Appendix H: Offset Area Management Plan

QTMP – Torbanlea Train Manufacturing Facility

2022-0931 Offset Area Management Plan

Department of Transport and Main Roads

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Document control record

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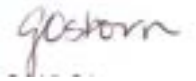
Author signature		Approver signature	
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Executive Summary

The Torbanlea Train Manufacturing Facility (the Project) is part of the Queensland Train Manufacturing Program (QTMP) which is a program of works that has been initiated by Department of Transport and Main Roads (TMR) to modernise and allow the expansion of the South-East Queensland (SEQ) passenger train fleet to support the region's population and economic growth, while reducing road congestion and associated emissions. The Project was determined by the Commonwealth Minister for the Environment and Water as a "Controlled Action" due to its potential to have a significant impact on the listed threatened species of the Greater glider (*Petauroides volans)* and the Grey-headed flying fox (*Pteropus poliocephalus)*, and the Threatened Ecological Community (TEC) of Swamp Sclerophyll.

This document is an Offset Area Management Plan (OAMP) that provides information to address item 6.3 of the Commonwealth Department of Climate Change, Energy, the Environment and Water's (DCCEEW) Request for Information (RFI). Offsets are required to achieve a conservation outcome that counterbalances any significant residual impact on a prescribed matter of national environmental significance (MNES) from proposed Project works. This OAMP has a purpose to provide high level guidance for the implementation of the offsets through using primary mechanisms that include:

- The dedication of a total offset area of 55 hectares (ha) of vegetation comprising of the Swamp Sclerophyll TEC (15.12 ha) and habitat suitable for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) (noting that the Greater glider and Grey-headed flying fox habitat will be provided as a composite offset)
- Rehabilitation and revegetation management to improve the condition of low and medium quality patches within the offset area to achieve high quality condition and size within the offset area
- Implementation of a management plan for the integrity of existing remnant vegetation.

In accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act), the environmental outcomes to be achieved for the offset area through the implementation of this OAMP are:

- Improve and restore the habitat quality of the ecological community Swamp Sclerophyll TEC across the offset area which is currently measured as an average condition value of 6 out of 10
- Improve and restore the habitat quality for Greater glider and Grey-headed flying fox habitat within the offset area which are currently measured as an average condition value of 5 out of 10
- Implement a vegetation management plan to ensure the integrity of existing remnant vegetation is maintained
- Facilitate an adaptive management plan for the offset area, including interim milestones and a monitoring program
- Compliance reports detailing progress and performance of the implemented management plan and the achievement towards, and maintenance of, the targeted environmental outcomes on an annual basis.

The outcomes will be achieved through a management plan that consists of:

- Maintaining habitat values
- Rehabilitation and restoration
- Pest and weed management
- Consistent monitoring and reporting to ensure that offset area is achieving and maintaining the completion criteria, including meeting the nominated interim milestone targets.

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Glossary of terms

Abbreviation	Full Text
ASL	Above sea level
SERA	Standards Reference Group
Cwlth	Commonwealth
DAWE	Department of Agriculture, Water and Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DES	Department of Environment and Science
DoE	Department of Environment
EOP	*Environmental Offset Policy 2012*
EPBC Act	*Environment Protection and Biodiversity Act 1999* (Cwlth)
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
MNES	Matter of National Environmental Significance
NC Act	*Nature Conservation Act 1992* (Qld)
NNC	NSW North Coast
NSW	New South Wales
OAMP	Offset Area Management Plan
QGIS	Quantum Geographic Information System
Qld	Queensland
QTMP	Queensland Train Manufacturing Program
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
RFI	Request for Information
SEC	South East Corner
SEQ	South East Queensland
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SYB	Sydney Basin
TEC	Threatened Ecological Community
TMR	Transport and Main Roads
VDec	Voluntary declaration
WoNS	Weeds of National Significance

1 Introduction

On 22nd August 2022, a referral for the Queensland Train Manufacturing Program (QTMP) – Torbanlea Train Manufacturing Facility Project (the Project) was submitted to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Act 1999* (Cwlth) (EPBC Act).

The Project is a program of works that has been initiated by the Department of Transport and Main Roads (TMR) to modernise and allow the expansion of the South-East Queensland (SEQ) passenger train fleet to support the region's population and economic growth, while reducing road congestion and associated emissions.

On 16th September 2022, a delegate for the Commonwealth Minister for the Environment and Water determined that the Project was a "Controlled Action" due to its potential to have a significant impact on listed threatened species and communities (sections 18 & 18A) protected under Part 3 of the EPBC Act. Subsequently, an additional information request (required for assessment by preliminary documentation) was issued by DCCEEW on 30th September 2022.

This document provides information to address item 6.3 of the DCCEEW's Request for Information (RFI) issued the 30th of September 2022, reference no. 2022/0931 (DCCEEW 2022a).

Appendix A includes a cross referencing table, that provides the location of the responses to each question item posed by DCCEEW for easy reference.

2 Offset Area Management Plan

Offsets are required to achieve a conservation outcome that counterbalances any significant residual impact on a prescribed matter of national environmental significance (MNES) from proposed Project works. These offsets must provide environmental values similar to the ones being lost, minimise the time-lap between the impact and delivery of the offset, and provide additional protection to the environmental values at risk or management actions to improve environmental values.

The provision of direct offsets is proposed based on the outcomes of the assessment of significance and the extent of the significant residual impacts on MNES. The RFI Response Report (refer **Appendix D** and **Appendix I)** identify three protected matters that are likely to be subject to significant impacts when assessed against the significant impact guidelines 1.1 (DoE 2013). These protected matters include the:

- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland Threatened Ecological Community (TEC) (Swamp Sclerophyll TEC) (Endangered under the EPBC Act)
- Greater glider (*Petauroides volans)* (Endangered under the EPBC Act)
- Grey-headed flying fox (*Pteropus poliocephalus)* (Vulnerable under the EPBC Act).

The Project will reduce the extent of the ecological community and fauna habitat from the removal of 17.42 hectares (ha). The removal of this vegetation and fauna habitat are unavoidable and therefore, to mitigate the loss, direct offsets are proposed in accordance with the Commonwealth's EPBC Act Environmental Offsets Policy and calculated as per the EPBC Act Offset Assessment Guide.

The offset area to which this management plan relates was determined to be suitable for the implementation of a targeted land management approach, which is to result in the preservation and restoration of habitat for the Swamp Sclerophyll TEC, Greater glider and Grey-headed flying fox. The suitability of the offset area was determined in consideration of the results of ecological investigations undertaken at the Project area.

This Offset Area Management Plan (OAMP) has the purpose of providing high level guidance for the implementation of the offsets. The primary mechanisms include:

- The dedication of an offset area of 55 ha of vegetation comprising of the Swamp Sclerophyll TEC and habitat suitable for the Greater glider and Grey-headed flying fox within the QTMP area located in Torbanlea, Queensland
- Rehabilitation and revegetation management to improve the condition of low and medium quality patches within the offset area to achieve high quality condition and size within the offset area
- Implementation of a management plan for the following categories to ensure the integrity of existing remnant vegetation is improved or maintained:
  - Maintaining habitat values
  - Rehabilitation and restoration
  - Pest and weed management
- Consistent monitoring and reporting to ensure that the offset area is achieving and maintaining the completion criteria, including meeting the nominated interim milestone targets.

The implementation of these offset mechanisms will create a continuous conservation area of high quality habitat for the threatened fauna species and ecological community. In addition, the OAMP provides an opportunity to improve knowledge in restoration and management for the Swamp Sclerophyll TEC and habitat for the Greater glider and Grey-headed flying fox.

2.1 Location of proposed offsets

The Project area, inclusive of the model disturbance footprint and offset area, is located adjacent to Ritchie Road in the town of Torbanlea, Queensland (refer Figure 1).

The Project is proposing to establish a train manufacturing facility in Torbanlea, Queensland, on Lot 35 SP326250, and associated infrastructure on the Ritchie Road and Bruce Highway road reserves, and the North Coast Rail Line. The Project is located approximately 23 km north of Maryborough. The property has been historically cleared for agricultural purposes and is situated 7 km to the southwest of Beelbi Creek Conservation Park and 12.5 km to the west of Vernon Conservation Park.

The Project will encompass approximately 68 ha and have a perimeter of approximately 10 km. Within this footprint, 17.42 ha of regulated vegetation will be removed.

Vegetation components within the Project area include Regional Ecosystems (REs) 12.3.6, 12.3.11 and 12.5.4. The presence of the Swamp Sclerophyll TEC within the model disturbance footprint forms the first requirement for proposed offsets (refer Figure 2). This protected matter is listed as Endangered under the EPBC Act. It is analogous to RE 12.3.6. Planned Project works are likely to remove 4.76 ha of this TEC.

The TEC within the Project area is also recognised as *habitat critical to the Survival of the Species* for the Greater glider (*Petauroides volans)* listed as Endangered under the EPBC Act and *Nature Conservation Act 1992* (Qld) (NC Act) and the Grey-headed flying fox (*Pteropus poliocephalus)* listed as Vulnerable under the EPBC Act and NC Act. The planned Project works will result in the clearing of 17.42 ha (inclusive of the 4.76 ha of the removed TEC) of potential Greater glider habitat and potential Grey-headed flying fox habitat.

The offset area is situated southwest adjacent to Ritchie Road, Torbanlea, and north of the model disturbance footprint (refer Figure 3). These sites are within a suitable position within the landscape as they are closely situated near the model disturbance footprint in patches of remnant vegetation inclusive of RE 12.3.6 ad RE 12.5.4 and contain the same environmental values to the ones being removed. Additionally, management to these environmental matters will lead to better protection and achieve a conservation outcome for the Swamp Sclerophyll TEC, Greater glider and Grey-headed flying fox.

The proposed offset area is within the same site, however, is divided by an access road and contains different habitat structures and attributes and therefore will be referred to as three separate offset assessment units. Assessment unit 1 is primarily vegetation consisting of RE 12.3.6, while assessment unit 2 is primarily consisting of RE 12.5.4, and assessment unit 3 contains non-remnant and regrowth vegetation (refer Figure 3). Central coordinates for the offset assessment units are listed in Table 2-1.

Table 2-1 Location of offset site

Offset site	Vegetation	Size (ha)	Latitude	Longitude
Assessment unit 1 (AU1)	12.3.6 (Swamp sclerophyll forest)	23.96	-25.36334	152.60690
Assessment unit 2 (AU2)	12.5.4 (Eucalypt woodland)	15.10	-25.36680	152.60606
Assessment unit 3 (AU3)	Non-remnant vegetation and regrowth vegetation	16.35	-25.36291	152.60922

The size of the proposed offset area is 55 ha. Required offset amounts (under the Commonwealth's EPBC Act Environmental Offsets Policy (SEWPaC 2012) and calculated as per the EPBC Act Offset Assessment Guide (DCCEEW 2012)) for the threatened matters are 15.12 ha for Swamp Sclerophyll TEC, 55 ha for Greater glider habitat and 45.4 ha for Grey-headed flying fox habitat. Composite offsets are used for the Greater glider and Grey-headed flying fox habitat and will encompass all three assessment unit areas (i.e. AU1, AU2 and AU3), as these assessment units provide suitable habitat for the species.

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Legend

- Property boundary
- Model disturbance footprint

A3 scale: 1:17,000

0 175 350 525Meters

Job No: P511003

Coordinate system: GCS WGS 1984

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Figure 1:
Locality Map

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Biocondition assessment sites

- 12.3.6
- 12.5.4
- Property boundary

RE

- RE 12.3.11 - Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains
- 12.3.11/12.3.6
- RE 12.3.6 - Melaleuca quinquenervia +/- Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia open forest on coastal alluvial plains
- 12.3.6/12.3.11
- RE 12.5.4 - Eucalyptus latisinensis +/- Corymbia intermedia, C. trachyphloia subsp. trachyphloia, Angophora leiocarpa, Eucalyptus exserta woodland on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments
- 12.5.4/12.5.7
- Model disturbance footprint

Date: 31/01/2023 10:15 PM Version:0

A3 scale: 1:17,000

0 175 350 525 Meters

Job No: P511003

Coordinate system: GCS WGS 1984

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Figure 2: Vegetation map

Map by: C:\Users\Andy.Dalton\Documents\ArcGIS\Projects\Torbanlea\Torbanlea.aprx Date: 31/01/2023 22:15

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Legend

Biocondition monitoring sites

- 12.3.6
- 12.5.4
- Property boundary

RE

- RE 12.3.6 - Melaleuca quinquenervia +/- Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia open forest on coastal alluvial plains
- RE 12.5.4 - Eucalyptus latisinensis +/- Corymbia intermedia, C. trachyphloia subsp. trachyphloia, Angophora leiocarpa, Eucalyptus exserta woodland on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments
- Model disturbance footprint
- Proposed offset sites

Date: 31/01/2023 10:15 PM Version:0

A3 scale: 1:7,500

0 79 158 237 Meters

Job No: P511003

Coordinate system: GCS WGS 1984

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Figure 3:
Proposed Offset Areas

2.2 Description of proposed offsets

Vegetation communities analogous to the Swamp Sclerophyll TEC vegetation and potential habitat for the Greater glider and Grey-headed flying fox are present within both the model disturbance footprint and the offset area (refer Figure 2). The placement of the offset area is important in maintaining connectivity between habitat of remnant vegetation for RE 12.3.6 and RE 12.5.4. Without protection to these areas, future works may reduce connectivity between habitats, causing further fragmentation and limiting passage for native fauna. The proposed offset area remains in the centre of this passage and provides connectivity for fauna passage (refer Figure 3).

Current environmental values present within the Project area include tertiary quaternary loamy plains and alluvial plains. Vegetation consistent with RE 12.3.6 include open forest to woodland on coastal alluvial plains, with a dominant canopy of *Melaleuca quinquenervia.* Other canopy species that occur are *Eucalyptus tereticornis, Eucalyptus latisinensis, Corymbia intermedia, Angophora leiocarpa* and *Lophostemon suaveolens.* Additionally, vegetation analogous to RE 12.5.4 consists of Eucalypt woodlands on a complex of remnant tertiary surfaces and Cainozoic and Mesozoic sediments, often with species *Eucalyptus latisinensis, Corymbia intermedia, Grevillea banksii, Lophostemon suaveolens, Allocasuarina litoralis* and the occasional *Eucalyptus tereticornis.* These ecological communities contribute to biodiversity by providing habitat for a wide array of fauna that support healthy ecosystem functions through pollination, seed dispersal, soil turnover, nutrient cycling, and predator/prey interactions. The ecosystems are known to provide key feeding, breeding, and roosting habitat for mammals, birds, reptiles, frogs, and invertebrates. Field-based investigations have indicated that the BioCondition rating for the offset sites for the three protected matters are as follows:

- Swamp Sclerophyll TEC BioCondition quality score of 6 out of 10 (refer Section 5)
- Greater glider BioCondition quality score of 5 out of 10 (refer Section 5)
- Grey-headed flying fox BioCondition quality score of 5 out of 10 (refer Section 5).

2.3 Legislative requirements

The EPBC Act Environmental Offset Policy (EOP) guides the delivery of improved environmental outcomes when compensating for residual adverse impacts of an action on the environment (SEWPaC 2012). Specific and measurable environmental outcomes are detailed to ensure efficient, effective, transparent, proportionate, and reasonable use of offsets under the EPBC Act to provide proponents and communities with guidance and certainty. The EOP requires proposed offsets to meet the following standards:

- Deliver an overall conservation outcome that improves or maintains the viability of the protected matter;
- Be built around direct offsets but may include other compensatory measures;
- Be in proportion to the level of statutory protection that applies to the protected matter;
- Be of a size and scale proportionate to the residual impacts on the protected matter;
- Effectively account for and manage the risks of the offset not succeeding;
- Be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs;
- Be efficient, effective, timely, transparent, scientifically robust and reasonable;
- Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced;
- Be informed by scientifically robust information; and
- Be conducted in a consistent and transparent manner (SEWPaC 2012).

The management objectives for the offset area, in accordance with the EPBC Act EOP, will:

- Deliver an overall conservation outcome that improves the viability of the Swamp Sclerophyll TEC, Greater glider habitat and Grey-headed flying fox habitat
- Provide a direct offset that is proportionate to the level of Commonwealth protection that applies to the Swamp Sclerophyll TEC, Greater glider, and Grey-headed flying fox
- Be of the size and scale proportionate to the direct residual impacts of the Swamp Sclerophyll TEC (15 ha)
- Be of a size and scale proportionate to the direct residual impacts on the Greater glider and Grey-headed fling fox (17.42 ha)
- Effectively account for and manage the risks of the offset not succeeding within the required management timeframe
- Provide a conservation gain additional to what is already required by a duty of care or to any environmental planning laws, schemes or programs
- Be efficient, effective, timely, transparent, scientifically robust and reasonable with appropriate governance arrangements in place to readily measure, monitor, audit or enforce the management offset area.

3 Environmental outcomes

The overarching environmental outcome for the proposed offset area is to achieve a conservation goal of the improvement of Swamp Sclerophyll TEC, Greater glider habitat, and Grey headed flying fox habitat. In accordance with the EBPC Act, the environmental outcomes to be achieved for the offset area through the implementation of this OAMP are:

- Improve and restore the habitat quality of the ecological community Swamp Sclerophyll TEC across the offset sites which is currently measured as a condition value of 6 out of 10
- Improve and restore the habitat quality for Greater glider and Grey-headed flying fox habitat within the offset sites which are currently measured as a condition value of 5 out of 10
- Implement a vegetation management plan to ensure the integrity of existing remnant vegetation is maintained
- Facilitate an adaptive management plan for the offset area, including interim milestones and a monitoring program
- Compliance reports detailing progress and performance of the implemented management plan and the achievement towards, and maintenance of, the targeted environmental outcomes on an annual basis.

As outlined in the *Guide to determining terrestrial habitat quality* (DES 2020) an offset must meet the following criteria to demonstrate a conservation outcome using habitat quality assessment:

1. After 20 years, the offset matter area habitat quality score must be at least 1 point greater than the impact matter area habitat quality score (prior to the impact); and
2. After 20 years, the offset matter area habitat quality score must have achieved an overall habitat quality gain of at least 2 points.

Therefore, to have successfully restored the habitat in the proposed offset area, the interim milestones and management plan must result in a habitat quality score of 8 out of 10 after 20 years for the TEC and 7 out of 10 after 20 years for the Greater glider and Grey-headed flying fox habitats. This criterion aligns with the EPBC Act's *Offset Assessment Guide* (DCCEEW 2012). Additionally, for the offset to be successful, Weeds of National Significance (WoNS) within the offset area must present densities lower than 1% and locally significant weeds must be reduced by over 90% from the baseline monitoring assessment (refer **Appendix F** for the list of locally significant weeds to be targeted). Additionally, pest animals must not be detected within the offset area for a period of two or more years.

4 Methodology to assess habitat quality

For land-based offsets, the suitability of the offset area relative to the model disturbance footprint and the prescribed environmental matters is measured by undertaking a habitat quality assessment. Initial confirmation that the Swamp Sclerophyll TEC occurs within the offset area was undertaken using the criteria identified in the key diagnostics and condition threshold outlined in the Conservation Advice (DAWE 2021). Suitability for habitat for the Greater glider and Grey-headed flying fox was determined using the Conservation Advice for *Petauroides volans* (DCCEEW 2022b) and the National Recovery Plan for the Grey-headed Flying-fox (DEW 2021) under the definitions of *habitat critical to the survival of the species*.

The methodology used to determine the habitat quality for the offset area is describes in *BioCondition Assessment Manual* (Version 2.2) (Qld Herbarium 2015) as per the advice from the *Guide to determining terrestrial habitat quality* (Version 1.3) (DES 2020). The method utilises benchmark scores to ensure assessments are measured to a known standard, repeatable and consistent in determining habitat quality. Calibration to a benchmark score provides better insurance of the scoring accuracy.

Using this methodology, ten sites were selected for BioCondition assessments and conducted at the model disturbance footprint and the offset area by two suitably qualified ecologists on the 3rd and 4th of November 2022 and the 10th to 13th of January 2023.

Locations of the sample sites were selected within assessment units. The assessment units are of relatively homogenous vegetation patches defined by a unique RE and broad condition state. The assessment units are inclusive of the offset area (refer Figure 3). As defined in the *BioCondition Assessment Manual,* assessment units do not need to be continuous tracts and can occupy two or more discrete areas, if they are larger than 1 ha in area. As the assessment units were between 0 and 50 ha, two sampling sites for BioCondition were selected per each assessment unit, as was recommended by the guidelines. Additionally, four BioCondition assessments were conducted within the assessment units found within the model disturbance footprint. All sites were compared to reference benchmarks for RE 12.3.6 and RE 12.5.4. The total inclusive area of the offset area is 55 ha consisting of remnant vegetation and RE 12.3.6 and RE 12.5.4.

Investigations were completed using the methodologies described by the *BioCondition Assessment Manual* (Qld Herbarium 2015). BioCondition Site Assessment Datasheet's (Qld Herbarium 2015) (refer **Appendix B**) were used to record values.

The BioCondition assessments measured the following site-based condition attributes:

- Large trees
- Tree canopy height
- Recruitment of canopy species
- Tree canopy cover (%)
- Shrub layer cover (%)
- Coarse woody debris
- Non-native plant cover
- Native perennial grass cover (%)
- Native plant species richness for four lifeforms (trees, shrubs, grasses, forbs and other)
- Litter cover.

As the Project location occurs in South East Queensland, the subregion is considered as fragmented and therefore, landscape attributes, over distance to permanent water, were used to determine the landscape attribute score.

The BioCondition assessments measured the following landscape attributes:

- Size of patch
- Context
- Connectivity.

BioCondition landscape attributes were calculated and measured using the geospatial systems (i.e. QGIS, Version 3.26.3). Scores were derived using calculations provided as prescribed in the *BioCondition Assessment Manual* (Qld Herbarium 2015). Detailed weighted attributes and scoring for all BioCondition sites are provided in **Appendix C**.

5 Baseline data

The EPBC Act trigger for the provision of offsets was the presence of Swamp Sclerophyll TEC, potential Greater glider habitat and potential Grey-headed flying fox habitat within the model disturbance footprint. The proposed offset area was selected to compensate for residual significant impacts from the proposed action. Baseline data and evidence was collected in the proposed offset area to document the presence of the protected matters, as well as the quality and area of habitat contained therein.

5.1 Confirmation of Swamp Sclerophyll TEC

The key diagnostic characteristics and condition thresholds criteria outlined in the Conservation Advice for the Swamp Sclerophyll TEC (DAWE 2021) were used to confirm presence of the Swamp Sclerophyll TEC within the offset areas. The following key diagnostics to support the nationally listed ecological community were met:

- Occurs on the mainland and islands near to the coast (within 20 km) from South East Queensland to south-eastern NSW specifically within these Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions: South Eastern Queensland (SEQ); NSW North Coast (NNC); Sydney Basin (SYB) and the Bateman sub-region of the South East Corner (SEC)
- Occurs in coastal catchments typically below 20 m above sea level (ASL), but occasionally up to 220 m ASL
- Occurs on hydric soils with inundation patterns ranging from intermittent to episodic
- The vegetation structure varies from tall closed to open forest to woodland, to dense (closed) shrubland or scrub forest. Minimum crown cover is at least 10%, but it is more typically in the range 50% to 70%.
- From South East Queensland to the Sydney Basin Bioregion, the canopy is typically dominated or co-dominated by *Melaleuca quinquenervia* and/or *Eucalyptus robusta*. In some areas, the canopy may be locally dominated by other melaleuca species, including *M. dealbata* (SEQ bioregion) (rarely)
- Other tree species may occur in the canopy (or sub-canopy) in some areas, but they are not dominant across a patch, including *Casuarina glauca, Banksia* spp., *Callistemon salignus, Corymbia intermedia* (Pink Bloodwood), *E. tereticornis*, (Forest Red Gum/Queensland Blue Gum), *E. longifolia* (Woollybutt), *E. botryoides* (Southern Mahogany/Bangalay), *E. ovata* (Swamp Gum), *Livistona australis* and/or *Lophostemon* spp.
- The understorey typically includes a variable ground layer, depending on the canopy cover and inundation rate/period. Tall sedges (typically *Gahnia* spp.) and/or ferns often dominate the ground layer, mixed with graminoids and other herbs, especially *Imperata cylindrica* (Blady Grass).
- While they can occur regularly in the ground layer, the ecological community is not present if halophytic species, more typically associated with estuarine/saltmarsh areas, dominate the ground layer of a patch, for example, *Appium prostratum, Atriplex cineria, Chenopodium glaucum, Rhagodia candolleaus* and *Samolus repens*.

Additionally, the patch was compared to the condition thresholds and determined to have met Condition Class A, being a large patch (at least 5 ha) that meets key diagnostics and has a predominantly native ground layer (<20% non-native species) (DAWE 2021).

Information regarding the Swamp Sclerophyll TEC and how it is to be impacted within the Project area is detailed in the significant impact assessment provided as part of the RFI Response Report as **Appendix D.**

5.2 Confirmation of Greater glider (*Petauroides volans)* habitat

The criteria for *habitat critical to the survival of the species* outlined in the Conservation Advice for the Greater glider was used to confirm presence of potential habitat within the offset area (DCCEEW 2022b). Habitat that meets any of the criteria listed is considered to be *habitat critical to the survival of the Greater glider (*southern and central) irrespective of the current abundance or density of Greater gliders or the perceived quality of the site*.* The following key points define *habitat critical* for the species:

- Large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees or trees with a basal diameter of >30 cm and a diverse range of the species' preferred food species in a particular region; and
- Smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonization; and
- Cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes); and
- Areas identified as refuges under future climate changes scenarios; and
- Short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.

