LOTS 12 AND 13 LODGE DRIVE EAST ROCKINGHAM

EPBC 2021/9069 PRELIMINARY DOCUMENTATION

Prepared for:	The Trustee for Hamersley Sub Trust
Report Date:	17 January 2023
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pgv ENVIRONMENTAL

EXECUTIVE SUMMARY

The Trustee for Hamersley Sub Trust is proposing to redevelop the proposal site. The redevelopment will include clearing the remaining vegetation on the proposal site and constructing buildings and carparks for general industry/commercial use.

Lots 12 and 13 Lodge Drive, East Rockingham (the proposal site) are in the City of Rockingham approximately 36km south of the Perth Central Business District (Figure 1). The proposal site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area. The proposal site is zoned 'Industrial' under the Metropolitan Region Scheme (SLIP, 2021) and 'General Industry' under the City of Rockingham Local Planning Scheme No. 3 (SLIP, 2021)

The lots contain a large shed and some disused infrastructure associated with a Wool Scouring plant that was built between 1995 and 2000. The shed and yards are now used for a different purpose. The shed and other areas of infrastructure occupy about 6ha of the 11.9ha proposal site. The balance of the proposal site remains undeveloped and contains a large number of trees and some bare areas.

If EPBC Approval is given, the lots will be cleared to accommodate the proposed commercial re-development. The Action to clear was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proposal was determined to be a 'Controlled Action'. The Controlled Action Decision was made for impacts pursuant to Section 18 and 18A Listed Threatened Species and Communities, specifically:

- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community – Critically Endangered; and
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – Endangered

The proposed development will impact on:

- 5.49ha (includes the 30m buffer, in this case the buffer is completely degraded and only has tree native species) of poor condition Tuart Woodland; and
- 1.5ha of low-quality foraging habitat and 58 potential future nesting trees for Black Cockatoo.

To offset the direct impacts on these Matters of National Environmental Significance (MNES) the proponent has developed an offsets package that provides for the:

- Reestablishment of 3.5ha of quality Tuart Woodland TEC in the Rockingham Lakes Regional Park or Bush Forever Site; and
- Reestablishment of 3ha of quality Black Cockatoo habitat in the Rockingham Lakes Regional Park or Bush Forever Site.

The proposed offsets will result in the enhancement of the environmental values of existing conservation estates in Rockingham.

The Preliminary Documentation report also includes the management of potential indirect impacts on MNES through the implementation of a Flora and Fauna Management Plan.

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Addendums

Addendum 1: Original Referral Documentation

ABBREVIATIONS

Table A: Table of Acronyms/Abbreviations

Acronym/ Abbreviation	Expansion
Organisations	
CoR	City of Rockingham
DCCEEW	Department of Agriculture, Water and the Environment (Commonwealth)
DBCA	Department of Biodiversity, Conservation and Attractions (WA)
DPLH	Department of Planning, Lands and Heritage (WA)
DPIRD	Department of Primary Industries and Regional Development (WA)
DWER	Department of Water and Environmental Regulation (WA)
EPA	Environmental Protection Authority (WA)
WAPC	Western Australian Planning Commission
Legislation	
BAM Act	*Biosecurity and Agriculture Management Act 2007* (WA)
BC Act	*Biodiversity Conservation Act 2006* (WA)
EP Act	*Environmental Protection Act 1986* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
P&D Act	*Planning and Development Act 2005* (WA)
General terms	
LSP	Local Structure Plan
MNES	Matter of National Environmental Significance
MRS	Metropolitan Region Scheme
POS	Public Open Space
TEC	Threatened Ecological Community
TPS	Town Planning Scheme
RIZ	Rockingham Industrial Zone
WONS	Weeds of National Significance
Units of Measure	
DBH	Diameter at breast height
ha	Hectare
m	Metre
m AHD	Metre in relation to the Australian height datum
mm	Millimetre

REFERENCE TABLE

The Reference Table indicates where the information requested by DCCEEW to be included in the Preliminary Documentation is addressed in the report.

Table B: Reference Table for Items in Request for Additional Information

Information Requested by DCCEEW	Reference in Documentation
1. Description of the action	
A description of the action should include the location of all works to be undertaken (including plans and maps) and elements of the action that may have impacts on EBPC Act listed threatened species and communities. It must also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for any structural or elements of the action that may have impacts on EBPC Act listed threatened species and communities.	Section 1.2
a) Provide details of the action, including i. a summary of all components/phases of the proposed action, including construction, operational and any decommissioning and rehabilitation, and their respective timing. ii. the activities associated with each phase of the proposed action. iii. the location, boundaries and size (in hectares) of the proposed action area, any discrete disturbance areas, and any adjoining areas which may be directly or indirectly impacted by the proposed action, including nearby habitat and areas for stockpiles, vehicle access and associated activities. iv. a layout plan for the proposed action area, including the location and type of land use, key infrastructure, etc. v. the anticipated timing and duration (including start and completion dates) of each component of the proposed action, and associated impacts. vi. a description of operational requirements of the action including any anticipated maintenance works. vii. a description and likely timing of rehabilitation activities associated with the proposed action.	Section 1.3- 1.8 Attachment 1
b) Any feasible alternatives to the action to the extent reasonably practicable, including, the alternative of taking no action, a comparative description of the impacts of each alternative on EBPC Act listed threatened species and communities and sufficient detail to make clear why any alternative is preferred to another. Short, medium and long-term advantages and disadvantages of the options should be discussed.	1.9

Information Requested by DCCEEW	Reference in Documentation
Listed Threatened Species and Ecological Communities (s18 & 18A)	
2. Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community - Critically Endangered	
The preliminary documentation must include an assessment of potential impacts (including direct, indirect, consequential, and cumulative impacts) on MNES that are likely to be present within the proposed action area and surrounds. The impacts of the proposed action should be considered at the broadest scope: all components of the proposed action should be considered, including any associated supporting infrastructure. The assessment must show the acceptability of the impacts, considering the proposed avoidance and mitigation measures, against the Matters of National Environmental Significance Significant Impact Guidelines 1.1 and the relevant statutory documents as listed in 9a.	
a) Provide a description of all potential impacts on the Tuart TEC that may be posed by land clearing and earthworks activities within the proposed action area and the surrounds. This can include, but not limited to the following: i. Impacts of fragmentation on remaining Tuart TEC patches in the surrounding areas, particularly the conservation area to the west and north. ii. Impact of abiotic (non-living) factors such as water, nutrients, and soil necessary for the survival of Tuart TEC in the surrounding patches. This can include impacts of stormwater runoff, changes to groundwater hydrology, and impacts of soil acidification. iii. Habitat degrading processes such as weed invasion and *Phytophthora cinnamomi* dieback into the project area and the surrounding areas.	Attachment 2 and Section 3
b) Provide a CEMP (Vegetation and Fauna Management Plan) to cover: • Management actions to reduce the introduction of edge effects into conservation area to the west of the proposed site. This includes species and weed management, chemical waste run off procedures, microclimate shifts, species shifts, native species loss. • Measures for continual upkeep of the site, including any bushfire management strategies that might involve modification to the conservation area to the west.	Attachment 4
c) Provide information (including engineering, technical and operational considerations) that demonstrates why the development must be constructed in the proposed location, and not in an alternative location which does not impact MNES. This information should include discussion of any alternative designs that were considered but ruled out prior to acceptance of the current proposed design.	Section 1.9
Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – Endangered	
d) Provide an assessment of potential impacts (direct and indirect) on the CBC as a result of project activities, particularly construction. This should include consideration of potential indirect impacts to adjacent areas of Black Cockatoo habitat.	Attachment 3 and Section 3

Information Requested by DCCEEW	Reference in Documentation
e) Provide a CEMP (Vegetation and Fauna Management Plan) that details how potential environmental impacts associated with construction activities will be managed. The CEMP provided should be developed consistent with the Department's Environmental Management Plan Guidelines referenced at item 9b. The CEMP should include, but not be limited to: i. Procedures to protect fauna during construction, through ensuring that a qualified fauna spotter catcher is present during all clearing and is given sufficient authority to guide all clearance, including stopping clearing while any checks or relocation requested by the fauna spotter catcher is undertaken. This should ensure that any Black Cockatoos that may be present have safely moved out of the development envelope identified for clearing, of their own volition, before the habitat is cleared. The Department notes that the survey done in July 2021 found no Black Cockatoos on site at the time. ii)Procedures to minimise impacts on surrounding areas. This may include measures for work vehicles, noise contamination, the amount of human and non-human traffic allowed in the area, specific speed limits for heavy vehicles.	Attachment 4
f) Provide information (including engineering, technical and operational considerations) that demonstrates why the development must be constructed in the proposed location, and not in an alternative location which does not impact MNES. This information should include discussion of any alternative designs that were considered but ruled out prior to acceptance of the current proposed design.	Section 1.9
3. Offsets	
An offset is required to compensate for all predicted or potential residual significant impacts (direct and indirect) to EBPC Act listed threatened species and communities, including the Tuart TEC and the CBC. Please provide an offset proposal that meets the principles of the EPBC Act Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (2012) referenced at item 9d. The offset proposal must include, but not be limited to, the following:	Section 5.1
The package must include, but not be limited to, the following:	Section 5
a) Details of the proposed direct offsets, including i. A description of the proposed offset site(s) including location, size, current condition and relevant ecological/species habitat features, landscape context and cadastre boundaries of the offset site(s), supported by mapping which meets the Guide for providing maps and boundary data for EPBC Act projects, referenced at item 9e. ii. An outline of the management and monitoring strategies and actions proposed to ensure the offset site attains and/or maintains the same or better habitat quality as the quality of the impact site. iii. Current and likely future tenure of the proposed offset site and details of how the offset site will be legally secured for the full duration of the impact. Iv. Justification of how the offset proposal meets the requirements of the EPBC Act Offsets Assessment Policy, referenced at item 9d.	Section 5

Information Requested by DCCEEW	Reference in Documentation
b) If possible, details and justification demonstrating how the proposed direct offset will maintain or improve the viability of the protected matter(s) consistent with the EPBC Environmental Offsets Policy referenced at item at item 7c. This includes: i. A conservative estimate of the offset completion criteria (i.e. environmental outcomes) to be achieved, and reasoning for these in reference to the Tuart TEC Conservation Advice listed at item 9a and the Carnaby Cockatoo Recovery Plan listed at 9c. ii. Milestones to demonstrate adequate progress towards achieving the offset completion criteria.	Section 5
4. Ecologically Sustainable Development	
The preliminary documentation should include a discussion of how the proposed action meets the principles of ecologically sustainable development, as defined in s. 3A of the EPBC Act	Section 7
5. Environmental record of the person proposing to take the action	
If the person proposing to take the action is a corporation, this extends to the executive officers of the corporation as well and details of the corporation's environmental policy and planning framework must also be included	Section 8
The preliminary documentation must include 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: a) The person proposing to take the action. b) For an action for which a person has applied for a permit, the person making the application.	Section 8
6. Other approvals and conditions	
The preliminary documentation must include information on any other requirements for approval or conditions that apply, or that you reasonably believe are likely to apply, to the proposed action. This must include: a) description of any approval obtained or required to be obtained from a State or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply (or are reasonably expected to apply) to the action; and a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action. Public comment was received, requesting that relevant measures dictated by the City of Rockingham's Planning Policy 3.3.8 East Rockingham Industrial Park Development Guidelines be approved through the Development Application process. This should be taken into consideration.	Section 9

Information Requested by DCCEEW	Reference in Documentation
7. Economic and social matters	
Please provide further detail on the social and economic costs and/or benefits of undertaking the proposed action, including: a) estimate of any anticipated economic costs and/or benefits (in AUD) b) basis for any estimations of costs and/or benefits c) potential employment opportunities expected to be generated at each phase of the proposed action d) details of any public and stakeholder consultation activities, including the outcomes e) details of any Indigenous stakeholder consultation - noting that the project area is within the Gnaala Karla Boodja native title group's region of the South West Native Title Settlement, and are contactable through their representatives, the South West Aboriginal Land and Sea Council. This consultation should seek to identify, protect and manage any tangible and intangible cultural heritage values, including culturally significant flora and fauna. Although not protected under the EPBC Act, public comment did identify the presence of local Aboriginal Scar trees in the area, protected under state legislation and this should be taken into consideration.	Sections 1.4 and Section 6
8. Relevant policies and publications	
For each protected matter, the preliminary documentation must include a statement of whether or not the proposed action is inconsistent with any relevant recovery plan and threat abatement plan.	Sections 3 and 10
Statements of whether or not relevant conservation advice have been considered must be included for those protected matters that do not have recovery plans	Sections 3 and 10
9. Other	
a) The response to this request for additional information must include a reference table demonstrating where in the additional information requirements are addressed. b) Where appropriate, the response must be supported by: i. evidence-based conclusions based on the best available peer-reviewed scientific literature with supporting references cited or expert opinion provided. ii. maps, plans, diagrams and technical information (e.g. specifications, schematics) any images provided must be clearly annotated, in colour and of high resolution; All maps submitted as part of the response to request for additional information must be consistent with the Departments Guide for providing maps and boundary data for EPBC Act projects, referenced at item 9e. iii. scientifically-robust methodologies that are appropriate for purpose, and sufficient description of the methodology used and justification of why the methodology was selected. c) The response will form part of the preliminary documentation that must be published for public comment. Therefore, the contact details of Departmental officers must not be included in the response. The response should not contain commercial in confidence markings. If the response contains sensitive information, please discuss with the assessment officer.	Section 11

1 DESCRIPTION OF THE ACTION

1.1 Introduction and Background

The Preliminary Documentation Report has been prepared by PGV Environmental on behalf of The Trustee for Hamersley Sub Trust (referred to herein as 'the Proponent') for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the proposed commercial redevelopment of Lots 12 and 13 Lodge Drive, East Rockingham (EPBC 2021/9069).

The Referral of the proposed commercial development was accepted by DAWE (now known as the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 1 November 2021. The original Referral documentation is provided as Addendum 1. The Action was determined as a 'Controlled Action' on 25 November 2021. The Controlled Action Decision was made for impacts pursuant to Section 18 and 18A; Listed threatened species and communities, specifically:

- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community – Critically Endangered; and
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – Endangered;

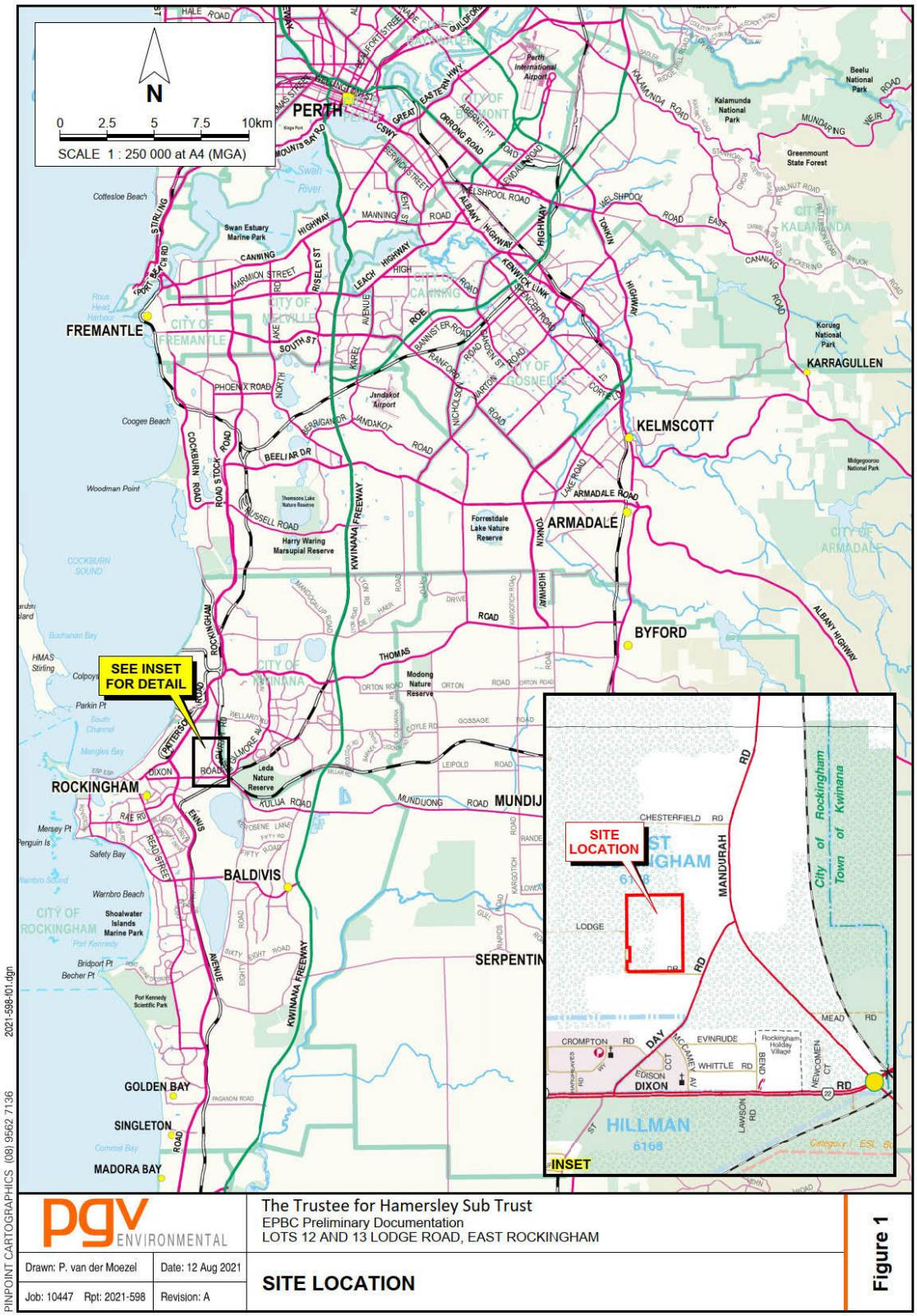
The "Controlled Action' decision is to be assessed by Preliminary Documentation. Correspondence dated 25 November 2021 outlined the Additional Information required by DCCEEW prior to the assessment process.

A reference table is provided in Table B, which cross-references the information in the report with that which was requested by DCCEEW to verify that all required information is contained and able to be located within the document.

1.2 Location and Size

Lots 12 and 13 Lodge Drive, East Rockingham (the proposal site) are located in the City of Rockingham approximately 36km south of the Perth Central Business District (Figure 1). The proposal site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area.

The proposal site is 11.9098ha in size (Figure 2). The shed and other areas of infrastructure occupy about 6ha of the proposal site. The balance of the proposal site remains undeveloped and contains a number of trees (1.5ha or 58 trees) and extensive bare areas.



PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-598-f01.dgn

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Drawn: P. van der Moezel	Date: 12 Aug 2021
Job: 10447 Rpt: 2021-598	Revision: A

The Trustee for Hamersley Sub Trust
EPBC Preliminary Documentation
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

SITE LOCATION

Figure 1


N
0 20 40 60 80 100m
SCALE 1 : 1 750 at A3 (MGA)
Legend
Site Boundary
Cadastral Boundary
Easement Boundary
Topographic Contour
Lot 13
Lot 12
8100
R 52979
149
6 429 200mN
6 429 000mN
384 800mE
384 600mE
384 400mE
6 428 800mN
LODGE
ROAD
CADASTRAL SOURCE: Landgate, July 2021.
CONTOUR SOURCE: Dept. of Agriculture, 2000.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.
PINPOINT CARTOGRAPHICS (08) 9562 7136
2021-605-002.dgn
pgv ENVIRONMENTAL
The Trustee for Hamersley Sub Trust
PRELIMINARY DOCUMENTATION
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM
Drawn: B. Heath
Date: 24 Oct 2021
Job: 10447 Rpt: 2022-660
Revision: A
SITE BOUNDARY AND TOPOGRAPHY
Figure 2

1.3 Detailed Description

The proposed action is the redevelopment of Lots 12 and 13 Lodge Drive, East Rockingham, Western Australia for the purpose of commercial development. The proposed action will include the following activities:

- Clearing of existing vegetation;
- Bulk earthworks, including cutting and filling of the land, importation of fill where required;
- Civil construction works, including the construction of commercial buildings, access road, and carparks, and
- Landscape works, including the design and construction of carpark treatments.

1.4 Proposed Development Design

The proposal site is proposed to be re-developed for commercial purposes (Attachment 1). The isolated trees on the proposal site will be cleared, resulting in a disturbance footprint of 5.495ha.

The development will be north and west of the existing building for the purpose of providing additional hardstand area, and potentially additional warehousing and manufacturing facilities. The details of the proposed development as are follows:

- An additional 5,000m^2 of hardstand to the north of the existing building for the storage of containers, vehicles and equipment associated with the existing building; and
- A development on approximately 29,000m^2 of lot area to the north-west of the existing building comprising either additional hardstand, or a building with 7400m^2 of warehousing or manufacturing space, drive through access for delivery trucks, and additional office and operating space including lunch and plant rooms

1.4.1 Development Approvals

The proposal site is located in the RIZ which is zoned Industrial under the Perth Metropolitan Region Scheme (MRS) and General Industry under the City of Rockingham Town Planning Scheme No. 2.

The RIZ has been part of an industrial estate earmarked since 1955 and recognised as a heavy industry site for 25 years (ECS, 2006). A Structure Plan for the RIZ (IP14 Area at that time) was developed in 1999 and was adopted by the City of Rockingham and the WAPC as stated in the Statement of Planning Policy No. 7.1 - East Rockingham Industrial Park: Environmental Planning Policy. The Structure Plan was finalised in 2012 to reflect determinations by the WAPC and EPA. Under the City of Rockingham Town Planning Scheme No. 2 the site is predominantly zoned as 'special industry' and 'general industry' with some areas zoned 'parks and recreation, 'primary regional roads and 'railways'. The Structure Plan is in keeping with the extent of the City of Rockingham's LPS 3 underlying 'Special Industry' and 'General Industry Zones'. The City of Rockingham' s Planning Policy 7.1: East Rockingham Industrial Park: Environmental Planning Policy (2004) was developed to establish guiding principles and policies for the environmental acceptability of industrial zoned land within the RIZ area.

The development of the proposal site with either additional hardstand, or warehouse and manufacturing capacity is consistent with the Industrial zoning of the proposal site under both the Metropolitan Region Scheme and the City of Rockingham Local Planning Scheme No. 2 respectively

(Attachment 1). The proposal site is well separated from any sensitive land uses and an appropriate location for the intensification of industrial-type activities. Any development will be assessed against the requirements of the local planning framework.

1.4.2 Indigenous Heritage

According to a search of the Department of Indigenous Affairs Aboriginal Heritage Enquiry System, the RIZ Area including the proposal site has been studied as part of the University of Western Australia's Perth Area Survey and the Ballaruk (Traditional Owners of Whadjuk territory) Site Recording Project. A scar tree is located to the north of the proposal site and will not be impacted by the proposed re-development.

A review of the DPLH Heritage Enquiry System for registered sites in the region indicates that there are no Aboriginal Heritage sites located on the proposal site.

Standard procedures will be followed during the re-development of the proposal site and any evidence of heritage issues will be reported to DPLH as required under the *Aboriginal Heritage Act, 1972* and work will stop until an investigation is complete.

1.5 Timing and Duration

The proposed action, if approved will commence as soon as all planning approvals are in place. The end date recorded in the Referral is 4 September 2030 however the project is anticipated to be completed much earlier than that date dependent on market conditions.

1.6 Operational Requirements and Maintenance Works

The proposed action is associated with the commercial re-development of the proposal site, which will be implemented through a construction process over a set period of time, following which the proposed action will be complete. As such the proposed action does not involve any ongoing operational requirements following construction.

Notwithstanding, the Proponent will be responsible for some initial maintenance works following completion of construction if the proposed action is approved. Specifically, the Proponent will be responsible for maintaining landscaping works. Following this, the ongoing management and maintenance responsibilities for the POS areas will be handed over to the local government authority (CoR), who will then manage and maintain these in perpetuity.

1.7 Rehabilitation Activities

No rehabilitation activities associated with achieving a specific environmental conservation outcome are proposed on the proposal site. The proposed action will involve some landscaping works. The landscape design will incorporate the use of native and endemic flora species and will be subject to approval by the City of Rockingham but is not intended to provide an environmental conservation function.

1.8 Component of a larger action or staged development

The proposed action is not part of a larger action. The re-development of the proposal site is not dependent on the development of any other area and therefore, is an independent action.

1.9 Alternatives to the proposed action

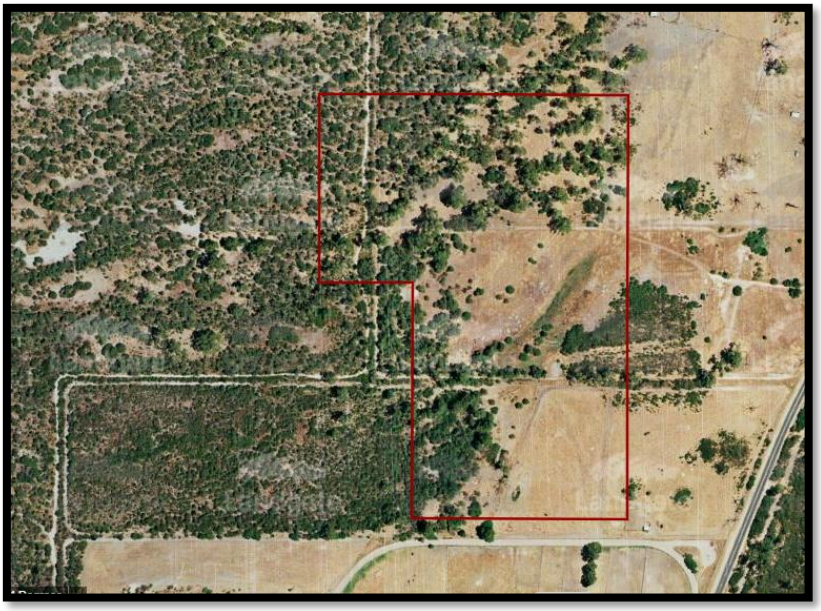
No alternatives to the proposed action have been considered by the Proponent. Planning instruments outlined in 1.4.1 above provide background to the proposed re-development on the proposal site and were considered in the strategic planning for the site.

2 DESCRIPTION OF THE ENVIRONMENT AND MNES

2.1 Existing environment

Aerial photography from 1995 shows the proposal site as undeveloped but with a large amount of clearing over the site (Plate 1). The proposal site was historically used for a wool scouring industry.

Plate 1: Aerial Photograph 1995 (Landgate, 2021)



The 2000 aerial photo shows the wool scouring shed had been constructed on most of the eastern half and a water treatment plant in the central western section (Plate 2). Native vegetation remains in the north-west corner, and some scattered trees at the north-east end and some vegetation in the south-west corner.

Plate 2: Aerial Photograph 2000 (Landgate, 2021)

2.1.1 Existing land use

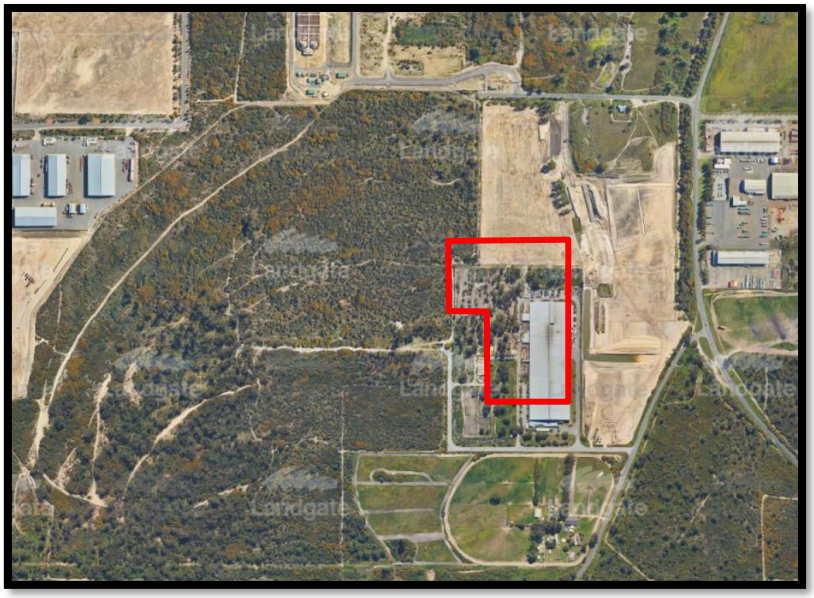
The 2021 aerial photograph shows the current situation with more trees on the proposal site than was previously there in 2000 (Plate 3). The additional trees are the result of landscape planting around the carparks as well as some natural recruitment of trees.

Plate 3: Aerial Photograph February 2021 (Landgate, 2022)

2.1.2 Surrounding land uses

The proposal site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area (Plate 4).

Plate 4: Aerial Photograph from October 2021 (Landgate, 2022)



2.1.3 Topography

The proposal site is flat at around 4m AHD, however the site's natural contours have been modified as a result of earthworks for past land use and importation of mulch (Figure 2).

2.1.4 Geology and soils

Geology

The proposal site is mapped as part of the Quindalup South System which is the youngest dune system on the Swan Coastal Plain, consists of sand dunes or ridges formed by windblown unconsolidated calcareous and quartz beach sand.

Soils

One Quindalup South soil unit is mapped on the proposal site and is described as follows:

- Quindalup Phase 3 (211Qu) Safety Bay sands -calcareous deep sands and yellow sands and coastal scrub.

2.1.5 Hydrology

The historical maximum groundwater level under the proposal site is between 1 and 2m AHD which 2-3m below the natural surface level (mAHD) (DoW, 2021).

The *Geomorphic Wetlands of the Swan Coastal Plain* database identifies a Conservation Category Wetland (CCW) occurs in the south-west portion of the proposal site and two eastern tips of another CCW just inside the property boundary (UFI 6,221) (Plate 5). The is flora and vegetation survey demonstrated that the CCWs no longer occur on the proposal site due to the lack of wetland flora species. The areas do not have the ability to regenerate to a CCW due to the high level of weeds in the eastern half and the amount of mulch in the western half.

Plate 5: Conservation Category Wetland Locations

2.1.6 Flora and Vegetation

2.1.6.1 Vegetation Complex

The vegetation on the proposal site was part of the Quindalup Vegetation Complex as mapped by Heddle *et al*. (1980). Approximately 60.49% of the pre-European vegetation extent of this complex remains, of which 10.98% is currently managed by DBCA (DBCA, 2018).

The percentage retention is above EPA's target for minimum 30% retention of vegetation complexes State-wide and above the 10% minimum criteria for vegetation complexes in the Perth and Peel Region Constrained Areas.

2.1.6.2 Vegetation Type

The vegetation on the proposal site has been partially cleared. Three vegetation types are mapped on the northern part of site (see Attachment 3 for vegetation Figures):

- EgMh *Eucalyptus gomphocephala* / *Melaleuca huegelii* Open Woodland over mulch and weeds (Plate 6)

The vegetation associated with the adjacent wetlands to the west of the proposal site:

- *Melaleuca rhaphiophylla / Acacia rostellifera / Gahnia trifida* Shrubland has been cleared from the proposal site and the area has been filled with mulch (Plate 7).
- Weeds - Several areas occurred on the proposal site that did not have any native species. These areas had been mulched in the past up to as much as 0.5m deep (Plate 8)

Plate 6: Tuart Trees over weed understorey

Plate 7: *Melaleuca rhaphiophylla/M. huegelii* Low Open Woodland over weeds

Plate 8: Weeds over Mulch

2.1.6.3 Floristic Community Type

Floristic Community Types (FCT) are based on the whole floristic composition of the vegetation rather than being determined by soil type and geomorphology (Vegetation Complex) or the nature of the dominant species (Vegetation Types).

The condition of the vegetation on the proposal site was rated as Completely Degraded and therefore could not be assigned to a FCT.

2.1.6.4 Tuart Woodland TEC

PGV Environmental (2021) undertook a Tuart Woodland TEC assessment according to the Approved Conservation Advice for the TEC published at the time of the proposed listing on 16 September 2016 for the EPBC listed *Tuart Woodlands and Forests of the Swan Coastal Plain: A Nationally Significant Ecological Community* (DoEE, 2019).

A summary of the result of the Tuart Woodland TEC assessment is provided below:

- One patch of Tuart woodland occurs on the proposal site, as determined using tree canopies and a perimeter of 30m around the outer edge of the canopies;
- The vegetation condition is rated as Poor on the Tuart Woodland TEC scale;
- The size of the Tuart patch within the site is 5.495ha, and at least 6.71ha including the offsite patch extension to the west in the RIZ conservation area; and
- The Tuart patch meets the definition of the *Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community*, as the size of the patch is larger than the 5ha minimum required for a patch of Tuart in Poor condition to be the TEC.

The extent of the Tuart Woodland TEC is shown in Attachment 2 Figure 4.

2.1.6.5 Vegetation Condition

The condition of the vegetation was assessed according to the system of Keighery as described in Bush Forever (Government of Western Australia, 2000) (Table 1).

Table 1: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

The vegetation, particularly the understorey, has been impacted by previous clearing. The vegetation on the proposal site was rated as being in Completely Degraded Condition. While the upper tree and large shrub canopies were intact, the understorey had a high number of weed species and density.

2.1.7 Flora

No Threatened (Declared Rare) flora species listed under the State Biodiversity Conservation Act 2016 or the EPBC Act and no Priority plant species were recorded on the proposal site or are expected to occur on the site at any other time of the year (see Attachment 3).

2.2 Matters of National Environmental Significance

2.2.1 Protected Matters Search Tool

The Protected Matters Search Tool (PMST) (DCCEEW, 2022) is an interactive platform that provides indicative information on matters of national environmental significance or other matters protected by the EPBC Act that are likely to occur in an area of interest. The following types of MNES were identified in the database search, excluding species that occur in the ocean environment:

- Three (3) Wetlands of International Significance;
- Four (4) Threatened Ecological Communities;
- Forty-Eight (48) Listed Threatened fauna species;
- Eight (8) flora species; and
- Fifty-Four (54) Listed Migratory species.

2.2.1.1 RAMSAR Wetlands

The Wetlands of National Significance identified in the PMST and their distance from the proposal site is provided in Table 2.

Table 2: RAMSAR Wetlands in the vicinity of the Site

Wetland	Distance from the Site
Becher Point Wetlands	24km to the SW
Forrestdale and Thomsons Lake	19km and 13km to the NE to respectively
Peel Yalgorup System	32 km to the SW

The three RAMSAR listed wetlands will not be impacted by the commercial re-development of the proposal site.

2.2.1.2 Threatened Ecological Communities

The threatened ecological communities identified in the PMST and their likelihood of occurring on the proposal site is provided in Table 3.

Table 3: Ecological Communities found within 5km of the Site

Ecological Community	Threatened Category	Likelihood of Occurring on the site
Banksia Woodlands of the Swan Coastal Plain	Endangered	There are no Banksia species on the site, therefore the ecological community is not present on the site.
Sedgelands in Holocene dune swales of the southern Swan Coastal Plain	Endangered	There are no wetlands on the site, therefore this ecological community is not present on the site.
Thrombolite (microbial) community of Swan Coastal Plain (Lake Richmond)	Endangered	The site is situated 6km to the SW of the site, therefore this ecological community is not present on the site

Ecological Community	Threatened Category	Likelihood of Occurring on the site
Tuart Woodland and Forests of the Swan Coastal Plain ecological community	Critically Endangered	This ecological community is present on the site. The condition is rated as poor quality due to the lack of diversity un the understory. See section 2.2.2

2.2.1.3 Listed Fauna Species

The PMST identified 48 fauna species as potentially occurring within 5km buffer of the proposal site. Of these species, 39 were marine related species and would therefore not occur on the proposal site. The 9 terrestrial fauna species that have the potential to occur within the 5km buffer and their likelihood of occurring on the proposal site is provided in Table 4.

Table 4: Listed Fauna Species that may occur within 5km of the Proposal site

Fauna Species	Common Name	Conservation Listing	Likelihood to occur on the site
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	Vulnerable	This species may occasionally land on the site, however the species are not known to forage or breed in Tuart Trees (DBCA, 2017; Johnstone and Kirkby, 2019).
Leipoa ocellata	Malleefowl	Critically Endangered	This species will not occur on the site as the fauna habitat is not mallee and wattle species (Sprat, 2022)
Calyptorhynchus baudinii	Baudin's Black-Cockatoo,	Endangered	This species is not known to frequent the western side of the Swan Coastal Plain. however, the species are not known to forage or breed in Tuart Trees (DBCA, 2017; Johnstone and Kirkby, 2019).
Calyptorhynchus latirostris	Carnaby's Black Cockatoo	Endangered	This species may frequent the site but would not rely on the site for their survival as it provides moderate quality foraging habitat (Johnstone and Kirkby, 2019).
Bettongia penicillata ogilbyi	Woylie	Endangered	This species will not occur on the site as the fauna habitat is not suitable due to the lack of density in the understorey (DEC, 2012)
Dasyurus geoffroii	Chuditch	Vulnerable	This species will not occur on the site as the fauna habitat is not suitable due to the lack of density in the understorey (DEC, 2012a)
Pseudocheirus occidentalis	Western Ringtail Possum	Critically Endangered	This species will not occur on the site as the fauna habitat does not include Agonis flexuosa which is key habitat for this species.

The only fauna species that may be impacted by the commercial re-development of the proposal site is Carnaby's Black Cockatoo.

2.2.1.4 Listed Flora Species

The PMST identified 8 Flora species as potentially occurring within 5km buffer of the proposal site as detailed in Table 5 below.

Table 5: EPBC Listed Flora Species that Occur in the Vicinity of the Proposal Site

Flora Species	Common Name	Conservation Listing	Likelihood to occur on the site
Andersonia gracilis	Slender Andersonia	Endangered	This species will not be found on the site due to the completely degraded condition of the understory.
Caladenia huegelii	Grand Spider orchid	Endangered	This species will not be found on the site due to the completely degraded condition of the understory
Diuris micrantha	Dwarf Bee orchid	Vulnerable	This species will not be found on the site due to the completely degraded condition of the understory
Diuris purdiei	Purdies Donkey Orchid	Endangered	This species will not be found on the site due to the completely degraded condition of the understory
Drakaea elastica	Glossy-leafed Hammer Orchid	Endangered	This species will not be found on the site due to the completely degraded condition of the understory
Drakaea micrantha	Dwarf Hammer Orchid	Vulnerable	This species will not be found on the site due to the completely degraded condition of the understory
Eucalyptus x balanites	Cadda Road Mallee	Endangered	This species will not be found on the site due to the completely degraded condition of the understory
Synaphea sp. Fairbridge Farm	Selena's Synaphea	Critically Endangered	This species will not be found on the site due to the completely degraded condition of the understory
Synaphea sp. Serpentine		Critically Endangered	This species will not be found on the site due to the completely degraded condition of the understory

2.2.1.5 Migratory Species

The listed migratory species are associated with wetlands or the marine environment and would not occur on the proposal site.

2.2.2 Site Surveys

Surveys of the proposal site have identified two of the MNES that would be impacted by the proposed development on the site being:

- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community (Critically Endangered); and
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered).

Detailed studies of the identified Matters of National Environmental Significance have been undertaken on the proposal site. The Tuart Woodland Assessment was undertaken in accordance with the *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community* (DoEE, 2019) and is included as Attachment 2. The additional information requested by DCCEEW is in section 3.

The Black Cockatoo Habitat Assessment was undertaken in accordance with the *EPBC Act referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii Forest red-tailed Black Cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines) and the methodology that is outlined in the SPRAT Database for each of the Black Cockatoo species for Black Cockatoo Habitat Assessments. The complete report is included as Attachment 3.

The Tuart Woodland TEC assessment recorded 127 established Tuart trees and they occurred in one patch as defined in the Tuart Woodland TEC Advice. Native understorey species richness was very low with only 3 species recorded in the entire patch. The number of introduced species was higher (7-19) and the percentage cover of introduced species was far higher than native with 22-82% compared to 0-10% for native species. The condition category of the Tuart Woodland patch was rated as Poor

The proposal site contains a total of 5.495ha of Tuart Woodland TEC with a condition category rated as Poor.

Detailed information on the TEC mapped on the proposal site is in Attachment 2.

A total of 2,320.3ha of Tuart Woodland occurs in the City of Rockingham according to the Tuart Woodland Mapping (Tuart Response Group, 2002) (Figure 3).

2.2.3 Carnaby's Black Cockatoo

Carnaby's Black Cockatoos feed on a wide range of proteaceous and myrtaceous species, as well as opportunistically foraging in fruit and nut orchards. On the Swan Coastal Plain, Banksia woodlands and pine plantations are the main food sources during the non-breeding season (DBCA, 2017). Habitat for Carnaby's Black Cockatoos is outlined in Table 6. Carnaby's have not been recorded breeding or roosting on the proposal site (Plate 9 and Figure 3).

The additional information requested by DCCEEW is provided in section 3.

