COTERRA ENVIRONMENT

Native Vegetation Clearing Permit Application

Orton Road Upgrades – Shire of Serpentine Jarrahdale

Rev 0 February 2024

CALIBRE | COMMITMENT | COLLABORATION

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1 Introduction

1.1 Background

The Shire of Serpentine Jarrahdale (the proponent) is proposing to undertake road upgrade works along a 5.8 km section of Orton Road between King Road in the west to Bullock Drive in the east (the project area; Figure 1).

Orton Road is currently a single carriageway (dual lane) local road (Main Roads, undated), with a posted speed limit of 90 kilometres per hour. Increased traffic and safety concerns have prompted the requirement for Orton Road to be upgraded and widened to support current and future traffic load.

The project area is located exclusively within Public Road lots which are managed by the Shire, covering Land ID 3994273, 3784709, and 3784710. The project area covers a total area of 7.15 hectares (ha) and includes predominately bituminised areas, with fringing native and introduced vegetation.

1.2 Planning and Environmental Approvals

Proposed upgrades to Orton Road necessitate the clearing of vegetation, including native vegetation, within the project area boundary (Figure 1). Design of the proposed upgrades has been undertaken to minimise the extent of clearing required, such that clearing will be undertaken within three meters of the travel line, only.

Potential impacts on Matters of National Environmental Significance (MNES) associated with the proposed upgrades were referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Based on the insignificance of potential impacts, the proposed action was deemed 'Not a Controlled Action' in the department's decision dated 16 February 2024.

1.3 Shire of Serpentine Jarrahdale

The management of native vegetation within the Shire of Serpentine Jarrahdale is underpinned by the Shire's Local Biodiversity Strategy (2019). The strategy focuses on 6,333 ha of local natural areas and local reserves, and is structured around five 'focus areas' with targets to retain, protect and enhance the values of the specific focus area. These being:

- Natural Areas
- Locally Characteristic Species
- Vegetation Complexes
- Specific Features
- Consultation and Education

With specific regard to native vegetation, the Shire has committed to protecting, retaining and enhancing a minimum area of each vegetation type found in the Shire, equating to a total area of approximately 1,690 ha. Further information on these commitments is presented in section 3.3.1.

The Shire's Local Biodiversity Strategy is also supported by a number of other strategies and policies which intersect with the strategy in terms of common goals and management actions. These include:

- Biodiversity Incentives Strategy
- Climate Change Strategy and Local Action Plan
- Natural Assets Management Plan

- Weed and Pest Management Plan
- Urban and Rural Forest Strategy
- State of the Environment Report.

At a statutory level, the Shire's *Local Planning Policy 4.16: Landscape and Vegetation Policy* guides the development of land within the Shire in accordance with the Shire's Local Planning Scheme No. 3. With specific regard to native vegetation, LPP 4.16:

- Ensures the effective integration of landscape and vegetation into land use planning processes
- Facilitates the effective integration of both state government and Shire planning and environmental documents
- Contributes towards achievement of vegetation and landscape outcomes that meet expectations of stakeholders and contribute towards the achievement of biodiversity targets and the creation of vibrant places for the Shire's communities.

The clearing of native vegetation along Orton Road to facilitate the proposed road upgrades has been minimised to the fullest extent possible, in accordance with the Shire's own biodiversity commitments.

1.4 Purpose of this report

This report has been prepared in support of a Native Vegetation Clearing Permit (NVCP) (Purpose Permit) application to clear vegetation within the project area to progress upgrades to Orton Road under Part IV of the *Environmental Protection Act 1986* (EP Act).

2 Proposed Clearing

2.1 Schedule

Works are proposed to be undertaken during 2024 to 2025, between the warmer months of September to May. This approach will minimise the risk of unnecessary topsoil disturbance and water runoff into adjacent retained vegetation.

2.2 Proposed works

Road upgrade works will involve the clearing of existing vegetation, installation of subbase, road base (limestone and crushed rock) and asphalt within a defined corridor approximately 5.8 km in length. Design of the proposed upgrades have been undertaken to minimise the extent of clearing required, such that this will be undertaken within 3 meters of the edge of the travel line, only. The majority of vegetation within the broader road corridor (i.e. the Public Road lots) will be retained.