The Project area where there is to be proposed development and where the offset sites are to occur both meet one or more of these definitions of *habitat critical to the survival of the Greater glider.* The proposed offset area has a habitat quality of 5 out of 10. Further details on the significant impact assessment for the Greater glider have been provided as part of the RFI Response Report as **Appendix I**.

5.3 Confirmation of Grey-headed flying fox (*Pteropus poliocephalus)* habitat

The criteria for *habitat critical to the survival of the species* outlined in the National Recovery Plan for the Grey-headed flying fox has been used to confirm presence of potential habitat within the offset area (DCCEEW 2021). *Habitat critical* to the survival of the Grey-headed flying fox includes:

- Where the existence of important winter and spring flowering vegetation communities is verified in the field, including:
  - those that contain *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata, E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia* or *Syncarpia glomulifera* (back yard fruit trees, orchards or non-native trees that may be used for foraging are not considered to be habitat critical)
- Contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May)
- Contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or
- Contain native and or exotic species used for roosting at the site of a nationally important Grey-headed flying fox camp as identified on the Department's interactive flying fox web viewer.

The Project area where there is to be proposed development and disturbance meets one or more of these definitions of *habitat critical to the survival of the Grey-headed flying fox.* More information regarding the significant impact assessment for this species have been provided as part of the RFI Response Report as **Appendix D**. The proposed offset area for the Grey-headed flying fox has been assessed as a habitat quality of 5 out of 10 and is suitable for Grey-headed flying fox *habitat critical to the survival of the species.*

5.4 Quality of habitat

Eleven BioCondition assessments were completed in accordance with the methodologies prescribed by the *BioCondition Assessment Manual* (Qld Herbarium 2015). Three assessments were completed within assessment units intersecting the model disturbance footprint and eight assessments were completed within the assessment units for the offset sites.

The location of the sample sites and transects are listed in Table 5-1.

Table 5-1 Transect location through coordinates

Transect number	Transect location	Plot	Datum	Zone	Easting	Northing	Accuracy	Bearing	Assessment Unit
1	Offset site (RE 12.3.6)	Plot origin	GDA94	56J	0460618	7194794	5m	81 ˚	AU1
1	Offset site (RE 12.3.6)	Plot centre	GDA94	56J	0460663	7194801	5m	81 ˚	AU1
2	Offset site (RE 12.3.6)	Plot origin	GDA94	56J	0460388	7194809	5m	260 ˚	AU1
2	Offset site (RE 12.3.6)	Plot centre	GDA94	56J	0460333	7194810	5m	260 ˚	AU1
3	Model disturbance footprint	Plot origin	GDA94	56J	0460931	7194639	5m	146 ˚	AU1
3	Model disturbance footprint	Plot centre	GDA94	56J	0460958	7194597	5m	146 ˚	AU1
4	Offset site (RE 12.5.4)	Plot origin	GDA94	56J	0460471	7195016	5m	114 ˚	AU3
4	Offset site (RE 12.5.4)	Plot centre	GDA94	56J	0460517	7195006	5m	114 ˚	AU3
5	Offset site (RE 12.3.6)	Plot origin	GDA94	56J	0460658	7194732	5m	327 ˚	AU1
5	Offset site (RE 12.3.6)	Plot centre	GDA94	56J	0460490	7194792	5m	327 ˚	AU1
6	Offset site (RE 12.5.4)	Plot origin	GDA94	56J	0460583	7194539	5m	245 ˚	AU3
6	Offset site (RE 12.5.4)	Plot centre	GDA94	56J	0460545	7194524	5m	245 ˚	AU3
7	Model disturbance footprint	Plot origin	GDA94	56J	0460220	7193829	5m	250 ˚	AU2
7	Model disturbance footprint	Plot centre	GDA94	56J	0460178	7193818	5m	250 ˚	AU2
8	Offset site (RE 12.5.4)	Plot origin	GDA94	56J	0460291	7194091	5m	268 ˚	AU2
8	Offset site (RE 12.5.4)	Plot centre	GDA94	56J	0460243	7194068	5m	268 ˚	AU2

Transect number	Transect location	Plot	Datum	Zone	Easting	Northing	Accuracy	Bearing	Assessment Unit
9	Model disturbance footprint	Plot origin	GDA94	56J	0461045	7194416	5m	325 ˚	AU1
9	Model disturbance footprint	Plot centre	GDA94	56J	0461025	7194464	5m	325 ˚	AU1
10	Offset site (RE 12.3.6)	Plot origin	GDA94	56J	0460563	7194798	5m	32 ˚	AU1
10	Offset site (RE 12.3.6)	Plot centre	GDA94	56J	0460593	7194822	5m	32 ˚	AU1
11	Offset site (RE 12.3.6)	Plot origin	GDA94	56J	0459700	7194151	5m	93 ˚	AU1
11	Offset site (RE 12.3.6)	Plot centre	GDA94	56J	0459751	7194143	5m	93 ˚	AU1

The BioCondition score was assessed by calculating scores for site-based and landscape-based attributes and were compared to reference benchmark values for RE 12.3.6 and RE 12.5.4. Site-based attributes and landscape-attributes are considered separately and not combined into one score. This is due to only the site-based attributes of an offset area being able to be managed as part of an offset, while the landscape-attributes are not. However, landscape attributes were calculated to demonstrate that the offset position in the landscape is appropriate for delivering an offset that achieves a conservation outcome.

A summary of the results for these assessments are described in Table 5-2. The overall area-weighted BioCondition score for the offset area was calculated using the average scores for the offset sites (assessment units) and multiplied by the assessment unit size, then divided by the matter area (offset area). The calculations for this assessment are provided in **Appendix C**. This resulted in the overall area-weighted BioCondition score of 5 (Eucalypt woodland, areas B and D) and 6 (Swamp sclerophyll forest, areas A & C) for the offset area. The habitat scoring system involves a rating out of 10, whereby the maximum score of 10 is representative of a fully intact system. Scores between 4-6 indicate good quality regrowth or medium value habitat, and a minimum score of zero would represent a cleared area. Therefore, habitat quality for this offset area is rated at 6 out of 10.

Table 5-2 Assessable attributes and weightings for BioCondition score calculations

	Attribute	Maximum weighting (%)	AU1 Offset area for Swamp Sclerophyll TEC (RE 12.3.6) & Greater glider and Grey-headed flying fox habitat (RE 12.5.4)					AU3 Offset area for Greater glider and Grey-headed flying fox habitat (RE 12.5.4)		AU2 Offset area for Greater glider and Grey-headed flying fox habitat (Regrowth RE 12.5.4)	
			Site 1	Site 2	Site 5	Site 10	Site 11	Site 4	Site 6	Site 8	Site 9
Landscape attributes	Size of patch	10	2	2	2	2	2	0	0	5	2
	Context	5	4	4	4	4	4	0	0	5	4
	Connectivity	5	5	5	5	5	5	2	2	2	5
	Total landscape score	**20**	**11**	**11**	**11**	**11**	**11**	**2**	**2**	**12**	**11**
Site-based condition attributes	Large trees	15	5	10	10	5	5	10	0	5	5
	Tree canopy height	5	5	5	5	5	5	2.5	2.5	5	2.5
	Recruitment of canopy species	5	5	5	5	5	5	5	0	5	5
	Tree canopy cover (%)	5	4	4	5	5	5	5	0	2	5
	Shrub layer cover (%)	5	3	3	5	3	3	3	3	5	3
	Coarse woody debris	5	5	5	2	2	2	0	0	5	2
	Native plant species richness for trees	5	2.5	2.5	2.5	2.5	2.5	2.5	0	2.5	2.5
	Native plant species richness for shrubs	5	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	Native plant species richness for grasses	5	2.5	5	2.5	2.5	2.5	0	2.5	2.5	2.5
	Native plant species richness for forbs and other	5	0	0	2.5	2.5	2.5	0	0	2.5	2.5

	Attribute	Maximum weighting (%)	AU1 Offset area for Swamp Sclerophyll TEC (RE 12.3.6) & Greater glider and Grey-headed flying fox habitat (RE 12.5.4)					AU3 Offset area for Greater glider and Grey-headed flying fox habitat (RE 12.5.4)		AU2 Offset area for Greater glider and Grey-headed flying fox habitat (Regrowth RE 12.5.4)	
			Site 1	Site 2	Site 5	Site 10	Site 11	Site 4	Site 6	Site 8	Site 9
	Non-native plant cover	10	5	10	5	3	5	0	0	5	5
	Native perennial grass cover (%)	5	5	5	3	3	5	0	3	3	3
	Litter cover	5	5	3	5	5	3	5	5	5	5
	Total site-based score	**80**	**52**	**60**	**55**	**46**	**48**	**35.5**	**18.5**	**50**	**45.5**
BioCondition Rating/Score for site-based attributes		**1**	**0.65**	**0.75**	**0.69**	**0.58**	**0.6**	**0.44**	**0.23**	**0.54**	**0.57**
BioCondition Rating/Score average		**10**	**6**					**5**			

Results of the BioCondition confirm that the quality scores of the proposed offset area allows for an uplift in condition in accordance with the requirements for an environmental offset delivered under the EOP. Supporting evidence in the form of the raw data for BioCondition assessment has been attached as **Appendix B**, as well as the overall BioCondition Score calculations as **Appendix C**. It is noted that assessment sites 7 and 8 were used as an extrapolation of the Biocondition score for AU2, it is recommended that for the purposes of the management actions suggested in Section 6 that baseline assessment sites are established prior to Project works commencing.

6 Management actions

This section outlines the management actions required to meet the identified environmental outcomes of the offset area. Management actions are designed to help reach environmental outcomes by having accountable processes to align with the interim milestones and management plan, minimise risk associated with key threatening processes, and maintain and improve the quality of habitat within the offset area.

Foremost, the management actions are developed to achieve the environmental outcomes listed in Section 3 primarily to improve the overall habitat quality and condition for the Swamp Sclerophyll TEC and habitat for the Greater glider and Grey-headed flying fox. However, the management actions are expected to enhance the condition and quality of a wide range of biodiversity, including other listed threatened species.

The management actions detailed below are considered suitable given the Endangered status of the Swamp Sclerophyll TEC and Greater glider as well as the Vulnerable status of the Grey-headed flying fox, the size of the offset area, and the delivery of actions that are measurable or monitorable and efficient, effective, timely, and transparent. Additionally, management actions align with guidance outlined in the Priority Conservation and Research Actions from the Conservation Advice for the Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland (Conservation Advice) (DAWE 2021).

The Conservation Advice for the Swamp Sclerophyll TEC identifies priority conservation and research actions under the following four approaches:

- Protection of the ecological community to prevent further losses
- Restoration of the ecological community by active abatement of threats, appropriate management, restoration and other conservation initiatives
- Communication, engagement with people to increase understanding of the value and function of the ecological community and encourage their efforts in its protection and recovery
- Research and monitoring to improve our understanding of the ecological community and the best method to aid its management and recovery (DAWE 2021).

The Greater glider Conservation Advice provides the following conservation management priorities:

- Re-assess and revise current prescriptions used for prescribed burning to ensure that the frequency and severity of fires in Greater glider habitat are minimised
- In the aftermath of bushfires, protect any unburnt habitat (within or adjacent to recently burnt landscapes) in order to support population recovery
- Incorporate measures to ensure ongoing recruitment of hollow-bearing trees into planning processes
- As a last resort, where hollows are limiting, consider the use of nest boxes and artificial hollows that are suitable for the species. Monitor use of these structures to ensure they are being utilised, and revise designs or placement as required.

The Grey-headed flying fox National Recovery Plan lists the following recovery objectives for the species:

- Identify, protect and increase native foraging habitat that is critical to the survival of the Grey-headed flying-fox
- Identify, protect and increase roosting habitat of Grey-headed flying fox camps
- Determine trends in the Grey-headed flying fox population so as to monitor the species' national distribution, habitat use and conservation status
- Build community capacity to coexist with flying foxes and minimise the impacts on urban settlements from new and existing camps while avoiding interventions to move on or relocate entire camps
- Increase public awareness and understanding of Grey-headed flying foxes and the recovery program, and involve the community in the recovery program where appropriate
- Reduce the impact on Grey-headed flying foxes of electrocution on power lines, and entanglement in netting and on barbed-wire

- Support research activities that will improve the conservation status and management of Grey-headed flying foxes.
- Improve the management of Grey-headed flying fox camps in areas where interaction with humans is likely
- Develop robust models of Grey-headed flying fox life history and population dynamics, to enable predictions of the likely impacts of threats on population viability
- Develop and publish information for the community to build their capacity to coexist with Grey-headed lying foxes
- Identify existing flying fox roosting habitat, opportunities for creating or rehabilitating habitat away from people and areas unsuitable for development due to potential conflict.

6.1 Management action 1 – maintaining habitat value

The maintenance of existing habitat value within the Swamp Sclerophyll TEC is one of the priority management actions proposed to align with the Conservation Advice. Maintaining habitat value is intended to protect the ecological community by preventing further losses in extent and integrity. The offset area will be managed to avoid risks and threats that reduce the size, condition, and ecological function in the future. Additionally, the location of the offset area allows for local and regional variation in the ecological community due to its proximity to the model disturbance footprint.

Particular attention must be given to the conservation of remaining areas of TEC and any impacts from changed hydrology regimes addressed before improvement can be considered for the ecological community. The following actions will be implemented to maintain the existing habitat value:

- Identification and baseline mapping of all remaining areas of the ecological community that meet the description of the condition threshold and whether they are of poor, medium, or high habitat quality and where mature vegetation, especially hollow-bearing trees are located within the first six months of commencement.
- Active maintenance, and identification of optimal hydrology schemes to maintain ecosystem functions in offset area identified in the baseline mapping. Areas of poor quality will be listed for improvement or reinstatement within the first 12 months from commencement. Measures may include waterbody management, filling in drains, installation of ‘smart gates’, etc.
- Maintenance of access tracks through the preservation of existing, or the installation of, barriers, gates, fencing, or signage at strategic locations that outline the TEC offset area appropriately.
- Liaison with private landholders and other fire management authorities to provide advice on the presence and significance of the TEC and the need to advocate for appropriate burning regimes.
- The design and implementation of buffers around the offset area to protect the ecological community from threats such as erosion and weed invasion from edge effects and can act as connectivity for a wildlife corridor within the first 12 months from commencement.
- Within offset area where there is limited hollow availability, install nest boxes or reuse of natural hollows cleared from impact areas. Monitor use of installed habitat.

6.2 Management action 2 – rehabilitation and regeneration

Rehabilitation and regeneration at the offset area is the key contributing action that will improve the existing vegetation of Swamp Sclerophyll TEC. The rehabilitation and regeneration process involves the reinstatement of relevant ecological value to degraded areas and/or exposed areas as a result of any additional management action, for instance, weed removal.

Restoration through assisted natural regeneration is the preferred method in comparison to rehabilitation through reconstruction (e.g. replanting programs). The use of weed and pest control and fire will be considered prior to reconstruction. Minor replanting will be implemented to facilitate recovery only when natural regeneration is not successful at restoration.

Restoration actions will be based on the best available knowledge and scientific research to maximise positive biodiversity outcomes (DAWE 2021). Therefore, the use of the National Standards for the Practice of Ecological Restoration in Australia (SERA 2017) will be used to guide restoration activities in a logical, ethical and systematic way to guide successful ecological restoration.

Management measures for rehabilitation and regeneration include the following:

- Baseline mapping to identify rehabilitation and regeneration areas and the development of an in-depth restoration plan to be completed within the first 12 months of commencement.
- Encouragement of natural regeneration and actively identifying patches of poor to moderate natural hydrology and implement restoration to a high quality within the first two years. This is inclusive of restoring degraded patches of the ecological community to meet the minimum condition thresholds of the TEC (refer Conservation Advice (DCCEEW2021)).
- In partnership with First Nations peoples, incorporation of Traditional Ecological Knowledge such as fire management and seasonal calendars will be taken into account to assist with appropriate restoration and management actions.
- Where regeneration occurs within the offset area, measures that will support the regeneration to maturity (e.g. provide tree guards to minimise grazing or trampling damage risk) will be provided.
- All rehabilitation activities are to be conducted by a suitably qualified bush regeneration contractor, and relevant advice from local authorities will be taken into consideration before undertaking restoration works.
- Where natural regeneration is not successful, infill planting will be implemented after three years.
- Local native species from the ecological community will be used to restore the understorey vegetation to a structure and diversity appropriate for the Swamp Sclerophyll TEC. Any plant reinstated must be consistent with species associated with RE 12.3.6 as described under the Regional Ecosystem Description Database (REDD) (DES 2021).
- Seed collections will follow appropriate national guidelines and protocols with long-term storage of germplasm in an appropriate State facility. Locally collected seeds, where available, will be used to revegetate native plant species.
- Stags, logs and mature and old-growth trees with hollows will be maintained within the offset area to provide important habitat for fauna.
- Any planting that occurs at the offset area will have a prior commitment plan to maintain care of the newly planted vegetation, including the watering, mulching, weeding and use or removal of tree guards.
- Evidence of rehabilitation success and survival rate will be reported annually. All rehabilitation is to commence within three years of Project commencement. Any regeneration areas that require infill replanting will be identified and actions for regeneration will be described, in the third year and following annual compliance reports.
- Habitat quality assessments using BioCondition are to be conducted annually for the first three years and then at year 5, 10, 15, and 20 to determine if the habitat quality score has been maintained and improved by 2 points or more (score of 9 or above) by year 20 for the offset area. Habitat quality monitoring is to be reported in the annual report adjacent to the years of assessment.

6.3 Management action 3 – pest and weed management

The points listed in the priority conservation and research actions within the Conservation Advice for the Swamp Sclerophyll TEC, Greater glider and Grey-headed flying fox is through protection and restoration. The control of pest and weeds is a fundamental measure to protecting and restoring existing ecological values, improving biodiversity, and improving ecological condition of the TEC within the offset area.

Surrounding patches of agricultural land use and clearing has led to the introduction and encroachment of a variety of environmental weeds from edge effects. Some of these weed species are WoNS (e.g. Lantana camara) and should be controlled to prevent further spread and improve native species richness and diversity within the offset area. Due to their persistent nature, the removal of some weed species will not be

possible in a single event and therefore, will require multiple revisits for weed control. The following will be implemented for weed management:

- Weed mapping for WoNS and locally significant weeds (refer **Appendix F**) within the offset area and site-specific treatment techniques developed per site location and extent of weed coverage within the first six months from commencement.
- Treatment using best practice bush regeneration techniques on all identified WoNS and locally significant weeds within the offset area within 12 months of commencement
- A suitably qualified bush regeneration contractor will be engaged to undertake the necessary control
- When conducting activities in or around the ecological community, good biosecurity hygiene to avoid spreading weeds or pathogens will be practiced
- Any unnecessary soil disturbance that may facilitate weed establishment will be minimised
- Treatment will be risk-based and managed to avoid any detrimental impacts on non-target species or having unintentional consequences (i.e. no management methods to weeds that may harm native species or expose soil to erosion)
- WoNS and locally significant weeds will be detected and controlled annually as small infestations are more likely to be eradicated
- When WoNS and locally significant weeds are no longer detected, comprehensive monitoring and treatment will be reduced to every two years.

In addition, implementation of effective control and management techniques for pests affecting the Swamp Sclerophyll TEC and the management to prevent the further spread of invasive pest animals will be implemented. This includes:

- Develop and coordinate a landscape-scale control program for the control of pest animals. Coordination with relevant authorities to supress feral animal numbers within the locality of the offset area in line with regional pest management strategies is to be implemented within the first 12 months from commencement.
- The control program will be risk-based and managed to avoid any detrimental impacts on non-target species or having unintentional consequences (i.e. no management methods to pest animals that may harm native species)
- Prevention of access by grazing animals to patches of the ecological community (e.g. construct fences, tree guards) where practicable
- Annual pest monitoring by a suitably qualified pest management contractor, with GPS evidence recorded. Where annual pest monitoring does not identify any pest species, monitoring will be reduced to every two years.

6.4 Management action 4 – fire management

Fuel loads in the offset area and in the surrounding paddocks will be controlled through a combination of weed control measures and fuel reduction burns to minimise the risk and impacts of unplanned and hot and intense fires and to improve habitat quality through controlling weeds and increased recruitment and establishment of native plants. Regular maintenance of firebreaks, roads and tracks will be an integral part of fire management to mitigate the risks associated with unplanned fire. Ground cover monitoring will be undertaken annually as part of fire management activities to assess fuel loads, determine the risk of unplanned fires to the offset area and inform fire management strategies. Fire management will be consistent with the recommended fire management regime for REs within the offset area as recommended in the Fire Management Guidelines produced by the Queensland Herbarium. Controlled burns will be low intensity with the aim of reducing fuel loads and promoting understorey growth. Moderate to high intensity fires will be avoided as they can degrade vegetation structure and destroy fauna habitats, particularly tree hollows and kill native fauna.

7 Monitoring and evaluation

A monitoring and evaluation plan has been developed for the offset area to assess the success of the management actions to maintain and improve the biodiversity and habitat values of the offset area. The plan is described in the sections below. These monitoring objectives are designed to measure the effectiveness of the proposed management actions and provide for 'early-control' (management actions are effective). Through detailed monitoring practices it can be determined whether the management actions have resulted in an ecological gain or maintenance of the Swamp Sclerophyll TEC and habitats for the Greater glider and Grey-headed flying fox, increased habitat quality, and successful control of pest and weed species within the offset area. The monitoring and evaluation plan also allows for 'early-warning', where corrective actions may be required when management actions are not effective, so as to inform timely decisions on corrective actions to ensure performance targets and the completion criteria are achieved.

Monitoring results will be evaluated against the associated management objectives for the Swamp Sclerophyll TEC and the Greater glider and Grey-headed flying fox habitats and reported to provide improved knowledge and understanding of maintaining and improving quality of habitat for these protected matters.

An implementation and monitoring schedule is provided in this document as **Appendix E**.

7.1 Annual compliance report

In accordance with the EPBC Act requirements, a compliance report will be prepared and made accessible by the proponent on an annual basis for the time of the Offset Plan period (20 years). The annual compliance report will address how the conditions of the offsets, environmental outcomes, or milestones are met and the progress on management actions during the 12-month period. Any non-compliance with the conditions of the offsets will be made transparent within the document. There will also be a chance for the proponent to address how effective management actions have resulted in, or leading to, the completion criteria.

The annual compliance report is adapted to document evidence that is both measurable and transparent. A copy will be provided to the DCCEEW at the time of publishing and stored for periodic technical review and evaluations of the monitoring program and timeframes for implementing program components. The periodic technical review and evaluation of the plan will be undertaken by a relevant review committee, which will include a suitably qualified ecologist/s. Technical reviews will address at a minimum monitoring, risks, and response to risk levels and changing circumstances.

7.1.1 Data handling

A data handling program will be implemented by the proponent for the data storage and protection, data extraction, quality control, analysis, interpretation, reporting and presentation of the progress of the Offset Plan, including all annual compliance reports and data that forms the basis of such reports. Clear specifications for data ownership, distribution, availability, and licensing to the DCCEEW for compliance and recovery planning purposes will be designed, recognised, and agreed to prior to the commencement of the Offset Plan.

7.2 Habitat values monitoring

Monitoring habitat value will be consistent with the Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 6.0) (Neldner et al. 2022) in combination with the BioCondition methodology for tree ecosystems provided in *BioCondition Assessment Manual* (Version 2.2: Feb 2015). Monitoring for habitat values will take a quantitative (measurable) and in some cases qualitative (descriptive) approach to aid precision and confidence of decisions. Transect sites for BioCondition assessments will occur at the same coordinates of the original transects for uniformity in results. BioCondition for habitat value assessments will be carried out by suitably qualified environmental consultants. Scores will be compared to the reference benchmark for the RE 12.3.6 and RE 12.5.4.

Improvement to the offset area habitat quality score must be at least 1 point greater than the impact matter area habitat score and an overall habitat gain of at least 2 points after 20 years. As 15.12 ha of offset area is required for Swamp Sclerophyll TEC, the habitat quality within this offset area (15.12 ha of RE 12.3.6) is to reach a habitat quality score of 8 out of 10 in 20 years. The remaining offset area for Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) must reach a habitat quality score of 7 out of 10 in 20 years. To achieve this, the following site-based attributes will be monitored after management actions are implemented:

- Large trees
- Tree canopy height
- Recruitment of canopy species
- Tree canopy cover (%)
- Shrub layer cover (%)
- Coarse woody debris
- Non-native plant cover
- Native perennial grass cover (%)
- Native plant species richness for four lifeforms (trees, shrubs, grasses, forbs and other plant types)
- Litter cover.

These attributes measured will help indicate the progress towards ecological maturity and increase the conditions for Swamp Sclerophyll TEC and Greater glider and Grey-headed flying fox habitats. For example, the increase of perennial grass cover can supress the increment of weeds to the offset area and encourage recruitment of *Melaleuca quinquenervia,* Eucalypts and species specific to foraging. Additionally, the increase of litter cover can improve surface soil moisture retention and improve hydrology and recruitment of canopy species. Increase in large trees, shrub canopy cover, grass cover, litter and woody debris will also help increase the biodiversity value within the offset area and attract more native fauna to the ecological community.

