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Technical Memorandum

Project	Habitat Status Assessment of BICT Saltmarsh Rehabilitation Area		
From:	Kara Borthwick, Elyssa McLeod, Suanne Richards		
Date:	03/07/2025	To:	Michael Linde PBPL
Doc Ref:	L.003776.01.00		
Subject:	Habitat Status Assessment of BICT Saltmarsh Rehabilitation Area		

1.1 Background

The Brisbane International Cruise Terminal (BICT) saltmarsh rehabilitation area is located at 90 Piped Road, Pinkenba (Lot 3 on SP299911). The Lot is owned by the Queensland Government with QPH Property Co Pty Limited as trustee for the purpose of Open Space and Buffer Zone as registered on title (Figure 1.1). Adjoining land at Lots 1 and 2 on SP299911 are also owned by the Queensland Government, with Brisbane Port Holdings Pty Ltd as lessee for the BICT. As part of the Development Agreement with the Queensland Government, Port of Brisbane Pty Ltd (PBPL) was required to undertake works on Lot 3 to "improve the visual amenity", including ground works, improving the appearance of the foreshore area and landscaping.

Lot 3 ('the BICT saltmarsh rehab area' or 'study area') has undergone substantial rehabilitation since 2014 within three defined rehabilitation areas (Figure 1.2). Key rehabilitation works have included:

- Clean Up Australia Day in 2014 to remove litter
- SEQ Catchments foreshore rehabilitation works, rock boundary placement, and some marine plant transplants in 2015. PBPL contributed to this work by supplying and placing the rock used in the foreshore rehabilitation works.
- Sand placement, path removal (as agreed with Department of Agriculture and Fisheries - DAF) and fencing in late 2019/early 2020

Additionally, commencing in early 2020, PBPL made the decision to start discharging stormwater from the constructed BICT into the rehabilitation area following treatment for gross pollutants. This decision was based on insights from PBPL's historical environmental monitoring which indicated that tidal wetland condition can positively respond to freshwater inputs.

While subsequent marine plant surveys and PBPL site visits have suggested anecdotal improvements in saltmarsh coverage (BMT, 2022; PBPL, 2025) (Table 1.1), there have been no quantitative assessments directly comparing habitat status of the saltmarsh in this area between 2015 (pre-rehabilitation / early rehabilitation), 2019 (prior to 2019/20 rehabilitation works) and 2025 (current).

1.2 Objectives

The aim of this assessment is to map and characterise changes in habitat extent, cover, composition and condition (i.e. ‘habitat status’) which have occurred since 2015 within the BICT saltmarsh rehabilitation area. This will be achieved by comparing habitat status between three-time intervals: 2015 (pre-rehabilitation), 2019 (prior to 2019/20 rehabilitation works) and 2025. Information on habitat coverage and condition is to be sourced from a combination of previous survey data, high-resolution aerial imagery, satellite vegetation indices and ground validation.

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Study Area

Title:

BICT Rehabilitation Area (Study Area)

Figure: 1-1

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- Foreshore Rehab
- Rehab Area 1
- Rehab Area 2

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BICT Saltmarsh Rehabilitation Areas 2015 (Left) to 2025 (Right)

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Table 1.1 Study Area General Photos 2015-2025 (PBPL, 2025)

2015 / 2016	2025
Rehab Area 1	
	
	
Foreshore Rehab	
	

2015 / 2016	2025
	
Rehab Area 2	
No available 2015/16 photos for Rehab Area 2.	

1.3 Methodology

1.3.1 Habitat Status Mapping

Vegetation survey data from 2015 (pre-rehabilitation) and 2019 (prior to 2019/20 rehabilitation works) were reviewed to provide an understanding of the baseline habitat status across the study area (BMT, 2016; BMT, 2019). New survey data collected from the 2025 ground-truthing survey (refer below) could then be compared to these previous datasets to identify any changes in habitat status focusing on saltmarsh extent and cover. It should be noted there were some differences in mapping approach between the three timescales. The linework from the 2015 and 2019 mapping was not amended, but for comparison purposes between the three products there have been some changes in the habitat classification definitions. High-resolution aerial imagery was downloaded from Nearmap to support the analysis. Imagery was downloaded to align with ground-truthing survey dates as closely as possible as follows:

- Nearmap imagery from **July 2015** to align with the ground-truthing survey conducted **September 2015**
- Nearmap imagery from **November 2018** to align with the ground-truthing survey conducted **January 2019**. November 2018 imagery was used due to this being the closest available data to the survey in January the following year.

- Nearmap imagery from **May 2025** to align with the ground-truthing survey conducted **June 2025**.

1.3.2 Ground-truthing Survey

A field survey of the study area was conducted by a BMT ecologist on the 12 June 2025 to assess habitat extent, cover and composition, with a particular focus on saltmarsh. The entire study area was accessible on foot. The objectives of this ground-truthing survey were to:

- Estimate the extent of different vegetation communities using a handheld GPS to enable comparison with historical habitat maps, with a focus on saltmarsh areas
- Collect georeferenced data points and photographs at key locations of interest
- Identify and record dominant native and invasive plant species within each vegetation community
- Qualitatively assess vegetation condition, including indicators of plant health such as stress, disease, or pest damage.

