor. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Gossia inophloia</i>	Rare (NCA)	Rainforest species known to occur north from Mt. Glorious.	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Graptophyllum reticulatum</i> Veiny Graptophyllum	Endangered (EPBC, NCA)	Known from remnant rainforest (RE 12.11.10/RE 12.12.16) on the Sunshine Coast.	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Lenwebbia</i> sp. Blackall Range (P.R. Sharpe 5387)	Rare (NCA)	Rare rainforest species from the Sunshine Coast. Occurs in poorly drained forests with <i>Melaleuca</i> sp. and palms.	<i>Potential habitat:</i> Known from various locations near Eudlo. Species not identified during field investigations. Not likely to occur within/adjacent to the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Macadamia ternifolia</i> Small-fruited Queensland Nut	Vulnerable (EPBC)	Occurs in riparian rainforest (RE 12.3.1) and Araucarian vine forest (RE 12.11.10 & RE 12.11.11) between Kin Kin and Pine River.	<i>Potential habitat:</i> Known from Eerwah Vale and Eumundi. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species. Further field investigation may be required for any corridor refinements if suitable habitat present, or known records within close proximity.
<i>Macadamia tetraphylla</i> Rough-shelled Macadamia	Vulnerable (EPBC)	Found in complex to simple notophyll vine forest on alluvial plains (RE 12.3.1) and on igneous rocks (RE 12.12.16).	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Marbled Baloghia <i>Baloghia marmorata</i>	Vulnerable (EPBC)	Occurs in notophyll vine forest (RE 12.12.16).	<i>Potential habitat:</i> No known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.1 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
<i>Marsdenia hemiptera</i>	Rare (NCA)	Rainforest climber occurring at rainforest edges and wet forests on slopes.	<i>Potential habitat:</i> No known records of this species within close proximity to the corridor. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Pararistolochia praeviosa</i>	Rare (NCA)	Occurs in sub-tropical rainforest. Food plant for the Richmond Birdwing Butterfly (<i>Ornithoptera richmondia</i>).	<i>Confirmed habitat:</i> Known records from Kulangoor, although not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species. Further field investigation may be required for any corridor refinements if suitable habitat present, or known records within close proximity.
<i>Parsonsia largiflorens</i>	Rare (NCA)	Known from the Blackall Range.	<i>Potential habitat:</i> No suitable habitat within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Phaius australis</i> Lesser Swamp-orchid	Endangered (EPBC, NCA)	Occurs within Melaleuca open forest on alluvial plains (RE 12.3.5). Known from remnant vegetation around Wappa Dam.	<i>Potential habitat:</i> Suitable habitat recorded adjacent to the corridor, but species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Phaius tancarvilleae</i> Swamp Orchid	Endangered (EPBC, NCA)	Occurs in moist to wet habitats, particularly near permanent swamps, localised depressions and soaks. Known from north-eastern Queensland to north-eastern New South Wales.	<i>Confirmed habitat:</i> Paynters Creek (northern section). <i>Potential impacts:</i> No significant impacts are expected for this species. Any potential impacts will be temporary and localised. Corridor will be constrained to avoid individual plants. Translocation of individuals to occur where cannot be avoided.
<i>Plectranthus torrenticola</i>	Endangered (EPBC, NCA)	Occurs in gullies and on rocky outcrops in heathland and along rainforest margins. Records from junction of Maroochy and North Maroochy Rivers.	<i>Potential habitat:</i> No known records of this species within close proximity to the corridor. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Pouteria eerwah</i> Shiny-leaved Coondoo	Endangered (EPBC, NCA)	Occurs in Araucarian vine forest (RE 12.11.10/12.11.11) and montane heath (RE 12.8.19). Records from North Arm.	<i>Potential habitat:</i> No known records of this species within close proximity to the corridor. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.1 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
<i>Prasophyllum wallum</i>	Vulnerable (EPBC)	Found in open or dry heaths on dunes and beaches (RE 12.2.13).	<i>Potential habitat:</i> No suitable habitat and no known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Prostanthera palustris</i> . Bundjalong Nat. Pk/Mt Tinbeerwah Swamp Mint Bush	Vulnerable (EPBC)	Occurs in coastal, wet heathland dominated by <i>Banksia</i> and <i>Allocasuarina</i> species.	<i>Potential habitat:</i> No suitable habitat and no known records of this species within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Riciniocarpus speciosus</i>	Vulnerable (NCA)	Occurs in wet eucalypt forest at Springbrook and Mount Mee.	<i>Potential habitat:</i> No suitable habitat and no known records of this species within close proximity to the corridor. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Romnaldia strobilacea</i>	Vulnerable (EPBC, NCA)	Occurs in riparian rainforest (RE 12.3.1) and Araucarian vine forest (RE 12.11.10 & RE 12.11.11).	<i>Potential habitat:</i> No suitable habitat identified within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
<i>Symplocos harroldii</i> Hairy Hazelwood	Rare (NCA)	Tall shrub or small tree to 6 m tall, north from Beenleigh.	<i>Confirmed habitat:</i> Pearsons Road (near crossing of Six Mile Creek (left branch)) <i>Potential Impacts:</i> This species was identified in riparian vegetation adjacent to corridor. No significant impacts are expected for this species.
<i>Syzygium hodgkinsoniae</i> Smooth-bark Rose Apple	Vulnerable (EPBC)	Occurs in fringing rainforest on deep alluvial soils in Moreton and Wide Bay districts.	<i>Potential habitat:</i> Known from Eudlo Creek, although species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species. Further field investigation may be required for any corridor refinements if suitable habitat present, or known records within close proximity.
<i>Tecomanthe hillei</i> Fraser Island Creeper	Rare (NCA)	Occurs in coastal rainforest. Known from Fraser Island and adjacent mainland areas.	<i>Potential habitat:</i> No suitable habitat identified within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.1 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
<i>Triunia robusta</i>	Endangered (EPBC)	Occurs in understorey of sub-coastal rainforest on the Sunshine Coast. Known from a number of locations within the study area.	<i>Potential habitat:</i> Known from North Maroochy River, although not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species. Further field investigation may be required for any corridor refinements/options if suitable habitat present, or known records within close proximity.
<i>Xanthostemon oppositifolius</i> Southern Penda	Vulnerable (EPBC)	Occurs in riparian rainforest (RE 12.3.1) and Araucarian vine forest (RE 12.11.10 & RE 12.11.11).	<i>Confirmed habitat:</i> Six Mile Creek (left branch) and anabranch, Lake Macdonald <i>Potential Impacts:</i> No significant impacts are expected for this species. Any potential impacts will be temporary and localised. Corridor will be constrained to avoid individual plants. Translocation of individuals to occur where cannot be avoided.
<i>Zieria</i> sp. Brolga Park (A.R. Bean 2002)	Endangered (EPBC, NCA)	Restricted to the Sunshine Coast hinterland where it is known from one population in Triunia National Park.	<i>Potential habitat:</i> No suitable habitat identified within the project area. Species not identified during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

