

Whyte Island Rehabilitation Program

Rehabilitation Outcomes and Closure Report
July 2026



Customer
Project
Deliverable
Version

Port of Brisbane Pty Ltd
004226
001
01
22 July 2026

Document Control

Document Identification

Title	Whyte Island Rehabilitation Program - Rehabilitation Outcomes and Closure Report, July 2026
Project No	004226
Deliverable No	001
Version No	01
Version Date	22 July 2026
Customer	Port of Brisbane Pty Ltd
Classification	PUBLIC
Author	Suanne Richards and Elyssa McLeod
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Approved By	Dr Darren Richardson
Project Manager	Suanne Richards

Amendment Record

The Amendment Record below records the history and issue status of this document.

Version	Version Date	Distribution	Record
00	14 July 2026	Port of Brisbane Pty Ltd	DRAFT
01	22 July 2026	Port of Brisbane Pty Ltd	FINAL

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Executive Summary

In accordance with *Section 5.2 KPI-2: Biodiversity* of the Port of Brisbane Pty Ltd (PBPL) sustainability finance framework, PBPL is committed to rehabilitate 10 ha of degraded land at Whyte Island (the project area) by mid-2026. Annual independent monitoring of the rehabilitation program is undertaken by BMT to track rehabilitation progress towards this commitment.

Previous assessments have documented outcomes to July 2024 (Year 1), July 2025 (Year 2) and a January 2026 (year 3) (BMT 2024; 2025; 2026). This Rehabilitation Outcomes and Closure Report provides the final assessment of rehabilitation gains achieved over the life of the program. It provides a quantified evaluation of all rehabilitation efforts delivered, including both direct on-ground works and indirect rehabilitation through management controls.

Method of Assessment

In accordance with *Section 5.2 KPI-2: Biodiversity* of the PBPL sustainability finance framework, rehabilitation outcomes have been assessed using the Queensland BioCondition Assessment Framework and addresses key criteria including:

1. increase in habitat
2. biodiversity condition assessment improvement over time, and
3. improvement in ecosystem services.

Condition assessments were undertaken in permanent monitoring plots within mapped Regional Ecosystem (RE) units. Standardised BioCondition methods were used to measure canopy structure, native species richness, regeneration, ground-layer composition, and coarse woody debris. Baseline and repeat-survey results were compared to RE-specific reference benchmarks to quantify changes in vegetation condition. Additional field surveys, vegetation transects and remote-sensing analyses were also used within the program to ensure the plots were representative of broader site conditions.

The Guide to Determining Terrestrial Habitat Quality (The Guide), part of the BioCondition Assessment Framework, was used to assess and quantify rehabilitation outcomes achieved through vehicle management controls that reduced disturbance to tidal flat habitats and shorebirds. The Guide includes condition attributes that capture disturbance pressures affecting fauna habitat quality, enabling evaluation of how reduced disturbance translates into functional habitat gains. In the context of shorebird habitat, these metrics were used to assess changes in habitat quality and functionality, focusing on improved suitability of roosting and feeding habitat as a result of rehabilitation actions.

Rehabilitation Target Achieved

PBPL has achieved its KPI-2 commitment, with 20.3 ha of degraded land at Whyte Island rehabilitated - exceeding the 10-ha requirement.

Outcomes have been independently verified using the Queensland BioCondition Assessment Framework, confirming measurable improvements in habit extent, vegetation condition and ecosystem services

Programme Outcomes

The rehabilitation program has delivered substantial ecological improvements across Whyte Island through a combination of revegetation, targeted weed management and the removal of key disturbance pressures.

Key achievements include:

- Rehabilitation of Coastal Swamp Oak Forest (RE 12.1.1), a threatened ecological community listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- Rehabilitation of saltmarsh, estuarine claypan and mangrove communities (RE 12.1.2 and RE 12.1.3), which provide important shorebird foraging and high-tide roosting habitat and contribute to the values of the adjacent Moreton Bay Ramsar Wetland.
- Rehabilitation of open forest communities on alluvial plains (RE 12.3.11 and RE 12.3.20), including vegetation corresponding to EPBC-listed Lowland Rainforest.
- Restoration of Phragmites wetland habitat previously degraded by exotic weed infestations.
- Implementation of vehicle exclusion measures and habitat restoration works that have substantially reduced disturbance and improved the quality and function of shorebird habitat.

The program has demonstrated that combining active restoration with the management of degrading processes can effectively restore ecological function and support the recovery of threatened coastal ecosystems. BioCondition assessments indicate that rehabilitated areas are on a positive trajectory, with improvements in vegetation condition, habitat quality and the protection of important shorebird habitat. Collectively, these outcomes have strengthened the ecological integrity and resilience of Whyte Island's coastal and estuarine ecosystems.

Recommendations

Rehabilitation objectives have been achieved across all previously degraded sites within the project area. Dense revegetation has been completed in all areas which had limited natural regeneration potential, while weed control and disturbance reduction measures have facilitated natural recovery of coastal ecosystems. The exclusion of vehicle access from sensitive claypan habitats has reduced ongoing disturbance to shorebirds and has contributed to measurable improvements in adjacent saltmarsh and wetland habitats.

With all available areas now rehabilitated, future management should focus on protecting and maintaining these outcomes through targeted maintenance and monitoring activities, as follows.

1. Vegetation Management and Habitat Maintenance:

- Continue targeted weed control within planted and naturally regenerating areas.
- Undertake infill planting, if required, to maintain native vegetation cover and species diversity.
- Support natural regeneration processes to further improve vegetation condition and structural complexity.

2. Disturbance Reduction and Access Management:

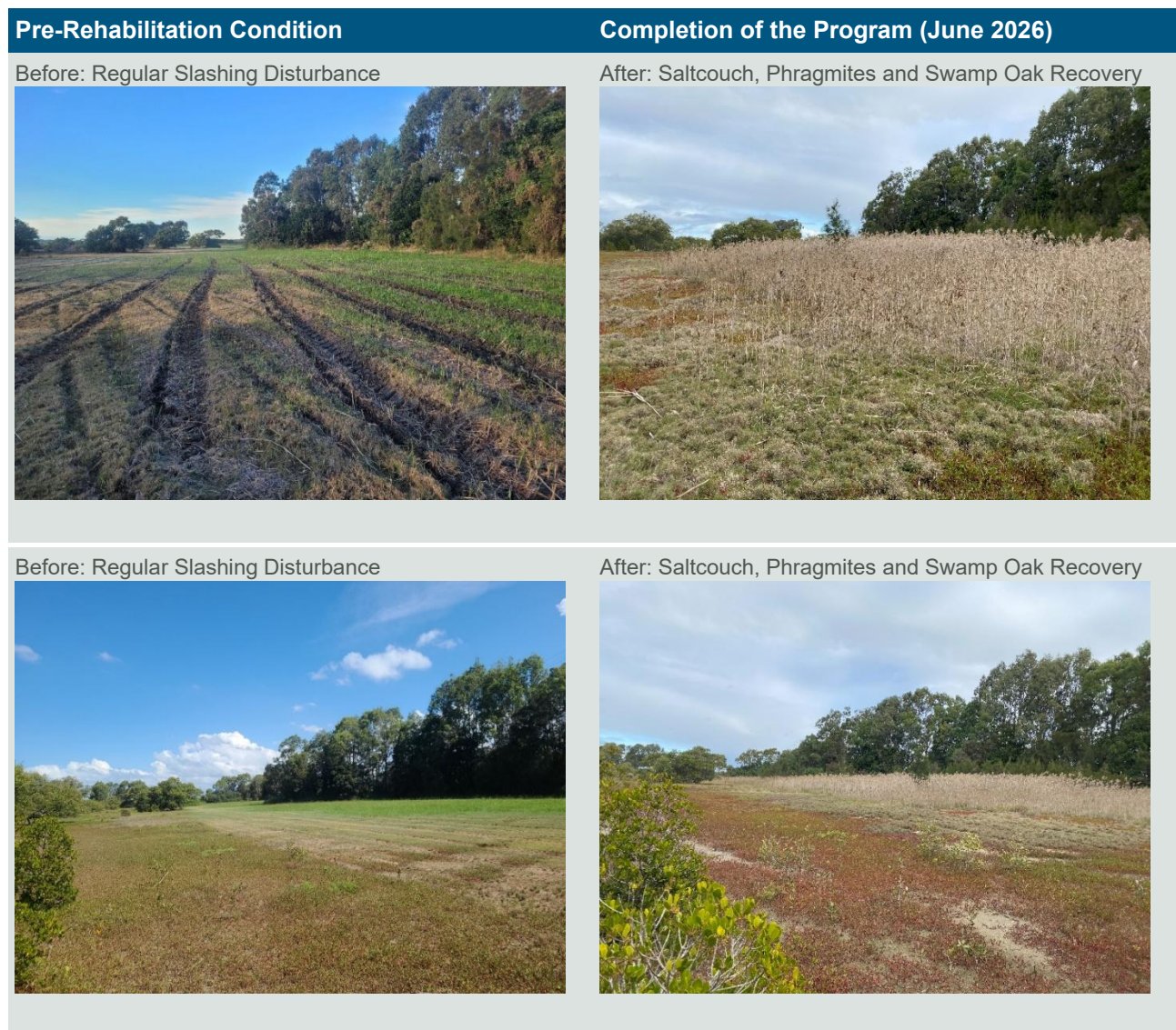
- Maintain vehicle exclusion measures within estuarine and near-shore habitats.
- Retain and enhance vegetative screening to minimise disturbance from surrounding land uses.
- Continue protection of key shorebird foraging and roosting habitats, including habitat used by migratory species such as the Critically Endangered Far Eastern Curlew.

3. Monitoring:

- Continue shorebird monitoring to assess habitat utilisation and conservation outcomes.
- Undertake periodic site assessments to verify vegetation recovery trajectories and inform adaptive management.

Overall, the rehabilitation program has successfully restored all feasible areas within the project area and established a strong foundation for the long-term protection and management of Whyte Island's coastal, wetland and shorebird habitats.

Figure 1. Site Condition Before Rehabilitation and at Completion of the Rehabilitation Program (June 2026)



Pre-Rehabilitation Condition

Before: Managed Exotic Grassland



Completion of the Program (June 2026)

After: Native Vegetation Establishment Through Restoration Planting



Before: Vehicle-Damaged Saltmarsh



After: Saltmarsh Recovery On Former Access Tracks



Before: Regular Slashing Disturbance



After: Saltmarsh and Phragmites Recovery



Pre-Rehabilitation Condition

Completion of the Program (June 2026)

Before: Regular Slashing Disturbance



After: Salt Couch and Phragmites Recovery



Before: Managed Exotic Grassland



After: Native Vegetation Establishment Through Restoration Planting



Before: Managed Exotic Grassland



After: Native Vegetation Establishment Through Restoration Planting and Weed Control



Pre-Rehabilitation Condition	Completion of the Program (June 2026)
Before: Managed Exotic Grassland 	After: Native Vegetation Establishment Through Restoration Planting 
Before: Managed Exotic Grassland 	After: Native Vegetation Establishment Through Restoration Planting 
Before: Managed Exotic Grassland 	After: Saltmarsh and Phragmites Recovery 

Pre-Rehabilitation Condition

Before: Managed Exotic Grassland



Before: Managed Exotic Grassland



Before: Managed Exotic Grassland



Completion of the Program (June 2026)

After: Native Vegetation Establishment Through Restoration Planting and Weed Control



After: Native Vegetation Establishment Through Restoration Planting and Weed Control



After: Native Vegetation Establishment Through Restoration Planting and Weed Control



Pre-Rehabilitation Condition	Completion of the Program (June 2026)
Before: Managed Exotic Grassland 	After: Native Vegetation Establishment Through Restoration Planting and Weed Control 
Before: Managed Exotic Grassland 	After: Native Vegetation Establishment Through Restoration Planting and Weed Control 
Before: Managed Exotic Grassland 	After: Native Vegetation Establishment Through Restoration Planting and Weed Control 

Pre-Rehabilitation Condition	Completion of the Program (June 2026)
Before: Vehicle-Damaged Saltmarsh 	After: Saltmarsh Recovery On Former Access Tracks 
Before: Vehicle-Damaged Saltmarsh 	After: Saltmarsh Recovery On Former Access Tracks 
Before: Vehicle-Damaged Mudflats 	After: Mudflat Recovery On Former Access Tracks 

Pre-Rehabilitation Condition

Before: Vehicle-Damaged Mudflats



Completion of the Program (June 2026)