1.3.3 Remote Sensing

Normalised Difference Vegetation Index (NDVI) is defined as the difference between near-infrared (which chlorophyll in vegetation strongly reflects) and red light (which chlorophyll absorbs) and is typically taken to represent leaf greenness. This makes it a useful tool for broadly assessing vegetation health (condition) and identifying any areas that are potentially declining in condition. NDVI represents a robust index for long-term comparisons in vegetation community condition due to its relative simplicity and similarities in central wavelengths for the red and NIR bands among sensors. In this study, NDVI was used for initial detection of any vegetation health improvements across the study area from 2015 to 2025 with a focus on saltmarsh vegetation.

Sentinel-2 high spatial resolution imagery (i.e., 10 m) was obtained for the study area for the following dates:

- June 2015
- June 2019
- June 2025

June was selected as a suitable comparison month between the three years since it is likely to represent the average saltmarsh community extent and condition in a year and generally coincides with the timing of ground-truthing surveys (with the exception of 2019). Despite a six-month gap between the January 2019 ground-truthing survey and the June 2019 Sentinel-2 imagery, the imagery was considered fit for purpose in this context, as rehabilitation works did not commence until later in 2019. As such, the imagery remained representative of pre-2019/20 rehabilitation conditions.

Sentinel-2 imagery was downloaded from Copernicus Open Data Hub using minimum good data threshold (based on cloud filtering) of 95% (Copernicus, 2024). Monthly mean Normalised Difference Vegetation Index (NDVI) was then computed for the pixels in each image using the following formula:

$$NDVI = (NIR - Red)/(NIR + Red)$$

where NIR is the near-infrared Bottom of Atmosphere (BoA) reflectance and Red is the BoA reflectance of the red band.

NDVI values range from -1 to +1, with higher values indicating dense, healthy vegetation and lower values indicating dead vegetation or non-vegetated land types (e.g. barren rock or sand) (USGS, 2018). Moderate NDVI values (0.2–0.5) are typically associated with sparse vegetation, including grasses and shrubs, while high values (0.6–0.9) correspond to dense vegetation such as mangrove forests. In Australia, NDVI typically ranges from 0.1 to 0.7 (BOM, 2024).

Inter-sensor comparisons (AVHRR, SPOT, MODIS SeaWiFS, Landsat) typically differ by less than 0.05 NDVI units over most of the non-polar regions of the world (Brown *et al.*, 2006). However, analysis-ready Sentinel-2 imagery can have geolocational errors of up to 12.5 m, potentially resulting in misalignments of up to two 10-metre pixels between image captures. These errors can lead to misregistration at habitat boundaries, particularly along the edges of mangrove forests. Additionally, in areas with sparse canopy cover, such as saltpans or regions affected by dieback, fluctuations in soil moisture may dominate the NDVI signal, requiring further interpretation.

1.4 Results

1.4.1 Saltmarsh and Associated Community Extents

Habitat maps comparing vegetation type and extent in the study area between 2015 (pre-rehabilitation), 2019 (prior to 2019/20 rehabilitation works) and 2025 are presented in Figure 1.4. Vegetation survey results for each year are provided in Annex B. The following vegetation classification definitions were adopted for this study:

1. Saltmarsh mosaic comprised of the following communities:
    - Saltmarsh: dominated by saltcouch with sparse succulents and minimal weeds (< 10% ground cover)
    - Weedy Saltmarsh: saltcouch dominated saltmarsh with exotic species comprising < 40% of ground over
    - Phragmites: brackish wetland dominated by *Phragmites australis* reedland
    - Saltpan: sparsely vegetated (< 10% groundcover) to unvegetated coastal depression subject to seasonal ponding and drying
2. Highly Disturbed: highly degraded coastal lands with extensive disturbance (e.g. tire tracks, re-profiling). May support small (in the order of meters), fragmented patches of saltmarsh vegetation.
3. Mangroves: mangrove trees
4. Foredune vegetation: dominated by species such as *Casuarina equisetifolia* (coastal she-oak) and *Ipomoea pes-caprae* (beach morning glory) on coastal sands
5. Weeds: terrestrial vegetation dominated by exotic species (i.e. weeds made up > 50% of groundcover)

When numerically comparing the extent of each community type from 2015 to 2019 with 2025, the five categories above were adopted (Figure 1.3). Further detail is included in Figure 1.4 (which distinguishes between the saltmarsh components).

The overall extent of saltmarsh over the period of 2015 to 2025 has more than tripled from approximately 2,963 m^2 to 9,761 m^2 (Figure 1.3). A substantial increase in saltmarsh extent of around 2,000 m^2 occurred between 2015 and early 2019, following 2015 remediation efforts. A further

saltmarsh increase of approximately 4,500 m^2 occurred following late 2019 rehabilitation works. The most substantial change was the conversion of highly disturbed areas - covering approximately 8,700 m^2 in 2015 and 6,600 m^2 in early 2019 - into healthier wetland mosaics comprised of saltpan, dense saltmarsh and mangrove patches, as a result of rehabilitation works. These transitions are shown in Figure 1.4 and Figure 1.5.

Mangrove extent increased by approximately 1571 ha between 2019 to 2025, with expansion occurring primarily in areas previously dominated by saltmarsh (Figure 1.5).

Weed coverage declined by approximately 500 m^2 between 2019 to 2025. This indicates that the 2019 rehabilitation works were successful in suppressing weed cover and recovery of native vegetation.

