Coomera Connector Stage One (1): Public Environmental Report

Queensland Department of Transport and Main Roads

Appendix 9: Helensvale Road vegetation survey (FRC 2022)

Coomera Connector:

Assessment of Vegetation on the Southern Side of Helensvale Rd

Prepared for:

Department of Transport and Main Roads

frc environmental

PO Box 2363, Wellington Point QLD 4160
Telephone: + 61 3286 3850

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Maps

1 Introduction

Vegetation on the southern side of Helensvale Rd that is within the Moreton Bay Ramsar area, and that may be impacted by the Coomera Connector (the Site) was assessed in the field to:

- establish and confirm the vegetation types in this area
- establish the distribution of marine plants (as defined by the *Fisheries Act 1994*), and to
- establish the level of disturbance (edge effects and weed incursion in this area).

From this assessment, the vegetation was mapped and described, including with reference to Regional Ecosystems under the *Vegetation Management Act 1999*, marine plants under the *Fisheries Act 1994*, and Threatened Ecological Communities under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, and also including the condition of the vegetation, and degree of disturbance.

2 Background

2.1 Marine Plants

Marine plants include mangroves, seagrass, samphires, marine couch and saltmarsh plants, algae and other tidal plants growing adjacent to the tidal zone, landward and seaward.

The definition of marine plant is given in section 8 of the *Fisheries Act 1994*. Under this Act marine plants include:

- a plant (a 'tidal plant') that usually grows on, or adjacent to, tidal land, whether it is living or dead, standing or fallen
- the material of a tidal plant, or other plant material on tidal land, and
- a plant, or material of a plant, prescribed under a regulation or management plan to be a marine plant.

Marine plants do not include a plant that is a:

- prohibited or restricted matters under the *Biosecurity Act 2014* are not considered to be marine plants, and can be removed without a permit, or a
- controlled biosecurity or regulated biosecurity matter under the *Biosecurity Act 2014.*

Species that are commonly considered to be marine plants are listed in the Fish Habitat Management Operational Policy 001 (FHMOP 001 (Couchman & Beumer 2007)).

Under a Fisheries Tribunal Decision all land inundated by HAT is considered to be tidal land. Consequently determining the area inundate by HAT is critical in determining whether or not a plant is a marine plant (Couchman & Beumer 2007). In Australia HAT is calculated as the highest level from tide predictions over the tidal datum epoch (TDE), this is currently set to 1992 to 2011, and is likely to be updated in 2022 (Marine Science Australia 2019; Metters pers. com. 2021).

The position of HAT was mapped in this area by frc environmental in an earlier project (frc environmental 2021) (Map 2). This determination of HAT was based on:

- the approximate new height of HAT for the next tidal epoch (Metters pers. com. 2021)

- recorded tide heights at nearby locations in Coombabah Lake
- observations of tidal inundation on a low tide, and a tide close to HAT, and
- surveys of the distribution of vegetation.

The Fisheries Act does not define what is meant by 'adjacent' as it relates to marine plants, however it is defined in FHMOP 001 (Couchman & Beumer 2007). This policy describes the application of 'adjacent' in terms of when a marine plant development permit application would be required for disturbance of plants in or adjacent to the tidal zone.

In this policy, marine plants are divided into two categories: plants of high significance to fisheries, and plants of low significance to fisheries. Only plants that are considered to be of high significance to fisheries require development approval for their destruction, damage or disturbance. Plants of high significance to fisheries include mangroves, seagrass, marine couch and algae (Couchman & Beumer 2007). Plants of high significance to fisheries also include Melaleuca and Casuarina species. In particular, where Melaleuca swamps adjacent to tidal areas are either permanently or periodically tidally connected and where Casuarina stands on the landward edge of tidal flats have salt couch or samphire communities growing underneath them (Couchman & Beumer 2007).

Plants with a low significance to fisheries, include terrestrial plants, such as river gums, terrestrial grasses and palm trees that grow adjacent to tidal land. Fisheries development approval is not required for any disturbance of low fisheries significance plants (Couchman & Beumer 2007).