Habitat quality monitoring using the above method and method described in Section 4 will be undertaken annually for the first three years and then subsequently once on years 5, 10, 15 and 20 to determine if the habitat quality score has been maintained or improved for the offset area. If the values have not been maintained, monitoring will resume annually until the habitat value is restored to the baseline data (6 out of 10 for 15.12 ha of the offset area for the Swamp Sclerophyll TEC and 5 out of 10 for the remaining offset area for the Greater glider and Grey-headed flying fox habitat) or a minimum of 7 for 15.12 ha of the offset area for Swamp Sclerophyll TEC and 6 for the remaining offset area for Greater glider and Grey-headed flying fox habitats by year 10. Baseline data will be used to establish the starting condition of the environment. Where the habitat quality assessments do not show improvements in each of the habitat attributes, and the overall habitat quality for the offset area, the adaptive management framework and performance criteria will be used to review the management actions and corrective actions that may be required to be implemented. The habitat quality monitoring is to be reported in the annual reporting period in the years of assessment.

7.3 Rehabilitation and regeneration monitoring

The progress and success of the Swamp Sclerophyll TEC and Greater glider and Grey-headed flying fox habitat restoration will be monitored and assessed annually. In the case where natural vegetation is not successful, infill planting will be implemented after three years. Rehabilitation planning and implementing will be led by a suitably qualified environmental consultant. Timing of monitoring of this aspect is dependent upon the bush regeneration contractor. Any planting that occurs at the offset area will have a prior commitment plan to maintain care of the newly planted vegetation, including the watering, mulching, weeding and use or removal of tree guard.

Monitoring of rehabilitated planting aspects will include:

- GPS coordinates and photos of the location and extent of rehabilitated site

- Annual collection of photo evidence at the same time each year, that details the success or failure of the rehabilitated plant or area, time of event, and location
- Baseline mapping will be consulted before each rehabilitation to establish the starting condition of the environment to measure performance
- For all rehabilitated areas and using the GPS points for reference, datasheets will detail the following information:
  - Success of rehabilitated stock
  - Average health and height of rehabilitated stock
  - Regeneration of naturally occurring native species
  - The presence of weed species within the rehabilitation area.

The collection of this data will be used to aid the precision and confidence of decisions and the state and rate of change to inform timely decisions on the effectiveness of the management actions and whether corrective actions are required. Rehabilitation of areas will have a 60% or higher success survival rate after 12 months of planting. If this is not the case, the active regeneration will be repeated until the completion criteria for the corresponding year is achieved.

7.4 Pest and weed monitoring

The presence of WoNS and locally significant weeds in the offset area will be monitored on an annual basis until the point where they are no longer observed. If or when this happens, WoNS and/or locally significant weeds will be comprehensively monitored and/or treated every two years. **Appendix F** provides a list of locally significant weeds to be monitored.

Timing of the monitoring will be consistent across years to ensure consistency with the baseline assessment. Annual monitoring of WoNS and locally significant weeds will include:

- GPS coordinated mapping to determine the presence and location of weed presence or infestation within the offset area
- A recorded datasheet, either hard-copy or tablet form, to identify the year, date, time, observed weed species, photo location, direction, and any other notes about the weed coverage
- A copy of the previous year's data and baseline mapping will be consulted before and after the assessments to determine any notable changes and establish the starting condition of the environment
- Create or collate data with previous years to develop an excel document listing all GPS points and a weed survey map for ongoing monitoring purposes and annual compliance reporting.

Pest animal management and monitoring will be developed and carried out by a suitably qualified pest management contractor. The control program will be risk-based and managed to avoid any detrimental impacts on non-targeted species. Any reasonable steps to be taken for the control of pest animals and will comply with the *Biosecurity Act 2014* (Qld) and the *Biosecurity Act 2015* (Cwlth). Monitoring of pest animals will include:

- GPS coordinated mapping to determine presence and location of sighting/evidence of presence (e.g. scats, tracks) will be recorded within the offset area
- A recorded datasheet, either hard-copy or tablet form, to identify the year, date, time, observed weed species, photo location, direction, and any other notes about the weed coverage
- A copy of the previous year's data and baseline mapping will be consulted before and after the assessments to determine any notable changes
- Create or collate data with previous years to develop an excel document listing all GPS points and pest occurrences for ongoing monitoring purposes and annual compliance reporting
- Maintain and monitor any long-term preventions mitigations to grazing animals (e.g. fences or tree guards in place)

- Targeted trapping programs or a previously confirmed controlled management method will be implemented at the end of the monitoring period if deemed suitable.

Monitoring of pest animals and outcomes will be reported annually in the compliance report. Where no pest animals are recorded in a monitoring period, monitoring will be reduced to every second year. The collection of this data will be used to aid the precision and confidence of decisions and the state and rate of change to inform timely decisions on the effectiveness of the management actions and whether corrective actions are required.

7.5 Interim milestones

The following interim milestones have been set to mark the progress of the management actions and towards achieving the offset completion criteria. The interim milestones are to be reviewed at five-yearly intervals (year 5, 10, 15 and 20) to manage and review expectations. The interim milestones are included in Table 7-1.

Table 7-1 Interim milestones

Year since commencement	Milestone
1	■ All baseline mapping and monitoring has been complete for the management actions
5	■ Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has been maintained at 6 or above out of 10 for 15.12 ha of the offset area for the Swamp Sclerophyll TEC and maintained at 5 or above out of 10 for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) habitats. ■ WoNS and locally significant weeds within the offset area have been reduced by >30% from the baseline monitoring assessment. ■ Detection of pest animals in annual monitoring has declined by >20% of baseline values, or no pest animals have been recorded in the monitoring period for a period of two or more years.
10	■ Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has improved by 1 point or more to result in a habitat quality of 7 or above out of 10 for 15.12 ha of the offset area for the Swamp Sclerophyll TEC and 6 or above out of 10 for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) habitats. ■ WoNS and locally significant weeds within the offset area have been reduced by >50% from the baseline monitoring assessment. ■ Detection of pest animals in annual monitoring has declined by over half of baseline values, or no pest animals have been recorded in the monitoring period for a period of two or more years.
15	■ Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has been maintained at 7 or above out of 10 for 15.12 ha of the offset area for the Swamp Sclerophyll TEC and 6 or above out of 10 for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying-fox (45.4 ha) habitats. WoNS and locally significant weeds within the offset area have been reduced by >70% from the baseline monitoring assessment. ■ Detection of pest animals in annual monitoring has declined by >70% of baseline values, or no pest animals have been recorded in the monitoring period for a period of two or more years.

Year since commencement	Milestone
20	■ Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has improved by 1 point since year 10 and 2 points or more since year zero to result in a high-quality habitat of 8 out of 10 for 15.12 ha of offset area for the Swamp Sclerophyll TEC and 7 or above out of 10 for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying-fox (45.4 ha) habitats. ■ Locally significant weeds within the offset area have been reduced by >90% from the baseline monitoring assessment. ■ WoNS do not exceed densities of over 1% within the offset area. ■ Pest animals are not detected within the offset area for a period of two or more years.

To contribute towards achieving this outcome, the reporting actions, timing, and responsibilities of the OAMP to maintain transparency and accountability are listed in Table 7-2.

Table 7-2 Timing and responsibility of the Offset Area Management Plan actions

Action	Timing of Action	Responsible persons
Baseline monitoring	Within the first 12 months of the action commencement	Environmental professional/s that are suitably qualified and directed by the Offset Area Manager.
Monitoring reporting within the annual compliance report	Annually	Environmental professional/s that are suitably qualified and directed by the Offset Area Manager.
Auditing	Annually	Environmental professional/s that are suitably qualified and directed by the Offset Area Manager.
Risk management implementation	Annually	Environmental professional/s that are suitably qualified and directed by the Offset Area Manager.
Adaptive implementation program	Annually	Environmental professional/s that are suitably qualified and directed by the Offset Area Manager.
Review	Every three years and/or upon failure to meet the performance criteria	Environmental professional/s that are suitably qualified and directed by the Offset Area Manager.

8 Offset performance and completion criteria

Monitoring results, as well as the interim milestones outcomes prior to completion, will be used to determine if the offset completion criteria are met. The criteria are implemented to provide an indication of success of the management measures implemented for the preservation and improvement of the Swamp Sclerophyll TEC and Greater glider and Grey-headed flying fox habitat offset area. Additionally, if it is deduced that these criteria have failed to be met, corrective actions will be instated. Performance criteria are provided for each management action to manage the expectations of the completion criteria.

8.1 Performance criteria

8.1.1 Management action 1 – maintaining habitat value

- Baseline mapping of the ecological community and where mature, hollow-bearing trees are located within the offset area within the first six months of commencement.
- Identification of hydrology schemes necessary to maintain ecosystem functions within the habitats identified in the baseline mapping of the offset areas and areas with poor quality hydrology functions have been identified for improvement within the first 12 months from commencement.
- Buffers around the offset area to protect the ecological community from threats such as erosion and weed invasion from edge effects have been applied within the first 12 months from commencement.

8.1.2 Management action 2 – rehabilitation and regeneration

- Baseline mapping to identify rehabilitation and regeneration areas and the development of an in-depth restoration plan completed for the offset area within the first 12 months of commencement.
- Degraded areas of hydrology identified and begun restoration processes to a high quality to maintain ecosystem function within the first two years.
- Areas allowed to regenerate will display signs of native vegetation regrowth at rates expected for the species.
- Habitat quality assessments using BioCondition are completed annually for the first three years and following, at year 5, 10, 15, and 20.
- Habitat quality scores will not decrease in the annual reporting from the baseline data. If reduction occurs, monitoring will continue annually until values return to the baseline level.
- Habitat value scores will have improved by 1 or more points (score of 7 or above for the Swamp Sclerophyll TEC offset area and 6 or above for the Greater glider and Grey-headed flying fox habitat offset area) by the 10th year from commencement, in line with the interim milestones. If habitat quality scores do not improve by 1 point, monitoring will continue annually until this value is reflected.

8.1.3 Management action 3 – pest and weed management

- Baseline weed mapping for WoNS within the offset area completed and a weed management strategy developed and implemented within six months of commencement.
- Initial treatment of all WoNS identified in the baseline mapping within 12 months of commencement.
- Annual assessments of detection and treatment until they are no longer observed in the offset area.
- Development of a pest animal control program/management strategy within the locality of the offset area in line with regional pest management strategies within 12 months of commencement.
- Annual updates to the pest animal control program based on monitoring outcomes.

8.1.4 Management action 4 – fire management

- Seek advice from local Rural Fire Service (RFS) to develop appropriate fire breaks.
- Install and maintain firebreaks at appropriate widths to prevent fires on adjoining properties from impacting on the offset area.
- Manage fuel loads through weed management and prescribed burning (utilising cool mosaic burning – and burning to the appropriate conditions).
- Seek advice from local Traditional Owners in cool burn practices.

8.2 Completion criteria

The offset area will have been successful when it completes all three of the following completion criteria points:

- Habitat value scores within the offset area will have improved by 2 or more points (score of 8 or above out of 10 for 15.12 ha of offset area dedicated to Swamp Sclerophyll TEC and a score of 7 or above for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying-fox (45.4 ha) habitat) by the 20th year from commencement to result in a high-quality habitat of RE 12.3.6 (Swamp Sclerophyll TEC), and RE 12.5.4 (potential Greater glider and Grey-headed flying fox habitat).
- Locally significant weeds within the offset area have been reduced by >90% from the baseline monitoring assessment.
- WoNS within the offset area do not exceed densities over 1%.
- Pest animals are not detected within the offset area for a period of two or more years.

8.3 Corrective actions

If performance criteria identified within Section 8.1 are not met, an adaptive management strategy is to be adopted to ensure compliance (i.e. in instances of drought, fire, disease, or planting failure). In instances where weeds persist on site, or excessive mortality within revegetation zones, management strategies are to be revaluated and updated to ensure that performance criteria and interim milestones are met. Reviews of the offset area management will occur every three years and/or upon failure to meet the performance criteria. If it is found that the completion criteria are not met within the timeframe, the following corrective actions will be adopted:

- Where the habitat quality assessment score drops below the 6 out of 10 (Swamp Sclerophyll TEC) or 5 out of 10 (Greater glider and Grey-headed flying fox habitat) or does not reach the required habitat score at the interim milestone checkpoints, management actions to restore and improve habitat will be increased in frequency and at a higher rate of control until the completion criteria is achieved.
- If WoNS, locally significant weeds, or pest animals are detected, the management actions and frequency of the management actions will be increased until the completion criteria have been achieved.
- Where vegetation rehabilitation has a success rate of below 60%, the active regeneration measures will be repeated until the completion criteria are achieved.
- In the instance of unplanned fires or flooding during the monitoring interval, any negative impacts to the habitat quality score will be regarded. Areas effected will be compared to monitoring sites that remain unaffected and were previously at the same, or nearest to, the quality of the affected site. Any resulting disturbance as a consequence of these instances, for instance weed infestation, will be managed to ensure the completion criteria for that value is attained.

Any alterations to any component of this OAMP will be approved by the relevant regulatory authority and to be accompanied by an Adaptive Management Statement (AMS) which clearly outlines the plan component to be altered and the reasoning for the alteration.

9 Risk management

This section provides a qualitative risk assessment, which addressed the risks associated with the objectives and outcomes of the offset area. This risk assessment has been implemented in accordance with the EPBC Act Environmental Management Plan Guidelines (DCCEEW 2014). A risk matrix for the likelihood and consequences used to determine risk values is presented in Table 9-1.

The risk assessment for the management objectives of this OAMP are detailed in Table 9-3. The risk assessment analyses the risk of failure to achieve the OAMP's management actions. Re-evaluation of this risk assessment should take place following the EPBC Act controlled approval phase to address any unforeseen changes or negative outcomes identified. During the first five years of the monitoring and compliance report, TMR will review the management commitments of this plan, and if the review results in the need to review the OAMP, the plan will be revised and DCCEEW informed in writing.

Table 9-1 Risk matrix

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Table 9-2 Likelihood and consequence

Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing low cost, well characterised corrective actions.
Moderate	Moderate risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing well characterised, high cost/effort corrective actions.
High	High risk of failure to achieve the plan's objectives. Results in medium-long term delays to achieving plan objectives, implementing uncertain, high cost/effort corrective actions.
Major	The plan's objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.
Critical	The plan's objectives are unable to be achieved, with no evidenced mitigation strategies.

Table 9-3 Risk assessment and management

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
To legally secure approved offset properties for conservation	Failure to legally secure approved offset area	The land for the Greater glider, Grey-headed flying fox and Swamp Sclerophyll TEC offsets is owned by TMR. A voluntary declaration (VDec) under the *Vegetation Management Act 1999* (Qld) will be used to legally protect the offset area. Protection will be for no less than 20 years.	✓	-	-	-	N/A. Protection measure will be in place prior to delivery of the offset	N/A
	Legislative reform prejudices proposed tenure arrangements for offset properties	The land for the Greater glider, Grey-headed flying fox and Swamp Sclerophyll TEC offsets is owned by TMR. A VDec under the *Vegetation Management Act 1999* (Qld) will be used to legally protect the offset area. Protection will be for no less than 20 years. The VDec is a legally binding protection measure that will not be impacted by changes in tenure or property owners.	✓	-	-	-	N/A. Protection measure will be in place prior to delivery of the offset	N/A
Maintaining habitat values	Failure to adequately document the baseline condition of the existing environment (i.e. no context to assess uplift in condition)	Identification and baseline mapping of all remaining areas of the ecological community that meet the description of the condition threshold and whether they are of poor, medium, or high habitat quality and where mature vegetation, especially hollow-bearing trees are located within the first six months of commencement.	✓	-	-	-	Assessment of existing TEC condition against existing DCCEEW approved conservation advice	Peer review of collected datasets to ensure data integrity and compliance with DCCEEW expectation
	Alterations to hydrology that may result in impacts to existing habitat values associated with the extant TEC and habitat for MNES species	Active maintenance, and identification of optimal hydrology schemes to maintain ecosystem functions in areas identified in the baseline mapping. Areas of poor quality will be listed for improvement or reinstatement within the first 12 months from commencement. Measures may include waterbody management, filling in drains, installation of 'smart gates'.	✓	-	-	-	Assessment of existing TEC condition against existing DCCEEW approved conservation advice and analysis of existing hydrological flows and conditions	Design to maintain existing natural hydrological flows. In instances of current impediment to hydrological flows, measures will be implemented to reinstate natural flow regimes.
	Establishment of unauthorised or ad-hoc access tracks that may lead to environmental degradation	Maintenance of existing access tracks through the preservation of existing, or the installation of, barriers, gates, fencing, or signage at strategic locations that outline the TEC offset area appropriately	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	In instances where damage by unauthorised access/tracks are detected, these are to be rehabilitated to reinstate the pre-disturbance vegetation communities

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	The occurrence of uncontrolled wildfires resulting from accumulated fuel-loads	Liaison with private landholders and other fire management authorities to provide advice on the presence and significance of the TEC and the need to advocate for appropriate burning regimes	-	✓	-	-	Annual monitoring detects excessive fuel loads (assessed by a suitably qualified professional)	Prescribed burns be undertaken in accordance with expert knowledge, undertaken by suitably qualified, licensed and experienced personnel
	Impacts to the offset area as a result of construction activities	The design and implementation of buffers around the offset area to protect the ecological community from threats such as erosion and weed invasion from edge effects and can act as connectivity for a wildlife corridor within the first 12 months from commencement	✓	-	-	-	Regular monitoring (weekly) during the construction period is to occur	In instances where damage to native plants outside of the construction envelope occurs, works within the area are to cease until the cause of the damage can be ascertain and corrected. Damaged vegetation communities are to be re-established to reflect their pre-disturbance state.
Rehabilitation and regeneration	Failure to adequately document the baseline condition of the existing environment (i.e. no context to assess uplift in condition)	Baseline mapping to identify rehabilitation and regeneration areas and the development of an in-depth restoration plan to be completed within the first 12 months of commencement	✓	-	-	-	Assessment of existing TEC condition against existing DCCEEW approved conservation advice	Peer review of collected datasets to ensure data integrity and compliance with DCCEEW expectation
	The use of species not of local provenance in the rehabilitation program, resulting in augmentation to the genetic composition of locally occurring vegetation communities	Encouragement of natural regeneration and actively identifying patches of poor to moderate natural hydrology and implement restoration to a high quality within the first two years. This is inclusive of restoring degraded patches of the ecological community to meet the minimum condition thresholds of the TEC.	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	Where natural recruitment does not occur, or where it is not of sufficient density, supplementary planting is to occur to ensure the offset area is analogous to the Swamp Sclerophyll TEC in regards to density and diversity
	The threat of increased wildfire as a result of accumulated fuel-loads within the offset area	In partnership with First Nations peoples, incorporation of Traditional Ecological Knowledge such as fire management and seasonal calendars will be taken into account to assist with appropriate restoration and management actions	-	✓	-	-	Annual monitoring detects excessive fuel loads (assessed by a suitably qualified professional)	Prescribed burns be undertaken in accordance with expert knowledge, undertaken by suitably qualified, licensed and experienced personnel
	Failure of natural regeneration to reach maturity	Where regeneration occurs within the offset area, measures that will support the regeneration to maturity (e.g. provide tree guards to minimise grazing or trampling damage risk) will be provided	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	Where failure of plants to establish or reach maturity is identified, determination of the cause is to be undertaken and replating is to take place to replace the individual plants lost

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Rehabilitation activities undertaken in a manner that results in failure due to inappropriate methods	All rehabilitation activities are to be conducted by a suitably qualified bush regeneration contractor, and relevant advice from local authorities will be taken into consideration before undertaking restoration works	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	Where failure of plant establishment of dye-back of natural recruitment is identified, an investigation is to be undertaken to identify the cause. A review of the management actions is to be undertaken implementing measures to ensure that compliance with performance targets is achieved.
	Failure of sufficient natural regeneration to meet the required density/diversity to be analogous to the Swamp Sclerophyll TEC	Where natural regeneration is not successful, infill planting will be implemented after three years	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	Where natural recruitment is not sufficient to establish offset of sufficient density or diversity, supplementary planting is to occur by suitably experienced personnel
	Failure of sufficient natural regeneration to meet the required density/diversity to be analogous to the Swamp Sclerophyll TEC	Local native species from the ecological community will be used to restore the understorey vegetation to a structure and diversity appropriate for the Swamp Sclerophyll TEC. Any plant reinstated will be consistent with species associated with RE 12.3.6 as described under the Queensland Regional Ecosystem Description Database.	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	Where natural recruitment is not sufficient to establish offset of sufficient density or diversity, supplementary planting is to occur by suitably experienced personnel
	Source material for supplementary planting is not of local provenance leading to genetic augmentation of extant vegetation communities over time	Seed collections will follow appropriate national guidelines and protocols with long-term storage of germplasm in an appropriate State facility. Locally collected seeds, where available, will be used to revegetate native plant species.	✓	-	-	-	Identified failure of locally collected seed to germinate, grow or establish following planting	Analysis of the seed collection methods and the viability of collected seeds is to occur. In instances where seed viability is low, alternative seed sources are to be used which are of local provenance.
	Loss or reduction of habitat feature for fauna species (e.g. Gliders and arboreal mammals and hollow-nesting birds) within the offset area	Stags, logs and mature and old-growth trees with hollows will be maintained within the offset area to provide important habitat for fauna	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area and associated fauna habitat	Notes to be taken on the availability of fauna habitat features within the offset area. Where an identified reduction in habitat features is observed, the instillation of nest boxes is to occur. The density of such next boxes is to be discussed (and agreed to) with the relevant authority prior to implementation.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Failure of supplementary planting as a result of failure to establish	Any planting that occurs at the offset area will have a prior commitment plan to maintain care of the newly planted vegetation, including the watering, mulching, weeding and use or removal of tree guards	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area. Observed failure to establish.	Review of the management measures and application of correction measure (e.g. regular watering, weeding, etc.)
	Failure of rehabilitation areas to meet the requirements of an offset (i.e no uplift in ecological value over time)	Evidence of rehabilitation success and survival rate will be reported annually. All rehabilitation is to commence within three years of Project commencement. Any regeneration areas that require infill replanting will be identified and actions for regeneration will be described, in the third and following annual compliance reports.	✓	-	-	-	Assessment of the offset area against the DCCEEW TEC Conservation Advice (i.e. condition criteria). Assessed through annual BioCondition assessment.	Peer review of collected datasets to ensure data integrity and compliance with DCCEEW expectation. In instances of non-compliance, a review of the OAMP is to occur with the implementation of corrective actions (e.g. supplementary planting, weed control, analysis and augmentation of hydrological flows).
	Failure to demonstrate ecological uplift over time (i.e. lack of demonstrated evidence to support compliance with the OAMP)	Habitat quality assessments using BioCondition are to be conducted annually for the first three years and then at year 5, 10, 15, and 20 to determine if the habitat quality score has been maintained and improved by 2 points or more (score of 8 or above for Swamp Sclerophyll TEC offset area and score of 7 or above for Greater glider and Grey-headed flying fox) by year 20 for the offset area. Habitat quality monitoring is to be reported in the annual report adjacent to the years of assessment.	✓	-	-	-	Assessment of the offset area against the DCCEEW TEC Conservation Advice (i.e. condition criteria). Assessed through annual BioCondition assessment.	Peer review of collected datasets to ensure data integrity and compliance with DCCEEW expectation. In instances of non-compliance, a review of the OAMP is to occur with the implementation of corrective actions (e.g. supplementary planting, weed control, analysis and augmentation of hydrological flows).
Pest and weed management	Failure to adequately document the baseline condition of the existing environment (i.e. no context to assess uplift in condition)	Weed mapping for WoNS and locally significant weeds within the offset area and site-specific treatment techniques developed per site location and extent of weed coverage within the first six months from commencement	✓	-	-	-	Assessment of existing condition of the offset area, focusing on the occurrence of WoNS and locally significantly weed species	Peer review of collected datasets to ensure data integrity
	Failure of the offset as a result of weed proliferation	Treatment using best practice bush regeneration techniques on all identified WoNS and locally significant weeds within the offset sites within 12 months of commencement	✓	-	-	-	Annual monitoring of the offset area to occur	In instances where weed proliferation are identified, weed control strategies are to be implemented with weed control occurring on an as needed basis until the weed proliferations are eradicated