Where possible, significant trees within the project area will also be retained, however determination on where construction works will enable this retention will need to be made as works progress.

2.3 Clearing methodology

2.3.1 Pre-clearing

Prior to clearing, the works area will be clearly demarcated to ensure over-clearing does not occur. Site contractors will be provided with an Environment Induction Note to:

- Ensure knowledge of the environmental values within and adjacent to the project area, and the importance of minimising construction related impacts
- Adequately implement measures to protect the environment, including the use of dust minimisation strategies
- Comply with local, state and federal environmental legislation.

2.3.2 Clearing

Clearing will be undertaken by mechanical removal. Dust emissions from the proposed works will be mitigated through the use of a water-cart where necessary, thereby ensuring that indirect impacts to adjacent retained vegetation will be minimised to the fullest extent possible. Protocols for environmental incidents which occur during the course of clearing (such as contingency actions in the event of fauna strike) will be implemented and communicated to site contractors.

2.4 Alternatives Considered

The Shire of Serpentine Jarrahdale has experienced significant urban residential development in the Byford area in recent years, including estates such as:

- Byford West Private Estate
- The Glades at Byford Estate
- Byford Meadows Estate
- The Brook at Byford.

Commutes from these areas to both the Perth CBD and significant industrial areas such as Kwinana necessitate the use of east west linkages from Byford to the freeway, which include Orton Road. No upgrades to this road have been made to account for its increased use in recent years, prompting significant road safety concerns. Further, it is reasonable to expect that further urban residential development in the Byford area will occur in the medium to long term, noting the significant area of land with conducive zoning in the area (as identified in the Shire of Serpentine Jarrahdale Local Planning Scheme No. 3). Upgrades to Orton Road, as well as ultimately other east-west linkages in the area, are required to account for significant historic and future growth in the Byford area.

3 Project Area Characteristics

3.1 Topography, Geology and Soils

Topography along Orton Road ranges from 26 metres Australian Height Datum (m AHD) in the west and east to 16 m AHD in the centre (Figure 2).

The project area contains the following soils, as described by Jordan (1986)

- Sandy Clay (Cs) – white-grey to brown, fine to coarse-grained, subangular to rounded sand, clay of moderate plasticity gravel and silt layers near scarp
- Sand (S8) – white to pale grey at surface, yellow at depth, fine to medium-grained, moderately sorted, subangular to subrounded, minor heavy minerals, of eolian origin.
- Sand (S10) – As S8 over sandy clay to clayey sand of the Guilford Formation, of eolian origin.

The location of soil units within the project area is displayed in Figure 2.

All soils within the project area are mapped as having a Moderate to Low Acid Sulfate Soil risk (Landgate 2023).

3.2 Hydrology

3.2.1 Groundwater

The project area falls within the Serpentine groundwater area and is underlain by the Superficial Swan, Leederville and Yarragadee North aquifers (DWER 2023).

Regional groundwater mapping undertaken across the western portion of the project area (DWER 2021) indicates that the minimum depth to groundwater from the surface ranges from 1 to 5 meters. Based on the topography, this equates to maximum groundwater levels of approximately 16 to 19 m AHD, in this location.

The westernmost extent of the project area (approximately 455 m) intersects a Priority 2 Public Drinking Water Source Area (PDWSA), specifically the Jandakot Underground Water Pollution Control Area. Priority 2 areas are typically located on land zoned rural, such as farm land and rural-residential lots. The Department of Water (now Department of Water and Environmental Regulation; DWER) (2016) states that the objective for Priority 2 areas is to minimise water quality contamination risks. It should be noted that the department's Water Quality Protection Note no. 25 (DWER 2021) identifies roads as being a compatible land use within Priority 2 areas, subject to condition 37, which states:

37. *In accordance with Roads to reuse: Product specification – recycled road base and recycled drainage rock:*
    - *Do not use recycled drainage rock in PDWSAs*
    - *Do not use recycled road base in P1 areas, WHPZs and RPZs*

There are no Wellhead Protection Zones (WHPZs) or Reservoir Protection Zones (RPZs) within the project area.

Further specifications for roads constructed in PDWSAs is provided within Water Quality Protection Note no. 44 (DWER 2006).