EPBC - Environmental Protection and Biodiversity Conservation Act 1999

NCA - Nature Conservation Act 1992

RE - Regional Ecosystem

Table K.2 Weed species with potential to occur within the NPI Stage 2 project area

CLASS 1 DECLARED WEEDS

Hygrophila costata, Glush Weed

CLASS 2 DECLARED WEEDS

Ambrosia artemisiifolia, Annual Ragweed

Baccharis halimifolia, Groundsel Bush

Bryophyllum delagoense, Mother-of-millions

Cabomba caroliniana, Cabomba (WONS)

Eichhornia crassipes, Water Hyacinth

CLASS 3 DECLARED WEEDS

Anredera cordifolia, Madeira Vine

Aristolochia spp., Dutchman's Pipe

Asparagus aethiopicus, Asparagus Fern

Asparagus africanus, Asparagus Fern

Asparagus plumosus, Asparagus Fern

Celtis sinensis, Chinese Celtis

Cardiospermum grandiflorum, Balloon Vine

Cinnamomum camphora, Camphor Laurel

OTHER WEED CATEGORIES

Grasses (eg *Setaria sphacelata*)

Smothering legumes, thickets and vines (including *Desmodium uncinatum*, *D. intortum*, *Ipomoea indica*, *Macroptilium atropurpureum* and *Neonotonia wightii*, *Tithonia diversifolia*)

Pistia stratiotes, Water Lettuce

Salvinia molesta, Salvinia (WONS)

Senecio madagascariensis, Fireweed

Sporobolus pyramidalis, Giant Rat's Tail Grass

Lantana camara, Lantana (WONS)

Lantana montevidensis, Creeping Lantana (WONS)

Ligustrum lucidum, Broad-leaf Privet

Ligustrum sinense, Chinese Privet

Macfadyena unguis-cati, Cat's Claw Creeper

Schinus terebinthifolius, Broad-leaved Pepper Tree

Spathodea campanulata, African Tulip Tree

Sphagneticola trilobata, Creeping Oxeye

Woody native plants from other areas (eg *Schefflera actinophylla*, *Corymbia torelliana*)

Exotic pines (eg *Pinus taeda*, *P. caribaea*, *P. elliottii*)

WONS—Weeds of National Significance

K.2 Terrestrial Fauna

Terrestrial fauna species likely to occur in the study area were identified by searching the following databases:

- EPBC Online Protected Matters search (DEWHA); and
- Wildlife Online database (EPA).