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Failure to control weeds as a result of inappropriate methodologies	A suitably qualified and experienced bush regeneration contractor is to be engaged to undertake the necessary control	✓	-	-	-	Annual monitoring of the offset area to occur	In instances where weed proliferation are identified, weed control strategies are to be implemented with weed control occurring on an as needed basis until the weed proliferations are eradicated
	Introduction of new biosecurity threats into the offset area, resulting in additional threatening processes within he offset area	When conducting activities in or around the ecological community, good biosecurity hygiene to avoid spreading weeds or pathogens will be practiced	✓	-	-	-	Annual monitoring of the offset area to occur	In instances where weed proliferation or biosecurity threats are identified, weed control strategies are to be implemented with weed control occurring on an as needed basis until the weed proliferations are eradicated
	Weed proliferation as a result of access to newly available resources (i.e. areas nor currently supporting flora species)	Any unnecessary soil disturbance that may facilitate weed establishment will be minimised	✓	-	-	-	Annual monitoring of the offset area to occur	In instances where weed proliferation or biosecurity threats are identified, weed control strategies are to be implemented with weed control occurring on an as needed basis until the weed proliferations are eradicated
	Failure or partial failure of the offset, or reductions of ecological condition as a result of the mis-use, or 'over-spray' of herbicides, resulting in the loss of native flora species	Treatment will be risk-based and managed to avoid any detrimental impacts on non-target species or having unintentional consequences (i.e. no management methods to weeds that may harm native species or expose soil to erosion)	✓	-	-	-	Annual monitoring and BioCondition assessment to assess condition of vegetation communities within the offset area	Where failure of plant establishment of dye-back of natural recruitment is identified, and investigation is be to undertaken to identify the cause. A review of the management actions is to be undertaken implementing measures to ensure that compliance with performance targets is achieved
	Weed proliferation, resulting in reduced ecological condition of the offset area	WoNS or locally significant weeds are to be detected and controlled annually as small infestations are more likely to be eradicated	✓	-	-	-	When WoNS or locally significant weeds are no longer detected, comprehensive monitoring and treatment will be reduced to every two years	If WoNS or locally significant weeds are detected, the management actions and frequency of the management actions will be increased until the compliance with performance indicators is achieved

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Threats to ecological values and reduced biodiversity as a result of the presence of pest animal species	Develop and coordinate a landscape-scale control program for the control of pest animals. Coordination with relevant authorities to suppress feral animal numbers within the locality of the offset area in line with regional pest management strategies is to be implemented within the first 12 months from commencement.	✓	-	-	-	Annual pest monitoring by a suitably qualified pest management contractor, with GPS evidence recorded. Where annual pest monitoring does not identify any pest species, monitoring will be reduced to every two years.	If pest animals are detected, the management actions and frequency of the management actions will be increased until the compliance with performance indicators is achieved
	Loss of biodiversity within the offset area through the mis-application of control measures	The control program will be risk-based and managed to avoid any detrimental impacts on non-target species or having unintentional consequences (i.e. no management methods to pest animals that may harm native species)	✓	-	-	-	Annual BioCondition assessment to assess condition of vegetation communities within the offset area	Instances of die-back of death of native flora species is to be investigated. If mis-use of herbicide is the cause of identified die-back, replacement planting is required and corrective actions to ensure mis-application of herbicides is to be implemented.
	Threats to ecological values and reduced biodiversity as a result of the grazing pressures from non-native species	Prevention of access by grazing animals to patches of the ecological community (e.g. construct fences, tree guards) where practicable	✓	-	-	-	Annual BioCondition assessment to assess condition of vegetation communities within the offset area	In instances where damage by domestic livestock has been identified, the livestock are to be removed from the offset area, and exclusion devices are to be reinstalled where they have been breached

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
Performance targets and completion criteria for all MNES	Failure to meet five year performance targets	Within **five years**: • Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has been maintained at 6 or above out of 10 for 15.12 ha of the offset area for the habitat of all three matters and 5 or above out of 10 for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) habitat • WoNS and locally significant weeds within the offset area have been reduced by >30% from the baseline monitoring assessment • Detection of pest animals in annual monitoring has declined by >20% of baseline values, or no pest animals have been recorded in the monitoring period for a period of two or more years.	-	✓	-	-	Monitoring conduced on an annual basis to assess the progress of the offset in relation to BioCondition, threatening processes and the establishment of vegetation communities	In instances were non-conformance is detected (during annual monitoring), correct actions to resolve the non-conformance to be implemented. Review of the OAMP is to occur at three yearly intervals or in instances of non-compliance.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Failure to meet 10 year performance targets	Within **10 years**: • Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has improved by 1 point or more to result in a habitat quality of 7 or above out of 10 for 15.12 ha of the offset area for the habitat of all three matters and 6 or above out of 10 for the remaining offset area for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) habitat • WoNS and locally significant weeds within the offset area have been reduced by >50% from the baseline monitoring assessment • Detection of pest animals in annual monitoring has declined by over half of baseline values, or no pest animals have been recorded in the monitoring period for a period of two or more years.	-	✓	-	-	Monitoring conduced on an annual basis to assess the progress of the offset in relation to BioCondition, threatening processes and the establishment of vegetation communities.	In instances were non-conformance is detected (during annual monitoring), correct actions to resolve the non-conformance to be implemented. Review of the OAMP is to occur at three yearly intervals or in instances of non-compliance.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Failure to meet 15 year performance targets	Within **15 years**: • Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has been maintained at 7 or above out of 10 for 15.12 ha of the offset area for the habitat of all three matters and 6 or above out of 10 for the remaining offset areas for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) habitat • WoNS and locally significant weeds within the offset area have been reduced by >70% from the baseline monitoring assessment • Detection of pest animals in annual monitoring has declined by >70% of baseline values, or no pest animals have been recorded in the monitoring period for a period of two or more years.	-	✓	-	-	Monitoring conduced on an annual basis to assess the progress of the offset in relation to BioCondition, threatening processes and the establishment of vegetation communities	In instances were non-conformance is detected (during annual monitoring), correct actions to resolve the non-conformance to be implemented. Review of the management plan is to occur at three yearly intervals or in instances of non-compliance.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk*				Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	M	H	S		
	Failure to meet 20 year performance targets	Within **20 years**: • Habitat quality of the offset area, as determined by the habitat values monitoring and BioCondition scoring, has improved by 1 point since year 10 and 2 points or more since year zero to result in a high-quality habitat of 8 out of 10 for 15.12 ha of offset area for the habitat of all three matters and 7 or above out of 10 for the remaining offset areas for the Greater glider (55 ha) and Grey-headed flying fox (45.4 ha) habitat • Locally significant weeds within the offset area have been reduced by >90% from the baseline monitoring assessment • WoNS do not exceed densities of over 1% within the offset area • Pest animals are not detected within the offset area for a period of two or more years.	-	✓	-	-	Monitoring conduced on an annual basis to assess the progress of the offset in relation to BioCondition, threatening processes and the establishment of vegetation communities	In instances were non-conformance is detected (during annual monitoring), correct actions to resolve the non-conformance to be implemented. Review of the OAMP is to occur at three yearly intervals or in instances of non-compliance.

Table note: * Residual Risk (refer Table 9-1 for definitions): L = Low, M = Medium, H = High, S = Severe.

10 Timing and offset mechanisms for protection

The proposed offset area exist on land that is currently owned by TMR. Multiple offset site options will be explored to ensure there are adequate contingencies should the on-site offset not progress. Additionally, the proponent will secure land-based offsets known to support the relevant MNES and the conservation gains proposed will be achieved through sound management measures tailored to the species and community with regular monitoring, and clear performance outcomes. Offset sites will be legally secured as soon as practicable and for the complete time of approval, likely by way of a VDec under the *Vegetation Management Act 1999*. A VDec developed by the proponent will be registered on the title to ensure offset measures are in place to ensure the longevity of the offset once the approval expires, or in the unlikely event that the proponent (being TMR) is unable to fulfil the full obligations required (i.e. dissolves or goes bankrupt).

11 Conclusion

This Plan has provided comprehensive responses to each of the questions addressed in item 6.3 of DCCEEW's RFI issued on 30th September 2022 for the QTMP Project (reference 2021/09301) (DCCEEW 2022a). The structure and information provided in the RFIs (refer **Appendix B.1)** has been followed wherever possible. For instance, to enable a streamlined assessment, a cross reference table has been provided in **Appendix A**.

12 References

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Appendix A

Information requirements for EPBC Act Offset Proposals and where they are addressed

B1. Minimum requirements for a draft Offset Area Management Plan	
B1.1	A description of the offset area/s, including location, size, condition, environmental values present and surrounding land uses (including a map).
	Addressed in **Section 2**: Offset Area Management Plan
B1.2	Baseline data and other supporting evidence that documents the presence of the relevant protected matter within the offset area/s, including the quality and area of habitat
	Addressed in **Section 4**: Methodology to assess habitat quality and **Section 5**: Baseline data
B1.3	Details, with supporting evidence, of how the proposed environmental offset/s meets the requirements of the department's EPBC Act Environmental Offsets Policy(2012) (Offsets Policy), available at: **www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy**
	Addressed in **Section 2.3**: Legislative requirements
B1.4	The methodology, with justification and supporting evidence, used to determine the habitat quality for the offset area/s(e.g. Using the Queensland Government Guide to determining terrestrial habitat quality (version 1.3: Feb 2–20) - Methods for assessing habitat quality under the Queensland Environmental Offsets Policy (des.qld.gov.au) [2020]).
	Addressed in **Section 4**: Methodology to assess habitat quality
B1.5	Details, with supporting evidence, to demonstrate how the environmental offset/s compensate for residual significant impacts of the proposed action on each relevant protected matter and/or their habitat, in accordance with the principles of the Offsets Policy and all requirements of the Offsets Assessment Guide, including: • time over which loss is averted (max. 20 years); • time until ecological benefit; • risk of loss (%) without offset; • risk of loss (%) with offset; and • confidence in result (%).
	Addressed in **Appendix D**
B1.6	Specific, committal and measurable environmental outcomes which detail the nature of the conservation gain to be achieved for each relevant protected matter, including the creation, restoration and/or revegetation of habitat in the proposed offset area/s.
	Addressed in **Section 3**: Environmental outcomes
B1.7	Details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant protected matter.
	Addressed in **Section 2.2**: Description of proposed offsets
B1.8	Maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g. Physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the relevant protected matter that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares).
	Addressed in **Section 2.1**: Location of proposed offsets. Shapefiles to be provided separately.
B1.9	Specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20-year period.

B1. Minimum requirements for a draft Offset Area Management Plan	
	Addressed in **Section 8**: Offset performance and completion criteria
B1.10	Interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria.
	Addressed in **Section 7.5**: Interim milestones
B1.11	Details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the offset area/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions)
	Addressed in **Section 7**: Monitoring and evaluation
B1.12	Proposed timing for the submission of monitoring reports that provide evidence interim milestones have been achieved.
	Addressed in **Section 7.5**: Interim milestones
B1.13	Timing for the implementation of tangible, on-ground corrective actions to be implemented if monitoring activities indicate the interim milestones have not been achieved.
	Addressed in **Section 8.3**: Corrective Actions
B1.14	Risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix.
	Addressed in **Section 9: Risk** management
B1.15	Discussion of how management actions align with relevant conservation advices, recovery plans and threat abatement plans.
	Addressed in **Section 6**: Management
B1.16	Details and execution timing of the mechanism to legally secure the proposed offset area/s, such that legal security remains in force over the offset area/s for at least 20 years to provide enduring protection for the offset area/s against development incompatible with conservation Ensure that offset measures are in place to ensure the longevity of the offset once the approval expires if the proponent/approval holder dissolves/ goes bankrupt/ is otherwise unable to fulfil obligations.
	Addressed in **Section 10**
B1.17	Please note, proposed management actions, monitoring approach and corrective actions must be written using committed language (e.g. 'will' and 'must').

Appendix B

BioCondition transect data

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

OFFICE USE ONLY
Entered:............
Checked:............
Corrected:............

Site ID: B004

DATE: 10/1/23

BioCon survey number: 4

OBSERVERS: AD KJJ

SITE INFORMATION

General habitat survey number:..................

LOCATION: (GPS reference) **Bioregion:** 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: _____ **Location derivation:** _____

Road: zone: ___ easting: ______ northing: ______ Plot Centre Direction: ____ m at ____ degrees

Plot Origin: zone: 56J easting: 0460471 northing: 7195016 Accuracy: 5M.

Plot Centre zone: 56J easting: 0460517 northing: 7195006 Accuracy: 5m

Plot bearing: 114° **Plot alignment description:** Easterly direction

Locality description (include tenure and reserve number): 2km South Tabooba township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description Disturbed regrowth woodland with homogenous Eucalypt and Acacia - Patches of open grassland (exotic) non-remnant

Regional Ecosystem: 12.5.4 **Tree Canopy (EDL*) height:** 6m **Tree subcanopy and/or emergent ht:** S: / E: ......

SITE PHOTOS: (Photo Numbers)

Plot centre: 1

North	South	East	West
1 ✓	3 ✓	2 ✓	4 ✓

Landscape photo(s): ✓ Spot photo(s): ✓

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: 9m all

Site Total: 9

Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

Acacia leiocalyx, Mel quin, C.citriodora,

Total:

Proportion of dominant canopy (EDL) species with evidence of recruitment: 100 %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm)

		Total
Shrub spp. richness:	Acacia leiocalyx, Mel quin, ~~[illegible]~~, lophostemon suaveolens, Hakea sp	~~3~~ 4
Grass spp. richness:	Cynodon dactylon, eragrostis brownii	
Forbs and others spp. richness:	Sphaeromorphaea australis, Wahlenbergia sp. Emilia sonchifolia	
Non-native plant cover (%):	Gev. banksii, lantana camara, Pinus elliotii, Eragrostis curvula, Melinis repens, Polygala sp., Paspalum dilatatum, sida cordifolia, Setaria, Scoparia dulcis, desmodium triflorum, Mitracarpus hirtus, Sida sp. Cyperus Phyllanthus Kikuyu	85%

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BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	95	10				
Native other grass (if relevant)*						
Native forbs and other species (non-grass)					2	
Native shrubs (<1m in height)						
Non-native grass		75	30		85	
Non-native forbs and shrubs	5	15			3	
Litter*			63	99	10	
Rock						
Bare ground			7	1		
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 42

Non-eucalypt large tree DBH*: N/A

No. of large eucalypt trees (tally): Total: 0

No. of large non-eucalypt trees (tally): Total: N/A

Total large trees (ha): 0

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	0-47	None									
	47-60	13									
	61-76	15									
	76-84	6									
	92-92.5	0.5									
	95-100	5									

Total C: 39.5
Total S:
Total E:

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	8-8.5	0.5	1*											

Total native: 0.5
Total exotic:

* Lophostemon suaveolens

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

OFFICE USE ONLY	
Entered:	
Checked:	
Corrected:	

Site ID: B005

DATE: 11/01/23 BioCon survey number: 5

OBSERVERS: AD/JT

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: Location derivation:

Road: zone: easting: northing: Plot Centre Direction: m at degrees

Plot Origin: zone: 56J easting: 0460658 northing: 7194732 Accuracy: 5m.

Plot Centre zone: 56J easting: 0460490 northing: 7194792 Accuracy: 5m.

Plot bearing: 327° Plot alignment description: North, to the west of road

Locality description (include tenure and reserve number): 2km South terbanke township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Melaleuca quinquenervia woodland with Eucalypts

Regional Ecosystem: 12.3.6 Tree Canopy (EDL*) height: 15 Tree subcanopy and/or emergent ht: S: \ E: 22

SITE PHOTOS: (Photo Numbers)

Plot centre: North 1 ✓ South 3 ✓ East 2 ✓ West 4 ✓

Landscape photo(s): ✓ Spot photo(s): ✓

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: 47

Side 1: 28
Side 2: 19
total: 47

Site Total: 47
Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

M. quin, E. siderophloia,
Corymbia intermedia

Total:

Proportion of dominant canopy (EDL) species with evidence of recruitment: 60 %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm)

		Total
Shrub spp. richness:	~~Pittosporum~~ Breynia oblongifolia, Alphitonia excelsa, Lophostemon excelsa, Acacia leiocalyx, Glochidion sumatranum	5
Grass spp. richness:	Imperata cylindrica, Ottochloa gracillima, Chloris ~~sp.~~, Themeda ~~triandra~~; Outside: ~~Xanthorrhoea~~, ~~Fimbrist~~	3
Forbs and others spp. richness:	Parsonsia straminea, Lobelia purpurascens, Phyllanthus virgatus, Dianella caerulea, Viola hederacea, Gonocarpus tetragynus, ~~Parsonsia~~ Cyperus sp1, Fimbristylis sp, Cyperus sp2, Persicaria sp, Baumea sl., Pseudoanthemum variabile	12

Non-native plant cover (%): Kikuyu, Polygala paniculata, Paspalum large leaf, Cuphea carthagenensis, Vasey grass, Urochloa decumbens — 10 %

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	46	80	15	52	85	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)	3	5	5	3		
Native shrubs (<1m in height)						
Non-native grass						
Non-native forbs and shrubs			20	10		
Litter*	1					
Rock	50	15	50	30	15	
Bare ground						
Cryptograms			10	5		
Total						
	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 44

Non-eucalypt large tree DBH*: 26

No. of large eucalypt trees (tally): Total: 4

No. of large non-eucalypt trees (tally): Total: 53

Total large trees (ha): .....

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	1-15	14									
	16-20	4									
	21-27	6									
	29-34	5									
	37-44	7									
	46-48	2									
	50-69	19									
	70-75	5									
	77-90	11									
	93-99	6									
										Total C: 79	
										Total S:	
		77								Total E:	

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	2-5													
	16-18													
	30-33													
	86-88													
	91-94													
													Total native:	
													Total exotic:	

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Corrected:

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

Site ID: B006

DATE: / /

BioCon survey number: 6

OBSERVERS: AD/JT

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER:

Location derivation:

Road: zone: 56 easting: northing: Plot Centre Direction: m at degrees

Plot Origin: zone: 56J easting: 0460583 northing: 7194589 Accuracy: 5m

Plot Centre zone: 56J easting: 0460545 northing: 7194524 Accuracy: 5m

Plot bearing: 245° Plot alignment description: Western direction

Locality description (include tenure and reserve number): 2km South Torbanlea township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Disturbed Pine dominated

4 Pines = 16m

Regional Ecosystem: 12.5.4 Tree Canopy (EDL*) height: 10 Tree subcanopy and/or emergent ht: S: E:

SITE PHOTOS: (Photo Numbers)

Plot centre: North 1 ✓ South 3 ✓ East 2 ✓ West 4 ✓

Landscape photo(s): ✓ Spot photo(s): ✓

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length:

Site Total: 17

Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

Total: 0

Proportion of dominant canopy (EDL) species with evidence of recruitment: 0 %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm) Total

Shrub spp. richness: Alphitonia excelsa, Acacia leiocalyx, Breynia oblong

Grass spp. richness: Gahnia aspera, eragrostis sp.

Forbs and others spp. richness: lobelia purpurascens, cheilanthes sieberi, emilia sonchus, Sphaeromorphea sp.

Non-native plant cover (%): Praxelis clematidea, Lantana camara, Pinus spp, eragrostis curvula, panicum maximum, Kikuyu, lantana, cyperus polystachy%, sweet licorice, cobbler daisy, phyllanthus virgatus, vasey grass. Sida cordifolia

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BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*		45	65			
Native other grass (if relevant)*						
Native forbs and other species (non-grass)		5	2			
Native shrubs (<1m in height)						
Non-native grass	95	40	26	25	99	
Non-native forbs and shrubs			5		1	
Litter*	5	10	51	75		
Rock						
Bare ground			7			
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 42

Non-eucalypt large tree DBH* NA

No. of large eucalypt trees (tally): Total: .....

No. of large non-eucalypt trees (tally): Total: .....

Total large trees (ha): 0

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	2-6	4	Pinus sp.								
	16-20	10									
	21-30	9									
	32-40	8									
	51-55	4									
	58-68	10									
	84-88	4									
	89-100	11									
										Total C:	
			60M							Total S:	
		60								Total E:	

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	9-10		N											
	47-47.5		N											
	51.5-52		N											
	82-83		N											
	89-92		N											
													Total native:	
													Total exotic:	

BIOCONDITION SITE ASSESSMENT DATASHEET

OFFICE USE ONLY
Entered:
Checked:
Corrected:

Site ID: B007
DATE: 11/01/23
BioCon survey number: 7
OBSERVERS: AD/JT

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SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) **Bioregion:** 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: ______ **Location derivation:** ______

Road: zone: [illegible] easting: ______ northing: ______ Plot Centre Direction: ____ m at [illegible] degrees

Plot Origin: zone: 56 easting: 0460220 northing: 7193829 Accuracy: 5

Plot Centre zone: 560 easting: 0460[illegible] northing: 7193818 Accuracy: 5

Plot bearing: 250 Plot alignment description: 178 westerly

Locality description (include tenure and reserve number): 2km south of Forbontea township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description E. latinensis + C. intermedia woodland with shrubby understory of A. leucadet, Mel quin, Alloces littoralis

Regional Ecosystem: 12.5.4 **Tree Canopy (EDL*) height:** 17 **Tree subcanopy and/or emergent ht:** S: / E: /

SITE PHOTOS:
(Photo Numbers)
Plot centre: North 1 ✓ South 5 ✓ East 2 ✓ West 4 ✓
Landscape photo(s): ✓ Spot photo(s):

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: Side 1 = 52m
Side 2 38m

Site Total: 90
Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

E. latinensis, C. intermedia, Mel quin,

Total: ~~400~~ 3

Proportion of dominant canopy (EDL) species with evidence of recruitment: (100) % 4

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm) **Total**

Shrub spp. richness: Grevillea banksii, A. leiocalyx, Alphitonia excelsa, Breynia oblongifolia —

Grass spp. richness: Gahnia aspera, Panicum sp., Themeda australis, Pseudopogonatherum contortum?, imperata cylindrica, Paspalidium sp., eragrostis brownii, Entolasia stricta, Digitaria sp., Xanthorrhoea sp., —

Forbs and others spp. richness: Goodenia sp., Fimbristylis sp. 1, Parsonsia straminea, desmodium sp., Emilia sonchifolia, carex sp., lomandra confertifolia, Lobelia purpurascens, Fimbristylis sp. 2, Sudrantham verdoulis, viola hederacea, Cheilanthes sieberi, ·

Non-native plant cover (%): ~~[illegible]~~ lantana, praxalis, Eragrostis curvula, Urochloa sp. 1 %

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	15	85	67	60	80	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)	6		3	5	5	
Native shrubs (<1m in height)						
Non-native grass						
Non-native forbs and shrubs	2					
Litter*	75	15	15	15	15	
Rock						
Bare ground	2		20	20		
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 42

Non-eucalypt large tree DBH*: NA

No. of large eucalypt trees (tally): Total: 12

No. of large non-eucalypt trees (tally): Total: .....

Total large trees (ha): 12

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	0-2	2									
	4-14	10									
	15-26	11									
	28-40	12									
	42-66	24									
	77-82	5									
	84-89	5									
	90-100	10									
										Total C: 79	
										Total S:	
		79								Total E:	

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	3-7		N				58-60		N					
	9-22		N	Correa/grevillea			63-68		N	soap				
	24-29		N				69-74		N	soap				
	34-36		N	grav			78-81		N	grav				
	40-44		N	grav/soap			84-85		N	grav				
	44-48		N	grav			92-93		E	exotic ochna				
	51-52		N	grav			93-96		N					
	53-54		N	grav										
	55-57		N	grav										

Total native:
Total exotic:

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

OFFICE USE ONLY
Entered:
Checked:
Corrected:

Site ID: B008

DATE: 12/01/23 BioCon survey number: 8

OBSERVERS: AD/JT

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: Location derivation:

Road: zone: easting: northing: Plot Centre Direction: m at degrees

Plot Origin: zone: 56J easting: 0460291 northing: 7194091 Accuracy: 5m.

Plot Centre zone: 56J easting: 0460243 northing: 7194068 Accuracy: 5m.

Plot bearing: 268° Plot alignment description: Westerly direction

Locality description (include tenure and reserve number): 2km South Toorbul township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Corymbia intermedia, Eucalypt & Mel quin woodland with shrubby understory

Regional Ecosystem: 12.5.4 Tree Canopy (EDL*) height: 16 Tree subcanopy and/or emergent ht: S: 10 E: /

SITE PHOTOS: (Photo Numbers)

Plot centre: North 1 ✓ South 3 ✓ East 2 ✓ West 4 ✓

Landscape photo(s): Spot photo(s):

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length:
Side 1 = 40 m
Side 2 = 78 m

Site Total: 118m
Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

Corymbia intermedia, ~~Mel quin~~, ~~Allocasuarina littoralis~~, Eucalyptus[illegible], Mel quin, Allocasuarina littoralis, Alphitonia excelsa, Acacia leiocalyx, Lophostemon suaveolens, Grevillea banksii

Total: ~~6~~ ~~7~~ 8

Proportion of dominant canopy (EDL) species with evidence of recruitment: 50 %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm) Total

Shrub spp. richness: Gravillea banksii, Acacia leiocalyx, Allocasuarina litoralis, Alphatonia excelsa,

Grass spp. richness: Ghania aspera, Themeda triandra, Xanthorea sp., Entolasia stricta, ~~[illegible]~~, Xanthorrhoea ~~[illegible]~~ sp., Digitaria sp., Eragrostis brownii, Aristida sp., Allopterus,

Forbs and others spp. richness: Golden Ladder, Hibbertia ~~[illegible]~~ stricta, Muirdamnia sp., Leucopogon sp., Lomandra confertifolia, ~~[illegible]~~ Pseudanthus virgatus, Hybanthus stellarioides, Haemodorum tenuifolium, Elaeocarpus sp.

Non-native plant cover (%): Pinus elliottii, Lantana camara, %

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	30	45	65	68	30	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)	20			25		
Native shrubs (<1m in height)	10	5	5		7	
Non-native grass						
Non-native forbs and shrubs						
Litter*	40	45	30	7	63	
Rock						
Bare ground		5				
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 42

Non-eucalypt large tree DBH*: NA

No. of large eucalypt trees (tally): Total: 1

No. of large non-eucalypt trees (tally): Total: .....

Total large trees (ha): .....