2.2 EPBC Threatened Ecological Communities

In Australia, threatened ecological communities (TECs) are listed and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). There are three categories of TECs under this Act:

- Critically Endangered – an ecological community at extremely high risk of extinction in the wild in the immediate future (i.e. in the next 10 years)
- Endangered – an ecological community that is not critically endangered but is at a very high risk of extinction in the wild in the near future (i.e. in the next 20 years), or
- Vulnerable – an ecological community that is not critically endangered or endangered, but is at a high risk of extinction in the wild in the medium–term future (i.e. in the next 50 years).

Actions with significant impact on listed critically endangered and endangered communities are prohibited without approval.

3 Methods

A desktop review was completed of vegetation on the Site to assist in producing preliminary maps, and target field surveys. This review included:

- Regional Ecosystem mapping by the State Government (Queensland Department of Resources 2021)
- Dowling and Stephens (2001) coastal wetland mapping by the State Government (Queensland Department of Resources 2019)
- historical images of the Site, and
- data previously collected on the Site by frc environmental.

Historical aerial photographs were assessed to determine the vegetation and marine plant communities on the Site. Previous reports pertaining to the Site were also reviewed, including the position of HAT report by letter (frc environmental 2021). The existing aquatic environmental values of the Site were assessed via a desktop review of (but not limited to):

- Protected Matters Search Tool administered by the Department of Agriculture, Water and Environment (DAWE) to determine matters of national significance or other matters protected by the *Environment Protection and Biodiversity Conservation Act 1999*
- Species Profile and Threats Database administered by the DAWE (2021)
- Vegetation management Regional Ecosystems mapping layer from Queensland Department of Resources (2021), and
- Dowling and Stephens (2001) vegetation types mapping layer from Queensland Department of Resources (2019).

Vegetation types and marine plant communities (under the *Fisheries Act 1994*) on the Site were surveyed on 02 December 2021. The area was surveyed after protracted and heavy rainfall, with 223 mm in the past 10 days, with an annual total of 1,402 mm.

The boundaries of each community were recorded using a hand held GPS. The community composition of each vegetation type and marine plant community was assessed, along with the level of disturbance (edge effects and weed incursions in this area).

The vegetation types and marine plant communities were mapped using the GPS points from the field survey and interpretation of aerial imagery (Nearmap), and with reference to previous mapping.

4 Results

4.1 Desktop Review

Vegetation on the Site is classed as remnant vegetation, and only one Regional Ecosystem (RE) was identified: RE 12.1.1 *Casuarina glauca* woodland on margins of marine clay plains (Queensland Department of Resources 2021; Map 1). In the more detailed South East Queensland (SEQ) Coastal Wetland mapping (Dowling and Stephens 2001; Queensland Department of Resources 2019) this vegetation is also mapped as *Casuarina glauca* woodland (Map 1).