A decline in foredune vegetation was also recorded, decreasing from approximately 670 m^2 in 2015 and 497 m^2 in 2018/19, a difference of 173 m^2. This decline is likely due to foreshore erosion. The study area extent declined by approximately 1,000 m^2 between 2019 and 2025, which was a direct result of shoreline erosion. Flood events occurred in the Brisbane River in 2022 and 2025 likely contributed to this erosion. The high abundance of exotic species observed along the foredune during the survey also suggests potential competition with native vegetation, further impacting foredune integrity.

The total area of wetland vegetation was higher in 2025 than in 2019 and 2015, indicating that coverage is continuing to improve following rehabilitation works. A more detailed qualitative description of vegetation composition, condition and extent within the study area is presented below. Accompanying photographs are included in Annex A.

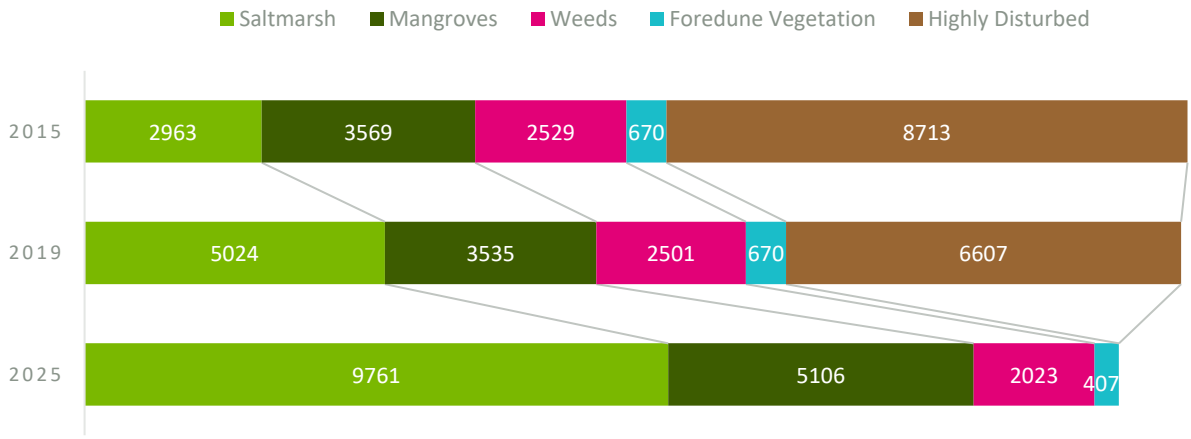

Figure 1.3 Area of saltmarsh, mangroves, weeds and other wetland types within the study area 2015 (pre-rehabilitation), 2019 (prior to 2019/20 rehabilitation works) and 2025. Note: the difference in study area extent between 2015/2019 and 2025 is due to the dynamic nature of the shoreline and the survey area not extending as far seaward as previous years

1.4.2 Study Area Vegetation Communities

Saltmarsh is an intertidal wetland type that is tolerant of periodic inundation of salt water and is generally found upslope of mangrove forests. Consistent with other estuaries on the south-eastern Queensland coast, remnant and regenerating saltmarsh in the study area was dominated by *Sporobolus virginicus* (salt couch), particularly in more elevated, landward zones, and *Sesuvium portulacastrum* (sea purslane). A variety of other saltmarsh species were also observed, including *Carpobrotus glaucescens* (sea fig), *Enchylaena tomentosa var. glabra* (ruby saltbush), *Salicornia*

quinueflora (beaded samphire), *Phragmites australis* (common reed) and *Fimbristylis ferruginea* (fringe rush).

Saltmarsh communities were generally in good condition, with only minor dieback observed on the eastern side of the study area (Rehabilitation Area 1). This eastern portion appeared drier than the western side (Rehabilitation Area 2), with areas of browning saltmarsh vegetation. The browning may reflect typical seasonal behaviour of the dominant species, which tends to exhibit reduced greenness during winter and periods of lower rainfall. In contrast, the western portion of the study area retained more surface water, with numerous stagnant pools (often supporting algal growth). This greater water retention appeared to promote greener and more vigorous saltmarsh growth, along with a more extensive development of saltpan areas. However, it also appeared to support a higher incidence of invasive plant species interspersed among the saltmarsh (as described below).

Mangrove forests at the site were dominated by *Avicennia marina* (grey mangrove), with C*eriops australis* (smooth-fruit yellow mangrove) observed along the edges of large patches of *Avicennia marina*. A single *Bruguiera gymnorhiza* (orange mangrove) tree was also recorded. Some mangroves had minor yellowing/browning on their leaves. Overall, the mangrove communities appeared to be in good health with no signs of disease or dieback.

A narrow band (approximately 1-3 m) of foredune species was present along the seaward edge of the study area. Species typically consisted of *Ipomoea pes-caprae* (beach morning glory), *Spinifex sericeus* (beach spinifex) and *Casuarina equisetifolia* (coastal she-oak). A singular *Hibiscus tiliaceus* (cotton tree) was also observed, as well as some *Pandanus tectorius* (screwpine) juveniles. The foredune species were interspersed with invasive species, which tended to be concentrated on the seaward side of the study area.

Several invasive species were identified within the study area during the 2025 survey. These were primarily concentrated directly adjacent to road fencing, as well as on the seaward and far western edges of the study area. Observed weeds included invasive grasses (*Melinis repens*, *Chloris gayana*, *Megathyrsus maximums var.pubiglumis*), *Neonotonia wightii* (glycine), *Sphagneticola trilobata* (singapore daisy), *Bidens pilosa* (cobblers pegs), *Emilia sonchifolia* (cupids shaving brush), *Erigeron bonariensis* (fleabane), *Ipomoea cairica* (mile-a-minute) and *Vigna lutelola* (wild cowpea). One ‘Category 3 restricted matter’ species under the Biosecurity Act 2014 was identified (*Schinus terebinthifolia* - broad-leaved pepper tree), as well as one WoNS (*Opuntia stricta* – prickly pear). All observed weeds are common throughout coastal areas of southeast Queensland.