3.2.2 Surface Water

Two surface water features have been mapped as intersecting the project area, including the Birriga Main Drain and Beenyup Brook Drain (Landgate 2023) (Figure 3). Crossing the project area between Kargotich and Kings Roads, the Birriga Main Drain was constructed to remove water from agricultural land in the area, and

drains the northern section of the Upper Serpentine River catchment (DWER and the Department of Primary Industries and Regional Development; DPIRD 2018).

The Beenyup Brook Drain crosses the project area between Hopkinson and Kargotich Roads, and ultimately feeds into the Birriga Main drain. The Beenyup Brook Drain typically flows during August and September (DWER 2023).

It is understood that implementation of the proposal will necessitate the widening of Orton Road Bridges, which cross the Birriga Main Drain and Beenyup Brook Drain.

At various intervals along the length of Orton Road run a series of additional minor drains of various sizes, widths and depths, which also serve to remove water from agricultural land in the area.

3.2.3 Wetlands

The majority of the project area lies within the mapped extent of two Multiple Use Wetlands (MUW), as defined by the Department of Biodiversity, Conservation and Attractions (DBCA) (Landgate 2023). These wetlands, which includes the Armadale Palusplain (Unique Feature Id: 15797) and an unnamed dampland (UFI: 14704) extend across approximately 7,266 ha and 277 ha respectively, of cleared and vegetated land.

One Conservation Category Wetland (CCW) is located in proximity to the western portion of the project area (Figure 3). This CCW (UFI: 14873) is an unnamed palusplain wetland, covering approximately 2.39 ha of cleared and vegetated land. The CCW is located approximately 30 m north of the project area.

On the Swan Coastal Plain, wetlands are afforded protection based on their management category as detailed in the following Table 1.

Table 1: Wetland Management Categories (EPA 2008)

Management Category	General Description	Management Objective
Conservation	Wetlands which support a high level of attributes and functions	Highest priority wetlands. Objective is to preserve and protect the existing conservation values of the wetlands through various mechanisms including: • Reservation in national parks, crown reserves and State-owned land, • Protection under Environmental Protection Policies, and • Wetland covenanting by landowners. No development or clearing is considered appropriate. These are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate.
Resource Enhancement	Wetlands which may have been partially modified but still support substantial ecological attributes and functions	Priority wetlands. Ultimate objective is to manage, restore and protect towards improving their conservation value. These wetlands have the potential to be restored to Conservation category. This can be achieved by restoring wetland function, structure and biodiversity. Protection is recommended through a number of mechanisms.
Multiple Use	Wetlands with few remaining important attributes and functions	Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.

3.3 Flora and Vegetation

3.3.1 Pre-European Vegetation

Pre-European vegetation within Western Australia has been mapped at a broad level by Beard (1990) as vegetation system associations, and by Heddle et al (1980) as vegetation complexes.

Two vegetation system associations have been mapped within the project area. This vegetation, their descriptions and the percentage of their original extent remaining are presented in Table 2.

Table 2: Vegetation system associations

Vegetation System Association	Description	Extent remaining in Western Australia	Extent remaining within the Shire of Serpentine Jarrahdale
Pinjarra 968	Southwest woodland of *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri), and *Eucalyptus wandoo* (Wandoo)	6.69%	4.6%
Bassendean 1001	Medium very sparse woodland; jarrah, with low woodland; banksia and casuarina.	21.38%	48.85%

Three vegetation complexes are mapped across the project area. This vegetation, their descriptions and the percentage of the original extent remaining in Western Australia and the Perth Metropolitan Region are presented in Table 3.

Table 3: Vegetation complexes

Vegetation complex	Description	Extent remaining within Swan Coastal Plain	Extent remaining in Perth Metropolitan Region
Bassendean Complex – Central and South	Vegetation ranges from woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth.	26.87%	21.99%
Beermullah Complex	Mixture of low open forest of *Casuarina obesa* (Swamp Sheoak) and open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah). Minor components include closed scrub of *Melaleuca* species and occurrence of *Callitris pyramidalis* (Swamp Cypress).	6.67%	6.67%
Guildford Complex	Open woodland of *Corymbia calophylla* (Marri) with second storey of *Banksia grandis* (Bull Banksia) and *Nuytsia floribunda*. Fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca rhaphiophylla* (Swamp Paperbark) along streams.	5.09%	5.02%

The EPA uses vegetation complexes as the basis for regional representation of biodiversity and has an overall objective to seek retention of at least 30 % of the pre-clearing extent of each ecological community (EPA

2015). The EPA does have a modified objective to seek retention of at least 10 % of the pre-clearing extent of each ecological community within the constrained areas such as the Perth Metropolitan Region. The project area is located within the Perth Metropolitan Region and is therefore considered a constrained area, however only one vegetation complex within the project area is considered to be above the 10% target (Bassendean Complex – Central and South).