These results were cross-referenced with species records obtained from the Queensland Museum and Birds Australia to determine a likelihood of occurrence within the study area. A review of essential habitat mapping (EPA) and available literature was subsequently undertaken to determine the habitat requirements of each species as provided in Table K.3.

Known habitat requirements for EVR fauna species were then compared with the results of preliminary fauna and habitat assessments to determine locations/species requiring further attention.

Table K.3 Significant fauna species occurring or potentially occurring within the NPI Stage 2 project area

Species	Status	Habitat and ecology	Potential habitat and potential impacts
BIRDS			
Australian Cotton Pygmy-goose, <i>Nettapus coromandelianus albipennis</i>	Migratory, Marine (EPBC)	Requires freshwater swamps with aquatic vegetation. Distribution along eastern coast of Queensland from Cape York Peninsula south to Brisbane.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Low likelihood of occurrence. <i>Potential impacts:</i> No significant impacts are expected for this species.
Australian Painted Snipe, <i>Rostratula australis</i>	Vulnerable (EPBC; NCA)	Rare, secretive and cryptic species. Feeds at the edge of water associated with mudflats, shallow vegetated and freshwater swamps or inundated grasslands.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Low likelihood of occurrence. <i>Potential impacts:</i> No significant impacts are expected for this species.
Black-breasted Button Quail, <i>Turnix melanogaster</i>	Vulnerable (EPBC, NCA)	Occurs in drier rainforests, vine thickets, scrubby woodlands, thickets of lantana on rainforest fringes. Distribution is patchy in suitable habitat in south-east Queensland and north-east New South Wales.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Low likelihood of occurrence. <i>Potential impacts:</i> No significant impacts are expected for this species.
Black-faced Monarch, <i>Monarcha melanopsis</i>	Migratory, Marine (EPBC)	Occurs in rainforests, eucalypt woodlands, coastal scrubs and damp gullies in rainforest. Distribution along the eastern coast of Australia and islands - coastward of the Great Dividing Range.	<i>Potential habitat:</i> Potential to occur in tall wet forested areas and riparian vegetation. <i>Potential impacts:</i> No significant impacts are expected for this species.
Black-necked Stork, <i>Ephippiorhynchus asiaticus</i>	Rare (NCA)	Distribution along east coast of Queensland, although presence is dependent upon availability of preferred habitat. Frequents larger, established swamps, wetlands, lakes and mangroves. Also forages in temporary wetlands associated with inundated and low lying farmland.	<i>Potential habitat:</i> South Maroochy River, Eudlo Creek tributaries. <i>Potential impacts:</i> No significant impacts are expected for this species. Temporary and localised disturbance to potential forage areas.
Cattle Egret, <i>Ardea ibis</i>	Migratory, Marine (EPBC)	Occurs in a wide variety of habitats - a common water bird.	<i>Potential habitat:</i> South Maroochy River, Eudlo Creek tributaries. <i>Potential impacts:</i> No significant impacts are expected for this species. Temporary and localised disturbance to habitat.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Coxen's Fig Parrot, <i>Cyclopsitta diophthalma coxeni</i>	Endangered (EPBC, NCA)	Uses lowland subtropical rainforest and dense canopy eucalypt forest habitat. Food resources include <i>Ficus</i> spp. and other native fruit and nectar-bearing trees and plants.	<i>Potential habitat:</i> Although species not detected during field investigations, although potential forage habitat within riparian forests. <i>Potential impacts:</i> Route alignment largely avoids clearing of native riparian. Minimal loss of habitat. No significant impacts are expected for this species.
Fork-tailed Swift, <i>Apus pacificus</i>	Migratory, Marine (EPBC)	Occurs over open country, from semi-deserts to coasts, islands and sometimes over forests and cities. A non-breeding aerial migrant to Australia.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> Aerial, non-breeding migrant. No significant impacts are expected for this species.
Glossy Black Cockatoo, <i>Calyptorhynchus lathami</i>	Vulnerable (NCA)	Requires large tree hollows for nesting (generally over-mature eucalypts). Preferred food resources are the cones of She-oaks (<i>Allocasuarina</i> spp.), particularly large-fruited varieties (eg <i>A. littoralis</i> , <i>A. cunninghamii</i>). Breeding occurs from March to August; with chicks fledging after 60 days.	<i>Potential habitat:</i> Casuarina groves within Ferntree special investigation area. <i>Potential Impacts:</i> Short-term disturbance to feeding resources where <i>Allocasuarina</i> spp. are removed. Potential loss of nesting sites where hollow-bearing trees are removed. No significant impacts are expected for this species.
Great Egret, <i>Ardea alba</i>	Migratory, Marine (EPBC)	Occurs in a wide variety of habitats - a common water bird.	<i>Potential habitat:</i> South Maroochy River, Eudlo Creek tributaries. <i>Potential impacts:</i> No significant impacts are expected for this species. Disturbance to potential habitat will be localised and temporary.
Grey Goshawk, <i>Accipiter novaehollandiae</i>	Rare (NCA)	Wide-ranging and highly mobile, foraging in rainforest habitats, tall open forests, woodlands, farmland and along timbered watercourses in high rainfall areas. Breeds August to December, nesting in tall trees.	<i>Potential habitat and impacts:</i> Likely to use the study area as part of forage range. <i>Potential impacts:</i> No significant impacts are expected for this species. Disturbance to potential habitat will be localised and temporary.