Plate 9: Carnaby's Black Cockatoo Roosting Sites (SLIP, 2022)

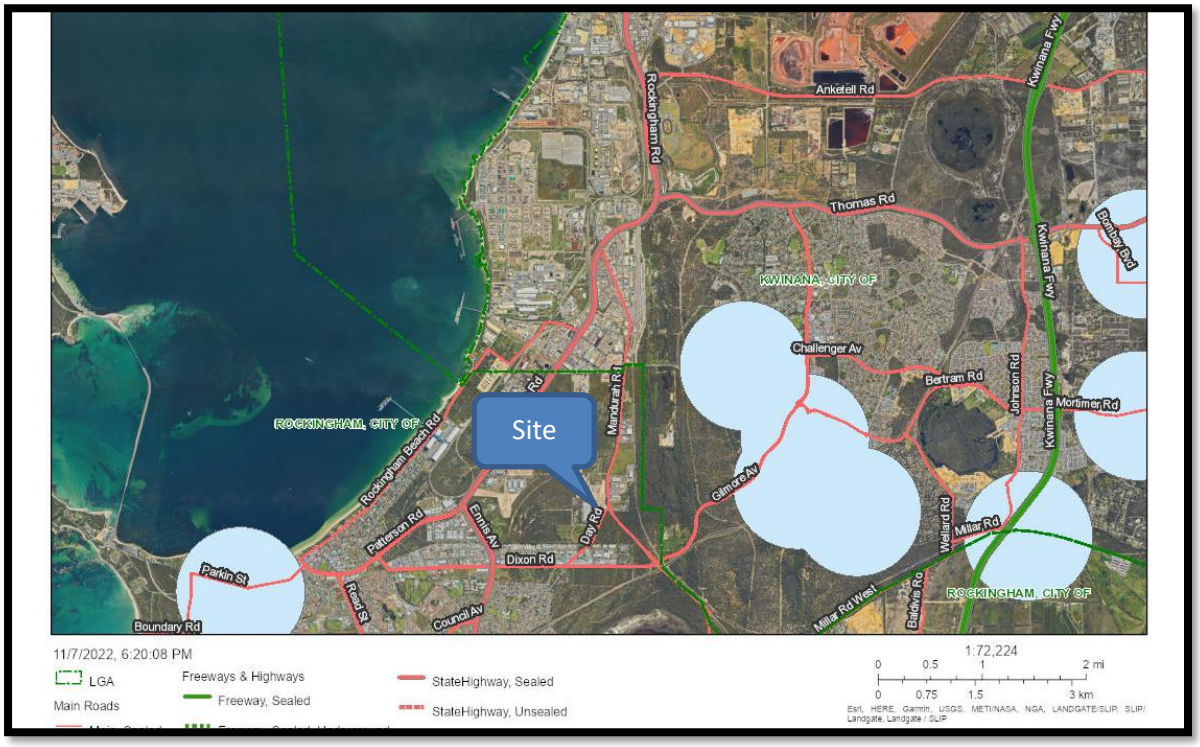


Figure 3: Regional Location of Tuart Woodland TEC and Black Cockatoo Habitat within 12km of the Referral Area

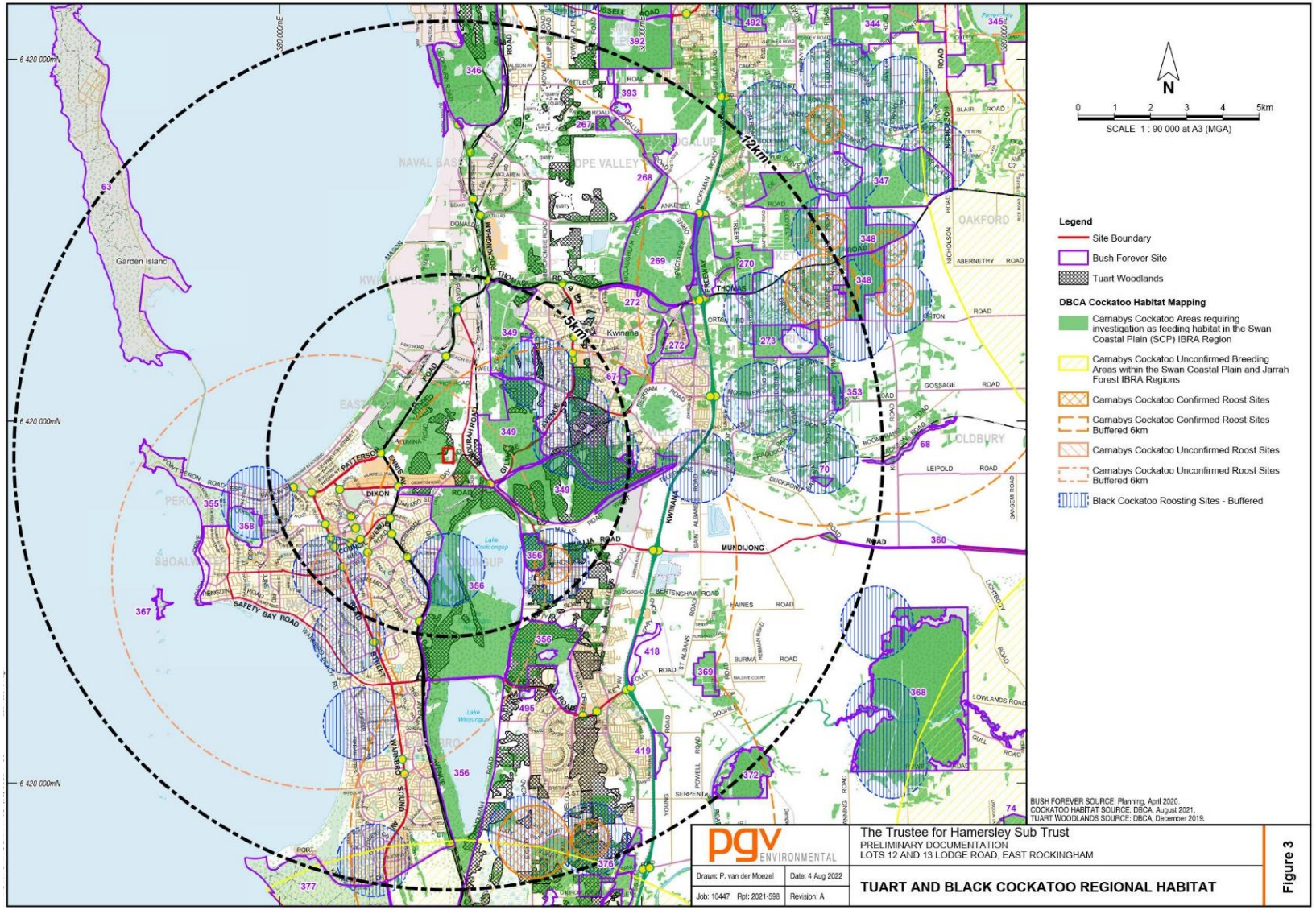


Table 6: Habitats used by Carnaby's Black Cockatoos

Habitat Type	Carnaby's Black Cockatoo Habitat Requirements *	Description of Habitat on proposal Site	Quantity
Breeding	Generally, in woodland or forest, but also breeds in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of Salmon Gum (*Eucalyptus salmonophloia*), Wandoo, Tuart, Jarrah (*Eucalyptus marginata*), Flooded Gum (*Eucalyptus rudis*), York Gum (*Eucalyptus loxophleba* subsp. *loxophleba*), Powderbark (*Eucalyptus accedens*), Karri and Marri.	There is no confirmed breeding on the site by Carnaby's Black Cockatoos and there are no trees with suitable hollows for breeding on the site (Attachment 3). Potential breeding sites are located greater than 12km to the east of the proposal site.	58 Potential Breeding Trees
Night Roosting	Generally, in or near riparian environments or natural and artificial permanent water sources. Flat-topped Yate (*Eucalyptus occidentalis*), Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, introduced Eucalypts (for example blue gum) and introduced Pines.	The site is not riparian vegetation or near a permanent water source and therefore not typical roosting habitat for Carnaby's Black Cockatoos. The tall trees do make it possible to be utilised if a water source is nearby, however roosting by any species of Black Cockatoo has not been recorded on the site during the great cocky count (Plate 8).	Possible impact 1.5ha – not typical habitat so Low possibility of impact
Foraging	Native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as *Banksia* sp., *Hakea* sp. and *Grevillea* sp. Forages in Pine plantations (*Pinus* sp.), Eucalypt woodland and forest that contains foraging species. Also individual trees and small stands of these species.	Carnaby's Black Cockatoos are known to forage on the Swan Coastal Plain in the winter non-breeding season (Rycken *et al*., 2021) The site contains of vegetation that contains Marri, the primary food source for this species and therefore is high quality foraging habitat. The Tuarts are a secondary food source so are considered to be moderate quality foraging habitat	1.5 ha Moderate quality foraging habitat
Foraging common food items	Seeds, flowers and nectar of native proteaceous plant species (for example, *Banksia* sp., *Hakea* sp. and *Grevillea* sp), Eucalypts and Bottlebrush (*Callistemon* sp.). Also seeds of introduced species including *Pinus spp., Erodium* sp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.		

* Source: SEWPaC, 2012

2.2.4 Black Cockatoo Habitat Regional Context

A number of Bush Forever sites occur within 12km of the proposal site with a total area of more than 7,434ha of vegetation that is typical Black Cockatoo Habitat (Figure 3). An estimated additional 5,100ha of potential habitat for Carnaby's Black Cockatoo occurs outside of conservation areas (Glossop *et al*., 2011).

The RIZ which is adjacent to the proposal site has 91ha of typical Black Cockatoo habitat providing significant resources for Carnaby's Black Cockatoo.

The full results for the Black Cockatoo habitat assessment are provided at Attachment 3.

3 ASSESSMENT OF IMPACTS

3.1 Direct Impacts

3.1.1 Impact

The impact on the Tuart TEC and Black Cockatoo habitat is outlined in Table 7.

Table 7: Impacts on MNES

MNES	Listing	Impact
Tuart Woodland TEC	Critically Endangered	5.495ha (includes 30m buffer)
Carnaby's Black Cockatoo	Endangered	58 Potential breeding habitat trees
		1.5 ha Roosting habitat
		1.5 ha low quality foraging habitat

3.1.2 Tuart TEC

The Tuart TEC onsite has a small extended area (1.295ha) into the RIZ conservation area to the west. The RIZ conservation area protects an approximate 25ha of Tuart TEC (SLIP, 2022) in one large patch in the SW corner. The 1.295ha is already fragmented from the larger patch in the conservation area by a track and firebreak, however it is large enough to continue to function as the TEC.

3.1.3 Carnaby's Black Cockatoo

The direct impacts on Black Cockatoos are defined as the loss of habitat associated with the proposed action, these are outlined in Table 7. The proposed action will impact black cockatoos through increased fragmentation of habitat across the wider locality. The impact of the fragmentation is unlikely to be significant due to the lower quality foraging value of Tuart Trees in the surrounding areas, including more than 91ha of quality habitat (Banksia spp., Jarrah, Marri, Sheoak) adjacent to the west of the proposal site (within the RIZ conservation area), and 7,434ha within 12 km of the proposal site within secure reserves (Figure 4). The availability of black cockatoo habitat in areas adjacent to the proposal site reduces the relative fragmentation impacts of the proposed action.

The implementation of the proposed action has the potential to result in black cockatoo interactions during clearing and construction works, which could lead to fauna injury or mortality. Potential impacts would only be at risk of occurring for a temporary period of time, being the duration of the clearing process.

The proposal site does not have any evidence of or known breeding trees suitable for Carnaby's Black Cockatoo. The closest known breeding sites are located greater than 12km to the east of the proposal site (Figure 3).

3.2 Indirect Impacts

The Tuart Woodland TEC is highly fragmented across the landscape as shown in the Tuart Mapping (Tuart Response Group, 2002) (Figure 3). The clearing of the proposal site will reduce a patch by 5.5ha (includes the 30m buffer).

A number of vegetation degrading processes can be associated with residential and commercial development that may impact on the Tuart Woodland TEC and Black Cockatoos habitat in adjacent areas. Identified risks to the Tuart Woodland TEC in the surrounding area include:

- Inadvertent clearing or damaging native vegetation on the adjacent area;
- Damage to the root zones on vegetation in the adjacent area;
- The spread of weeds from the proposal site into the adjacent area;
- The spread of dieback from the proposal site into the adjacent area;
- Temporary impact of dust during construction;
- Rubbish blowing off the proposal site into the adjacent area;
- Increased illegal dumping; and
- Changes in hydrology of surface water and groundwater.

However, whilst the proposed action may result in some minor impacts in this regard, these are unlikely to be significant.

3.3 Consequential Impacts

There are no consequential impacts associated with the proposed development.

3.4 Cumulative Impacts

The Tuart Woodland TEC has 2,320.3ha in the City of Rockingham according to the Tuart Woodland Mapping (Tuart Response Group, 2002) (Figure 3). The total impact of the clearing is <0.04% of the Tuart Woodland in the City (Attachment 2).

The Black Cockatoo habitat in surrounding areas has been estimated from the local reserves and the descriptions of the vegetation in the reserves to determine the habitat value for Black Cockatoos. The Black Cockatoo Habitat Assessment and Figure 3 shows that there is more than 7,434ha of quality habitat in secure Bush Forever sites within 12km of the proposal area. An additional 91ha of potential habitat for Carnaby's Black Cockatoo is in conservation listed land directly adjacent to the western boundary of the Proposal Area. The impact of clearing the proposal area will reduce the area of foraging habitat by 1.5ha or 0.02% of the total Carnaby's Black Cockatoo habitat within 12km of the proposal area. The cumulative impact is not considered to be significant. A full analysis of habitat in the surrounding reserves is provided in Attachment 3.

3.5 Risk Assessment of Potential Impacts

A risk assessment of the potential impacts to the Tuart Woodland TEC and Black Cockatoos discussed above has been undertaken, based on the definitions in Table 8 and the risk matrix provided in Table 9. As the impacts are to the Tuart Woodland TEC vegetation as well as vegetation that provides Black Cockatoos Habitat the risks are considered for the two MNES, except the risks pertaining specifically to Black Cockatoos. The risk assessment has calculated the residual risk of the proposed impacts, when implementation of the proposed mitigation measures is considered. The results of the risk assessment are provided in Table 10.

Table 8: Risk Assessment Definitions

Qualitative measure of likelihood (how likely is it that this event/circumstance will occur after management activities are implemented)	
Highly likely (E)	Is expected to occur in most circumstances
Likely (D)	Will probably occur during the life of the project
Possible (C)	Might occur during the life of the project
Unlikely (B)	Could occur but considered unlikely or doubtful
Rare (A)	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor (1)	Minor incident of environmental damage that can be reversed (*e.g. short-term delays to achieving plan objectives, implementing low- cost, well-characterised corrective actions*)
Moderate (2)	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. short term delays to achieving plan objectives, implementing well- characterised, high-cost/effort corrective actions*)
High (3)	Substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions*)
Major (4)	Major loss of environmental amenity and real danger of continuing (*e.g. plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies*)
Critical (5)	Severe widespread loss of environmental amenity and irrecoverable environmental damage (*e.g. plan objectives are unable to be achieved, with no evidenced mitigation strategies*)

Table 9: Risk Assessment Matrix

		Likelihood				
		Rare (A)	Unlikely (B)	Possible (C)	Likely (D)	Highly Likely (E)
Consequences	Minor (1)	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	Moderate (2)	Acceptable	Acceptable	Acceptable	Moderate	Moderate
	High (3)	Acceptable	Moderate	Moderate	High	High
	Major (4)	Moderate	Moderate	High	High	Extreme
	Critical (5)	Moderate	High	High	Extreme	Extreme

Inherent risk to the MNES assumes all controls typical to residential and commercial developments such as Urban Water Management Plans, Acid Sulphate Soils investigation and Management, Dewatering Management Plans are not prepared and implemented in accordance with best practice.

The residual risk is determined with the development and implementation of these plans as well as the Flora and Fauna Management Plan that has been specifically developed to mitigate the offsite impacts on MNES (Attachment 4). The risk analysis is provided in Table 10. The residual risk of each

potential impact (when the proposed mitigation measures have been considered) are all Acceptable, which is considered to be a satisfactory outcome.

Table 10: Risk Analysis

Potential Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Significance		Likelihood	Consequence	Significance
Black cockatoo interactions during clearing and construction works	B	3	Moderate	Speed limits, regulated clearing times, fauna friendly clearing methods as per the Flora and Fauna Management Plan	A	3	Acceptable
Direct impacts of the future development on clearing or damaging native vegetation on the adjacent area	B	3	Moderate	Access and vegetation clearing demarcation as well as onsite inductions as per the Flora and Fauna Management Plan	A	3	Acceptable
Damage to the root zones on vegetation in the adjacent area unlikely due to the currently cleared fire break on the adjacent site and the cleared area along the western boundary of the site providing 10m cleared separation	A	3	Acceptable	Access and vegetation clearing demarcation as well as onsite inductions as per the Flora and Fauna Management Plan	A	3	Acceptable
The spread of weeds from the development site into the adjacent area	B	3	Moderate	Access control, regular monitoring and control if required as per the Flora and Fauna Management Plan	A	2	Acceptable
The spread of dieback from the development site into the adjacent area	C	3	Moderate	Hygiene procedures as per Flora and Fauna Management Plan	B	3	Acceptable
Temporary impact of dust during construction	C	2	Moderate	Dust control methods as per Flora and Fauna Management Plan	B	2	Acceptable
Rubbish blowing off the development site into the adjacent area	C	1	Acceptable	Adopting clean work practices as per the Flora and Fauna Management Plan	B	1	Acceptable
Increased illegal dumping	B	1	Acceptable	No controls proposed – currently dumping being undertaken and increased surveillance should decrease this activity	A	1	Acceptable

Potential Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Significance		Likelihood	Consequence	Significance
Changes in hydrology of surface water and groundwater	B	4	Moderate	Management of groundwater and stormwater in accordance with the Urban Water Management Plan	A	4	**Acceptable**
Disruption of foraging or roosting during construction	**C**	**2**	**Acceptable**	Limitation of work hours to protect any night roosting and limited access to adjacent bushland as per the Flora and Fauna Management Plan	**B**	**2**	**Acceptable**

4 AVOIDANCE AND MITIGATION MEASURES

4.1 Impact avoidance measures

Measures to avoid potential impacts to Black Cockatoos and Tuart TEC as part of commercial development proposals are typically associated with the provision of conservation or POS areas, which provide for the retention of habitat and avoid potential impacts associated with loss and fragmentation of habitat.

There are limited opportunities to avoid these potential impacts of the proposed action on Black Cockatoos and Tuart TEC. This is primarily due to the small size of the Lot and its land use zoning for General Industry/Commercial purposes.

The impact to the Tuart TEC is considered significant in terms of the "Critically Endangered' listing of the TEC. The Proponent is proposing to offset the clearing of the TEC by revegetating a portion of the nearby Rockingham Lakes Regional Park with Tuarts.

The impact to Black Cockatoos is not considered to be significant in terms of the availability of suitable habitat (91ha) in a conservation area adjacent to the proposal site. Therefore, there are no avoidance measures proposed for the re-development of the proposal site.

4.2 Impact mitigation measures

There are areas adjacent to the proposed development that contain Tuart Woodland TEC and habitat for Black Cockatoos.

The mitigation of the potential impact on these MNES will be guided by the Flora and Fauna Management Plan that has specifically been developed to manage both direct and indirect impacts on MNES. The Management Plan is provided as Attachment 4 and addresses the risk as identified in the risk assessment and provides management measures that will result in the offsite impacts to the MNES are appropriately managed.

4.3 Residual impacts

As there is no ability to retain any of the native vegetation in the development the proposed action will result in residual impacts to the Tuart Woodland TEC and Black Cockatoos. An offset package is proposed to revegetate a portion of the Rockingham Lakes Regional Park with Tuarts and Banksia species.

5 OFFSETS

5.1 Need for an Offset

The proposed re-development of the proposal site will have residual impacts on the *Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community* and on Carnaby's Black Cockatoo. According to the EPBC Act Environmental Offsets Policy an offset for each listed species and community is required.

5.2 Tuart Woodland TEC Offset

5.2.1 Strategy

The proposed offset strategy is to create a 3.5ha Tuart Woodland TEC in an area of bare ground within the Rockingham Lakes Regional Park that is in close proximity to existing areas of Tuart Woodland TEC as well as other Tuart revegetation sites. The revegetated area will contain Tuart trees, mid-storey and understorey native species that meet the definition of a Tuart Woodland TEC in Very High condition with at least 12 understorey species. The species mix will also include tree and shrub species suitable for Black Cockatoo foraging and potential breeding.

5.2.2 Offset Site

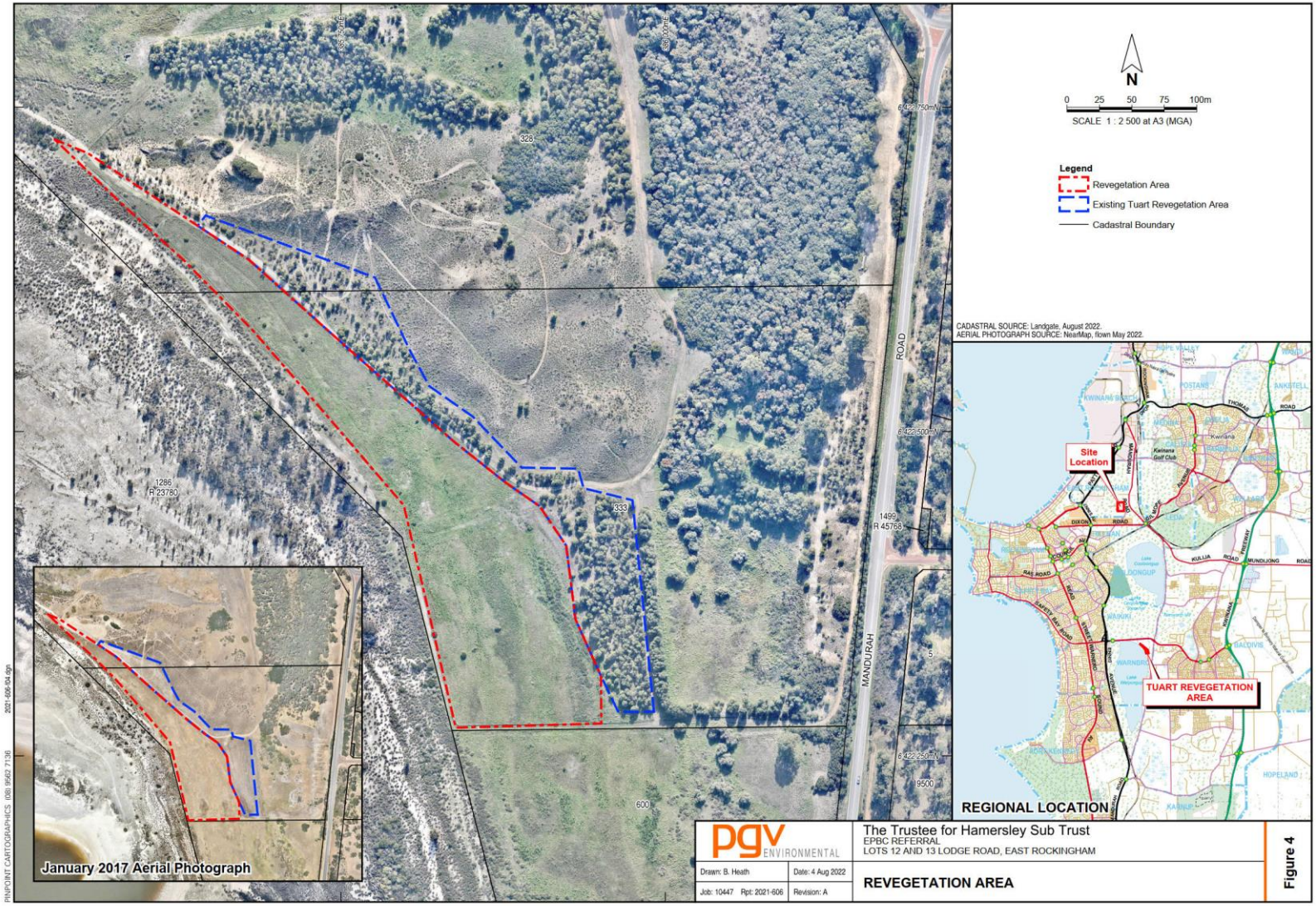
The offset site (Lot 333 Mandurah Road, WAPC REF 1386/2) is located 7km to the south of the Proposal Area and is within the Rockingham Lakes Regional Park (Bush Forever Site No. 356) at the corner of Safety Bay Road and Mandurah Road. The offset site is in the vicinity of large areas of mature Tuart woodland (Figure 4). The area to be revegetated was partly cleared prior to 1965 and completely cleared between 1965 and 1970 and used for grazing purposes. An existing successful Tuart rehabilitation project located immediately adjacent to the offset site is more than 6 years old and demonstrates that the site is suitable to be rehabilitated as a Tuart woodland.

All national parks, conservation parks, nature reserves, and other similar reserves are vested in the Conservation Commission of Western Australia (Conservation Commission). These reserves are managed on behalf of the Conservation Commission by the DBCA. The potential offset site has been discussed with DBCA, the land manager, and the Western Australian Planning Commission (WAPC), the landowner of the proposed offset site. The DBCA has confirmed that the proposed offset is satisfactory from their perspective and that the WAPC have agreed to the proposed revegetation of the offset site.

The revegetation of the offset site will increase the regional extent of Tuart Woodland ecological community protected in conservation estate by 3.5ha and complement the existing areas of Tuart Woodland in the Regional Park. The quality and value of the proposed offset will be greater than that being cleared as the ecological community will have a greater diversity of native species than the area proposed to be cleared and is in an area that is protected for conservation purposes. Creation of the TEC will also provide habitat suitable for Black Cockatoos.

The condition of the offset site is completely degraded as it was historically cleared for stock grazing purposes. A baseline Flora and Vegetation Survey of the offset site is not required as it only contains weed species as shown in Figure 4.

Figure 4: Proposed Offset Site



5.2.3 Previous Experience

PGV Environmental has previous experience in successfully creating Tuart Woodland communities on completely cleared paddocks.

The first example was undertaken in Yellagonga Regional Park as an offset for EPBC 2010/5777. The project rehabilitated two areas of Yellagonga Regional Park that were cleared paddocks. Initially topsoil from a recently cleared site was transferred onto the paddock and additional seed was spread onto the site. However, the results from that method did not meet the completion criteria. Therefore, the whole area was planted with tubestock in the following year. The results of that planting have been very successful, with the completion criteria being met after 5 years. Plate 10 shows one part of the site at the commencement of the rehabilitation programme with site works having just been finished. Plate 11 shows the exact same spot and angle in November. Plate 12 and 13 show another part of the site prior to rehabilitation Plate 12 and 3 years after planting tubestock (Plate 13).

Plate 10: Yellagonga Site 1 in 2016

Plate 11: Yellagonga Site 1 in 2022

Plate 12: Yellagonga Site 2 in 2015

Plate 13: Yellagonga Site 2 in 2018

The twice-yearly monitoring of the Yellagonga Regional Park rehabilitation project site over 6 years documented the survival of many native tree, mid-shrub and small shrub species. Tuart trees are surviving in all six monitoring plots and are up to 6m tall. Table 11 lists the native species present in each of the monitoring plots after 5 years. Each plot is 100m^2 in size. One plot meets the species diversity of a Tuart Woodland TEC in Moderate Condition, two meet the High Condition category and three meet the Very High condition threshold (Table 11). The Yellagonga Regional Park

rehabilitation project was only an offset for Carnaby's Black Cockatoo and not for the Tuart Woodland TEC. The results provided here demonstrate that it was possible to create a Tuart Woodland TEC without that being the objective of the programme. If the objective was to re-create the TEC the outcome would be superior with more focus on diversity and stratification of the planted vegetation.

Table 11: Species Recorded in Yellagonga Monitoring Plots

Species	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
Eucalyptus gomphocephala	**4**	**3**	**5**	**1**	**2**	**2**
Acacia cyclops	+					+
Acacia huegelii				+		
Acacia lasiocarpa		+				+
Acacia pulchella			+		+	+
Allocasuarina fraseriana	+	+				
Allocasuarina humilis	+	+				+
Banksia attenuata				+	+	+
Banksia dallanneyi						+
Banksia menziesii			+	+	+	+
Banksia prionotes		+		+	+	+
Calothamnus quadrifidus	+			+		
Calothamnus sanguineus	+		+	+		+
Corymbia calophylla	+			+	+	+
Eucalyptus marginata		+				+
Eucalyptus todtiana	+	+	+			+
Hakea prostrata	+			+		+
Hakea lissocarpha	+	+				+
Hakea trifurcata		+				+
Jacksonia calcicola	+	+			+	
Jacksonia furcellata					+	+
Kunzea glabrescens	+	+	+	+	+	+
Lomandra maritima	+					
Melaleuca huegelii	+					+
Melaleuca systena	+	+	+	+	+	+
Number of Native Species	**15**	**12**	**7**	**11**	**10**	**20**

The rehabilitated areas in the Yellagonga Regional Park are starting to provide foraging habitat for Black Cockatoos with foraging recorded in 2020 on Marri nuts (Plate 14) (four years after planting) and 2022 on Banksia species (Plate 15 and 16) (six years after planting). The rehabilitation undertaken on the Yellagonga site clearly shows that a rehabilitation program is capable of re-creating a Tuart Woodland that meet the criteria of a TEC in High condition, as well as provide foraging habitat from Black Cockatoos within 6 years.

Plate 14: Foraging on Planted Marri, 2020

Plate 15: Foraging on Planted Acorn Banksia 2022

Plate 16: Foraging on Planted Parrot Bush 2022

The second example of successfully creating a Tuart woodland is located directly to the east of the proposed offset site as shown on Figure 4. The revegetation programme was an offset for Carnaby's Black Cockatoo in Rockingham (EPBC2010/5337). The revegetation project was undertaken over four areas of bare paddock within the Rockingham Lakes Regional Park. Rehabilitation work commenced in 2016 and by 2021 the project was deemed to have met the completion criteria due to the number of Tuart plants surviving.

Plate 17 shows one of the bare areas prior to planting. Plate 18 shows a healthy stand of Tuart trees 6 years after planting.

Plate 17: Cleared Paddock that was part of the Revegetation Project

Plate 18: Healthy Tuarts 6 Years Post Planting

The rehabilitation work was not undertaken to create a Tuart Woodland TEC, however some native understorey species were planted in the revegetation programme. Monitoring was only undertaken for Tuart tree survival therefore there are no monitoring data over the 5 year trial to assess against the Tuart Woodland TEC condition criteria. A site visit undertaken in January 2023 recorded eight native species in the understorey of one of the rehabilitated areas being:

- *Acacia pulchella* (Prickly Moses);
- *Acacia rostellifera* (Summer-scented Wattle);

- *Acacia saligna* (Coojong);
- *Daviesia* sp.
- *Hakea prostrata* (Harsh Hakea);
- *Jacksonia furcellata* (Grey Stinkwood);
- *Macrozamia riedlei* (Zamia Palm) (mature plants); and
- *Xanthorrhoea preissii* (Grass Tree) (juvenile plant).

As with the Yellagonga Regional Park project, the creation of a Tuart Woodland TEC in the Rockingham Lakes Regional Parks site was not the objective. Had it been, a greater number of understorey species would have been planted. The results here demonstrate that Tuarts can be established easily on this site as well as understorey species.

Previous experience on both sites shows that the use of tubestock over planting seed is more successful in these weedy paddock situations. The use of watering over at least two summers after planting was shown to greatly improve the seedling survival over summer on one site and result in healthy growth in the tubestock. These learnings as well as the use of current best practice management will be utilised in the establishment of the Tuart Woodland TEC vegetation for this project.

The ease at which Tuart trees and many of the Tuart Woodland TEC understorey species are able to be grown on bare sites indicates the completion criteria to meet the definition of the Tuart Woodland TEC would not be difficult to obtain. The following section provides further detail on a Rehabilitation Plan that will guide the site preparation, planting and maintenance of the rehabilitation area in order to meet the objective of restoring the bare paddock to a Very High condition Tuart Woodland TEC.

5.2.4 Proposed Rehabilitation Plan

5.2.4.1 Objective

The proposed Rehabilitation Plan for the offset site would be prepared using the learnings from previous experience. The overarching objective of the Plan will be to establish vegetation in the cleared area that meets the definition of a Tuart Woodland TEC in Very High condition as defined by the Tuart Woodland Listing advice. The listing advice states:

> *Very High condition*
> *≥80 % of all understorey^ vegetation cover is native# Or At least 12 native understorey^ species per 0.01 ha (10 m x 10 m plot or equivalent sample unit)*

The proposed rehabilitation will have completion criteria that will ensure that the vegetation meets, or will meet when mature, both of these criteria by establishing at least 12 native species in the understorey and establishing an understorey that is at least 2 native plants per square metre that are likely to reach maturity. These completion criteria have been far exceeded in the Yellagonga Regional Park.

5.2.4.2 Initial Planting Phase

The Rehabilitation Plan will be a technical document that provides detail for the following pre-planting, planting and post-planting phases of the project:

- Weed management including weed treatments specific to the weeds that are present on the site and those of weed species known to be emergent in the area that may colonise the prepared site as per previous experience;
- Management of pest fauna such as rabbits that may impact on the success of the rehabilitation, likely to include fencing as well as use of tree guards when appropriate;
- Soil management including areas in which light scarifying or deeper ripping are required and the directionality of furrows to prevent the causing of soil erosion as well as to collect water, directing it to the root-zone of seedlings by ensuring the spoil will be hilled on the down-slope side to better trap and retain water.
- Soil Hygiene measures to prevent the spread of soil borne pathogens, particularly *Phytophthora multivora*, commonly known as Tuart Dieback, which, while not often causing the death of Tuarts unless the tree is already stressed, can impact on the health of Tuart trees;
- The final species list to be used in the rehabilitation will be endorsed by DBCA. The list is most likely to include species as used in the adjacent area of the Regional Park in the previous rehabilitation efforts which include:
  - *Acacia pulchella* (Prickly Moses);
  - *Acacia lasiocarpa*;
  - *Acacia saligna* (Coojong)
  - *Banksia menziesii* (Firewood Banksia);
  - *Rytidosperma occidentale*;
  - *Austrostipa flavescens*;
  - *Banksia sessilis* (Parrot Bush);
  - *Conostylis aculeata* (Prickly Conostylis);
  - *Hakea prostrata* (Harsh Hakea);
  - *Hardenbergia comptoniana* (Native Wisteria);
  - *Jacksonia furcellata* (Grey Stinkwood);
  - *Macrozamia riedlei* (Zamia Palm);
  - *Olearia axillaris* (Coastal Daisybush);
  - *Templetonia retusa* (Cockies Tongues); and
  - *Xanthorrhoea preissii* (Grass Tree)
- Tubestock will be sourced using local provenance seed where possible;
- Timing of planting to ensure the planting of tubestock takes place at the optimal time to enhance the possibility of tubestock survival; and
- Density of planting of each strata to establish vegetation that is varied to have a level of naturalness as well as to ensure the overstory, understory and climbing species are evenly distributed throughout the rehabilitated area.

5.2.4.3 Monitoring and Follow-up Management

The Rehabilitation Plan will also detail the management of the rehabilitation area once the initial planting is complete including:

- Specifying a 5 year monitoring program which is the length of time it took the Yellagonga project and the Tuart planting project to reach a point at which there is confidence in the final outcome that will meet the objective of the project;
- A monitoring regime to guide management actions to ensure the rehabilitation will meet completion criteria and meet the overall objective;
- Ongoing weed management measures after the planting is complete to prevent weeds impacting on the planted vegetation; and
- Trigger levels that require infill planting to be undertaken to ensure that the quality of the rehabilitated vegetation meets the completion criteria.

5.2.4.4 Completion Criteria

Completion criteria to be achieved will ensure the recreation of the TEC meets the definition of High quality as per the listing advice and will include:

- Survival of, on average, 1.6 Tuart trees every 100m^2;
- Diversity of at least 12 understorey species in each monitoring quadrat (10 m x 10 m plot or equivalent sample unit);
- Weed coverage of less than 20% of the overall vegetation cover (in each 10 m x 10 m plot or equivalent sample unit); and
- Native vegetation coverage of 80% of the overall vegetation cover or maturing to a cover of 80%.

5.2.4.5 Contingency Planning

Contingency planning will detail trigger levels that would require the contingency plan to be implemented that will be measured during monitoring or if an event occurred such as fire or vandalism.

- If there is a decline in the vegetation health or condition within rehabilitation site as measured during monitoring and compared to previous monitoring results, the following contingency plan will be implemented:
    1. Consider potential causes for decline in vegetation health or increase in weed cover.
    2. Determine if the decline may be within normal limits, ie a result of seasonal fluctuations or timing of scheduled weed control.
    3. If decline in health is not within normal limits, determine the most likely cause of this decline.
    4. Prepare a management plan to remediate and mitigate the impacts on the vegetation once the source of the decline is known, for example if the site becomes infested with dieback prepare a dieback management plan detailing the treatment using phosphite and ongoing monitoring and testing to ensure the disease does not cause the loss of Tuarts.
    5. Undertake infill planting and weed management once the source of the decline has been mitigated.

6. Continue monitoring vegetation health and the effectiveness of remedial actions.

- If new infestations of invasive weeds are recorded in the rehabilitation site the following will be undertaken:
  1. Investigation of the potential sources of the weeds.
  2. If the weeds originate in adjacent areas:
     - Liaison with DBCA to manage the weeds in the adjacent area; and
     - The weeds occurring on the site will be managed by an appropriate weed contractor that is proficient in managing weeds in bushland.
  3. Follow-up monitoring will be undertaken on a monthly basis to ensure the weeds have been managed.

- If the site is damaged by fire the following will be undertaken:
  1. Consider potential causes of the fire and liaise with DBCA if the cause can be mitigated to prevent further fires.
  2. Review the recovery of the vegetation including weed emergence and resprouting.
  3. Manage any weed emergence in accordance with the weed contingency plan.
  4. If the planted tubestock don't survive then arrangements to be made for replanting in the following autumn.
  5. Ongoing monitoring of recovering and/or planted tubestock until the completion criteria are met.

- If the site is damaged by vandalism the following will be undertaken:
  1. Consider potential access point and liaise with DBCA if additional fencing or other access restriction methods should be employed.
  2. Repair any fences that could have provided the access point.
  3. Review the recovery of the vegetation including weed emergence and resprouting.
  4. Manage any weed emergence in accordance with the weed contingency plan.
  5. If the planted tubestock don't survive then arrangements to be made for replanting in the following autumn.
  6. Ongoing monitoring of recovering and/or planted tubestock until the completion criteria are met.

All contingency actions and outcomes, if required, will be reported in the annual compliance report.

5.2.5 Assessment Against DCCEEW's Offset Assessment Guide

Table 12 is an assessment of the proposed Tuart Woodland Offset site utilising the parameters in the Offset Assessment Guide (DCCEEW, 2021). The complete calculator spreadsheet is provided as Attachment 5 and achieves a 109.07% value for the offset.

Table 12: Assessment Using Offsets Guide for Tuart Woodland TEC

Parameter	Value	Justification
Impact Site		
Area of Community	5.49ha	As determined by the Tuart Woodland TEC assessment
Quality of Community	2	The condition of the vegetation on the site was assessed as Completely Degraded (Keighery scale) and Low quality (Conservation Advice) and contains a high percentage of weed species and very low native species richness (3 species).
Offset Site		
Time over which loss is averted	20	The maximum 20 years has been applied
Time until ecological benefit	5	Five years is considered an adequate time for Tuart trees and understorey species to have been revegetated to the required completion criteria necessary to obtain a high degree of confidence that the vegetation will continue to grow into a mature Tuart Woodland TEC
Area of habitat	3.5ha	The revegetation area will be approximately 3.5ha in size. Provides a 109.07% outcome for the offset.
Start quality of habitat	0	The proposed area for revegetation is currently a bare paddock located in a Regional Park that is zoned for Parks and Recreation.
Future quality of habitat without offset	0	There are no plans to revegetate the area according to DBCA and the WAPC.
Future quality of habitat with offset	7	7 is considered realistic given that many of the understorey species typical of Tuart Woodland TEC, such as ephemeral species and sedges will likely not be able to be propagated and planted in the revegetation exercise. The mid a lower stratums will include greater than 12 species and will include Black Cockatoo foraging species.
Risk of loss without offset	N/A	There is no TEC in the area, therefore this value is not relevant to a revegetation exercise
Risk of loss with offset	N/A	As above
Confidence in result (bottom row)	75%	Tuart trees are one of the easiest Eucalypts to grow and have been used in revegetation programmes in the Rockingham Lakes Regional Park with success for other EPBC Act offsets. A wide range of Tuart woodland understorey species are also readily used in revegetation projects. The project examples provided confirm the ability to recreate a High condition Tuart Woodland TEC is absolutely possible.

5.2.6 Assessment Against EPBC Act Offsets Policy

Table 13 assesses the proposed offsets for the Tuart Woodland TEC against the EPBC Act Offsets Policy.

Table 13: Assessment Against EPBC Act Offsets Policy for Tuart Woodland TEC

EPBC Act Environmental Offsets Policy Principles	Assessment of proposed offset strategy against principles
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	The offset will create 3.5ha of high quality Tuart Woodland TEC within a Regional Park and Bush Forever Site managed by DBCA/DPLH to offset the clearing of 5.49ha (Poor Quality) Tuart Woodland on the proposal site.
Be built around direct offsets but may include other compensatory measures	The proposed offset for Tuart Woodland TEC is a direct offset
Be in proportion to the level of statutory protection that applies to the protected matter	The area of revegetation, 3.5ha has been calculated based on the Critically Endangered status of the Tuart Woodland TEC
Be of a size and scale proportionate to the residual impacts on the protected matter	The area of revegetation, 3.5ha provides a 109.07% outcome for the offset which is over and above the required 100% offset.
Effectively account for and manage the risks of the offset not succeeding	The revegetation programme will have completion criteria that require infill planting if the requisite criteria are not being met.
Be additional to what is already required, determined by law or planning regulations or agreed to under other scheme or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action)	The 3.5ha of bare land in the Regional Park/Bush Forever Site is not proposed for revegetation by DBCA/DPLH in the long-term. Therefore, the proposed offset is additional to the management of the Regional Park/Bush Forever Site already being undertaken by DBCA/DPLH.
Be efficient, effective, timely, transparent, scientifically robust and reasonable	Planning for the proposed revegetation plan can commence immediately upon approval of the Action. The land is available as it is already part of the Regional Park/Bush Forever Site and owned by the WA Government.
Have transparent governance arrangement including being able to be readily measured, monitored, audited and enforced.	The progress of the revegetation works will be reported on in the annual compliance reporting required under the EPBC Act approval and will be available for public viewing on the proponent's website.