It is noted that via its Local Biodiversity Strategy (2019), the Shire has committed to the protection of 266 ha of the Bassendean Complex – Central and South, 20 ha of the Beermullah Complex, and 96 ha of the Guildford Complex in local parks and reserves.

Pre-European vegetation across the project area is illustrated in Figure 4.

3.3.2 Site Assessment

A detailed and targeted flora and vegetation survey was undertaken of the project area and broader road corridor (collectively, the survey area) by Ecoedge on the 5th and 6th of September, and 20th October 2023 (Ecoedge 2023). Six native vegetation units were mapped, of which 98% was considered to be in a Degraded or Completely Degraded condition. These vegetation units are illustrated within Figure 5 and Figure 6 and are described in Table 4 below.

Table 4: Vegetation types identified within the survey area (Ecoedge 2023)

Vegetation Unit	Description	Extent within survey area (ha)
VU1	Mid woodland of Melaleuca preissiana with isolated *Corymbia calophylla* mid trees over *Cenchrus clandestinus, **Ehrharta longiflora* grassland on grey sand.	0.663
VU2	Low woodland of *Banksia attenuata*, *B. menziesii*, (*B. ilicifolia*) over tall open/very open shrubland of *Kunzea glabrescens* over mid open shrubland of *Adenanthos cygnorum* subsp. *cygnorum* over low open shrubland of *Bossiaea eriocarpa*, *Hibbertia hypericoides*, *Dasypogon bromeliifolius* and *Stirlingia latifolia* over low open forbland of *Conostylis aculeata, Corynotheca micrantha* and *Phlebocarya ciliata*, and grassland of **Ehrharta calycin*a on grey sand	0.31
VU3	Mid open forest of *Melaleuca preissiana* or *M. rhaphiophylla* and *Corymbia calophylla* over very open forbland of **Fumaria capreolata* and **Oxalis pes-caprae* and mid closed of grassland of **Cenchrus clandestinus* and **Ehrharta longiflora* on grey-brown clay-loam.	0.885
VU4	Mid open forest of *Casuarina obesa* over isolated tall shrubs of *Acacia saligna* and *Viminaria juncea* over patches of *Chorizandra enodis* and *Eleocharis acuta* sedgeland, and forbland of **Watsonia meriana*, **Oxalis pes- caprae*, **Trifolium dubium* and **Cenchrus clandestinus*, **Ehrharta calycina* and **Eragrostis curvula* grassland on grey-brown silty clay-loam.	2.09
VU5	Mid woodland of *Corymbia calophylla* and *Eucalyptus rudis* over isolated tall shrubs of *Acacia saligna* and *Xanthorrhoea preissii* over mid grassland of **Ehrharta calycina* and **Eragrostis curvula* on orange-brown sandy clay-loam.	3.133
VU6	Tall open shrubland of *Acacia saligna*, *Melaleuca viminea*, Hakea varia and *Viminaria juncea* over open mid grassland of **Ehrharta calycina* and low grassland of **Briza maxima* and **B. minor*, and forbland including **Hypochaeris glabra, Ficinia marginata, Schoenus plumosus* and **Watsonia meriana* on grey-brown clay-loam	0.349

3.3.2.1 Conservation significant flora

No Threatened flora listed under either the *Biodiversity Conservation Act 2016* (BC Act) or EPBC Act, nor Priority flora listed by DBCA were identified within the survey area during the flora and vegetation assessment (Ecoedge 2023; Appendix 2). In considering the results of the survey, including the generally degraded nature of the site and mapped vegetation units, it was determined that all of the 36 potentially occurring conservation significant flora were unlikely to persist within the survey area.