Ground Parrot, <i>Pezoporus wallicus</i>	Vulnerable (NCA)	This species is generally found in dry heathland in Queensland. Distribution from north-east of Gympie and Fraser Island in Queensland to east and south-east Victoria.	<i>Potential habitat:</i> Adjacent to the corridor at Eudlo Creek tributaries. <i>Potential impacts:</i> No clearing of potential habitat required. No significant impacts are expected for this species.
Latham's Snipe, <i>Gallinago hardwickii</i>	Migratory (EPBC)	Inhabits freshwater and brackish swamps, marshes and flooded paddocks. Mostly coastal and sub-coastal, but substantial movement inland.	<i>Potential habitat:</i> Minimal suitable habitat within the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Lewin's Rail, <i>Rallus pectoralis</i>	Rare (NCA)	Prefers swamplands wet heaths and wet grass lands with dense vegetation. Forages a range of insects, crustaceans and plant matter.	<i>Confirmed habitat:</i> South Maroochy River. <i>Potential Impacts:</i> Temporary loss of a small area of reed beds along alignment. These are expected to rapidly regrow. No significant impacts are expected for this species.
Magpie Goose, <i>Anseranas semipalmata</i>	Marine (EPBC)	Found in large, seasonal wetlands and well-vegetated dams with rushes and sedges. Distribution extends coastally from about Broome (Western Australia) to Brisbane in Queensland.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Marbled Frogmouth, <i>Podargus ocellatus plumiferus</i>	Vulnerable (NCA)	Inhabits pockets of closed subtropical rainforests, particularly those with an understorey of palms or ferns. Nests are located mostly on horizontal branches or epiphytic plants.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impact:</i> No significant impacts are expected for this species.
Powerful Owl, <i>Ninox strenua</i>	Vulnerable (NCA)	Forages along the margins of dense wet sclerophyll forest along coastal uplands and hills. Require large tracts of intact forest to support their prey and breeding sites in hollow-bearing trees.	<i>Potential habitat:</i> Foraging possible along upland riparian areas within Ferntree special investigation area <i>Potential impacts:</i> Potential disturbance to hunting habitats, although likely to be temporary and localised. No significant impacts are expected for this species.
Rainbow Bee-eater, <i>Merops ornatus</i>	Migratory, Marine (EPBC)	Habitat includes open woodlands with sandy, loamy soil, sand ridges, riverbanks, road cuttings, beaches, dunes, cliffs, rainforest and woodlands. Breeding resident in Australia - inland and dry west coast. Mostly a passage migrant. Primarily an aerial species.	<i>Potential habitat:</i> Foraging possible along upland riparian areas within Ferntree special investigation area. <i>Potential impacts:</i> Potential disturbance to hunting habitats, although likely to be temporary and localised. No significant impacts are expected for this species.
Red Goshawk, <i>Erythrotriorchis radiatus</i>	Vulnerable (EPBC); Endangered (NCA)	Coastal and sub-coastal distribution. Rare across range. Preferred forage habitats are tall open forest and woodlands and along the margins of riverine gallery forest.	<i>Potential habitat:</i> Likely to be an infrequent visitor to the Ferntree special investigation area as part of forage range. <i>Potential impacts:</i> Minimal disturbance to forage range. No significant impacts are expected for this species.
Red-browed Treecreeper, <i>Climacteris erythroptus</i>	Rare (NCA)	Uses tall eucalypt forest and woodland, predominantly in hilly areas. May be found in remnant riparian habitats if connected to tall forest habitats. Requires large forested areas for foraging.	<i>Potential habitat:</i> Ferntree special investigation area <i>Potential impacts:</i> Loss of potential habitat areas, although likely to be localised. No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Regent Honeyeater, <i>Xanthomyza phrygia</i>	Endangered, Migratory (EPBC)	Inhabits dry open eucalypt forest and woodlands. Patchy distribution - occurs mostly on the inland slopes of the Great Dividing Range.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Rufous Fantail, <i>Rhipidura rufifrons</i>	Migratory, Marine (EPBC)	Distribution along coastal north and eastern Australia and islands. Occurs in undergrowth of rainforest/wetter eucalypt forests and gullies.	<i>Potential habitat:</i> Wet eucalypt forest in gullies of Ferntree special investigation area, riparian forests. <i>Potential impacts:</i> Disturbance of potential habitat areas likely to be minimal. No significant impacts are expected for this species.
Satin Flycatcher, <i>Myiagra cyanoleuca</i>	Migratory, Marine (EPBC)	Occurs in heavily vegetated gullies in forest, taller woodlands, usually above the shrub layer. During migration this species inhabits coastal forests, woodlands, mangroves, trees in open country and gardens. Distribution along the eastern coast of Australia and islands - from Cape York to Tasmania.	<i>Potential habitat:</i> Wet eucalypt forest in gullies of Ferntree special investigation area, riparian forests. <i>Potential impacts:</i> Disturbance of potential habitat areas likely to be minimal. No significant impacts are expected for this species.
Sooty Owl, <i>Tyto tenebricosa</i>	Rare (NCA)	Occur in wet eucalypt forests and rainforests where tall emergent trees are present. Territorial species dependent on hollows for nesting.	<i>Potential habitat:</i> Ferntree special investigation area. <i>Potential impacts:</i> No significant impacts are expected for this species. Potential loss of some foraging habitat, although likely to be localised.
Spectacled Monarch, <i>Monarcha trivirgatus</i>	Migratory, Marine (EPBC)	Occurs in understorey of mountain/lowland rainforests, thickly wooded gullies, waterside vegetation - mostly well below the canopy. Summer breeding migrant to south-east Queensland.	<i>Potential habitat:</i> Wetter gullies within Ferntree special investigation area. <i>Potential impacts:</i> No significant impacts are expected for this species.