5.2.7 Implementation

The offset site is part of the Rockingham Lakes Regional Park/Bush Forever Site and is owned by the WAPC. Therefore, preparations for revegetating the 3.5ha site can commence if the Proposal is approved under the EPBC Act. The Proponent will undertake all revegetation works and manage the site for the required number of years until the completion criteria are met.

The revegetation will create a Tuart Woodland TEC of Very High condition. The revegetation will be undertaken in consultation with DBCA and will comprise of a Tuart overstorey, mixed with other tree

species with Black Cockatoo habitat value, and planted native understory with at least 12 different species. The understorey species to be used will be determined from the surrounding native vegetation.

5.3 Black Cockatoos

5.3.1 Strategy

The proposed offset strategy is to include quality foraging species in the Tuart revegetation project.

5.3.2 Offset Site

The same offset site identified in 5.2.2 will be used for the foraging revegetation project.

5.3.3 Assessment Against DCCEEW's Offset Assessment Guide

The proposed offset was assessed using the DCCEEW Offset Assessment Guide. The offset spreadsheet is shown in Attachment 7. Justification for the parameters used in the offset spreadsheet are provided in Table 14.

Table 14: Assessment Using Offsets Guide for Black Cockatoos

Parameter	Value	Justification
Impact Site		
Area of Habitat	1.5ha	As determined in the Black Cockatoo habitat assessment
Quality of Habitat	6	The foraging habitat on the proposal site is limited to Tuart Trees. The condition of the vegetation on the proposal site is rated as Completely Degraded as there is no structure or diversity of flora species. Tuarts provide a moderate quality foraging habitat. The foraging quality scoring tool and the habitat quality scoring tool provided by DCCEEW both gave a score of 6 to the impact site (Attachment 7 and 8). The tools use site and regional context for assessing the value of a site.
Offset Site		
Time over which loss is averted	20 years	The maximum 20 years has been applied.
Time until ecological benefit	5 year	5 years is considered an adequate time for Tuart, Banksia spp. and understorey species to have been revegetated to the required completion criteria necessary to obtain a high degree of confidence that the vegetation will continue to grow into a mature Tuart Woodland TEC supplemented with quality foraging habitat (Banksia spp.) for Black Cockatoos. The 5 year timeframe has been based on recent experience in two other EPBC offset revegetation projects (2010/5777 and 2010/5337) for creating black cockatoo foraging habitat in areas that were bare paddocks.
Area of habitat	3.5ha	As determined by the spreadsheet to achieve the minimum 137.39%.
Start quality of habitat	0	The revegetation site is largely bare paddock with weeds and is zoned for Parks and Recreation and is within a large Regional Park next to two lakes.

Parameter	Value	Justification
Future quality of habitat without offset	0	The revegetation site would remain in its current state as DBCA don't anticipate a revegetation project being implemented in the future.
Future quality of habitat with offset	5	5 is considered realistic given that many of the understorey species typical of Banksia woodland, such as ephemeral species and sedges will likely not be able to be propagated and planted in the revegetation program. The focus for the revegetation is to provide habitat for Black Cockatoos and the mid and lower strata will include foraging species whilst the Tuart Trees will provide future roosting habitat once they mature.
Confidence in result (top row)	90%	DBCA/WAPC don't have any plans to revegetate the area.
Risk of loss without offset	N/A	There is no foraging habitat in the area, therefore this value is not relevant to a revegetation exercise
Risk of loss with offset	N/A	As above
Confidence in result (bottom row)	75%	Tuart trees are one of the easiest Eucalypts to grow and have been used in revegetation programmes in the Rockingham Lakes Regional Park with success for other EPBC Act offsets. A range of Black Cockatoo foraging species will be planted amongst the Tuarts to provide quality foraging habitat. Woodland understorey species are also readily used in revegetation projects.

5.3.4 Assessment Against EPBC Act Offsets Policy

Table 15 assesses the proposed offsets for Carnaby's Black Cockatoos against the EPBC Act Offsets Policy.

Table 15: Assessment Against EPBC Act Offsets Policy for Black Cockatoos

EPBC Act Environmental Offsets Policy Principles	Assessment of proposed offset strategy against principles
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	The offset will create 3.5ha of Tuart Woodland TEC including Black Cockatoo foraging species within a Regional Park/Bush Forever Site managed by DBCA to offset the clearing of 1.5ha of poor foraging habitat in the offset area.
Be built around direct offsets but may include other compensatory measures	The proposed offset for Carnaby's Black Cockatoo is a direct offset
Be in proportion to the level of statutory protection that applies to the protected matter	The area of revegetation, 3.5ha has been calculated based on the Endangered status of the Carnaby's Black Cockatoo.
Be of a size and scale proportionate to the residual impacts on the protected matter	The area of revegetation, 3.5ha provides a 137.39% outcome for the offset which is more than the required 100% offset.
Effectively account for and manage the risks of the offset not succeeding	The revegetation programme will have completion criteria that require infill planting if the required criteria are not being met.
Be additional to what is already required, determined by law or	The 3.5ha of bare land in the Regional Park/Bush Forever Site is not proposed for revegetation by

EPBC Act Environmental Offsets Policy Principles	Assessment of proposed offset strategy against principles
planning regulations or agreed to under other scheme or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action)	DBCA/DPLH in the long-term management. Therefore, the proposed offset is additional to the management of the Regional Park/Bush Forever Site already being undertaken by DBCA/DPLH.
Be efficient, effective, timely, transparent, scientifically robust and reasonable	Planning for the proposed revegetation plan can commence immediately upon approval of the Action. The land is available as it is already part of the Regional Park/Bush Forever Site and owned by the WA Government (WAPC).
Have transparent governance arrangement including being able to be readily measured, monitored, audited and enforced.	The progress of the revegetation works will be reported on in the annual compliance reporting required under the EPBC Act approval and will be available for public viewing on the proponent's website.

5.3.5 Implementation

The proposed revegetation site is part of the Rockingham Lakes Regional Park and is owned by the W.A. Government. Therefore, preparations for revegetating the 3.5ha site can commence as soon as EPBC approval is given for the action. The Proponent will undertake all revegetation works and manage the offset site for the required number of years until the completion criteria are met.

The revegetation will create a Tuart Woodland TEC of High condition and will provide good quality foraging habitat through the planting of forestry tubestock Banksia species. The revegetation will be undertaken in consultation with DBCA and will comprise of a Tuart overstorey, Banksia dominated midstory and planted native understory. The understorey species to be used will be determined from a spring survey in similar surrounding native vegetation.

6 ECONOMIC AND SOCIAL MATTERS

6.1 Financial Investment of the Proposed Action

The total financial investment of the project is estimated to be in excess of $20,000,000.

6.2 Projected Costs and Benefits of the Proposed Action

The re-development of the proposal site provides a range of economic benefits to the wider community, including:

- The delivery of the project will support direct and indirect jobs in the construction industry, throughout the course of the development, including workforce during the civil and landscape construction stages, in addition to building construction;
- Rates and taxes revenue for local and state government; and
- Sustainable and energy efficient development including the instillation of solar panels to reduce carbon footprint

6.3 Public and Stakeholder Consultation

There have been many public consultation periods throughout the planning and environmental processes for the RIZ, which includes the proposal site.

The consultation with stakeholders will continue throughout the Planning process with a Development Application to undertake future works on the proposal site.

7 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The principles of ecologically sustainable development pursuant to Section 3A of the EPBC Act, are:

(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;

(e) improved valuation, pricing and incentive mechanisms should be promoted.

Table 16 responds to these factors in the context of the proposed action and offsets.

Table 16: Principles of Ecologically Sustainable Development

Part	Development Response
(a)	The proposed re-development on the proposal site has been recognised in both State and local government planning frameworks since 1955. Overall, the short and long term environmental impacts of the proposed action are considered to be acceptable, given the proposed impact mitigation and offsetting measures to be implemented, in addition to the economic and social benefits of the proposed action.
(b)	The Proponent has addressed the precautionary principle by undertaking a range of thorough and detailed site-specific investigations to avoid any scientific uncertainty and has a comprehensive understanding of the fauna, flora and vegetation values of the proposal site and surrounding area. Decisions regarding the proposed action can be made without the risk of any potentially unknown environmental values being impacted.
(c)	The development provides employment opportunities and is in accordance with the RIZ structure plan which guides commercial and industrial development across the RIZ. The overall impact on MNES is not significant in the area and will be offset in more appropriate areas that are protected for future generations.
(d)	It is acknowledged that the Black Cockatoo habitat and Tuart Woodland TEC within the proposal site have value. However, the relative value of this habitat is likely to be reduced compared to more intact habitats which occur across the locality and region and the offsets areas will result in creation of high quality Tuart Woodland and Black Cockatoo foraging habitat.
(e)	A sub-component of this principle is that environmental factors should be included in the valuation of assets and services. In this respect, it is acknowledged that the black cockatoo habitat and Tuart Woodland TEC within the proposal site has value. However, the relative value of this habitat is likely to be reduced and the proposed offsets provide higher habitat values.

8 ENVIRONMENTAL RECORD OF THE PERSON TAKING THE ACTION

There are no 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 Trustee for Hamersley Sub Trust.

The Proponent is a small property/development manager rather than a property developer. As such, they have not developed a green fields site where state or commonwealth environmental legislation and approvals has been required.

The Proponent does not have a company environmental or sustainability policy.

9 OTHER APPROVALS AND CONDITIONS

9.1 RIZ Structure Plan

Commercial re-development of the proposal site will be implemented in accordance with the over-arching RIZ Structure Plan.

9.2 Development Application

The implementation of commercial development within the proposal site will implemented in accordance with a Development Application (DA) approval. The DA approval are subject to conditions, a number of which are relevant to environmental considerations. Where required, the CoR will also included additional 'advice' for specific conditions to guide their implementation.

These approval conditions are required to be suitably addressed and implemented and will include, but are not limited to:

- Urban Water Management Plan;
- Fauna Relocation and Management Plan; and
- Landscaping Plan.

The implementation of the plans will be undertaken to ensure there are no offsite impacts or indirect impacts on the surrounding land.

10 RELEVANT POLICIES AND PUBLICATIONS

10.1 Tuart Woodland Listing Advice

The *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community* (DCCEEW, 2019) does not recommend a recovery plan as the main threats to the ecological community and priority actions are within the advice. The identified threats and the response to these are outlined in Table 18.

Table 18: Response to Threats Identified in Tuart Woodland Conservation Advice

No.	Threat	Response
1	Clearing and fragmentation of vegetation	The Proposal will result in the direct loss of 5.49 ha of Poor quality Tuart Woodlands TEC vegetation (equivalent to a <0.01% reduction in extent) but will result in recreation of 3.5ha of Tuart Woodland in a cleared part of the Rockingham Lakes Regional Park/Bush Forever Site. The nett result will be an increase in the overall area of quality Tuart Woodland TEC protected in conservation zoned land.
2	Invasive flora and fauna	A Vegetation and Fauna Management Plan will be implemented for construction to minimise risk of the impact of spread of invasive flora and feral species onto adjoining areas of vegetation
3	Tree dieback and pathogens	Implementation of the Vegetation and Fauna Management Plan (Attachment 4) for construction of the Proposal includes operational controls to minimise risk of the impact of disease on adjoining areas of native vegetation
4	Altered fire regimes	Clearing activities are a potential risk of fire generation in adjoining areas of vegetation. To minimise the risk of fire, clearing activities will not be undertaken when the Fire Danger Rating is severe or higher.
5	Climate change	The clearing of 5.49ha of poor quality native vegetation is not expected to have any impact on climate change.
6	Water extraction and other hydrological change	No dewatering is anticipated to be required. Urban water management will be undertaken in accordance with the relevant approved plans as required by the DA approval.
7	Loss of fauna supporting key ecological processes	The Proposal will result in the direct loss of 1.5ha of fauna habitat from the proposal site but will not have any impact on the fauna composition of nearby areas of native vegetation.

10.2 Black Cockatoo Recovery Plans

Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan (DEC 2013a)

The development will be undertaken in accordance with the principles of the Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (DEC 2013a) as summarised in Table 19.

Table 19: Response to Carnaby' Black Cockatoo Recovery Plan

Action		Response
1	Protect and Manage Important Habitat	Opportunities to strategically retain black cockatoo habitat within the proposal site are limited due to bulk earthworks requirements. Therefore, impacts to Carnaby's Black Cockatoo habitat as a result of the proposed action will be offset through implementation of the proposed offset strategy. The strategy will involve the revegetation of 3.5ha in the Rockingham Lakes Regional Park/Bush Forever Site with Tuart and Banksia woodland. The offset site will provide superior foraging habitat than that on the proposal site.
2	Undertake Regular Monitoring	No evidence of active roosts or breeding sites was observed during the surveys conducted over the proposal site, therefore the monitoring framework from the recovery plan is less applicable to the site. Nonetheless government supported monitoring programs such as the Great Cocky Count will continue to be undertaken in the local area and contribute to the wider monitoring of the species.
3	Conduct Research to Inform Management	A Carnaby's Black Cockatoo habitat assessment was undertaken on the proposal site. This information will contribute to the wider understanding and research base regarding Carnaby's Black Cockatoo range and habitat requirements.
4	Manage other impacts	Other impacts to Carnaby's Black Cockatoo, such as bird strikes, and impacts on surrounding habitat will be managed in accordance with the Flora and Fauna Management Plan (Attachment 4), minimising the risk to Black Cockatoos and surrounding habitat.
5	Engage with the Broader Community	Assessment of the proposed action will include a mandatory public comment period, enabling community feedback on the proposal.
6	Undertake Information and Communication Activities	Assessment of the proposed action will include a mandatory public comment period, enabling the community and industry to be informed of the proposed action.

The majority of the actions associated with the Recovery Plan are strategic tasks to be carried out by state government departments. However, components of some of the management actions are applicable to the proposed action, as follows:

- Manage nest hollows to increase recruitment: There were no habitat trees that contain suitable hollows that will be impacted by the action.
- Minimising the effects of development on habitat loss:
    - Black cockatoo habitat within the proposal site will not be retained due to bulk earthworks requirements.
    - Impacts to black cockatoo habitat as a result of the proposed action will be counterbalanced through implementation of the proposed offset strategy, which will involve the revegetation of 4ha in the nearby Rockingham Lakes Regional Park.

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12 PERSON TAKING THE ACTION AND DESIGANTED PROPONENT

The proponent contact details for The Trustee for Hamersley Sub Trust are in Table 17.

Table 17: Proponent Details

Information Required	Proponent
Name	Julie Drago
Job Title	CEO
Email	Julie.drago@ovest.net.au
Postal Address	3/195 Cockburn Road, Henderson, WA 6166
Phone Number	(08) 6498 9470
ACN/ABN	81176233525

The designated proponent qualifies for an exemption from cost recovery fees under section 520(4C)(e)(v), as cost recovery applies to future phases of the assessment process.

ATTACHMENT 1

Local Structure Plan


-CLIPPER ESTATE ROAD-
405.45
OFFICE
400m²
OFFICE
400m²
T3 WORKSHOP
7,572m²
T2 WORKSHOP
5,812m²
T1 WORKSHOP
10,929m²
OFFICE
800m²
-ACCESS ROAD-
LOADING DOCK
-ACCESS ROAD-
-ACCESS ROAD-
-LODGE DRIVE-
296.59
OFFICE
800m²
T4 WORKSHOP
8,960m²
T5 WORKSHOP
5,760m²
T6 WORKSHOP
5,760m²
OFFICE
400m²
OFFICE
400m²
395.4
-LODGE DRIVE-
Ovest East Rockingham
Redevelopment Master Plan
OVEST
Level 6, 1008 Hay Street
Perth 6000
Mobile 0466 506 802
Email nick.dalziell@ovest.net.au
A.01
1:1000 @ A2
28/09/21

ATTACHMENT 2

Tuart Woodland TEC and Black Cockatoo Habitat Assessment

LOTS 12 AND 13 LODGE DRIVE EAST ROCKINGHAM

TUART WOODLAND TEC ASSESSMENT AND BLACK COCKATOO HABITAT ASSESSMENT

Prepared for:	The Trustee for Hamersley Sub Trust
Report Date:	27 October 2021
Version:	3
Report No.	2021-598

pgv ENVIRONMENTAL

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Appendix 2: Black Cockatoo Significant Trees

1 INTRODUCTION

1.1 Site Location

Lots 12 and 13 Lodge Drive, East Rockingham (the site) are located in the City of Rockingham approximately 36km south of the Perth Central Business District (Figure 1). The site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area.

The site is 11.9098ha in size.

1.2 Background

The site contains a large shed and some disused infrastructure associated with a Wool Scouring plant that was built between 1995 and 2000. The shed and yards are now used for a different purpose.

The shed and other areas of infrastructure occupy about 6ha of the 11.9ha site. The balance of the site remains undeveloped and contains a large number of trees and some bare areas.

The Trustee for Hamersley Sub Trust is assessing the potential for development of the site. Development is likely to include the clearing of most of the vegetation on the site.

Preliminary site investigations undertaken by PGV Environmental for The Trustee for Hamersley Sub Trust identified the trees on the site are all Tuart trees (*Eucalyptus gomphocephala*). The Tuart trees have the potential to be a part of the Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community (Tuart Woodland TEC) which is listed as a Critically Endangered community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Tuart trees provide a low value foraging source for Carnaby's Black Cockatoos, and any Tuart trees with a DBH greater than 500mm may provide future nesting habitat for Carnaby's and Forest Red-tailed Black Cockatoo.

The site was not included in the RIZ environmental approvals obtained at State and Commonwealth level. Therefore, the potential presence of the Tuart Woodland TEC and Black Cockatoo habitat on the site may have implications for the future development of the site.

PGV Environmental was commissioned by The Trustee for Hamersley Sub Trust to assess whether the Tuart vegetation on the site meets the criteria of the Tuart Woodland TEC and to assess the Black Cockatoo habitat in accordance with the EPBC Black Cockatoo Referral guidelines and the EPBC Significant Impact Guidelines.

1.3 Scope of Works

The scope of work for the assessment included the following:

1 Undertake the appropriate survey work to obtain information with which to assess the Tuart Woodland TEC;

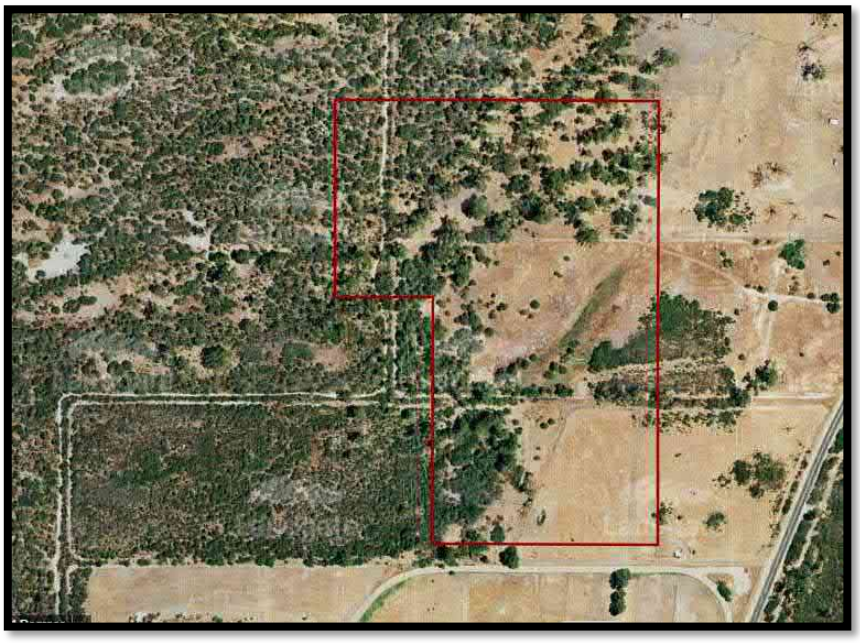
2 Determine whether the Tuart Woodland TEC occurs on Lots 12 and 13, using the criteria contained in the Approved Tuart Woodland TEC Conservation Advice; and

3 Undertake a Black Cockatoo Habitat assessment using the EPBC Black Cockatoo Guidelines and EPBC Significant Impact guidelines.

2 SITE HISTORY

Aerial photography from 1995 shows the site as undeveloped but with a large amount of clearing over the site (Plate 1). Trees are apparent at the northern end and south-west corner.

Plate 1: Historic Aerial Photograph 1995



The 2000 aerial photo shows the wool scouring shed had been constructed on most of the eastern half and the smaller built area in the western half is the water treatment plant (Plate 2). Native vegetation remains in the north-west corner, and some scattered trees at the north-east end and some vegetation in the south-west corner.

Plate 2: Historic Aerial Photograph 2000

The 2021 aerial photograph shows the current situation with more trees on the site than was previously there in 2000 (Plate 3). The additional trees are the result of landscape planting around the carparks as well as some natural recruitment of trees.

Plate 3: Historic Aerial Photograph 2021

3 TUART WOODLAND TEC ASSESMENT

3.1 Tuart Woodlands and Forests TEC Description

The Tuart Woodlands and Forests of the Swan Coastal Plain was listed as a Threatened Ecological Community (TEC) with a rating of Critically Endangered under the Commonwealth EPBC Act on 4 July 2019 (for brevity the community will be called the Tuart Woodland TEC in this report). A description of the Tuart Woodland TEC is available through the EPBC Act listing and more specifically the *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community* (DoEE, 2017) released by the Commonwealth Government. According to the Conservation Advice the diagnostic characteristics of the TEC are outlined in the following sections.

3.1.1 Key Diagnosis Characteristics

- The ecological community is limited to patches of vegetation (with their associated biota) that meet all of the following key diagnostic characteristics:
- Occurs in the Swan Coastal Plain Bioregion, Western Australia (IBRA v7. Department of the Environment 2012).
- Primarily occurs on the Spearwood and Quindalup dune systems but can also occur on the Bassendean dunes and Pinjarra Plain. It can occur on the banks of rivers and wetlands.
- The primary defining feature is the presence of at least two living established *Eucalyptus gomphocephala* (Tuart) trees in the uppermost canopy layer, although they may co-occur with trees of other species. There is a gap of no more than 60 m between the outer edges of the canopies of adjacent Tuart trees. These trees may occur either as single stemmed trees or as a mallee growth form.
- Most often occurs as a woodland but can occur in other structural forms, For example, forest, open forest, woodland, open woodland, and various mallee forms (NVIS Technical Working Group 2017).
- Other tree species may be present in the canopy or sub-canopy. They commonly include: *Agonis flexuosa* (Peppermint) and *Banksia grandis* (Bull Banksia) (both in the southern part of the range), *Banksia attenuata* (Candlestick Banksia), *Eucalyptus marginata* (Jarrah); and less commonly, *Corymbia calophylla* (Marri), *Banksia menziesii* (Firewood Banksia) and *Banksia prionotes* (Acorn Banksia).
- An understorey of native plants is typically present, which may include grasses, herbs and shrubs, although this is often modified by disturbance. Some understorey plant species that are most commonly present are listed in Section 2.3.3 of the Conservation Advice.
- Native fauna species that are most commonly present are noted in Section 2.4 of the Conservation Advice.

3.1.2 Defining a Patch of the Ecological Community

- A patch of the ecological community is a discrete and mostly continuous area of vegetation that meets the key diagnostic characteristics.
- Boundaries for a patch can extend beyond a site or property boundary, or potential area of impact for a proposed action.

- The patch boundary is 30 m beyond the outer canopy of the established Tuart trees (≥15 cm diameter at breast height (DBH)), including dead Tuart trees (stags). See Plate 4
- Where a dead Tuart tree (stag) is being considered for inclusion in a patch of the ecological community, the vertical projection of its outermost remaining branches is used to define the edge of its canopy. If the species of a stag tree is unclear, if the edge of its canopy is within 60 m of an identified Tuart tree the stag is presumed to be a Tuart.
- Patches of Tuart woodlands and forests may contain areas that vary in structural or biological complexity. One part of a patch may have a larger number of mature trees and more ecological diversity, whereas another part of the same patch may demonstrate fewer mature trees and less groundcover. Areas with soil exposed and/or plant litter can also be expected within this ecological community.
- Variation in quality or condition of vegetation across a patch should not necessarily be considered to be evidence of multiple patches. Patches of the ecological community can be spatially variable and are often characterised by one or more areas within a patch that meet higher condition thresholds amongst areas of lower condition.
- If an area meets the key diagnostic characteristics but the average condition across that area falls below the minimum condition thresholds, the largest area or areas of at least 0.5 ha that meet minimum condition thresholds on average, should be specified as the patch or patches of the nationally listed ecological community. This may result in multiple patches of the ecological community being identified within the overall area first identified as meeting the key diagnostics.
- A patch may include small areas without understorey vegetation, such as bare ground, as well as waterbodies or hardscape (e.g. roads, paths, car parks, or buildings) that do not significantly alter the overall function of the ecological community. These small areas do not break up a patch, or divide a patch into multiple patches, as long as there are some parts of the canopy within 60 m of the outer edges of the canopies of adjacent Tuart trees (as per Plate 4). However, existing buildings and other human-made structures and gardens are not part of the nationally protected ecological community and should be excluded from the calculation of patch size and condition. See Plate 5.

Plate 4: Patch boundaries (DoEE, 2019)

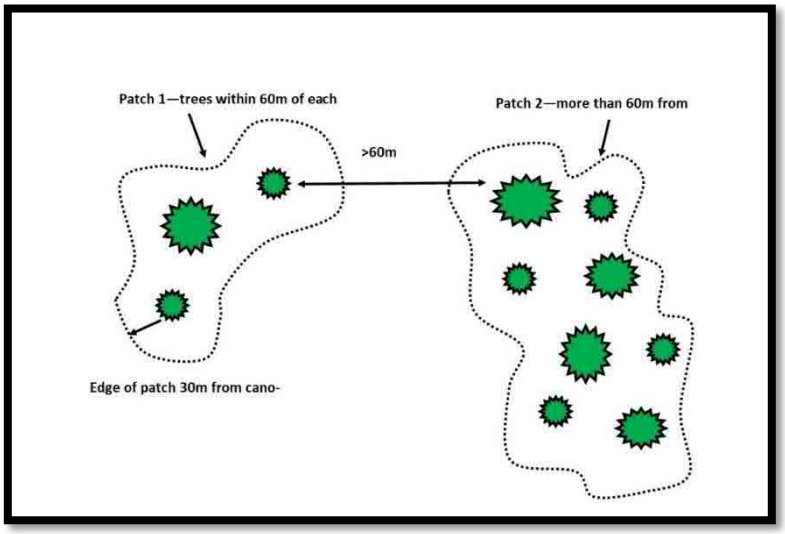
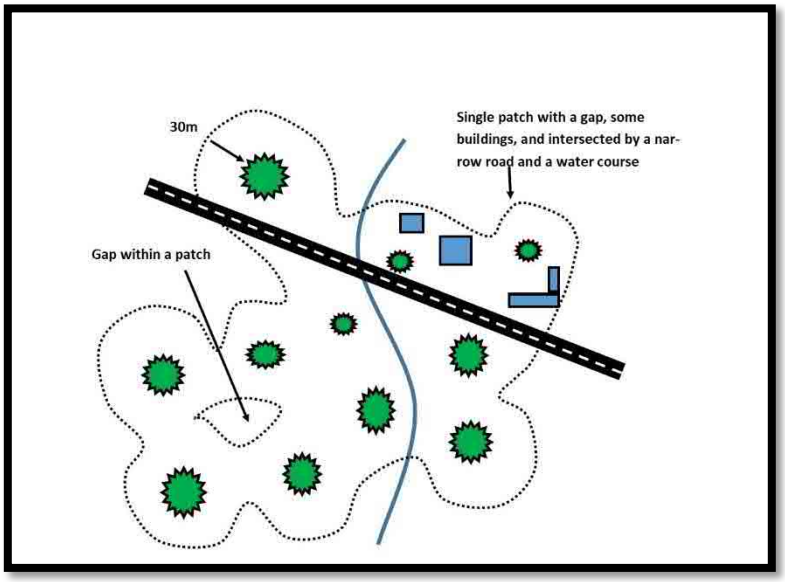


Plate 5: Variation within a patch, including small areas without understorey vegetation, and a small gap within a patch due to part of the Tuart canopy being >60 m apart (DoEE, 2019).



3.1.3 Condition Thresholds and Categories

For confirmed patches of the ecological community, following the key diagnostic characteristics and patch definition above (Step 1), determine the following requirements for information on condition to indicate if they are part of the nationally protected ecological community:

- If the patch is smaller than 0.5 ha it is **not** part of the nationally protected ecological community.
- If **the patch is at least 0.5 ha and up to 5 ha** in size, conduct on ground surveys (see Section 3.4.3) to determine which condition category applies, referring to Section 3.3.1. Patches in this size range are presumed to be part of the nationally protected ecological community unless surveys indicate they do not meet the minimum condition required for national protection. For patches in this size range inclusion in the nationally protected ecological community is determined by surveyed characteristics such as native plant species richness and contribution to cover, habitat values, evidence of regeneration and landscape characteristics.
- **All patches of 5 ha or greater** that meet the key diagnostic characteristics **are part of the nationally protected ecological community**. It is not necessary to conduct additional surveys to confirm that they meet biotic condition thresholds (Table 2) and that they are protected. However more detailed survey may assist in environment impact assessment, planning and monitoring management, or in determining relative biodiversity value between and within different large patches (e.g. to be used in prioritising conservation works etc.). Patches of this size that meet the key diagnostic characteristics provide important contributions to local biodiversity, habitat features and contribute to ecological connectivity of the ecological community and other surrounding ecological communities. Larger patches are likely to be more resilient to some kinds of disturbance and native species loss associated with fragmentation. These characteristics are all important for the long-term resilience of the ecological community across its range.

Table 1: Condition Categories and Thresholds

All patches ≥5 ha is part of the nationally protected ecological community, regardless of their understorey condition. That is, thresholds in this table do not apply to patches ≥5 ha, but the key diagnostic characteristics and patch definition must be met.

Patch size Biotic thresholds	≥2 ha <5 ha	≥0.5 ha <2 ha
Very high condition ≥80 % of all understorey vegetation cover is native Or At least 12 native understorey species per 0.01 ha (10 m x 10 m plot or equivalent sample unit)	Medium sized patches with very high condition understorey. PART OF THE PROTECTED ECOLOGICAL COMMUNITY	Smaller patches with very high condition understorey. PART OF THE PROTECTED ECOLOGICAL COMMUNITY
High condition ≥60 % of all understorey vegetation cover is native Or At least 8 native understorey species per 0.01 ha (10 m x 10 m plot or equivalent sample unit)	Medium sized patches with high condition understorey. PART OF THE PROTECTED ECOLOGICAL COMMUNITY	Smaller patches with high condition understorey. AND That either: have an important landscape role (≤100 m to native vegetation) OR have a habitat role (≥2 very large trees per 0.5 ha) OR show regeneration (≥15 seedlings and/or saplings per 0.5 ha) PART OF THE PROTECTED ECOLOGICAL COMMUNITY
Moderate condition ≥50 % of all understorey vegetation cover is native Or At least 4 native understorey species per 0.01 ha (10 m x 10 m plot or equivalent sample unit)	Medium sized patches with moderate condition understorey. **AND** That either: have an important landscape role (≤100 m to native vegetation) OR have a habitat role (≥2 very large trees per 0.5 ha) OR show regeneration (≥15 seedlings and/or saplings per 0.5 ha) PART OF THE PROTECTED ECOLOGICAL COMMUNITY	NOT PART OF THE PROTECTED ECOLOGICAL COMMUNITY (but may be a focus for local protection or restoration)
Poor Has minimal or no native cover and species richness. That is: <50 % of all understorey vegetation cover is native And Less than 4 native understorey species per 0.01 ha (10 m x 10 m plot or equivalent sample unit)	NOT PART OF THE PROTECTED ECOLOGICAL COMMUNITY (but may be a focus for local protection or restoration)	NOT PART OF THE PROTECTED ECOLOGICAL COMMUNITY (but may be a focus for local protection or restoration)

3.2 Methodology

A survey of the Tuart vegetation on the site was undertaken by Dr Paul van der Moezel of PGV Environmental on 1 July 2021.

All Tuart trees with a diameter at breast height (DBH) greater than 15cm were mapped using a hand-held GPS with an accuracy of around 3m. The canopy of the outermost Tuart in each stand of trees was also measured using a GPS.

In addition, the percentage cover and height of native and introduced species was recorded from four 10m x 10m quadrats sampled from within areas of Tuart vegetation.

The location of the closest Tuart trees and their canopies in the adjoining RIZ Conservation Area was also measured.

3.3 Vegetation

3.3.1 Tuart Vegetation

A total of 134 Tuart trees with a DBH greater than 15cm were mapped on the site (Figure 2). Seven of these were in the landscaped carpark at the southern end of the shed and have not been included for further analysis. Most of the Tuarts were relatively young, with DBH less than 50cm. Overall, the Tuarts occurred in a Woodland structure (10-30% foliage cover), with some isolated trees further away from the woodland areas.

The understorey of the Tuart trees consisted either of a thick layer of mulch (Plate 6) or dense weeds (Plate 7). The mulch layer was around 0.5m thick. The date of mulching is not known but is likely to be associated with the clearing of the adjoining Clipper Precinct in early 2021. The areas containing weeds are considered to be representative of the vegetation that previously existed in the areas that were mulched. That is, the mulch was placed over weeds rather than over good quality native vegetation.

Only three native species were recorded in the whole area containing Tuart trees; *Acacia rostellifera, Acacia saligna* and the climbing plant *Clematis linearifolia.*

Introduced weed species dominated the species list. Common introduced species were Veltdgrass (*Ehrharta longiflora*), Cotton Bush (*Gomphocarpus fruticosus*), Geraldton carnation Weed (*Euphorbia terracina*), Oxalis (*Oxalis pes-caprae*), Fumitory (*Fumaria capreolata*) and Bridal Creeper (*Asparagus asparagoides*).

Several Tuart trees were planted since 2000 after construction of the wool scouring shed and carparks. The planted trees are obvious due to them being in a straight line and of relatively even size structure. Other trees are likely to have been planted given the increase in tree density from the 2000 aerial photo (Plate 2) and the 2021 aerial photo (Plate 3) but these are less obvious on the site.

Plate 6: Tuart Trees over Mulch

Plate 7: Tuart Trees over Weeds

3.3.2 Patch Size

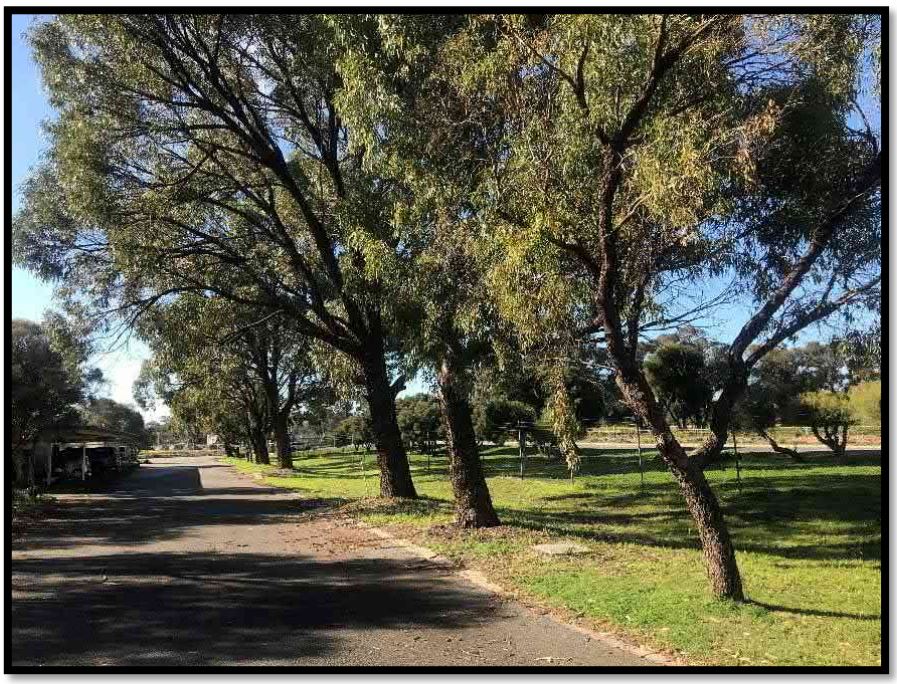
The definition of a 'patch' of Tuart woodland is included in the Conservation Advice. The boundary of a patch is 30m beyond the outer canopy of the established (≥15cm DBH) Tuart trees. A patch can include man-made structures such as roads, paths, carparks and buildings provided that they do not significantly alter the overall function of the ecological community. According to the conservation

advice existing buildings and other man-made structures and gardens are not part of the TEC and should be excluded from the calculation of patch size and condition.

The 30m boundary around the Tuart trees extends into the carpark and access road as well as the large shed on the site. PGV Environmental has excluded these areas from the boundary of the patch as these areas clearly do not function in any way as an ecological community (Plate 8). Similarly, the planted Tuarts in the landscaped carpark at the southern end of the shed have been excluded (Plate 9) as has the dis-used water treatment plant which is all hardstand and offers no ecological function to the Tuart community.

Plate 8: Carpark and Shed Within 30m of Tuart Canopy

Plate 9: Planted Tuarts in Landscaped Carpark



Taking into consideration the definition of a patch of Tuart woodland ecological community PGV Environmental considers there is one patch of Tuart Woodland on the site. The size of the Tuart Woodland on the site is 5.495ha.

There are no Tuart trees to the north or east. Some planted Tuarts on the rural land to the south are more than 60m from the nearest Tuart in natural conditions on the site.

Tuart trees occur in the RIZ Conservation Area to the west. PGV Environmental mapped the co-ordinates of the nearest established tree as well as the boundary of the canopy (Figure 2). The distance between the nearest Tuart tree canopy in the Conservation Area and the canopy on the site is 28m. As a result, the Tuart trees in the Conservation Area are part of the same patch.

The size of the patch mapped on the site is:

- Patch (on-site only)– 5.495ha

The size of the patch including the Tuart trees in the RIZ Conservation Area is:

- Patch (including Tuarts off-site) – minimum 6.71ha, extending further west into the Conservation Area.

3.3.3 Vegetation Condition

The condition of the Tuart vegetation was all rated as Completely Degraded according to the Keighery scale (Government of Western Australia, 2000).

3.3.4 Quadrat Data

Four quadrats were sampled in the area containing Tuart trees. The locations of the quadrats are shown in Figure 2. The quadrat information is provided in Appendix 1 and summarised in Table 2.

Table 2: Quadrat Information

Quadrat	Species Richness (understorey spp.)		% Cover (understorey spp.)		Understorey Mulched?	Condition (Keighery)
	native	introduced	native	introduced		
LR1	1	27	1	80	No	Completely Degraded
LR2	0	12	1	40	Yes	Completely Degraded
LR3	3	12	1	34	Yes	Completely Degraded
LR4	2	14	12	84	No	Completely Degraded

Native understorey species richness ranged from 0-3 in the quadrats. The average number of native understorey species in the quadrats was 1.5. The number of native species is highly unlikely to increase in a spring survey given that more than half the understorey is thick mulch and the rest is dominated by weeds.

The number of introduced species ranged from 12-27 in the quadrats with the lowest number in the areas containing mulch.

Percentage cover of native species was very low ranging from 0-10%. Percentage cover of introduced species was higher, at 22-84% with the higher amounts in the areas without mulch.

3.4 Tuart Woodland Tec Assessment

3.4.1 Step-wise Analysis

The key diagnostic characteristics of the Tuart Woodland TEC are contained in the Approved Conservation Advice for the TEC published at the time of the proposed listing on 16 September 2016 and with the Tuart Woodlands and Forests of the Swan Coastal Plain: A Nationally Significant Ecological Community (DoEE, 2019).

The Conservation Advice contains the following step-wise approach to use in determining if the TEC occurs on a site:

- Step 1: Is the Tuart Woodlands and Forests ecological community in your proposed project site? Is it in other adjacent or off-site areas that may be impacted (for example, by introducing weeds)?
- Step 2: What is the patch size and condition category of the Tuart Woodlands and Forests in the proposed project site and in the surrounding area?
- Step 3: What further information can assist in identifying patches of the Tuart Woodlands and Forests and avoiding significant adverse impacts?
- Step 4: Will your proposed action have a significant impact on Tuart Woodlands and Forests

Step 1: Is the Tuart Woodlands and Forests ecological community in your proposed project site? Is it in other adjacent or off-site areas that may be impacted (for example, by introducing weeds)?