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	0-1	1									
	4-9	5									
	11-14	3									
	18-23	5									
	25-26	1									
	26.5-31	4.5									
	35-39	4									
	43-44	1									
	52-56	4									
	68-73	5									
Subc.	86-93	7									
	99-100	1									

Total C: 34.5
Total S: 7
Total E: –

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	4-6		N	Grav			76-79		N	Grav				
	10-11		N	Grav			80-84		N	Albc/grav				
	23-24		N	Acacia			99-100		N	Acacia				
	26-29		N	Albcas/gra										
	35-39		N	Albcas										
	48-53		N	Albcas/gra										
	60-63		N	Acacia										
	65-68		N	Grav								Total native:		
	70-73		N	Grav								Total exotic:		

BIOCONDITION SITE ASSESSMENT DATASHEET

OFFICE USE ONLY
Entered:............
Checked:............
Corrected:............

Site ID: B009

DATE: 12/01/23

BioCon survey number: 9

OBSERVERS: AD/JT

Queensland Government

SITE INFORMATION

General habitat survey number:..................

LOCATION: (GPS reference) **Bioregion:** 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: ______ **Location derivation:** ______

Road: zone: ___ easting: ______ northing: ______ **Plot Centre Direction:** ____ m at ____ degrees

Plot Origin: zone: 56J easting: 0461045 northing: 7194416 **Accuracy:** 5m

Plot Centre zone: 56J easting: 0461025 northing: 7194464 **Accuracy:** 5m

Plot bearing: 325° **Plot alignment description:** North westerly

Locality description (include tenure and reserve number): 2km South Torbanlea township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description Mel quin woodland with Eucalypts emergent layer evidence of burn/fire

Regional Ecosystem: 12.3.6 **Tree Canopy (EDL*) height:** 12 **Tree subcanopy and/or emergent ht:** S: / E: 18

SITE PHOTOS: (Photo Numbers)

Plot centre: North 1 ✓ South 3 ✓ East 2 ✓ West 4 ✓

Landscape photo(s): ______ Spot photo(s): ______

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: Side 1: 39 m

Side 2: 28 m

Site Total: 67m

Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

Mel quin, E. latinensis, A. leiocalyx

Grev Banksii

Total:

Proportion of dominant canopy (EDL) species with evidence of recruitment: 75 %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm) **Total**

Category	Species	Total
Shrub spp. richness:	Mel quin, A. leiocalyx, Grev banksii,	
Grass spp. richness:	Digitaria sp., Fimbristylis sp., ~~Xanthorrhoea~~ Themeda triandra, Paspalidium sp., Panicum effusum, Eragrostis sp., Ottochloa sp., Setaria surgens, Aristida sp.,	
Forbs and others spp. richness:	Pseudanthemum variabile, Xanthorrhoea sp., Gahnia aspera, Lobelia purpurascens, Carex sp., Fimbristylis sp., Hybanthus sp., Xyris sp.,	

Non-native plant cover (%): Pinus elliottii, Kikuyu, Eragrostis curvula, Paspalum sp., Sida sp., 10 %

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	50	15	20	[illegible]	10	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)		5	20	[illegible]5	5	
Native shrubs (<1m in height)						
Non-native grass	10	10	[illegible]	25		
Non-native forbs and shrubs						
Litter*	15	55	[illegible]60	[illegible]5	80	
Rock						
Bare ground	25	15	[illegible]		5	
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 44

Non-eucalypt large tree DBH*: 26

No. of large eucalypt trees (tally): Total: 5

No. of large non-eucalypt trees (tally): Total: 23

Total large trees (ha): 28

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	6-15	15		91-92	1						
Em	17-22	5	Em	98-99	1						
	19-28	9									
Em	34-36	2									
	38-45	7									
	47-52	5									
	54-63	9									
Em	65-73	8									
	72-77	5									
	78-80	2									
Em	81-94	13									

Total C: 53
Total S: –
Total E: 29

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	4-6		N	Grevillia			66-67		N	Acacia				
	8-9		N	Acacia			77-78		N	Acacia				
	11-12		N	Grevillia			85-86		N	Gra/Aca/Soap				
	17-18		N	Grevillia			87-90		N	Grev/Soap				
	25-26		N	Acacia			95-96		N	Grev				
	29-31		N	Grevillia			98-99		N	Grev				
	32-33		E	Pine										
	35-36		E	Pine										
	35-41		N	Gra/Acac										

Total native:
Total exotic:

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

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Entered:
Checked:
Corrected:

Site ID: BOIO
DATE: 12/01/23
BioCon survey number: 10
OBSERVERS: AD/JT

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: Location derivation:

Road: zone: easting: northing: Plot Centre Direction: m at degrees

Plot Origin: zone: 56J easting: 0460563 northing: 7194798 Accuracy: 5

Plot Centre zone: 56J easting: 0460593 northing: 7194822 Accuracy: 5

Plot bearing: 32° Plot alignment description: NE

Locality description (include tenure and reserve number): 2km South Torbanlea township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Dominant Mel quinquenervia ~~woodland~~ forest

Regional Ecosystem: 12.3.6 Tree Canopy (EDL*) height: 19 Tree subcanopy and/or emergent ht: S: / E: 24

SITE PHOTOS: (Photo Numbers)
Plot centre: North 1 ✓ South 3 ✓ East 2 ✓ West 4 ✓

Landscape photo(s): Spot photo(s):

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: 30m = side 1 North
14m side 2 Sth

Site Total: 44
Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:
M. quin, A. leiocalyx, E. tereticornis

Total:

Proportion of dominant canopy (EDL) species with evidence of recruitment: ~~28~~ 35 %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm) Total

Shrub spp. richness: A. leiocalyx, L. suaveolens, Mel quin, Breynia oblong, Glochidion ferdinandi, Glochidion sumatranum, Alphitonia excelsa,

Grass spp. richness: Imperata cylindrica, Paspalidium sp, ~~Digitaria~~, Entolasia stricta, Oplismenus sp.

Forbs and others spp. richness: Ficinia nodosa, Phyllanthus virgatus, Fimbristylis sp, Parsonsia straminea, Viola hederacea, Gonocarpus sp., Gahnia aspera, Dianella caerulea, ~~[illegible]~~ sp.

Non-native plant cover (%): Pinus elliottii, ~~Digitaria sp~~, Sida, Digitaria scrobiculatum, Kikuyu. 25 %

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	59	50	45	15	25	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)			1	5		
Native shrubs (<1m in height)	3					
Non-native grass	20		10		30	
Non-native forbs and shrubs						
Litter*	20	50	44	50	40	
Rock						
Bare ground				15	5	
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 44

Non-eucalypt large tree DBH*: 26

No. of large eucalypt trees (tally): Total: 5

No. of large non-eucalypt trees (tally): Total: 33

Total large trees (ha): 38

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	0-11	11									
	13-19	6									
	21-24	3									
	25-38	13									
Emerg	33-41	8									
	40-47	7									
	49-61	12									
	66-72	6									
	74-85	11									
	90-100	10									
										Total C:	79
										Total S:	1
										Total E:	8

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	13-14		N	Acacia			62-64		E/N	Privet on Soap				
	19-21		N	Acacia			85-89		N	Soap				
	24-25.5		E	Pine										
	36-37		N	Gahlox										
	37-40		N	Acacia										
	50-51		N	Acacia										
	53-53.5		E	Pine										
	52-56		N	Soap/acacia										
	57-59		N	Acacia									Total native:	
													Total exotic:	

BIOCONDITION SITE ASSESSMENT DATASHEET

OFFICE USE ONLY
Entered:
Checked:
Corrected:

Site ID: B011
DATE: 13/01/23
BioCon survey number: 11
OBSERVERS: AD/JT

Queensland Government

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: Location derivation:

Road: zone: easting: northing: Plot Centre Direction: m at degrees

Plot Origin: zone: 56J easting: 0469700 northing: 7194151 Accuracy: 5m

Plot Centre zone: 56J easting: 0469751 northing: 7194143 Accuracy: 5m

Plot bearing: 93 Plot alignment description: Easterly

Locality description (include tenure and reserve number): 2km South Torbanlea Township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Mel quin dominated forest

Regional Ecosystem: 12.3.6 Tree Canopy (EDL*) height: 14 Tree subcanopy and/or emergent ht: S: \ E: 21

SITE PHOTOS: (Photo Numbers)

Plot centre: North 1 South 3 East 2 West 4

Landscape photo(s): Spot photo(s):

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: Side 1 = 29
side 2 = 11

Site Total: 40
Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness:

E. latisinensis, Mel quin, E. tere,
E. intermedia, Grev banksii,
A. excelsa, A. leiocalyx

Total:

Proportion of dominant canopy (EDL) species with evidence of recruitment: %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm)

	Total
Shrub spp. richness: Mel qui, A. leiocalyx, Al. excelsa, L. suaveolens, Breynia oblongifolia, Allocasuarina littoralis.	
Grass spp. richness: Aristida sp., Themeda triandra, Entolasia stricta, Eragrostis sp., Panicum simile, ~~[illegible]~~ Sacciolepis indica, Cockatoo grass, Imperata cylindrica	
Forbs and others spp. richness: Lobelia purpurascens, Xanthorrhoea sp., Lomandra hystrix, Fimbristylis sp., Baumea sp., Gonocarpus sp., Lepidosperma sp., Phyllanthus virgatus, Parsonsia straminea	
Non-native plant cover (%): Digitaria scrobiculatum, Passiflora suberosa, lantana, Eragrostis curvula, Polygala;	5 %

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	45	5			78	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)		85	85	90		
Native shrubs (<1m in height)					2	
Non-native grass	10					
Non-native forbs and shrubs						
Litter*	45	10	15	10	15	
Rock						
Bare ground					5	
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 44

Non-eucalypt large tree DBH*: 26

No. of large eucalypt trees (tally): Total: 7

No. of large non-eucalypt trees (tally): Total: 21

Total large trees (ha): 28

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
C	~~3~~ 0-4	4									
	6-8	2									
~~C~~	17-27	10									
Emerg	19-24	5									
	28-32	4									
	33-34	1									
	37-46	9									
	50-57	7									
	67-70	3									
	74-76	2									
	78-91	3									
Emerg	95-99	4									

Total C: 45
Total S: 1
Total E: 9

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	3-4		N	Alloc			61-63		N	Soap/Melg				
	5-6		N	Melg			65-66		N	Melg				
	7-8		N	Allocas			73-76		N	Acacia				
	~~23~~ 29		N	Melg			85-87		N	Grass?				
	30-31		E	Pine			98-100		N	Soap				
	36-38		N	Soap										
	52-53		N	Corymbia										
	54-56		N	Melg/acacia/corymbia										
	59-60		N	Acacia										

Total native:
Total exotic:

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

OFFICE USE ONLY
Entered:
Checked:
Corrected:

Site ID: B012
DATE: 13/01/23
BioCon survey number: 12
OBSERVERS: AD/JT

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER: Location derivation:

Road: zone: easting: northing: Plot Centre Direction: m at degrees

Plot Origin: zone: 55 easting: 0460625 northing: 7194588 Accuracy: 5M

Plot Centre zone: 55 easting: 0460627 northing: 7194609 Accuracy: 5M

Plot bearing: 69° Plot alignment description:

Locality description (include tenure and reserve number): 2km South Tarbanlea township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Non-remnant exotic grassland

Regional Ecosystem: 12.5.4 Tree Canopy (EDL*) height: / Tree subcanopy and/or emergent ht: S: E:

SITE PHOTOS: (Photo Numbers) Plot centre: North 1 ✓ South 3 ✓ East 2 ✓ West 4 ✓

Landscape photo(s): Spot photo(s):

50 x 20m area: (NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Coarse woody debris:

Length: 0

Site Total:
Per ha Total:

100 x 50m area: (NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

Total native tree spp richness: 0

Total:

Proportion of dominant canopy (EDL) species with evidence of recruitment: %

50 x 10m area: Native Plant Spp Richness: (NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm) Total

Shrub spp. richness: A. leiocalyx, Nat Gum

Grass spp. richness: Eragrostis brownii

Forbs and others spp. richness: Fimbristylis sp, Lobelia purpurascens, Cyperus sp, Sharonsphaera,

Non-native plant cover (%): Pinus Pinaster, lotus Queensland blue couch, Tobgate, Digitaria sanguinalis, Gomphocarpus, Eragrostis curvula, goosegrass 95 %

5: Sida sp, Chamaecrista, 6: Sida cordifolia, indigofera, snake weed, Lantana weed
Polystachya, fleabane

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*	15	5	5	20	10	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)					5	
Native shrubs (<1m in height)						
Non-native grass	82	55	75	35	60	
Non-native forbs and shrubs	3	35	10	45	15	
Litter*		10				
Rock						
Bare ground						
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: 42

Non-eucalypt large tree DBH*: NA

No. of large eucalypt trees (tally): Total: 0

No. of large non-eucalypt trees (tally): Total: 0

Total large trees (ha): 0

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	NA										
										Total C:	
										Total S:	
										Total E:	

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	97-100	3												
													Total native:	
													Total exotic:	

BIOCONDITION SITE ASSESSMENT DATASHEET

Queensland Government

OFFICE USE ONLY
Entered:
Checked:
Corrected:

Site ID: BO13

DATE: 13/01/23

BioCon survey number: 13

OBSERVERS: AD/JT

SITE INFORMATION

General habitat survey number:

LOCATION: (GPS reference) Bioregion: 12

Datum: ☐ AGD84 ☑ GDA94 (WGS84) OTHER:

Location derivation:

Road: zone: easting: northing:

Plot Centre Direction: m at degrees

Plot Origin: zone: 56J easting: 0460819 northing: 7194440 Accuracy: 5

Plot Centre zone: 56J easting: 0460772 northing: 7194115 Accuracy: 5

Plot bearing: 224 Plot alignment description: South Westerly

Locality description (include tenure and reserve number): 2km South Torbanlea township

REGIONAL ECOSYSTEM AND TREE HEIGHTS:

Habitat Description: Non remnant exotic grassland

Regional Ecosystem: 12.5.4 (partial) Tree Canopy (EDL*) height: / Tree subcanopy and/or emergent ht: S: / E: /

SITE PHOTOS: (Photo Numbers)

Plot centre: North / South / East / West /

Landscape photo(s): / Spot photo(s): /

50 x 20m area: Coarse woody debris:

(NB: All logs >10cm, >0.5m within 50 x 20m area measured to the plot boundary)

Length:

35m

(wood pile dumping = ~30m)

Site Total:

Per ha Total:

100 x 50m area: Total native tree spp richness:

(NB: *Ecologically Dominant Layer. Tree defined as single stemmed over 2m. All tree species in the 100 x 50m (not just EDL species)

/

Total: 0

Proportion of dominant canopy (EDL) species with evidence of recruitment: 0 %

50 x 10m area: Native Plant Spp Richness:

(NB: List species if known or count if unknown. Shrub is defined as single stemmed below 2m or multi-stemmed from base or below 20cm)

	Total
Shrub spp. richness: Acacia leiocalyx, Alphitonia excelsa	
Grass spp. richness: Eragrostis brownii	
Forbs and others spp. richness: Fimbristylis, juncus elachyston	

Non-native plant cover (%): Pinus, pratensis, Cyperus polystachya, Eragrostis curvula, lantana, giant rat tail grass, Purple Climbing bean, fireweed, ditch millet 95 % multiflora/bantry couch

Version 2.4 10/01/2019 The Database Manager, DES Queensland Herbarium: 3199 7659

BIOCONDITION SITE ASSESSMENT DATASHEET cont....

Five 1 x 1m plots: *attributes are essential to assess as used in scoring, however assessment of all attributes improves your ability to more accurately visualise proportions of each of the attributes.

Ground Cover:	1	2	3	4	5	Mean
Native perennial ('decreaser') grass cover*					5	
Native other grass (if relevant)*						
Native forbs and other species (non-grass)	1		7			
Native shrubs (<1m in height)						
Non-native grass	96	100	83	70	70	
Non-native forbs and shrubs	3		10	30	20	
Litter*						
Rock						
Bare ground					5	
Cryptograms						
Total	100%	100%	100%	100%	100%	

100 x 50m area: *from benchmark doc.

Eucalypt large tree DBH*: .....

Non-eucalypt large tree DBH*: .....

No. of large eucalypt trees (tally):

Total: .....

No. of large non-eucalypt trees (tally):

Total: .....

Total large trees (ha): .....

100m transect:

Tree Canopy Cover: (Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them)

Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total	Tree or tree group* (C or S or E)	Distance (m)	Total
	NA										
										Total C:	
										Total S:	
										Total E:	

Shrub Canopy Cover: * denote as native or exotic. Only native shrub cover is used in the scoring.

Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total	Shrubs*	Distance (m)	Total
	84-85		E	Pine										
													Total native:	
													Total exotic:	

Appendix C

BioCondition score calculations for offsets

The following calculation are recommended for use by the *Guide to determining terrestrial habitat quality* (DES 2020) and the *BioCondition Assessment Manual* (Qld Herbarium 2015).

Matter area 1 – Swamp Sclerophyll TEC (RE 12.3.6):

Calculate the BioCondition score for each sampling site in offset area using the following equation:

$$BC^x = \frac{a + b + c \ldots j}{SBAmax\%}$$

Where:

BC^x = BioCondition score for sampling site x

$a + b + c \ldots j =$ Scores for site-based attributes

$SBAmax\% =$ The maximum site-based score that can be obtained for site-based attributes a-j that are relevant to the regional ecosystem being assessed (e.g 80 for wooded ecosystems)

Site 1:	Site 2:	Site 5:	Site 10:	Site 11:
$BC^x = \frac{52}{80}$ =0.65	$BC^x = \frac{60}{80}$ = 0.75	$BC^x = \frac{55}{80}$ = 0.69	$BC^x = \frac{46}{80}$ = 0.58	$BC^x = \frac{48}{80}$ = 0.6

Calculate the BioCondition score for each assessment unit:

$$BC^{AUx} = \frac{BC1 + BC2}{N}$$

Where:

BC^{AUx} =BioCondition score average for assessment unit 1

BC1 = BioCondition score for sampling site 1 within the assessment unit

BC2 = BioCondition score for sampling site 2 within the assessment unit

N = Number of sampling sites within the assessment unit

$$BC^{AUx} = \frac{0.65 + 0.75 + 0.69 + 0.58 + 0.6}{5}$$

= 0.6

Calculate the area-weighted BioCondition score for the matter area:

$$Z = \frac{BC^{AUx} \text{ x A}}{T}$$

Where:

BC^{AUx} =BioCondition score average for assessment unit 1

Z = Area-weighted site score for assessment unit 1

A = Area in hectares of assessment unit 1 (Area A and Area C from Table 2-1)

T = Area in hectares of matter area

$$Z = \frac{0.6 \text{ x } 22.18}{47.1}$$

= 13.3/ 22.18 =0.6 Convert the matter area BioCondition score into a score out of 10 by multiplying the matter area BioCondition score by 10.

Habitat quality score for Matter area 1 is 6 out of 10.

Matter area 2 - Greater glider & Grey-headed flying fox (RE 12.3.6 & 12.5.4):

Site 1:	Site 2:	Site 4:	Site 5:	Site 6:
$BC^x = \frac{52}{80}$ =0.65	$BC^x = \frac{60}{80}$ = 0.75	$BC^x = \frac{35.5}{80}$ =0.44	$BC^x = \frac{55}{80}$ = 0.69	$BC^x = \frac{18.5}{80}$ =0.23

Site 8:	Site 10:	Site 11:
$BC^x = \frac{50}{80}$ =0.62	$BC^x = \frac{46}{80}$ = 0.58	$BC^x = \frac{48}{80}$ = 0.6

$$BC^{AUx} = \frac{BC1 + BC2}{N}$$

$$BC^{AUx} = \frac{0.65 + 0.75 + 0.69 + 0.58 + 0.6 + 0.44 + 0.23 + 0.62}{8}$$

= 0.5

$$Z = \frac{BC^{AUx} \text{ x A}}{T}$$

$$Z = \frac{0.5 \text{ x } 25.12}{25.12}$$

= 0.5

Habitat quality score for Matter area 2 is 5 out of 10.

Appendix D

EPBC Act offset calculator

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Grey-Headed Flying fox
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes		**Area**		Hectares	
			Quality		Scale 0-10	
			Total quantum of impact	0.00	Adjusted hectares	
Threatened species habitat						
Area of habitat	Yes	Habitat for Grey-headed flying fox	**Area**	17.42	Hectares	Extent validated by ground-truthing and detailed field investgations
			Quality	**6**	Scale 0-10	
			Total quantum of impact	10.45	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00		0.00	#DIV/0!	#DIV/0!	
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0									
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	10.45	Adjusted hectares	45.4	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	45.4	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	80%	0.00	0.00		100.16%	Yes		
									Future area without offset (adjusted hectares)	45.4	**Future area with offset (adjusted hectares)**	45.4									
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**5**	**Future quality without offset (scale of 0-10)**	**4**	**Future quality with offset (scale of 0-10)**	**7**	3.00	80%	2.40	2.31					
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	10.452	10.47	100.16%	**Yes**	$0.00	N/A	$0.00
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Greater Glider
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Habitat for Greater glider	**Area**	17.4	Hectares	Extent validated by ground-truthing and detailed field investgations
			Quality	**6**	Scale 0-10	
			Total quantum of impact	10.44	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	10.44	Adjusted hectares	55	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	55	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	80%	0.00	0.00	10.40	99.60%	Yes	
									Future area without offset (adjusted hectares)	55.0	**Future area with offset (adjusted hectares)**	55.0								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**5**	**Future quality without offset (scale of 0-10)**	**4**	**Future quality with offset (scale of 0-10)**	**7**	3.00	80%	2.40	1.89				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	10.44	10.40	99.60%	**Yes**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Swamp Sclerophyll TEC
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	The assessed patch:**contains 33 diagnostic endemic species listed in Appendix A of the listing advice* contains 118 endemic species and 26 non-endemic species	**Area**	4.76	Hectares	Extent validated by ground-truthing and detailed field investgations
			Quality	**6**	Scale 0-10	
			Total quantum of impact	2.86	Adjusted hectares	
Threatened species habitat						
Area of habitat	Yes		**Area**		Hectares	
			Quality		Scale 0-10	
			Total quantum of impact	0.00	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	Yes	2.86	Adjusted hectares	15.12	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	15.12	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	80%	0.00	0.00	2.86	100.09%	Yes		
									Future area without offset (adjusted hectares)	15.1	**Future area with offset (adjusted hectares)**	15.1									
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**5**	**Future quality with offset (scale of 0-10)**	**8**	3.00	80%	2.40	1.89					
Threatened species habitat																					
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0									
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**		0.00		0.00	0.00					
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	2.856	2.86	100.09%	**Yes**	$0.00	N/A	$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix E

Management Plan

Table E-1 Implementation schedule

Management objective/outcome	Performance targets and/or completion criteria	Management measure/s	Where	When	Related monitoring activity
1.Limiting/restricting disturbance	The extent and condition of the offsets will be maintained or increased between each successive BioCondition assessment.	Disturbance to vegetation within the offset is not permitted, except for maintenance of vegetation for: • Existing access roads, firebreaks, easements and fencing. Thinning of areas of regrowth to manage dense regrowth (to promote rapid recovery) may occur where tree canopy cover is >200% of benchmark for the regional ecosystem, and recommended by a qualified ecologist. Ground disturbance is not permitted. Removal of native groundcover and organic litter is not permitted. Vehicle and machinery movement through the offset area is to be minimised. Deliberate introduction of non-endemic species is not permitted. The use of fertilisers on the property at locations where it could move into the offset area is to be avoided. Signs and fences will be erected within three months of the offset commencement. They will be erected at all entrances and potential access points to the site identifying the area as an environmental offset and stating that access to the site is forbidden.	All offset sites	Throughout the life of the offset. BioCondition reporting to be undertaken ever five years. A detailed report will be submitted to the administering Government department at an interval not exceeding five years.	Ongoing monitoring throughout the offset area timeframe. Monitoring will occur every five years and within the period of maintenance and monitoring to the ecological community and habitat quality. The detailed report will compile and make an Assessment of: • Photo point monitoring data • BioCondition results. The summary report will undertake recalculation of the offset area score (as per EPBC calculator) to determine condition trajectory and ascertain if the offset area has achieved the outcome.
2. Weed management	Keep weed cover at or below baseline levels as determined by BioCondition surveys.	Baseline weed mapping for WoNS and locally significant weeds within the offset site completed and a weed management strategy developed and implemented within six months of commencement. Initial treatment of all WoNS identified in the baseline mapping within 12 months of commencement. Annual assessments of detection and treatment until they are no longer observed in the offset area.	All offset sites	Weed mapping and strategy within six months of commencement, initial treatment within 12 months. Annual treatment and assessment.	Monitoring and maintenance of WoNS and locally significant weeds within the offset area and annual compliance reports.