Square-tailed Kite, <i>Lophoictinia isura</i>	Rare (NCA)	Habitat is generally tall, open forest and woodland; however, also uses dense, wet forest along watercourses. Mated pairs require permanent home ranges of approximately 800–1000 ha for adequate food resources (possums, gliders, small mammals).	<i>Potential habitat:</i> Wide ranging species with potential to utilise habitats along the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species. Disturbance to potential habitat will be temporary and localised.
Swift Parrot, <i>Lathamus dicolor</i>	Endangered (EPBC, NCA)	Occurs in woodlands, riparian vegetation and remnant eucalypt forests, preferring dry sclerophyll forests. This species breeds in Tasmania during spring and summer, dispersing widely across south-eastern Australia during winter. Considered nomadic and irruptive, moving in response to food resources.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Low likelihood of occurrence. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
White-bellied Sea Eagle, <i>Haliaeetus leucogaster</i>	Migratory, Marine (EPBC)	Generally associated with marine and estuarine habitats and larger wetlands. Occurs in coastal areas of Australia, islands, estuaries, inlets, large rivers, inland lakes and reservoirs. Builds large nest in tall trees near water.	<i>Potential habitat:</i> This species was observed along the corridor (over-fly). <i>Potential impacts:</i> No loss of habitat will occur. No significant impacts are expected for this species.
White-throated Needletail, <i>Hirundapus caudacutus</i>	Migratory, Marine (EPBC)	Occurs in airspace of forests, woodlands, farmlands, plains, lakes, coasts and towns. Feeding companies frequently patrol back and forward along favoured hilltops and timbered ranges. Regular summer migrant to eastern Australia. Arrives from mid-October and departs by mid-April. Locally common, particularly in eastern Queensland.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
AMPHIBIANS			
Cascade Treefrog, <i>Litoria pearsoniana</i>	Vulnerable (NCA)	Inhabits streams in rainforest and adjacent wet sclerophyll forest at elevations of 200 - 1000m in south-eastern Queensland and north-eastern New South Wales. Prefers shaded rainforest gullies in association with fast flowing rocky streams.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Not likely to occur within the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species.
Giant Barred Frog, <i>Mixophyes iteratus</i>	Endangered (EPBC; NCA)	Deep, slow-flowing creeks with overhanging banks in lowland vine forest and riparian gallery forest habitat. Most movements are restricted to within 20 m of the stream. Breeding occurs in spring and summer, often on leaf litter near streams and ponds.	<i>Potential habitat:</i> Paynters Creek, Petrie Creek, Tuckers Creek <i>Potential impacts:</i> Temporary displacement from and loss of potential habitat. Temporary disruption of movements along riparian habitats. Transport of sediment into downstream reaches with temporary impacts on water quality. Impacts expected to be short-term and localised.
Green-thighed Frog, <i>Litoria brevipalmata</i>	Rare (NCA)	Patchy distribution restricted to Northern NSW & SE Qld. Rainforest & wet sclerophyll forest & sometimes flooded areas bordering forest when surface water present after rain. Generally in denser vegetation, leaf-litter & ground debris (Hines et al 1999; Cogger 2000).	<i>Potential habitat:</i> Low-lying and seasonally inundated eucalypt habitat within the Ferntree special investigation area. <i>Potential impacts:</i> Disturbance to potential habitat will be localised and temporary. No significant impacts are expected for this species.
Pouched Frog, <i>Assa darlingtonia</i>	Rare (NCA)	Monotypic species restricted to coastal ranges of SE Qld & Northern NSW border region. Inhabits damp leaf-litter & ground debris in rainforest, Antarctic beech & wet sclerophyll forest. Generally at cooler, higher altitude (Robinson 1993; Cogger 2000).	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Not likely to occur within the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Southern Dayfrog, <i>Taudactylus diurnus</i>	Extinct (EPBC), Endangered (NCA)	This species has not been recorded since 1980 and is presumed extinct.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Not likely to occur within the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species.
Southern Gastric Brooding Frog, <i>Rheobatrachus silus</i>	Extinct (NCA)	This species has not been recorded since 1978 and is presumed extinct.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. Not likely to occur within the corridor. <i>Potential impacts:</i> No significant impacts are expected for this species.
Tusked Frog, <i>Adelotus brevis</i>	Vulnerable (NCA)	Occupies a wide range of habitats, including disturbed/degraded areas. Slow moving streams and dams in vine forest habitat, particularly around accumulated leaves and small woody debris. Breeding occurs between September and April, when males construct nests in concealed sites at the edge of ponds or stream pools.	<i>Confirmed habitat:</i> Winston Road, Woombye; Sandy Creek; Paynters Creek; Rocky Creek; Six Mile Creek (left branch). <i>Potential habitat:</i> Many other numerous waterways along the alignment. <i>Potential impacts:</i> Temporary displacement from and loss of existing habitat within the easement. Changes in water quality may also adversely impact eggs or tadpoles.