After: Mudflat Recovery On Former Access Tracks

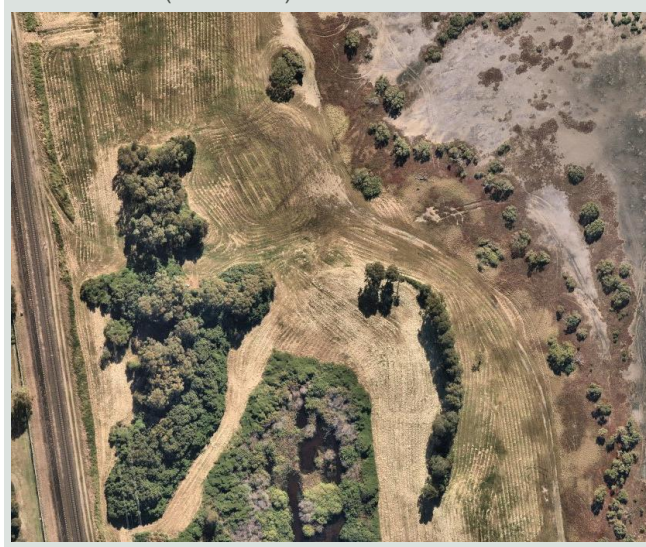
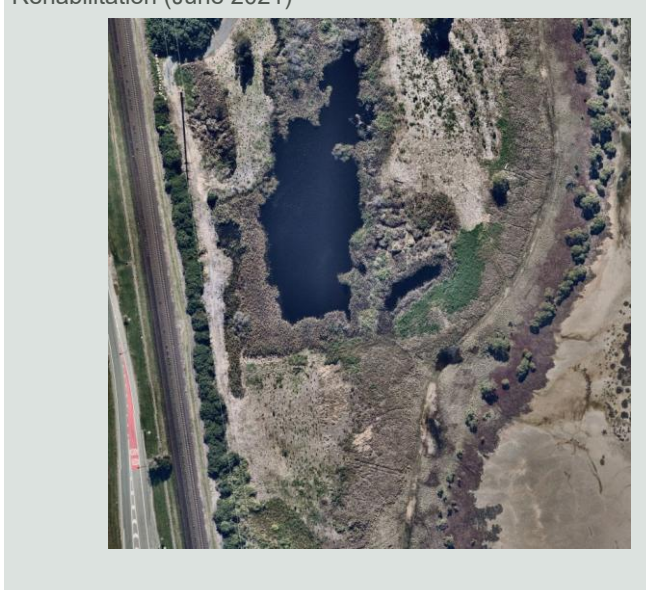


Aerial View of the Northern Project Area Before Rehabilitation (June 2021)



Aerial View of the Northern Project Area After Rehabilitation (June 2026)



Pre-Rehabilitation Condition	Completion of the Program (June 2026)
Aerial View of the Central Project Area Before Rehabilitation (June 2021) 	Aerial View of the Central Project Area After Rehabilitation (June 2026) 
Aerial View of the Central Project Area Before Rehabilitation (June 2021) 	Aerial View of the Central Project Area After Rehabilitation (June 2026) 

Pre-Rehabilitation Condition	Completion of the Program (June 2026)
Aerial View of the Southern Project Before Rehabilitation (June 2021) 	Aerial View of the Southern Project Area After Rehabilitation (June 2026) 

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1 Introduction

1.1 Background

Whyte Island supports a mosaic of coastal, estuarine and wetland habitats within the Port of Brisbane landscape, including vegetation communities and shorebird habitats that contribute to broader ecological values in western Moreton Bay. Parts of the site had been degraded by weed invasion, vehicle access, slashing and other disturbance pressures, reducing vegetation condition and habitat function across areas with rehabilitation potential.

In accordance with *Section 5.2 KPI-2: Biodiversity* of the Port of Brisbane Pty Ltd (PBPL) sustainability finance framework, PBPL committed to rehabilitate 10 ha of degraded land at Whyte Island (the project area) by mid-2026. BMT undertook annual independent monitoring to track progress against this commitment, with previous assessments documenting outcomes to July 2024 (Year 1), July 2025 (Year 2) and January 2026 (Year 3) (BMT 2024; 2025; 2026).

The remaining assessment need was to consolidate the annual monitoring record into a final, quantified account of rehabilitation outcomes over the life of the program. This required evaluation of direct on-ground rehabilitation works, such as planting and weed control, together with indirect rehabilitation achieved through management controls that reduced disturbance to estuarine and shorebird habitats.

This Rehabilitation Outcomes and Closure Report addresses that need by presenting the final assessment of rehabilitation gains achieved by the program. It draws on BioCondition assessments, vegetation transects, site inspections, rehabilitation mapping and shorebird habitat assessment to quantify changes in vegetation condition, habitat quality and ecosystem function, and to identify management actions required to maintain the outcomes achieved.

1.2 Scope and Aims

The objectives of this assessment are to:

- Evaluate and quantify all rehabilitation efforts delivered under the program, including both direct on-ground works and indirect rehabilitation through management controls.
- Assess vegetation condition using standardised BioCondition methods to measure canopy structure, native species richness, regeneration, ground-layer composition, and coarse woody debris.
- Use the BioCondition Assessment Framework to assess and quantify improvements to shorebird habitat achieved through vehicle management controls to prevent physical disturbance to estuarine habitats and remove associated noise and visual disturbance to shorebirds.
- Provide recommendations to ensure that rehabilitated areas continue to maintain upward condition and extent trajectories.

2 Methodology

2.1 Vegetation Assessment

Current Nearmap imagery was assessed to map the extent of new rehabilitation works undertaken within the project area since FY 24/25. Ground truthing surveys were then undertaken to assess habitat condition within actively managed areas of the project area consistent with previous monitoring survey techniques, as follows:

- Site walk over to document project area condition in terms of recent works undertaken, site disturbances, flooding, presence or signs of feral animals / pests etc.
- Vegetation transects: transects established perpendicular to highest astronomical tide were re-measured to monitor changes in groundcover condition and extent.
- BioCondition assessments: monitoring plots established in the project area were re-measured in accordance with the Queensland BioCondition manual.

BioCondition plots were established and measured in accordance with the Queensland BioCondition framework (Eyre *et al.* 2015) as follows.

2.1.1 Site Condition

Site-based attributes were assessed for each plot in accordance with the framework as follows (note plot size was modified at some sites based on site condition):

- 100 m x 50 m plot were established to assess:
 - large native trees count
 - recruitment of woody perennial species
 - native tree canopy height
 - native tree species richness.
- 50 m x 10 m plot were established along the transect to assess native plant species richness for shrubs, grasses and forbs/other
- twenty 5 m x 5 m sub-plots were established each side of the transect to determine non-native plant cover
- a 50 m x 20m sub-plot was established to measure coarse woody debris (logs or dead timber on the ground that is >10 cm diameter and >0.5 m in length and more than 80% in contact with the ground)
- five 1 m x 1 m squares were established to measure and photograph native perennial grass cover and organic litter
- native tree and shrub canopy cover was estimated, and percentage of canopy cover measured along the 100 m transect line.

2.1.2 Condition Scores

To provide quantitative data to compare baseline and post-rehabilitation works, site vegetation attributes were scored against the published Regional Ecosystem (RE) benchmark to evaluate the condition of site vegetation against 'best on offer' communities in south-east Queensland.

Historical aerial imagery and pre-clearing RE mapping indicates the entire project area comprised intertidal lands supporting a mosaic of estuarine wetlands. The project area was highly modified for road, rail and port development with land above current highest astronomical tide comprising fill. Whilst modified lands do not correspond to a land zone under the RE framework, these lands currently support patches of native regrowth and plantings consistent with remnant RE 12.3.11 and 12.3.20 woodlands, which occur in the near vicinity. Despite the small size of the project area, both RE's have been adopted as suitable benchmarks for the site with RE 12.3.11 occurring on higher ground and 12.3.20 occurring on lower ground directly adjacent to highest astronomical tide (HAT).

Refer Table 2.1 for BioCondition benchmarks for the following vegetation communities in the project area:

- RE 12.1.2 (*State*: Vegetation Management Act Class - Least concern; Biodiversity status - No concern at present. *Commonwealth*: Vulnerable Ecological Community under the EPBC Act): Saltpan vegetation comprising *Sporobolus virginicus* grassland and samphire herbland. Includes saline or brackish sedgeland. Usually occurs on hypersaline Quaternary estuarine deposits.

Saltmarsh within the Port of Brisbane region is comprised of two distinct vegetation communities: *Sporobolus virginicus* grassland at the interface between terrestrial and intertidal lands, and; samphire forbland with saltpan/claypan at the upper tidal range. The RE12.1.2 benchmark is more reflective of *Sporobolus virginicus* grassland and does not adequately measure local samphire forbland attributes. For the purposes of this monitoring assessment, the RE12.1.2 benchmark was adjusted to reflect local vegetation conditions where samphire forbs are the dominant groundcover.
- RE 12.3.11 (*State*: Vegetation Management Act Class and Biodiversity status – Of concern): *Eucalyptus tereticornis* +/- *E. siderophloia* and *Corymbia intermedia* open forest to woodland. *Corymbia tessellaris*, *Lophostemon suaveolens* and *Melaleuca quinquenervia* frequently occur and often form a low tree layer. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands.
- RE 12.3.20 (*State*: Vegetation Management Act Class and Biodiversity status – Endangered): *Melaleuca quinquenervia*, *Casuarina glauca* +/- *Eucalyptus tereticornis*, *E. siderophloia* open forest. Occurs on lowest terraces of Quaternary alluvial plains in coastal areas. May be subject to storm surge inundation.

BioCondition scores for the monitoring plots were determined by adding the scores obtained for each vegetation attribute and dividing by the maximum possible score for the community. Vegetation attributes are weighted to standardise the relative degree they have on the potential to impact on long-term condition (e.g. non-native plants), difficulty for replacement (e.g. large trees) or habitat value (refer Table 2.2).

Note that landscape-scale attributes were not used in this assessment given the small size of each site, their close proximity to each other, and the same landscape context across the project area.

Table 2.1 Published BioCondition Benchmark (Queensland Herbarium 2021)

Attribute	RE 12.1.2	RE 12.3.11	RE 12.3.20
Max Score	25	80	80
Recruitment	na	100	100
Non-native Plants	0	0	0
Tree Species Richness	na	7	4
Shrub Species Richness	na	7	4
Grass Species Richness	1	12	2
Forb/Other Species Richness	3	25	8
Emergent Canopy Height	na	na	na
Tree Canopy Height	na	23	16
Tree Subcanopy Height	na	8	8
Emergent Canopy Cover	na	na	na
Tree Canopy Cover	na	56	70
Tree Subcanopy Cover	na	33	20
Large tree threshold (Eucalypt)	na	49	na
Large tree threshold (Non eucalypt)	na	36	30
Total Number Large Trees (Eucalypt)/ ha	na	22	na
Total Number Large Trees (non-eucalypt)/ ha	na	8	165
Shrub Canopy Cover	na	20	15
Native Perennial Grass/Samphire Forb ³	35	44	20
Litter Ground Cover	na	37	30
Woody Debris Length/ha	na	555	890

³ RE 12.1.2 benchmark was adjusted to reflect dominance of forbs in local samphire communities; na = not applicable

Table 2.2 Weightings for Vegetation Attributes (Eyre *et al.* 2015)

Site-based Condition Attribute	Weighting (%)
Large trees	15
Tree canopy height	5
Recruitment of canopy species	5
Tree canopy cover (%)	5
Shrub layer cover (%)	5
Coarse woody debris	5
Native plant species richness for four lifeforms	20
Non-native plant cover	10
Native perennial grass cover (%)	5
Litter cover	5

2.1.3 Vegetation Transects

In June (2024), four transects were established perpendicular to highest astronomical tide to monitor potential changes in groundcover condition and extent at the interface between terrestrial and intertidal lands over the project timeframe. Variable transect lengths were established depending on site condition. Percentage and type of vegetation cover was measured along each transect with representative photos taken at each site at the approximate mid-point. In July 2026 these transects were remeasured to assess any changes in cover and/or condition.

2.2 Shorebird Habitat Assessment

The *Guide to Determining Terrestrial Habitat Quality* (version 1.3, February 2020) (the Guide), part of the BioCondition Assessment Framework, was applied to assess and quantify improvements to shorebird habitat achieved through vehicle management controls designed to prevent physical disturbance to estuarine habitats and remove associated noise and visual disturbance to shorebirds. The Guide includes condition attributes that capture disturbance pressures affecting fauna habitat quality, enabling an evaluation of how reduced disturbance translates into functional habitat gains. In the context of shorebird habitat, these attributes were used to assess changes in habitat quality and functionality, with a focus on improvements to roosting and feeding habitat suitability resulting from rehabilitation measures. For this assessment, the ‘absence of threats’ attribute outlined in the Guide was evaluated. This attribute considers the magnitude of known or potential threats occurring within, or in close proximity to, shorebird habitat that may negatively affect habitat condition and/or a species’ ability to utilise the area.

An analysis of Queensland Wader Study Group (QWSG) data was undertaken to assess shorebird species richness and abundance recorded within the project area between 2021 and 2026. With the fence installation and cessation of slashing occurring in 2024, the analysis aimed to determine whether any emerging trends could be detected.

As the number of surveys undertaken within each year has varied, a single survey within each month was selected to reduce any survey effort bias. Where multiple surveys were undertaken within the same month of a year, the survey with the highest records (i.e. individual bird counts) for the month has been used. Note there were no survey records for June 2021 and January 2024 so these months have been excluded when comparing year totals.