A variety of fauna were observed in the study area during the 2025 survey. Opportunistic observations included the *Egretta novaehollandiae* (white-faced heron), *Egretta garzetta* (little egret), *Vanellus miles* (masked lapwing) and *Threskiornis molucca* (Australian white ibis), which were utilising the pooled water in the saltpan areas. *Chenonetta jubata* (Australian wood duck), *Coracina novaehollandiae* (black-faced cuckoo-shrike), *Pelecanus conspicillatus* (Australian pelican), *Larus novaehollandiae* (silver gull) and *Gymnorhina tibicen* (Australian magpie) were also observed either within or near the study area. This suggests that the BICT saltmarsh rehabilitation area provides locally good quality habitat for various bird species.

2015

Imagery: July 2015 from Nearmap

2019

Imagery: November 2018 from Nearmap
(closest available to the January 2019 survey)

2025

Imagery: May 2025 from Nearmap

Legend

- Study Area
- Foredune Vegetation
- Mangroves
- Phragmites
- Saltmarsh
- Saltpan
- Weeds
- Weedy Saltmarsh
- Highly Disturbed

Title:

Vegetation Survey Comparison 2015 (pre-rehab), 2019 (prior to 2019/20 rehab) and 2025 (current)

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2015

Imagery: July 2015 from Nearmap

2019

Imagery: November 2018 from Nearmap
(closest available to the January 2019 survey)

2025

Imagery: May 2025 from Nearmap

Legend
Study Area

Title:
Aerial Imagery Comparison 2015 (pre-rehab), 2019 (prior to 2019/20 rehab) and 2025 (current)

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1.4.3 Remote Sensing - NDVI Analysis

NDVI values for the study area fell within the range of -0.1 to 0.7 for June 2015, 2019 and 2025, with very low / negative values typically located along the mudflats of the inter-tidal zone (Figure 1.7). Maximum NDVI values ranged from 0.4 to 0.69, with the lowest value occurring in 2015 and the highest occurring in 2025. An increase in mean NDVI was also observed throughout the three focus years. Mean NDVI increased by 0.04 between 2015 and 2019 (from 0.22 to 0.26), and again by 0.12 from 2019 to 2025 (0.38). This suggests a comparatively smaller increase in vegetation health following initial restoration works in 2015, and a larger increase in vegetation health following the rehabilitation works in late 2019. This is consistent with temporal patterns in vegetation community extent described previously.

Cumulative 12-month antecedent rainfall data for Brisbane Airport (040842) station (the closest station to the study area) is presented in Figure 1.6. According to this data, 2024/25 has been wetter than 2019/2020 and 2014/2015, suggesting conditions during this year were favourable for vegetation growth. Improvements in NDVI between 2015, 2019 and 2025 were therefore likely driven by a combination of successful rehabilitation works and favourable growing conditions. The more favourable growing conditions in 2025 also likely contributed to the larger NDVI increase observed from 2019 – 2025 (compared to the smaller increase observed from 2015 - 2019).

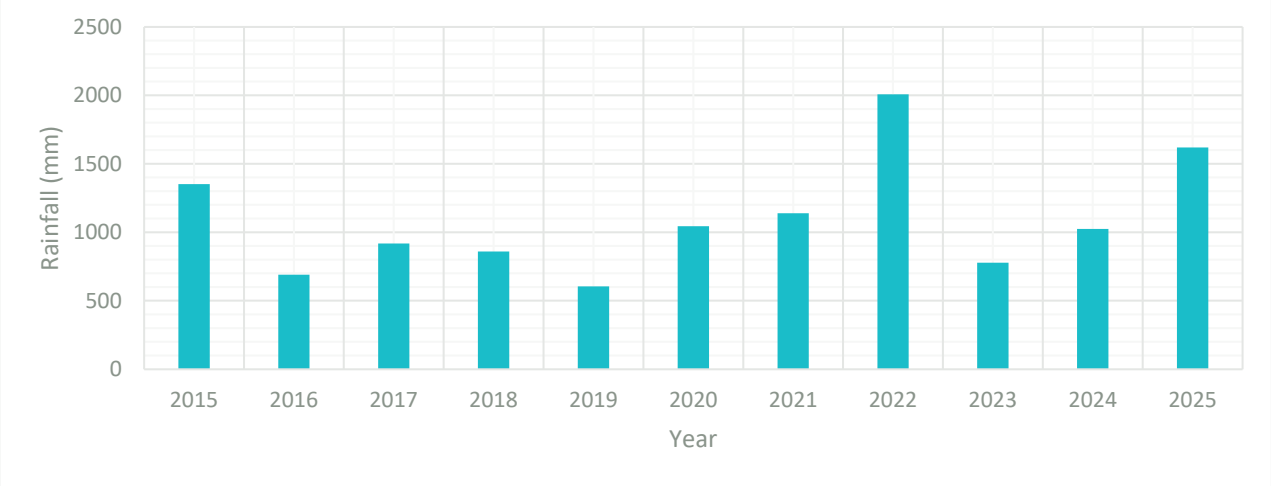

Figure 1.6 12-monthly cumulative antecedent rainfall for the study area in millimetres (based on Brisbane Airport station 040842).