Table 3: Step 1

Key diagnostic characteristics♦	Information	Key diagnostic questions* (Refer to Section 3.2 of the Approved Conservation Advice for a complete explanation of these diagnostic features – other sections of the Approved Conservation Advice are referenced where relevant)	Response (yes/no/possibly) and detailed comments. Use as much space as you need to fully answer the question#
Location and physical environment	Bioregion	Is the proposal site within the Swan Coastal Plain IBRA bioregion?	Yes
Soils and Landform	Soil type	Is the soil type consistent with where the Tuart Woodlands and Forests may occur? (see Section 2.2.1♦)	Yes - Quindalup
	Location in the landscape, topography	Is the topography/physical environment consistent with where the Tuart Woodlands and Forests may occur? Is the site associated with any hydrology (groundwater/surface water)?	Yes Not associated with any hydrological features
Structure	Presence of Tuart trees	How many Tuart trees are present and are they consistent with the characteristics set out in the Approved Conservation Advice? **Note:** Please present this information in terms of total number of trees (dead, established, seedlings etc.) and trees per hectare of the footprint. Diagrams/maps should also be provided.	127 trees with DBH ≥15cm on the lot
	Structural form	What structural form is the vegetation?	Woodland

Key diagnostic characteristics♦	Information	Key diagnostic questions* (Refer to Section 3.2 of the Approved Conservation Advice for a complete explanation of these diagnostic features – other sections of the Approved Conservation Advice are referenced where relevant)	Response (yes/no/possibly) and detailed comments. Use as much space as you need to fully answer the question#
Composition	Dominant tree species, emergent tree layer, understory	Is the composition of the community consistent with the characteristics set out in the Approved Conservation Advice? What other tree species are present? How many native understorey species are present and what is the number of weedy species/proportion of weeds?	Yes, Only tree species present is Tuart Native understorey species richness ranges from 0-3 (average 1.75) in 10m x 10m quadrats. Weed species 7-19 in 10m x 10m quadrats. Weed species cover 22-82% well above the native species cover which was very sparse at 0-10% cover overall.
Defining a patch of Tuart Woodlands and Forests	Patch definition	What is the extent of the patch? **Note:** Descriptions of patch extent must include analysis of canopy extent and associated understorey vegetation (see Section 3.2.2♦). Patches may extend beyond the project area or include areas of infrastructure (i.e. road, powerline). The referral should make clear how, and how much of the patch will be directly or indirectly impacted.	A 30m boundary was drawn around all established Tuart trees in the survey area resulting in the delineation of one patch on site and extending off-site to the west. The area of the patch is: On-site – 5.495ha On-site and off-site – Minimum 6.71ha
Relationship with other ecological communities	Other vegetation communities	Are other vegetation communities present? What are they and how do they intergrade and/or interact with the Tuart Woodlands and Forests TEC? (see Section 3.2.3♦)	A small stand of *Melaleuca rhaphiophylla* trees occurs in the north-west corner of the site. The vegetation is Completely Degraded and does not provide any additional ecological function to the patch of Tuart trees.

The complete key diagnostic characteristics are provided in the Approved Conservation Advice.
* The Tuart Woodlands and Forests may include restored, planted or revegetated flora. Do not exclude vegetation from being classed as the Tuart Woodlands and Forests because it is a planted, restoration or revegetation site (unless it is a garden).
# Comments should include references to appropriate supporting information and data.

Step 2: What is the patch size and condition category of the Tuart Woodlands and Forests in the proposed project site and in the surrounding area?

Table 4: Step 2

Size and condition♦	Information	Relevant content to be discussed in the referral (Refer to Section 3.3 of the Approved Conservation Advice for a complete explanation of these diagnostic features)	Detailed comments. Use as much space as you need to fully answer the question#
Patch Size	Patch size in hectares	Is the patch size large enough to meet the minimum patch size in this section? (Section 3.3♦) **Note:** Patch boundaries are not limited to the proposal site. You must make clear that the patch boundary is consistent with Section 3.2.2♦.	Yes, the patch is larger than the minimum 0.5ha threshold for the TEC.
Patch condition	Condition thresholds	Using the condition categories in this section, what is the patch condition? (Section 3.3.1♦) What is the quality and size (hectares) of the vegetation community in and around the site where the proposed action will occur? Is the patch expected to improve in condition (e.g. after appropriate fire management) or is there a threatening process underway that will reduce the current size and/or condition? **Note:** Refer to Section 3.4 – Step 3 – Further information to assist in identifying patches of the protected ecological community and avoiding significant adverse impacts If patch quality varies over the site; characterisation of the variation should be provided. Patch condition includes consideration of thresholds for characteristics such as plant species richness, landscape features, Tuart tree age and size and other habitat roles of the vegetation. Other vegetation condition measures (e.g. Keighery scale) do not necessary reflect the condition thresholds and both should be provided, where relevant. Where threats are identified (i.e. those listed in Appendix C of the Approved Conservation Advice) please provide further information on what these are and how they have impacted the condition.	Based on the number of native species per 10m x 10m quadrat the condition category is Poor.

♦ Further information on the key diagnostic characteristics is provided in the Approved Conservation Advice.
Comments should include references to appropriate supporting information and data. The response which includes the information does not need to be presented in table form.

Step 3: What further information can assist in identifying patches of the Tuart Woodlands and Forests and avoiding significant adverse impacts?

Table 5: Step 3

Other characteristics♦	Information	Relevant content to be discussed in the referral (Refer to Section 3.4 of the Approved Conservation Advice for a complete explanation of these)	Detailed comments. Use as much space as you need to fully answer the question#
Buffer zone	Condition thresholds	Has a buffer zone been applied to the Tuart Woodlands and Forests patch and what size is the buffer? What activities will occur within the buffer zone? (Section 3.4.1♦) **Note:** Activities within the buffer zone must be considered where they have the potential or may significantly impact Tuart Woodlands and Forests.	No buffer zone possible to the north or east due to existing developments. Land to the south zoned industrial and is currently cleared and offers no buffer to the Tuart patch. Vegetation to the west is a Conservation Area and will be protected in perpetuity.
Revegetated areas and areas of regrowth	Revegetation	Does the area contain revegetation or areas of regrowth? (Section 3.4.2♦) **Note:** Revegetated areas, if they meet the key diagnostic criteria can be Tuart Woodlands and Forests.	No regrowth of native understorey has occurred or is possible.
Sampling protocol	Design	Is the sampling consistent with what is described in Section 3.4.3♦?	Yes – all areas with Tuarts were surveyed on site including sampling from 10m x 10m quadrats
	Timing of surveys, seasonal variation and post-disturbance surveys	Is the sampling consistent with what is described in Section 3.4.4♦(evidence must be provided)? Has any disturbance or other factors which may impact on the outcome of the survey been identified (fire, drought)?	Yes. Further sampling in spring not necessary as it will not lead to a change in condition category rating

Other characteristics♦	Information	Relevant content to be discussed in the referral (Refer to Section 3.4 of the Approved Conservation Advice for a complete explanation of these)	Detailed comments. Use as much space as you need to fully answer the question#
Other guidance for impact assessment and mitigation (see section 3.4.5)	Size and/or area to boundary ratio	What is the size/area to boundary ratio? **Note:** A map/diagram should be provided with the location and shape of the proposal site in context to the surrounding area.	Not determined
	Species recruitment	What evidence exists of recruitment of overstorey and understory species? Does the site have a range of Tuart tree age cohorts? Are very large trees and/or tree hollows present?	Some younger Tuarts but not considered regrowth, rather natural recruitment of plants in a stable tree community. Several large (>0.5m dbh) Tuarts present, none with a hollow.
	Faunal habitat	What habitat does the site provide for fauna (e.g. water, variety in substrate, nest hollows)? What fauna does the site support?	Habitat for avifauna
	Combination of species	Does the site contain a unique combination of species?	No intact native understorey present, only some scattered individual plants.
	Species richness	What is the species richness of the site? Is it high? Note: this should include both flora and fauna.	Understorey native species richness ranges from 0-3 in 10m x 10m quadrats which is extremely low for Tuart vegetation
	Other listed species	Are any other EPBC Act listed species located on the site?	No listed flora. Potential breeding habitat for Black Cockatoos occurs on the site, but no actual breeding habitat.
	Soil surface characteristics	Is there presence of cryptogams, soil crust, leaf litter, intact proteaceous root mats or other indicators of a low level of soil disturbance?	Leaf litter and mulch present.

♦ Further information is provided in the Approved Conservation Advice.
Comments should include references to appropriate supporting information and data. The response which includes the information does not need to be presented in table form.

3.4.2 Results

The result of the Tuart Woodland TEC assessment is as follows:

- One patch of Tuart woodland occurs on the site, as determined using tree canopies and a perimeter 30m around the outer edge of the canopies;
- The vegetation condition is rated as Poor on the Tuart Woodland TEC scale
- The size of the Tuart patch within the site is 5.495ha, and at least 6.71ha when considering the extension to the west; and
- The Tuart patch meets the definition of the Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community, as the size of the patch is larger than the 5ha minimum required for a patch of Tuart in Poor condition to be the TEC.

4 BLACK COCKATOO HABITAT ASSESSMENT

4.1 Black Cockatoo Species

4.1.1 Forest Red-tailed Black Cockatoo

Forest Red-tailed Black Cockatoos *(Calyptorhynchus banksii naso*) are endemic to the humid to sub-humid south-west of Western Australia (SEWPaC, 2012). The range of Forest Red-tailed Black Cockatoos is bound by Gingin in the north to Mt Helena, Christmas Tree Well, West Dale, North Bannister, Mt Saddleback, Kojonup, Rocky Gully, upper King River and Green Range (east of Albany) (SEWPaC, 2012; DoE, 2016). Forest Red-tailed Black Cockatoos nest in tree hollows with a depth of 1-5m, that are predominately Marri, Jarrah and Karri and feed primarily on the seeds of Marri and Jarrah (Johnstone and Kirkby, 2011).

The site is within the modelled distribution for Forest Red-tailed Black Cockatoos (SEWPaC, 2012).

4.1.2 Carnaby's Black Cockatoo

Carnaby's Black Cockatoos (*Calyptorhynchus latirostris*) are found in the south-west of Australia from Kalbarri through to Ravensthorpe. The species has a preference for feeding on the seeds of Banksia, Dryandra, Hakea, Eucalyptus, Grevillea, Pinus and Allocasuarina spp. Carnaby's Black Cockatoos are nomadic, often moving toward the coast after breeding. The species breeds in tree hollows that are 2.5 – 12m above the ground and have an entrance of 23-30cm with a depth of 1-2.5m. Nesting mostly occurs in smooth-barked trees (eg. Salmon Gum, Wandoo, Red Morrell). Eggs are laid from July to October, with incubation lasting 29 days (DoE, 2014).

The site is within the modelled distribution and outside of the known breeding range for Carnaby's Black Cockatoos (SEWPaC, 2012).

4.1.3 Baudin's Black Cockatoo

Baudin's Black Cockatoos *(Calyptorhynchus baudinii)* are most common in the far south-west of Western Australia. The species is known to breed from the southern forests north to Collie and east to near Kojonup. Baudin's Black Cockatoo is typically found in vagrant flocks and utilises the taller, more open Jarrah and Marri woodlands where it feeds mainly on Marri seeds and various Proteaceous species (Johnstone and Kirkby, 2011).

The site is within the modelled distribution for Baudin's Black Cockatoos (SEWPaC, 2012).

4.2 Black Cockatoo Habitat Assessment

4.2.1 Methodology

PGV Environmental undertook a Black Cockatoo Habitat Assessment in accordance with the *EPBC Act referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii Forest red-tailed Black Cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines) and the methodology that is outlined in the SPRAT Database for each of the Black Cockatoo species for Black Cockatoo Habitat Assessments.

A site visit was undertaken by PGV Environmental on 1 July 2021.

The extent, type and quality of the vegetation present, including the presence and extent of plants known to be used by Black Cockatoos, was investigated during the assessment. The quality of the vegetation was determined in the context of foraging habitat for Black Cockatoos. During the site visit a search for feeding signs or feeding debris such as chewed Tuart (*Eucalyptus gomphocephala*) nuts was undertaken.

The assessment also searched for evidence of roosting including areas of droppings, moulted feathers, feather down or clippings from branches under trees.

Breeding habitat was assessed using the definition in the Black Cockatoo Referral Guidelines, which is trees of species known to support breeding within the range of the Black Cockatoo species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For the relevant tree species on the site, Tuart, the suitable DBH is 500mm. The assessment recorded all trees within the site that have a DBH of 500mm or greater. The location, species, trunk DBH and any other important descriptive information about each tree located within the site was recorded. The presence of hollows or spouts was recorded, and any potential large hollows were examined using 20x binoculars from the ground.

4.3 Results

4.3.1 Foraging

One native plant species was recorded on the site by PGV Environmental that is recognised as foraging habitat for Black Cockatoos (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Valentine and Stock, 2008; Groom 2011; Johnstone *et al*., 2011; SEWPaC, 2012; Johnstone, *et al.*, 2013; Johnstone *et al*., 2016) as shown in Table 2 (Figure 3).

Table 2: Foraging Species for Black Cockatoos Recorded on the Site

Species	Common Name
Eucalyptus gomphocephala	Tuart

Tuart was the dominant species in the remnant vegetation. The understorey was largely cleared of native vegetation.

The use of this flora species by each Black cockatoo species and their foraging value is shown in Table 3.

Table 3: Foraging Value for each Black Cockatoos Species

Species	Common Name	Carnaby's Black Cockatoo	Forest red-tailed Black Cockatoo	Baudin's Black Cockatoo
Eucalyptus gomphocephala	Tuart	Low	None	None

There was no evidence of foraging by Black Cockatoos on the site.

The extent of foraging is estimated at 1.4ha which is calculated using an average of 70% canopy cover for the Tuart trees on the site (Figure 3).

The Black Cockatoo Referral Guidelines refer to the quality of the foraging habitat as an important characteristic in determining the significance of the impact. However, there is no guidance as to how the quality is determined in the Black Cockatoo Referral Guidelines other than specifying that 'quality' foraging habitat refers to the use of the habitat by Black Cockatoos rather than the overall quality of the vegetation which would normally be described using understorey as well as tree canopy.

The foraging habitat on the site is considered to be low quality foraging habitat for Carnaby's Black Cockatoo. Forest Red-tailed Black Cockatoos and Baudin's Cockatoo are not known to forage on Tuart Trees (Johnstone *et al*., 2011; SEWPaC, 2012; Johnstone, *et al.*, 2013; Johnstone *et al*., 2016).

4.3.2 Roosting

The site does not contain a known roosting site for Black Cockatoos. There was no evidence of roosting observed during the site assessment on 1 July 2021.

The closest known roosting sites are within 3km of the site (Figure 4) (DoP, 2011).

4.3.3 Breeding

Black Cockatoos are known to breed in hollows of large eucalypts. The Black Cockatoo Referral Guidelines define trees of certain species with a DBH of 500mm or greater as breeding habitat regardless of the presence or not of hollows. The theory behind this definition is the concept that while the trees may not currently contain hollows, they are mature enough that in the next 50 years or so a hollow might form and be of use to Black Cockatoos for the purposes of breeding.

The site is outside of the known breeding range for Carnaby's Black Cockatoo. Tuart Trees are not a recognised species that Baudin's Cockatoo will use for breeding (Johnstone *et al*., 2011; SEWPaC, 2012; Johnstone, *et al.*, 2013; Johnstone *et al*., 2016).

The survey recorded 58 Tuart trees with a DBH ≥500mm. None of the trees had hollows visible form the ground. Consequently, no recent or old evidence of breeding in hollows was observed on the site (Figure 4).

4.4 Regional Context

The site has protected Black Cockatoo habitat to the north and west in the RIZ conservation area and to the east in Bush Forever Site No. 349 - Leda and Adjacent Bushland, and to the south in Bush Forever Site No. 356 Lake Cooloongup, Lake Walyungup and Adjacent Bushland (Figure 4).

The areas requiring investigation as foraging habitat within 12km of the site is estimated to be around 7,434ha (DBCA, 2021). The amount of Tuart Woodland proposed to be cleared (1.4ha) represents 0.02% of the Black Cockatoo habitat in a 12km radius. The 12km radius is used as this is the distance a Black Cockatoo male bird will fly up to from a nest in search of food during chick rearing times.

4.5 Significance of Impact

According to the *EPBC Act Significant Impact Guidelines 1.1* (DoE, 2013), the significance of the impact on Black Cockatoos depends on the sensitivity, value and quality of the environment and the intensity, duration, magnitude and geographic extent of the impacts. The category of listing (for example;

Endangered, Vulnerable or Migratory) determines the significant impact criteria for listed flora and fauna species and ecological communities.

This Black Cockatoo Habitat Assessment assumes all of the foraging and potential breeding trees on the site would be cleared. Using this assumption, the clearing would result in approximately 1.4ha of foraging habitat and 58 potential breeding trees being cleared.

The following assessments are for Forest Red-tailed and Baudin's Black Cockatoos which are listed as Vulnerable and Carnaby's Black Cockatoos which are listed as Endangered.

Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo

The impact on Forest Red-tailed Black and Baudin's Cockatoos from clearing the Black Cockatoo habitat on the site has been assessed against the criteria set out in the *Significant Impact Guidelines 1.1* for the impact on a Vulnerable species and is shown below:

• *Lead to a long-term decrease in the size of an important population of a species*

In the *Significant Impact Guidelines 1.1* an important population is defined as "a population that is necessary for a species' long-term survival and recovery" and may be "key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species' range".

There was no evidence of breeding occurring on the site and the surrounding area contains habitat for foraging, roosting, and breeding for Black Cockatoos that utilise the site.

Clearing 1.4ha of native vegetation on the site would not impact on the long-term survival or recovery of the species due to the large amount of Black Cockatoo habitat in the surrounding area.

• *Reduce the area of occupancy of an important population*

There was no evidence found of Forest Red-tailed or Baudin's Black Cockatoos breeding or roosting on the site. Clearing the site will not impact on these species as they don't utilise Tuart Trees for foraging.

Clearing 1.4ha of native vegetation from the site would not reduce the area of occupancy of the population.

• *Fragment an existing important population into two or more populations*

There are large areas of suitable habitat within 500m of the site that provide foraging and potential breeding habitat. Forest Red-tailed and Baudin's Black Cockatoos are highly mobile and can fly large distances between foraging areas.

Clearing 1.4ha of native vegetation from the site will not fragment the existing population.

• *Adversely affect habitat critical to the survival of a species*

There was no evidence that Forest Red-tailed and Baudin's Black Cockatoos breed on the site and Tuart Trees are not a recognised species of tree that they nest in. There are large areas of foraging habitat within 500m of the site.

Clearing the site would not adversely affect habitat critical to the survival of the species.

• *Disrupt the breeding cycle of an important population*

There was no evidence that Forest Red-tailed or Baudin's Black Cockatoos breed on the site, there were no suitable hollows for breeding.

Clearing native vegetation from the site would not disrupt the breeding cycle.

• *Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The large areas (7,434ha) of high quality foraging and breeding habitat located in the surrounding region and within 500m of the site would prevent the population from declining.

Clearing native vegetation will not reduce the availability or quantity of foraging habitat as neither of the species forage on Tuart Trees.

• *Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Clearing the site will not result in invasive species being introduced, therefore would not result in this outcome.

• *Introduce disease that may cause the species to decline*

Clearing the site will not result in disease being introduced, therefore would not result in this outcome.

• *Interfere substantially with the recovery of the species*

The Forest Red-tailed and Baudin's Black Cockatoos may pass through the site however they don't forage in Tuart Trees. Therefore, the clearing of approximately 1.4ha of foraging habitat on the site would not interfere substantially with the recovery of the species.

In accordance with the criteria set out in the *Significant Impact Guidelines 1.1* the conclusion of this assessment is that development of the site would not have a significant impact on Forest Red-tailed Black Cockatoos or Baudin's Black Cockatoos.

Carnaby's Black Cockatoo

The impact on Carnaby's Black Cockatoos from clearing the Black Cockatoo habitat on the site has been assessed against the criteria set out in the Significant Impact Guidelines 1.1 for the impact on an Endangered species and is shown below:

• *Lead to a long-term decrease in the size of a population*

There was no evidence of breeding occurring on the site and the site is outside of the known breeding range for the species. The surrounding region contains native vegetation suitable for foraging, roosting, and breeding habitat for Carnaby's Black Cockatoos. The Tuart Trees provide a low quality foraging habitat for Carnaby's Black Cockatoos.

Clearing 1.4ha of native vegetation on the site would not impact on the long term survival or recovery of the species due to the large amount of Carnaby's Black Cockatoo habitat in the surrounding area.

• *Reduce the area of occupancy of the species*

There was no evidence of Carnaby's Black Cockatoos breeding or roosting on the site. Clearing will reduce the area of foraging available, however the large areas of higher-quality foraging and breeding habitat located in the surrounding Bush Forever Sites and the RIZ conservation area within 500m of the site would prevent the population from declining

Clearing 1.4ha of native vegetation on the site would not reduce the area of occupancy of the population.

• *Fragment an existing population into two or more populations*

There are large areas of suitable habitat within 500m of the site that provide foraging and potential breeding habitat. Carnaby's Black Cockatoos are highly mobile and can fly large distances between foraging areas.

Clearing 1.4ha of native vegetation on the site will not fragment the existing population.

• *Adversely affect habitat critical to the survival of a species*

There was no evidence that Carnaby's Black Cockatoos breed on the site and there are large areas of habitat within 500m of the site.

Clearing on the site would not adversely affect habitat critical to the survival of the species.

• *Disrupt the breeding cycle of a population*

The site contained no evidence of breeding and there were no trees that contained suitable hollows/spouts therefore clearing of the site would not result in this outcome.

• *Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The large areas of high-quality foraging and breeding habitat located in the surrounding region within 200m of the site would prevent the population from declining.

Clearing native vegetation will not reduce the availability or quantity of foraging habitat when considered in terms of the 7,434ha within 12km surrounding the site.

• *Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Clearing of the site will not result in the establishment of an invasive species harmful Carnaby's Black Cockatoos.

• *Introduce disease that may cause the species to decline*

Clearing of the site will not cause disease to be introduced therefore will not result in this outcome.

• *Interfere with the recovery of the species*

Carnaby's Black Cockatoos have access to suitable habitat (7,434ha) protected within 500m and 12km of the site. Therefore, the clearing of approximately 1.4ha of foraging habitat and 58 potential breeding habitat trees on the site would not interfere substantially with the recovery of the species.

In accordance with the criteria set out in the *Significant Impact Guidelines 1.1* the conclusion of this assessment is that development of the site would not have a significant impact on Carnaby's Black Cockatoos.

4.6 Black Cockatoo Referral Guidelines

The *EPBC Act referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii Forest red-tailed Black Cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines) contain several steps to determine whether or not a referral is required. These steps are:

1. The definition of habitat (breeding, roosting and foraging – Table 1 in the Black Cockatoo Referral Guidelines);
2. A description of the type of action that may have a high or low risk of being a significant impact and therefore require referral (Table 3 in the Black Cockatoo Referral Guidelines);
3. Formulation of a mitigation strategy to reduce the scale of impact; and
4. A flowchart to assist in decision making on whether or not an action should be referred.

Step 1 Black Cockatoo Habitat

There is approximately 1.4ha of foraging habitat (Carnaby's Black Cockatoo only) on the site.

The site contains 58 trees that are considered to be potential breeding trees (Carnaby's Black Cockatoo only). There is no evidence of breeding or roosting on the site.

Step 2 Level of Impact

Foraging

According to Table 3 in the Black Cockatoo Referral Guidelines the clearing of more than 1ha of quality foraging habitat has a high risk of causing a significant impact. Degradation of more than 1ha of quality habitat by things such as altered hydrology or fire regimes has an uncertain risk. The significance of degradation depends on the type of degradation and the quality of the habitat.

The site contained approximately 1.4ha of foraging habitat for Black Cockatoos. Tuart trees provide low quality foraging for Carnaby's Black Cockatoo and the other two species of Black Cockatoos don't

forage on Tuart Trees. Clearing the site will lead to the loss of more than 1ha of low quality foraging habitat and is unlikely to result in a significant impact according to the guidelines.

Roosting

The Black Cockatoo Referral Guidelines consider the clearing of a known roosting site as a high risk of being a significant impact. Anecdotally, there is no evidence of roosting on the site and there was no evidence of roosting found during the site visit on 1 July 2021. The risk of a significant impact on a known roosting site is considered to be low.

Breeding

According to Table 3 in *the Black Cockatoo Referral Guidelines* the clearing of any known nesting tree has a high risk of being a significant impact. A known nesting tree is defined in the Black Cockatoo Referral Guidelines as any existing tree in which breeding has been recorded or suspected. There are no known nesting trees that occur on the site and therefore there is no risk of a significant impact on known breeding habitat of Black Cockatoos.

The *Black Cockatoo Referral Guidelines* also consider that the clearing or degradation of any part of a vegetation community known to contain breeding habitat is likely to have a high risk of a significant impact. In Table 1 of the *Black Cockatoo Referral Guidelines* breeding habitat is defined as woodlands, forests or isolated trees that contain or consist of live or dead trees of certain species with either a DBH of or greater than 500mm or the presence of suitable nest hollows.

The site contains 58 Tuart trees with a DBH of or greater than 500mm none of which contained hollows/spouts suitable for Black Cockatoos. Baudin's Black Cockatoos are not known to breed in Tuart Trees and the Site is outside of the known breeding range for Carnaby's Black Cockatoo.

According to the Black Cockatoo Referral Guidelines the risk of a significant impact on breeding habitat of Carnaby's Black Cockatoos is high.

Surrounding Habitat

According to the Black Cockatoo Referral Guidelines clearing of vegetation that results in a gap of greater than 4km between patches of Black Cockatoo habitat (foraging, roosting or breeding) has a high risk of having a significant impact.

Clearing the native vegetation will not create large gaps between native vegetation therefore the risk is considered to be low.

Step 3 Mitigation

The consideration of a mitigation strategy during the determination of the level of impact and requirement to refer is allowed by the *Black Cockatoo Referral Guidelines* and setting in place the best practice mitigation strategy may reduce the level of impact and in turn the risk of a significant impact. Mitigation strategies include avoiding impact, managing impact so that there is no net decline in habitat and monitoring the effectiveness of mitigation.

This assessment is based on the entire 1.4ha of low quality foraging habitat and all 58 potential breeding habitat trees being cleared. There is no alternative for the vegetation clearing if the Lots are developed for general industry in line with the zoning under the MRS and TPS.

Step 4 Referral Advice

The Decision Making flowchart in Figure 1 of the Black Cockatoo Referral Guidelines was applied to the site without consideration of mitigation strategies and is shown in sequence below:

1. Could the impacts of your action occur within the modelled distribution of the black cockatoos? – YES
2. Could the impacts of your action affect any black cockatoo habitat or individuals? - YES
3. Have you surveyed for black cockatoo habitat using the recommended methods? – YES
4. Could your action have an impact on black cockatoos or their habitat? – YES
5. Is your impact mitigation best practice so that it may reduce the significance of your impacts on black cockatoos? Prioritise impact avoidance over impact minimisation - NO

RESULT – Referral Recommended: Risk of resulting in significant impact.

5 SUMMARY AND CONCLUSIONS

5.1 Tuart Woodland TEC Assessment

The Tuart Woodland TEC Assessment concludes the following:

1. A total of 127 established (DBH ≥15cm) Tuart trees were recorded on Lots 12 and 13 Lodge Road. Seven Tuarts planted for landscaping at the southern end of the shed were not included;
2. The Tuart trees occurred in one patch as defined by the Tuart Woodland TEC Conservation Advice;
3. Native understorey species richness was very low with only three species recorded in the whole patch and 0-3 (average 1.7) in the four 10m x 10m quadrats sampled. The number of introduced species was higher (7-19) and the percentage cover of introduced species was far higher than native with 22-82% compared to 0-10% for native species;
4. The condition of the Tuart vegetation was rated as Completely Degraded according to the Keighery vegetation scale;
5. The condition category of the Tuart Woodland patch was rated as Poor according to the Conservation Advice condition category scale;
6. The size of the Tuart Woodland patch on site was measured as:
   - 5.495ha
7. The size of the Tuart Woodland patch on site and extending off-site into the RIZ Conservation Area is at least 6.71ha; and
8. Despite the almost complete absence of native understorey species, the Tuart patch meets the criteria of being the Tuart Woodlands and Forests of the Swan Coastal Plain TEC due to the size of the patch being larger than 5ha.

The Tuart Woodland TEC is listed as Critically Endangered under the Commonwealth EPBC Act. Any proposal that is likely to have a significant impact on a Critically Endangered TEC is required to be referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) for consideration for assessment.

The significance of an impact is determined by the EPBC Act Significant Impact Guidelines 1.1. A reduction in the extent of an ecological community is one of the seven actions that is likely to have a significant impact. There is no threshold to the amount of vegetation that can be cleared before it is considered significant.

A referral of a proposed impact on the Tuart Woodland TEC on the site should highlight the Poor condition of the patch due to the almost absent native understorey, and the large area of Tuart Woodland TEC in the adjoining RIZ Conservation Area that is in very good condition.

5.2 Black Cockatoo Habitat Assessment

The Black Cockatoo Habitat Assessment identified 1.4ha of foraging habitat (Tuart only) on the site consisting of Tuart trees. There was not any evidence of foraging by Black Cockatoos was observed on the site.

The site does not contain a known roosting site and no evidence was observed that the site has been used as roosting habitat.

The site does not contain known breeding sites and no evidence of breeding was recorded on the site. There were 58 potential breeding habitat trees (all Tuart) recorded on site, none of which had hollows visible from the ground.

Clearing of the site will result in the loss of 1.4ha of Black Cockatoo habitat. According to the EPBC Act Significant Impact Guidelines, the impact on Forest Red-tailed Black Cockatoos, Baudin's Black Cockatoo and Carnaby's Black Cockatoos is not likely to be significant. The site is unlikely to be used by Forest Red-tailed Black Cockatoos and Baudin's Black Cockatoo as they are not known to forage in Tuart Trees.

However, in accordance with the Black Cockatoo Referral Guidelines the clearing of Black Cockatoo habitat is likely to have a high risk of being a significant impact due to the loss 1.4ha low quality foraging habitat and 58 potential breeding trees. Referral to the Department of Agriculture, Water and the Environment under the EPBC Act is therefore recommended.

6 REFERENCES

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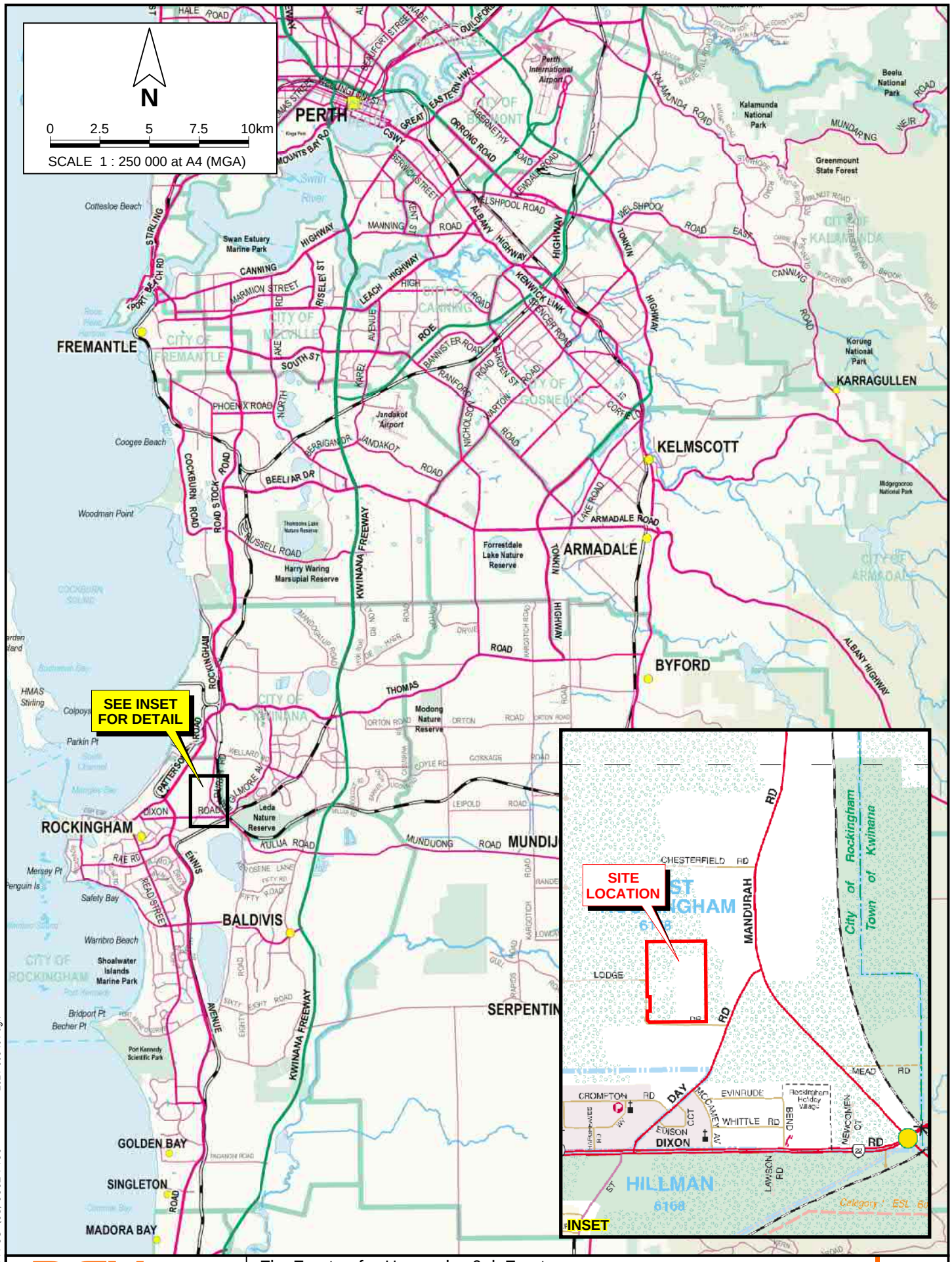
FIGURES



PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f01.dgn

pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust
FLORA AND VEGETATION SURVEY
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: B. Heath	Date: 24 Oct 2021
Job: 10447 Rpt: 2021-605	Revision: A

SITE LOCATION

Figure 1

N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, July 2021.
CONTOUR SOURCE: Dept. of Agriculture, 2000.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f02.dgn

pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust

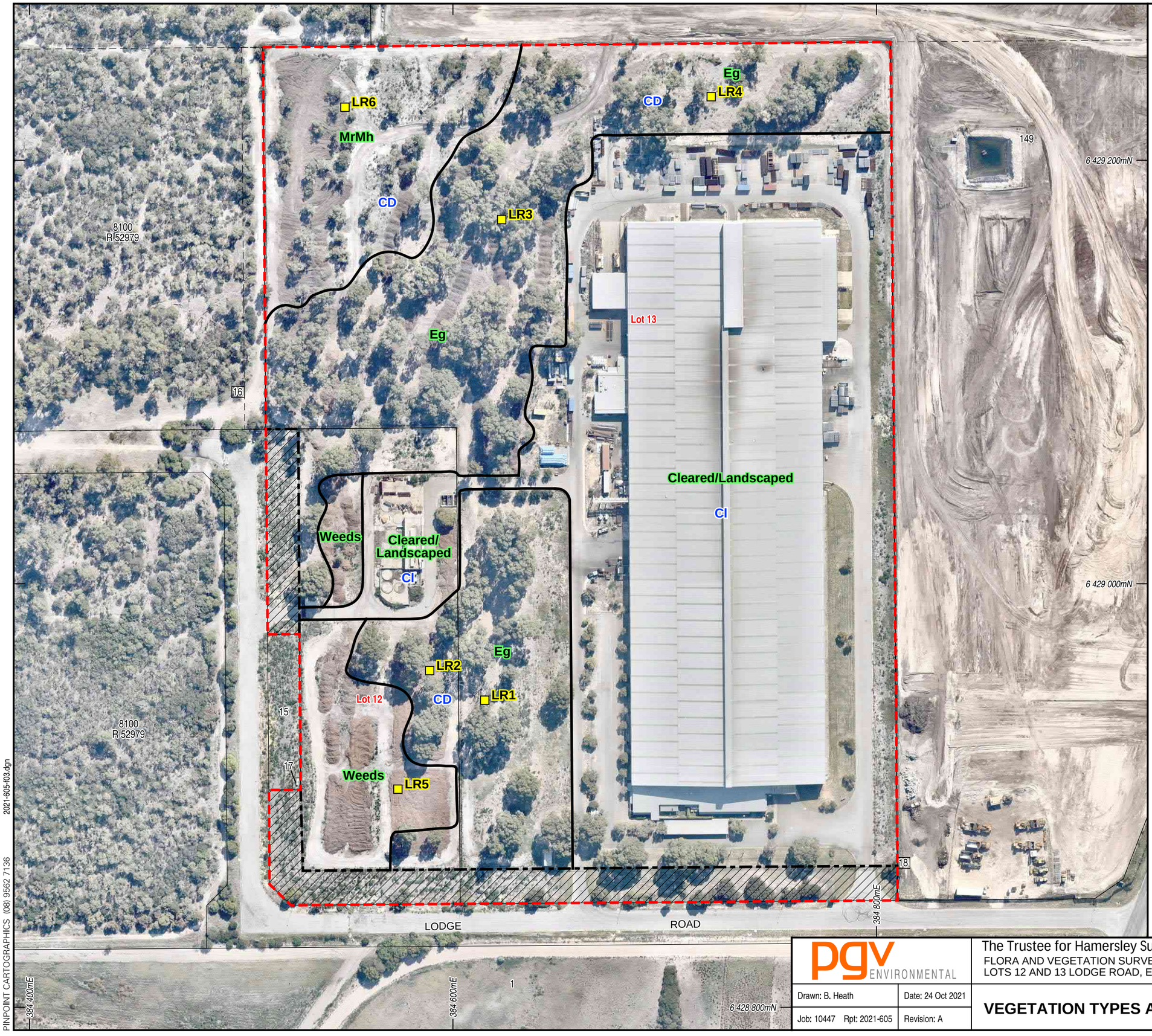
PRELIMINARY DOCUMENTATION
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: B. Heath | Date: 24 Oct 2021

Job: 10447 Rpt: 2022-666 | Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Not Surveyed (Outside Boundary Fence)
- Quadrat Location
- Vegetation Type Boundary
- Em — Vegetation Type
- CD — Vegetation Condition

Vegetation Types

Eg
Eucalyptus gomphocephala (Tuart) Woodland over mulch and weeds

MrMh
Melaleuca rhaphiophylla/M. huegelii Low Open Woodland over weeds

Weeds

Vegetation Condition
(SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

G - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

D - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

CD - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

Cl - Cleared
No native vegetation remaining.