A comprehensive literature review was also undertaken to identify ecological factors relevant to shorebirds, including the characteristics of suitable habitat and the variables that influence habitat quality. The review focused on factors affecting a shorebird's ability to occupy an area, as well as those influencing long-term survival. Key themes included shorebird life cycles, ecological requirements, population dynamics, patterns of habitat use, and known threats. Using this information, the scope and severity of threat factors were then rated for the project area according to the Guide as follows:

- **Scope:** The proportion of the species' habitat or local population within the project area that can reasonably be expected to be affected by the threat within ten years given the continuation of current circumstances and trends (IUCN-CMP, 2007). The five-point rating scale for scope is:
 - 1. Very High: The threat is likely to be pervasive in its scope, affecting the species' habitat or the species' local population across all or most (80-100%) of its occurrence or population within the project area.
 - 2. High: The threat is likely to be widespread in its scope, affecting the species' habitat or the species' local population across a majority (60-79%) of its occurrence or population within the project area.
 - 3. Medium: The threat is likely to be restricted in its scope, affecting the species' habitat or the species' local population across some (40-59%) of its occurrence or population within the project area.
 - 4. Low: The threat is likely to be narrow in its scope, affecting the species' habitat or the species' local population across small proportion (20-39%) of its occurrence or population within the project area.
 - 5. Very Low: The threat is likely to be very narrow in its scope, affecting the species' habitat or the species' local population across a negligible proportion (1-19%) of its occurrence or population within the project area.
- **Severity:** Within the scope, the level of damage from the threat to the species' habitat/local population that can reasonably be expected given the continuation of current circumstances and trends (IUCN CMP, 2007). The five-point rating scale for severity is:
 - 1. Very High: Within the scope, the threat is likely to destroy or reduce the species' habitat/local population by 80-100% within ten years or three generations.
 - 2. High: Within the scope, the threat is likely to seriously degrade or reduce the species' habitat/local population by 40-79% within ten years or three generations.
 - 3. Medium: Within the scope, the threat is likely to moderately degrade or reduce the species' habitat/local population by 11-39% within ten years or three generations.
 - 4. Low: Within the scope, the threat is likely to only slightly degrade or reduce the species' habitat/local population by 6-10% within ten years or three generations.
 - 5. Very Low: Within the scope, the threat is likely to have a negligible damage or will only degrade or reduce the species' habitat/local population by 1-5% within ten years or three generations.

Using the ratings for scope and severity assigned to the threat factor, the corresponding score between 1 and 25 was then determined for the threat factor using the threat matrix in Table 2.3, where a threat factor of 1 poses a very high threat to the species, and a threat factor with a score of 25 poses a very low threat to the species.

Table 2.3 Threat matrix for scoring each threat factor according to its scope and severity (Guide to Determining Terrestrial Habitat Quality, version 1.3, February 2020)

Threat Matrix (adapted from IUCN-CMP, 2007)			Severity				
			Very High	High	Medium	Low	Very Low
			1	2	3	4	5
Scope	Very High	1	1	2	3	4	5
	High	2	2	4	6	8	10
	Medium	3	3	6	9	12	15
	Low	4	4	8	12	16	20
	Very Low	5	5	10	15	20	25

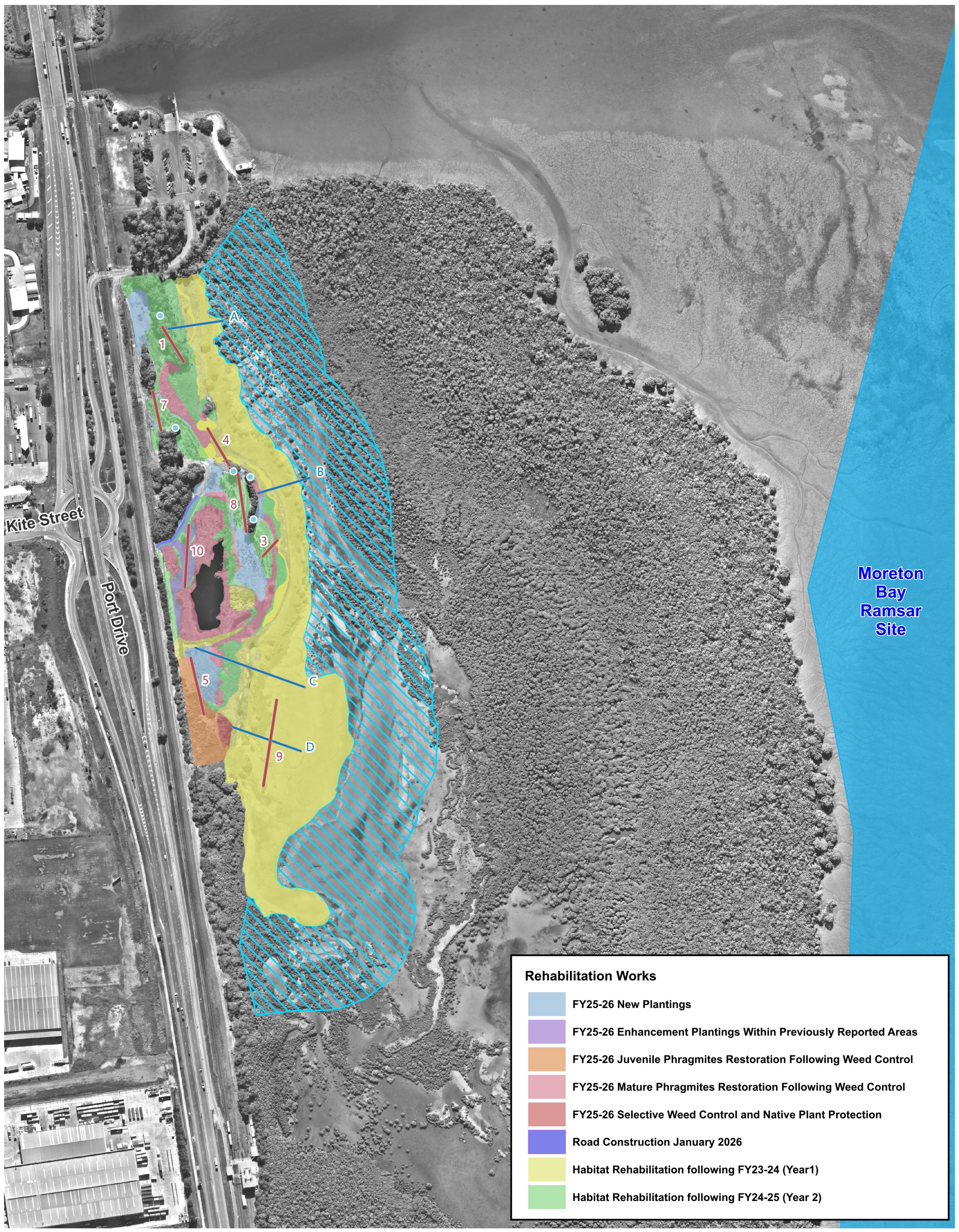
Threat factors were rated for the project area before and after rehabilitation works based on:

1. the proportion of habitat or local population likely to be affected and
2. the expected level of damage to habitat or population resulting from the threat.

Based on this information, habitat attributes for locally occurring shorebirds were evaluated and scored within the project area, both before and after rehabilitation works. This assessment was used to determine and justify whether improvements in habitat quality or availability have occurred within the project area and whether these changes are likely attributable to direct or indirect management actions implemented as part of the program.

3 Results

Figure 3.1 shows the location of rehabilitation works undertaken within the project area in each year of the program, a breakdown of the rehabilitation works undertaken in FY25-26, and key site features and project context.



Rehabilitation Works

FY25-26 New Plantings

FY25-26 Enhancement Plantings Within Previously Reported Areas

FY25-26 Juvenile Phragmites Restoration Following Weed Control

FY25-26 Mature Phragmites Restoration Following Weed Control

FY25-26 Selective Weed Control and Native Plant Protection

Road Construction January 2026

Habitat Rehabilitation following FY23-24 (Year1)

Habitat Rehabilitation following FY24-25 (Year 2)

3.1 Rehabilitation Works Undertaken in FY25-26

3.1.1 Environmental Plantings

In FY25-26, extensive environmental planting was undertaken across approximately 0.75 ha of previously cleared and weed-infested land within the project area (Figure 3.1). Plantings comprised native species consistent with the composition of local REs 12.3.20 and 12.3.11. Approximately 0.14 ha of plantings around the wetland at Site 10 had previously been reported as weed control gains in earlier annual reports and have therefore been excluded from the final tally to avoid double counting. After accounting for this adjustment, **an additional 0.61 ha of new plantings was achieved during this final reporting year.**

Figure 3.2 Native Vegetation Plantings 2026

Native vegetation plantings established in 2026:



3.1.2 Weed Control

Weed control was undertaken in FY25-26 across the project area focusing on the treatment of Broad-leaved Pepper Tree (*Schinus terebinthifolius*), Lantana (*Lantana camara*), Ochna (*Ochna serrulata*), Madeira Vine (*Anredera cordifolia*), Guinea Grass (*Megathyrsus maximus*), Leucaena (*Leucaena leucocephala*) and Groundsel Bush (*Baccharis halimifolia*). Control methods included targeted herbicide application, manual removal, and staged clearing of dense infestations.

Approximately 0.34 ha of disturbed land in the southern section of the project area, which previously supported dense Broad-leaved Pepper Tree shrubland and regularly slashed grassland, was treated for weeds and allowed to regenerate naturally. This area is now largely dominated by regenerating Phragmites wetland vegetation.

Approximately 0.05 ha of dense Broad-leaved Pepper Tree shrubland has been retained in the south-western portion of the project area, adjacent to the mudflats, to maintain visual screening for wader habitat. However, all native woody species within this patch have been identified and flagged, with targeted weed control undertaken around them to promote the regeneration and expansion of native woody vegetation.

Approximately 0.96 ha of Phragmites wetland vegetation has regenerated across the remainder of the project area, primarily within previously slashed habitats and areas where weed control treatments have been undertaken.

In summary, the **cessation of slashing and targeted weed control has resulted in the regeneration of an additional 1.35 ha of native vegetation, predominantly Phragmites wetland.**

Figure 3.3 Selective Weed Control 2026

Selective woody weed management to retain wader screening and encourage native regeneration:



3.1.3 Feral Animal and Pest Control

Bellden Environmental Services were commissioned to undertake fox (*Vulpes vulpes*) den surveys in the project area in May and June 2026. Evidence of fox activity was found within the project area including tracks and scent markings but no active dens were observed.

Two European brown hares (*Lepus capensis*) were observed in the project area in June 2026.

No fire ant (*Solenopsis invicta*) nests were recorded within the project area.

Cane toad populations were managed by B4C using targeted pole trapping methods.

3.2 Vegetation Condition – Year 3 Results

3.2.1 BioCondition Sites

BioCondition scores measured at each of the monitoring plots over the duration of the rehabilitation program are shown in Table 3.1 to Table 3.8. Annex A provides the 2026 raw data for each BioCondition site and Annex B provides photos of each site taken in June 2026.

Table 3.1 Site 1 BioCondition Scores

Year	2023	2025	2026	Maximum Possible Score
Site 1				
Regional Ecosystem 12.3.11				
Recruitment	5	5	5	5
Non-native Plant Cover	3	10	10	10
Tree Species Richness	5	5	5	5
Shrub Species Richness	0	2.5	2.5	5
Grass Species Richness	2.5	2.5	2.5	5
Forb/Other Species Richness	0	2.5	2.5	5
Tree Canopy Height	3	3	3	5
Tree Subcanopy Height	5	5	5	5
Tree Canopy Cover	5	5	5	5
Tree Subcanopy Cover	2	2	2	5
Total Number Large Trees (Eucalypt)/ ha	5	5	5	15
Total Number Large Trees (non-eucalypt)/ ha	0	0	0	15
Shrub Canopy Cover	0	0	0	5
Native Perennial Grass Cover	5	0	0	5
Litter Ground Cover	5	3	5	5
Woody Debris Length/ha	0	0	0	5
Plot Score	45.5	50.5	52.5	
Max Score for RE	80	80	80	80
% Benchmark Condition	57	63	65	100
Baseline Description:				
Regenerating <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> and <i>Casuarina glauca</i> open forest on fill (RE 12.3.11)				
Key Rehabilitation Actions:				
Environmental infill planting, weed control, mulch placement and installation of microbat boxes.				
Program Outcomes:				
BioCondition score increased from 57 to 65 over the program. Improvements were driven by increased shrub and forb richness from planting and effective weed control, with the non-native score increasing from 3 to 10.				
The site score improved markedly over the three-year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as native plantings mature and structural complexity increases.				

Table 3.2 Site 3 BioCondition Scores

Year	2023	2025	2026	Maximum Possible Score
Site 3				
Regional Ecosystem 12.3.20				
Recruitment	0	0	0	5
Non-native Plant Cover	3	5	5	10
Tree Species Richness	0	5	5	5
Shrub Species Richness	2.5	2.5	2.5	5
Grass Species Richness	5	5	5	5
Forb/Other Species Richness	2.5	5	5	5
Tree Canopy Height	0	0	0	5
Tree Subcanopy Height	0	0	0	5
Tree Canopy Cover	0	0	0	5
Tree Subcanopy Cover	0	0	0	5
Total Number Large Trees (Eucalypt)/ ha	0	0	0	15
Total Number Large Trees (non-eucalypt)/ ha	0	0	0	15
Shrub Canopy Cover	0	0	0	5
Native Perennial Grass Cover	5	5	5	5
Litter Ground Cover	5	5	3	5
Woody Debris Length/ha	0	0	0	5
Plot Score	23	32.5	30.5	
Max Score for RE	80	80	80	80
% Benchmark Condition	29	41	38	100
Baseline Description:				
Slashed grasslands dominated by exotic species.				
Key Rehabilitation Actions:				
Reduced disturbance through cessation of slashing and vehicle access.				
Targeted weed control to reduce exotic species cover.				
Native species planting to increase floristic diversity and vegetation structure.				
Program Outcomes: BioCondition score increased from 29 (baseline) to 41 (mid-program) and remained above baseline at 38 at program completion. Improvements were driven by effective weed control and increased tree and forb species richness from planting.				
The site score improved markedly over the three-year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as native plantings mature, structural complexity increases, and weed cover continues to decline.				