The largest NDVI values occurred in the centre and eastern sections of the study area for all three years (Figure 1.7). Improvements in NDVI between years were also typically observed in these locations. Saltmarsh patches have occupied these areas since 2015, suggesting consistent improvements in saltmarsh health. The large area of sparse saltmarsh on saltpan in the west of the site has also shown substantial improvement, transitioning from low NDVI values in 2015 and 2019 (approximately 0.2) to higher NDVI values in 2025 (approximately 0.3-0.4) associated with denser vegetation and saltpan ponding. The exception to this is the far west of the study area, which has shown substantial improvements in NDVI from 2015-2025. However, this area is dominated by weeds and therefore the improved NDVI values do not indicate an increase in vegetation condition in terms of composition and wetland habitat value.

The change vector (change detection) for the NDVI values from June 2015 to June 2025 is shown in Figure 1.8. This vector represents the direction and magnitude of changes in NDVI values over the specified period which is a basis for identifying areas of saltmarsh health improvement or decline during the period. Table 1.2 presents the extent of the study area categorised by the magnitude of NDVI

change. Most of the study area (82%) has experienced improvements in NDVI since 2015. Smaller portions of the study area experienced minimal change (13%) or decreases (5%) in NDVI. The areas which displayed a decrease in NDVI were located along the southwest seaward edge on the mudflats. Negative changes in NDVI (decreases) are likely due to the dynamic nature of the shoreline between years.

As shown in Figure 1.8, all areas mapped as saltmarsh in 2025 were located within areas of positive NDVI change (with the exception of one small seaward patch). The largest NDVI improvements were observed in the saltmarsh patch towards the centre of the study area. These results suggest a general improvement in saltmarsh health since restoration works commenced in 2015.

Table 1.2 Area (m^2) of the Study Area Showing NDVI Changes Between June 2015 and June 2025

Site	Area (m^2)		
	Declined NDVI Change < -0.1	Minimal Change NDVI Change -0.1 to 0.1	Improved NDVI Change > 0.1
Study Area	1,000	2,802	17,113

2015

Imagery: July 2015 from Nearmap

2019

Imagery: November 2018 from Nearmap
(closest available to the January 2019 survey)

2025

Imagery: May 2025 from Nearmap

Legend

NDVI Values

- < 0.1
- 0.2
- 0.3
- 0.4
- 0.5
- 0.6
- 0.7

- Study Area
- Saltmarsh Survey Extents

Title:

NDVI Comparison 2015 (pre-rehab), 2019 (prior to 2019/20 rehab) and 2025 (current)

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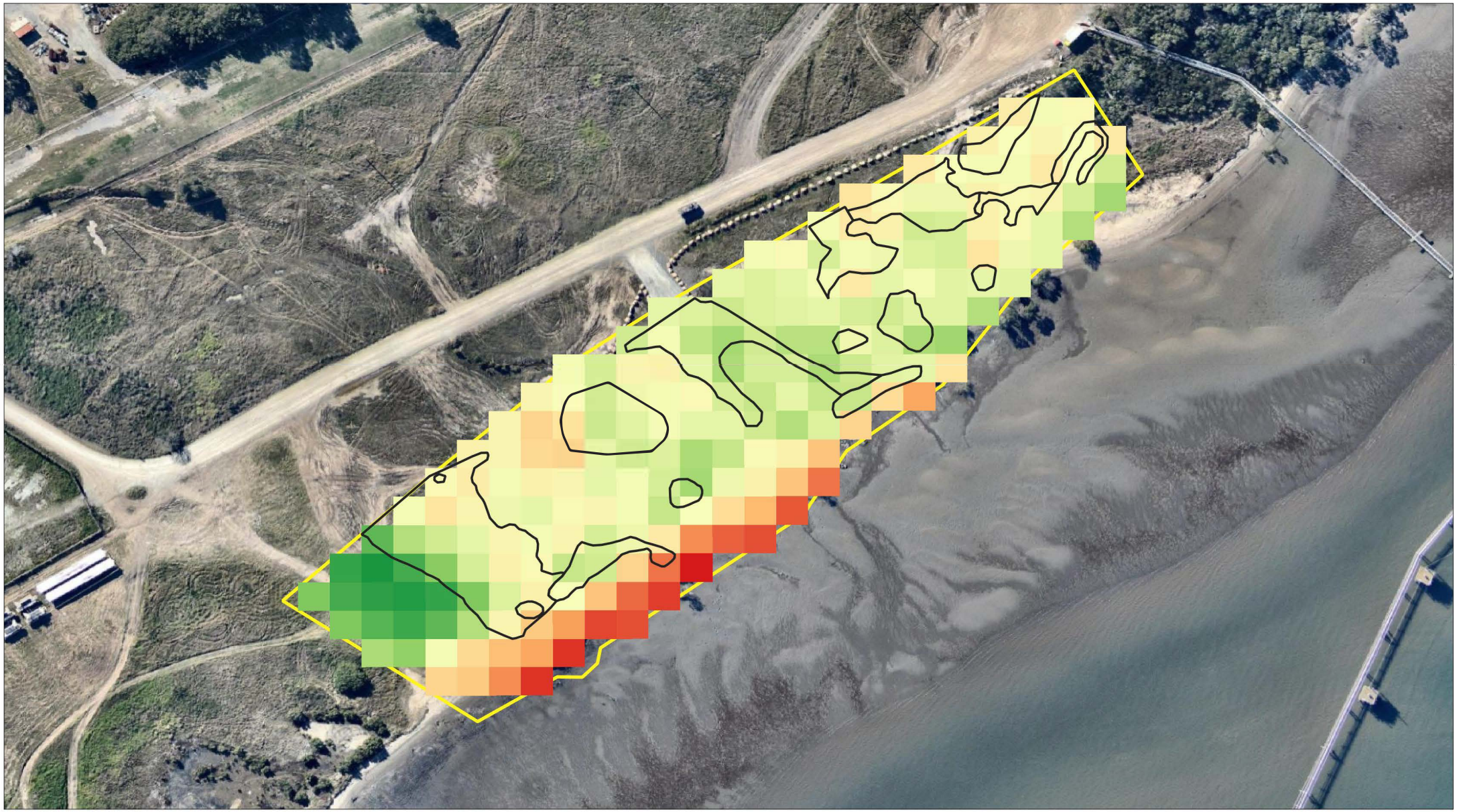