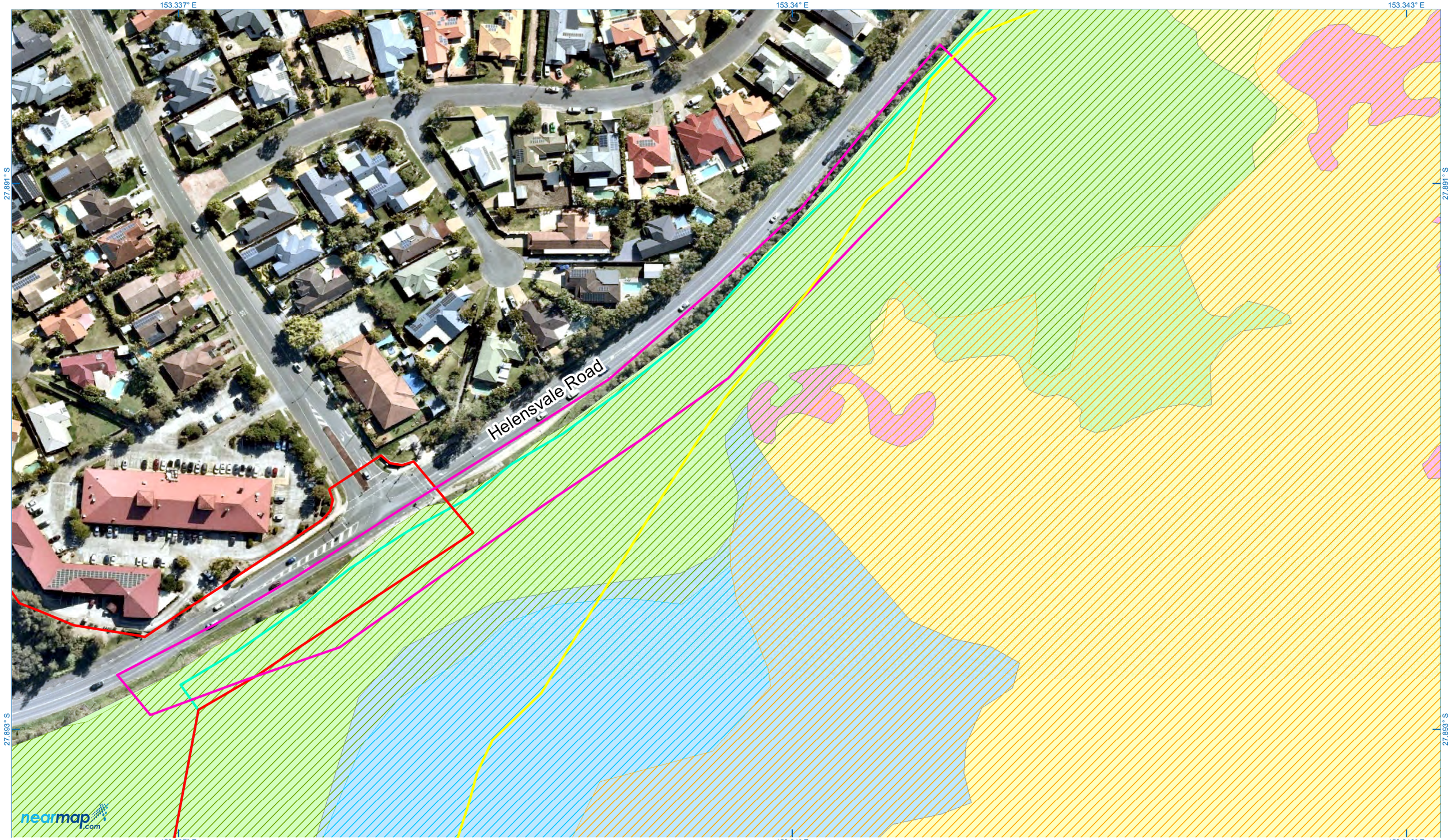
RE 12.1.1 is listed as 'of concern' under the *Vegetation Management Act 1999*.

Further south of Helensvale Road, and towards Coombabah Lake two other communities dominate:

- RE 12.1.3 (Mangrove shrubland to low closed forest on marine clay plains and estuaries), and
- a mixed forest of RE 12.1.1 (*Casuarina glauca*) and RE 12.1.3 (mangroves).

RE 12.1.3 is listed as of 'no concern at present' under the *Vegetation Management Act 1999*.

Similar communities are mapped on the SEQ Coastal Wetlands mapping, although boundaries between wetlands are slightly different to the RE mapping (Map 1).



frc environmental
AQUATIC ECOLOGISTS
deep thinking. science.

PO Box 2363
Wellington Point
Q 4160 Australia

P 07 3286 3850
E info@frcenv.com.au
www.frcenv.com.au

Coombabah Ramsar Mapping

Map 1: Regional Ecosystems, and Dowling and Stephens vegetation mapping

SOURCES

Document Path: Z:\Utility\Mappings\Mappings\2021\211015_DTMR_Coomera_offset\Workspaces\Task 1\211015_Task1_Map1_22-01-14_LA.mxd

LEGEND

- Study Area
- Proposed Road Corridor
- Landward Boundary of Ramsar Wetlands
- Estimated HAT