Wallum Froglet <i>Crinia tinnula</i>	Vulnerable (NCA)	Occurs in 'acid' swamps with a pH 4.3-5.2. The conservation status of this species reflects the loss of suitable acid habitat throughout its range. Breeding occurs in swamps, dams and flooded ditches primarily in autumn but also in late winter, spring and late summer.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Wallum Rocketfrog, <i>Litoria freycineti</i>	Vulnerable (NCA)	Distributed across coastal regions of New South Wales to south-eastern Queensland. Usually encountered after rain in spring and summer within a wide variety of heath and forest habitats.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Wallum Sedgefrog, <i>Litoria olongburensis</i>	Vulnerable (EPBC, NCA)	Found throughout north-eastern New South Wales and south-east Queensland. Occurs in emergent vegetation and reeds within swampy or marshy lowland "wallum" habitats.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
INSECTS			
Australian Fritillary Butterfly, <i>Argyreus hyperbius incana</i>	Endangered (NCA)	Species distribution is dependent on its larval food plant, <i>Viola betonicifolia</i> . Preferred habitat consists of open sedge-land, wetlands and swamps in coastal areas.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Pink Underwing Moth, <i>Phyllodes imperialis</i>	Endangered (EPBC)	Occurs mainly in thick, lower montane rainforests. Specifically depends on <i>Carronia multiseppalea</i> in collapsed, shrub-like form as a larval food plant.	<i>Potential habitat:</i> No clearing of larval food plant (<i>Carronia multiseppalea</i>) is likely to be required. <i>Potential impacts:</i> No significant impacts are expected for this species.
Richmond Birdwing Butterfly, <i>Ornithoptera richmondia</i>	Vulnerable (NCA)	Occurs in subtropical rainforest, littoral rainforest and gallery forest in upland and lowland areas, predominantly on volcanic soils where the larval food plants (<i>Pararistolochia praevenosa</i>) grow. Breeding occurs from September to November and February to April.	<i>Confirmed habitat:</i> Ferntree special investigation area. <i>Potential impacts:</i> Species is known from the broader area, but has not been located within or adjacent to the proposed corridor. No significant impacts are expected for this species.
REPTILES			
Common Death Adder, <i>Acanthophis antarcticus</i>	Rare (NCA)	Uses a wide range of habitats, including rainforest, shrublands, heaths and woodlands. Requires undisturbed forested areas with heavy leaf litter substrate. Often associated with rocky outcrops and forested slopes at wet/dry sclerophyll forest ecotones.	<i>Potential habitat:</i> Wildlife corridors from Ferntree Creek National Park to the west. <i>Potential Impact:</i> Temporary loss of habitat associated with vegetation clearing. No significant impacts are expected for this species.
Cooloolool Blind Snake, <i>Ramphoiphlops silvia</i>	Rare (NCA)	Endemic to coastal south-east Queensland between and including Fraser Island and Noosa. Occurs in rainforest, wet sclerophyll forest, and heath communities. Fossorial, shelters in sand, under logs and in chambers of ant and termite nests. Little known about this species (Cogger 2000; Wilson 2005).	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Elf Skink, <i>Eroticoscincus graciloides</i>	Rare (NCA)	Requires damp leaf litter, logs and stones for shelter and forages in shaded, moist environments. Breeding occurs in spring to mid-summer.	<i>Confirmed habitat:</i> Petrie Creek crossing. <i>Potential habitat:</i> Several other similar creek crossings. <i>Potential impacts:</i> Minor, short-term disturbance to logs and leaf litter layer. Temporary disruption to movement within proposed corridor. No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Short-limbed Snake–skink, <i>Ophioscincus truncatus</i>	Rare (NCA)	Known from moist forests of the Blackall Range, inhabiting rainforests and wet sclerophyll forests. Likely to be adversely affected by disturbance to upper layers of soil and leaf litter.	<i>Potential habitat:</i> Ferntree special investigation area. <i>Potential impacts:</i> Minor, short-term disturbance to logs and leaf litter layer will have minimal impacts on this species. No significant impacts are expected for this species.
MAMMALS			
Grey-headed Flying Fox, <i>Pteropus poliocephalus</i>	Vulnerable (EPBC)	Uses a wide range of habitats for foraging—including rainforests, open eucalypt forests and woodlands. Camping sites are typically within dense vegetation close to water where breeding occurs during the spring months.	<i>Potential habitat:</i> No camp sites located along the corridor. <i>Potential impacts:</i> Localised loss of intermittent food resources. No significant impacts are expected for this species.
Koala, <i>Phascolarctos cinereus</i>	Vulnerable (NCA)	Uses a variety of trees for feeding, shelter and breeding purposes but are generally associated with open eucalypt habitat types in Queensland.	<i>Potential habitat:</i> Several forest areas by waterways along the alignment. <i>Potential impacts:</i> Temporary disruption to movement corridors. Removal of food resources. No significant impacts are expected for this species.
Large-eared Pied Bat, <i>Chalinolobus dwyeri</i>	Vulnerable (EPBC); Rare (NCA)	Habitat and roosting requirements of this species are poorly understood. It is thought to forage in a range of vegetation types, including rainforest, open eucalypt forest and around sandstone outcrops. Natural preferred roosts are primarily sandstone outcrops but this species also uses disused mine shafts, caves, tree hollows and rock overhangs.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.
Long-nosed Potoroo, <i>Potorous tridactylus</i> <i>tridactylus (SE Mainland)</i>	Vulnerable (EPBC)	Fragmented distribution across Eastern Australia, but known populations in south-east Queensland & Northern New South Wales coastal regions. Utilises a wide-range of vegetation types but prefers dense undergrowth with thick ground cover and light, sandy soils (Johnston 1995; Maxwell et al 1996; Johnson 2003; Menkhorst & Knight 2004).	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impacts:</i> No significant impacts are expected for this species.