CADASTRAL SOURCE: Landgate, July 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f03.dgn

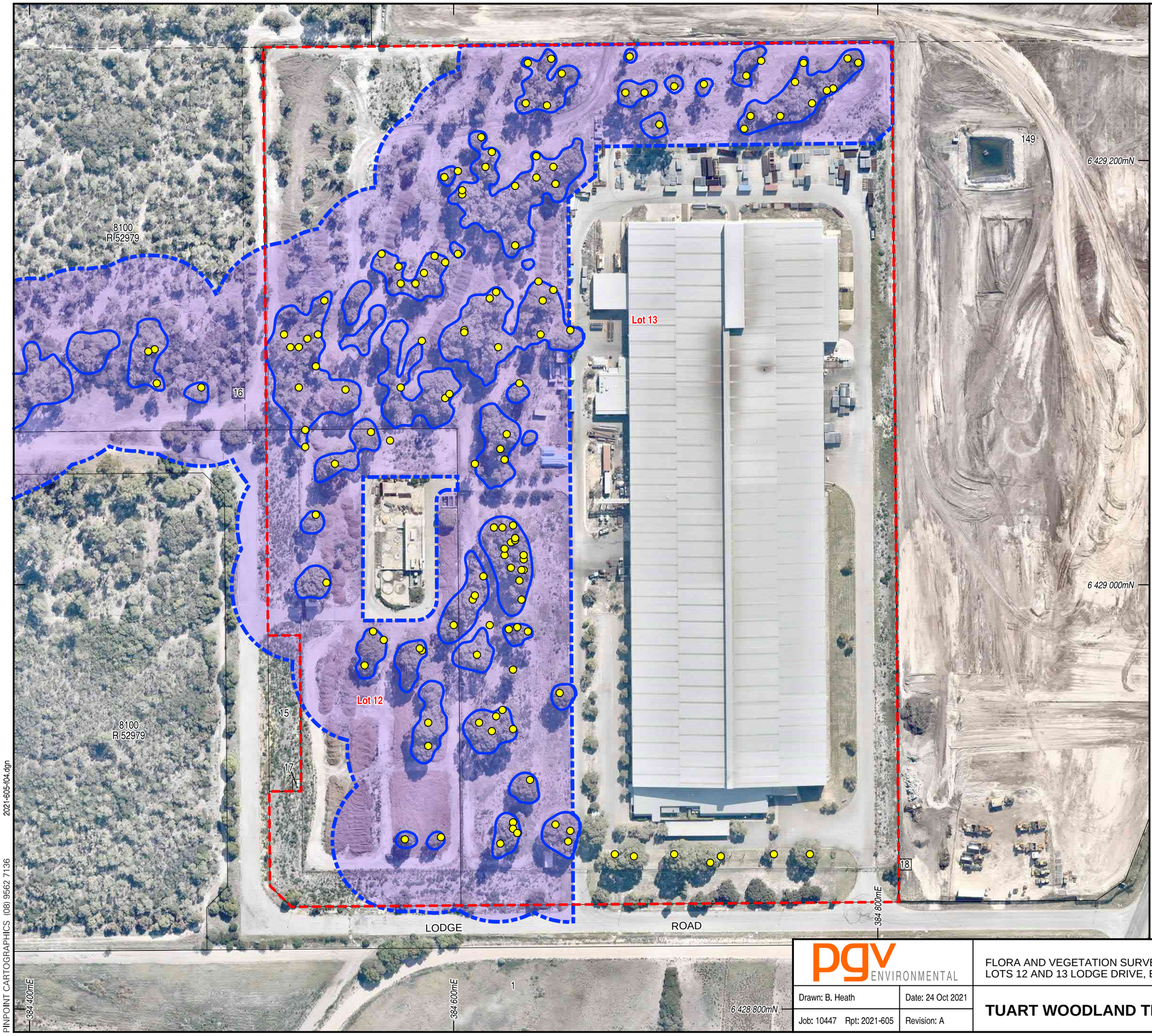
pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust
FLORA AND VEGETATION SURVEY
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: B. Heath	Date: 24 Oct 2021
Job: 10447 Rpt: 2021-605	Revision: A

VEGETATION TYPES AND CONDITION

Figure 3



N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Tuart Tree Location
- Tuart Tree Canopy
- 30m Perimeter Around Tuart Canopies
- Tuart Woodland TEC

CADASTRAL SOURCE: Landgate, July 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f04.dgn

pgv ENVIRONMENTAL

FLORA AND VEGETATION SURVEY
LOTS 12 AND 13 LODGE DRIVE, EAST ROCKINGHAM

Drawn: B. Heath	Date: 24 Oct 2021
Job: 10447 Rpt: 2021-605	Revision: A

TUART WOODLAND TEC

Figure 4

APPENDIX 1

Quadrat Data

QUADRAT LR1

50 384615 E 6428945 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	12	25
**Avena fatua*	1.2	10
**Rhamnus alaternus*	1.2	1
**Gomphocarpus fruticosus*	1.1	15
**Schinus terebinthifolius*	1	<1
**Ehrharta longiflora*	1	25
Acacia rostellifera	0.8	1
**Melilotus indicus*	0.6	<1
**Raphanus raphanistrum*	0.6	<1
**Lolium rigidum*	0.5	2
**Sonchus asper*	0.5	1
Acacia saligna	0.5	<1
**Solanum nigrum*	0.4	5
**Trachyandra divaricata*	0.4	<1
**Sonchus oleraceus*	0.4	<1
**Bromus diandrus*	0.4	<1
**Briza minor*	0.4	<1
**Lysimachia arvensis*	0.3	2
**Euphorbia terracina*	0.3	1

SPECIES	HEIGHT (m)	COVER (%)
**Asphodelus fistulosus*	0.3	<1
**Arctotheca calendula*	0.3	<1
**Malva parviflora*	0.2	1
**Oxalis pes-caprae*	0.2	10
**Fumaria capreolata*	0.1	10
**Euphorbia peplus*	0.1	<1
**Trifolium sp*	<0.1	<1
**Taraxacum officinale*	Flat	<1
**Cirsium vulgare*	Flat	<1
**Hypochaeris glabra*	Flat	<1
**Asparagus asparagoides*	Climber	2

* introduced species

QUADRAT LR2

50 384589 E 6428959 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over mulch and weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	15	20
**Avena fatua*	1	10
**Ehrharta longiflora*	0.7	5
**Rhamnus alaternus*	0.5	1
**Bromus diandrus*	0.4	10
**Sonchus asper*	0.4	<1
**Euphorbia terracina*	0.3	<1
**Medicago polymorpha*	0.3	40
**Fumaria capreolata*	0.3	<1
**Oxalis pes-caprae*	0.2	20
**Sixalix atropurpurea*	0.1	<1
**Lysimachia arvensis*	0.1	<1
**Asparagus asparagoides*	Climber	<1

* introduced species

QUADRAT LR3

50 384623 E 6429172 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over mulch and weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	15	25
**Rhamnus alaternus*	2	2
**Avena fatua*	1	20
Melaleuca huegelii	1	1
**Gomphocarpus fruticosus*	0.8	1
**Ehrharta longiflora*	0.7	1
**Bromus diandrus*	0.4	5
**Euphorbia terracina*	0.3	<1
**Oxalis pes-caprae*	0.2	2
**Trifolium campestre*	0.2	1
Acacia rostellifera	0.2	<1
**Asphodelus fistulosus*	0.2	<1
**Solanum nigrum*	0.1	<1
**Lysimachia arvensis*	0.1	<1
**Asparagus asparagoides*	Climber	1
Clematis linearifolia	Climber	<1

* introduced species

QUADRAT LR4

50 384722 E 6429230 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	14	20
Spyridium globulosum	1	2
**Rhamnus alaternus*	1	1
**Solanum nigrum*	1	1
**Gomphocarpus fruticosus*	0.8	10
**Ehrharta longiflora*	0.8	50
**Sonchus oleraceus*	0.8	20
Acacia rostellifera	0.7	10
**Bromus diandrus*	0.5	5
**Euphorbia terracina*	0.5	<1
**Euphorbia peplus*	0.2	4
**Lysimachia arvensis*	0.2	1
**Trifolium campestre*	0.2	<1
**Fumaria capreolata*	0.1	1
**Hypochaeris glabra*	Flat	<1
**Taraxacum officinale*	Flat	<1
**Asparagus asparagoides*	Climber	1
Clematis linearifolia	Climber	<1

* introduced species

QUADRAT LR5

50 384574 E 6428903 N

Vegetation: Weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
**Avena fatua*	1	10
**Bromus diandrus*	0.5	10
**Rhamnus alaternus*	0.4	<1
**Solanum nigrum*	0.4	<1
**Lolium rigidum*	0.3	<1
**Ehrharta longiflora*	0.3	<1
**Trifolium campestre*	0.2	15
**Fumaria capreolata*	0.2	2
**Euphorbia terracina*	0.2	1
**Medicago polymorpha*	0.1	5
**Oxalis pes-caprae*	0.1	1

* introduced species

QUADRAT LR6

50 384549 E 6429225 N

Vegetation: *Melaleuca rhaphiophylla/M. huegelii* Low Open Woodland over weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Melaleuca rhaphiophylla	5	10
Melaleuca huegelii	4	2
Spyridium globulosum	1.4	5
**Gompholobium fruticosus*	1.4	1
**Avena fatua*	1.2	2
Acacia rostellifera	0.6	2
**Urospermum picroides*	0.6	1
**Ehrharta longiflora*	0.5	25
**Euphorbia terracina*	0.5	1
**Lolium perenne*	0.4	5
**Sonchus oleraceus*	0.4	1
**Petrorhagia dubia*	0.4	<1
**Asphodelus fistulosus*	0.4	<1
**Erigeron bonariensis*	0.3	<1
**Lagurus ovatus*	0.3	<1
**Briza minor*	0.2	<1

SPECIES	HEIGHT (m)	COVER (%)
**Lysimachia arvensis*	0.1	4
**Trifolium campestre*	0.1	2
**Crassula glomerata*	0.1	1
**Euphorbia peplus*	0.1	1
**Galium murale*	<0.1	<1
**Taraxacum officinale*	Flat	<1
**Asparagus asparagoides*	Climber	<1

* introduced species

APPENDIX 2

SIGNIFICANT TREE LOCATIONS

Lots 12 and 13 Lodge Road

Tree No.	Species	Easting	Northing	DBH	2nd branch	3rd branch	Comments		
108	Tuart	384754	6429221	95					
51	Tuart	384620	6429138	94					
94	Tuart	384690	6429232	94					
95	Tuart	384697	6429217	94					
107	Tuart	384769	6429227	93					
98	Tuart	384718	6429236	91					
53	Tuart	384605	6429120	88					
61	Tuart	384527	6429093	86					
76	Tuart	384604	6429184	82					
119	Tuart	384567	6428974	81					
66	Tuart	384536	6429118	79					
73	Tuart	384591	6429155	79					
78	Tuart	384604	6429186	77					
44	Tuart	384621	6429112	74					
89	Tuart	384634	6429227	73					
72	Tuart	384586	6429147	72					
54	Tuart	384605	6429119	70					
64	Tuart	384527	6429112	70					
88	Tuart	384644	6429226	70					
2	Tuart	384655	6428884	69					
129	Tuart	384685	6428872	69					tree in carpark S of big shed
1	Tuart	384654	6428879	68			no hollows or spouts		
42	Tuart	384625	6429071	68					
93	Tuart	384681	6429232	68	44				
75	Tuart	384602	6429156	67					
134	Tuart	384768	6428873	67					tree in carpark S of big shed
4	Tuart	384628	6428888	66					
130	Tuart	384704	6428873	66					tree in carpark S of big shed
113	Tuart	384544	6429057	65					
131	Tuart	384721	6428869	65					tree in carpark S of big shed
106	Tuart	384776	6429233	64	24				
110	Tuart	384740	6429221	63					
111	Tuart	384570	6429068	63					
92	Tuart	384651	6429241	62					
43	Tuart	384631	6429095	60					
77	Tuart	384588	6429185	60					
121	Tuart	384585	6428969	60					
70	Tuart	384575	6429142	59					
81	Tuart	384618	6429204	59					
9	Tuart	384650	6428949	58					
80	Tuart	384615	6429197	58					
114	Tuart	384530	6429073	58					
8	Tuart	384636	6428908	57	20				
59	Tuart	384549	6429092	57					
71	Tuart	384582	6429142	57					
60	Tuart	384535	6429103	56					
112	Tuart	384561	6429072	56					
33	Tuart	384627	6429020	55					
36	Tuart	384628	6429028	55					
3	Tuart	384648	6428887	54					
15	Tuart	384611	6428967	54	53				
17	Tuart	384635	6428978	54					
100	Tuart	384745	6429247	54	30				
14	Tuart	384612	6428935	53					
21	Tuart	384609	6428993	51					
31	Tuart	384633	6429014	51					
57	Tuart	384598	6429090	51	38			32	
96	Tuart	384704	6429235	50					
105	Tuart	384779	6429234	50	42				
7	Tuart	384622	6428878	49					
22	Tuart	384610	6428995	49					
116	Tuart	384535	6429033	49	42	29			
128	Tuart	384676	6428873	49					tree in carpark S of big shed
6	Tuart	384630	6428883	48					
46	Tuart	384655	6429120	48	41				
56	Tuart	384596	6429088	48	27				
97	Tuart	384683	6429249	48					
102	Tuart	384765	6429246	48					
52	Tuart	384617	6429135	47					

ATTACHMENT 3

Flora and Vegetation Survey

LOTS 12 AND 13 LODGE DRIVE, EAST ROCKINGHAM

FLORA AND VEGETATION SURVEY

Prepared for:	The Trustee for Hamersley Sub Trust
Report Date:	18 October 2021
Version:	1
Report No.	2021-606

pgv ENVIRONMENTAL

CONTENTS

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Appendix 5: Conservation Codes

1 INTRODUCTION

1.1 Site Location

Lots 12 and 13 Lodge Drive, East Rockingham (the site) are located in the City of Rockingham approximately 36km south of the Perth Central Business District (Figure 1). The site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area.

The site is 11.9098ha in size (Figure 2).

1.2 Background

The site contains a large shed and some disused infrastructure associated with a Wool Scouring plant that was built between 1995 and 2000. The shed and yards are now used for a different purpose.

The shed and other areas of infrastructure occupy about 6ha of the 11.9ha site. The balance of the site remains undeveloped and contains a large number of trees and some bare areas.

The Trustee for Hamersley Sub Trust is assessing the potential for development of the site. Development is likely to include the clearing of most of the vegetation on the site.

The site was not included in the RIZ environmental approvals obtained at State and Commonwealth level. Therefore, the potential presence of conservation significant plant species and ecological communities needs to be assessed as part of any application for approval to clear the vegetation.

PGV Environmental was commissioned by The Trustee for Hamersley Sub Trust to undertake a Detailed Flora and Vegetation survey of the site.

1.3 Scope of Works

A Detailed Flora and Vegetation Survey was undertaken in accordance with EPA Technical Guidance *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The survey included the following:

- A search of the Naturemap website (DBCA, 2020);
- A search of the Commonwealth Government's Protected Matters Search Tool (DAWE, 2020) to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*;
- Examination of historic and recent aerial photography and contour and soil maps to provisionally identify vegetation types and condition;
- Field survey using quadrats to record native and introduced species as well as a thorough site walkover of any areas of native vegetation;
- Recording of any significant plant species using a hand-held GPS;
- Description and mapping of vegetation types and vegetation condition; and
- Compilation of a flora list.

2 EXISTING ENVIRONMENT

2.1 Land Use

Aerial photography from 1995 shows the site as undeveloped but with a large amount of clearing over the site (Plate 1).

Plate 1: Aerial Photograph 1995 (Landgate, 2021)

The 2000 aerial photo shows the wool scouring shed had been constructed on most of the eastern half and a water treatment plant in the central western section (Plate 2). Native vegetation remains in the north-west corner, and some scattered trees at the north-east end and some vegetation in the south-west corner.

Plate 2: Aerial Photograph 2000 (Landgate, 2021)

The 2021 aerial photograph shows the current situation with more trees on the site than was previously there in 2000 (Plate 3). The additional trees are the result of landscape planting around the carparks as well as some natural recruitment of trees.

Plate 3: Aerial Photograph 2021

The site is zoned 'Industrial' under the Metropolitan Region Scheme (SLIP, 2021) and 'General Industry' under the City of Rockingham Local Planning Scheme No. 3 (SLIP, 2021).

2.2 Topography

The site is flat at around 4m AHD, however the site's natural contours have been modified as a result of earthworks for past land use and importation of mulch.

2.3 Geology and Soils

2.3.1 Geology

The site is mapped as part of the Quindalup South System which is the youngest dune system on the Swan Coastal Plain, consists of sand dunes or ridges formed by windblown unconsolidated calcareous and quartz beach sand.

2.3.2 Soils

One Quindalup South soil unit is mapped on the site and is described as follows:

- Quindalup Phase 3 (211Qu) Safety Bay sands -calcareous deep sands and yellow sands and coastal scrub.

2.4 Hydrology

2.4.1 Groundwater

The historical maximum groundwater level under the site is between 1 and 2m AHD which 2-3m below the natural surface level (mAHD) (DoW, 2021).

2.4.2 Wetlands

The *Geomorphic Wetlands of the Swan Coastal Plain* database identifies a Conservation Category Wetland (CCW) occurs in the south-west portion of the site and two eastern tips of another CCW just inside the property boundary (UFI 6,221) (Plate 4). The is flora and vegetation survey will demonstrate that the CCWs no longer occur on the site (see Section 4.5.4).

Plate 4: Conservation Category Wetland Locations

3 METHODOLOGY

3.1 Database Searches

Searches of the following databases were undertaken for a 10km radius around the central point of the site prior to the site survey:

- DBCA NatureMap Database (DBCA, 2021) (Appendix 1); and
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation Act 1999*(EPBC Act) (DAWE, 2021). A radius of 5km was used for this database (Appendix 2).

Searches for Threatened flora and Threatened Ecological Communities (TECs) were not undertaken as the site has been highly modified.

3.2 Site Survey

A flora and vegetation survey of the site was conducted by Dr Paul van der Moezel of PGV Environmental on two occasions, the first preliminary survey on 1 July 2021 and a follow-up survey on 15 October 2021.

The site was thoroughly walked to record all species and vegetation types in the survey area. Information on flora composition and vegetation structure was recorded in six 10m x 10m non-permanent quadrats in representative vegetation types.

All plant species were identified in the field.

3.3 Survey Conditions

The conditions that the survey was undertaken in are presented in Table 1 in order to assess the adequacy of the survey. In summary, there were no constraints to the survey.

Table 1: Statement of Botanical Survey Conditions

Issue	Constraints (Y/N)*	Comment
Competency/experience of the consultant conducting the survey	No	Dr Paul van der Moezel has extensive botanical survey experience in the Perth Metropolitan Region.
Proportion of the flora identified^	No	The timing of the survey in mid-October was optimal to identify all flora species on the site including any potential Threatened and Priority Flora. No follow-up survey required.
Sources of information (historic/recent or new data)	No	The flora in the Perth Metropolitan Region is well documented.
Proportion of the task achieved and further work that may need to be undertaken	No	No follow-up survey required as no Threatened Flora expected to occur in other seasons.

Issue	Constraints (Y/N)*	Comment
Timing/weather/season/cycle	No	The spring survey was optimal for most flora species. 2021 was a good year for ephemeral species, including orchids.
Disturbances (Fire)	No	The fire age of the vegetation was greater than 5 years.
Intensity of survey (e.g. In retrospect was the intensity adequate)	No	The time spent on the site (approx. 6hr in two surveys) was considered adequate for the size of the site (7ha of highly disturbed vegetation), and the low variation in vegetation types.
Completeness (e.g. was relevant area fully surveyed)	No	
Resources (e.g. degree of expertise available for plant identification)	No	Experienced botanist undertook plant identifications on site.
Remoteness and/or access problems	No	Easily accessible site in the Perth Metropolitan Region.
Availability of contextual (e.g. bioregional) information for the study area.	No	Bush Forever

*Constraints have been rated as Significant, Moderate or No constraints

^Fungi and nonvascular flora (eg. algae, mosses and liverworts) were not specifically surveyed for during the survey.

4 RESULTS

4.1 Flora Database Searches

A search of the DBCA Naturemap Database (Appendix 1) indicates that a number of species that are listed as Endangered, Threatened or Priority have been located within a 10km radius of the site. The EPBC Act Protected Matters Search Tool (Appendix 2) indicates species that may have habitat within 5km radius of the site. The results from these database searches are shown in Table 2.

Table 3 lists the likelihood that any of these species could occur on the site based on the soil types and vegetation condition.

Table 2: Conservation Significant Flora Identified in Database Searches

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Andersonia gracilis	Slender Andersonia		Endangered
Caladenia huegelii	King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	Schedule 1	Endangered
Drakaea elastica	Glossy-leafed Hammer Orchid	Schedule 1	Endangered
Diuris purdiei	Purdie's Donkey-orchid	Schedule 2	Endangered
Drakaea micrantha	Dwarf Hammer-orchid	Schedule 2	Vulnerable
Diuris micrantha	Dwarf Bee-orchid	Schedule 3	Vulnerable
Synaphea sp. Serpentine G.R. Brand 103			Critcally Endangered
Acacia sp. Binningup G. Cockerton et al. WB 37784		Priority 1	
Jacksonia sericea	Waldjumi	Priority 3	
Dodonaea hackettiana	Hackett's Hopbush	Priority 3	

Conservation Codes are shown in Appendix 5

Table 3: Likelihood of Identified Significant Flora Species Occurring on the Site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Andersonia gracilis	Slender Andersonia	Slender Andersonia occurs in white/grey sand, sandy clay, gravelly loam in winter-wet areas, near swamps.	Highly Unlikely – no winter wet areas
Caladenia huegelii	King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	The Grand Spider-orchid prefers sand or clay loam. This species generally does not survive in disturbed areas.	Highly Unlikely – not usually associated with Quindalup soil type

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Drakaea elastica	Glossy-leafed Hammer Orchid	The Glossy-leafed Hammer Orchid prefers low-lying situations adjoining winter-wet swamps. This species does not survive in disturbed areas.	High Unlikely – no winter wet areas
Diuris purdiei	Purdie's Donkey-orchid	Purdie's Donkey Orchid occurs in grey-black sand in moist winter-wet swamps.	High Unlikely – no winter wet areas
Drakaea micrantha	Dwarf Hammer-orchid	Dwarf Hammer-orchid occurs in grey sands over dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps.	High Unlikely – no winter wet areas
Diuris micrantha	Dwarf Bee-orchid	The Dwarf Bee-orchid is usually found on cleared firebreaks or open sandy patches that have been disturbed with in Jarrah Banksia woodland or thickets of Spearwood (*Kunzea ericifolia/ glabrescens*) (Williams *et al.,* 2001).	Highly Unlikely – not habitat typical to this species
Dodonaea hackettiana	Hackett's Hopbush	Hackett's Hopbush occurs in sand with outcropping limestone.	Unlikely – not habitat typical to this species
Jacksonia sericea	Waldjumi	Waldjumi grows in calcareous and sandy soils.	Possible

* sourced from Florabase (DBCA, 2017) and SPRAT Database (DoEE, 2016) as well as the DBCA database searches unless otherwise denoted

4.2 TEC and PEC Desktop Search

A search of DAWE's Protected Matters Search Tool was conducted within a radius of 5km around the site (Appendix 2). Three ecological communities are listed as TECs under the Commonwealth EPBC Act. The communities identified in the database searches are outlined in Table 4.

Table 4: Threatened and Priority Ecological Communities likely to occur within 5km of the Site

Ecological Community	Description	Conservation Status WA	Status under the EPBC Act
SCP19b	Sedgelands in Holocene dune swales of the southern Swan Coastal Plain (	Critically Endangered	Endangered (Listed as FCT19)
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered
Tuart woodlands	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	Priority 3	Critically Endangered

4.3 Flora

A total of 55 plant species were recorded on the site during the survey (Appendix 3). The total consists of 13 native and 42 introduced species. The number of native species is very low for the size of the

survey area (7ha of undeveloped land) and the percentage of introduced species (76%) is very high which is indicative of the past land use.

The plant Families with the highest representation of species were the Asteraceae (Daisy family – 11 species, including 2 native and 9 introduced), Poaceae (Grass family – 8 species, all introduced) and the Fabaceae (Pea and Wattle family – 5 species, including 2 native and 3 introduced),

None of the species is listed as a Threatened or Priority species. No species with any other conservation significance were recorded on the site.

Quadrat Data are provided in Appendix 4.

Species richness in the five quadrats in areas of native vegetation ranged from 13-30 species. The number of native species in the quadrats was very low and ranged from 1-4. The percentage of introduced species in the quadrats was very high (average 84%).

4.4 Vegetation

4.4.1 Vegetation Complex

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle *et al*., 1980). The areas of remnant native vegetation on the site is part of the Quindalup Complex which is described as:

> Coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *Melaleuca lanceolata* (Rottnest Teatree) - *Callitris preissii* (Rottnest Island Pine), the closed scrub of *Acacia rostellifera* (Summer-scented Wattle) and the low closed *Agonis flexuosa* (Peppermint) forest of Geographe Bay. (Heddle *et al.,* 1980).

The general description of the vegetation complex matches the vegetation types recorded on the site.

4.4.2 Vegetation Type

For small scale sites, such as the survey area, vegetation mapping can be further refined by using vegetation types which are described by the composition and structure of the dominant species rather than based on geomorphology.

Two native vegetation types and one non-native vegetation type were described and mapped on the site (Figure 3). The vegetation types are described in Table 5.

Table 5: Vegetation Type on the Site

Vegetation Type	Description	Photograph
Eg *Eucalyptus gomphocephala* (Tuart) Woodland over mulch and weeds	This is the main vegetation type occurring on the site. The Tuart trees were around 12-15m high with an average canopy cover of 20-25%. There were very few native understorey species present throughout the site. The only native shrub species that was reasonably common on the site was *Acacia rostellifera* while the climbing plant *Clematis linearifolia* was sometimes present. The 'soils' were mostly a half metre of mulch that had been spread out over the site in the past. Quadrats LR1, 2, 3 and 4 are representative of this vegetation type.	 

Vegetation Type	Description	Photograph
MrMh *Melaleuca rhaphiophylla/M. huegelii* Low Open Woodland over weeds	This vegetation type occurred in the north-west corner of the site. The vegetation type contained medium tree species *Melaleuca rhaphiophylla* and to a lesser extent *M. huegelii* and some *Banksia littoralis* up to 5m high. *Acacia rostellifera* and *Spyridium globulosum* were sparse native shrubs in the area otherwise the understorey was all introduced species. The dominant shrub species are indicative of wetland vegetation found elsewhere in the RIZ, however the area is not mapped as a wetland and the 0.5m layer of mulch has altered the natural surface level such that wetland species are unlikely to regenerate in the area over time. The 'soils' were mostly a half metre of mulch that had been spread out over the site in the past. Quadrat LR6 is representative of this vegetation type.	
Weeds	Several areas occurred on the site that did not have any native species. These areas had been mulched in the past up to as much as 0.5m deep. The condition of the areas prior to the mulching is not known. The areas contained abundant weeds, particularly grass species. No regeneration of any native species was observed in these areas. The 'soils' were mostly a half metre of mulch that had been spread out over the site in the past. Quadrat LR5 is representative of this vegetation type.	

4.4.3 Floristic Community Types

Floristic Community Types (FCT) are based on the whole floristic composition of the vegetation rather than being determined by soil type and geomorphology (Vegetation Complex) or the nature of the dominant species (Vegetation Types).

The condition of the vegetation on the site was rated as Completely Degraded and therefore could not be assigned to a FCT.

4.4.4 Vegetation Condition

The condition of the vegetation was assessed according to the system of Keighery as described in Bush Forever (Government of Western Australia, 2000) (Table 6).

Table 6: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

The condition of the vegetation is Completely Degraded due to historic clearing, very low native understorey species and high weed densities (Figure 3).

4.5 Conservation Significance of Flora and Vegetation

4.5.1 Flora

No Threatened (Declared Rare) flora species listed under the State *Biodiversity Conservation Act 2016* or the EPBC Act and no Priority plant species were recorded on the site or are expected to occur on the site at any other time of the year.

4.5.2 Vegetation Complex

The vegetation on the site is part of the Quindalup Complex (Heddle *et al.*, 1980). Approximately 60.49% of the pre-European vegetation extent of this complex remains, of which 10.98% is currently managed by DBCA (DBCA, 2018).

The percentage retention is above EPA's target for minimum 30% retention of vegetation complexes State-wide and above the 10% minimum criteria for vegetation complexes in the Perth and Peel Region Constrained Areas.

4.5.3 Threatened and Priority Ecological Communities

The potential for the three TECs listed in Table 4 as potentially occurring on the site is summarised below.

- Sedgelands in Holocene dune swales of the southern Swan Coastal Plain (SCP 19) – Not present due to the absence of any wetland vegetation and dune swales;
- Banksia Woodlands of the Swan Coastal Plain – Not present due to the absence of appropriate Banksia tree species;
- Tuart Woodlands and Forests of the Swan Coastal Plain – Potentially present (see below for assessment)

PGV Environmental (2021) undertook a Tuart Woodland TEC assessment according to the *Approved Conservation Advice* for the TEC published at the time of the proposed listing on 16 September 2016 for the EPBC listed *Tuart Woodlands and Forests of the Swan Coastal Plain: A Nationally Significant Ecological Community* (DoEE, 2019).

A summary of the result of the Tuart Woodland TEC assessment is provided below:

- One patch of Tuart woodland occurs on the site, as determined using tree canopies and a perimeter of 30m around the outer edge of the canopies;
- The vegetation condition is rated as Poor on the Tuart Woodland TEC scale;
- The size of the Tuart patch within the site is 5.495ha, and at least 6.71ha as the patch extends further west offsite; and
- The Tuart patch meets the definition of the *Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community*, as the size of the patch is larger than the 5ha minimum required for a patch of Tuart in Poor condition to be the TEC.

The extent of the Tuart Woodland TEC is shown on Figure 4.

4.5.4 Conservation Category Wetland Assessment

The areas mapped as containing a Conservation Category Wetland (CCW) in the south-west part of the site were assessed during the flora and vegetation survey. The areas now contain a layer of mulch, up to 0.5m thick, which was laid down some time ago. No native plants were recorded in any of the areas mapped as CCW. Plate 5 shows the general appearance of the larger CCW mapped on the site. Plant species in the area were all introduced species, particularly *Avena fatua* (Wild Oats), *Trifolium campestre* (Clover), *Medicago polymorpha* (Burr Medic) and *Bromus diandrus* (Great Brome). The woody weed species Rhamnus (*Rhamnus alaternus*) was abundant on the edges of the mulch (Plate 6).

No native plant species were observed regenerating in the mapped wetland areas.

The CCW areas are considered to be no longer a CCW and likely to no longer function as a wetland.

Plate 5: Conservation Category Wetland Area

Plate 6: Rhamnus in the Conservation Category Wetland Area

5 SUMMARY AND CONCLUSIONS

5.1 Summary

The Flora and Vegetation survey of a 11.9098ha parcel of land on Lots12 and 13 Lodge Drive resulted in the following findings:

- The survey area contains highly disturbed native vegetation and large areas without any native plants;
- A total of 55 plant species have been recorded on the site. The total consisted of 13 native species and 42 introduced species. The high (76%) proportion of introduced species reflects the past history of the site and the high degree of disturbance;
- No Threatened (Declared Rare) or Priority species were recorded on the site or are expected to occur on the site due to the highly degraded condition;
- Two native vegetation types were described and mapped on the site and one non-native vegetation type (weeds). The main vegetation type was *Eucalyptus gomphocephala* (Tuart) Woodland over Mulch and Weeds. One area of *Melaleuca rhaphiophylla/M. huegelii* Low Open Woodland over weeds occurred in the north-west corner;
- The vegetation was all rated as Completely Degraded. The site has only 12 native species and a high density of weed coverage;
- The vegetation is part of the Quindalup Complex which is well retained in the Perth Metropolitan Region;
- The vegetation was too degraded to be assigned to a Floristic Community Type;
- The Tuart woodland vegetation type was assessed as being part of the Tuart Woodlands and Forests of the Swan Coastal Plain TEC which is listed as Critically Endangered under the Commonwealth EPBC Act. While the understorey of the Tuart woodland had very few native species, the assessment is based on the size of the patch being greater than 5ha; and
- The areas mapped as containing Conservation Category Wetlands in the south-west portion of the site no longer have any native vegetation and have been mulched to such an extent that the CCW rating no longer applies. The areas are likely to no longer function as a wetland.

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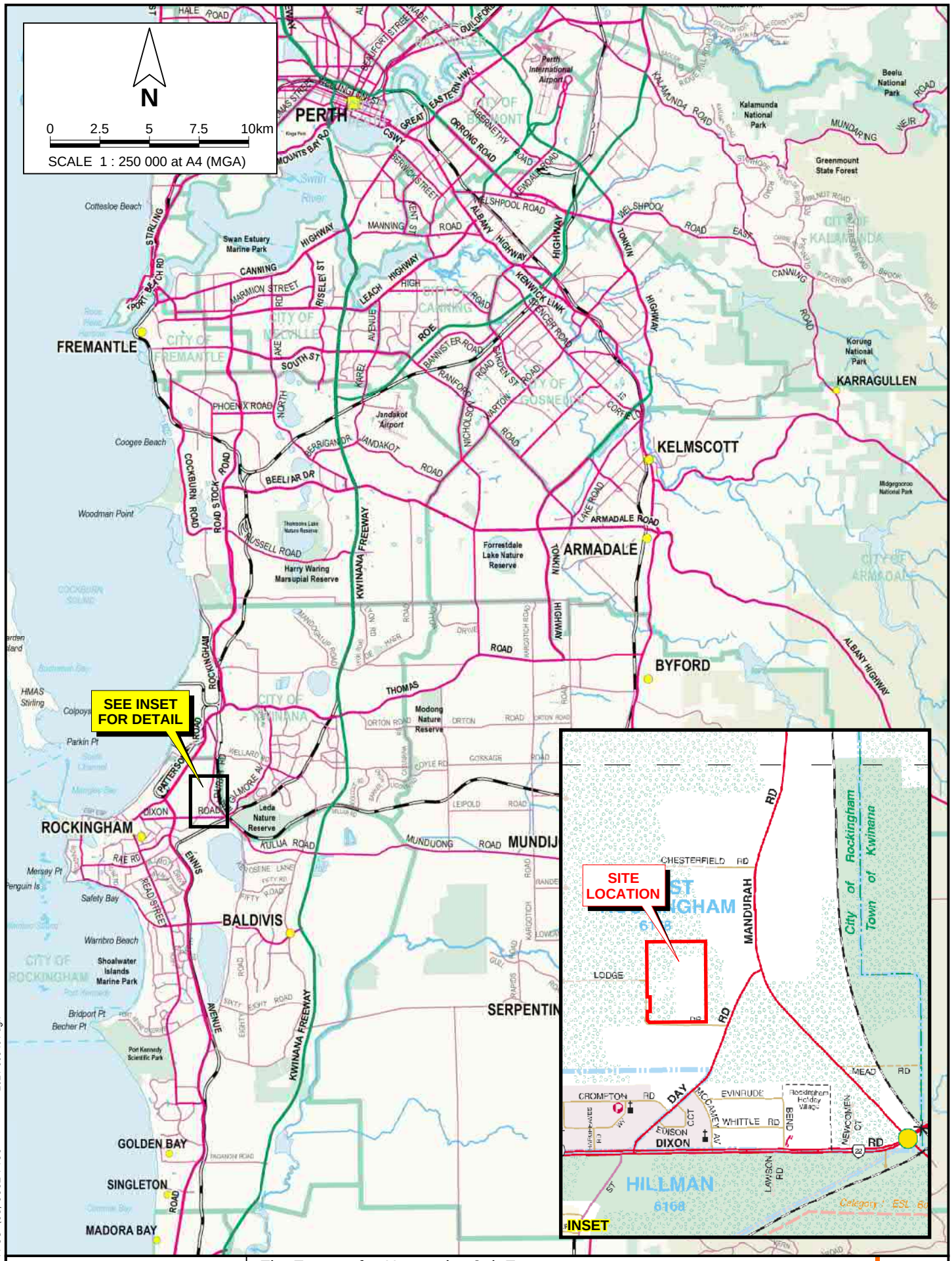
FIGURES



PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f01.dgn

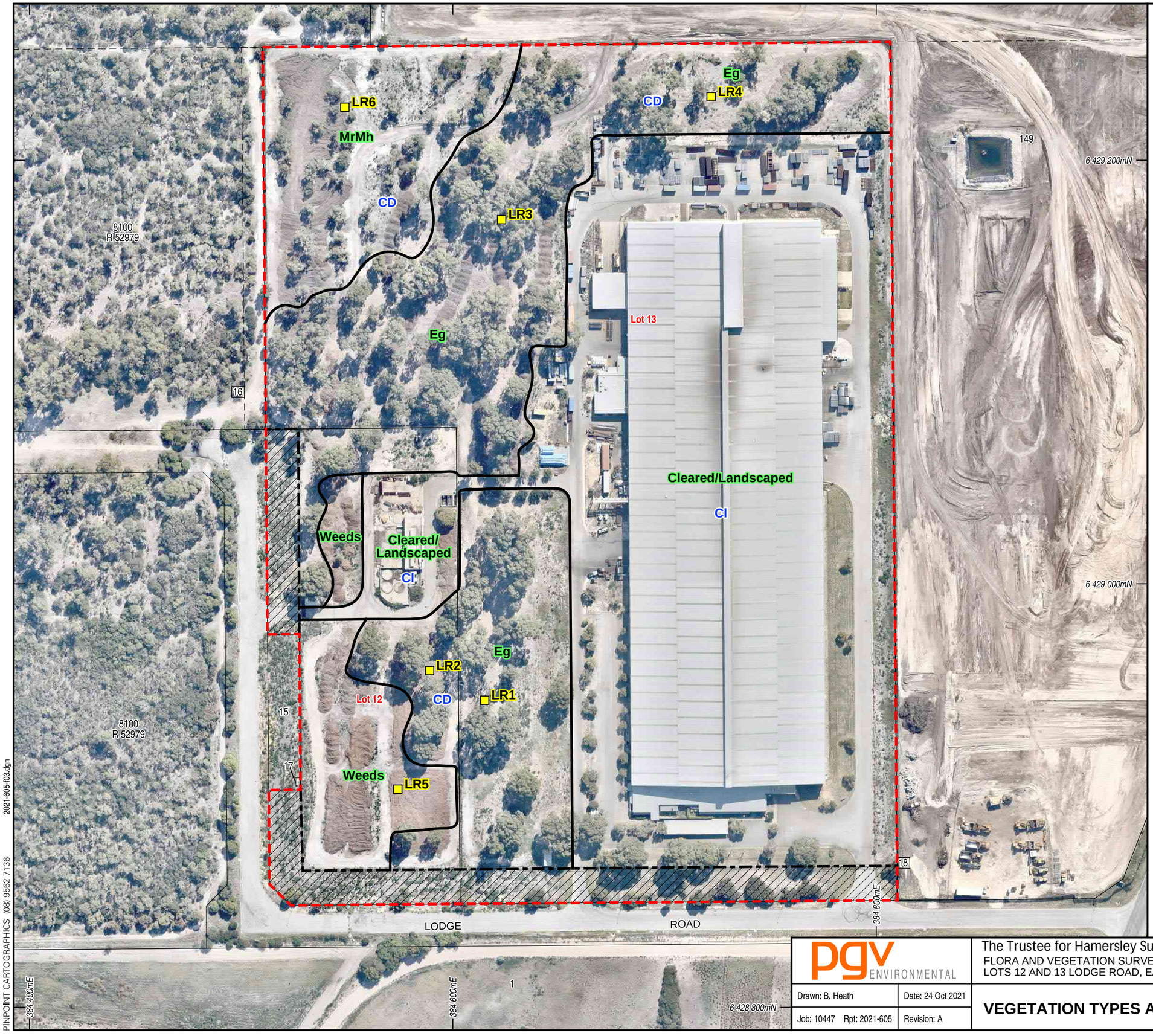
pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust
FLORA AND VEGETATION SURVEY
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: B. Heath	Date: 24 Oct 2021
Job: 10447 Rpt: 2021-605	Revision: A

SITE LOCATION

Figure 1



N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Not Surveyed (Outside Boundary Fence)
- Quadrat Location
- Vegetation Type Boundary
- Em — Vegetation Type
- CD — Vegetation Condition

Vegetation Types

Eg
Eucalyptus gomphocephala (Tuart) Woodland over mulch and weeds

MrMh
Melaleuca rhaphiophylla/M. huegelii Low Open Woodland over weeds

Weeds

Vegetation Condition
(SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

G - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

D - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

CD - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

Cl - Cleared
No native vegetation remaining.