Regional Ecosystems

- 12.1.1 *Casuarina glauca*
- 12.1.3 Mangrove
- 12.1.1/12.1.3 Mixed *C.glauca* and mangrove

SEQ Coastal Wetland (Dowling and Stephens 2016)

- *Casuarina glauca* woodland
- Mixed *C. glauca* woodland and *Avicennia marina* open scrub
- *A.marina* open scrub
- Free standing water

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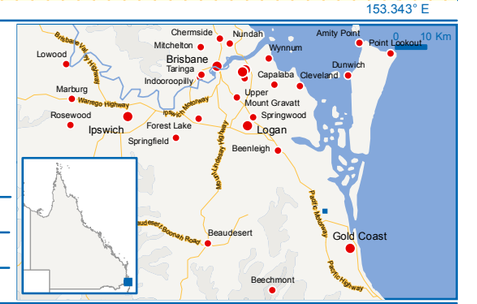

4.2 Field Survey

There were three dominant vegetation communities on the Site (Map 2):

- *Casuarina glauca* (swamp she oak) dominated community
- *Avicennia marina* (grey mangrove) dominated community, and
- mown grass on road verge.

The *Casuarina glauca* community dominated the Site, and extended from the fence line adjacent to Helensvale Rd towards the lake. Between the road and the fence line there was a mown grass verge, and in wetter areas towards the Coombabah Lake, vegetation was dominated by mangroves.

Casuarina glauca Dominated Community

This community was dominated by *Casuarina glauca* (swamp she oak) trees to 12+ m high with a canopy cover of approximately 50 to 70 %, and with *Acrostichum speciosum* (mangrove fern) dominating the understory (Figure 4.1). There were also sparse, scattered trees of *Avicennia marina* (grey mangroves) approximately 8+ m high.

In this community, there were also patches of *Phragmites australis* (common reed) in the understory, near the road (Figure 4.2). In wet areas, *Juncus* sp., *Eclipta prostrata* (false daisy), *Eleocharis* sp. (water chestnut) and *Typha* sp. (bullrush) were present. Vines, including *Parsonsia straminea* (monkey pod vine), were common growing up the swamp she oak trees. On the edge of the forest near the road, there were also some sparse, scattered trees including, *Cupaniopsis anacardioides* (tuckeroo), *Livistona australis* (cabbage tree palm), *Syzygium smithii* (lilly pilly), *Melaleuca quinquenervia* (broad-leaf paperbark) and *Excoecaria aggallocha* (milky mangrove). Under the canopy on the roadside edge of the forest, there was a strip of weed dominated plants 1 – 3 m wide, including Cyperaceae sp., *Emilia sonchifolia* (tasselflower) and *Ludwigia octovalvis* (Mexican primrose-willow) (Figure 4.3). There were also scattered patches of *Sporobolus virginicus* (marine couch) in this strip.

There was a significant amount of litter throughout this community, particularly close to the road (Figure 4.4).

There was some ponding of water in this community, with water depth up to approximately 0.5 m. The water was predominantly fresh (850 µS/cm; 0.5 ppt), and depth did not vary with the tide. There were a number of culverts along the fence line that discharged water

onto the site. At the time of the survey water was ponded at the end of the culverts, and there were dense populations of the introduced *Gambusia holbrooki* (mosquito fish – declared as restricted noxious fish under the *Biosecurity Act 2014*).

The landward edge of this community, from the fence line to approximately 10 m in, is highly disturbed, with introduced plants, a significant amount of litter, and ponding of water adjacent to the culverts. While there is less disturbance over 10 m from the road, there was still a considerable amount of litter. While the dominant plants were in good condition, ponding of water in this area may also negatively impact the medium to long term viability of this community.

Regional Ecosystem

This community is mapped as RE 12.1.1 *Casuarina glauca* woodland on margins of marine clay plains (Queensland Department of Resources 2021), which is 'of concern' under the Queensland *Vegetation Management Act 1999*.