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NDVI Change from 2015 to 2025

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1.5 Conclusion

This assessment mapped and characterised changes in saltmarsh extent, vegetation cover, composition and condition within the BICT saltmarsh rehabilitation area since 2015. Saltmarsh status was compared between 2015 (pre-rehabilitation / early rehabilitation), 2019 (prior to 2019/20 rehabilitation works) and 2025 (current) using a combination of previous survey data, high-resolution aerial imagery, satellite vegetation indices and a ground-truthing survey in June 2025.

Key results from this assessment were:

- The extent of saltmarsh within the BICT rehabilitation area has more than tripled since 2015, reaching approximately 9,761 m² by 2025.
- Vegetation structure has shifted from highly disturbed habitat to a more diverse wetland mosaic, including saltpan, dense saltmarsh, and expanding mangrove areas.
- Above-average annual rainfall during 2024/25 likely supported favourable conditions for vegetation growth and rehabilitation success.
- Dominant saltmarsh species included *Sporobolus virginicus* (salt couch) and *Sesuvium portulacastrum* (sea purslane), with vegetation generally observed to be in good condition.
- Higher water retention in the western portion of the site (Rehab Area 2) supported greener, denser saltmarsh and more extensive saltpan, but was also associated with a higher presence of invasive species.
- NDVI analysis showed a steady improvement in vegetation health from 2015 to 2025, with the most significant gains occurring between early 2019 and 2025.
- NDVI increases were observed across 82% of the study area, and nearly all areas mapped as saltmarsh in 2025 were located within these improving zones.
- The rehabilitation works—including fencing, vehicle exclusion, and landform re-profiling—have resulted in a net gain of saltmarsh habitat and a more structurally diverse wetland.
- Stormwater discharge into the wetland has likely contributed to the recovery of saltmarsh and mangrove communities by maintaining soil moisture and supporting plant growth. However, this increased moisture availability may also have facilitated the establishment and spread of invasive weed species in wetter areas.
- The BICT site now represents a locally significant estuarine wetland mosaic that supports habitat for various bird species and contributes to regional ecological value.

1.6 References

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BMT (2019) BICT Lot 3 on SP299911 Marine Plant Assessment (M.B22969.001), Technical Note. Prepared by BMT for Port of Brisbane Pty Ltd (PBPL).

BMT (2016) Luggage Point Cruise Terminal: Review of Environmental Factors (R.B21636.002.01), Report. Prepared by BMT for Port of Brisbane Pty Ltd (PBPL).

Brown ME, Pinzón JE, Didan K, Morisette JT, Tucker CJ (2006). Evaluation of the Consistency of Long-Term NDVI Time Series Derived From AVHRR, SPOT-Vegetation, SeaWiFS, MODIS, and Landsat ETM+ Sensors. IEEE Transactions on Geoscience and Remote Sensing 44(7):1787-1793.

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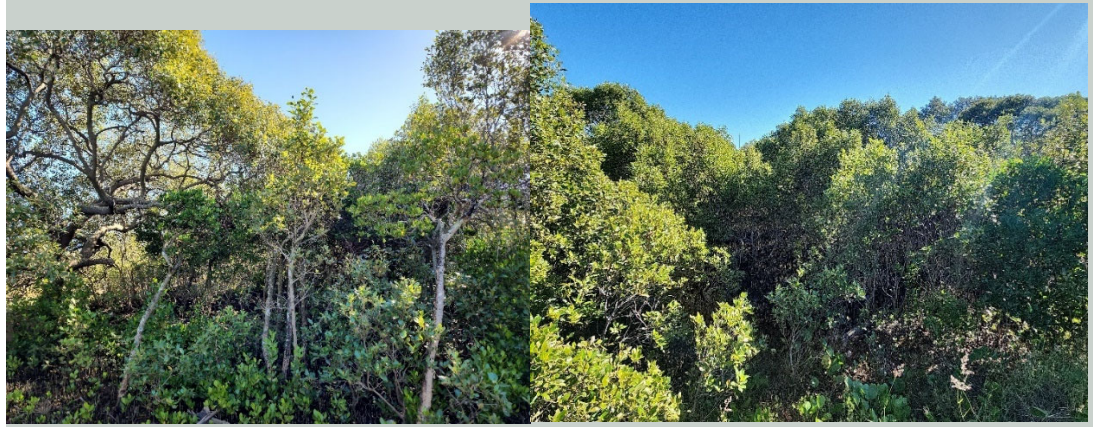
PBPL (Port of Brisbane Pty Ltd) (2025) Port of Brisbane Planning and Environment Forum: Environmental Management [PowerPoint slides], provided by Michael Linde (PBPL) 13 May 2025.