Management objective/outcome	Performance targets and/or completion criteria	Management measure/s	Where	When	Related monitoring activity
3. Pest animal management	Occurrence of pest animals remains at or below levels estimated through baseline biodiversity assessments.	Conduct baseline assessments of offset site of the presence of pest animals. Development of a pest animal control program/management strategy within the locality of the offset area in line with regional pest management strategies within 12 months of commencement. Annual updates to the pest animal control program based on monitoring outcomes.	All offset sites	Baseline pest surveys at the commencement. Annual assessment.	Monitoring and maintenance of pest animals within the offset area and annual compliance reports.
4. Fire management	Maintenance of appropriate controls to enhance biodiversity and reduce fuel loads. The occurrence of any fire in the offset area will be recorded. Biocondition assessments will make a determination of impact resulting from any fire. Allow the accumulation of fallen timber/debris and the establishment of natural undergrowth. Biocondition Assessments will be used to measure this.	In partnership with First Nations peoples, incorporation of Traditional Ecological Knowledge such as fire management and seasonal calendars must be taken into account to assist with appropriate restoration and management actions. Planned burns to be undertaken and in accordance with the recommended fire management guidelines for Regional Ecosystems and will involve a range of burn strategies including patchwork/mosaic burns. In the instance of unplanned fires or flooding during the monitoring interval, any negative impacts to the habitat quality score will be regarded. Areas effected will be compared to monitoring sites that remain unaffected and were previously at the same, or nearest to, the quality of the affected site. Any resulting disturbance as a consequence of these instances, for instance weed infestation, will be managed to ensure the completion criteria for that value is attained.	All offset sites	Yearly planned burns where possible (given appropriate conditions) Monitoring through BioCondition surveys every five years Overall fine fuel assessment to be completed every five years	Monitoring through BioCondition and **Overall fine fuel hazard assessment**

Table E-2 Monitoring schedule

Monitoring activity	Management needs/questions addressed	Parameter/s measured	Survey/monitoring guidelines	Monitoring frequency	Reliability
1. Initial habitat quality assessment	Baseline establishment	Site condition, site context and species stocking rates as outlined in this OAMP	As per BioCondition methodology	Initial and baseline assessment was completed in December 2022 and January 2023.	Certain
2. Ecological Condition	Improvement of habitat score	As per BioCondition methodology	As per BioCondition methodology	Every five years	Certain
3. Fire	Appropriate fire regimes followed	Presence of fire and extent of burning. Overall fine fuel hazard level and BioCondition score.	As per **Overall fine fuel hazard assessment**	Every five years	Certain
4. Weeds	Success of the control measures.	Weed cover and species present	Visual site inspection by suitable qualified bush regenerators	Weed mapping and strategy within six months of commencement, initial treatment within 12 months Annual treatment and assessment	Certain
5. Feral animals	Success of the control measures.	Presence of pest animals, control measures undertaken	Wildlife camera surveys	Annual	Certain

Appendix F

WoNS and Locally Significant Weeds

Weeds
Lantana camara (WoNS)
Polygala paniculata
Cyperus polystachos
Praxalis clematidea
Sida cordifolia
Kikuyu clandestinus
Lotus corniculatus
Scoparia dulcis
Chamaesyce hirta
Cuphea carthagenensis
Paspalum urvillei
Eragrostis curvula
Megathyrsus maximum
Digitaria scrobiculatum
Ochna serrulata
Gomphocarpus fruticosus
Conyza spp.

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Bringing ideas to life

Appendix I: Torbanlea rail facility site key benefits summary

Queensland Train Manufacturing Program

Torbanlea rail facility site key benefits summary

About the project

The Queensland Train Manufacturing Program (QTMP) will deliver 65 new trains to support Queensland's population and economic growth, including generating hundreds of manufacturing and rail jobs for Queenslanders.

The program also includes the construction of a purpose-built manufacturing facility in Torbanlea, outside of Maryborough, as well as a rail facility for train maintenance and stabling in Ormeau on the Gold Coast.

In February 2023, Downer was announced as the preferred applicant to deliver the program. Contract award is expected to occur later in 2023.

Construction of the manufacturing facility is expected to commence later in 2023.

Key benefits of the Manufacturing Facility

The QTMP was established to meet the increasing demand for rail transport in South East Queensland over the next 10 years. It is expected to provide a number of key benefits for Queensland including:

The Queensland Government's QTMP will build 65 new six-car passenger trains at a purpose-built manufacturing facility at Torbanlea, in the Maryborough region and represents a total investment of approximately $7.1 billion.

The Queensland Train Manufacturing Program will support South East Queensland's population and economic growth, as well as Cross River Rail and the Brisbane 2032 Olympic and Paralympic Games.

Construction of the facilities, trains, and maintenance of the fleet will support Queensland jobs now and into the future. The program brings with it a pipeline of training and development opportunities to bolster Queensland as the train building capital of Australia.

In the Maryborough region during 2023–2031, it is expected that QTMP on average will support more than 100 jobs per year (equivalent to full-time work at 38 hours per week, or 'FTE') for train manufacturing and operations. Approximately 100 additional jobs will be required in 2024 for the Torbanlea facility's construction and commissioning.

Economic modelling shows that the entire QTMP (including both the manufacturing and rail facility) will support more than 500 jobs per annum between 2026 and 2031 peaking at 610 FTE in 2029. QTMP will support more than 100 operational FTE per annum from 2031 through to 2061.

To support these employment opportunities the State is currently:

- exploring opportunities for QTMP to partner with Fraser Coast high schools to help train the students who will form the backbone of the next generation of the local engineering and manufacturing workforce.
- considering strategies to transition people who are out of work or under-employed into jobs to support the facility.
- working closely with the Butchulla People as Traditional Owners of the land of the manufacturing facility to create job opportunities, and skills and training pathways for Butchulla People.

The manufacturing facility is owned by the Queensland Government and will be operated by the State after the successful applicant delivers the project requirements. The manufacturing facility is a long-term State-owned asset able to support the long-term or future requirements of the South East Queensland rail network.

The state-of-the-art QTMP fleet will provide efficient, reliable, and accessible travel, which will contribute to an improved passenger experience and reduced road congestion and emissions.

Sub-program benefits

The rollingstock sub-program direct benefits are identified as:

- ✓ improved reliability and safety (modernising fleet)
- ✓ improved passenger comfort and quality of service
- ✓ increased direct employment (manufacturing and maintenance).

Indirect (enabling or resulting in) benefits associated with the rollingstock sub-program are identified as:

- ✓ increased service frequency enabled by more trains
- ✓ increased passenger carrying capacity (more trains, larger trains)
- ✓ decreased crowding resulting from the increased number of services
- ✓ decreased greenhouse gas emissions resulting from reduced electricity consumption due to regenerative braking.

Transport network benefits generated by the QTMP must be considered concurrently with wider network improvements to obtain a complete understanding. The Rail Coordination Program fittingly considers cumulative transport network benefits resulting from a wide program of proposed rail network enhancements.

Combined with longer term rollingstock requirements, the QTMP can be a catalyst for long-term Queensland rollingstock industry development opportunities.

The positive economic impacts that arise from increased local production of rollingstock include:

- ✓ developing an industry cluster and creating high value jobs
- ✓ increased research and development that can create spill-over benefits to businesses
- ✓ enhanced export opportunities in niche markets and a greater culture of entrepreneurship
- ✓ a more stable pipeline supporting long-term productivity.

Queensland already has a high degree of expertise in rail rollingstock manufacturing and maintenance, with specialised facilities across the state including in Maryborough. The rail manufacturing and repair services sector in Queensland would benefit from a more constant pipeline of work that would provide certainty for businesses and increased confidence to invest, in turn supporting local jobs and output.

Appendix J: DCCEEW RFI

Additional information required for assessment by preliminary documentation

QTMP – Torbanlea Train Manufacturing Facility, Queensland (2022/09301)

On 16 September 2022, a delegate of the Minister for the Environment determined the above project is likely to have a significant impact on the following matters protected under Part 3 of the *Environment Protection and Biodiversity Act 1999* (EPBC Act):

- Listed threatened species and communities (sections 18 & 18A).

It has been determined that the proposed action will be assessed by preliminary documentation. Preliminary documentation for the proposal will include:

- The information contained in the original referral;
- The further information you provide on the impacts of the action and the strategies you propose to avoid, mitigate and offset those impacts (as described below); and
- Any other relevant information on the matters protected by the EPBC Act.

The preliminary documentation should be sufficient to allow the Minister (or delegate) to make an informed decision on whether to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

The preliminary documentation must address the matters set out below and follow the content, style and formatting requirements set out in Appendix A.

1. DESCRIPTION OF THE ACTION

Information required	
1.1	Include updated information if any changes have been made to the project since the referral documentation was submitted. Include updated disturbance footprints (in hectares) and layout plans for the proposed action, where relevant.

2. HABITAT ASSESSMENT

Background

Based on the information provided in your referral, and other available information, the department considers that the listed species and ecological community identified below may be significantly impacted by the proposed action.

- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland (Costal Swamp Sclerophyll Forest TEC)
- Grey-headed Flying-fox (*Pteropus poliocephalus*).

It is the proponent's responsibility to be aware of any changes to the distribution of listed threatened species and ecological communities, and information available in the Species Profile and Threats (SPRAT) Database. The proponent must ensure that a recent Protected Matters Search Tool (PMST) report has been generated and considered before finalising the draft preliminary documentation.

Habitat assessments must be informed by desktop and field surveys (in accordance with departmental guidelines or as defined by best practice surveys), and with reference to

relevant departmental documents (e.g. approved Conservation Advices, Recovery Plans, draft referral guidelines and Listing Advices, and SPRAT Database), including published research and other relevant sources.

Please note, the department does not accept the consideration of only Queensland Regional Ecosystem (RE) mapping to determine habitat for listed threatened species.

2.1 Species/Communities general information

Information required	
2.1.1	Include an assessment of the adequacy of any surveys undertaken (including survey effort and timing). In particular, the extent to which these surveys were appropriate for the listed species or community and undertaken in accordance with relevant departmental survey guidelines and/or best practice.
2.1.2	Attach all relevant ecological surveys referenced in the referral and preliminary documentation as supporting documents to the preliminary documentation.

2.2 Community specific information

Information required	
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland – Endangered	
2.2.1	Provide an assessment (in a cross-reference table) of vegetation composition against the key diagnostic characteristics provided in the Coastal Swamp Sclerophyll Forest TEC Conservation Advice, including any remnant and regrowth vegetation.
2.2.2	Provide the total area (in hectares) of identified Coastal Swamp Sclerophyll Forest TEC (i.e. all vegetation that meet the key diagnostic characteristics).
2.2.3	Provide an assessment of all Coastal Swamp Sclerophyll Forest TEC against the condition thresholds provided in the Coastal Swamp Sclerophyll Forest TEC Conservation Advice.

3. IMPACT ASSESSMENT

Background

The proposed action is considered likely to have impacts to listed threatened species and communities. The preliminary documentation must include an assessment of direct, indirect and consequential impacts as a result of the proposed action, and must be assessed in accordance with relevant departmental policies and guidelines, including the SPRAT Database.

The department considers the proposed action may result in, at a minimum, the following impacts:

- Vegetation clearing and loss of habitat
- Fragmentation of habitat

- Altered hydrological regimes
- Habitat degrading processes such as weed invasion (and other edge effects)
- Increased risk of vehicle strike.

3.1 Listed Threatened Species and Communities

Information required	
3.1.1	An assessment of the likely impacts associated with the proposed action, including construction and operational phases.
3.1.2	Include the direct and indirect loss and/or disturbance of habitat as a result of the proposed action. This must include the quality and area (in hectares) of habitat to be impacted.
3.1.3	An assessment of the impacts of habitat fragmentation in the proposed action area and surrounding areas, including consideration of species' movement patterns.
3.1.4	An assessment of the likely duration of impacts as a result of the proposed action.
3.1.5	A discussion of whether the impacts are likely to be repeated, for example as part of maintenance.
3.1.6	A discussion of whether any impacts are likely to be unknown, unpredictable or irreversible.
3.1.7	Justification, with supporting evidence, as to how the proposed action will not be inconsistent with: • Australia's obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and • Any relevant recovery plan or threat abatement plan.

4. AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES – Where relevant

Background

Avoidance and mitigation measures are the primary methods of eliminating and reducing significant impacts on MNES. Where possible and practicable, it is best to avoid impacts. If impacts cannot be avoided, then they should be minimised or mitigated as much as possible. Avoidance and mitigation measures must be investigated thoroughly as a part of the assessment and be supported by evidence to demonstrate likely success.

Management commitments by the person proposing to take the action must be clearly distinguished from recommendations or statements of best practice made by the document author or other technical expert.

The SPRAT Database, and associated statutory documents, may provide relevant mitigation measures for listed threatened species and ecological communities and listed migratory species.

The department notes the referral did not include a detailed description of the proposed avoidance, mitigation and management measures to be implemented by the proponent during the construction, operation and maintenance stages of the proposed action.

Information required	
4.1	A detailed summary of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of the proposed action on relevant MNES.
4.2	The proposed measures must be based on best available practices, appropriate standards, evidence of success for other similar actions and supported by published scientific evidence.
4.3	All proposed measures for MNES must be drafted to meet the 'S.M.A.R.T' principle: • S – Specific (what and how) • M – Measurable (baseline information, number/value, auditable) • A – Achievable (timeframe, money, personnel) • R – Relevant (conservation advices, recovery plans, threat abatement plans) • T – Time-bound (specific timeframe to complete)
4.4	Details of specific and measurable environmental outcomes to be achieved for relevant MNES. All commitments must be drafted using committal language (e.g. 'will' and 'must') when describing the proposed measures.
4.5	Details of the proposed measures to be undertaken to avoid, mitigate and manage the relevant impacts of the proposed action, including those required through other Commonwealth, State and local government approvals.
4.6	Information on the timing, frequency and duration of the proposed avoidance, mitigation, management and monitoring measures, and any corrective actions to be implemented, where relevant.
4.7	An assessment of the expected or predicted effectiveness of the proposed measures.
4.8	Any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved conservation advice, recovery plan or threat abatement plan, and a discussion on how the proposed measures are not inconsistent with relevant plans.
4.9	Details of ongoing management, including monitoring programs to support an adaptive management approach, that validate the effectiveness of the proposed measures and overall demonstrate that environmental outcomes will be achieved.

4.10	Details of tangible, on-ground corrective actions that will be implemented in the event the monitoring programs indicate that the environmental outcomes have not or will not be achieved.

5. REHABILITATION REQUIREMENTS

If relevant, provide information and commitments with regard to any rehabilitation measures proposed to be undertaken at the project site.

Information required (where relevant)	
5.1	Rehabilitation acceptance criteria, including for the restoration of habitat for relevant listed threatened species and communities.
5.2	A summary of the procedures, including contingency measures, that will be undertaken to achieve the rehabilitation acceptance criteria.
5.3	A summary of a monitoring program to determine the success of rehabilitation activities implemented by the proponent.
5.4	The details of any rehabilitation activities proposed to be undertaken as required by Commonwealth, State or Territory, and local government legislation. Attach relevant Commonwealth, State or Territory, and local government approvals and permits as supporting documents to the preliminary documentation.

6. OFFSETS

Background

Environmental offsets are measures that compensate for the residual significant impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after consideration of avoidance and mitigation measures. It is important to consider environmental offsets early in the assessment process. Correspondence with the department regarding offsetting is highly encouraged. The department's *EPBC Act Environmental Offsets Policy* (2012) (Offsets Policy) is available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

At a minimum, based on the referral information, the department considers the proposed action is likely to have a residual significant impact on up to 4.76 ha of Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland.

As such, please include a draft Offset Area Management Plan (OAMP) as an appendix in the preliminary documentation. Please note, the department is likely to recommend to the Minister (or delegate) that conditions of approval require the OAMP be approved and implemented prior to the commencement of the action.

Information required

6.1	An assessment and conclusion on whether residual significant impacts will occur on relevant protected matters, after application of avoidance, mitigation and management measures.
6.2	A summary of the proposed environmental offset and key commitments to achieve a conservation gain for each relevant protected matter.
6.3	Where offset area/s have been nominated, include a draft OAMP as an appendix to the PD. The draft OAMP must meet the minimum information requirements set out in Appendix B.1, and must be prepared by a suitably qualified ecologist and in accordance with the department's *Environmental Management Plan Guidelines* (2014), available at: www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines.

7. ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

Information required	
7.1	A description of how the proposed action meets the principles of ESD, as defined in section 3A of the EPBC Act. a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations; b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation; c) the principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations; d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and e) improved valuation, pricing and incentive mechanisms should be promoted.

8. ECONOMIC AND SOCIAL MATTERS

Information required	
8.1	An analysis of the economic and social impacts of the action, both positive and negative.
8.2	Details of any public consultation activities undertaken and their outcomes.
8.3	Details of any consultation with Indigenous stakeholders. Indigenous engagement Identify existing or potential native title rights and interests, including any areas and objects that are of particular significance to Indigenous peoples and communities, possibly impacted by the proposed action and the potential for managing those impacts.

	Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. The department considers that best practice consultation, in accordance with the *Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act* (2016) includes: • identifying and acknowledging all relevant affected Indigenous peoples and communities; • committing to early engagement; • building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management; • setting appropriate timeframes for consultation; and • demonstrating cultural awareness. Describe any state requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regards to Indigenous peoples and communities.
8.4	Projected economic costs and benefits of the project, including the basis for their estimate through cost/benefit analysis or similar studies.
8.5	Employment opportunities expected to be generated by the project (including construction and operational phases).

9. ENVIRONMENTAL RECORD OF THE PERSON PROPOSING TO TAKE THE ACTION

Information required	
Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:	
9.1	the person proposing to take the action;
9.2	for an action for which a person has applied for a permit, the person making the application;
9.3	if the person is a body corporate—the history of its executive officers in relation to environmental matters; and
9.4	if the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers.

APPENDIX A: Preliminary documentation content, style and formatting requirements

A1. Content requirements	
A1.1	Be a stand-alone document containing sufficient information to avoid the need to search out previous or supplementary reports.
A1.2	Enable interested stakeholders and the Minister to easily understand the consequences of the project on MNES.
A1.3	Be written so that any conclusions reached can be independently assessed. Include all key claims, findings, proposals and undertakings in the main document.
A1.4	Refer to all relevant standards, policies and other guidance material published by the department. Any instances where published guidance is not followed must be justified. Where no Commonwealth standards exist, state government and industry standards may be useful.
A1.5	Include the names, roles and qualifications (where relevant) of all persons involved in preparing the preliminary documentation.
A1.6	Include a copy of this request for information and a cross-reference table indicating where the information fulfilling this request is included in the preliminary documentation (e.g. Section 4.2.2 and Appendix A, Chapter 2.1).
A1.7	The preliminary documentation must state the following for all information provided: • The source and date of the information; • How the reliability of the information was tested; • The uncertainties (if any) in the information; and • The guidelines, plans, and/or policies considered.
A2. Format and style requirements	
A2.1	Be in a suitable format to be published in hardcopy (A4 or A3 size, with maps and diagrams in A4 or A3 size and in colour) and published in electronic format (e.g. MSWord or PDF) on the internet.
A2.2	Include detailed technical information, studies or investigations necessary to support the information in the stand-alone document as appendices.
A2.3	Be objective, clear, succinct, avoid technical jargon and, where appropriate, be supported by maps, plans, diagrams, data or other descriptive detail.
A2.4	Reference all sources using the Harvard standard of referencing. Ensure that other supporting documents (e.g. academic studies, regulatory standards) are publicly accessible, with electronic links provided where possible.
A2.5	Redact the contact details of departmental officers.

A2.6	Not contain any commercial in confidence markings. If the preliminary documentation contains sensitive information, please discuss this with the department.
A3. Ecological data provision	
A3.1	The preliminary documentation must include an appendix of occurrence records (both sightings and evidence of presence) for all listed threatened and migratory species identified during field surveys for the proposed action. This data may be used by the department to update the relevant species distribution models that underpin the publicly available Protected Matters Search Tool (PMST).
A3.2	The species occurrence records must be provided in accordance with the department's *Guidelines for biological survey and mapped data* (2018) using the species observation data template provided with this request for additional information. Sensitive ecological data must be identified and treated in accordance with the department's *Sensitive Ecological Data – Access and Management Policy V1.0* (2016) or subsequent revision.

APPENDIX B: Information Requirements for EPBC Act Offset Proposals

B1. Minimum Requirements for a draft Offset Area Management Plan	
B1.1	A description of the offset area/s, including location, size, condition, environmental values present and surrounding land uses (including a map).
B1.2	Baseline data and other supporting evidence that documents the presence of the relevant protected matter within the offset area/s, including the quality and area of habitat.
B1.3	Details, with supporting evidence, of how the proposed environmental offset/s meets the requirements of the department's *EPBC Act Environmental Offsets Policy* (2012) (Offsets Policy), available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.
B1.4	The methodology, with justification and supporting evidence, used to determine the habitat quality for the offset area/s (e.g. using the Queensland Government *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* [2020]).
B1.5	Details, with supporting evidence, to demonstrate how the environmental offset/s compensate for residual significant impacts of the proposed action on each relevant protected matter and/or their habitat, in accordance with the principles of the Offsets Policy and all requirements of the Offsets Assessment Guide, including: • time over which loss is averted (max. 20 years); • time until ecological benefit; • risk of loss (%) without offset; • risk of loss (%) with offset; and • confidence in result (%).
B1.6	Specific, committal and measurable environmental outcomes which detail the nature of the conservation gain to be achieved for each relevant protected matter, including the creation, restoration and/or revegetation of habitat in the proposed offset area/s.
B1.7	Details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant protected matter.
B1.8	Maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the relevant protected matter that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares).
B1.9	Specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20-year period.
B1.10	Interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria.

B1.11	Details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the offset area/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions).
B1.12	Proposed timing for the submission of monitoring reports that provide evidence interim milestones have been achieved.
B1.13	Timing for the implementation of tangible, on-ground corrective actions to be implemented if monitoring activities indicate the interim milestones have not been achieved.
B1.14	Risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix.
B1.15	Discussion of how management actions align with relevant conservation advices, recovery plans and threat abatement plans.
B1.16	Details and execution timing of the mechanism to legally secure the proposed offset area/s, such that legal security remains in force over the offset area/s for at least 20 years to provide enduring protection for the offset area/s against development incompatible with conservation.
B1.17	Please note, proposed management actions, monitoring approach and corrective actions must be written using committed language (e.g. ‘will’ and ‘must’).

Appendix K: Referral (via portal)

QTMP - Torbanlea Train Manufacturing Facility

Application Number: **01197** Commencement Date: **09/05/2022** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

QTMP - Torbanlea Train Manufacturing Facility

1.1.2 Project industry type *

Transport - Land

1.1.3 Project industry sub-type

Railway

1.1.4 Estimated start date *

1/02/2023

1.1.4 Estimated end date *

31/12/2023

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

The Queensland Train Manufacturing Program (QTMP) (previously known as Rollingstock Expansion Project (REP)) is a program of works that has been initiated by Department of Transport and Main Roads (TMR) to modernise and allow the expansion of the SEQ passenger train fleet to support the region's population and economic growth, while reducing road congestion and associated emissions.

In the 2017 State election, the Queensland Government made a commitment that all future trains and associated infrastructure, for which Queensland has the manufacturing capacity to deliver, will be manufactured and maintained by Queenslanders to support jobs in Maryborough and other regional centres. The QTMP will deliver an initial fleet of 65 six-car multiple units (MUs) under the first Design, Build, Maintain contract. The purpose of the new QTMP fleet will be to service Queensland's growing need for efficient public transport, which is particularly driven by transformative infrastructure projects, such as Cross River Rail (CRR) and the 2032 Olympic and Paralympic Games.

As part of the Queensland Train Manufacturing Program (QTMP), the State - through the Department of Transport and Main Roads (TMR) – is proposing to establish a train manufacturing facility in Torbanlea, Queensland (the Proposed Action), on Lot 35 on CK3261, and associated infrastructure on the Ritchie Road and Bruce Highway road reserves, and the North Coast Rail Line (Project site). [

The Proposed Action is located approximately 23 km north of Maryborough. The area of the Proposed Action is bordered by the Bruce Highway to the west, the North Coast Rail Line at the eastern boundary, Torbanlea township to the north and forest plantations to the south. The Model disturbance footprint shown in Figure 1 depicts a proposed disturbance footprint that is indicative of the final design. The site has a total area of 1,289,040 m² (128.90 ha).

The Proposed Action will likely include the following (subject to final design):

- Site preparation works, including clearing and earthworks
- Construction of a train manufacturing facility, consisting of a main assembly area, bogie frame manufacturing, assembly stores, main assembly stores and offices, and associated infrastructure
- Rail network connection to the North Coast Rail Line
- Internal road access connections from the Bruce Highway and Ritchie Road
- Widening and reconstruction of Ritchie Road

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

No

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

***Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)**

MNES have been identified within and directly adjacent to the Project site. As such, the Project must comply with the EPBC Act.

***EPBC Act Environmental Offsets Policy* (*2012*) (EPBC Act Offsets Policy)**

The Project will implement avoidance and mitigation measures (including the provision of offsets) to minimise the significant residual impacts on the MNES.

Offsets provided for under the policy include direct offsets, and other compensatory methods (or indirect offsets). The provision of direct offsets is proposed based on the outcomes of the assessment of significance, and the extent of the significant residual impacts on MNES.

***Significant impact guidelines 1.1 – Matters of National Environmental Significance*:**

***Environment Protection and Biodiversity Conservation Act 1999* (MNES Guidelines)**

Assessment of MNES against the MNES Guidelines facilitate the determination of a significant residual impact to MNES.

Species recovery plans

Species recovery plans for the following MNES relevant to this Project have been adopted by DAWE and have been considered as part of this assessment of likelihood of occurrence and tests of significance, in particular the

- National Recovery Plan for the Koala *Phascolarctos cinereus*
- National Recovery Plan for the Grey-headed Flying-fox *Pteropus poliocephalus*.