Marine Plants

A conservative approach was taken, and this community was considered to be a marine plant community, even though it is predominantly above HAT as:

- mangrove ferns (listed as a mangrove and hence a marine plant in FHMOP 001) dominated the understory
- the area is adjacent to HAT, and the ponded water is likely to be periodically connected to tidal water
- there are sparse scattered mangroves in the community, including *Excoecaria aggallocha* near the fence line
- there was some sparse *Sporobolus virginicus* (a listed marine plant) near the fence line
- the canopy was dominated by *Casuarina glauca*, which in some situations is considered to be a marine plant.

Threatened Ecological Communities

This community is part of the Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales, and South East Queensland TEC, listed as endangered under the EPBC Act (DAWE 2021). This community was defined as this TEC by the following key diagnostic characteristics (DAWE 2018):

- it is in the South east Queensland bioregion
- it is in a coastal catchment less than 20 m above sea level, on a lake margin / estuarine fringe, where soils are at least occasionally saturated, water-logged or inundated
- it has an open forest to low open woodland structure with a tree canopy significantly over 10%
- *Casuarina glauca* dominates the canopy, and
- it is within 30 km of the coast

Further, it is considered to be a 'CATEGORY A' patch of this TEC as it is part of a patch larger than 5 ha, and the understory is predominantly native, with less than 20% of the understory consisting of non-native species (DAWE 2018). CATEGORY A patches are of the greatest conservation value and highest priority for protection (DAWE 2018).

Figure 4.1 *Casuarina glauca* dominated community with *Acrostichum speciosum* understory.

Figure 4.2 *Casuarina glauca* dominated community with *Phragmites australis* in the understory.

Figure 4.3 Weeds near the road verge, beneath the *Casuarina glauca* canopy.

Figure 4.4 Litter was common, particularly near the road verge.

Avicennia marina Dominated Community

This community was dominated by grey mangroves approximately 8+ m tall, with an understorey dominated by mangrove ferns (Figure 4.5). Water was predominantly fresh in this area, with plants that are intolerant of highly saline water such as Azolla (duckweed), floating on the surface. Tidal flushing on the landward side of these mangroves is poor in this area – with little to no tidal movement recorded between low and high tide in June 2021. While the mangroves currently appear to be in good condition, the ponding and poor tidal exchange in this area may limit their long term viability.

Figure 4.5 *Avicennia marina* community with mangrove fern understory.

Regional Ecosystem

This community is equivalent to RE 12.1.3 (Mangrove shrubland to low closed forest on marine clay plains and estuaries), which is classed as 'least concern' under the Queensland *Vegetation Management Act 1999*.

Marine Plants

This community is a marine plant community as it is dominated by mangroves and was below HAT.

Threatened Ecological Communities

This community is not a threatened ecological community.

Mown Grass on Road Verge

This community was approximately 4 m wide, and was along the road verge, between the road and the fence. It is regularly mown and is dominated by a variety of grasses (Figure 4.6).

Figure 4.6 Mown grass on road verge.

This community is not a:

- Remnant Regional Ecosystem
- marine plant community as it is above HAT and does not contain marine plants, and is not
- a TEC.

Coombabah Ramsar Mapping

Map 2: Vegetation and Marine Plant Communities

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PO Box 2363
Wellington Point
Q 4160 Australia

P 07 3286 3850
E info@frcenv.com.au
www.frcenv.com.au

SOURCES

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LEGEND

- Study Area
- Proposed Road Corridor
- Landward Boundary of Ramsar Wetlands
- Estimated HAT

Marine Plant Communities

- *Avicennia marina* Dominated Community
- *Casuarina glauca* Dominated Community

Highly Disturbed Communities

- Mown Grass on Road Verge

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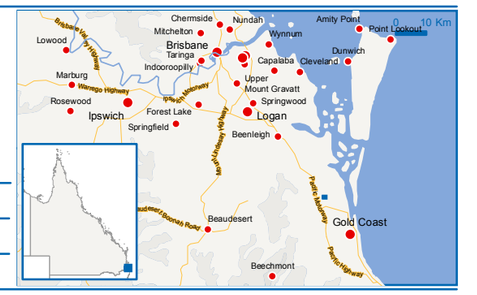

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