United States Geological Survey (USGS) (2018) *NDVI, the Foundation for Remote Sensing Phenology*, United States Geological Survey Website, accessed 23 June 2025.

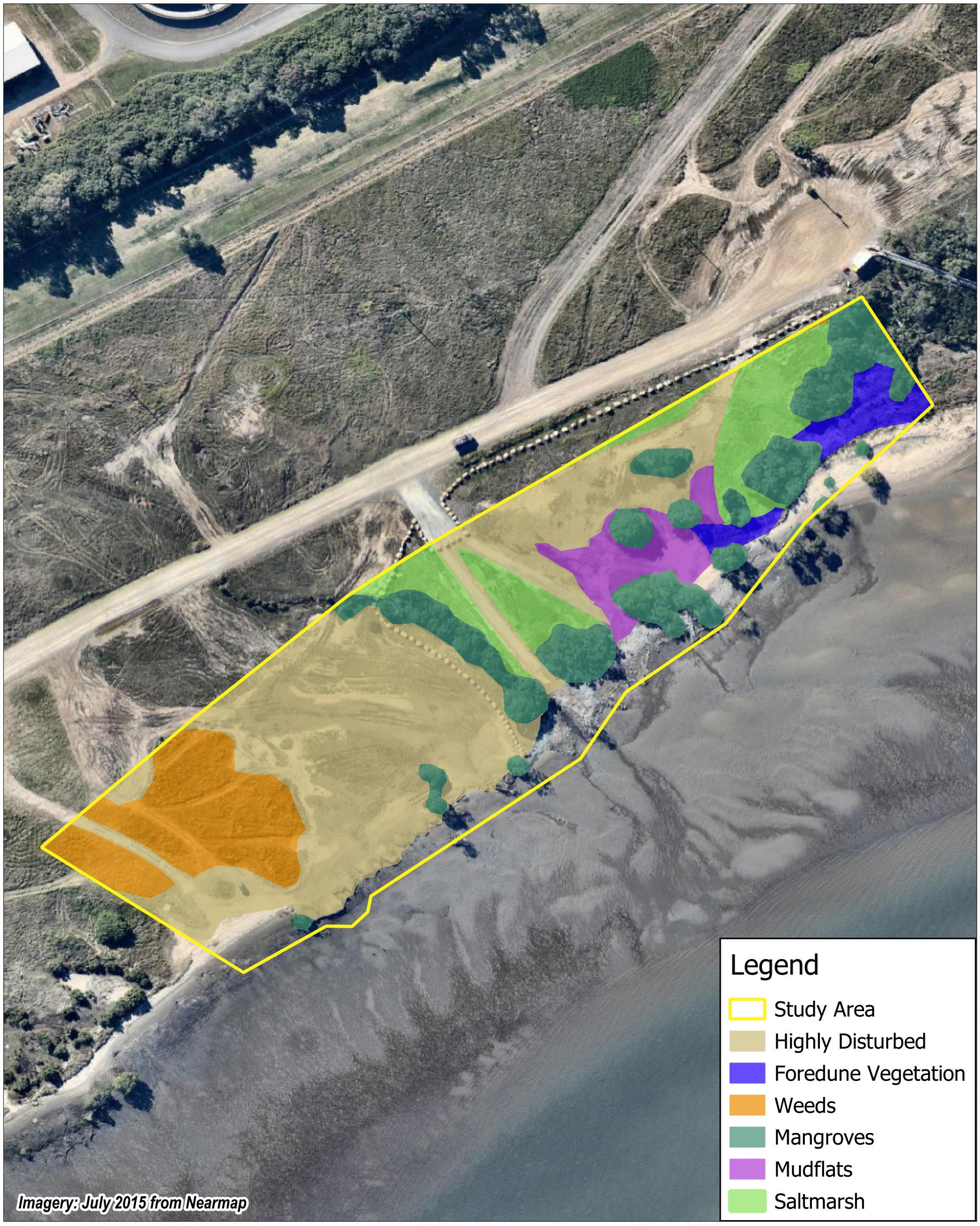
Annex A Summary of Habitat Features in the Study Area

Community Type	Brief Description	Species Present
Mangroves		
	Large patches of healthy mangroves were present throughout the study area. Patches were dominated by *Avicennia marina*, however, *Ceriops australis* were also observed along the edges of large patches. A singular *Bruguiera gymnorhiza* (orange mangrove) tree was also recorded.	• *Avicennia marina* • *Ceriops australis* • *Bruguiera gymnorhiza*

Community Type	Brief Description	Species Present
Saltmarsh		
  	The study area comprised large patches of saltmarsh in generally good condition, with patches towards the west of the site becoming interspersed with exotic species. Saltmarsh was typically browner in the eastern section of the study area. The east also appeared to be drier than the west, which had much more water retention. Consistent with other estuaries on the south-eastern Queensland coast, remnant and regenerating saltmarsh in the study area was dominated by *Sporobolus virginicus* and *Sesuvium portulacastrum*.	• *Sporobolus virginicus* • *Sesuvium portulacastrum* • *Carpobrotus glaucescens* • *Enchylaena tomentosa var. glabra* • *Salicornia quinueflora* • *Phragmites australis* • *Fimbristylis ferruginea*