CADASTRAL SOURCE: Landgate, July 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f03.dgn

pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust
FLORA AND VEGETATION SURVEY
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: B. Heath	Date: 24 Oct 2021
Job: 10447 Rpt: 2021-605	Revision: A

VEGETATION TYPES AND CONDITION

Figure 3

N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, July 2021.
CONTOUR SOURCE: Dept. of Agriculture, 2000.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust

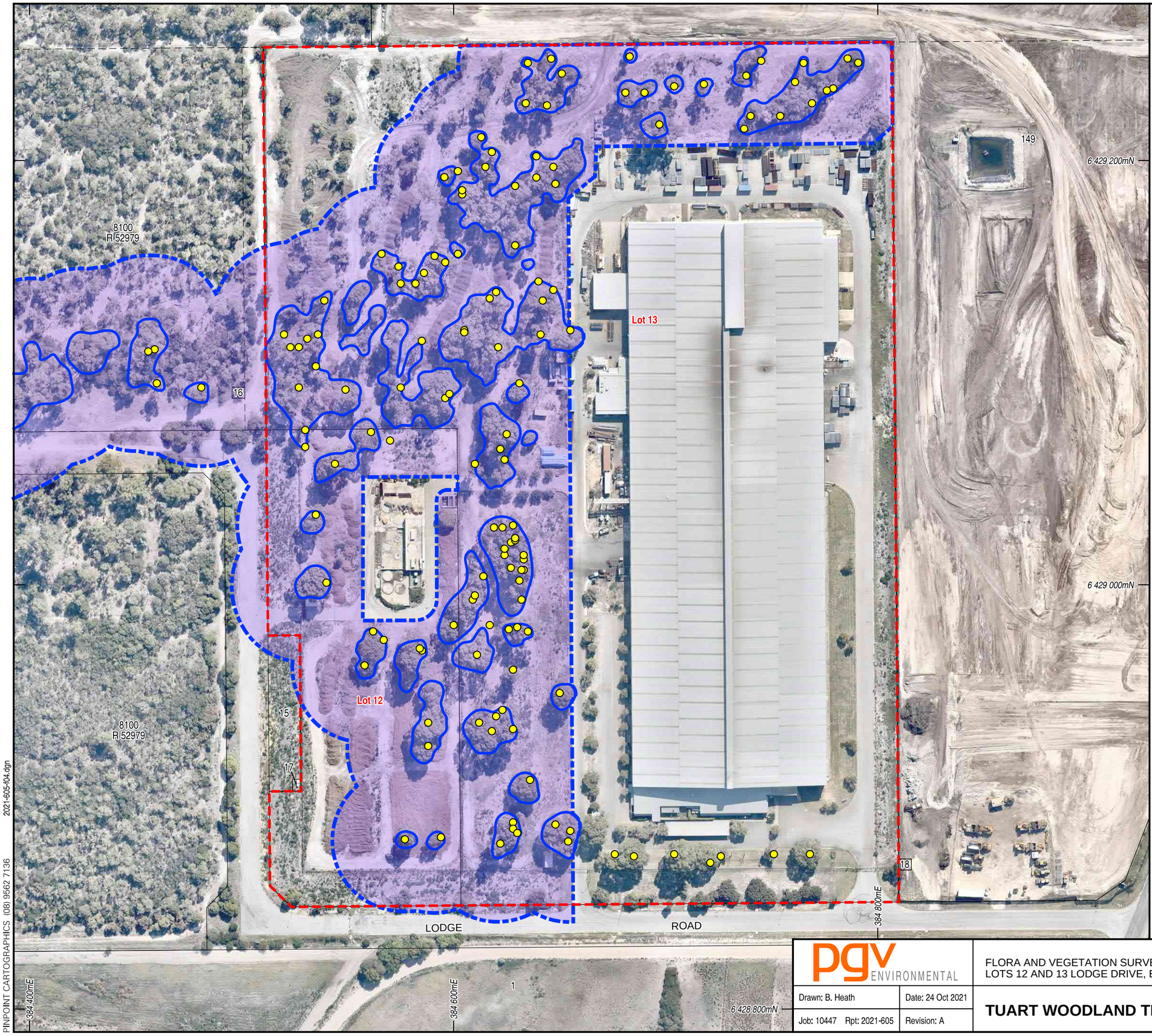
PRELIMINARY DOCUMENTATION
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: B. Heath | Date: 24 Oct 2021

Job: 10447 Rpt: 2022-666 | Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Tuart Tree Location
- Tuart Tree Canopy
- 30m Perimeter Around Tuart Canopies
- Tuart Woodland TEC

CADASTRAL SOURCE: Landgate, July 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-605-f04.dgn

pgv ENVIRONMENTAL

FLORA AND VEGETATION SURVEY
LOTS 12 AND 13 LODGE DRIVE, EAST ROCKINGHAM

Drawn: B. Heath	Date: 24 Oct 2021
Job: 10447 Rpt: 2021-605	Revision: A

TUART WOODLAND TEC

Figure 4

Attachment 3

APPENDIX 1

Naturemap Report

Attachment 3

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 10/08/2021

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 46' 29" E,32° 16' 09" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	439	1838
Priority 1	1	1
Priority 3	4	8
Priority 4	8	51
Protected under international agreement	17	74
Rare or likely to become extinct	9	62
TOTAL	**478**	**2034**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
2.	24790	*Calidris tenuirostris (Great Knot)*		T	
3.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
4.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
5.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
6.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
7.	25335	*Caretta caretta (Loggerhead Turtle)*		T	
8.	25336	*Chelonia mydas (Green Turtle)*		T	
9.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
Protected under international agreement					
10.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
11.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
12.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
13.	24786	*Calidris melanotos (Pectoral Sandpiper)*		IA	
14.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
15.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
16.	41332	*Chlidonias leucopterus (White-winged Black Tern, white-winged tern)*		IA	
17.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
18.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
19.	24690	*Macronectes giganteus (Southern Giant Petrel)*		IA	
20.	41347	*Onychoprion anaethetus (Bridled Tern)*		IA	
21.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
22.	25640	*Sterna dougallii (Roseate Tern)*		IA	
23.	48597	*Thalasseus bergii (Crested Tern)*		IA	
24.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
25.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
26.	24809	*Tringa stagnatilis (Marsh Sandpiper, little greenshank)*		IA	
Priority 1					
27.	48762	*Acacia sp. Binningup (G. Cockerton et al. WB 37784)*		P1	
Priority 3					
28.	48935	*Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)*		P3	
29.	25147	*Lerista lineata (Perth Slider, Lined Skink)*		P3	
30.	25249	*Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)*		P3	
31.	25006	*Pletholax gracilis subsp. edelensis (Keeled Legless Lizard (Shark Bay))*		P3	
Priority 4					
32.	4763	*Dodonaea hackettiana (Hackett's Hopbush)*		P4	
33.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
34.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
35.	4027	*Jacksonia sericea (Waldjumi)*		P4	
36.	48022	*Notamacropus irma (Western Brush Wallaby)*		P4	
37.	25196	*Notoscincus butleri (lined soil-crevice skink (Dampier))*		P4	
38.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
39.	48135	*Thinornis rubricollis (Hooded Plover, Hooded Dotterel)*		P4	

Non-conservation taxon

40.	3502	*Acacia pulchella (Prickly Moses)*			
41.	15482	*Acacia pulchella var. goadbyi*			
42.	3525	*Acacia rostellifera (Summer-scented Wattle)*			
43.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
44.	30032	*Acacia saligna subsp. saligna*			
45.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
46.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
47.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
48.	24262	*Acanthiza inornata (Western Thornbill)*			
49.	1208	*Acanthocarpus preissii*			
50.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
51.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
52.	25536	*Accipiter fasciatus (Brown Goshawk)*			
53.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
54.	1505	*Agave americana (Century Plant)*	Y		
55.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
56.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
57.		*Allotrochosina karri*			
58.		*Aname mainae*			
59.	24312	*Anas gracilis (Grey Teal)*			
60.	24315	*Anas rhynchotis (Australasian Shoveler)*			
61.	24316	*Anas superciliosa (Pacific Black Duck)*			
62.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw, Kurulbrang)*			
63.	44629	*Anilios australis*			
64.		*Anser anser*			
65.	6949	*Anthocercis littorea (Yellow Tailflower)*			
66.	24561	*Anthochaera carunculata (Red Wattlebird)*			
67.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
68.	6211	*Apium prostratum (Sea Celery)*			
69.	12040	*Apium prostratum subsp. prostratum var. prostratum (Sea Celery)*			
70.		*Apogon rueppellii*			
71.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
72.	24285	*Aquila audax (Wedge-tailed Eagle)*			
73.		*Araneus cyphoxis*			
74.	41324	*Ardea modesta (great egret, white egret)*			
75.	24340	*Ardea novaehollandiae (White-faced Heron)*			
76.		*Argiope trifasciata*			
77.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
78.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
79.		*Artoria flavimana*			
80.		*Artoria linnaei*			
81.		*Artoriopsis expolita*			
82.	226	*Arundo donax (Giant Reed)*	Y		
83.		*Atherinosoma wallacei*			
84.	47713	*Austronomus australis (White-striped Free-tailed Bat)*			
85.	17240	*Austrostipa flavescens*			
86.	231	*Avellinia michelii*	Y		
87.	234	*Avena fatua (Wild Oat)*	Y		
88.	235	*Avena sativa (Common Oat)*	Y		
89.		*Backobourkia brounii*			
90.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
91.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
92.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
93.		*Barnardius zonarius*			
94.	740	*Baumea arthrophylla*			
95.	743	*Baumea juncea (Bare Twigrush)*			
96.	7046	*Bellardia trixago (Bellardia)*	Y		
97.	48868	*Bellardia viscosa*	Y		
98.	24319	*Biziura lobata (Musk Duck)*			
99.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
100.	16636	*Boronia crenulata subsp. viminea*			
101.	6341	*Brachyloma preissii (Globe Heath)*			
102.	244	*Briza maxima (Blowfly Grass)*			

Attachment 3

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
			Y		
103.	245	*Briza minor (Shivery Grass)*	Y		
104.	249	*Bromus diandrus (Great Brome)*	Y		
105.	250	*Bromus hordeaceus (Soft Brome)*	Y		
106.	12770	*Burchardia congesta*			
107.		*Byssomerulius corium*			
108.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
109.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
110.	25715	*Cacatua roseicapilla (Galah)*			
111.	25716	*Cacatua sanguinea (Little Corella)*			
112.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
113.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
114.	1276	*Caesia micrantha (Pale Grass Lily)*			
115.	2846	*Calandrinia calyptrata (Pink Purslane)*			
116.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
117.	96	*Callitris preissii (Rottnest Island Pine, Maro)*			
118.	5415	*Calothamnus lateralis*			
119.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
120.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
121.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
122.	1162	*Cartonema philydroides*			
123.	2957	*Cassytha racemosa (Dodder Laurel)*			
124.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
125.	6539	*Centaurium erythraea (Common Centaury)*	Y		
126.	6214	*Centella asiatica*			
127.	1125	*Centrolepis drummondiana*			
128.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
129.	17685	*Chaetanthus aristatus*			
130.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
131.	1280	*Chamaescilla corymbosa (Blue Squill)*			
132.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
133.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
134.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
135.	24980	*Christinus marmoratus (Marbled Gecko)*			
136.		*Chroicocephalus novaehollandiae*			
137.	24288	*Circus approximans (Swamp Harrier)*			
138.	7937	*Cirsium vulgare (Spear Thistle, Scotch Thistle)*	Y		
139.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
140.		*Clynotis albobarbatus*			
141.		*Clynotis severus*			
142.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
143.	24399	*Columba livia (Domestic Pigeon)*	Y		
144.	4552	*Comesperma confertum*			
145.	4555	*Comesperma integerrimum*			
146.	6217	*Conium maculatum (Hemlock)*	Y		
147.	1885	*Conospermum triplinervium (Tree Smokebush)*			
148.	1418	*Conostylis aculeata (Prickly Conostylis)*			
149.	11826	*Conostylis aculeata subsp. aculeata*			
150.	12109	*Conostylis aculeata subsp. preissii*			
151.	11438	*Conostylis candicans subsp. candicans*			
152.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
153.	48259	*Cortaderia selloana subsp. selloana*	Y		
154.	25592	*Corvus coronoides (Australian Raven)*			
155.	24419	*Corvus splendens (House Crow)*			
156.	11283	*Corynotheca micrantha var. micrantha*			
157.		*Coryphaena hippurus*			
158.	25595	*Cracticus tibicen (Australian Magpie)*			
159.	25596	*Cracticus torquatus (Grey Butcherbird)*			
160.	3137	*Crassula colorata (Dense Stonecrop)*			
161.	3140	*Crassula glomerata*	Y		
162.	25399	*Crinia glauerti (Clicking Frog)*			
163.	25400	*Crinia insignifera (Squelching Froglet)*			
164.	30893	*Cryptoblepharus buchananii*			
165.	1627	*Cryptostylis ovata (Slipper Orchid)*			
166.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
167.	25027	*Ctenotus australis*			
168.	25039	*Ctenotus fallens*			
169.	25040	*Ctenotus gemmula (Jewelled South-west Ctenotus (Swan Coastal Plain subpop P3), skink)*			
170.	6663	*Cuscuta epithymum (Lesser Dodder, Greater Dodder)*	Y		

Attachment 3

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
171.	24322	*Cygnus atratus (Black Swan)*			
172.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
173.	30902	*Dacelo novaeguineae subsp. novaeguineae (Laughing Kookaburra)*	Y		
174.		*Dactylopus dactylopus*			
175.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
176.	18560	*Daviesia divaricata subsp. divaricata*			
177.	3845	*Daviesia triflora*			
178.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
179.	1259	*Dianella revoluta (Blueberry Lily)*			
180.	11636	*Dianella revoluta var. divaricata*			
181.	1287	*Dichopogon capillipes*			
182.	17838	*Dielsia stenostachya*			
183.		*Dingosa serrata*			
184.	3011	*Diplotaxis muralis (Wall Rocket)*	Y		
185.	7054	*Dischisma arenarium*	Y		
186.	12943	*Diuris brumalis*			
187.	1634	*Diuris laxiflora (Bee Orchid)*			
188.	12939	*Diuris magnifica*			
189.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
190.	3106	*Drosera macrantha (Bridal Rainbow)*			
191.	3131	*Drosera stolonifera (Leafy Sundew)*			
192.		*Egretta novaehollandiae*			
193.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
194.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
195.		*Elanus axillaris*			
196.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
197.		*Eolophus roseicapillus*			
198.	24567	*Epthianura albifrons (White-fronted Chat)*			
199.		*Eragrostis sp. indet.*			
200.	17175	*Eremophila glabra subsp. albicans*			
201.	15446	*Eryngium pinnatifidum subsp. pinnatifidum*			
202.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
203.	5615	*Eucalyptus decipiens (Limestone Marlock, Moit)*			
204.	5649	*Eucalyptus foecunda (Narrow-leaved Red Mallee)*			
205.	5659	*Eucalyptus gomphocephala (Tuart, Duart)*			
206.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
207.	25746	*Eudyptula minor (Little Penguin)*			
208.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
209.	25621	*Falco berigora (Brown Falcon)*			
210.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
211.	25623	*Falco longipennis (Australian Hobby)*			
212.	24041	*Felis catus (Cat)*	Y		
213.		*Fomitopsis lilacinogilva*			
214.	25727	*Fulica atra (Eurasian Coot)*			
215.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			
216.	907	*Gahnia trifida (Coast Saw-sedge)*			
217.	7323	*Galium murale (Small Goosegrass)*	Y		
218.	24763	*Gallinula tenebrosa subsp. tenebrosa (Dusky Moorhen)*			
219.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
220.	20346	*Gamochaeta coarctata*	Y		
221.	4339	*Geranium molle (Dove's Foot Cranesbill)*	Y		
222.	25530	*Gerygone fusca (Western Gerygone)*			
223.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
224.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
225.	24443	*Grallina cyanoleuca (Magpie-lark)*			
226.	1982	*Grevillea crithmifolia*			
227.	15839	*Grevillea preissii subsp. preissii*			
228.	2119	*Grevillea vestita*			
229.	12824	*Grevillea vestita subsp. vestita*			
230.		*Gymnothorax woodwardi*			
231.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
232.	2175	*Hakea lissocarpha (Honey Bush)*			
233.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
234.	24295	*Haliastur sphenurus (Whistling Kite)*			
235.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
236.	25410	*Heleioporus eyrei (Moaning Frog)*			
237.	3016	*Heliophila pusilla*	Y		
238.	6710	*Heliotropium europaeum (Common Heliotrope)*	Y		
239.	25119	*Hemiergis quadrilineata*			
240.		*Heterodontus portusjacksoni*			

Attachment 3

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
241.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
242.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
243.	48381	*Hibbertia striata*			
244.	47965	*Hieraaetus morphnoides (Little Eagle)*			
245.	25734	*Himantopus himantopus (Black-winged Stilt)*			
246.	24491	*Hirundo neoxena (Welcome Swallow)*			
247.		*Hogna crispipes*			
248.	6222	*Homalosciadium homalocarpum*			
249.	448	*Hordeum glaucum (Northern Barley Grass)*	Y		
250.	3968	*Hovea trisperma (Common Hovea)*			
251.	12859	*Hovea trisperma var. trisperma*			
252.	5216	*Hybanthus calycinus (Wild Violet)*			
253.	5218	*Hybanthus debilissimus*			
254.	6224	*Hydrocotyle blepharocarpa*			
255.	25366	*Hydrophis elegans (Elegant Seasnake, Bar-bellied Seasnake)*			
256.	43384	*Hydrophis platurus (Yellow-bellied Seasnake)*			
257.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
258.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
259.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
260.		*Idiommata blackwalli*			
261.	910	*Isolepis cernua (Nodding Club-rush)*			
262.	20199	*Isolepis cernua var. cernua*			
263.	917	*Isolepis marginata (Coarse Club-rush)*			
264.		*Isopeda leishmanni*			
265.	8092	*Ixiolaena viscosa (Sticky Ixiolaena)*			
266.	1178	*Juncus bufonius (Toad Rush)*	Y		
267.	1185	*Juncus kraussii (Sea Rush)*			
268.	4044	*Kennedia prostrata (Scarlet Runner)*			
269.	24070	*Kogia breviceps (Pygmy Sperm Whale)*			
270.	1370	*Lachenalia reflexa*	Y		
271.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
272.		*Lampona cylindrata*			
273.	30920	*Larus crassirostris (Black-tailed Gull)*			Y
274.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
275.	925	*Lepidosperma angustatum*			
276.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
277.		*Lepidosperma sp.*			
278.	15418	*Leptoceras menziesii*			
279.	25133	*Lerista elegans*			
280.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
281.	6436	*Leucopogon propinquus*			
282.	25005	*Lialis burtonis*			
283.	25661	*Lichmera indistincta (Brown Honeyeater)*			
284.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
285.	4362	*Linum marginale (Wild Flax)*			
286.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
287.	25388	*Litoria moorei (Motorbike Frog)*			
288.	9289	*Lobelia anceps (Angled Lobelia)*			
289.	7408	*Lobelia tenuior (Slender Lobelia)*			
290.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
291.	1231	*Lomandra maritima*			
292.	1198	*Luzula meridionalis (Field Woodrush)*			
293.		*Lycosa godeffroyi*			
294.	1097	*Lyginia barbata*			
295.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
296.	25654	*Malurus splendens (Splendid Fairy-wren)*			
297.		*Maxillicosta scabriceps*			
298.	25758	*Megalurus gramineus (Little Grassbird)*			
299.	13271	*Melaleuca huegelii subsp. huegelii*			
300.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
301.	5978	*Melaleuca teretifolia (Banbar)*			
302.	13280	*Melaleuca viminea subsp. viminea*			
303.	4516	*Melia azedarach (White Cedar)*			
304.	25184	*Menetia greyii*			
305.	25185	*Menetia maini*			
306.	25186	*Menetia surda subsp. cresswelli*			
307.	25187	*Menetia surda subsp. surda*			
308.	24598	*Merops ornatus (Rainbow Bee-eater)*			
309.	955	*Mesomelaena pseudostygia*			
310.		*Microcarbo melanoleucos*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
311.	485	*Microlaena stipoides (Weeping Grass)*			
312.		*Missulena granulosa*			
313.		*Missulena hoggi*			
314.	25188	*Morethia adelaidensis*			
315.	25189	*Morethia boulengeri*			
316.	25191	*Morethia lineoocellata*			
317.	25192	*Morethia obscura*			
318.	25193	*Morethia ruficauda subsp. exquisita*			
319.	25194	*Morethia ruficauda subsp. ruficauda*			
320.	25195	*Morethia storri*			
321.	48008	*Morus serrator (Australasian Gannet)*			
322.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
323.	24223	*Mus musculus (House Mouse)*	Y		
324.		*Myandra bicincta*			
325.	25252	*Notechis scutatus (Tiger Snake)*			
326.	25197	*Notoscincus ornatus subsp. ornatus*			
327.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
328.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
329.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
330.	8149	*Olearia rudis (Rough Daisybush)*			
331.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
332.		*Ophisurus serpens*			
333.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
334.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
335.	516	*Parapholis incurva (Coast Barbgrass)*	Y		
336.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
337.	25682	*Pardalotus striatus (Striated Pardalote)*			
338.	24630	*Pardalotus striatus subsp. westraliensis (Striated Pardalote)*			
339.	24642	*Passer montanus (Eurasian Tree Sparrow)*	Y		
340.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
341.	24674	*Pavo cristatus (Common Peafowl, Indian Peafowl)*	Y		
342.		*Pegasus volitans*			
343.	4346	*Pelargonium littorale*			
344.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
345.	16984	*Persicaria lapathifolia*	Y		
346.	48061	*Petrochelidon nigricans (Tree Martin)*			
347.	48066	*Petroica boodang (Scarlet Robin)*			
348.	2299	*Petrophile linearis (Pixie Mops)*			
349.	25697	*Phalacrocorax carbo (Great Cormorant)*			
350.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
351.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
352.	25699	*Phalacrocorax varius (Pied Cormorant)*			
353.	24409	*Phaps chalcoptera (Common Bronzewing)*			
354.		*Phlebia rufa*			
355.		*Phlebia subceracea*			
356.	1478	*Phlebocarya ciliata*			
357.		*Phryganoporus candidus*			
358.	6734	*Phyla nodiflora var. nodiflora*	Y		
359.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
360.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
361.	4675	*Phyllanthus calycinus (False Boronia)*			
362.		*Phyllophryne scortea*			
363.	20652	*Physalis angulata*	Y		
364.	6983	*Physalis peruviana (Cape Gooseberry)*	Y		
365.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
366.	24750	*Platycercus zonarius subsp. semitorquatus (Twenty-eight Parrot)*			
367.	25007	*Pletholax gracilis subsp. gracilis (Keeled Legless Lizard)*			
368.	577	*Poa poiformis (Coastal Poa)*			
369.	578	*Poa porphyroclados*			
370.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
371.	25704	*Podiceps cristatus (Great Crested Grebe)*			
372.	8175	*Podolepis gracilis (Slender Podolepis)*			
373.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
374.	24908	*Pogona minor subsp. mitchelli (Dwarf Bearded Dragon)*			
375.	24909	*Pogona nullarbor (Nullabor Bearded Dragon)*			
376.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
377.	25722	*Polytelis anthopeplus (Regent Parrot)*			
378.	4691	*Poranthera microphylla (Small Poranthera)*			
379.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
380.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			

Attachment 3

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
381.	24769	*Porzana fluminea (Australian Spotted Crake)*			
382.	24771	*Porzana tabuensis (Spotless Crake)*			
383.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
384.		*Prionosternum nitidiceps*			
385.		*Prionosternum scutatum*			
386.	25199	*Proablepharus reginae*			
387.	25200	*Proablepharus tenuis*			
388.	25201	*Pseudemoia baudini*			
389.	25511	*Pseudonaja affinis (Dugite)*			
390.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
391.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
392.	24702	*Pterodroma brevirostris (Kerguelen Petrel)*			
393.	15426	*Pterostylis aspera*			
394.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
395.		*Purpureicephalus spurius*			
396.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
397.	25009	*Pygopus nigriceps*			
398.	24245	*Rattus rattus (Black Rat)*	Y		
399.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
400.	11341	*Rhagodia baccata subsp. baccata*			
401.	4822	*Rhamnus alaternus (Buckthorn)*	Y		
402.	48096	*Rhipidura albiscapa (Grey Fantail)*			
403.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
404.	1556	*Romulea rosea (Guildford Grass)*	Y		
405.	10970	*Rostraria cristata*	Y		
406.	6483	*Samolus junceus*			
407.	6484	*Samolus repens (Creeping Brookweed)*			
408.	7595	*Scaevola anchusifolia*			
409.	7606	*Scaevola crassifolia (Thick-leaved Fan-flower)*			
410.	48834	*Schinus terebinthifolia*	Y		
411.	982	*Schoenus clandestinus*			
412.	1004	*Schoenus nitens (Shiny Bog-rush)*			
413.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
414.	25878	*Senecio condylus*			
415.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
416.		*Servaea spinibarbis*			
417.	2909	*Silene gallica (French Catchfly)*	Y		
418.		*Simaetha tenuior*			
419.	25267	*Simoselaps littoralis (West Coast Banded Snake)*			
420.	30948	*Smicrornis brevirostris (Weebill)*			
421.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
422.	7037	*Solanum symonii*			
423.	9367	*Sonchus hydrophilus (Native Sowthistle)*			
424.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
425.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
426.	635	*Sporobolus virginicus (Marine Couch)*			
427.	2918	*Stellaria media (Chickweed)*	Y		
428.	19403	*Stenopetalum gracile*			
429.	24522	*Sterna bergii (Crested Tern)*			
430.	48594	*Sternula nereis (Fairy Tern)*			
431.	2316	*Stirlingia latifolia (Blueboy)*			
432.	25597	*Strepera versicolor (Grey Currawong)*			
433.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
434.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
435.	24942	*Strophurus spinigerus subsp. spinigerus*			
436.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
437.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
438.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
439.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
440.	4256	*Templetonia retusa (Cockies Tongues)*			
441.	2791	*Tersonia cyathiflora (Button Creeper)*			
442.		*Tetragnatha demissa*			
443.		*Tetragnatha nitens*			
444.	1708	*Thelymitra fuscolutea (Chestnut Sun Orchid)*			
445.	5077	*Thomasia cognata*			
446.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
447.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
448.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
449.	25203	*Tiliqua occipitalis (Western Bluetongue)*			

Attachment 3

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
450.	25519	*Tiliqua rugosa*			
451.	25207	*Tiliqua rugosa subsp. rugosa*			
452.		*Torquigener pleurogramma*			
453.	6280	*Trachymene pilosa (Native Parsnip)*			
454.	1481	*Tribonanthes australis (Southern Tiurndin)*			
455.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
456.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
457.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
458.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
459.	1363	*Tricoryne tenella*			
460.	4292	*Trifolium campestre (Hop Clover)*	Y		
461.	151	*Triglochin striata*			
462.	708	*Triticum aestivum (Wheat)*	Y		
463.	24069	*Tursiops truncatus (Bottlenose Dolphin)*			
464.	99	*Typha orientalis (Bulrush, Cumbungi)*			
465.	25762	*Tyto alba (Barn Owl)*			
466.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
467.	25227	*Varanus tristis subsp. tristis (Racehorse Monitor)*			
468.		*Venatrix pullastra*			
469.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
470.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
471.	12052	*Vulpia myuros forma megalura*	Y		
472.	33101	*Vulpia myuros forma myuros*	Y		
473.	6658	*Wilsonia backhousei (Narrow-leaf Wilsonia)*			
474.	1394	*Wurmbea dioica (Early Nancy)*			
475.	12072	*Wurmbea dioica subsp. alba*			
476.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
477.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
478.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Attachment 3

APPENDIX 2

Protected Matters Search Tool Report

Attachment 3

Australian Government
Department of Agriculture, Water and the Environment

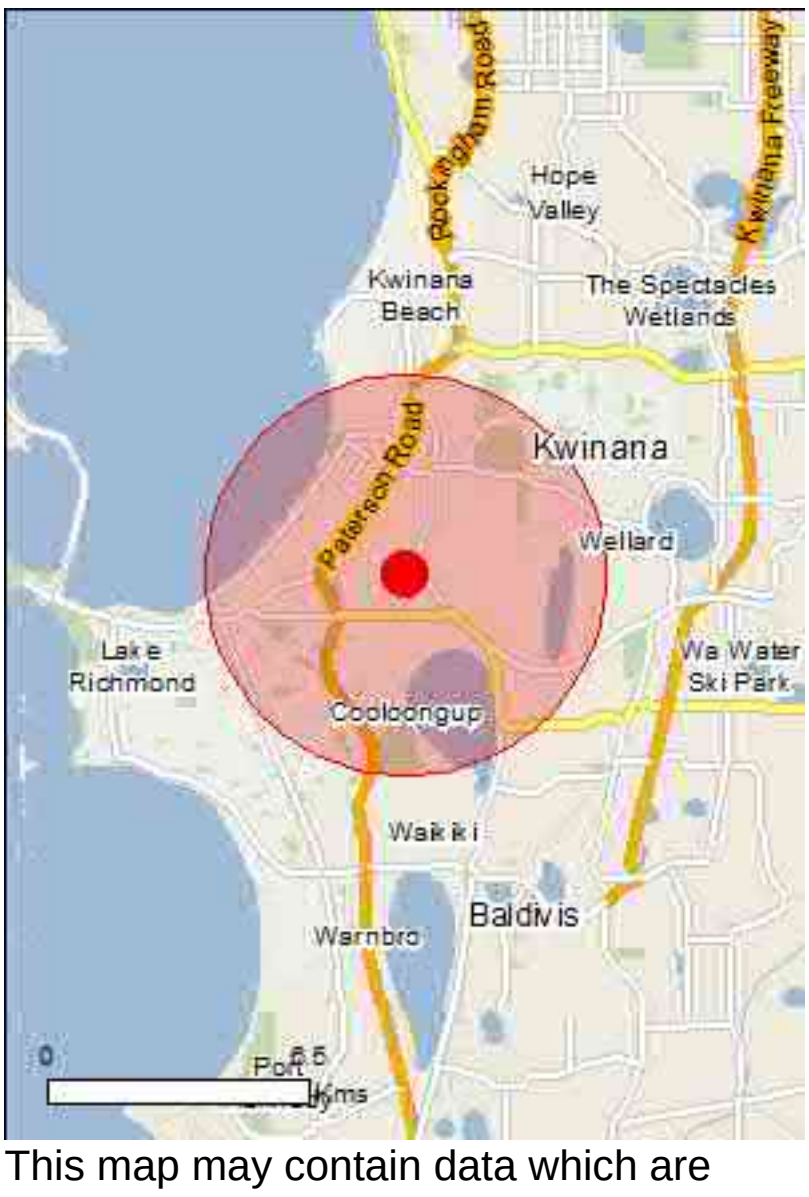
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

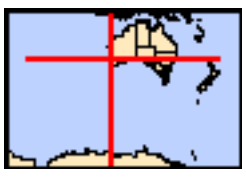
Report created: 05/08/21 19:01:10



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 5.0Km



Attachment 3

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	48
Listed Migratory Species:	51

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	80
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	36
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Attachment 3

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Becher point wetlands	Within 10km of Ramsar
Forrestdale and thomsons lakes	Within 10km of Ramsar
Peel-yalgorup system	20 - 30km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community may occur within area
Sedgelands in Holocene dune swales of the southern Swan Coastal Plain	Endangered	Community known to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area

Attachment 3

Name	Status	Type of Presence
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area

Attachment 3

Name	Status	Type of Presence
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Mammals		
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat may occur within area
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Breeding known to occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Neophoca cinerea		
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Pseudocheirus occidentalis		
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area
Plants		
Andersonia gracilis		
Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Caladenia huegelii		
King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
Diuris micrantha		
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area
Diuris purdiei		
Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Drakaea elastica		
Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha		
Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Synaphea sp. Serpentine (G.R. Brand 103)		
[86879]	Critically Endangered	Species or species habitat may occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur

Attachment 3

Name	Status	Type of Presence within area
[Natator depressus](#)		
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Sharks		
[Carcharias taurus (west coast population)](#)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
[Carcharodon carcharias](#)		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
[Rhincodon typus](#)		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
[Anous stolidus](#)		
Common Noddy [825]		Species or species habitat may occur within area
[Apus pacificus](#)		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardenna carneipes](#)		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
[Diomedea amsterdamensis](#)		
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
[Diomedea dabbenena](#)		
Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
[Diomedea epomophora](#)		
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Diomedea exulans](#)		
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Diomedea sanfordi](#)		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
[Hydroprogne caspia](#)		
Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
[Macronectes giganteus](#)		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
[Macronectes halli](#)		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
[Onychoprion anaethetus](#)		
Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area

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Name	Threatened	Type of Presence
Sterna dougallii		
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis		
Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Caperea marginata		
Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharhinus longimanus		
Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Lamna nasus		
Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi		
Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris		
Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area

Attachment 3

Name	Threatened	Type of Presence
[Megaptera novaeangliae](#) Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat likely to occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area
[Calidris ruficollis](#) Red-necked Stint [860]		Species or species habitat known to occur within area
[Calidris subminuta](#) Long-toed Stint [861]		Species or species habitat known to occur within area
[Charadrius dubius](#) Little Ringed Plover [896]		Species or species habitat known to occur within area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area
[Limosa limosa](#) Black-tailed Godwit [845]		Species or species habitat known to occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area
[Philomachus pugnax](#) Ruff (Reeve) [850]		Species or species habitat known to occur

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Name	Threatened	Type of Presence within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Defence - ROCKINGHAM - NAVY CPSO

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species

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Name	Threatened	Type of Presence
		habitat known to occur within area
[Calidris ruficollis](#) Red-necked Stint [860]		Species or species habitat known to occur within area
[Calidris subminuta](#) Long-toed Stint [861]		Species or species habitat known to occur within area
[Catharacta skua](#) Great Skua [59472]		Species or species habitat may occur within area
[Charadrius dubius](#) Little Ringed Plover [896]		Species or species habitat known to occur within area
[Charadrius ruficapillus](#) Red-capped Plover [881]		Species or species habitat known to occur within area
[Diomedea amsterdamensis](#) Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
[Diomedea dabbenena](#) Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
[Halobaena caerulea](#) Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
[Himantopus himantopus](#) Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
[Larus pacificus](#) Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area
[Limosa limosa](#) Black-tailed Godwit [845]		Species or species habitat known to occur within area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within

Attachment 3

Name	Threatened	Type of Presence
		area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Sterna anaethetus Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
Sterna caspia Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area

Attachment 3

Name	Threatened	Type of Presence
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Thinornis rubricollis](#) Hooded Plover [59510]		Species or species habitat known to occur within area
[Tringa glareola](#) Wood Sandpiper [829]		Species or species habitat known to occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Fish		
[Acentronura australe](#) Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
[Campichthys galei](#) Gale's Pipefish [66191]		Species or species habitat may occur within area
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
[Hippocampus angustus](#) Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
[Hippocampus breviceps](#) Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
[Hippocampus subelongatus](#) West Australian Seahorse [66722]		Species or species habitat may occur within area
[Histiogamphelus cristatus](#) Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
[Lissocampus caudalis](#) Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
[Lissocampus fatiloquus](#) Prophet's Pipefish [66250]		Species or species habitat may occur within area
[Lissocampus runa](#) Javelin Pipefish [66251]		Species or species habitat may occur within area
[Maroubra perserrata](#) Sawtooth Pipefish [66252]		Species or species habitat may occur within area
[Mitotichthys meraculus](#) Western Crested Pipefish [66259]		Species or species habitat may occur within area
[Nannocampus subosseus](#) Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area

Attachment 3

Name	Threatened	Type of Presence
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence

Attachment 3

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Leda	WA
Unnamed WA51658	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence

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Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur

Attachment 3

Name	Status	Type of Presence within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		

Attachment 3

Name	Status	Type of Presence
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Attachment 3

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-32.26939 115.77587

Attachment 3

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Attachment 3

APPENDIX 3

Flora Species List

Attachment 3

SPECIES LIST – Lots 12 and 13 Lodge Drive, East Rockingham

MONOCOTYLEDONS

ASPARAGACEAE
**Asparagus asparagoides*

ASPHODELACEAE

**Asphodelus fistulosus*

**Trachyandra divaricata*

PAPAVERACEAE

**Fumaria capreolata*

POACEAE
**Avena fatua*

**Briza minor*

**Bromus diandrus*

**Ehrharta longiflora*

**Lagurus ovatus*

**Lolium perenne*

**Lolium rigidum*

DICOTYLEDONS

ANACARDIACEAE

**Schinus terebinthifolius*

APOCYNACEAE

**Gomphocarpus fruticosus*

ASTERACEAE

**Arctotheca calendula*

**Cirsium vulgare*

**Erigeron bonariensis*

**Hypochaeris glabra*

**Sonchus asper*

**Sonchus oleraceus*

**Taraxacum officinale*

**Urospermum picroides*

BRASSICACEAE

**Raphanus raphanistrum*

CARIFOLIACEAE

**Sixalix atropurpurea*

CARYOPHYLLACEAE

**Petrorhagia dubia*

CRASSULACEAE

**Crassula glomerata*

EUPHORBIACEAE

**Euphorbia peplus*

**Euphorbia terracina*

FABACEAE
Acacia rostellifera

Acacia saligna

**Medicago polymorpha*

**Melilotus indicus*

Trifolium sp

**Trifolium campestre*

Attachment 3

MALVACEAE

**Malva parviflora*

MYRTACEAE
Eucalyptus gomphocephala

Melaleuca huegelii

Melaleuca rhaphiophylla

OXALIDACEAE

**Oxalis pes-caprae*

PAPAVERACEAE

**Fumaria capreolata*

PRIMULACEAE

**Lysimachia arvensis*

RANUNCULACEAE

Clematis linearifolia

RHAMNACEAE

**Rhamnus alaternus*

Spyridium globulosum

RUBIACEAE

**Galium murale*

SOLANACEAE

**Solanum nigrum*

Attachment 3

APPENDIX 4

Quadrat Data

Attachment 3

QUADRAT LR1

50 384615 E 6428945 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	12	25
**Avena fatua*	1.2	10
**Rhamnus alaternus*	1.2	1
**Gomphocarpus fruticosus*	1.1	15
**Schinus terebinthifolius*	1	<1
**Ehrharta longiflora*	1	25
Acacia rostellifera	0.8	1
**Melilotus indicus*	0.6	<1
**Raphanus raphanistrum*	0.6	<1
**Lolium rigidum*	0.5	2
**Sonchus asper*	0.5	1
Acacia saligna	0.5	<1
**Solanum nigrum*	0.4	5
**Trachyandra divaricata*	0.4	<1
**Sonchus oleraceus*	0.4	<1
**Bromus diandrus*	0.4	<1
**Briza minor*	0.4	<1
**Lysimachia arvensis*	0.3	2
**Euphorbia terracina*	0.3	1

Attachment 3

SPECIES	HEIGHT (m)	COVER (%)
**Asphodelus fistulosus*	0.3	<1
**Arctotheca calendula*	0.3	<1
**Malva parviflora*	0.2	1
**Oxalis pes-caprae*	0.2	10
**Fumaria capreolata*	0.1	10
**Euphorbia peplus*	0.1	<1
**Trifolium sp*	<0.1	<1
**Taraxacum officinale*	Flat	<1
**Cirsium vulgare*	Flat	<1
**Hypochaeris glabra*	Flat	<1
**Asparagus asparagoides*	Climber	2

* introduced species

Attachment 3

QUADRAT LR2

50 384589 E 6428959 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over mulch and weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	15	20
**Avena fatua*	1	10
**Ehrharta longiflora*	0.7	5
**Rhamnus alaternus*	0.5	1
**Bromus diandrus*	0.4	10
**Sonchus asper*	0.4	<1
**Euphorbia terracina*	0.3	<1
**Medicago polymorpha*	0.3	40
**Fumaria capreolata*	0.3	<1
**Oxalis pes-caprae*	0.2	20
**Sixalix atropurpurea*	0.1	<1
**Lysimachia arvensis*	0.1	<1
**Asparagus asparagoides*	Climber	<1

* introduced species

Attachment 3

QUADRAT LR3

50 384623 E 6429172 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over mulch and weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	15	25
**Rhamnus alaternus*	2	2
**Avena fatua*	1	20
Melaleuca huegelii	1	1
**Gomphocarpus fruticosus*	0.8	1
**Ehrharta longiflora*	0.7	1
**Bromus diandrus*	0.4	5
**Euphorbia terracina*	0.3	<1
**Oxalis pes-caprae*	0.2	2
**Trifolium campestre*	0.2	1
Acacia rostellifera	0.2	<1
**Asphodelus fistulosus*	0.2	<1
**Solanum nigrum*	0.1	<1
**Lysimachia arvensis*	0.1	<1
**Asparagus asparagoides*	Climber	1
Clematis linearifolia	Climber	<1

* introduced species

Attachment 3

QUADRAT LR4

50 384722 E 6429230 N

Vegetation: *Eucalyptus gomphocephala* (Tuart) Woodland over weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus gomphocephala	14	20
Spyridium globulosum	1	2
**Rhamnus alaternus*	1	1
**Solanum nigrum*	1	1
**Gomphocarpus fruticosus*	0.8	10
**Ehrharta longiflora*	0.8	50
**Sonchus oleraceus*	0.8	20
Acacia rostellifera	0.7	10
**Bromus diandrus*	0.5	5
**Euphorbia terracina*	0.5	<1
**Euphorbia peplus*	0.2	4
**Lysimachia arvensis*	0.2	1
**Trifolium campestre*	0.2	<1
**Fumaria capreolata*	0.1	1
**Hypochaeris glabra*	Flat	<1
**Taraxacum officinale*	Flat	<1
**Asparagus asparagoides*	Climber	1
Clematis linearifolia	Climber	<1

* introduced species

Attachment 3

QUADRAT LR5

50 384574 E 6428903 N

Vegetation: Weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
**Avena fatua*	1	10
**Bromus diandrus*	0.5	10
**Rhamnus alaternus*	0.4	<1
**Solanum nigrum*	0.4	<1
**Lolium rigidum*	0.3	<1
**Ehrharta longiflora*	0.3	<1
**Trifolium campestre*	0.2	15
**Fumaria capreolata*	0.2	2
**Euphorbia terracina*	0.2	1
**Medicago polymorpha*	0.1	5
**Oxalis pes-caprae*	0.1	1

* introduced species

Attachment 3

QUADRAT LR6

50 384549 E 6429225 N

Vegetation: *Melaleuca rhaphiophylla/M. huegelii* Low Open Woodland over weeds
Condition: Completely Degraded
Landform: Flat
Soil: Mulch
Date: 15.10.21
Recorder: P. van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Melaleuca rhaphiophylla	5	10
Melaleuca huegelii	4	2
Spyridium globulosum	1.4	5
**Gompholobium fruticosus*	1.4	1
**Avena fatua*	1.2	2
Acacia rostellifera	0.6	2
**Urospermum picroides*	0.6	1
**Ehrharta longiflora*	0.5	25
**Euphorbia terracina*	0.5	1
**Lolium perenne*	0.4	5
**Sonchus oleraceus*	0.4	1
**Petrorhagia dubia*	0.4	<1
**Asphodelus fistulosus*	0.4	<1
**Erigeron bonariensis*	0.3	<1
**Lagurus ovatus*	0.3	<1
**Briza minor*	0.2	<1

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SPECIES	HEIGHT (m)	COVER (%)
**Lysimachia arvensis*	0.1	4
**Trifolium campestre*	0.1	2
**Crassula glomerata*	0.1	1
**Euphorbia peplus*	0.1	1
**Galium murale*	<0.1	<1
**Taraxacum officinale*	Flat	<1
**Asparagus asparagoides*	Climber	<1

* introduced species

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APPENDIX 5

Conservation Codes

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Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. Conservation codes have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018.*

T Threatened species – Schedules 1-4

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

- **Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
- **Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife*

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Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

EX Presumed extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

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Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

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Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

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Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

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Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;

(iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

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Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
b) the following subparagraphs are satisfied:
    i. the species is a species of fish;

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ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

ATTACHMENT 4

Flora and Fauna Management Plan

LOTS 12 AND 13 LODGE DRIVE EAST ROCKINGHAM

EPBC 2021/9069
VEGETATION AND FAUNA MANAGEMENT PLAN

Prepared for:	The Trustee for Hamersley Sub Trust
Report Date:	28 July 2022
Version:	2
Report No.	2022-662

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1 INTRODUCTION

1.1 Background

Lots 12 and 13 Lodge Drive, East Rockingham (the site) are in the City of Rockingham approximately 36km south of the Perth Central Business District (Figure 1). The site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area.

The site is 11.9098ha in size.

1.2 Proposed Action

The proposed Action is the development of the site for the purpose of commercial development. The proposed action will include (but is not necessarily limited to) the following activities:

- Clearing of existing vegetation.
- Bulk earthworks, including cutting and filling of the land, importation and/or exportation of fill where required.
- Civil construction works, including the construction of the pad, servicing and all other associated construction works.
- Landscape works

1.3 Requirement for the Plan

The site is being assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC 2021/9069).

The Referral of the proposed commercial development was accepted by DAWE on 1 November 2021. The original Referral documentation is provided as Addendum 1. The Action was determined as a 'Controlled Action' on 25 November 2021. The Controlled Action Decision was made for impacts pursuant to Section 18 and 18A; Listed threatened species and communities, specifically:

- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community – Critically Endangered; and
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – Endangered;

The decision on the assessment approach was by Preliminary Documentation. Correspondence dated 25 November 2021 outlined the Additional Information required by DAWE prior to the assessment process.