Table 3.3 Site 4 BioCondition Scores

Year	2023	2025	2026	Maximum Possible Score
Site 4				
Regional Ecosystem 12.1.2				
Recruitment				
Non-native Plant Cover	3	5	5	10
Tree Species Richness				
Shrub Species Richness				
Grass Species Richness	5	5	5	5
Forb/Other Species Richness	2.5	5	5	5
Tree Canopy Height				
Tree Subcanopy Height				
Tree Canopy Cover				
Tree Subcanopy Cover				
Total Number Large Trees (Eucalypt)/ ha				
Total Number Large Trees (non-eucalypt)/ ha				
Shrub Canopy Cover				
Native Perennial Grass Cover	5	5	5	5
Litter Ground Cover				
Woody Debris Length/ha				
Plot Score	15.5	20	20	
Max Score for RE	25	25	25	25
% Benchmark Condition	62	80	80	100
Baseline Description:				
Degraded <i>Sporobolus virginicus</i> saltmarsh (RE 12.1.2)				
Key Rehabilitation Actions:				
Reduce disturbance through cessation of slashing and installation of fencing to prevent vehicle access.				
Targeted weed control to reduce exotic species cover.				
Summary: BioCondition score increased from 62 at baseline to 80 at mid-program and was maintained at program completion. The improvement was primarily driven by reduced weed cover and increased native forb recruitment following the cessation of slashing, which enhanced native species richness.				
The site score improved markedly over the three-year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as weed cover continues to decline.				

Table 3.4 Site 5 BioCondition Scores

Year	January 2026	June 2026	Maximum Possible Score
Site 5			
Regional Ecosystem 12.3.20			
Recruitment	0	0	5
Non-native Plant Cover	3	3	10
Tree Species Richness	0	5	5
Shrub Species Richness	0	5	5
Grass Species Richness	5	5	5
Forb/Other Species Richness	0	1	5
Tree Canopy Height	0	0	5
Tree Subcanopy Height	0	0	5
Tree Canopy Cover	0	0	5
Tree Subcanopy Cover	0	0	5
Total Number Large Trees (Eucalypt)/ ha	0	0	15
Total Number Large Trees (non-eucalypt)/ ha	0	0	15
Shrub Canopy Cover	0	0	5
Native Perennial Grass Cover	1	3	5
Litter Ground Cover	5	5	5
Woody Debris Length/ha	0	0	5
Plot Score	14	27	
Max Score for RE	80	80	80
% Benchmark Condition	18	34	100
Baseline Description:			
Dense exotic shrubland dominated by <i>Schinus terebinthifolius</i> and slashed exotic grasslands			
Key Rehabilitation Actions:			
Targeted weed control to reduce exotic species cover.			
Native species planting to increase floristic diversity and vegetation structure.			
Summary: BioCondition score increased from 18 at baseline to 34 at program completion, driven by planting that increased tree, shrub and forb species richness, together with an increase in native perennial grass cover.			
The site score improved markedly over the three-year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as native plantings mature, structural complexity increases, and weed cover continues to decline.			

Table 3.5 Site 7 BioCondition Scores

Year	2023	2025	2026	Maximum Possible Score
Site 7				
Regional Ecosystem 12.3.20				
Recruitment	0	0	0	5
Non-native Plant Cover	0	5	3	10
Tree Species Richness	0	5	5	5
Shrub Species Richness	0	5	5	5
Grass Species Richness	2.5	5	5	5
Forb/Other Species Richness	2.5	2.5	2.5	5
Tree Canopy Height	0	0	0	5
Tree Subcanopy Height	0	0	0	5
Tree Canopy Cover	0	0	0	5
Tree Subcanopy Cover	0	0	0	5
Total Number Large Trees (Eucalypt)/ ha	0	0	0	15
Total Number Large Trees (non-eucalypt)/ ha	0	0	0	15
Shrub Canopy Cover	0	0	3	5
Native Perennial Grass Cover	0	5	5	5
Litter Ground Cover	0	0	5	5
Woody Debris Length/ha	0	0	0	5
Plot Score	5	27.5	33.5	
Max Score for RE	80	80	80	80
% Benchmark Condition	6	34	41	100
Baseline Description:				
Slashed grasslands dominated by exotic species.				
Key Rehabilitation Actions:				
Targeted weed control to reduce exotic species cover.				
Native species planting to increase floristic diversity and vegetation structure.				
Summary: BioCondition score increased from 6 at baseline to 34 at mid-program and 41 at program completion. Improvements were driven by planting, which increased tree, shrub and grass species richness, together with increases in shrub cover, native perennial grass cover and litter cover.				
The site score improved markedly over the three-year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as native plantings mature, structural complexity increases, and weed cover continues to decline.				
Recommendation: Non-native plant cover increased slightly between Years 2 and 3, highlighting the importance of ongoing weed management to protect and maintain restoration outcomes.				

Table 3.6 Site 8 BioCondition Scores

Year	2023	2025	2026	Maximum Possible Score
Site 8				
Regional Ecosystem 12.3.11				
Recruitment	0	0	0	5
Non-native Plant Cover	0	5	5	10
Tree Species Richness	2.5	5	5	5
Shrub Species Richness	0	5	5	5
Grass Species Richness	0	0	2.5	5
Forb/Other Species Richness	0	0	0	5
Tree Canopy Height	3	3	3	5
Tree Subcanopy Height	0	0	0	5
Tree Canopy Cover	0	0	0	5
Tree Subcanopy Cover	0	0	0	5
Total Number Large Trees (Eucalypt)/ ha	0	0	0	15
Total Number Large Trees (non-eucalypt)/ ha	0	0	0	15
Shrub Canopy Cover	0	0	3	5
Native Perennial Grass Cover	0	3	1	5
Litter Ground Cover	0	5	5	5
Woody Debris Length/ha	0	0	0	5
Plot Score	5.5	26	29.5	
Max Score for RE	80	80	80	80
% Benchmark Condition	7	33	37	100
Baseline Description:				
Highly modified and managed exotic grassland on elevated fill				
Key Rehabilitation Actions:				
Targeted weed control to reduce exotic species cover.				
Native species planting to increase floristic diversity and vegetation structure.				
Nest box installation to substitute lack of hollow bearing trees				
Summary: BioCondition score increased from 7 at baseline to 33 at mid-program and 37 at program completion. Improvements were driven by weed control and revegetation planting, which increased tree, shrub and grass species richness, together with increased shrub cover as plantings matured and increased litter cover.				
The site score improved markedly over the three-year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as native plantings mature, structural complexity increases, and weed cover continues to decline.				

Table 3.7 Site 9 BioCondition Scores

Year	2023	2025	Jan-26	Maximum Possible Score
Site 9				
Regional Ecosystem 12.1.2				
Recruitment				
Non-native Plant Cover	10	10	10	10
Tree Species Richness				
Shrub Species Richness				
Grass Species Richness	5	5	5	5
Forb/Other Species Richness	5	5	5	5
Tree Canopy Height				
Tree Subcanopy Height				
Tree Canopy Cover				
Tree Subcanopy Cover				
Total Number Large Trees (Eucalypt)/ ha				
Total Number Large Trees (non-eucalypt)/ ha				
Shrub Canopy Cover				
Native Perennial Grass Cover	3	1	3	5
Litter Ground Cover				
Woody Debris Length/ha				
Plot Score	23	21	23	
Max Score for RE	25	25	25	25
% Benchmark Condition	92	84	92	100
Baseline Description:				
Remnant succulent saltmarsh and saltpan but some vehicle disturbance.				
Key Rehabilitation Actions:				
Perimeter fencing to remove vehicle access.				
Summary: BioCondition score declined slightly from 92 at baseline to 84 at mid-program before returning to 92 at program completion. The site is considered to have remained in generally stable condition throughout the monitoring period. The temporary reduction in score is likely attributable to minor differences in quadrat placement during the mid-program assessment.				

Table 3.8 Site 10 BioCondition Scores

Year	2025	2026	Maximum Possible Score
Site 10			
Regional Ecosystem 12.3.20			
Recruitment	0	0	5
Non-native Plant Cover	10	5	10
Tree Species Richness	2.5	5	5
Shrub Species Richness	0	5	5
Grass Species Richness	2.5	2.5	5
Forb/Other Species Richness	0	2.5	5
Tree Canopy Height	0	0	5
Tree Subcanopy Height	0	0	5
Tree Canopy Cover	0	0	5
Tree Subcanopy Cover	0	0	5
Total Number Large Trees (Eucalypt)/ ha			15
Total Number Large Trees (non-eucalypt)/ ha	5	5	15
Shrub Canopy Cover	0	0	5
Native Perennial Grass Cover	1	1	5
Litter Ground Cover	3	3	5
Woody Debris Length/ha	0	0	5
Plot Score	24	29	
Max Score for RE	80	80	80
% Benchmark Condition	30	36	100
Baseline Description: Dense exotic shrubland dominated by <i>Schinus terebinthifolius</i>			
Key Rehabilitation Actions: Staged weed control Tree, shrub, groundcover plantings			
Summary: BioCondition score increased from 30 at baseline to 36 at program completion. Improvements were driven by planting, which increased tree, shrub and forb species richness			
Recommendation: Non-native plant cover increased slightly between Years 2 and 3, highlighting the importance of ongoing weed management to protect restoration gains and support continued improvement in site condition. The site score improved markedly over the 1 year monitoring period, demonstrating a strong positive rehabilitation trajectory. Site condition is expected to continue improving as native plantings mature, structural complexity increases, and weed cover continues to decline.			

3.2.2 Vegetation Transects

Table 3.9 summarises the groundcover composition changes measured at transects across the terrestrial and intertidal interface throughout the rehabilitation program. Annex C provides the photos of each site for 2026.

Vegetation monitoring indicates a positive shift in groundcover composition between 2024 and 2026. Across all sites, exotic grass and exotic forb cover declined, while native grass and native forb cover generally increased. Exotic forb cover was reduced to near-zero levels at all sites by 2026.

The strongest response was recorded at Site C, where exotic grass cover declined from 37.5% to 1.1% and native grass cover increased from 12.2% to 37.6% between 2024 and 2026. Native grass cover also increased substantially at Site A (39.5% to 59.3%), while Sites A and B showed an overall shift towards greater dominance of native species.

Bare ground remained relatively stable at Sites A and B, increased at Site C, and remained high at Site D, reflecting the naturally sparse vegetation characteristics of this location.

Overall, estuarine wetland habitat condition has improved substantially following the removal of regular slashing and vehicle access. Reductions in weed cover and increased dominance of native saltmarsh species have resulted in improved vegetation condition and ecological function. While some bare ground remains along historic vehicle tracks, reflecting legacy disturbance, these areas are expected to continue revegetating over time.

Table 3.9 Groundcover Cover by Category (%)

Site	A			B			C			D		
Cover	2024	2025	2026	2024	2025	2026	2024	2025	2026	2024	2025	2026
Exotic Grass	22.6	14.6	12.9	14.8	7.7	5.6	37.5	10.3	1.1	0.0	0.0	0.0
Native Grass	39.5	38.1	59.3	35.0	36.8	31.7	12.2	26.5	37.6	5.4	6.5	7.2
Exotic Forb	1.5	1.6	0.0	1.6	0.5	0.0	2.4	1.9	0.2	0.0	0.0	0.0
Native Forb	33.6	41.7	25.3	39.1	36.1	53.0	11.9	12.0	14.9	14.0	8.4	20.5
Bare	2.9	3.9	2.5	9.5	18.8	9.8	36.0	49.3	46.1	80.6	85.1	72.3

3.3 Shorebird Assessment

3.3.1 Shorebird Use of the Project Area

Queensland Wader Study Group (QWSG) surveys indicate that the project area regularly supports abundant and species rich assemblages of migratory shorebirds, including species occurring in nationally and internationally significant numbers. .

Overall shorebird abundance from 2021 - 2025 is shown in Figure 3.4, while Figure 3.5 presents abundance by month. Perimeter fencing was installed in early 2024 to exclude vehicles from high-value shorebird saltpan and saltmarsh habitat, therefore providing three years of pre-fencing baseline data (2021-2023), and two years of post-fencing data (2024-25). Total abundance in 2024 and 2025 was higher than in the preceding three years, with 2025 recording the highest count of the monitoring period at 25,901 individuals.

Consistent with broader regional patterns, shorebird numbers were lowest during winter and highest during summer when migratory species return to Moreton Bay from late September (Figure 3.5).