Table K.3 (continued)

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Platypus, <i>Ornithorhynchus anatinus</i>	Culturally significant (NCA)	Generally found in clearer water areas with sandy gravel to sandy silty bottom sediments that better suit foraging behaviour. Constructs stream bank burrows around slow-moving water. Mating season occurs around August in Queensland, with young weaned around 4-5 months after hatching.	<i>Potential habitat:</i> Eudlo Creek, Tuckers Creek, South Maroochy River, North Maroochy River and Rocky Creek. <i>Potential impacts:</i> Changes to riparian bank structure and potential loss of burrows. Sediment release into aquatic habitats downstream of construction sites. No significant impacts are expected for this species.
Short-beaked Echidna, <i>Tachyglossus aculeatus</i>	Culturally significant (NCA)	Uses a wide range of habitat types and shelters in logs, crevices, burrows and leaf litter. Mating takes place in July and August with juveniles seen from September.	<i>Potential habitat:</i> North Maroochy River and several other locations along the alignment. <i>Potential Impacts:</i> Minor, short-term loss of habitat. No significant impacts are expected for this species.
Spotted-tailed Quoll (SE Mainland), <i>Dasyurus maculatus maculatus</i>	Endangered (EPBC); Vulnerable (NCA)	Uses a variety of habitat types including sclerophyll forest, woodland, coastal heathland and rainforest. Requires a relatively large territory (estimated minimum 800 ha) of intact vegetation.	<i>Potential habitat:</i> No suitable habitat for this species was recorded during field investigations. <i>Potential impact:</i> Temporary disruption to movement corridors. No significant impacts are expected for this species.