Part of the information requested relates to the *Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community* and was to:

Provide a Construction Environmental Management Plan (CEMP) to cover:

- *Management actions to reduce the introduction of edge effects into conservation area to the west of the proposed site. This includes species and weed management, chemical waste run off procedures microclimate shifts, species shifts, native species loss.*
- *Measures for continual upkeep of the site, including any bushfire management strategies that might involve modification to the conservation area to the west.*

In addition, information was also requested for the management of Black Cockatoos as follows:

> *Provide a CEMP that details how potential environmental impacts associated with construction activities will be managed. The CEMP provided should be developed consistent with the Department's Environmental Management Plan Guidelines referenced at item **9**b.*
>
> *The CEMP should include, but not be limited to:*
>
> > ***i.** Procedures to protect fauna during construction, through ensuring that a qualified fauna spotter catcher is present during all clearing and is given sufficient authority to guide all clearance, including stopping clearing while any checks or relocation requested by the fauna spotter catcher is undertaken. This should ensure that any Black Cockatoos that may be present have safely moved out of the development envelope identified for clearing, of their own volition, before the habitat is cleared. The Department notes that the survey done in July 2021 found no Black Cockatoos on site at the time.*
> >
> > *ii) Procedures to minimise impacts on surrounding areas. This may include measures for work vehicles, noise contamination, the amount of human and non-human traffic allowed in the area, specific speed limits for heavy vehicles.*

This Vegetation and Fauna Management Plan (VFMP) has been prepared to provide the information as requested to assist in the assessment of the proposed Action.

1.4 Scope of Works

The VFMP has been prepared in accordance with the *Environmental Management Plan Guidelines 2014* (DoE, 2014).

The VFMP highlights the key project management issues and provides actions required to be undertaken by the Proponent before, during and following project completion. The VFMP provides actions to manage the clearing impacts, to allocate areas of responsibility required for the implementation of identified management actions and to provide mechanisms to report on compliance with those actions. Timing in relation to the proposed development for the completion of actions and monitoring are also provided.

1.5 Management Objectives

The vegetation on the site will be cleared for the proposed commercial development. The site is surrounded by cleared areas for industrial development to the north and east, by Lodge Drive to the south and the Rockingham Industrial Zone (RIZ) to the west.

The VFMP has the following objectives:

- No impact to vegetation, including TEC, beyond the prescribed construction area;
- Minimise the impacts to Black Cockatoos during clearing of the site; and
- No impact on Black Cockatoo habitat beyond the prescribed construction area.

2 POTENTIAL IMPACTS ON MNES

2.1 Matters of National Environmental Significance

2.1.1 Tuart Woodland TEC

The *Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain TEC* was identified as potentially being present on the site and in the surrounding area. A survey of the site and the adjacent bushland indicates that the TEC is present on the site and one of the patches extends beyond the site boundary into the conservation area to the west (PGV Environmental, 2021). (Figure 2).

The impact of developing the site will not retain any native vegetation and therefore 1.5ha will be directly impacted (Figure 3). The VFMP is to ensure the risk of any impacts to the adjacent vegetation is minimised.

2.1.2 Carnaby's Black Cockatoos

The site contains habitat for Carnaby's Black Cockatoo as identified in the Black Cockatoo Habitat Assessment (PGV Environmental, 2021).

The Black Cockatoo Habitat Assessment identified approximately 1.5ha of foraging habitat on the site consisting of Tuart Trees which are considered a moderate foraging source (Johnson and Kirkby, 2018). Evidence of foraging was not found on the site during the site survey in October 2021.

The site does contain any evidence of breeding by Black Cockatoos. Potential breeding habitat for Carnaby's Black Cockatoos was recorded on the site and consisted of 58 Tuart trees with a diameter at breast height (DBH) of 500mm or greater. None of these trees contain suitable hollows or spouts for use by Black Cockatoos.

The site is not used as roosting habitat.

Higher quality habitat (91ha) for Black Cockatoos occurs in the conservation area adjacent to the site.

2.2 Identified Risks

Identified risks to the Tuart Woodland TEC in the surrounding area include:

- Direct impacts of the future development on clearing or damaging native vegetation in the adjacent area;
- Indirect impacts on trees through the installation of services severing tree roots;
- The spread of weeds from the development site into the adjacent area;
- The spread of dieback from the development site into the adjacent area;
- Temporary impact of dust during construction;
- Rubbish blowing off the development site into the adjacent area; and
- Changes in hydrology of surface water and groundwater.

These factors can also impact on habitat for Black Cockatoos with the additional direct impacts on Black Cockatoos during the clearing of the site including:

- Injury or death of Black Cockatoos during clearing; and

- Disruption of foraging or roosting during construction.

2.3 Clearing

During clearing and construction there is a risk of inadvertent clearing off-site through inappropriate delineation of the vegetation to be cleared and lack of induction procedures to identify the limit of clearing. There is also the risk of clearing being undertaken for off-site laydown areas and storage of materials for the development.

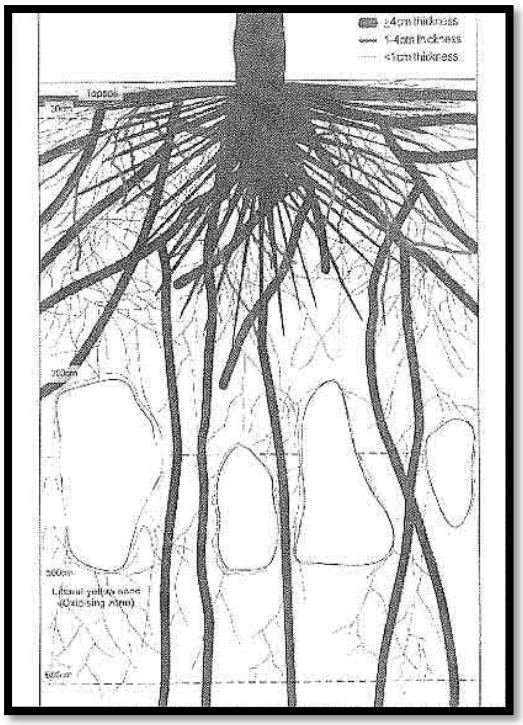
2.4 Damage to Root Zones

2.4.1 Tuart Root Morphology

The installation of services on the site may require digging trenches of varying depth. Trenches dug on the western boundary of the lot may have an impact on severing the roots of Tuart trees located to west of the development site. Information guiding the possible impact on Tuart tree roots is provided below.

The root system of Tuarts is similar to other eucalypts grown on deep sandy soils. The large root bowl is the dominant feature of the root system, consisting of abundant heart roots emanating from the rootstock and a dense network of fine and very fine roots. Extending from the root bowl and originating at the rootstock are numerous slope runner roots, which continue throughout the depth of the soil profile and are highly branched by horizontal and sinker roots. The surface lateral root system, which generally occurs in the surface 20cm of the soil profile, consists of large primary laterals radiating from the base of the tree. Smaller secondary laterals branch along the entire length of the primary laterals and a dense fine and very fine feeder root system is associated with both types of laterals. Sinker roots, which branch from both the primary and secondary laterals, traverse the entire soil profile (Plate 1) (EPA, 2003).

Plate 1: Typical Tuart Root Morphology (source EPA, 2003)



On sites with deep groundwater, such as on the site, large vertical roots with minimal horizontal branching dominate the root system (EPA, 2003).

Potential impacts on Tuart tree roots on the adjoining sites to the east can be managed under AS 4970-2009 (Standards Australia, 2010) as outlined in the following section.

2.4.2 Australian Standard

The AS 4970-2009 Protection of trees on development sites describes the best practices for the planning and protection of trees on development sites based on plant biology and current best practices as covered in recently published literature. The Standard defines the Tree Protection Zone (TPZ) which is "a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development" (Standards Australia, 2010).

Trees need to have an area that is greater than just the structural root area to maintain viability and according to the Australian Standard:

TPZ = DBH x 12

Where TPZ is the radius of the Tree Protection Zone; and

DBH is the tree's Diameter at Breast Height (1.4m from the ground).

The TPZ is a combination of the root area and crown area requiring protection. According to the Australian Standard the TPZ extends slightly outside the crown of the tree (Standards Australia, 2010).

The TPZ incorporates the Structural Root Zone (SRZ). The Structural Root Zone is defined as "The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area (Standards Australia, 2010).

It is possible to encroach into the TPZ with such works as excavation, compacted fill and machine trenching. The proposed encroachment should be less than 10% of the area of the TPZ and outside the SRZ. The Australian Standard outlines the investigations required if there is to be encroachment into the TPZ (Standards Australia, 2010). The SRZ is not advised to be compromised which is calculated as:

SRZ radius = (D x 50)0.42 x 0.64

Where D is diameter of the trunk at the buttress (Standards Australia, 2010).

As an example, the two closest Tuarts to the eastern boundary of the site have a DBH of 0.55m and less than 0.5m. The tree with a DBH of 0.55m is 28m from the boundary of the site and the tree with a DBH less than 0.50m is 18m from the boundary.

Using the calculation in the Australian Standard the larger tree would have a TPZ with a radius of 6.6m. The same tree would have an SRZ radius of 2.57m (assuming the buttress was the same as the DBH

which is not unrealistic for Tuart trees). The TPZ and SRZ for the smaller tree would be less than these figures. As the two trees are 28m and 18m from the eastern boundary, respectively, there would be.

2.5 Weeds

The development of the site has the potential to spread weeds during construction and have a detrimental impact on the adjoining conservation area.

The vegetation on the site is rated as Completely Degraded and contains abundant weed cover. However, the VFMP includes measures to not exacerbate the weeds that already occur on the site.

Weeds are classified under several listings, based on their invasiveness and impact, being:

- A Weed of National Significance (WoNS);
- A Declared Pest under Section 22 of the Biosecurity and Agriculture Management Act 2007 (BAM Act) (DPIRD, 2012); or
- A Priority weed within the Natural Resource Management (NRM) region (DPaW, 2016).

Any species listed under the above three categories are priorities for management. The weeds recorded on the site are outlined in Table 1.

Table 1: Weed Species Recorded on the Site

Species	Common Name	Priority Species
Arctotheca calendula	Cape Weed	No
Asparagus asparagoides	Bridal Creeper	Declared, WoNS
Asphodelus fistulosus	Onion Weed	No
Avena fatua	Wild Oats	No
Briza minor	Shivery Grass	No
Bromus catharticus	Prairie Grass	No
Bromus diandrus	Great Brome	No
Cirsium vulgare	Spear Thistle	No
Crassula glomerata		No
Ehrharta longiflora	Annual Veldt	No
Erigeron bonariensis	Fleabane	No
Euphorbia peplus	Petty Spurge	No
Euphorbia terracina	Geraldton Carnation Weed	Yes Priority Swan NRM
Fumaria capreolata	White Flower Fumitory	No
Gomphocarpus fruticosus	Narrow Leafed Cotton Bush	Yes Declared Pest S22
Hypochaeris glabra	Flatweed	No
Lagurus ovatus	Hare's Tail Grass	No
Lolium perenne	Ryegrass	No
Lolium rigidum	Wimmera Ryegrass	No
Lysimachia arvensis	Pimpernel	No
Malva parviflora	Marshmallow	No
Medicago polymorpha	Toothed Medic	No

Melilotus indicus	Annual Yellow Sweet Clover	No
Orobanche minor	Lesser Broomerape	No
Osteospermum ecklonis	Veldt Daisy	No
Oxalis pes-caprae	Soursob	No
Pelargonium capitatum	Geranium	Yes Priority species in ICAMP
Petrorhagia dubia	Hairy Pink	No
Raphanus raphanistrum	Wild Radish	No
Rhamnus alaternus	Buckthorn	No
Ricinus communis	Castor Oil Plant	Yes – Priority species in ICAMP
Rumex hypogaeus	Doublegee	Yes – Declared pest S22
Schinus terebinthifolius	Brazilian Pepper Tree	Yes – Priority NRM, WoNS nominated
Sixalix atropurpurea	Wildenowia	No
Solanum nigrum	Blackberry Nightshade	No
Sonchus asper	Rough Sowthistle	No
Sonchus oleraceus	Common Sowthistle	No
Taraxacum officinale	Dandelion	No
Trachyandra divaricata	Dune Onion Weed	No
Trifolium campestre	Clover	No
Urospermum picroides	False Hawkbit	No
Zantedeschia aethiopica	Arum Lily	Declared pest S22

The RIZ conservation area has undergone a long period of weed control management for weeds that are considered to be highly invasive and listed under the three categories listed above.

The weeds recorded on the site that are invasive and are being actively managed in the RIZ conservation area are:

- *Asparagus asparagoides;*
- *Euphorbia terracina;*
- *Gomphocarpus fruticosus;*
- *Pelargonium capitatum;*
- *Ricinus communis;*
- *Rumex hypogaeus;*
- *Schinus terebinthifolius; and*
- *Zantedeschia aethiopica*

2.6 Dieback

Dieback is caused by the genus of water mould Phytophthora that infects the roots of vulnerable species, limiting the roots' ability to take up water, thereby weakening or killing the host plant. The spores of Phytophthora Dieback are transported by water and in soil.

In sloping areas Phytophthora dieback spreads quickly in surface and sub-surface water flows. It spreads slower up-slope and on flat ground because it is restricted to movement by root-to-root contact.

The most common species is *Phytophthora cinnamomi* (Jarrah Dieback), which generally infects proteaceous species, Xanthorrhoea, Jarrah and a number of other species. The vegetation on the site does not contain species identified as susceptible. *Phytophthora multivora* was recently described and associated with a range of Phytophthora sensitive indicator species including Tuart and Jarrah.

Phytophthora is commonly spread from site to site by:

- The transfer of soil on machinery;
- Human transfer in soil on shoes and equipment;
- Downhill movement of water;
- Use of infected tubestock or plants from another source;
- Use of fill and mulch from infected sources; and
- Use of water for irrigation/watering from infected sources.

The assessment of the Phytophthora Dieback disease status of the vegetation within the site can be mapped as three categories of vegetation, being Uninfested (no apparent Phytophthora Dieback disease), Infested (Phytophthora Dieback disease present), and Unmappable (unable to determine Dieback disease presence). Each category requires effective management to mitigate the spread of the existing Infested areas. Definitions of the categories are in Table 2.

Therefore, the area is considered to be Uninfested. The spread of dieback into the adjacent areas would have an adverse impact on the Tuart Woodland TEC and Black Cockatoo Habitat.

Table 2: Categories of Dieback Infestation Mapping

Mappability	**Diagnosis**	
Unmappable Areas that are sufficiently disturbed so that Dieback disease occurrence mapping is not possible at the time of inspection	Further categorisation may be possible after variable regeneration periods for different types of disturbance	
Mappable Natural undisturbed vegetation. Dieback disease occurrence mapping is possible. Three categories may result	Infested	Determined to have plant disease symptoms (Dieback disease) consistent with the presence of the pathogen.
	Uninfested	Areas that are determined to be free of plant disease symptoms (*Phytophthora* Dieback disease) that indicate the presence of the pathogen.
	Uninterpretable	Areas where indicator plants are absent or too few to determine the presence or absence of disease caused by *P. cinnamomi*

2.7 Dust

The generation of dust on the site has the potential to impact on vegetation by:

- Impeding plant photosynthesis;
- Potentially spreading the seed of invasive weed species; or
- Potentially spreading pathogens such as dieback.

The impact of dust on vegetation could have an adverse impact on the Tuart Woodland TEC and Black Cockatoo habitat.

2.8 Rubbish

The inappropriate management of waste and rubbish on a construction site can result in the rubbish being transferred into the adjoining conservation area as well as the increase in feral species such as rats and mice due to an increase in food resources, thereby adversely impacting the TEC and Black Cockatoo habitat.

2.9 Hydrology

Altered hydrological regimes in groundwater or on surface water flows can lead to increased or decreased water availability to vegetation, both of which can have a detrimental impact on vegetation values. There are no surface water flows on the deep sandy soils and groundwater is at least 10m below the natural surface. Clearing the 5.495ha of native vegetation, in an area that is already highly modified or cleared, will not result in any change to the groundwater levels under the site.

2.10 Impact on Black Cockatoos

Black Cockatoos can feed and drink water in puddles at the edge of roads and being a large-winged bird, Black Cockatoos usually take off into the wind often putting them in the path of vehicles, making them vulnerable to vehicle strike (Dawson, 2014). The impact can lead to injury or death.

Impact on Black Cockatoos utilising the adjoining habitat may occur due to disturbance to foraging or roosting from truck movements. The impacts may cause interruptions to the Black Cockatoos, thereby reducing their use of the adjoining bushland.

2.11 Bushfire Management

The site will maintain the required firebreaks around the perimeter of the site in accordance with State Planning Policy 3.7 – Planning in Bushfire Prone Areas (WAPC, 2015) and Local government by-laws..

3 MANAGEMENT PLAN

3.1 Site Induction

3.1.1 Objective

To ensure all construction personnel are familiar with and comply with the VFMP.

3.1.2 Induction Package

The induction package will be presented to all construction personnel during the start up meeting and will include:

- Location and identification of the development area, limit of clearing, habitat for Black Cockatoos and Tuart Woodland TEC;
- Procedures for clean-on-entry and exiting the development area;
- Information on the cause and effect of dust on the environment;
- Required record keeping, including incident reporting; and
- Requirements to comply with any management actions in the VFMP.

M1 An induction package will be presented to all personnel prior to the commencement of works outlining the objectives, procedures and management actions in the VFMP.

3.2 Fencing

3.2.1 Objective

Vehicle and pedestrian access to the bushland area will be restricted by the installation of fencing around the perimeter of the area.

3.2.2 Proposed Fencing

The existing fence around the Lots is 1.8m high chain mesh fence. Dust curtains will be installed along the western side of the Lots to minimise any airborne dust during construction. Fencing will be maintained, and any breaches noted during visual inspections will be repaired in a timely fashion to ensure that the barrier remains in place.

At the conclusion of development, the dust curtains will be taken down. The existing fence meets the design requirements from the City of Rockingham.

M2 The existing fence will have dust curtains installed along the western boundary.

M3 The fence will be maintained during construction to ensure unauthorised access is minimised.

M4 Post construction the dust curtains will be taken down.

3.3 Vegetation

3.3.1 Objective

Native vegetation in the conservation area adjacent to the site will not be removed or disturbed.

3.3.2 Management

Implementation of the VFMP actions will not require any clearing in the adjoining bushland.

M5 Native vegetation outside of the development footprint will not be removed or disturbed

3.4 3.4 Weeds

3.4.1 Objective

No Declared weed species or Swan Region NRM Priority weeds will be introduced into the conservation area as a result of the development.

3.4.2 Weed Management

The spread of weed species from the development site to the adjoining RIZ conservation would most likely occur due to vehicle movements from weed-affected areas on the development site driving into the adjoining bushland. Access to the adjoining bushland area is prevented through a 1.8m chain mesh fence. Weeds could also be spread during clearing works and weed seeds blowing into the adjoining bushland. The existing 1.8m high fence will have dust curtains installed to limit the risk of spread of priority weed species. Any priority weeds that occur in landscaped areas will be managed.

M6 Fencing with dust curtains to prevent spread of airborne seeds as well as those that can be transported on vehicles.

M7 Any priority weeds that grow in the landscaped areas of the site will be removed during landscaping maintenance works.

3.5 Landscaping

3.5.1 Objective

Landscaping should avoid using non-endemic species that could invade the adjoining bushland area over time.

3.5.2 Management

Landscaping is to be undertaken in accordance with an approved Plan as a Condition of the Development Application approval. The species list will include locally native species, specifically Black Cockatoo foraging species as listed in Plants Used by Carnaby's Black Cockatoo (Groom, 2011). No non-native species that could invade the bushland area will be used in the landscaping.

M8 Landscaping is to be undertaken in accordance with an approved Plan and will include, but not be limited to, species from Plants Used by Carnaby's Black Cockatoo (Groom, 2011).

3.6 Dieback

3.6.1 Objective

To prevent the spread of dieback into the adjoining bushland.

3.6.2 Dieback Management

All machinery entering the site will have undergone a hygiene process at their headquarters after their last project. Hygiene management procedures will be implemented on the site with signage erected at all access points to the development area. The signs should include the following procedures:

- Vehicle inspection protocols to ensure the vehicle is free from soil/organic material prior to entry and exit;
- Brush down of contaminated vehicles and machinery in dry weather
- Wash down of contaminated vehicles and machinery used in clearing with suitable disinfectant such as bleach dilution, methylated spirits or an approved product such as Phytoclean during wet weather.

To prevent transfer of potentially infected soil into the adjoining bushland there will be no access to the adjoining bushland from the development area. There are two 1.8m fences separating the lots.. Earthworks will ensure that no contours are created that drain surface water from the development area to the conservation area. Stockpiles of soil and mulch will be:

- Located in sheltered areas
- Limited in height and steepness;
- Piled lengthways to prevailing winds; and
- Stabilised if required.

All soils or mulch to be imported to the site during works will be disease and pathogen free, including seedlings and any building materials will be free from soil.

M09 Initial clearing works will be scheduled as much as possible in drier conditions.

M10 Soil in the construction footprint will be stabilised so it is not prone to water erosion and being washed into adjoining bushland areas.

M11 No contours will be created that will allow surface water drainage into the bushland.

M12 Stockpiles will be constructed to ensure no soil transfer occurs to the adjoining bushland

M13 All imported landscaping and revegetation materials (i.e. soil, mulch, seedlings) brought onsite will be weed and certified dieback free. Imported pipes, stone pitching materials and other construction materials are to be free of mud and soil.

3.7 Dust

3.7.1 Objective

To minimise dust generated from the development area to avoid adverse impacts on the vegetation in the adjoining bushland.

3.7.2 Dust Management

Dust will be minimised by ensuring that speed limits in the development area are set, appropriately sign posted and enforced during construction. Water carts will be utilised in the event of dust generation and if the dust is caused due to unfavourable weather conditions activities likely to

generate dust will be suspended until conditions are less likely to create dust. If stockpiles are to be left for more than one month the pile will be stabilised using a hydro-mulch or equivalent.

Additional dust control measures may be required under a Dust Management Plan as a condition of the Development Application approval.

M14 Establish and enforce vehicle speed limits for unsealed areas with an objective to minimise dust generation soil.

M15 Water cart to be present on-site during construction to dampen areas if dust is being generated and commence dust suppression immediately on visual evidence of dust lift.

M16 Avoid dust generating activities during unfavourable weather conditions (e.g. high wind speed) and unfavourable wind directions relative to sensitive areas, where practicable.

M17 Implement semi-permanent dust control treatments (e.g. hydro-mulching, dust stabilisers, tarps or geo-textile materials) on stockpiles that are to be left for longer than one month.

3.8 Rubbish

3.8.1 Objective

To minimise rubbish being transferred from the development area to the adjoining bushland.

3.8.2 Rubbish Management

The construction site office will use self-closing lids on bins. Road and drainage basin construction will need to be undertaken in a clean manner, ensuring no waste, including plastic wrapping, tape, bags and other moveable materials are able to be blown off-site.

M18 All outdoor bins at the site office are to have self-closing lids.

M19 Any waste that can become airborne to be removed from the construction site as soon as possible.

M20 All road and drainage basin construction waste are to be removed at the conclusion of construction.

3.9 Hydrology

3.9.1 Objective

To maintain surface water and groundwater quality in the adjoining bushland.

3.9.2 Hydrological Management

The hydrology of the site will be managed in accordance with the approved Urban Water Management Plan. The Urban Water Management Plan will ensure that there is no overland flow into the bushland areas and stormwater is appropriately managed.

M21 Ensure construction is consistent with the drainage design as outlined in an approved Urban Water Management Plan

M22 All stormwater to be retained and infiltrated on site

M23 No overland flow of water will be allowed from the development into the adjoining bushland areas

3.10 Black Cockatoos

3.10.1 Objective

To reduce the risk of birdstrike in the subdivision and impacts on individuals during clearing and those utilising the surrounding habitat.

3.10.2 Bird strike Management

Vehicles entering the development will be turning in from Lodge Drive, limiting truck speeds to low levels. The development site will be speed limited at 20km/hr. The industrial area does not contain any major roads so will be speed limited to 50km/hr. Roads and tracks will be maintained to prevent formation of water holding structures which may attract Black Cockatoos and increase the risk of vehicle strike. Any areas noted to have Black Cockatoos on the ground on a regular basis will be signposted with a traffic sign to alert drivers to the presence of black cockatoos as shown in Plate 2.

Plate 2: Black Cockatoo Traffic Alert Sign

M24 Implement a 20km/hr speed limit during construction and 50km/hr limit in the industrial area

M25 Maintain construction roads to prevent the formation of water holding structures

M26 Install traffic alert signs in areas noted to regularly have Black Cockatoos

3.10.3 Impacts During Clearing

A zoologist will assess the trees prior to clearing to ensure that Black Cockatoos are not present. Most often Black Cockatoos will not remain on the site during clearing. The trees will be bumped with machinery before being pushed over, then felled if no fauna is spotted. This will give any avian fauna a chance to fly off before the tree is felled.

M27 A zoologist will assess the trees prior to clearing.

M28 Employ fauna friendly clearing protocols by bumping trees prior to felling

3.10.4 Utilisation of Adjoining Habitat

As well as access being prohibited into the bushland area construction and movement of machinery will be restricted to daylight hours so will not impact on night roosting, should Cockatoos start roosting

on the site during the development period. To avoid light spill into the adjoining bushland at night, lights that are directional (minimising spill to surrounding areas) will be utilised.

M29 Construction to be limited to daylight hours.

M30 Use of cut-off lights designed to direct light onto the road and minimise off-target glare and light spill where appropriate.

3.11 Monitoring

Monitoring will be undertaken to determine whether the environmental objectives specified in this VFMP are being achieved in accordance with the performance indicators, and whether the management actions require remedial action.

The boundary of the development area and the adjoining bushland will be inspected weekly by the site manager for:

- Damage to the fence and any signs of unauthorised access;
- Any areas that have inadvertently been cleared;
- Rubbish;
- Invasive Weeds (Declared pests or Priority Swan NRM weeds);
- Dust on leaves of the vegetation; and
- Any decline in plant health along the boundary.

During monitoring if any of these parameters are observed remediation will be initiated immediately.

Three permanent 10x10m quadrats will be established within the adjoining bushland, two of which will be in the Tuart Woodland TEC. The quadrats will be located approximately 20m in from the cleared track/firebreak.

The quadrats will be inspected prior to commencement of construction to establish a baseline and on an annual basis during construction. The following parameters will be recorded including:

- A photo to be taken on the south-western corner;
- Invasive weed species;
- Invasive weed density (% cover), if present
- Native species health;
- Vegetation condition;
- Visual signs of disturbance;
- Visual signs of dust on vegetation; and
- Visual signs of dieback.

On a monthly basis the contractor's hygiene register will be reviewed to ensure protocols and hygiene requirements are met and all soil and mulch products imported to the site are dieback free.

M31 Visual inspection of the boundary of the development area on a weekly basis by the site manager.

M32 Visual inspection by the project botanist of three photo points in the adjoining bushland on an annual basis.

M33 Monthly review of the hygiene register by site manager.

3.12 Reporting

Monitoring results will be provided in an annual Compliance Report that will be required under the EPBC Approval.

M34 Annual monitoring report detailing activities, any contingency actions, any remedial actions and monitoring results will be submitted in the annual compliance report

Table 3: Management Action Table

Number	Action	Timing	Responsibility
M1	An induction package will be presented to all personnel prior to the commencement of works outlining the objectives, procedures and management actions in the VFMP.	Pre-Construction	Site Manager
M2	The existing fence will have dust curtains installed along the western boundary.	Pre-Construction	Construction Manager
M3	The fence will be maintained during construction to ensure unauthorised access is minimised.	Ongoing	Site Manager
M4	Post construction the dust curtains will be taken down	Post Construction	Construction Manager
M5	Native vegetation outside of the development footprint will not be removed or disturbed	Ongoing	Site Manager
M6	Fencing with dust curtains installed to prevent spread of airborne seeds as well as those that can be transported on vehicles.	Pre-Construction	Construction Manager
M7	Any priority weeds that grow in the landscaped areas of the site will be removed during landscaping maintenance works	Ongoing	Site Manager
M8	Landscaping is to be undertaken in accordance with an approved Plan and will include, but not be limited to, species from Plants Used by Carnaby's Black Cockatoo (Groom, 2011).	Post Construction	Site Manager
M09	Initial clearing works will be scheduled as much as possible in drier conditions.	Pre-Construction	Site Manager
M10	Soil in the construction footprint will be stabilised so it is not prone to water erosion and being washed into adjoining bushland areas.	During Construction	Construction Manager
M11	No contours will be created that will allow surface water drainage into the bushland	During Construction	Construction Manager
M12	Stockpiles will be constructed to ensure no soil transfer occurs to the adjoining bushland	During Construction	Construction Manager
M13	All imported landscaping and revegetation materials (i.e. soil, mulch, seedlings) brought onsite will be weed and certified dieback free. Imported pipes, stone pitching materials and other construction materials are to be free of mud and soil	Post Construction	Site Manager
M 14	Establish and enforce vehicle speed limits for unsealed areas with an objective to minimise dust generation soil.	Preconstruction	Site Manager
M15	Water cart to be present on-site during construction to dampen areas if dust is being generated and commence dust suppression immediately on visual evidence of dust lift.	During Construction	Construction Manager
M16	Avoid dust generating activities during unfavourable weather conditions (e.g. high wind speed) and unfavourable wind directions relative to sensitive areas, where practicable	During Construction	Construction Manager
M17	Implement semi-permanent dust control treatments (e.g. hydro-mulching, dust stabilisers, tarps or geo-textile materials) on stockpiles that are to be left for longer than one month	During Construction	Construction Manager

M18	All outdoor bins at the site office are to have self-closing lids.	Ongoing	Site Manager
M19	Any waste that can become airborne to be removed from the construction site as soon as possible.	Ongoing	Site Manager
M20	All road and drainage basin construction waste are to be removed at the conclusion of construction.	Post Construction	Construction Manager
M21	Ensure construction is consistent with the drainage design as outlined in an approved Urban Water Management Plan	During Construction	Construction Manager
M22	All stormwater to be retained and infiltrated on site	During Construction	Construction Manager
M23	No overland flow of water will be allowed from the development into the adjoining bushland areas	During Construction	Construction Manager
M24	Implement a 20km/hr speed limit during construction and 50km/hr limit in the industrial area	During Construction	Site Manager
M25	Maintain construction roads to prevent the formation of water holding structures	During Construction	Construction Manager
M26	Install traffic alert signs in areas noted to regularly have Black Cockatoos	During Construction	Site Manager
M27	A zoologist will assess the trees prior to clearing.	Pre-Construction	Site Manager
M28	Employ fauna friendly clearing protocols by bumping trees prior to felling	During Construction	Construction Manager
M29	Construction to be limited to daylight hours.	During Construction	Site Manager
M30	Use of cut-off lights designed to direct light onto the road and minimise off-target glare and light spill where appropriate	During Construction	Site Manager
M31	Visual inspection of the boundary of the development area on a weekly basis by the site manager	Ongoing	Site Manager
M32	Visual inspection by the project botanist of three photo points in the adjoining bushland on an annual basis.	Pre Construction	Site Manager and Project Botanist
M33	Monthly review of the hygiene register by site manager.	Ongoing	Site Manager
M34	Annual monitoring report detailing activities, any contingency actions, any remedial actions and monitoring results will be submitted in the annual compliance report	Ongoing until Development Complete	Environmental Consultant

Number	Action	Timing	Responsibility
M1	An induction package will be presented to all personnel prior to the commencement of works outlining the objectives, procedures and management actions in the VFMP.	Pre-Construction	Site Manager
M2	The existing fence will have dust curtains installed along the western boundary.	Pre-Construction	Construction Manager
M3	The fence will be maintained during construction to ensure unauthorised access is minimised.	Ongoing	Site Manager
M4	Post construction the dust curtains will be taken down	Post Construction	Construction Manager
M5	Native vegetation outside of the development footprint will not be removed or disturbed	Ongoing	Site Manager
M6	Fencing with dust curtains installed to prevent spread of airborne seeds as well as those that can be transported on vehicles.	Pre-Construction	Construction Manager
M7	Any priority weeds that grow in the landscaped areas of the site will be removed during landscaping maintenance works	Ongoing	Site Manager
M8	Landscaping is to be undertaken in accordance with an approved Plan and will include, but not be limited to, species from Plants Used by Carnaby's Black Cockatoo (Groom, 2011).	Post Construction	Site Manager
M09	Initial clearing works will be scheduled as much as possible in drier conditions.	Pre-Construction	Site Manager
M10	Soil in the construction footprint will be stabilised so it is not prone to water erosion and being washed into adjoining bushland areas.	During Construction	Construction Manager
M11	No contours will be created that will allow surface water drainage into the bushland	During Construction	Construction Manager
M12	Stockpiles will be constructed to ensure no soil transfer occurs to the adjoining bushland	During Construction	Construction Manager
M13	All imported landscaping and revegetation materials (i.e. soil, mulch, seedlings) brought onsite will be weed and certified dieback free. Imported pipes, stone pitching materials and other construction materials are to be free of mud and soil	Post Construction	Site Manager
M 14	Establish and enforce vehicle speed limits for unsealed areas with an objective to minimise dust generation soil.	Preconstruction	Site Manager
M15	Water cart to be present on-site during construction to dampen areas if dust is being generated and commence dust suppression immediately on visual evidence of dust lift.	During Construction	Construction Manager
M16	Avoid dust generating activities during unfavourable weather conditions (e.g. high wind speed) and unfavourable wind directions relative to sensitive areas, where practicable	During Construction	Construction Manager
M17	Implement semi-permanent dust control treatments (e.g. hydro-mulching, dust stabilisers, tarps or geo-textile materials) on stockpiles that are to be left for longer than one month	During Construction	Construction Manager

M18	All outdoor bins at the site office are to have self-closing lids.	Ongoing	Site Manager
M19	Any waste that can become airborne to be removed from the construction site as soon as possible.	Ongoing	Site Manager
M20	All road and drainage basin construction waste are to be removed at the conclusion of construction.	Post Construction	Construction Manager
M21	Ensure construction is consistent with the drainage design as outlined in an approved Urban Water Management Plan	During Construction	Construction Manager
M22	All stormwater to be retained and infiltrated on site	During Construction	Construction Manager
M23	No overland flow of water will be allowed from the development into the adjoining bushland areas	During Construction	Construction Manager
M24	Implement a 20km/hr speed limit during construction and 50km/hr limit in the industrial area	During Construction	Site Manager
M25	Maintain construction roads to prevent the formation of water holding structures	During Construction	Construction Manager
M26	Install traffic alert signs in areas noted to regularly have Black Cockatoos	During Construction	Site Manager
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M28	Employ fauna friendly clearing protocols by bumping trees prior to felling	During Construction	Construction Manager
M29	Construction to be limited to daylight hours.	During Construction	Site Manager
M30	Use of cut-off lights designed to direct light onto the road and minimise off-target glare and light spill where appropriate	During Construction	Site Manager
M31	Visual inspection of the boundary of the development area on a weekly basis by the site manager	Ongoing	Site Manager
M32	Visual inspection by the project botanist of three photo points in the adjoining bushland on an annual basis.	Pre Construction	Site Manager and Project Botanist
M33	Monthly review of the hygiene register by site manager.	Ongoing	Site Manager
M34	Annual monitoring report detailing activities, any contingency actions, any remedial actions and monitoring results will be submitted in the annual compliance report	Ongoing until Development Complete	Environmental Consultant

3.13 Contingency Plans

3.13.1 Vegetation

It is highly unlikely that the adjoining RIZ Conservation area will be disturbed due to the separation area between the lot to be developed and that there are two 1.8m fences in the separation zone.

1. Consider potential causes of the clearing and provide the appropriate action to prevent any further clearing;

2. Map the impacted area;

3. Prepare a Rehabilitation Plan using flora studies on the site and surrounding vegetation as a baseline to determine appropriate species and level of biodiversity that should be reinstated on the cleared area;

4. Implement the Rehabilitation Plan until the completion criteria have been met; and

5. Continue monitoring vegetation health and the effectiveness of remedial actions.

If there is a decline in the vegetation health or condition within the adjoining bushland, the following contingency plan will be implemented:

1. Consider potential causes for decline in vegetation health or increase in weed cover.

2. Determine if the decline may be within normal limits.

3. If decline in health is not within normal limits, determine the most likely cause of this decline.

4. Determine management and/or contingency actions implemented if the cause is from construction activities.

5. Continue monitoring vegetation health and the effectiveness of remedial actions.

3.13.2 Weeds

If new infestations of invasive weeds are recorded in the adjoining bushland the following will be undertaken:

1. Investigation of the potential sources of the weeds.
2. If the weeds originate in the development area:

- The weeds in the development area will be eradicated; and
- The weeds will be managed by an appropriate weed contractor that is proficient in managing weeds in bushland.

3. Follow-up monitoring will be undertaken on a monthly basis to ensure the weeds have been managed.

3.13.3 Dust

If dust deposition is recorded on vegetation in the bushland areas:

1. Investigate the cause.

2. If the dust is the result of construction activities, ensure dust control measures are being implemented and are appropriate.

3. Consider spraying dust covered vegetation with water truck to remove dust (note this should occur no more than monthly during October – April).

3.13.4 Erosion and Sedimentation

In the event that visual erosion or sedimentation occurs in the adjoining bushland:

1. Investigate cause.

2. If the cause is due to construction activities implement appropriate control to reduce or rectify impact which could include:

- restricting access to areas that are impacted;
- installing additional fencing in consultation with City of Rockingham; and
- undertaking rehabilitation of the eroded area.

3. Continue to observe any changes.

3.13.5 Hydrology

In the event that there is erosion in the adjoining bushland caused by surface water flow from off-site the following will be undertaken:

1. Consider potential causes for erosion.

2. Rectify the cause.

3. Determine management and/or contingency actions implemented if the cause is from construction activities.

4. Continue monitoring the area to ensure remedial action is effective.

3.14 Implementation

The Trustee for Hamersley Sub Trust has overall responsibility to implement the Flora and Fauna Management Plan. The FMP will be considered to be fully implemented at the completion of construction once all management actions are undertaken and, if required, any remedial actions have been completed.

Completion of construction is deemed to be once all earthworks, internal roads, drainage features and landscaping has been installed to the City of Rockingham's satisfaction.

3.15 Risk Assessment

A risk assessment of the potential impacts to black cockatoos discussed above has been undertaken, based on the definitions in Table 3 and the risk matrix provided in Table 4. The risk assessment has calculated the residual risk of the proposed impacts when implementation of the proposed mitigation measures is considered. The results of the risk assessment are provided in Table 5.

Table 3: Risk Assessment Definitions

Qualitative measure of likelihood (how likely is it that this event/circumstance will occur after management activities are implemented)	
Highly likely (E)	Is expected to occur in most circumstances
Likely (D)	Will probably occur during the life of the project
Possible (C)	Might occur during the life of the project
Unlikely (B)	Could occur but considered unlikely or doubtful
Rare (A)	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor (1)	Minor incident of environmental damage that can be reversed (*e.g. short-term delays to achieving plan objectives, implementing low- cost, well-characterised corrective actions*)
Moderate (2)	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. short term delays to achieving plan objectives, implementing well- characterised, high-cost/effort corrective actions*)
High (3)	Substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions*)
Major (4)	Major loss of environmental amenity and real danger of continuing (*e.g. plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies*)
Critical (5)	Severe widespread loss of environmental amenity and irrecoverable environmental damage (*e.g. plan objectives are unable to be achieved, with no evidenced mitigation strategies*)

Table 4: Risk Assessment Matrix

		Likelihood				
Consequence		Rare (A)	Unlikely (B)	Possible (C)	Likely (D)	Highly likely (E)
	Minor (1)	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	Moderate (2)	Acceptable	Acceptable	Acceptable	Moderate	Moderate
	High (3)	Acceptable	Moderate	Moderate	High	High
	Major (4)	Moderate	Moderate	Moderate	High	Extreme
	Critical (5)	Moderate	High	High	Extreme	Extreme

Inherent risk to the MNES assumes all controls are not implemented in accordance with best practice. The residual risk is determined with the development and implementation of the VFMP that has been specifically developed to mitigate the offsite impacts on MNES. As the impacts are to the Tuart Woodland TEC vegetation as well as vegetation that provides Black Cockatoos Habitat the risks are

considered for both MNES, except the risks pertaining specifically to Black Cockatoos. The risk analysis is provided in Table 5. All risks have been managed and are Acceptable.

Table 5: Risk Analysis

Potential Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Significance		Likelihood	Consequence	Significance
Inadvertent clearing during the DA works	B	3		Delineation of works on all plans and on ground and induction procedures to ensure all personnel are aware of areas that cannot be disturbed	A	3	Acceptable
Direct impacts of the future development on clearing or damaging native vegetation on the adjacent area	B	3		Access and vegetation clearing demarcation as well as onsite inductions as per the VFMP	A	3	Acceptable
Damage to the root zones on vegetation in the adjacent area unlikely due to the currently cleared track providing separation	A	3		No management required	A	3	Acceptable
The spread of weeds from the development site into the adjacent area	B	3		Access control, dust fencing, regular monitoring and control if required as per the Flora and VFMP	A	2	Acceptable
The spread of invasive species from landscaping	B	1		Landscaping list limited to species as listed in Groom (2011)	A	1	Acceptable
The spread of dieback from the development site into the adjacent area	C	3		Hygiene procedures as per VFMP	B	3	Acceptable
Temporary impact of dust during construction	D	2		Dust control methods as per VFMP	B	2	Acceptable
Rubbish blowing off the development site into the adjacent area	D	1		Adopting clean work practices as per the VFMP	B	1	Acceptable

4 REFERENCES

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Tuart Response Group (2002) An Atlas of Tuart Woodlands on the Swan Coastal Plain in Western Australia Perth, Western Australia

Department of Planning (DoP) (2011) Carnaby's Cockatoo foraging, breeding and roosting mapping. Produced by the Mapping and GeoSpatial Data Branch. Perth, Western Australia.