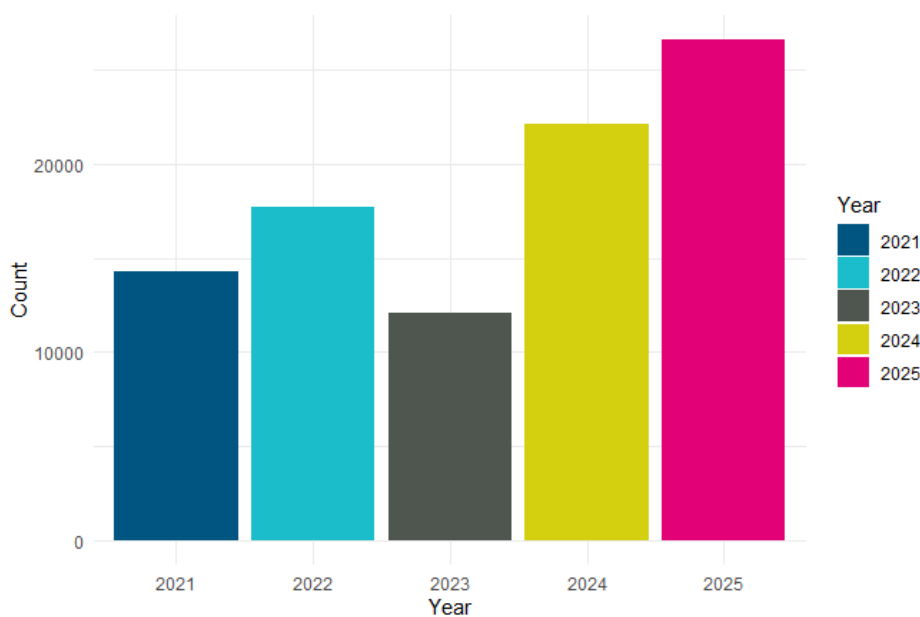


Figure 3.4 Total wader and shorebird count by year from 2021 to 2025 (excluding months January and June for all years) (Source of data: QLD Wader Study Group)

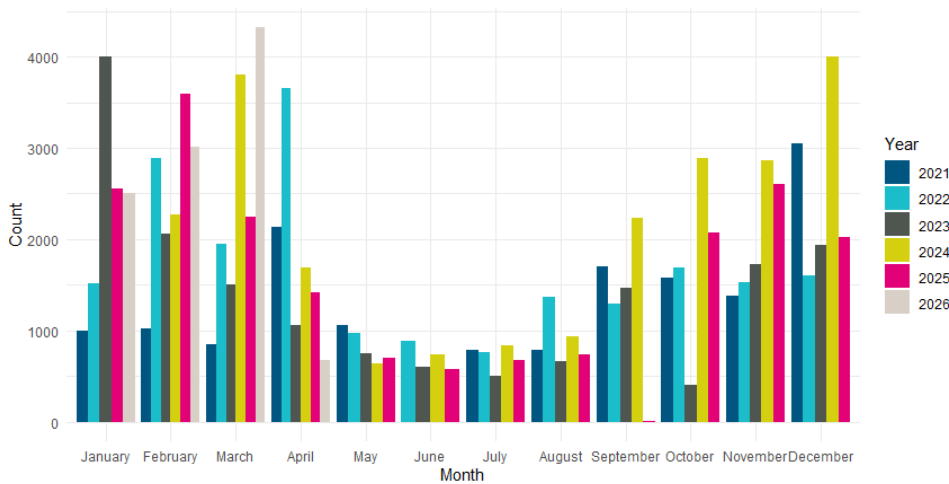


Figure 3.5 Total wader and shorebird count by month (one survey selected per month) from January 2021 to April 2026. (Source of data: QLD Wader Study Group)

Across the 2021-2025 monitoring period, peak counts regularly exceeded 2,000 migratory shorebirds and reached up to 19,000 individuals, with 9-11 species recorded annually (Table 3.10). At the time of reporting, QWSG data for 2026 were available for January-April 2026 only. Eight migratory shorebird species were recorded during this period. The three species not yet recorded - the Grey-tailed Tattler, Pacific Golden Plover and Red Knot - have previously occurred in low numbers or been absent from the site in some years. Despite only four months of monitoring data being available, counts of several species were already comparable to or exceeded 2025 totals, including Curlew Sandpiper, which had surpassed the total recorded for the entire previous year.

Table 3.10 Shorebird Records within the Whyte Island Project Area (QWSG unpubl. data). Note these totals include one survey from each month to reduce bias from differing numbers of surveys per month each year.

Species	Final populati on estimate (van Swindere n et. al., 2025)	1% Flyway Populati on (van Swindere n et. al., 2025)	0.1% Flyway Populati on (van Swindere n et. al., 2025)	2021	2022	2023	2024	2025	(Jan – Apr data only) 2026
Bar-tailed Godwit	375,000	3,750	375	2,406	6,755	7,746	10,980	7,716	6,056
Black-tailed Godwit	230,000	2,300	230	866	85	133	135	107	54
Curlew Sandpiper	120,000	1,200	120	3,678	4,477	712	2,457	332	767
Eurasian Whimbrel	90,000	900	90	544	1,359	1,341	1,026	810	717
Far Eastern Curlew	35,000	350	35	604	2,247	2,204	1,739	1,861	728
Great Knot	400,000	4,000	400	26	382	1,391	388	200	54
Grey-tailed Tattler	80,000	800	80	677	118			1	
Pacific Golden Plover	150,000	1,500	150					11	
Red Knot	130,000	1,300	130	690	114	36	301	2	
Red-necked Stint	600,000	6,000	600	352	967	303	796	698	454
Sharp-tailed Sandpiper	130,000	1,300	130	854	360	74	1,340	741	34
Total abundance				10,697	16,864	13,940	19,162	12,479	8,864
Species richness				10	10	9	9	11	8

Internationally and nationally important population

Nationally important population

Several species exceeded East Asian–Australasian Flyway (EAAF) population thresholds that define important habitat:

- Internationally important populations (>1% EAAF population) were regularly recorded for: Bar-Tailed Godwit, Curlew Sandpiper, Far Eastern Curlew, Eurasian Whimbrel and Sharp-Tailed Sandpiper.
- Nationally important populations (>0.1% EAAF population) were regularly recorded for: Black-Tailed Godwit, Great Knot, Grey-Tailed Tattler, Red Knot and Red-Necked Stint.

These records demonstrate that the project area forms part of a functionally important non-breeding landscape for migratory shorebirds associated with the adjacent Moreton Bay Ramsar Site (MBRS) (refer Figure 3.1). The extensive mudflats, saltmarsh, mangroves and near-shore habitats provide high-tide roosting and low-tide foraging opportunities and support high site fidelity among key species.

Several patterns are evident from the QWSG dataset:

- Far Eastern Curlew, a species of high conservation concern, occurred in internationally significant numbers in all years and remains one of the most frequently recorded large migratory shorebirds at Whyte Island.
- Bar-tailed Godwit and Curlew Sandpiper showed consistently high abundance, reinforcing the project area's role as a key roosting and foraging location.
- Species richness remained stable across the five-year period, indicating continued habitat use despite historical disturbance pressures.
- A comparison of shorebird abundance before (2021–2023) and during rehabilitation (2024–2025) indicates an increase in total shorebird numbers within the Whyte Island project area. Mean total abundance increased from approximately 14,500 individuals pre-rehabilitation to 24,000 individuals during rehabilitation (approximately 65% increase). Statistical testing (Welch two-sample t-test) indicated that this increase was marginally non-significant ($p = 0.055$), reflecting both the magnitude of the observed change and the limited number of years available for comparison.
- For important migratory species, mean abundance increased from approximately 11,500 to 16,000 individuals (approximately 40% increase); however, this change was not statistically significant ($p = 0.346$), indicating substantial interannual variability.
- While these patterns are consistent with an improvement in habitat availability and reduced disturbance associated with rehabilitation works, it is important to note that shorebird abundance can vary considerably between years due to external factors such as rainfall, regional habitat availability, and migratory dynamics. As such, the observed increases cannot be attributed solely to rehabilitation actions, and additional monitoring over a longer time period is required to confirm whether these trends are sustained.

Collectively, these results confirm that the Whyte Island project area provides high-value, regularly used habitat for multiple migratory shorebird species of national and international significance. Comparison of total shorebird counts with migratory shorebird counts indicates that the majority of shorebirds utilising the habitat are migratory species (Figure 3.6) This establishes a strong foundation for interpreting how rehabilitation actions, particularly the removal of vehicle access and the discontinuation of slashing, have influenced shorebird behaviour and habitat quality within the project area.

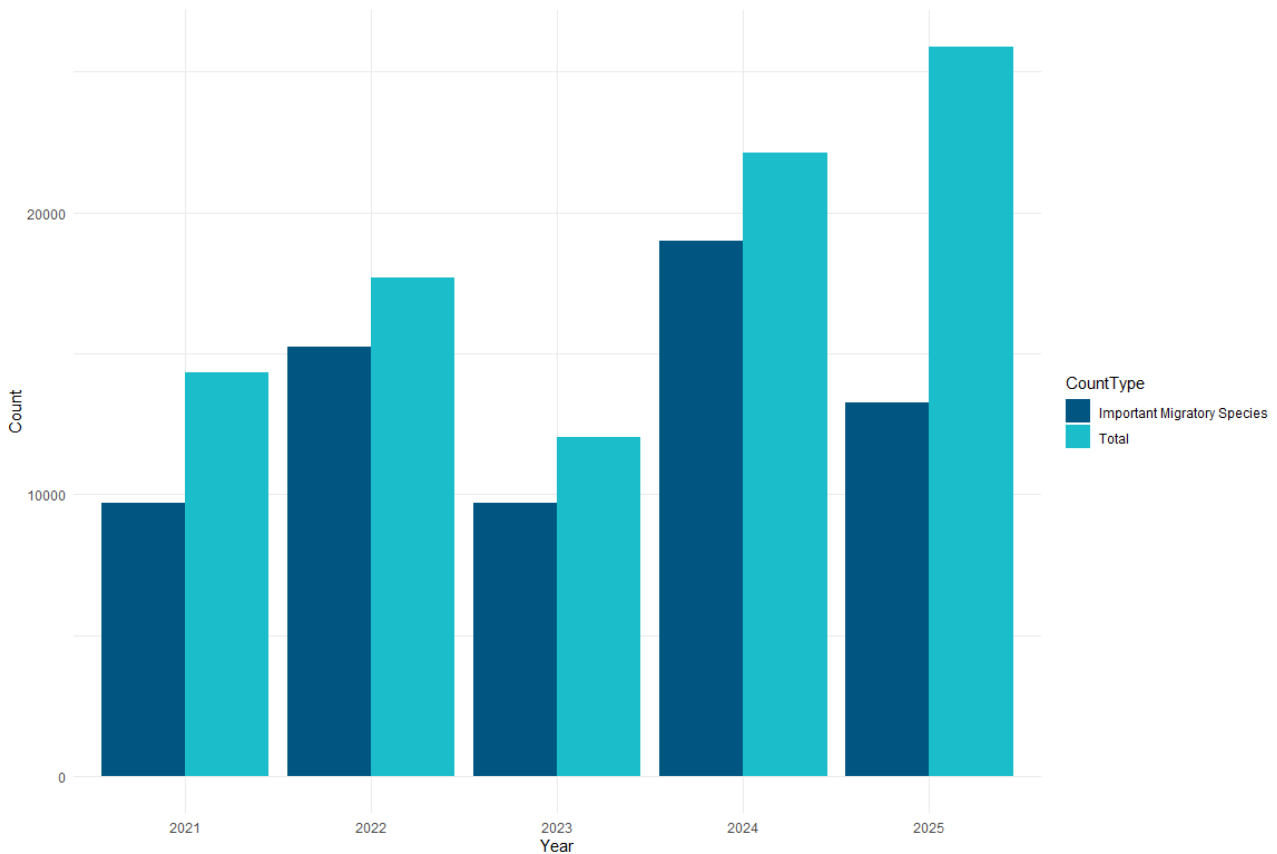


Figure 3.6 Comparison of total shorebird count each year and amount of the total that were important migratory species

3.3.2 Threat Assessment Results

Using the Guide, threat-matrix scores were estimated for the project area for conditions before and after rehabilitation works.

Pre-rehabilitation condition:

- Scope = 2 (High) – reflecting the widespread presence of illegal vehicle access and regular slashing across 60–79 % of shorebird habitat in the project area.
- Severity = 3 (Medium) – reflecting repeated disturbance and moderate degradation of habitat function.
- Threat score = 6, indicating a relatively high threat level and corresponding reduction in habitat quality.

Post-rehabilitation condition:

- Scope = 5 (Very low) – threats largely removed or confined to a negligible proportion ($\leq 19\%$) of the project area following vehicle access control and revegetation.
- Severity = 5 (Very low) – residual impacts minimal, with negligible influence on habitat condition and ecological function.
- Threat score = 25, representing the maximum possible score and indicating an effective absence of material threats within the project area.

The improvement from **6 to 25** represents a substantial reduction in disturbance pressure and a corresponding improvement in migratory shorebird habitat quality within the project area, which is important habitat in close proximity and contiguous with an internationally recognised Ramsar site. Threat-matrix scores show a shift from high to very low disturbance conditions, demonstrating that the key threats to shorebird habitat in the project area have been effectively addressed.