EPBC - Environmental Protection and Biodiversity Conservation Act 1999

NCA - Nature Conservation Act 1992

K.3 Aquatic Flora and Fauna

Database searches identified five aquatic fauna species of conservation significance listed under the EPBC Act and the Queensland NCA. This included four fish species and one reptile. No significant aquatic flora species were identified as part of the desktop or field surveys.

Preliminary field investigations are considered to be qualitative in nature with likely presence or absence being recorded. In some cases, further work will be required to undertake monitoring of populations of species of conservation significance during and after construction of the pipeline.

Reflecting the listing of species of particular conservation significance, aquatic habitat assessments were conducted for Six Mile Creek along the main channel, the left branch and the anabranch. These assessments were carried out to determine the likelihood of occurrence of significant aquatic species recorded in Six Mile Creek. Target species with potential to occur within the project area are listed in Table K.4.

Table K.4 Significant aquatic fauna occurring or potentially occurring within the NPI Stage 2 project area

Species	Status	Habitat and ecology	Potential habitat and potential impacts
Australian Lungfish, <i>Neoceratodus forsteri</i>	Vulnerable (EPBC)	Adults prefer deep pools (3-10 m) with submerged structure for shelter. Spawning and juvenile habitat found in slow-flowing reaches of shallow-moderate depth where macrophyte cover exceeds 70%. Closely associated with overhanging vegetation, woody debris and macrophyte beds.	<i>Potential habitat:</i> Six Mile Creek main channel <i>Potential impacts:</i> No significant impacts are expected for this species.
Honey Blue-eye, <i>Pseudomugil mellis</i>	Endangered (EPBC); Vulnerable (NCA)	Coastal wallum waterways and lakes, characterised by dystrophic, acidic, darkly stained waters with siliceous sand substrates and abundant submerged and emergent vegetation.	<i>Potential habitat:</i> Tolerable conditions were recorded at Six Mile Creek (left branch); however, this reach lacks dense macrophyte cover. <i>Potential impacts:</i> No significant impacts are expected to occur.
Mary River Cod, <i>Maccullochella peelii mariensis</i>	Endangered (EPBC)	Endemic to the Mary River catchment but stocked elsewhere for recreational angling. Found in high gradient upland streams to large-flowing pools in lowland areas. Prefers shaded, deep water pool habitat with abundant submerged woody debris or other structural features.	<i>Confirmed habitat:</i> Known to occur in Six Mile Creek main channel. <i>Potential habitat:</i> Sub-optimal habitat recorded in left branch and anabranch. <i>Potential impacts:</i> Waterway crossings impacts include: loss of snag habitat and removal of woody debris, infilling of deep pools, temporary restriction of fish passage during construction. No significant impacts are expected for this species.
Mary River Turtle, <i>Elusor macrurus</i>	Endangered (EPBC)	Endemic to the Mary River and major tributaries. Occurs in flowing, well-oxygenated sections of streams in riffles to allow cloacal respiration and shallower stretches alternating with deeper, flowing pools. This species commonly emerges to bask on protruding logs and rocks.	<i>Potential habitat:</i> Six Mile Creek main channel. <i>Potential impacts:</i> No significant impacts are expected for this species.
Oxleyan Pygmy Perch, <i>Nannoperca oxleyana</i>	Endangered (EPBC); Vulnerable (NCA)	Coastal lowland waterways and lakes with darkly tannin-stained, dystrophic water, riparian cover and extensive macrophyte and/or leaf litter cover. Most frequently observed in areas of low water velocity, mud and sand substrates in moderate depths.	<i>Potential habitat:</i> Six Mile Creek (left branch) and anabranch. <i>Potential impacts:</i> Temporary restriction of fish movement and removal of leaf litter habitat. No significant impacts are expected for this species.

EPBC—Environment Protection and Biodiversity Conservation Act 1999; NCA—Nature Conservation Act 1992