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Johnstone, R. E. C. and Kirkby, T. (2011) Carnaby's Cockatoo (Calyptorhynchus latirostris), Baudin's Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin–Dunsborough), Western Australia. Studies on distribution, status, breeding, food, movements and historical changes. Report for the Department of Planning, Perth, Western Australia.

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WAPC Western Australian Planning Commission (WAPC) (2015). State Planning Policy 3.7 - Planning in Bushfire Prone Areas.

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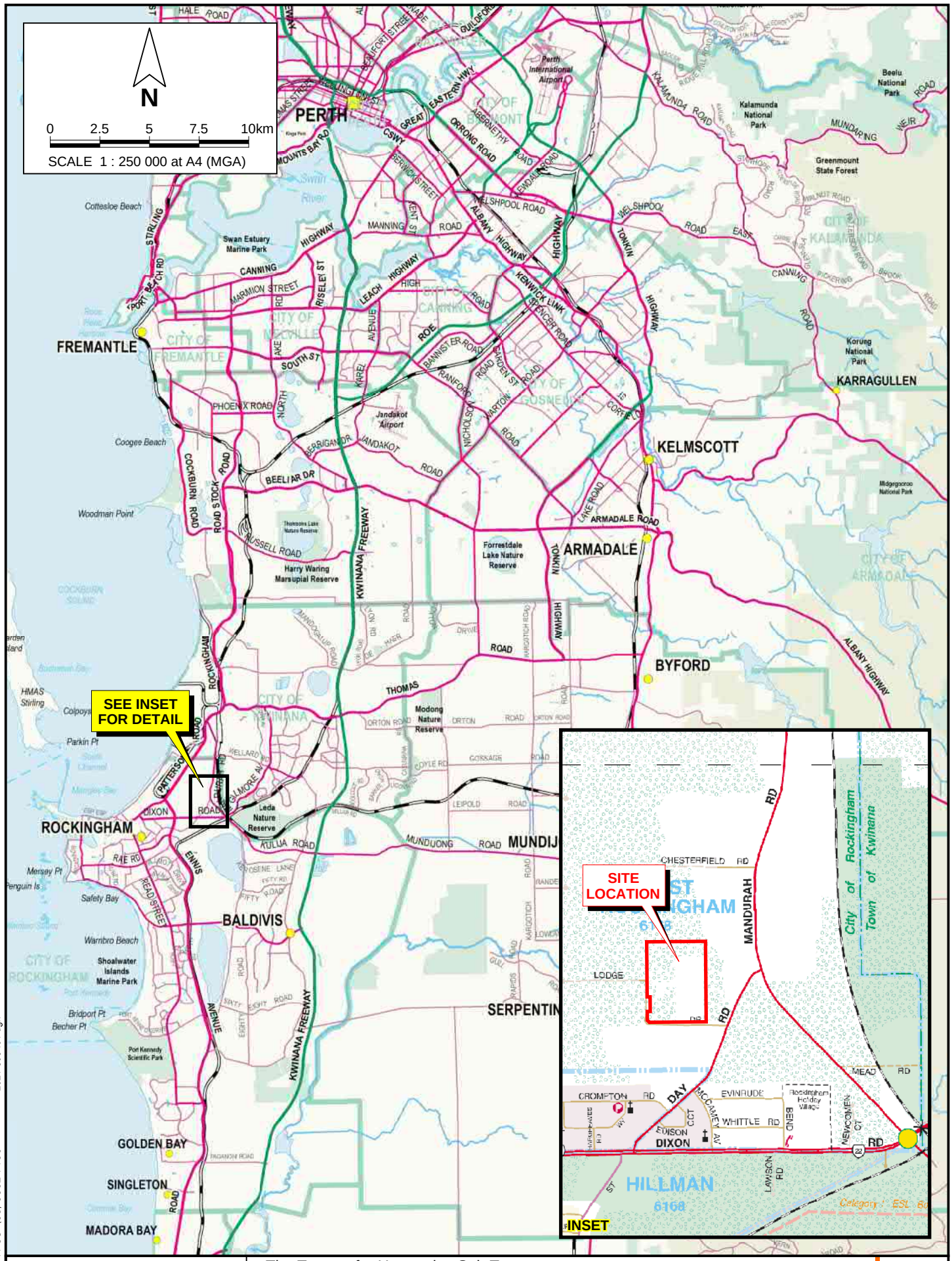
FIGURES



PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-598-f01.dgn

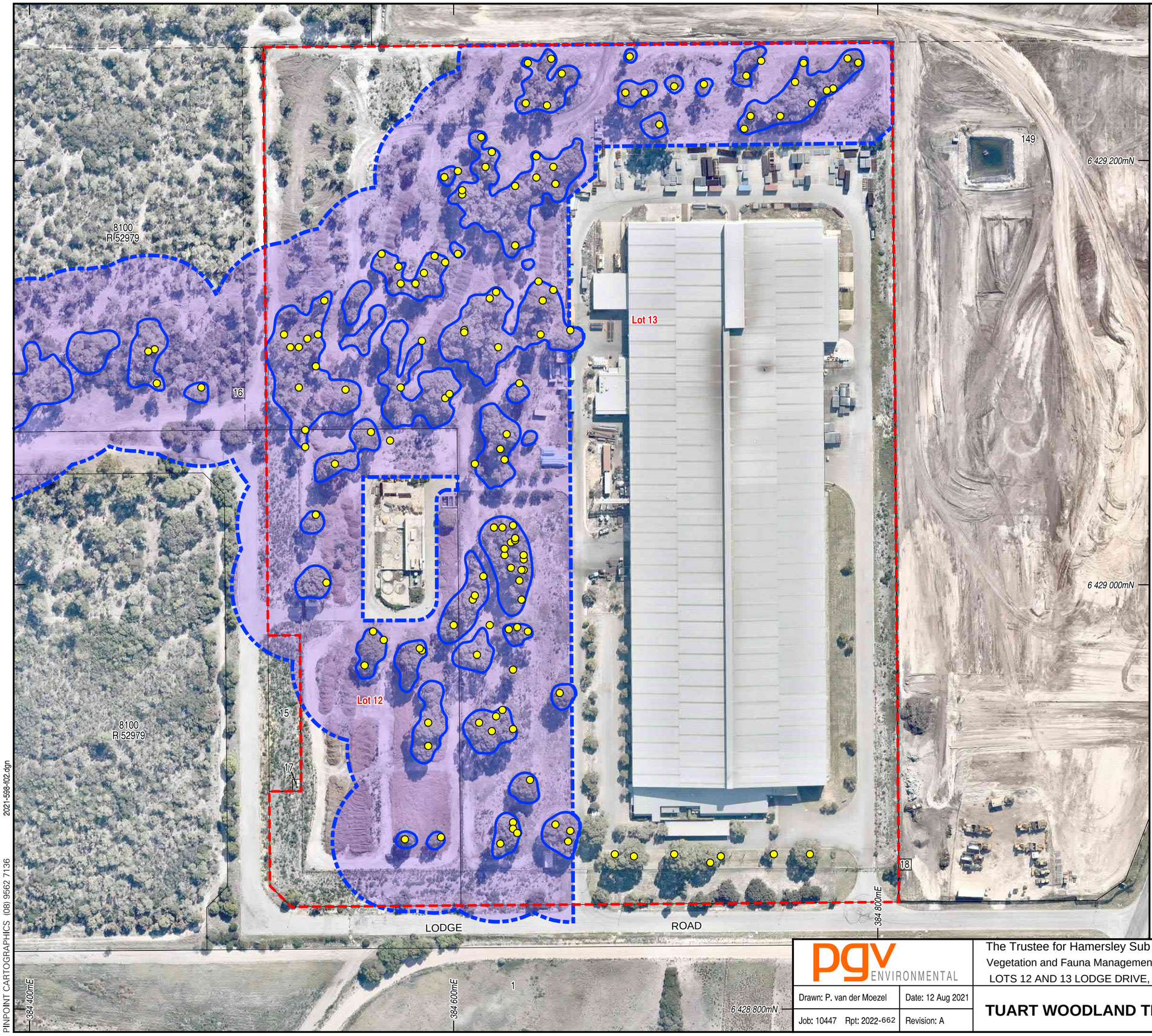
pgv ENVIRONMENTAL

The Trustee for Hamersley Sub Trust
TUART WOODLAND TEC ASSESSMENT
LOTS 12 AND 13 LODGE ROAD, EAST ROCKINGHAM

Drawn: P. van der Moezel	Date: 12 Aug 2021
Job: 10447 Rpt: 2021-598	Revision: A

SITE LOCATION

Figure 1



N

0 20 40 60 80 100m

SCALE 1 : 1 750 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Tuart Tree Location
- Tuart Tree Canopy
- 30m Perimeter Around Tuart Canopies
- Tuart Woodland TEC

CADASTRAL SOURCE: Landgate, July 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.

PINPOINT CARTOGRAPHICS (08) 9562 7136 2021-598-f02.dgn

pgv ENVIRONMENTAL

Drawn: P. van der Moezel	Date: 12 Aug 2021
Job: 10447 Rpt: 2022-662	Revision: A

The Trustee for Hamersley Sub Trust
Vegetation and Fauna Management Plan
LOTS 12 AND 13 LODGE DRIVE, EAST ROCKINGHAM

TUART WOODLAND TEC

Figure 2

ATTACHMENT 5

Offsets Calculator for Tuart Woodland TEC

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	tuart Woodland TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

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	Tuart Woodland TEC	**Area**	5.49	Hectares	TEC Assessment
			Quality	**2**	Scale 0-10	
			Total quantum of impact	1.10	Adjusted hectares	
Threatened species habitat						
Area of habitat	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
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	1.10	Adjusted hectares	revegetate site	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	3.5	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	20%	-0.70	95%	-0.67	-0.18	1.20	109.07%	Yes		
									Future area without offset (adjusted hectares)	3.5	**Future area with offset (adjusted hectares)**	2.8									
					Time until ecological benefit	5	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**7**	7.00	75%	5.25	3.78					
Threatened species habitat																					
Area of habitat	No				**Time over which loss is averted (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)**										
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		$0.00
Area of community	1.098	1.20	109.07%	**Yes**	$0.00	N/A	$0.00
					$0.00	**$0.00**	**$0.00**

ATTACHMENT 6

Offsets Calculator for Black Cockatoos

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	Black Cockatoos
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	Carnaby's Black Cockatoo	**Area**	1.5	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	0.90	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	0.90	Adjusted hectares	revegetate with Black Cockatoo species	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	3.5	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	3.5	**Future area with offset (adjusted hectares)**	3.5	0.00	90%	0.00	0.00	1.24	137.39%	Yes	
					Time until ecological benefit	5	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**5**	5.00	75%	3.75	3.53				
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	0.9	1.24	137.39%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

ATTACHMENT 7

EPBC Habitat Scoring Tool

Habitat Scoring System for WA black cockatoo foraging habitat (DAWE)

This habitat scoring system describes elements indicative of suitable foraging habitat [1][1] for the three WA black cockatoo species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo) in WA. It does not replace robust and appropriate survey information (i.e. indicators of species presence, vegetation type and condition), which must be provided to support proposed offsets. Surveys must be undertaken by suitably experienced experts.

Habitat scores are for site condition (score out of 7) and site context (score out of 3). The total makes a score out of 10, which can be used in the EPBC Offset Assessment Guide (the calculator). Species stocking rate is considered only in terms of presence or absence of the species and does not add to the total score. Note that the species, or strong indicators of the species, must be present, consistent with the presence/usage description below, for an offset to be considered suitable.

[1] In some cases, an impact or offset site may contain or require both foraging and breeding habitat for one or more black cockatoos. Breeding habitat is species of trees known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most species of trees, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm.

[2]No tree deaths indicate robustness of habitat, unlikely for the habitat to decline in the medium-term. Tree deaths may be owing to disease, water stress, fire, etc

[3] Species stocking rate is indicated by yes or no to confirm if any of the species is frequently present or not. If yes, the presence must be for the species being impacted by the proposal, not for a species that will not be impacted.

Indicator	Score	Foraging Value	Detail	Impact Site	Offset Start Quality	Without Offset	With Offset
Site Condition							
Vegetation condition and structure. Habitat features	7	Very High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>30% projected foliage cover), banksia and eucalypt woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths[2].				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
	6	High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>25% projected foliage cover), banksia and eucalypt woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
	5	Moderate to High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>20% projected foliage cover), banksia and eucalypt woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Baudins's Black Cockatoo				

			Marri-Jarrah Forest or woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
	4	Moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 20-30% projected foliage cover. Moderate percentage of tree deaths (30-40%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 20-30% projected foliage cover; OR Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to tree deaths (up to 30-40%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with: 20-30% projected foliage cover; OR 40-60% projected foliage cover but veg. condition reduced due to tree deaths (up to 30-40%).				
	3	Low to Moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 10-20% projected foliage cover				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 5-20% projected foliage cover.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 5-20% projected foliage cover.				
	2	Low	Carnaby's Black Cockatoo				

			Native kwongan heath and shrubland, banksia and eucalypt woodlands with <10% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksias, marri	2			
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksia, hakea, dryandra				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*				
	1	Negligible to Low	All Species				
			Scattered specimens of known food plants but projected foliage cover of these is <2%. May include: paddocks or urban areas with scattered foraging trees.				
	0	None	All Species				
			No Proteaceae, eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).				
			Total	2			

Site Context								
Proximity of the site in relation to other habitat	3	Site is within 6km of Known Breeding Site	**or**	Site is within 12km of other foraging sources with site condition of at least 3.	3			
	2	Site is within 12km of known breeding site	**or**	Site is within 15km of other foraging resources with site condition of at least 4.				
	1	Site is within 15km of known breeding site	**or**	Site is between 15km and 20km of other foraging resources with site condition of at least 5.				
	0	Site is further than 15km from known breeding site	**or**	Site is further than 20km from other foraging resources				
				Totals	3			

Final Totals	6			

Indicator	Species Stocking Rate[3]		Impact Site			Offset Site		
			CBC	BBC	FRT	CBC	BBC	FRT
Confirm presence/ absence of species.	Yes	Species is seen or reported regularly and/or there is abundant foraging evidence, e.g. chewed nuts can be identified as this species. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year.						
	No	Species is recorded or reported very infrequently and there is little or no foraging evidence of						

Legend	
	If the site scores between 0-2 (low to no value) for site condition, 0 for the site context score, or is No for species stocking rate, it is extremely unlikely to be considered as suitable habitat. This would not be appropriate to use as an offset site.

ATTACHMENT 8

Foraging Habitat Scoring Tool

Foraging Quality Scoring Tool Template (DAWE, 2022)

Starting Score	Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black Cockatoo
10	**Start at a score of 10** if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	**Start at a score of 10** if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size**.	**Start at a score of 10** if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. **This tool only applies to sites equal to or larger than 1 hectare in size**.

Attribute	Subtractions	Context Adjustor (Attributes reducing functionality of foraging habitat)		
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.
Connectivity	-2	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding	-2	Subtract 2 if you have evidence to conclude that your site is more than	Subtract 2 if you have evidence to conclude that your site is more than 12	Subtract 2 if you have evidence to conclude that your site is more than

		12 km from breeding habitat	km from breeding habitat.	12 km from breeding habitat.
Proximity to roosting	-1	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease	-1	Subtract 1 if your site has disease present (e.g. *Phytophthora spp*. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. *Phytophthora spp*. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. *Phytophthora spp*. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Total Score			6	
Appraisal	To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.			

ADDENDUM 1

Original Referral Documentation

EPBC Act referral

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Title of proposal	**2021/9069 - Commercial Development of Lots 12 and 13 Lodge Drive, East Rockingham, Western Australia**

Section 1

Summary of your proposed action

1.1 Project industry type Commercial Development

1.2 Provide a detailed description of the proposed action, including all proposed activities

Lots 12 and 13 Lodge Road, East Rockingham (the site) contains a large shed and some disused infrastructure associated with a wool scouring plant that was built between 1995 and 2000. The shed and yards are now used for a different purpose. The shed and other areas of infrastructure occupy about 6ha of the 11.9ha site. The balance of the site remains undeveloped and contains a large number of trees over bare ground that contains deep mulch.

The Proponent is proposing to develop of the remainder of the site for commercial purposes and as a worse case scenario will likely clear all of the remaining native vegetation.

The site contains 1.5ha Tuart trees (includes 30m buffer around Tuarts) which is considered low quality foraging habitat for Black Cockatoos and 5.5ha of Poor condition (based on conservation advice) Tuart Woodlands and Forests of the Swan Coastal Plain ecological community. The site contains 58 potential future nesting trees for Black Cockatoos.

The proposed action is to clear native vegetation from the site which will impact on 1.5ha Black Cockatoo foraging habitat, 5.5ha of Tuart Woodland Threatened ecological community and 58 Tuart Trees that are potential future nesting trees.

1.3 What is the extent and location of your proposed action?

See Appendix B

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland)

The site is located in the City of Rockingham approximately 36km south of the Perth Central Business District (Att A). The site is bound to the north and east by cleared land in the Clipper Precinct of the Rockingham Industry Zone (RIZ), to the south by cleared rural land and to the west by native vegetation in the RIZ Conservation Area (Att B).

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The site (work area) is 11.9098ha and the action is to clear 1.5ha (disturbance footprint) of completely degraded native vegetation to allow for further development of the site.

The Proponent seeks approval to clear vegetation to the north and west of the existing building for the purpose of providing additional hardstand area, and potentially additional warehousing and manufacturing facilities. The details of the proposed development as are follows:

- An additional 5,000m2 of hardstand to the north of the existing building for the storage of containers, vehicles and equipment associated with the existing building.
- A development on approximately 29,000m2 of lot area to the north-west of the existing building comprising either additional hardstand, or a building with 7400m2 of warehousing or manufacturing space, drive through access for delivery trucks, and additional office and operating space including lunch and plant rooms

1.7 Proposed action location

Lot - Lots 12 and 13 Lodge Road P023754 13 and P023754 12

1.8 Primary jurisdiction Western Australia

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

☐ Yes ☑ No

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

1.10 Is the proposed action subject to local government planning approval?

☐ Yes ☑ No

1.11 Provide an estimated start and estimated end date for the proposed action	Start Date	03/01/2022
	End Date	04/09/2030

1.12 Provide details of the context, planning framework and state and/or local Government requirements

The site is located in the RIZ which is zoned Industrial under the Perth Metropolitan Region Scheme (MRS) and General Industry under the City of Rockingham Town Planning Scheme No. 2.

The RIZ has been part of an industrial estate earmarked since 1955 and recognised as a heavy industry site for 25 years (ECS, 2006). The broad planning framework was established in the Stephenson Hepburn Report (1955), the "Premiers Committee for the Development of Cockburn Sound and Kwinana" (1961) and the 1963 Metropolitan Region Scheme (MRS). The land at Kwinana Beach was zoned Special Industry under the MRS in 1972. A concept plan for the area was formulated in 1976 and revised in 1978 to resolve the disjointed ownership and other difficulties with the sites. Improvement Plan 14 (IP14) was included in a 1981 Concept Plan "Study for the Future Development of East Rockingham and Kwinana Beach". The IP14 was adopted in 1985 by WAPC. In 1991 the Strategic Development Plan for the East Rockingham Industrial Park was incorporated into the MRS.

The RIZ is surrounded by the Greater Kwinana Industrial Area which produces outputs worth $4.34 billion per annum and exports $1.58 billion a year. The area generates total economic activity worth $15.3 billion (20% of Western Australia's total value of production). This includes providing 3,600 jobs and 70% of the employees in this workforce live locally. The Kwinana area also generates indirect and induced employment that contributes 24,400 jobs, which is vital to the Western Australian economy.

A Structure Plan for the RIZ (IP14 Area at that time) was developed in 1999 and was adopted by the City of Rockingham and the WAPC as stated in the Statement of Planning Policy No. 7.1 - East Rockingham Industrial Park: Environmental Planning Policy. The Structure Plan was finalised in 2012 to reflect determinations by the WAPC and EPA. Under the City of Rockingham Town Planning Scheme No. 2 the site is predominantly zoned as 'special industry' and 'general industry' with some areas zoned 'parks and recreation, 'primary regional roads and 'railways'. The Structure Plan is in keeping with the extent of the City of Rockingham's LPS 3 underlying 'Special Industry' and 'General Industry Zones'. The City of Rockingham' s Planning Policy 7.1: East Rockingham Industrial Park: Environmental Planning Policy (2004) was developed to establish guiding principles and policies for the environmental acceptability of industrial zoned land within the RIZ area.

The development of the subject site with either additional hardstand, or warehouse and manufacturing capacity is consistent with the Industrial zoning of the site under both the Metropolitan Region Scheme and the City of Rockingham Local Planning Scheme No. 2 respectively. The site is well separated from any sensitive land uses and an appropriate location for the intensification of industrial-type activities. Any development will be assessed against the requirements of the local planning framework.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

There have been many public consultation periods throughout the planning and environmental processes for the RIZ.

A Development Application (DA) for future works will include a public consultation period including Indigenous stakeholders.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

The site has not been subject to any formal assessment under the State Environmental Protection Act 1986 or under the Commonwealth EPBC Act.

1.15 Is this action part of a staged development (or a component of a larger project)?

☐ Yes ☑ No

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Department of Agriculture, Water and the Environment

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1.16 Is the proposed action related to other actions or proposals in the region?

☐ Yes ☑ No

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Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 2

Matters of national environmental significance

2.1 Is the proposed action likely to have any direct or indirect impact on the values of any World Heritage properties?

☐ Yes ☑ No

2.2 Is the proposed action likely to have any direct or indirect impact on the values of any National Heritage places?

☐ Yes ☑ No

2.3 Is the proposed action likely to have any direct or indirect impact on the ecological character of a Ramsar wetland?

☐ Yes ☑ No

2.4 Is the proposed action likely to have any direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

☑ Yes ☐ No

Species or threatened ecological community

Tuart Woodland and Forests of the Swan Coastal Plain

Impact

Clearing the 5.5ha (includes 30m buffer) of poor quality Tuart Woodland Threatened Ecological Community will reduce the amount of this ecological community, but not its overall regional distribution on the Swan Coastal Plain. Very good quality examples of the ecological community are well represented in the adjacent RIZ conservation area which is protected under both State and Commonwealth legislation.

The clearing of 5.5ha of this ecological community will reduce the extent of the community on a local scale (Att B). Considering the Critically Endangered rating for the ecological community the impact is considered to be significant in terms of the conservation advice. However, the very poor quality of the ecological community, lack of species diversity in the understorey and the density of weed species must be taken into account when considering the level of significance (Attachment E).

Species or threatened ecological community

Carnaby's Black Cockatoo (Calyptorhynchus latirostris)

Impact

Clearing the remaining native vegetation will reduce the regional foraging habitat by 1.5ha and 58 potential future nesting trees will be cleared (58 Tuart) from the site (Att C). Tuart is recognised to be of low foraging value to Carnaby's Black Cockatoo (Johnstone and Kirkby, 2008).

The impact of clearing 1.5ha of low quality foraging habitat is highly unlikely to have a direct or indirect impact on Carnaby's Black Cockatoo or on the Recovery Plan (DPaW, 2013) for the species for the following reasons:

- the site is outside of the known breeding range for the species;
- the site is not known to be a roosting or nesting site (DoP, 2011);
- Tuart trees are not considered to be a high quality foraging species;
- there is approximately 91ha retained in the RIZ conservation area directly west of the site which contains high levels of foraging, roosting and nesting habitat; and
- There is significant foraging habitat protected in Bush Forever Sites within 12km radius of Lot 170 (Att D).

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A detailed assessment of the impact is provided in Attachment E.

2.4.2 Do you consider this impact to be significant?

☑ Yes ☐ No

2.5 Is the proposed action likely to have any direct or indirect impact on the members of any listed migratory species or their habitat?

☐ Yes ☑ No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

☐ Yes ☑ No

2.7 Is the proposed action likely to be taken on or near Commonwealth land?

☐ Yes ☑ No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

☐ Yes ☑ No

2.9 Is the proposed action likely to have any direct or indirect impact on a water resource from coal seam gas or large coal mining development?

☐ Yes ☑ No

2.10 Is the proposed action a nuclear action?

☐ Yes ☑ No

2.11 Is the proposed action to be taken by a Commonwealth agency?

☐ Yes ☑ No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage place overseas?

☐ Yes ☑ No

2.13 Is the proposed action likely to have any direct or indirect impact on any part of the environment in the Commonwealth marine area?

☐ Yes ☑ No

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Department of Agriculture, Water and the Environment

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Section 3

Description of the project area

3.1 Describe the flora and fauna relevant to the project area

Flora

The site is highly unlikely to contain any conservation significant flora listed under the State Biodiversity Conservation Act 2016 (BC Act) or the Commonwealth EPBC Act due to the cleared understorey and level of mulching (Att E and F).

A database search of Nature Map was undertaken to determine if any conservation significant Flora species have been found within a five kilometres of the site. The marine relevant species have not been included as the site is terrestrial based. The following Priority species were listed:

- Acacia sp. Binningup Priority 1;
- Dodonaea hackettiana (Hackett's Hopbush) Priority 4; and
- Jacksonia sericea (Waldjumi) Priority 4.

A database search of Protected Matters tool was undertaken to determine if any conservation significant Flora species have been found within a five kilometres of the site. The following conservation species were listed:

- Andersonia gracilis (Slender Andersonia) Endangered;
- Caladenia huegelii (Grand Spider Orchid) Endangered;
- Diuris micrantha (Dwarf Bee-orchid) Vulnerable;
- Diuris purdiei (Purdie's Donkey orchid) Endangered;
- Drakaea elastica (Glossy Leafed Hammer Orchid) Endangered;
- Drakaea micrantha (Dwarf Hammer Orchid) Vulnerable; and
- Synaphae sp. Serpentine Critically Endangered.

The likelihood of any of these conservation significant flora species occurring on the site is very low due to the completely degraded condition of the vegetation or the habitat not being suitable (Att E and F).

Fauna

A database search of Nature Map was undertaken to determine if any conservation significant Fauna species have been found within a five kilometres of the site. The following Schedule 1 and Priority species were listed:

- Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo) Schedule 1;
- Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo) Schedule 1 ;
- Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo) Schedule 1;
- Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider) Priority 3;
- Lerista lineata (Perth Slider, Lined Skink) Priority 3;
- Neelaps calonotos (Black-striped Snake, black-striped burrowing snake) Priority 3;
- Hydromys chrysogaster (Water-rat, Rakali) Priority 4;
- Isoodon fusciventer (Quenda) Priority 4;
- Notamacropus irma (Western Brush Wallaby) Priority 4;
- Notoscincus butleri (Lined soil-crevice skink (Dampier) Priority 4;
- Oxyura australis (Blue-billed Duck) Priority 4; and
- Thinornis rubricollis (Hooded Plover, Hooded Dotterel)Priority 4 .

A database search of Protected Matters tool was undertaken to determine if any conservation significant Fauna species have been found within a five kilometres of the site. The marine relevant species have not been included as the site is terrestrial based. The following conservation species were listed:

- Botaurus poiciloptilus (Australasian Bittern) Endangered;
- Calidris canutus (Red Knot) Endangered;
- Calidris ferruginea (Curlew Sandpiper) Endangered;
- Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo) Vulnerable;
- Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo) Endangered;
- Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo) Endangered;
- Leipoa ocellata (Malleefowl) Vulnerable;
- Bettongia penicillata ogilbyi (Woylie) Endangered;
- Dasyurus geoffroii (Chuditch) Vulnerable; and
- Pseudocheirus occidentalis (Western Ringtail Possum) Critically Endangered.

Carnaby's Black Cockatoo has been discussed in Section 2.

Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo may occasionally pass through the site, however they would be highly unlikely to forage on the Tuarts as it is not a known foraging species and they do not nest in Tuarts. Both

species of Black Cockatoo nest in old Marri Trees (Corymbia calophylla) and occasionally in Jarrah (Eucalyptus marginata) (DBCA, 2017; Johstone and Kirkby, 2008; Johnstone and Kirkby, 2019)

The likelihood of the remaining conservation significant Fauna species occurring on the site is very low due to the degraded condition of the fauna habitat and/or the fauna habitat is not suited to these types of species.

3.2 Describe the hydrology relevant to the project area (including water flows)

Groundwater
Groundwater occurs at 2m BGL below the site (Perth Groundwater Atlas, 2021). The shallow groundwater salinity level is predominantly 3000-7000mg/L influenced possibly by saline water from Lake Cooloongup (JDA, 2006).

The groundwater beneath the site has a general movement westwards towards the coast. Monitoring of the groundwater levels in the adjacent RIZ showed a seasonal range in groundwater levels between 0.9m in April 2005 up to 1.7m AHD in September 2005 (JDA, 2006).

Wetlands
The DBCA geomorphic wetland mapping shows three Conservation Category Wetlands are mapped over the south-west portion of the site (Att. F). The portion of wetlands on the lots in each case is the eastern end of wetlands that extend into the bushland to the west that is part of the RIZ Conservation Area.

The site inspection on 4 June 2021 found all three areas mapped as wetlands are mostly cleared of vegetation. The western half of the large wetland and all of the two smaller wetlands contain mulch to a depth of around 1m. The eastern half of the large wetland contains some Tuart trees over an understorey of weed species. Very few native plants were observed in the eastern area and none of these are wetland species.

PGV Environmental consider that the areas mapped as Conservation Category wetlands (CCWs) no longer have the values of CCWs due to the absence of any intact native vegetation and no wetland plant species present. The areas do not have the ability to regenerate to a CCW due to the high level of weeds in the eastern half and the amount of mulch fill in the western half.

RAMSAR Wetlands
The protected matters database search identified three RAMSAR listed wetlands in the vicinity of the site. The wetlands are:
- Becher point wetlands;
- Forrestdale and Thomsons Lakes; and
- Peel-Yalgorup system.

The three RAMSAR wetlands are between 10 and 30km away from the site and surface water does not flow from the site into these wetlands (Figure 1).

3.3 Describe the soil and vegetation characteristics relevant to the project area

Soils
The site is located on the northern portion of the Rockingham-Becher Plain, a relatively recent feature of the Quindalup Dune System between Kwinana and Mandurah created as a result of coastline accretion caused by sea level fall over the last 6,400 years.

The soil landscape mapping shows the site is mapped as Quindalup South System which is described as coastal dunes of the Swan Coastal Plain, with calcareous sands and yellow sands (DPIRD, 2021).

Vegetation
The vegetation in the EAA is part of the Quindalup Vegetation Complex as mapped by Heddle et al. (1980). There is currently 14.5% of the original extent of the Quindalup complex protected in the Perth metropolitan region, therefore at the level of vegetation complex the vegetation on the site is well protected in terms of meeting the State Government's target within the Perth Metropolitan Region (WALGA, 2013).

The vegetation on the site has been partially cleared. One vegetation type is mapped on the northern part of site:
- EgMh Eucalyptus gomphocephala Open Woodland over Melaleuca huegelii Shrubland.

The vegetation associated with the adjacent wetlands to the west of the site Melaleuca rhaphiophylla / Acacia rostellifera / Gahnia trifida Shrubland has been cleared from the site and the area has been filled with mulch.

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The condition of the vegetation was rated by PGV Environmental during the site visit as Completely Degraded according to the Keighery scale (Government of Western Australia, 2000) (Att F).

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area

The site does not have any outstanding natural or unique features.

3.5 Describe the status of native vegetation relevant to the project area

The native vegetation on the site is Completely Degraded with the understorey consisting of a thick layer of mulch or dense weeds.

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

the site is largely flat and sits at 3.00m AHD.

3.7 Describe the current condition of the environment relevant to the project area

The site is completely degraded and has been used for industry use in the past.

3.8 Describe any Commonwealth Heritage places or other places recognised as having heritage values relevant to the project

There are no listed Commonwealth or State heritage values associated with the site.

3.9 Describe any Indigenous heritage values relevant to the project area

There are no listed registered sites in the DPLH Aboriginal Heritage Places database and no other registered heritage sites under the Heritage Council WA.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

The site is owned freehold by Hero Properties Pty Ltd.

3.11 Describe any existing or any proposed uses relevant to the project area

A wool scouring plant was operated on the site historically, it is currently used for storage. Future use will be in accordance with the General Industry zoning.

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Section 4

Measures to avoid or reduce impacts

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

The vegetation on the site does meet the definition for the Tuart Woodlands and Forests of the Swan Coastal Plain ecological community in Poor condition as the patch is greater than 5ha. The native understorey species richness was very low with only three species recorded in the entire patch.

Development of the site will likely result in clearing all of the remaining native vegetation including the 5.5ha of ecological community. Avoiding or reducing the impact is not possible.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved

Clearing the 5.5ha of poor quality Tuart ecological community will reduce the regional extent of the ecological community.

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Section 5

Conclusion on the likelihood of significant impacts

5.1 You indicated the below ticked items to be of significant impact and therefore you consider the action to be a controlled action

- ☐ World Heritage properties
- ☐ National Heritage places
- ☐ Wetlands of international importance (declared Ramsar wetlands)
- ☑ Listed threatened species or any threatened ecological community
- ☐ Listed migratory species
- ☐ Marine environment outside Commonwealth marine areas
- ☐ Protection of the environment from actions involving Commonwealth land
- ☐ Great Barrier Reef Marine Park
- ☐ A water resource, in relation to coal seam gas development and large coal mining development
- ☐ Protection of the environment from nuclear actions
- ☐ Protection of the environment from Commonwealth actions
- ☐ Commonwealth Heritage places overseas
- ☐ Commonwealth marine areas

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

Clearing the 1.5ha of native vegetation will result in the following:
- loss of 5.5ha (includes 30m buffer) of poor quality Tuart Woodland ecological community (Critically Endangered) which according to the EPBC Act Significant Impact Guidelines 1.1 will have a significant impact. However the poor quality of the ecological community should be taken into account when considering the significance;
- loss of 1.5ha of low value Black Cockatoo foraging habitat will not have a significant impact on the the three species of Black Cockatoo as large areas of foraging habitat are protected in conservation reserves in the local area; and
- loss of 58 potential breeding trees will reduce the regional number of breeding trees however the impact is not considered significant to Carnaby's Black Cockatoo as they don't breed in the region and there are large numbers of trees in local conservation reserves that contain suitable nesting trees and higher quality foraging habitat. The other two species of Black Cockatoo do not breed in Tuart Trees.

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Section 6

Environmental record of the person proposing to take the action

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Explain in further detail

Hero Properties Pty Ltd were established in 1970 and are a fully integrated development and investment management business focused on the industrial sector of Western Australia.

The Proponent is a small property/development manager rather than a property developer. As such, they have not developed a green fields site where state or commonwealth environmental legislation and approvals has been required.

The Proponent does not have a company environmental or sustainability policy.

6.2 Provide 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 either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application

There are no past or preset proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

☐ Yes ☑ No

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

☐ Yes ☑ No

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Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 7

Information sources

Reference source

Perth Groundwater Atlas (accessed 9 August 2021)

Reliability

third party data, reliable at time of access

Uncertainties

No Uncertainties

Reference source

SLIP Database (accessed 9 August 2021)

Reliability

third party data, reliable at time of access

Uncertainties

No Uncertainties

Reference source

Johnstone, R.E. and Kirkby, T. (2019). Black Cockatoo Research Project. Report prepared for the Housing Authority.

Reliability

Reliable at time of preparation

Uncertainties

No Uncertainties

Reference source

Department of Environment and Conservation. (2008). Forest Black Cockatoo (Baudin's cockatoo Calyptorhynchus baudinii and Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso) Recovery Plan. Perth WA: DEC. Retrieved from: http://www.environment.gov.au/resource/forest-black-cockatoo-baudin%E2%80%99s-cockatoo-calyptorhynchus-baudinii-and-forest-red-tailed

Reliability

Reliable at time of preparation

Uncertainties

No uncertainties

Reference source

Johnstone, R. & Kirby, T. (2008). Distribution, status, social organisation, movements and conservation of Baudin's Cockatoo (Calyptorhynchus baudinii) in South-west Western Australia. Records of the Western Australian Museum 25: 107-118.

Reliability

Reliable at time of preparation

Uncertainties

No Uncertainties

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Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reference source

Johnstone, R.E. & C. and Kirkby, T. (2011). Carnaby's Cockatoo (Calyptorhynchus latirostris), Baudin's Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin-Dunsborough), Western Australia. Studies on distribution, status, breeding, food, movements and historical changes. Report for Department of Planning, Western Australia.

Reliability

Reliable at time of preparation

Uncertainties

No uncertainties

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Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 8

Proposed alternatives

Do you have any feasible alternatives to taking the proposed action?

Yes ☑ No

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Department of Agriculture, Water and the Environment

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Section 9

Person proposing the action

9.1.1 Is the person proposing the action an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	The Trustee for Hamersley Sub Trust
Business name	
ABN	81176233525
ACN	
Business address	3/915 Cockburn Rd, Henderson, 6166, WA, Australia
Postal address	
Main Phone number	08 6498 9470
Fax	
Primary email address	julie.drago@ovest.net.au
Secondary email address	

9.1.2 I qualify for exemption from fees under Regulation 5.23(1)(ii) of the EPBC Regulations because I am:

☑ Small business
☐ Not applicable

9.1.2.1 You must provide the date/income year that you became a small business entity:

18/05/2021

9.1.2.2 I would like to apply for a waiver of full or partial fees under Regulation 5.21A of the EPBC Regulations

☐ Yes ☑ No

9.1.3 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Julie
Last name	Drago
Job title	Chief Executive Officer
Phone	08 6498 9470
Mobile	
Fax	
Email	julie.drago@ovest.net.au
Primary address	3/915 Cockburn Rd, Henderson, 6166, WA, Australia
Address	

Declaration: Person proposing the action (To be signed by the person at 9.1.3)

I, JULIE DRAGO, 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.

Signature: ..... Date: 15/10/21

I, JULIE DRAGO, the person proposing the action, consent to the designation of THE TRUSTEE FOR HAMERSLEY SUB TRUST as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature: ..... Date: 15/10/21

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small business entity and confirm that I qualify for a small business exemption.

Signature: ..... Date: 15/10/21

Australian Government
Department of Agriculture, Water and the Environment

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Proposed designated proponent

9.2.1 Is the proposed designated proponent an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	The Trustee for Hamersley Sub Trust
Business name	
ABN	81176233525
ACN	
Business address	3/915 Cockburn Rd, Henderson, 6166, WA, Australia
Postal address	
Main Phone number	08 6498 9470
Fax	
Primary email address	julie.drago@ovest.net.au
Secondary email address	

9.2.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Julie
Last name	Drago
Job title	Chief Executive Officer
Phone	08 6498 9470
Mobile	
Fax	
Email	julie.drago@ovest.net.au
Primary address	3/915 Cockburn Rd, Henderson, 6166, WA, Australia
Address	

Declaration: Proposed Designated Proponent

I, JULIE DRAGO **,the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: ..... **Date:** 15/10/21

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Referring party (person preparing the information)

9.3.1 Is the referring party an organisation or a business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	The trustee for KNIGHTSIDE TRUST
Business name	
ABN	44981725498
ACN	
Business address	Suite 3, 67 Howe Street, Osborne Park, 6017, Western Australia, AU
Postal address	
Main Phone number	0429500027
Fax	
Primary email address	belinda@pgv.net.au
Secondary email address	belinda@pgv.net.au

9.3.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Belinda
Last name	Heath
Job title	Senior Environmental Consultant
Phone	0429500027
Mobile	0429500027
Fax	
Email	belinda@pgv.net.au
Primary address	Suite 3, 67 Howe Street, Osborne Park, 6017, Western Australia, Australia
Address	

Declaration: Referring party (person preparing the information)

I, _____, 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.

Signature: ..... **Date:** 25 October 2021

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Department of Agriculture, Water and the Environment

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Appendix A

Attachment

Document Type	File Name
action_area_images	Att A Figure 1.pdf
action_area_images	Att B Figure 2.pdf
action_area_images	Att C Figure 3.pdf
action_area_images	Att D Figure 4.pdf
action_area_images	Att E Report.pdf
supporting_tech_reports	*E -.pdf
flora_fauna_investigation	Att F Report.pdf
trust-deed	**Hamersley_ConstituionSigned_Stamped.pdf

*NOT PUBLISHED - SUPERSEDED
**NOT PUBLISHED - SENSITIVE

Appendix B

Coordinates

Area 1
-32.271165598799,115.77690868577
-32.27115933768,115.77471585293
-32.271156922254,115.77386674903
-32.271066438899,115.77376095443
-32.270665113205,115.77376247711
-32.270665546161,115.77392169184
-32.270002817003,115.77392420447
-32.270002384043,115.77376498975
-32.269127913241,115.77376829921
-32.267500900667,115.7737742893
-32.267509284368,115.77692221827
-32.271165598799,115.77690868577

Area 2
-32.271165598799,115.77690868577
-32.27115933768,115.77471585293
-32.271156922254,115.77386674903
-32.271066438899,115.77376095443
-32.270665113205,115.77376247711
-32.270665546161,115.77392169184
-32.270002817003,115.77392420447
-32.270002384043,115.77376498975
-32.269127913241,115.77376829921
-32.267500900667,115.7737742893
-32.267509284368,115.77692221827
-32.271165598799,115.77690868577