4 Discussion

4.1 Baseline Conditions

Prior to rehabilitation, the project area comprised a mosaic of native and modified habitats, including exotic grasslands, broad-leaved pepper tree shrubland, patches of native regrowth, and intertidal habitats comprising mangroves, mudflats, saltpans and saltmarsh. While the intertidal habitats were generally in good structural condition and provided important habitat for migratory and threatened shorebirds, including the critically endangered Eastern Curlew (*Numenius madagascariensis*), disturbance associated with vehicle access and noise was identified as a key threat to shorebird roosting and foraging behaviour. Weed invasion, historical slashing and uncontrolled vehicle access had also degraded the saltmarsh margins and claypan habitats, reducing habitat quality and ecological function.

Baseline assessments identified opportunities to improve biodiversity values through restoration of native vegetation communities, creation of new habitat areas and enhanced habitat connectivity, installation of supplementary fauna habitat structures (primarily nest boxes and woody debris), protection of shorebird roosting and foraging habitat from disturbance, and ongoing management of pest animals and invasive species, including fire ants. The rehabilitation program was designed to address these threats and improve the ecological condition, habitat values and long-term resilience of the project area.

4.2 General Habitat Improvements

4.2.1 Year 1 Rehabilitation Outcomes (FY23–24)

The first year of the rehabilitation program focused on addressing key disturbance factors affecting habitat condition across the project area. Management actions included cessation of slashing, installation of exclusion fencing, woody weed control, and ongoing fox and red imported fire ant management. These measures reduced pressures on native vegetation communities and facilitated the recovery of approximately 5.7 ha of saltmarsh, estuarine wetland and claypan habitat, including restoration of *Phragmites australis* wetland communities and improvement of wetland buffer condition through weed removal.

4.2.2 Rehabilitation Outcomes (FY24–25)

Year 2 rehabilitation efforts focused on revegetation, weed management, habitat enhancement and protection of sensitive habitats from disturbance. Environmental plantings and targeted weed control improved vegetation condition across revegetation monitoring sites, while the ongoing cessation of slashing continued to support natural regeneration of wetland, saltmarsh and native woodland communities. These actions contributed to the rehabilitation of a further 1.65 ha of habitat and reinforced the gains achieved during the first year of the program.

4.2.3 Year 3 Rehabilitation Outcomes (FY25–26)

During the final year of the program, rehabilitation activities focused on revegetation, weed management and supporting natural regeneration processes. Approximately 0.61 ha of previously cleared and weed-infected land was revegetated using species representative of local regional ecosystems (RE 12.3.20 and RE 12.3.11). Targeted weed control and ongoing exclusion of disturbance promoted the regeneration of an additional 1.35 ha of native vegetation, predominantly *Phragmites* wetland.

Pest fauna monitoring identified only limited evidence of pest animal activity, with no active fox dens or fire ant nests recorded during the reporting period. Continued management of cane toads and other pest species further reduced pressures on recovering habitats.

Collectively, Year 3 actions contributed to an additional 1.96 ha of habitat rehabilitation through a combination of revegetation, weed management and natural regeneration.

4.2.4 Overall Vegetation and Fauna Habitat Outcomes

The rehabilitation program demonstrates the effectiveness of combining active restoration with the removal of ongoing disturbance pressures to improve habitat condition and ecological function. Key interventions included cessation of slashing, exclusion of vehicle access, targeted weed control, environmental planting, pest animal management and installation of supplementary fauna habitat structures.

Across the three-year program, these actions resulted in the rehabilitation or restoration of approximately 9.31 ha of habitat, comprising 5.7 ha in FY23–24, 1.65 ha in FY24–25 and 1.96 ha in FY25–26. Outcomes included the recovery and expansion of saltmarsh, estuarine wetland, claypan and Phragmites wetland communities, increased native vegetation cover and connectivity, reduced weed abundance, and improved habitat values for native fauna.

The effectiveness of these rehabilitation measures was independently verified through the BioCondition monitoring program. BioCondition scores increased at seven of the eight monitored sites over the life of the program, indicating measurable improvements in vegetation structure, species composition and habitat condition. The greatest gains were recorded at previously degraded sites that received active revegetation and weed management, including Site 7 (6 to 41), Site 8 (7 to 37) and Site 5 (18 to 34). Site 9 remained stable in good ecological condition throughout the monitoring period, demonstrating that existing habitat values were maintained while surrounding areas improved.

Groundcover monitoring provided additional evidence of rehabilitation success, with reductions in exotic species cover and increasing dominance of native species across the terrestrial–intertidal interface. These results indicate that both active restoration measures and disturbance reduction actions have contributed to improved vegetation condition, ecological function and resilience across the project area.

Overall, the rehabilitation program achieved substantial and measurable ecological improvements, with monitoring demonstrating positive trajectories in habitat condition and vegetation recovery. Continued weed and pest animal management will assist in maintaining these gains and supporting the long-term persistence of the restored habitat communities.

4.3 Shorebird Habitat Improvements

To assist in interpreting the monitoring results, a review of relevant literature was undertaken to provide broader context on shorebird habitat use and the ecological values of coastal wetland and saltmarsh habitats. The literature review, together with the monitoring findings, supports an assessment of the ecological significance of the project area and provides a basis for evaluating changes in habitat use following the removal of disturbance.

4.3.1 Project Area Context

Moreton Bay Ramsar Site

The tidal flats, saltmarsh and mangroves within and adjacent to the Whyte Island project area lie approximately 700 m west of the Internationally recognised MBRS (refer Figure 3.1). The MBRS regularly supports more than 50,000 waterbirds, representing at least 43 species of shorebirds and at least 28 migratory shorebird species (DCCEEW, 2026). The MBRS is recognised as a network site

under the EAAF and serves as critical non-breeding habitat for multiple Arctic-breeding shorebird species (DCCEEW, 2026). The mudflats, mangroves, saltmarsh and seagrass meadows of the MBRS support resident shorebirds and provide crucial feeding grounds for migratory species that use the site to build up the energy reserves necessary to support northward migration and subsequent breeding (DCCEEW, 2026).

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), 'important habitat' is a key concept for migratory species to ensure that sites necessary for the ongoing survival of the listed species are appropriately managed. Figure 4.1 illustrates the process for identifying important habitat for migratory shorebirds under the EPBC Act, with the exception of Latham's snipe (*Gallinago hardwickii*). Shorebird habitat is considered internationally important if it regularly supports 1% of the EAAF population of a migratory shorebird species. It is considered nationally important, under the Wildlife Conservation Plan for Migratory Shorebirds, if it regularly supports 0.1% of an EAAF population of any migratory shorebird species.

The Australian National Directory of Important Migratory Shorebird Habitat is a comprehensive national inventory of sites that provide essential habitat for migratory shorebirds (the Directory). The Directory indicates the MBRS is:

- Internationally important for nine wader species: Bar-tailed Godwit (*Limosa lapponica*), Curlew Sandpiper (*Calidris ferruginea*), Far Eastern Curlew (*Numenius madagascariensis*), Grey-tailed Tattler (*Tringa brevipes*), Red Knot (*Calidris canutus*), Red-necked Stint (*Calidris ruficollis*), Sharp-tailed Sandpiper (*Calidris acuminata*), Siberian Sand Plover (*Anarhynchus mongolus*) and Whimbrel (*Numenius phaeopus*) (BirdLife Australia, 2026).
- Nationally important for 18 wader species: Bar-tailed Godwit, Black-tailed Godwit (*Limosa limosa*), Broad-billed Sandpiper (*Calidris falcinellus*), Curlew Sandpiper, Double-banded Plover (*Anarhynchus bicinctus*), Great Knot (*Calidris tenuirostris*), Greater Sand Plover (*Charadrius leschenaultia*), Grey Plover (*Pluvialis squatarola*), Grey-tailed tattler, Latham's Snipe, Pacific Golden Plover (*Pluvialis fulva*), Red-necked Stint, Ruddy Turnstone (*Arenaria interpres*), Sanderling (*Calidris alba*), Sharp-tailed Sandpiper, Siberian Sand Plover, Terek Sandpiper (*Xenus cinereus*), Wandering Tattler (*Tringa incana*) and Whimbrel (BirdLife Australia, 2026).

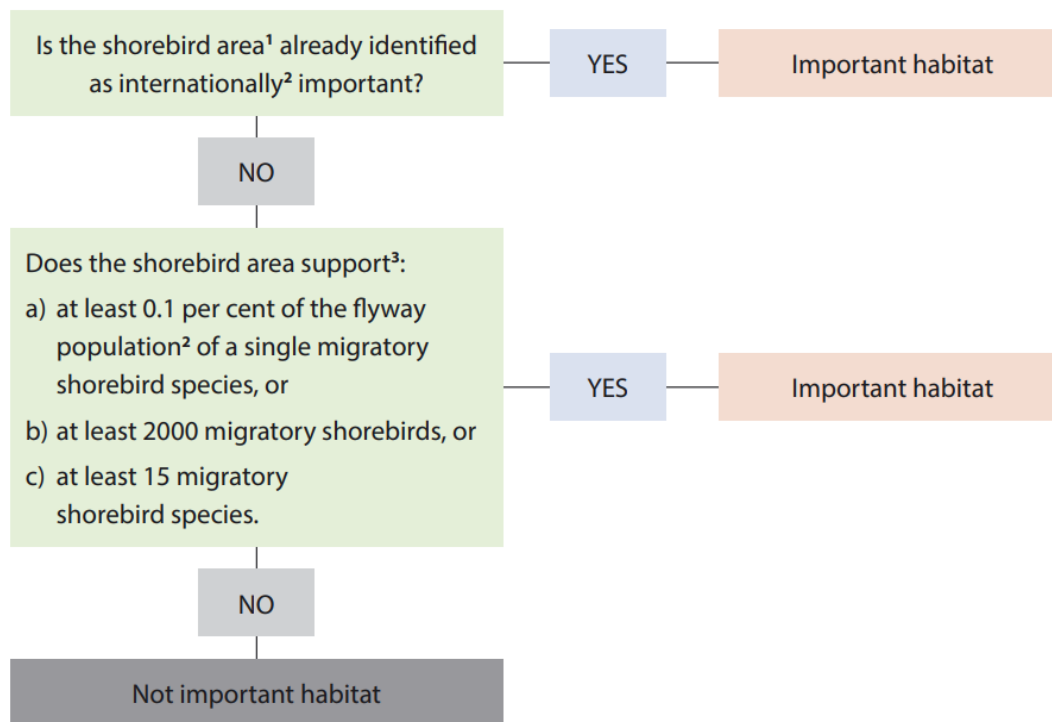


Figure 4.1 Process for identifying important habitat for migratory shorebirds (excluding Latham's snipe)¹

Whyte Island Project Area

The Directory identifies nationally significant habitat for migratory shorebirds, but it also explicitly recognises that important habitat occurs outside the formal shorebird area network. QWSG data indicates the Whyte Island project area supports a range of migratory species that the Directory recognises as contributing to the Moreton Bay Ramsar Site's importance. Based on the QSWG data analysed, the project area regularly supports internationally and nationally important populations of Bar-tailed Godwit, Curlew Sandpiper, Whimbrel, Far Eastern Curlew and Sharp-tailed Sandpiper and nationally important populations of Black-tailed Godwit, Great Knot, Grey-tailed Tattler, Red Knot and Red-necked Stint (refer Table 3.10). The project area also regularly supports at least 2,000 migratory shorebirds.

On this basis, the intertidal flats, mangroves, saltmarsh, and near-shore habitats in the Whyte Island project area provide important non-breeding habitat for migratory shorebirds including low-tide foraging areas and high-tide roost sites outside the formal shorebird area network. The Whyte Island project area is also considered to play a crucial role in buffering impacts to the MBRS. Activities outside Ramsar site boundaries can disrupt foraging, reduce habitat quality, and constrain shorebirds' ability to meet critical energy needs (Driessen et al., 2025). Effective management of adjacent areas is therefore essential to maintain habitat connectivity, protect refuge areas, and preserve the ecological character of Ramsar wetlands.

¹ EPBC Act Policy Statement 3.21 Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species. Australian Government, 2017

4.3.2 Importance of Non-breeding Shorebird Habitat

Globally and within Australia migratory shorebird populations continue to decline, driven primarily by ongoing habitat loss and degradation across the EAAF (Steven et al., 2017). The long-term survival of migratory shorebirds depends on the protection of their full suite of habitats across the EAAF (Steven et al., 2017). Because these species rely on a network of sites throughout their annual migration, the loss or degradation of even a single location can substantially reduce population viability (Mu and Kilbane, 2015).

Although major threats currently occur further north along the migration route, non-breeding habitat (such as the MBRS and adjacent habitats, including the Whyte Island Project area), are highly significant for sustaining populations (Lilleyman et al., 2020). Much of the annual cycle of threatened migratory shorebirds is spent in non-breeding areas (Lilleyman et al., 2024). During this period, birds must build and maintain the energy reserves required for survival and long-distance migration, making access to high-quality habitat essential (Thomas, 2023). Both the quantity and quality of stopover and non-breeding habitats strongly influence overall population abundance (Studds et al., 2017).