Threat abatement plans

Threat abatement plans relevant to MNES associated with the Project include:

1. Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*
2. Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads (*Rhinella marina*)
3. Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)
4. Threats identified in the Threat abatement plan for competition and land degradation by rabbits
5. Threat abatement plan for predation by feral cats
6. Threat abatement plan for predation by the European red fox.

***Nature Conservation Act 1992* (Qld) (NC Act)**

The following permits and management plans will be required for the Proposed Action:

- Clearing Permit (Protected Plants) (Section 89 of the NC Act) – for the clearing of vegetation contained within High risk areas identified on the Department of Environment and Science (DES) flora survey trigger map, or where protected plants have been identified in a Project survey within a proposed clearing area
- Rehabilitation Permit (spotter catcher endorsement)
- Damage Mitigation Permit (removal and relocation)
- Species management plan must be submitted to DES for approval for tampering with some animal breeding places (*Nature Conservation (Animals) Regulation 2020*).

***Biosecurity Act 2014* (Qld)**

1. The Proposed Action will potentially involve interaction with restricted matters and prohibited matters (potentially including pests and weeds) and will therefore require compliance with the *Biosecurity Act 2014*.

2. The pest and weed management strategies will consider construction activities and operational impacts associated with the Proposed Action.

***Fisheries Act 1994* (Qld) (Fisheries Act)**

1. The Proposed Action transverses mapped waterways for waterway barrier works.
2. Obstruction of the waterway is not proposed at this time, and therefore approvals under the Fisheries Act are not applicable to the Proposed Action.

***Planning Act 2016* (Qld) (Planning Act), the *Planning Regulation 2017* (Qld), the Minister's Guidelines and Rules (Queensland Treasury 2020), - Ministerial Infrastructure Designation (MID)**

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

Ministerial Infrastructure Designation (MID) submission engagement

An Initial Advice Request (IAR) was lodged to the Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) in seeking initial advice regarding the MID proposal.

TMR undertook preliminary stakeholder engagement with the Torbanlea community in August 2021 in accordance with the Minister's Guidelines and Rules for the MID process and the Operational Guidance for Making or Amending a Ministerial Infrastructure Designation. This correspondence included a brief program overview letter and frequently asked questions (FAQ) sheet, which was mailed in early November 2021 to residents within the vicinity of the Project site. The letters served as preliminary advice of the MID process and the related upcoming public consultation period. Contact details for the QTMP Project team were provided within the contents of the letter, however limited responses were received.

Ministerial Infrastructure Designation (MID) submission engagement

The MID public consultation period was open between 28 April 2022 and 30 May 2022. As part of this process, the local community and key stakeholder had the opportunity to provide feedback about the future train manufacturing facility. Letters were sent advising stakeholders and 100 surrounding residents of the MID process, QTMP MID submission and guidance for to provide feedback to DSDILGP. Approval of the MID application cannot be received until the public notification period closes and submissions from stakeholders and residents are considered by DSDILGP.

Local industry and community engagement

A briefing event was held at Maryborough in early December 2021 to engage local suppliers and manufacturers and introduce QTMP's supply chain opportunities. Strong attendance and encouraging survey outcomes suggest positive public perception was established and maintained from the November 2021 media coverage following the Premier's announcement of the Program.

Over 500 members of the Maryborough region community were engaged at five drop-in information sessions held around the region between 26 April and 7 May 2022. To conduct the engagement program, the QTMP Communications team collaborated with representatives of DSDILGP, Department of Employment Small Business and Training, Department of Regional Development Manufacturing and Water and Translink Wide Bay.

The purpose of the engagement program was to inform the community about the current status of the QTMP, and to understand from local communities, the current and future potential operational, access and environmental impacts of the manufacturing site. The information sessions served as the initial face-to-face engagement with the local community to create awareness and education about the Program.

From community information sessions, general project information and supply chain, employment and training enquiries accounted for just under 80% of all interactions. Construction impacts and accommodation for workers accounted for approximately 7% of tracked interactions each. No significant environmental concerns were raised by community members. Overall, the sentiment QTMP within the community was overwhelmingly positive and supportive of the future Torbanlea Train Manufacturing Facility.

A future engagement program targeting local industry, job seekers, local community and small business owners is currently being planned for Q4 2022.

Stakeholders, local government, and council

The QTMP team has engaged the local government and Fraser Coast Regional Council through regular briefings and project updates.

The Butchulla people of the Maryborough region have been engaged during various stages of the Project. Representatives from the Butchulla Native Title Aboriginal Corporation were present during geotechnical and site investigation works. Discussions are currently underway regarding a Cultural Heritage Management Plan for the Project.

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

The Department of Climate Change, Energy, the Environment and Water (the department) collects your personal information (as defined by the Privacy Act 1988) through this platform for the purposes of enabling the department to consider your submission and contact you in relation to your submission. If you fail to provide some or all of the personal information requested on this platform (name and email address), the department will be unable to contact you to seek further information (if required) and subsequently may impact the consideration given to your submission.

Personal information may be disclosed to other Australian government agencies, persons or organisations where necessary for the above purposes, provided the disclosure is consistent with relevant laws, in particular the Privacy Act 1988 (Privacy Act). Your personal information will be used and stored in accordance with the Australian Privacy Principles.

See our Privacy Policy to learn more about accessing or correcting personal information or making a complaint. Alternatively, email us at privacy@awe.gov.au.

☑ **Confirm that you have read and understand this Privacy Notice ***

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN	54005139873
Organisation name	Aurecon Australasia
Organisation address	Ground Floor, 25 King Street Bowen Hills QLD 4006

Referring party details

Name	Andy Dalton
Job title	Senior Ecologist
Phone	0438739968
Email	andy.dalton@aurecongroup.com
Address	25 King St Bowen Hills 4006

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details	
ABN	39407690291
Organisation name	Queensland Department of Transport and Main Roads
Organisation address	GPO Box 1549 Brisbane Qld 4001

Person proposing to take the action details	
Name	Jason Moffitt
Job title	Delivery Director
Phone	0417 627 676
Email	Jason.C.Moffitt@tmr.qld.gov.au
Address	Level 14, 295 Ann Street, Brisbane, QLD, 4000

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

No

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

Yes – TMR does have a satisfactory record of responsible environment management. TMR, as the proponent, are highly experienced in the planning, delivery and operation of major transport infrastructure projects. TMR's core role is the planning, building and maintaining of Queensland's road, rail, freight, and maritime infrastructure.

TMR North Coast has an excellent track record in coordinating environmental assessments and delivery of environmentally sensitive transport solutions, evidenced through recent major infrastructure on the Bruce Highway upgrades. Further information about TMR's achievements, performance and outlook is available at www.tmr.gov.au

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details

ABN	39407690291
Organisation name	Queensland Department of Transport and Main Roads
Organisation address	GPO Box 1549 Brisbane Qld 4001

Proposed designated proponent details

Name	Jason Moffitt
Job title	Delivery Director
Phone	0417 627 676
Email	Jason.C.Moffitt@tmr.qld.gov.au
Address	Level 14, 295 Ann Street, Brisbane, QLD, 4000

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN	54005139873
Organisation name	Aurecon Australasia
Organisation address	Ground Floor, 25 King Street Bowen Hills QLD 4006
Representative's name	Andy Dalton
Representative's job title	Senior Ecologist
Phone	0438739968
Email	andy.dalton@aurecongroup.com
Address	25 King St Bowen Hills 4006

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN	39407690291
Organisation name	Queensland Department of Transport and Main Roads
Organisation address	GPO Box 1549 Brisbane Qld 4001
Representative's name	Jason Moffitt
Representative's job title	Delivery Director
Phone	0417 627 676
Email	Jason.C.Moffitt@tmr.qld.gov.au
Address	Level 14, 295 Ann Street, Brisbane, QLD, 4000

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Has the department issued you with a credit note? *

No

1.4.5 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.7 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A? *

No

1.4.8 Would you like to add a purchase order number to your invoice? *

No

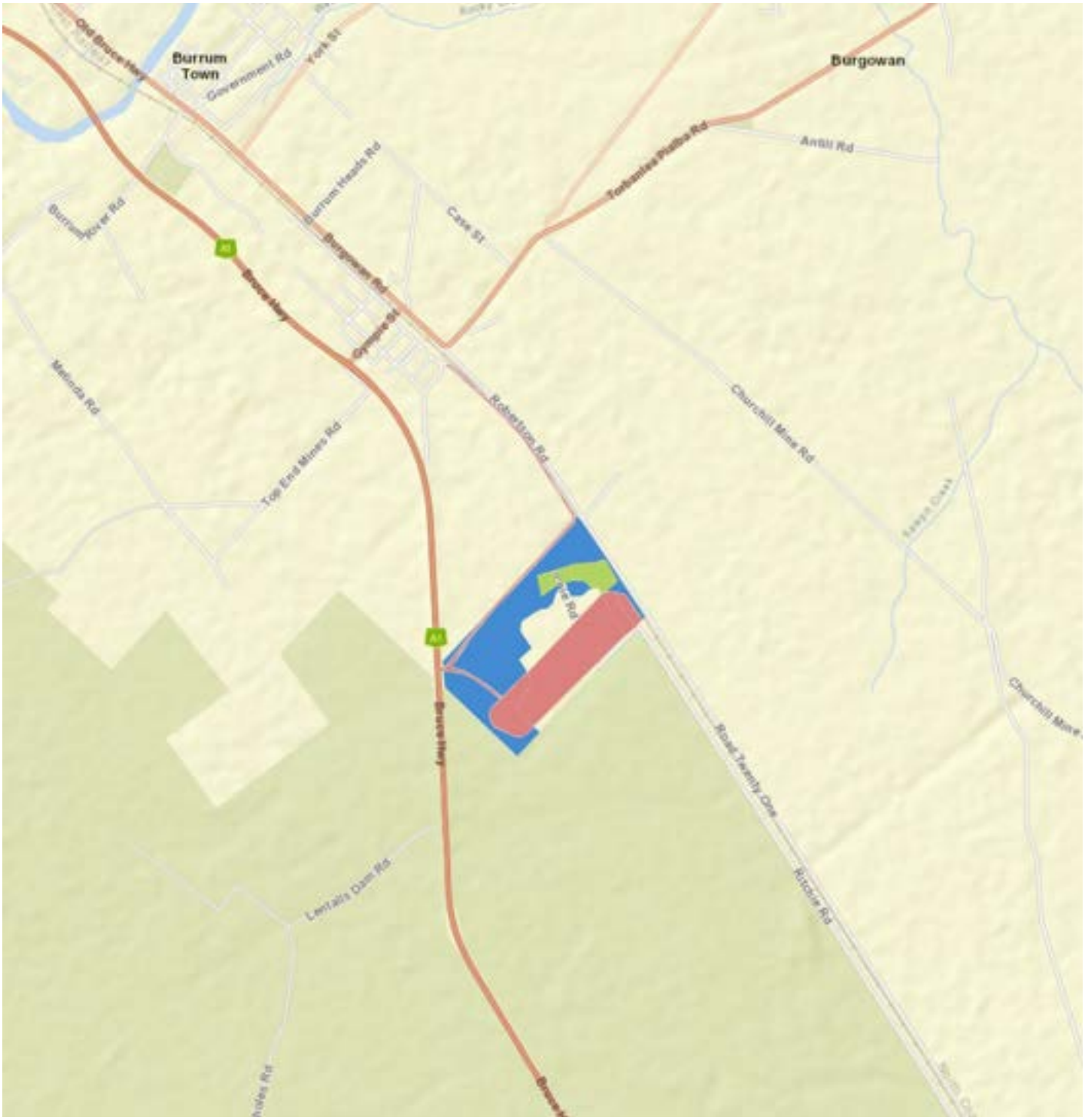
1.4 Payment details: Payment allocation

1.4.10 Who would you like to allocate as the entity responsible for payment? *

Proposed designated proponent

2. Location

2.1 Project footprint



2.2 Footprint details

2.2.1 What is the address of the proposed action? *

Lot 35 Bruce Highway, Torbanlea QLD 4662

2.2.2 Where is the primary jurisdiction of the proposed action? *

Queensland

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

Ritchie Road: Road reserve

North Coast Rail Line: State Land

Bruce Highway: Road reserve

Lot 35 on CK3261: Freehold

3. Existing environment

3.1 Physical description

3.1.1 Describe the current condition of the project area's environment.

The Proposed Action is located approximately 25 km north of Maryborough. The area of the Proposed Action is bordered by the Bruce Highway on the western boundary, the North Coast Rail Line at the eastern boundary, Torbanlea township to the north and forest plantations to the south. The Project site has direct access to the Bruce Highway and Ritchie Road. The Project site has a total area of 1,289,040 m² (128.90 ha). The Project site and surrounding areas are zoned as 'Rural' under the Fraser Coast Planning Scheme.

The area encompassed by the Proposed Action has historically been subject to anthropogenic disturbance. Historic land management practices associated with agriculture has resulted in large areas surrounding the Proposed Action being cleared of vegetation. Much of the regenerated vegetation located in the centre of the Project site contains a mosaic of pine plantation and Acacia regrowth. The area associated with the Proposed Action currently supports low intensity cattle grazing, and a single dwelling, which is located within areas of non-remnant vegetation.

Areas of remnant vegetation communities within the Project site consists of open forest to woodland, dominated by *Melaleuca quinquenervia* +/- *Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia* with a grassy ground layer dominated by species such as *Imperata cylindrica*. *Eucalyptus tereticornis* is present as an emergent layer. Occurs on quaternary floodplains and fringing drainage lines in coastal areas.

Areas of remnant vegetation communities within the Project site consist of woodland, dominated by *Eucalyptus latisinensis* +/- *Corymbia intermedia, Corymbia trachyphloia, Angophora leiocarpa* and *Eucalyptus exserta*. Other characteristic species include *Eucalyptus siderophloia, Lophostemon suaveolens, Melaleuca quinquenervia* and *Grevillea banksii*. Patches of *Banksia oblongifolia* are present locally and *Xanthorrhoea johnsonii* is common in ground layer. Occurs on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments.

3.1.2 Describe any existing or proposed uses for the project area.

The major industries in the surrounding the Project site are forestry, rural residential and farming.

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

There are no natural features and/or any other important or unique values relevant to the Project site.

3.1.4 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The Project site is reasonably flat and undulates gently between approximately 27.5 m and 38.0 m AHD. The highest elevation occurs towards the centre and southern portion of the Project site and slopes towards the north and west, to the Bruce Highway.

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

Areas of remnant vegetation communities within the Project site consists of open forest to woodland may support habitat for the Koala (*Phascolarctos cinereus*) – Endangered and Grey-headed flying-fox (*Pteropus poliocephalus*) – Vulnerable. Based on ecological surveys

that took place in May 2021, no presence, or signs of presence of these species, was observed to occur within the Project site.

One migratory species (Satin flycatcher - *Myiagra cyanoleuca*) was observed within the Melaleuca Open Forest.

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

Areas of remnant vegetation communities within the Project site consists of open forest to woodland, dominated by *Melaleuca quinquenervia* +/- *Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia* with a grassy ground layer dominated by species such as *Imperata cylindrica*. *Eucalyptus tereticornis* is present as an emergent layer. Occurs on quaternary floodplains and fringing drainage lines in coastal areas. This community is analogous to the Coastal Swamp Sclerophyll Forest threatened ecological community.

Areas of remnant vegetation communities within the Project site consist of woodland, dominated by *Eucalyptus latisinensis* +/- *Corymbia intermedia, Corymbia trachyphloia, Angophora leiocarpa* and *Eucalyptus exserta*. Other characteristic species include *Eucalyptus siderophloia, Lophostemon suaveolens, Melaleuca quinquenervia* and *Grevillea banksii*. Patches of *Banksia oblongifolia* are present locally and *Xanthorrhoea johnsonii* is common in ground layer. Occurs on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments. This community may support the habitat for the Koala (*Phascolarctos cinereus*) – Endangered and Grey-headed flying-fox (*Pteropus poliocephalus*) – Vulnerable.

3.3 Heritage

3.3.1 Describe any Commonwealth heritage places overseas or other places recognised as having heritage values that apply to the project area.

The Project site has not been identified as containing matters of Commonwealth, National, State or local cultural heritage significance.

3.3.2 Describe any Indigenous heritage values that apply to the project area.

An Aboriginal Cultural Heritage Field Assessment (CHFA) has been undertaken for the Project by Everick Heritage. One scarred tree, five potential scarred trees, and one Aboriginal artefact scatter were identified during the survey undertaken as part of the CHFA.

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

Two small non-perennial drainage lines meander through the Project site flowing west towards the Bruce Highway from the east. One drainage line flows from a waterhole on the opposite side of the North Coast Rail Line and across the Project site and the second drainage line flows from the elevated southern portion of the Project site. These drainage lines join in the western portion of the Project site before flowing west beneath the Bruce Highway and connecting to the Burrum River. Culverts are located at the intersection of the drainage lines and the Bruce Highway, which is also the lawful point of discharge for stormwater flows.

Three small farm dams also exist, with two in the north eastern portion of the Project site adjacent to the rail line and Ritchie Road. The remaining dam is located along the south-eastern border, adjacent to the residential dwelling.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	No	Yes
S20	Migratory Species	No	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes

EPBC Act section	Controlling provision	Impacted	Reviewed
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth heritage places overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

A search of the EPBC PMST (see Appendix D of QTMP MNES report - RFI update) indicates that there are no World Heritage Properties or Commonwealth heritage places within a 2km area around the subject site.

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

A search of the EPBC PMST (see Appendix D - of MNES Report - RFI update) indicates that there are no World Heritage Properties or

Commonwealth heritage places within a 10km area around the subject site.

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

A search of the EPBC PMST indicates that there are no listed Ramsar places within a 10km area around the subject site.

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species
No	No	Apus pacificus
No	No	Chaetura caudacuta
Yes	No	Cuculus optatus

Direct impact	Indirect impact	Species
No	No	Hirundapus caudacutus
Yes	No	Myiagra cyanoleuca
Yes	No	Phascolarctos cinereus
Yes	No	Pteropus poliocephalus
Yes	No	Symposiachrus trivirgatus

Ecological communities

—

4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.4.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Please provide a response to the question above.

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.5.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Please provide a response to the question above.

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No nuclear matters have been identified within the vicinity of the Proposed action

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

A search of the EPBC PMST indicates that there are no Commonwealth marine areas within a 10km area around the subject site.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

With the combination of proposed mitigation measures to reduce downstream impacts and the location of the project it is unlikely that the proposed impacts will have a direct or indirect impact on the Great Barrier Reef

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.9.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Proposed Action does not involve water resources in relation to large coal mining development or coal seam gas.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Proposed Action is not located within or directly adjacent to Commonwealth Land

4.1.11 Commonwealth heritage places overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

A search of the EPBC PMST indicates that there are no Commonwealth heritage places overseas within a 10km area around the subject site.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

- Threatened Species and Ecological Communities (S18)

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth heritage places overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

Yes

4.3.2 Do you have an alternative timeline you are proposing for your proposed action? *

No

4.3.3 Briefly describe why an alternate timeline for your proposed action was not possible. *

Due to the time criticality of CRR opening and long procurement lead times, TMR immediately commenced the recommended approach for accelerated procurement following the Cabinet Budget Review Committee (CBRC) submission approval.

Following the CBRC approval in October 2021, the recommended rollingstock procurement transaction process was required to be expedited without delay or disruption. In order to meet the planned contract close date, the Request for Proposal phase was initiated with the shortlisted proponents in November 2021.

This process recently concluded (June, 2022) and tenders are currently being assessed with the current date for contract close scheduled for November 2022. Contractual obligations on the Successful Contractor will include adherence to any development conditions, including those imposed under EPBC Act. The Queensland Government prefers to have the final approval conditions prior to contract close.

Construction activities at the Project site are required to commence from early 2023 to meet planned project milestones and delivery timeframes. The Train Manufacturing Facility is on the critical path for train delivery, and delays in commencement date will result in

undesirable program and delivery delays. These delays would impact the local and regional economy, efficient operation of the Cross River Rail tunnel, train availability and operations and potentially impact the public transport needs for the 2023 Olympic and Paralympic Games.

4.3.4 Do you have an alternative location you are proposing for your proposed action? *

No

4.3.5 Briefly describe why an alternative location for your proposed action was not possible. *

To identify the preferred site for the manufacturing facility, TMR undertook a detailed site selection process in April 2021, which included Geographic Information Systems (GIS) Site Suitability Assessment which allowed the study area to be mapped and potential sites overlayed with selected constraints. From this process, three sites were determined to be potentially suitable for the train manufacturing facility.

A comparative analysis was then undertaken on the three sites, referred to as Torbanlea (Project site), Aldershot South and Owanyilla, using a Multi-Criteria Analysis (MCA). Key considerations of the MCA included proximity to road and rail infrastructure, environmental values, flooding, community impacts and constructability.

The Project site scored best due to its suitability for construction, driven by the smaller amount of earthworks required to make the site viable for construction, in addition to the Project site contained fewer ecological values and lower potential for impacts on MNES and Matters of State Environmental Significance (MSES). Both alternative sites, Aldershot South and Owanyilla, are significantly closer to known Koala and Grey-headed flying-fox populations, and potentially contain the Swamp Sclerophyll Forest TEC. Therefore, undertaking the Proposed Action on the Torbanlea Project site is still considered the least constrained in terms of MNES of all three sites. Changes to the EPBC Act on the 8th December 2021 (The Coastal Swamp Sclerophyll Forest of NSW and SEQ TEC was listed as Endangered) and particularly February 2022 (listing for Koala in Queensland changed from vulnerable to endangered) would have had a greater impact on the other (Aldershot and Owanyilla) sites.

4.3.6 Do you have alternative activities you are proposing for your proposed action? *

No

4.3.7 Briefly describe why an alternative activity for your proposed action was not possible. *

In the 2017 State election, the Queensland Government made a commitment that all future trains and associated infrastructure, for which Queensland has the manufacturing capacity to deliver, will be manufactured and maintained by Queenslanders to support jobs in Maryborough and other regional centres. The QTMP will deliver an initial fleet of 65 six-car multiple units (MUs) under the first Design, Build and Maintain contract. The purpose of the new QTMP fleet will be to service Queensland's growing need for efficient public transport, which is particularly driven by transformative infrastructure projects, such as Cross River Rail (CRR) and the 2032 Olympic and Paralympic Games.

The key strategic objectives of the QTMP are to:

- Ensure the provision of affordable, safe, accessible, and high-quality passenger rail services for the people of SEQ
- Grow passenger rail customer satisfaction and facilitate the predicted increase of passenger rail patronage in SEQ
- Deliver trains and associate infrastructure which integrates with, and enhances SEQ's existing and future rail operating environment, including CRR
- Improve train availability and reliability to meet operational requirements
- Create genuine, quality, secure, and ongoing jobs for Queenslanders, and to increase manufacturing capability and encourage supply chain resilience through the engagement of local suppliers and local workforces.

4.3.4 Alternatives: Impact and mitigation

4.3.4.1 Do these alternatives have a different impact, avoidance, or mitigation measure compared to what you have already provided? *

Yes

4.3.4.2 On World Heritage properties *

No

4.3.4.4 On National Heritage places *

No

4.3.4.6 On the ecological character of a Ramsar wetland *

No

4.3.4.8 Listed threatened species, their habitat, or threatened ecological communities *

Yes

4.3.4.9 Describe how this alternative has different impacts or mitigations from the original proposal relating to listed threatened species, their habitat, or threatened ecological communities. *

The Project site scored best due to its suitability for construction, driven by the smaller amount of earthworks required to make the site viable for construction, in addition to the Project site contained fewer ecological values and lower potential for impacts on MNES and Matters of State Environmental Significance (MSES). Both alternative sites, Aldershot South and Owanyilla, are significantly closer to known Koala and Grey-headed flying-fox populations, and potentially contain the Swamp Sclerophyll Forest TEC. Therefore, undertaking the Proposed Action on the Torbanlea Project site is still considered the least constrained in terms of MNES of all three sites. Changes to the EPBC Act on the 8th December 2021 (The Coastal Swamp Sclerophyll Forest of NSW and SEQ TEC was listed as Endangered) and particularly February 2022 (listing for Koala in Queensland changed from vulnerable to endangered) would have had a greater impact on the other (Aldershot and Owanyilla) sites.

4.3.4.10 Listed migratory species or their habitat *

Yes

4.3.4.11 Describe how this alternative has different impacts or mitigations from the original proposal relating to listed migratory species or their habitat. *

The Project site scored best due to its suitability for construction, driven by the smaller amount of earthworks required to make the site viable for construction, in addition to the Project site contained fewer ecological values and lower potential for impacts on MNES and Matters of State Environmental Significance (MSES). Both alternative sites, Aldershot South and Owanyilla, are significantly closer to known Koala and Grey-headed flying-fox populations, and potentially contain the Swamp Sclerophyll Forest TEC. Therefore, undertaking the Proposed Action on the Torbanlea Project site is still considered the least constrained in terms of MNES of all three sites. Changes to the EPBC Act on the 8th December 2021 (The Coastal Swamp Sclerophyll Forest of NSW and SEQ TEC was listed as Endangered) and particularly February 2022 (listing for Koala in Queensland changed from vulnerable to endangered) would have had a greater impact on the other (Aldershot and Owanyilla) sites.