Community Type	Brief Description	Species Present
Foredune Vegetation		
	A narrow band (approximately 1-3 m) of foredune species was present along the seaward edge of the study area. Species typically consisted of *Ipomoea pes-caprae*, *Spinifex sericeus* and *Casuarina equisetifolia*. Foredunes also contained exotic grasses interspersed with native species.	• *Ipomoea pes-caprae* • *Spinifex sericeus* • *Casuarina equisetifolia* • *Hibiscus tiliaceus* • *Pandanus tectorius*
Weeds		
	Exotic grassland was most prominent at the west extent of the study area and dominated by *Melinis repens*, *Chloris gayana*, and *Megathyrsus maximums var.pubiglumis*. Other observed weeds were concentrated adjacent to road fencing and on the seaward edge of the study area, interspersed with foredune vegetation.	• *Melinis repens* • *Chloris gayana* • *Megathyrsus maximums var.pubiglumis* • *Neonotonia wightii* • *Sphagneticola trilobata* • *Bidens pilosa* • *Emilia sonchifolia* • *Erigeron bonariensis* • *Ipomoea cairica* • *Vigna lutelola* • *Schinus terebinthifolia* • *Opuntia stricta*

Annex B Vegetation Survey Results by Year



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Vegetation Survey Results 2015 (pre-rehab)

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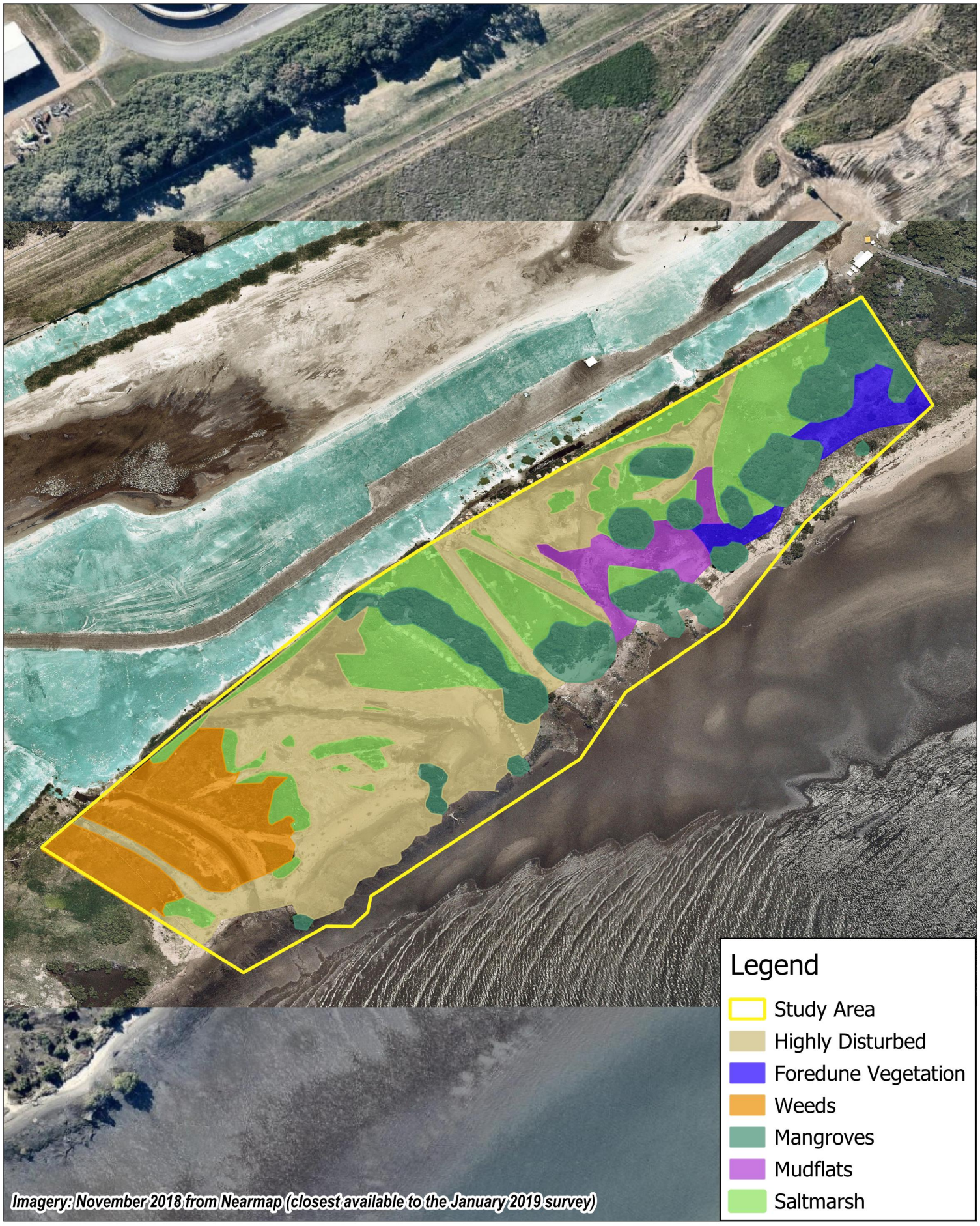

Title:

Vegetation Survey Results 2019 (prior to 2019/20 rehab)

Figure:

Rev: **A**

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Title:

Vegetation Survey Results 2025 (current)

Figure:

Rev: **A**

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