Managing disturbance within and beyond key shorebird habitats remains a major conservation challenge. Activities outside Ramsar site boundaries can disrupt foraging, reduce habitat quality, and constrain shorebirds' ability to meet critical energy needs (Driessen et al., 2025). Effective management of adjacent areas is therefore essential to maintain habitat connectivity, protect refuge areas, and preserve the ecological character of Ramsar wetlands.

Research on the Ruddy Turnstone has demonstrated the critical importance of high-quality non-breeding habitat for migratory success (Lilleyman et al., 2020). A 10% reduction in food intake during the non-breeding season resulted in a 30% decline in breeding success, while a 20% reduction led to 100% mortality during migration (Lilleyman et al., 2020). These findings underscore the sensitivity of migratory shorebirds to even small declines in habitat quality and resource availability.

4.3.3 Shorebird Habitat Quality and Threats

Although many pressures on migratory shorebirds originate outside Australia, significant local threats persist (Steven et al., 2017). In Moreton Bay, shorebirds are affected by habitat loss, coastal development, declining water quality and anthropogenic disturbance (Steven et al., 2017).

Human disturbance is widely recognised as harmful to wildlife, influencing physiology, behaviour, and population dynamics (Dertien et al., 2021). For shorebirds, disturbance from people, dogs, and vehicles is recognised as a major threat (Glover et al., 2011; Weston et al., 2016). Vehicles can disturb bird behaviors, cause direct mortality, destroy habitat, and alter sediment structure (Steven et al., 2017). People on foot, especially with off-leash dogs, are also well-documented disturbance sources, causing birds to flush from nests and roosts, reducing foraging time and expending additional energy (Steven et al., 2017). Highly sensitive shorebird species are particularly vulnerable to disturbance, and sites with high levels of human activity show reduced shorebird diversity and abundance (Weston et al., 2012). High-tide roosts are particularly sensitive habitat with migratory shorebirds being especially vulnerable to disturbance at these sites.

Shorebirds react to perceived threats through behavioural responses, such as vigilance, fleeing on foot, taking flight, or diving, and through physiological changes including increased heart rate, elevated body temperature, or heightened stress hormones (Weston et al., 2012). Shorebird reactions to disturbance are energetically costly, reduce feeding opportunities and can alter habitat use and force birds to temporarily or permanently abandon preferred habitats (Glover et al., 2011). This is particularly concerning for migratory species that rely on building substantial energy reserves to complete long-distance flights, especially given the widespread loss of stopover sites throughout the EAAF (Steven et al., 2017). Shorebirds that are unable to accumulate sufficient energy during the

non-breeding season may be unable to fuel their northward migration or meet the considerable energetic demands of breeding (Choi et al., 2015; Leseberg et al., 2000; Marasinghe, 2020, cited in Thomas, 2023).

Energy-budget modelling shows that frequent disturbance events, equivalent to 10 alarm flights per day, increase daily energy expenditure by 4.5–4.7% in Knots and 7.5–7.8% in Sand Plovers, which can depress energy reserves below recoverable thresholds (Lilleyman et al., 2016). Even brief behavioural disruptions can accumulate over time, ultimately producing long-term population-level impacts (Weston et al., 2012). Repeated or cumulative disturbances can drive reductions in individual survival and overall population health and may also cause birds to abandon high-quality sites, compounding energetic stress (Steven et al., 2017).

Disturbance sensitivity differs greatly among shorebird species. While some species allow humans to approach closely, others flush at distances of several hundred metres (Weston et al., 2012). These responses are mediated by a range of ecological and behavioural factors, including habitat context, species-specific life-history traits, learned behaviours, and attributes of the disturbance stimulus such as group size, approach speed, and the type of human activity involved (Weston et al., 2012). Vehicle characteristics such as size, noise, speed, and colour can also influence bird responses (McLeod et al., 2013). Large flocks are also more likely to take flight in response to disturbance sources (Stillman et al., 2007, cited in Thomas, 2023).

The distance at which birds flee from an approaching disturbance, the FID, varies by species and disturbance type (Blumstein, 2003; Rodgers & Smith, 1997; Tarlow & Blumstein, 2007, cited in Glover et al., 2011). For example, Sand Plovers initiate flight at shorter distances than Knots but require longer periods to resettle, especially shortly after arriving on their non-breeding grounds (Lilleyman et al., 2016). It is well known that the FID is strongly positively associated with a species' body size since larger species need more time to become airborne and escape (Morelli *et al.*, 2022). The maximum FID recorded for any Australian species is 196 m for the Far Eastern Curlew (Glover *et al.* 2011) but longer FIDs are likely to occur (Weston *et al.*, 2016).

The following indicative FID ranges have been reported for shorebird species known to occur in the project area, based on published Australian datasets and reviews (after Weston et al., 2012; 2016). These values represent observed average ranges across multiple studies and are context-dependent, varying with behaviour (roosting vs foraging), site setting (urban vs remote), and flock composition (single- vs mixed-species). FIDs should therefore not be applied as fixed or universal buffer distances.

- FID ranges (m):
 - Far Eastern Curlew: 64.5–126.1
 - Curlew Sandpiper: 24.9–34.8
 - Bar-tailed Godwit: 22.1–59.5
 - Eastern Whimbrel: 37.7–90
 - Sharp-tailed Sandpiper: 14.8–39.3
 - Black-tailed Godwit: 21–31.3
 - Grey-tailed Tattler: 17.3–23
 - Red Knot: 21.3
 - Red-necked Stint: 16.4–32.6

In summary:

- Far Eastern Curlew exhibits the largest FIDs, frequently exceeding 100 m.
- Godwits and whimbrels display intermediate but variable FIDs approx. 25–90 m.
- Small Calidris sandpipers and stints typically show FIDs of approx. 5–35 m.
- For some species e.g. Red Knot, Black-tailed Godwit, values are based on fewer Australian records and should be interpreted with caution.

4.3.4 Project Area Flagship Species - Far Eastern Curlew (*Numenius madagascariensis*)

The Far Eastern Curlew is the largest migratory shorebird in the EAAF and has undergone a severe population decline of more than 75% since 1993 (Rogers et al., 2023, as cited in Lilleyman et al., 2024).

After breeding in the northern hemisphere, individuals of this species migrate to non-breeding coastal habitats in Australia (Thomas, 2023). As the largest migratory shorebird, the Far Eastern Curlew has exceptionally high energy requirements with most individuals overwintering in Australia gaining 40–70% of their body weight to fuel their return journey (Mu and Kilbane, 2015). Younger birds often remain for several years before undertaking their first northward migration (Morrisk *et al.*, 2022, as cited in Lilleyman *et al.*, 2024).

Non-breeding habitat suitability for this species is strongly influenced by human disturbance, substrate type, and food availability (Mu and Kilbane, 2015). The species relies on extensive, high-quality foraging and roosting habitats (Lilleyman *et al.*, 2024) including productive soft intertidal mudflats for foraging at low tide and high-tide roosts for resting (Thomas, 2023). They show strong fidelity to non-breeding sites, returning to the same feeding and roosting locations year after year and rarely forage outside familiar areas (Lilleyman *et al.*, 2020).

Far Eastern Curlews frequently encounter human activities that alter how they use coastal landscapes (Thomas, 2023) and it is recognised the species has high sensitivity to human disturbance in Australian nonbreeding habitats (Congdon and Catterall, 1994). High disturbance levels from human activities can jeopardise their already narrow energy budgets and protecting key roosting and feeding habitats in non-breeding grounds is recognised as an important conservation action for the species (Lilleyman *et al.*, 2020). Ensuring the long term survival of the species requires strong protection and management of both primary core habitats and surrounding secondary habitat areas, along with targeted efforts to minimise disturbance (Lilleyman *et al.*, 2020).

The ecological characteristics of the Far Eastern Curlew, including its large body size, high sensitivity to disturbance, specialised habitat requirements, and ongoing population decline, make it an effective umbrella species for shorebird management. It is also widely recognised as a flagship species for broader migratory shorebird conservation (Mu & Kilbane, 2015; Lilleyman *et al.*, 2020). As the Whyte Island project area regularly supports internationally and nationally important populations of Far Eastern Curlew it is an effective indicator species for informing disturbance-based shorebird management in the project area. Implementing site-specific disturbance controls to meet the habitat requirements of this species would ensure that the rehabilitation program provides adequate protection for a broader assemblage of migratory shorebirds, including those that are more common or exhibit lower sensitivity thresholds.

4.3.5 Shorebird Habitat Outcomes

The rehabilitation program substantially improved shorebird habitat quality by reducing key disturbance pressures within the Whyte Island project area. Installation of perimeter fencing, cessation of slashing and revegetation of previously disturbed areas eliminated vehicle access to estuarine habitats, reduced human disturbance and increased vegetative screening around important roosting and foraging areas.

Vehicle exclusion measures implemented in Year 1 directly improved 4.2 ha of estuarine wetland and claypan habitat. In addition to the habitat improvements recorded within areas previously subject to regular vehicle disturbance, published Flight Initiation Distance (FID) studies for disturbance-sensitive shorebirds, including the Far Eastern Curlew (Glover *et al.* 2011; Weston *et al.* 2012, 2016), suggest that habitat within approximately 100 m of formerly disturbed areas has likely undergone a functional improvement. This includes an additional 11 ha of mudflat, saltmarsh, mangrove and near-shore habitat (refer Figure 3.1), which is expected to benefit from reduced disturbance pressure and more stable roosting and foraging conditions. Consequently, the ecological benefits of the rehabilitation program are likely to extend beyond the areas directly rehabilitated through on-ground works.

These outcomes are reflected in the BioCondition habitat threat assessment, with shorebird habitat threat scores increasing from 6 at baseline to 25 at program completion. This substantial improvement demonstrates that disturbance pressures within the project area have been effectively minimised, resulting in improved habitat suitability for migratory shorebirds. Concurrent improvements in wetland and saltmarsh condition, verified through BioCondition monitoring and groundcover assessments, further enhanced habitat quality and ecological function across the site.

Reducing disturbance is widely recognised as a critical component of shorebird conservation, particularly in internationally important non-breeding areas such as Moreton Bay. Disturbance can reduce foraging opportunities, increase energy expenditure through repeated flushing events, and compromise the ability of migratory shorebirds to accumulate the energy reserves required for migration and breeding (Mu & Kilbane 2015; Steven *et al.* 2017). Studies have shown that management measures that increase separation distances between people and shorebirds, restrict access to sensitive habitats and minimise disturbance at roosting and feeding areas can improve habitat function and support shorebird persistence (Mu & Kilbane 2015; Lilleyman *et al.* 2016).

By eliminating major disturbance pathways and improving habitat condition, the rehabilitation program has enhanced the suitability of intertidal flats, saltmarsh and mangrove habitats for a range of East Asian–Australasian Flyway species, including Far Eastern Curlew, Bar-tailed Godwit, Curlew Sandpiper, Eurasian Whimbrel and Sharp-tailed Sandpiper. The reduction in disturbance is likely to support increased foraging efficiency, reduced flushing frequency and lower energetic costs, outcomes that are particularly important for large migratory shorebirds such as the Far Eastern Curlew (Weston *et al.* 2012; Lilleyman *et al.* 2020). Research has demonstrated that even small reductions in feeding opportunities can have cumulative impacts on migration success and population viability (Studds *et al.* 2017).

Continued high species richness and peak abundance recorded throughout the monitoring period (10,697–19,162 birds between 2021 and 2025) indicate that the project area continues to function as an important component of the Moreton Bay shorebird network. Although located outside the formal Moreton Bay Ramsar Site boundary, the project area provides important supporting habitat for migratory shorebirds. Reducing disturbance and improving habitat condition within the project area contributes to maintaining habitat connectivity, supporting predictable patterns of habitat use and helping to maintain the ecological character of the broader Moreton Bay Ramsar Site (Driessen *et al.* 2025).

5 Conclusion

PBPL has successfully rehabilitated 20.3 ha of degraded land at Whyte Island, delivering measurable improvements in habitat extent, vegetation condition, ecosystem function and shorebird habitat values across coastal and estuarine environments. Rehabilitation outcomes, assessed using the Queensland BioCondition Assessment Framework, confirm positive changes in vegetation structure, species composition and habitat quality within rehabilitated areas.

Key achievements of the rehabilitation program include:

- Rehabilitation of Coastal Swamp Oak Forest (RE 12.1.1), a threatened ecological community listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- Rehabilitation of saltmarsh and estuarine claypan communities (RE 12.1.2), which form part of the EPBC-listed Subtropical and Temperate Coastal Saltmarsh ecological community, together with associated mangrove habitats (RE 12.1.3) that provide important feeding and high-tide roosting habitat for shorebirds.
- Rehabilitation of open forest on alluvial plains (RE 12.3.11), listed as Of Concern under the Vegetation Management Act 1999 (VMA).
- Rehabilitation of open forest on low coastal alluvial plains (RE 12.3.20), corresponding to the EPBC-listed Lowland Rainforest ecological community and listed as Endangered under the VMA.
- Restoration of Phragmites wetland habitat previously dominated by exotic weeds.
- Implementation of vehicle exclusion measures and coastal habitat restoration that have substantially improved the quality and function of high-value shorebird habitat.

The program has demonstrated that a combination of active restoration, targeted weed management and reduction of key disturbance pressures can successfully restore ecological function and support the recovery of threatened coastal ecosystems. BioCondition monitoring indicates that rehabilitated areas are on a positive trajectory, with improvements observed in both vegetation condition and habitat values for migratory shorebirds.