4.3.4.12 Is a Nuclear action *

No

4.3.4.14 On Commonwealth Marine Areas *

No

4.3.4.16 Taking place in or flowing into the Great Barrier Reef Marine Park *

No

4.3.4.18 Impacts a water resource relating to a coal seam gas or large coal mining development *

No

4.3.4.20 On or near Commonwealth Land *

No

4.3.4.22 On Commonwealth heritage places overseas *

No

4.3.4.24 Action undertaken by the Commonwealth or a Commonwealth Agency *

No

4.3.5 Alternatives: Considered alternatives

4.3.5.1 Do you have any other alternative actions, including not taking the action, that you have considered but are not proposing as part of this referral? *

No

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

#1.	QTMP MNES Report - RFI update	Document	MNES report

1.2.6 Commonwealth or state legislation, planning frameworks or policy documents that are relevant to the proposed action

#1.	QTMP MNES Report - RFI update	Document	MNES report

1.2.7 Public consultation regarding the project area

#1.	Cultural Heritage Field Assessment	Document	Cultural Heritage Field Assessment
#2.	QTMP MNES Report - RFI update	Document	MNES report

3.3.2 Indigenous heritage values that apply to the project area

#1.	Cultural Heritage Field Assessment	Document	Cultural Heritage Field Assessment

4.1.1.3 (World Heritage) Why your action is unlikely to have a direct and/or indirect impact

#1.	QTMP MNES Report - RFI update	Document	MNES report

4.1.2.3 (National Heritage) Why your action is unlikely to have a direct and/or indirect impact

#1.	QTMP MNES Report - RFI update	Document	Cultural Heritage Field Assessment

4.1.3.3 (Ramsar Wetland) Why your action is unlikely to have a direct and/or indirect impact

#1.	QTMP MNES Report - RFI update	Document	MNES report

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN	54005139873
Organisation name	Aurecon Australasia
Organisation address	Ground Floor, 25 King Street Bowen Hills QLD 4006
Representative's name	Andy Dalton

Representative's job title	Senior Ecologist
Phone	0438739968
Email	andy.dalton@aurecongroup.com
Address	25 King St Bowen Hills 4006

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ By checking this box, I, **Andy Dalton of Aurecon Australasia**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN	39407690291
Organisation name	Queensland Department of Transport and Main Roads
Organisation address	GPO Box 1549 Brisbane Qld 4001
Representative's name	Jason Moffitt
Representative's job title	Delivery Director
Phone	0417 627 676
Email	Jason.C.Moffitt@tmr.qld.gov.au
Address	Level 14, 295 Ann Street, Brisbane, QLD, 4000

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Jason Moffitt of Queensland Department of Transport and Main Roads**, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

☐ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

- [x] Check this box to indicate you have read the referral form. *
- [x] I would like to receive notifications and track the referral progress through the EPBC portal. *
- [x] I, **Jason Moffitt of Queensland Department of Transport and Main Roads**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *
- [ ] I would like to receive notifications and track the referral progress through the EPBC portal. *

Appendix L: Response to Submissions

The Draft Preliminary Documentation (this report in draft) was made available for public comment from Monday 13 March to Monday 27 March 2023.

The draft report public notification was advertised and communicated to key stakeholders and the community as follows:

- Information was made available on the Department of Transport and Main Roads (TMR) project webpage - https://www.tmr.qld.gov.au/projects/torbanlea-manufacturing-facility
- Submissions were also accepted via this web page, and in writing to the QTMP Project Team.
- A public notice advertisement was published in The Courier-Mail on Monday 13 March 2023.
- A email update was distributed to Torbanlea and Project wide subscribers on Monday 13 March 2023. At the time, this email update was distributed to 457 subscribers.
- Copies of the report were made available at local and state libraries including the Howard Library, Maryborough Library and Queensland State Library (Brisbane).
- Briefings were held with key stakeholders, including the local member and the Traditional Owners.

A total of two (2) submissions were received during the public notification period via the Project web page. A summary of these submissions (which have been de-identified for privacy), and responses to the topics raised, are outlined in Table 9.

Table 9: Submissions – Summary of topics raised, section references and responses

Sub ID	Submission comments	Summary of how the comments have been addressed	
		Relevant report sections	**Response**
1	"…as long as the train manufacturing plan provides ideas on dealing with the relocation or flora to a safe zone outside, or within, the grounds for the manufacturing plant, and the fauna can be catered for, with passageways under, or safe passageways over the plant, then I have no objections to a new facility at Torbanlea. This state does need better train manufacturing facilities, so that we can manufacture our own trains, and not outsource them to other countries."	Relevant report sections that respond to the topics raised in this submission: Main Report - ■ Section 2.4.1: Protected plants clearing permit and general mitigation measures Offset Area Management Plan – Appendix H - ■ Section 6.3 Management action 3 – pest and weed management	No threatened flora species listed under the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) (EPBC Act) or under the provisions on the Nature Conservation Act 1992 (Qld) (NC Act) were found during flora and fauna assessments conducted at the proposed Torbanlea manufacturing facility site on 18 and 19 May 2021. Despite this, actions will be implemented to manage and control the removal of vegetation to comply with legislation and avoid unnecessary impacts to flora and fauna. Measures include obtaining appropriate vegetation clearing permits where applicable and the delineation of vegetation boundaries to contain vegetation clearing within the disturbance area. The proposed offset areas for the manufacturing facility will aim to enhance habitat values within the site. Management within the offset areas include the removal of Weeds of National Significance (WoNS) and locally significant weeds to allow for native species growth and the rehabilitation of habitat values within proposed offset areas. As stated in Section 2.4.1 of this report, vegetation clearing is not to take place without an appropriate vegetation clearing permit in place. A permit is required under the NC Act to

Sub ID	Submission comments	Summary of how the comments have been addressed	
		Relevant report sections	**Response**
		Matters of National Environmental Significance Report – Appendix D - ■ Section 4.1: General measures to avoid, minimise and mitigate potential impacts on MNES and other environmental values ■ Section 4.1.2.1: Fauna Sensitive Road Design Manual ■ Section 4.1.3: General mitigation measures ■ Appendix E: High Risk SMP > Appendix C: Impact Mitigation Measures	undertake clearing that may impact Critically endangered, Endangered, Vulnerable, or Near Threatened (CEEVNT) species. The NC Act provides exemptions for work that will not impact CEEVNT flora species. It is proposed that clearing works involved with the development of manufacturing facility will qualify for such an exemption, as the flora species recorded were identified as either Least concern or not deemed to be 'in the wild' under the NC Act. An exemption for a Protected Plant Clearing Permit has been granted for the Project (Department of Environment and Science Reference: APP0083083) and will be applicable for three years from the date of survey (May 2021). Any vegetation clearing to occur after this date will require a renewed application for a clearing permit under the Nature Conservation (Plants) Regulation 2020. No Special least concern flora species will be harvested from the site. Therefore, an application for a protected plant harvesting licence is not required. Section 2.4.1 of this report states as a mitigation measure, clear delineation of significant vegetation boundaries is required to contain disturbance of the matter of national environmental significance (MNES) values. Further mitigation measures include wash down, weed and seed certificates to be gained in accordance with local and State government biosecurity requirements. As per Section 6.3 of the Offset Area Management Plan (Appendix H), weed species identified will be controlled to prevent further spread and improve native species richness and diversity within the offset areas. Weed management actions will include the annual treatment of WoNS and locally significant weeds using best practice techniques and management to avoid any detrimental impacts on non-target species. Fauna movement will be considered in the clearing and design stages of the Project. As stated in Section 4.1.2.1 of the Matters of National Environmental Significance Report (Appendix D), when considering the suitability of fauna friendly infrastructure as a possible mitigation measure, TMR will consider several issues, including: ■ The design needs of the target species ■ Existing landscape connectivity ■ Current and future land uses adjacent to the Project ■ Physical design constraints such as topography, geometry, accessibility, and drainage ■ Road safety and funding availability for both construction and an ongoing maintenance commitment ■ The suitability of alternative mitigation measures such as signage, habitat restoration and reduced speed limits.

Sub ID	Submission comments	Summary of how the comments have been addressed	
		Relevant report sections	Response
			Section 4.1.3 of the Matters of National Environmental Significance Report (Appendix D) details that in the event of any clearing activities, a Suitably Qualified and Experienced Person will be nominated to oversee the environmentally relevant tasks and activities. This may include (but not limited to) overseeing vegetation clearing, liaising with any spotter/catcher contractors, reporting any environmentally relevant information to the appropriate regulatory authorities, and ensuring conformance occurs for all environmental requirements documented in the Environmental Management Plan (EMP). A certified fauna spotter/catcher (i.e. holding a Damage Mitigation Permit (Removal and Relocation of Wildlife) and/or Rehabilitation Permit issued by Department of Environment and Science (DES) will be engaged to inspect the Project site within 48 hours prior to vegetation clearing. The fauna spotter/catcher will undertake pre-clearance ecological assessments prior to any vegetation clearing and where practical, active breeding nests will be relocated prior to clearing. Infrastructure will be identified which are used by fauna (e.g. culverts that may be used by some species for roosting). Where a fauna habitat tree requires removal, the habitat is removed by suitably qualified personnel with a certified spotter/catcher present prior to the commencement of any clearing to safely remove any fauna species which might be located inside. Actions to be implemented include: ■ Measures will be taken to avoid injuring animals. ■ Displaced fauna will then be relocated to a suitable, previously identified recipient site, provided the animal did not sustain any injuries. Any injured animals (native or introduced) are to be taken to receive veterinary attention immediately. Once recovered, animals will be relocated to an area of similar habitat adjoining the Project site. ■ In the case of the presence of other fauna species, the spotter/catcher will encourage the fauna to leave by reasonable means or capture and relocate it in the local environment prior to felling and trimming. If the spotter/catcher determines that a fauna species is present in a tree, he/she will remove the animal prior to the felling of that tree or any tree of which the crown overlaps that tree. All members of staff have an obligation to report any fauna species seen in areas to be cleared to the fauna spotter/catcher prior to clearing. ■ Where practical and possible to do so, stockpiled microhabitat features that were not able to be relocated during construction phase in a functionally suitable position will be re-established (as per the Matters of National Environmental Significance Report (Appendix D), Appendix E: High Risk SMP > Appendix C: Impact Mitigation Measures.

Sub ID	Submission comments	Summary of how the comments have been addressed	
		Relevant report sections	**Response**
			During construction, a certified fauna spotter/catcher is to inspect trenches, culverts, and other structures to determine whether there are any trapped or injured fauna species present. Where practical, any fauna to be relocated will be moved to an area of similar habitat within proximity to the Project site. It is preferable that this site is of similar vegetation characteristics to replicate habitat for displaced fauna. Suitable relocation areas will be identified prior to the commencement of clearing by the spotter/catcher.
2	*"This is a great project for Queensland jobs and a great opportunity to increase our skills outside of coal and gas mining.* *The only concern I have is the statement in the offset report that the offset may not go ahead adjacent to the site.* *… statements and big promises of environmental rehabilitation, only to be left holding the bag when the company bails once they have stripped the profits from our land and economy.* *I will fully support this… once the offset has been locked in prior to clearing of the works site!!..."*	Relevant report sections that respond to the topics raised in this submission: **Offset Area Management Plan – Appendix H -** ■ Section 2.1: Location of proposed offsets ■ Section 3: Environmental outcomes ■ Section 10: Timing and offset mechanisms for protection	As stated in Section 2.1 of the Offset Area Management Plan (Appendix H), the offset area is situated southwest adjacent to Ritchie Road, Torbanlea, and north of the proposed site for the manufacturing facility. The proposed offset areas are within a suitable position within the landscape as they are closely situated near the manufacturing facility in patches of remnant vegetation inclusive of Regional Ecosystem (RE) 12.3.6 and RE 12.5.4. The proposed offset areas contain the same environmental values to the ones being removed. As per Section 10 of the Offset Area Management Plan (Appendix H); the proposed offset area exists on land that is currently owned by TMR. Multiple offset site options will be explored to ensure there are adequate contingencies should the on-site offset not progress. Additionally, the proponent will secure land-based offsets known to support the relevant MNES. The conservation gains proposed will be achieved through sound management measures tailored to the species and community with regular monitoring, and clear performance outcomes. Offset areas will be legally secured as soon as practicable and for the complete time of approval, likely by way of a Voluntary Declaration (VDec) under the *Vegetation Management Act 1999* (Qld). A VDec developed by the proponent will be registered on the title to ensure offset measures are in place to ensure the longevity of the offset once the approval expires, or in the unlikely event that the proponent (that is, TMR) is unable to fulfil the full obligations required (i.e. dissolves or goes bankrupt). The overarching environmental outcome for the proposed offset areas is to achieve a conservation goal of the improvement of Swamp Sclerophyll threatened ecological community, Greater Glider habitat, and Grey Headed Flying Fox Habitat (as discussed in Section 3 of the Offset Area Management Plan – Appendix H). In accordance with the EBPC Act, the desired environmental outcomes are to improve and restore habitat quality, implement a vegetation management plan, and regularly report on compliance to monitor the success and/or shortcomings of the Offset Area Management Plan and modify when necessary.

Appendix M: Greater Glider Survey Memorandum

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Memorandum

To	**Jason Moffitt**	From	**Jiordyn Trinca**
Copy	**Matt McQuaid**	Reference	**511003**
Date	**2023-03-28**	Pages (including this page)	**10**
Subject	**Supplementary targeted ecological fauna surveys for Greater glider (*Petauroides volans)* for QTMP Torbanlea**		

1 Introduction

As part of the Queensland Train Manufacturing Program (QTMP), the Department of Transport and Main Roads (TMR) are proposing to establish a train manufacturing facility located at the Bruce Highway, Torbanlea and formally described as Lot 35 SP326250 (the Project). The Project is a program of works that has been initiated by TMR to modernise and allow the expansion of the South-East Queensland (SEQ) passenger train fleet to support the region's population and economic growth, while reducing road congestion and associated emissions.

On 22 August 2022, a referral for the Project was submitted to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

On 16 September 2022, a delegate for the Commonwealth Minister for the Environment and Water determined that the Project was a 'Controlled Action' due to its potential to have a significant impact on listed threatened species and communities (sections 18 & 18A of the EPBC Act). Subsequently, an additional information request (required for assessment by preliminary documentation) was issued by DCCEEW on 30 September 2022.

On 5 July 2022, the DCCEEW listed *Petauroides volans* (the Greater glider (southern and central)) as Endangered under the EPBC Act. The species was subsequently listed as Endangered under the Nature Conservation (Animals) Regulation 2020 (Queensland) in November 2022. Through site and desktop ecological investigations this Matter of National Environmental Significance (MNES) and Matter of State Environmental Significance (MSES) has been identified as having potential habitat on site and within the proposed scope of works (henceforth referred to as the Project disturbance footprint).

As per the significant residual impact assessment for the Greater glider (assessed against the Significant Impact Guidelines 1.1) it was determined the Project was likely to result in a significant impact due to the clearing of 17.42 hectares (ha). Due to the significant impact, an offset area for the Greater glider has been proposed. Therefore, targeted ecological fauna surveys to assess Greater glider presence and carrying capacity within the Project disturbance footprint and proposed offset areas were conducted.

The purpose of this memorandum is to report on the targeted ecological fauna surveys for Greater glider conducted at the Project site (inclusive of the Project disturbance footprint and the proposed offset area.

2 Background to the Greater glider

The Greater glider is Australia's largest gliding marsupial with a head and body length of 35-46 cm and a tail measuring up to 60 cm. This species has thick fur that is pale below and the upper side varies from dark grey, brown to light mottled grey and cream. The tail lacks the ability to curl around objects and the ears are large and rounded.

Greater gliders are arboreal and nocturnal, largely restricted to eucalypt forests and woodlands. The diet is mostly folivorous, feeding on eucalypt leaves and occasionally flowers. The largest populations are in taller, montane forests with old trees and abundant hollows. Even in suitable habitat, the species may have a patchy distribution. Due to the seasonal variation of eucalypts, this species prefers forests of high species diversity.

During the day it shelters in tree hollows, with a preference for large hollows in large, old trees. In Southern Queensland, greater gliders require at least 2-4 live den trees for every 2 ha of suitable forest habitat.

Home ranges are small, becoming larger in lower productivity forests. This species is particularly sensitive to forest clearance and to intensive logging and wildfire. Following disturbance, it is slow to recover. Due to the sensitivity of the species and the low dispersal ability, it is sensitive to habitat fragmentation.

The conservation advice for the Greater glider listed by DCCEEW in July 2022 lists the considerations for Habitat critical to the survival of the species. Habitat critical to the survival for the Greater glider (southern and central) can be broadly defined as:

- Large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees (or trees with a basal diameter >30 cm can be used as a proxy measurement for tree hollow in Queensland) and a diverse range of the species' preferred food species in a particular region; and
- Smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonization; and
- Cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes); and
- Areas identified as refuges under future climate changes scenarios; and
- Short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.

3 Methodology

Field investigations were undertaken between 20 February 2023 and 23 February 2023 at the QTMP Project location at Torbanlea by two suitably qualified Aurecon ecologists (Nathan Litjens and Jiordyn Trinca).

Due to there being limited standard documentation for survey requirements for the Greater glider in Queensland, field methodology practices were developed using the Victorian standards outlined in the Approved Survey Standards: Greater glider *Petauroides volans* (Department of Sustainability and Environment 2011).

To demonstrate occurrence of Greater gliders, any detections were based on sightings of the species, rather than calls, as the species do not normally vocalise. Additionally, the relatively stationary nature of Greater gliders and bright eye-shine make them comparatively easy to detect by sight (Wintle et al. 2005). Therefore, spotlight transects were utilised as the preferred methodology.

A standardised approach was applied whereby two qualified ecologists conducted spotlight transects on foot covering 400 metres (m) in length and 50 m wide (25 m either side of transect) per every 2 ha.

The transects were positioned to maximise coverage of the Project site and minimise any allowances to not see Greater gliders that were present. Therefore, in some occurrences transects were configurated to enable more complete coverage of the targeted area. Each transect was walked over a period of 40 minutes. However, where transects intersected with unsuitable habitat for the Greater glider (ie. Grassland, or Slash pine (*Pinus elliottii)* monocultures) time taken was reduced to focus on areas of suitable habitat. Figure 1 demonstrates the placement of transects throughout the Project site.

aurecon

Legend

- Transects
- Survey tracks
- Model Disturbance Footprint
- Project boundary
- Proposed offset sites

Date: 28/03/2023 2:48 PM Version:0

Map by: C:\Users\Andy.Dalton\Documents\ArcGIS\Projects\Torbanlea\Torbanlea.aprx Date: 28/03/2023 14:48

A3 scale: 1:17,000

0 175 350 525 Meters

Job No: P511003

Coordinate system: GCS WGS 1984

Department of Transport and Main Roads

QTMP - Torbanlea Train Manufacturing Facility

Figure 1:
Survey effort regarding transect placement throughout the Project site

A total of 32 transects were monitored by spotlight over a total of 22 hours per ecologist to equal a total of 44 hours of survey effort.

Targeted ecological surveys for the Greater glider were conducted during optimal climate conditions for the species to ensure the best possible chance of identifying the species. Optimal conditions include warm temperatures with limited moonlight, rain, or fog. Surveys were conducted after sunset, between the hours of 7:30 pm and 1:30 am to allow for any opportunities for Greater gliders to emerge from their hollows. Table 1 outlines the climate conditions per night of survey effort.

Table 1 Climate conditions over the four nights of field investigations

	Monday 20 February	Tuesday 21 February	Wednesday 22 February	Thursday 23 February
Moon phase	New moon 0% visible	Waxing crescent 2% visible	Waxing crescent 7% visible	Waxing crescent 14% visible
Temperature	26˚C	24˚C	24˚C	23˚C
Cloud cover	90%	5%	12.5%	12.5%
Precipitation	0 – No rain	1 – Periodic drizzle	0 – No rain	2 – Light rain
Wind	0	0	10-15 knots: southerly	5-10 knots: south westerly

Detection probability for Greater gliders under ideal conditions is estimated at 90% under survey efforts of 40 minutes per 2 ha over two visits (Wintle et al. 2005).

The following minimum reporting standards as listed by the Approved Survey Guidelines, were used to assess the presence/absence and relative abundance of the Greater glider during field investigations (Department of Sustainability and Environment 2011):

- Name and contact details of the observers;
- Permit details of the surveyors;
- Date and time;
- Precise geographic location;
- Details of the species present and number of individuals detected;
- Method of obtaining record (ie. Sampling effort); and
- Environmental variables.

Field investigations were conducted in accordance with Aurecon's Scientific Purposes Permit (WISP14453114) (valid between 20 April 2019 and 19 April 2024).

4 Field investigations

Targeted ecological field surveys conducted by Aurecon did not find any signs of Greater glider (southern and central) presence (i.e. individuals, scats, or scratch marks) within the Project site. Extensive survey effort within the Project disturbance footprint and the proposed offset area found potentially suitable eucalypt species that may support denning and feeding requirements; however, the habitat throughout the Project site as it currently stands is considered marginal (i.e. Greater glider could occur in the habitat only irregularly or infrequently) (IUCN 2023).

It is to be noted there are scattered database records (i.e. WildNet) beyond the Project site. The nearest species occurrence record is 5km northeast of the Project site near Vernon State Forest taken in April 2022. Therefore, the Project site was recognised as having potential to provide a refuge under future climate change scenarios, or short-term post-fire refuge to allow for species persistence and recovery. Furthermore, under the current offset requirements to improve habitat quality for the Greater glider, there is the possibility that future populations will utilise the area as the existing eucalypt forest becomes more contiguous throughout the proposed offset area.

A list of fauna observed during field investigations has been provided as Appendix A.

5 Conclusion

Based upon targeted ecological field surveys conducted between 20 February to 23 February 2023, Greater glider (*Petauroides volans)* presence (and therefore abundance) at the Project site was considered negligible. Survey effort across the Project disturbance footprint and proposed offset area were developed based on the Victorian standards of Approved Survey Guidelines for the Greater glider and therefore, was considered as adequate. Although no Greater gliders nor evidence of Greater gliders were found during the time of investigation, the current habitat within the Project site, although marginal, may provide a post-fire refuge or refuge under future climate change scenarios.

6 References

Department of Climate Change, Energy, the Environment and Water (2022). Conservation Advice for Petauroides volans (greater glider (southern and central)). Canberra: Department of Climate Change, Energy, the Environment and Water. In effect under the EPBC Act from 05-Jul-2022. Available from: **http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-05072022.pdf**. Accessed: February 2023.

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Appendix A

Table 2 Fauna species identified during field investigations

Species name	Common name	EPBC Act status	Comments
Amphibians			
Crinia parinsignifera	Beeping froglet	-	
Crinia tinnula	Wallum froglet	-	Vulnerable under NC Act
Limnodynastes peronii	Striped marsh frog	-	
Limnodynastes tasmaniensis	Spotted grass frig	-	
Litoria (Nyctimystes) brevipalmata	Green-thighed frog	-	
Litoria caerulea	Common green tree frog	-	
Litoria fallax	Eastern sedge frog	-	
Litoria gracilenta	Graceful tree frog	-	
Litoria rothii	Northern laughing tree frog	-	
Litoria rubella	Ruddy tree frog	-	
Litoria tyleri	Southern laughing tree frog	-	
Platyplectrum ornatum	Ornate burrowing frog	-	
Pseudophryne raveni	Copper backed brood frog	-	
Rhinella marina	Cane toad	-	Introduced
Mammals			
Felis catus	Cat	-	Restricted matter (Biosecurity Act 2014)
Macropus gigas	Eastern grey kangaroo	-	
Melomys burtoni	Grassland melomy	-	
Petaurus krefftii/ breviceps	Sugar glider	-	

Species name	Common name	EPBC Act status	Comments
Trichosurus vulpecula	Common brushtail possum	-	
Wallabia bicolor	Swamp wallaby	-	
Reptiles			
Amalosia jacovae	Cloudy velvet gecko	-	
Cryptophis nigrescens	Eastern small-eyed snake	-	
Dendrelaphis punctulatus	Green tree snake	-	
Morelia spilota	Carpet python	-	
Pogona barbata	Bearded dragon	-	
Pseudonaja textilis	Eastern brown snake	-	
Birds			
Aegotheles cristatus	Australian owlet nightjar	-	
Colluricincla harmonica	Grey shrike thrush	-	
Dacelo novaeguineae	Laughing kookaburra	-	
Eopsaltria australis	Eastern yellow robin	-	
Geopelia placida	Peaceful dove	-	
Myiagra cyanoleuca	Satin flycatcher	**Migratory**	Special Least Concern under NC Act
Myiagra rubecula	Leaden flycatcher	-	
Pachycephala rufiventris	Rufous whistler	-	
Podargus strigoides	Tawny frogmouth	-	
Rhipidura leucophrys	Willy wagtail	-	
Symposiachrus trivirgatus	Spectacled monarch	**Migratory**	Special Least Concern under NC Act
Arachnids			
Arkys lancearius	Triangular spider	-	
Austracantha minax	Jewel spider	-	

Species name	Common name	EPBC Act status	Comments
Cyrtophora parnasia	Russian tent spider	-	
Deinopis subrafa	Rufous net-casting spider	-	
Latrodectus hasseltii	Redback spider	-	
Ordgarius magnificus	Magnificent bolas spider	-	
Sparassidae	Huntsman spider	-	
Crustacean			
Cherax sp.	Yabby	-	
Fish			
Gambusia holbrooki	Mosquitofish	-	Restricted matter (Biosecurity Act 2014)

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