To maintain these gains and support continued ecological recovery, the following management actions are recommended:

Vegetation management and habitat rehabilitation

- Continue targeted weed control across planted and naturally regenerating areas, particularly during periods of peak growth.
- Maintain planting success through replacement of failed tubestock and infill planting where required.
- Support ongoing natural regeneration and recruitment to further improve vegetation condition and structural complexity.

Disturbance reduction and access management

- Maintain strict vehicle exclusion within estuarine and near-shore habitats, limiting access to authorised maintenance activities only.
- Retain and enhance vegetative screening to minimise visual disturbance from adjacent roads and operational areas.
- Continue to protect key roosting and foraging habitats for disturbance-sensitive shorebird species, including Far Eastern Curlew.

Monitoring

- Continue annual shorebird habitat and utilisation assessments using Queensland Wader Study Group (QWSG) data to track changes in habitat use and conservation outcomes.
- Continue periodic assessments to verify vegetation condition trajectories and inform adaptive management.

Overall, the rehabilitation program has delivered significant ecological outcomes and established a strong foundation for the long-term recovery and management of Whyte Island's coastal and estuarine ecosystems.

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Annex A 2026 BioCondition Site Data

	2026	2026	2026	2026	2026	2026	2026	Jan-26	Jun-26
	1	3	4	7	8	9	10	5	5
RE	12.3.11	12.3.20	12.1.2	12.3.20	12.3.11	12.1.2	12.3.11	12.3.20	
Tree canopy median height:	15 m	0 m		0 m	15 m		0 m	0 m	0 m
Tree canopy cover:	82	0		0	0		0	0	0
Sub-canopy median height:	8m	0 m		0 m	0 m		0 m	0 m	0 m
Sub-canopy cover:	10	0		0	0		0	0	0
Number of large trees/ha:	6	0		0	0		0	0	0
Tree species richness:	19	15		13	15		12	0	8
Tree species:	Acacia disparrima subsp. disparrima	Acacia disparrima subsp. disparrima		Acacia disparrima subsp. disparrima	Acacia sp.		Casuarina glauca		Ficus macrophylla
	Acacia leiocalyx	Acacia leiocalyx		Acacia leiocalyx	Acacia sp.		Macaranga tanarius		Melaleuca quinquenervia
	Alectryon coriaceus	Casuarina glauca		Allocasuarina littoralis	Casuarina glauca		Hibiscus tiliaceus		Cupaniopsis anacardioides

2026	2026	2026	2026	2026	2026	2026	Jan-26	Jun-26
Allocasuarina littoralis	Elaeocarpus reticulatus		Casuarina glauca	Corymbia tessellaris		Acacia fimbriata		Macaranga tanarius
Casuarina glauca	Eucalyptus tereticornis subsp. tereticornis		Corymbia tessellaris	Eucalyptus siderophloia		Acacia sp.		Hymenosporum flavum
Corymbia tessellaris	Ficus coronata		Eucalyptus tereticornis subsp. tereticornis	Eucalyptus tereticornis subsp. tereticornis		Cupaniopsis anacardioides		Eucalyptus sp.
Cupaniopsis anacardioides	Lophostemon suaveolens		Lophostemon suaveolens	Lophostemon suaveolens		Eucalyptus tereticornis		Streblus brunonianus
Eucalyptus tereticornis	Macaranga tanarius		Macaranga tanarius	Macaranga tanarius		Eucalyptus sp.		Casuarina glauca
Ficus coronata	Melaleuca quinquenervia		Syzygium australe	Pittosporum undulatum		Cryptocarya laevigatum		
Ficus obliqua	Glochidion sumatranum		Syzygium oleosum	Grevillea robusta		Melaleuca quinquenervia		
Glochidion ferdinandi	Syzygium sp.		Hibiscus tiliaceus	Melaleuca quinquenervia		Leptospermum sp.		
Glochidion sumatranum	Hymenosporum flavum		Glochidion sumatranum	Ficus coronata		Pittosporum undulatum		
Leptospermum polygalifolium	Glochidion sumatranum		Pandanus tectorius	Allocasuarina littoralis				
Livistona australis	Cryptocarya laevigatum			Pandanus tectorius				

	2026	2026	2026	2026	2026	2026	2026	Jan-26	Jun-26
	Lophostemon confertus	Pittosporum undulatum			Melaleuca nodosa				
	Lophostemon suaveolens								
	Macaranga tanarius								
	Melaleuca quinquenervia								
	Pittosporum undulatum								
Native shrub cover:	0			4%					1%
Shrub species richness:	5	3		10	8		5		7
Shrub species:	Breynia oblongifolia	Myoporum acuminatum		Banksia robur	Banksia robur		Trema tomentosa		Acacia sp.
	Dodonaea triquetra	Alchornea ilicifolia		Elaeocarpus reticulatus	Elaeocarpus reticulatus		Breynia oblongifolia		Acacia sp.
	Jagera pseudorhus	Acacia sp.		Jagera pseudorhus	Jagera pseudorhus		Myoporum acuminatum		Banksia sp.
	Trema tomentosa			Leptospermum polygalifolium	Leptospermum polygalifolium		Hakea sp.		Myoporum acuminatum
	Banksia sp.			Melastoma malabathricum subsp. malabathricum	Melastoma malabathricum		Austromyrtus dulcis		Breynia oblongifolia

	2026	2026	2026	2026	2026	2026	2026	Jan-26	Jun-26
				Myoporum acuminatum	Myoporum acuminatum				Austromyrtus dulcis
				Trema tomentosa	Trema tomentosa				Leptospermum sp.
				Hakea sp.	Breynia oblongifolia				
				Dodonaea sp.					
				Hovea acutifolia					
Native perennial grass cover:		18%	35%	20%	6%	20%		7%	31%
Grass species richness:	5	3	3	5	3	1	1	2	2
Grass species:	Cynodon dactylon	Cynodon dactylon	Cynodon dactylon	Carex appressa	Imperata cylindrica	Sporobolus virginicus	Phragmites australis	Imperata cylindrica	Imperata cylindrica
	Imperata cylindrica	Phragmites australis	Phragmites australis	Cynodon dactylon	Themeda triandra			Phragmites australis	Phragmites australis
	Phragmites australis	Sporobolus virginicus	Sporobolus virginicus	Imperata cylindrica	Cymbopogon refractus				
	Themeda triandra			Themeda triandra					
	Cymbopogon refractus			Cymbopogon refractus					

	2026	2026	2026	2026	2026	2026	2026	Jan-26	Jun-26
Organic litter cover:	71%	78%	0%	40%	66%	0%	61%	38%	45%
Forb species richness:	10	12	6	4	5	3	2	0	3
Forb/Other:	Carex appressa	Carex appressa	Bacopa monnieri	Bacopa monnieri	Carex appressa	Salicornia quinqueflora	Cyperus polystachyos		Bacopa monnieri
	Commelina ensifolia	Dianella brevipedunculata	Cyperus polystachyos	Cyperus polystachyos	Lomandra longifolia	Sesuvium portulacastrum	Hippocratea barbata		Cyperus polystachyos
	Cyperus polystachyos	Dianella caerulea	Fimbristylis dichotoma	Lomandra longifolia	Dianella brevipedunculata	Suaeda australis			Fimbristylis dichotoma
	Dianella brevipedunculata	Eustrephus latifolius	Fimbristylis ferruginea	Pandorea jasminoides	Dianella caerulea				
	Dianella caerulea	Imperata cylindrica	Sesuvium portulacastrum		Pandorea jasminoides				
	Hibbertia scandens	Juncus sp.	Suaeda australis						
	Lomandra hystrix	Lomandra hystrix							
	Lomandra longifolia	Lomandra longifolia							
	Pandorea jasminoides	Tetragonia tetragonoides							
	Cordyline sp.	Portulaca oleracea							

2026		2026	2026	2026	2026	2026	2026	Jan-26	Jun-26
		Sesuvium portulacastrum							
		Suaeda australis							
Coarse Woody Debris total length:		5m							5m
Non-native plant cover:	<5%	5%	5%	5%	5%		20%	50%	30%

Annex B BioCondition Photos

B.1 Site 1

North



East



South



West



PUBLIC



B.2 Site 3

North



East



South



West





B.3 Site 4

North



East



South



West





B.4 Site 5

North



East



South



West



PUBLIC



B.5 Site 7

North



East



South



West



PUBLIC



B.6 Site 8

North



East



South



West



PUBLIC



B.7 Site 9

North



East



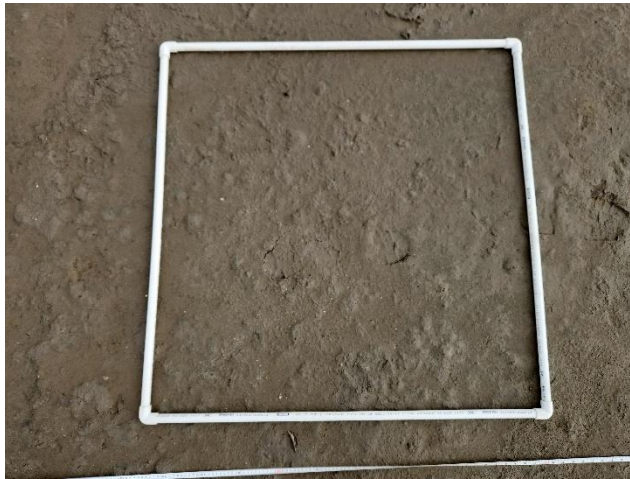
South



West



PUBLIC



B.8 Site 10

North



East



South



West



PUBLIC



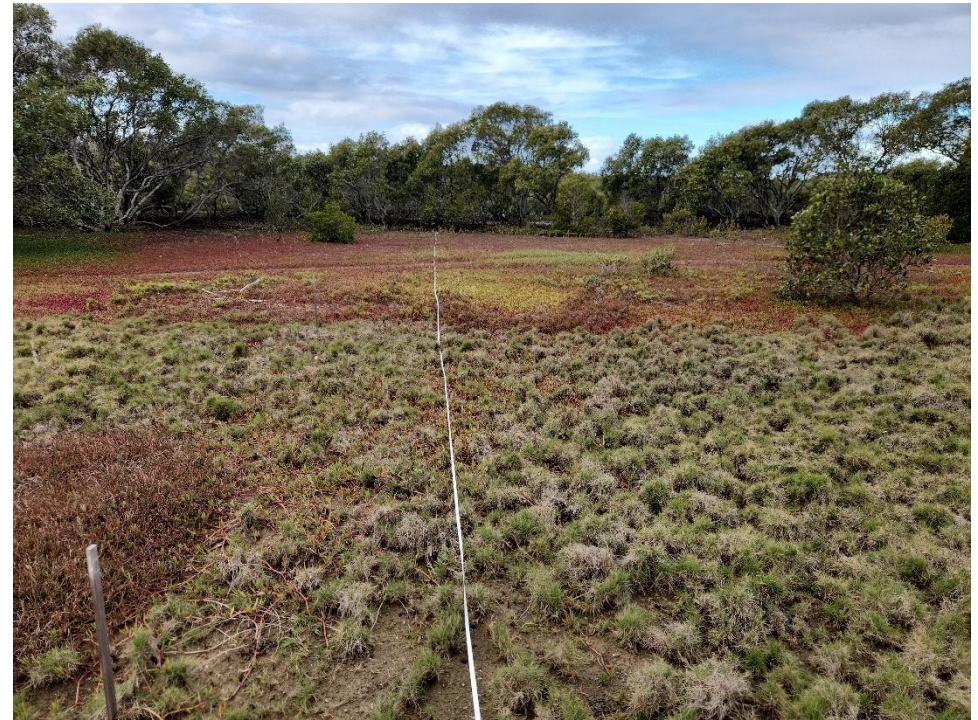
Annex C Vegetation Transect Photos

C.1 Transect A

North



East



South



West



C.2 Transect B

North



East



South



West



C.3 Transect C

North



East



South



West



C.4 Transect D

North



East

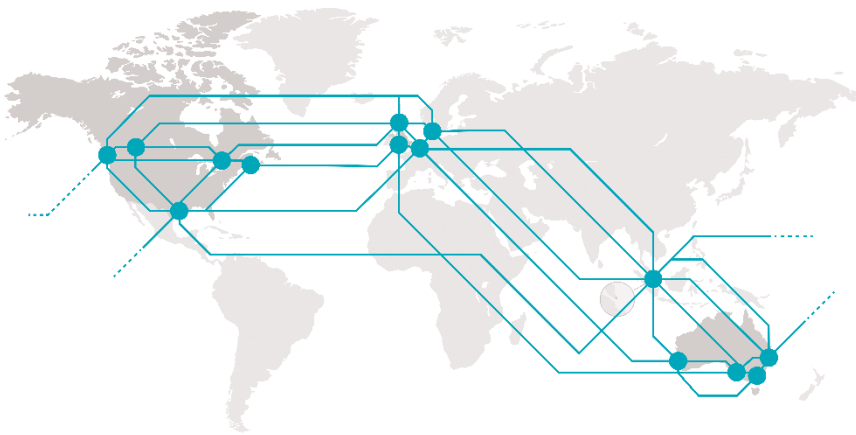


South



West





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