3.3.2.2 Conservation significant vegetation

3.3.2.2.1 Banksia Woodland

The VU2 vegetation unit identified as a part of the flora and vegetation assessment was inferred to represent Floristic Community Type (FCT) 23a 'Central *Banksia attenuata – Banksia menziesii* woodlands' via multivariate analysis (Ecoedge 2023; Appendix 2). Whilst not a Threatened or Priority listed Ecological Community in its own right, this FCT is recognised as a subcomponent of the federally listed Threatened Ecological Community (TEC) Banksia Woodlands of the Swan Coastal Plain. This federally listed TEC is recognised at a state level as a Priority Ecological Community (PEC; Priority 3) of the same name. Approximately 0.0854 ha of the VU2 vegetation unit was considered to meet the minimum size and condition thresholds to be considered extant occurrences of the TEC/PEC within the survey area. The location and extent of the TEC/PEC relative to the survey area and project area is displayed in Figure 6.

Recognising that the majority of this TEC/PEC (0.084 ha) is located on the southern side of the project area, the Shire of Serpentine Jarrahdale has endeavoured to undertake the necessary construction activities on the northern side of the road in this location so as to avoid direct impacts to this TEC/PEC to the fullest extent practicable. In doing so, no more than 0.009 ha of this TEC/PEC will be cleared to facilitate the proposed action. This corresponds to approximately 1% of the extent identified within the survey area. Potential impacts to avoided vegetation are anticipated to be limited to dust emissions associated with construction activities only. It is also recognised that this patch of Banksia Woodlands TEC/PEC extends south beyond the boundary of the project area to cover greater than 18 ha of remnant vegetation. On this basis, the anticipated impacts to no more than 0.0009 ha are not anticipated to be significant at a local or regional scale.

Potential impacts to this TEC/PEC associated with upgrades to Orton Road were referred to the DCCEEW under the EPBC Act (EPBC 2023/09680). Based on the insignificance of potential impacts, the proposed action was deemed 'Not a Controlled Action' in the department's decision dated 16 February 2024.

3.3.2.2.2 Marri Woodland

The VU5 vegetation unit identified as a part of the flora and vegetation assessment was inferred to potentially correspond to the federally listed *Corymbia calophylla – Xanthorrhoea pressii* woodlands and shrublands TEC. However, the entire extent of this vegetation unit was considered to be in either a degraded or completely degraded condition. The mapped extent of the VU5 vegetation unit which was in a degraded condition and therefore potentially representative of the federally listed TEC was 2.912 ha. Recognising that only vegetation in either Good or better condition can be considered occurrences of TEC's and PECs at a state level, VU5 is not conserved to represent any state recognised TEC or PEC. The location and extent of this federal TEC relative to the survey area and project area is displayed in Figure 6.

The Shire of Serpentine Jarrahdale has endeavoured to avoid directly impacting occurrences of this federal TEC where practicable. To this end, no more than 0.051 ha of this TEC will be cleared to facilitate the proposed action, the entirety of which is in a degraded condition. This corresponds to approximately 1.8% of the mapped extent of this TEC. Potential indirect impacts to avoided occurrences of the TEC are anticipated to be limited to dust emissions during construction, only. It is also recognised that occurrences of this TEC likely extend into adjacent rural residential lots to the south of the survey area, where some Marri and

Xanthorrhoea appear to have been retained. On this basis, the anticipated direct impacts on no more than 0.051 ha of this federal TEC are not considered to be significant at a local or regional scale.

Potential impacts to this TEC associated with upgrades to Orton Road were referred to the DCCEEW under the EPBC Act (EPBC 2023/09680). Based on the insignificance of potential impacts, the proposed action was deemed 'Not a Controlled Action' in the department's decision dated 16 February 2024.

3.4 Fauna and Habitat

A desktop assessment of conservation significant fauna that could potentially occur within the project area and within a 10 km buffer was undertaken utilizing the Department of Biodiversity Conservation and Attractions' (DBCA) Naturemap Database and the DCCEEW Protected Matters Search Tool. A total of 14 Threatened, 13 Priority listed and 15 Migratory and two specially protected fauna were identified to potentially occur within the project area or associated buffer (Appendix 3).

Based on a review of known distributions and habitat requirements, the following conservation significant fauna were considered to potentially occur within the project area:

- Carnaby's Black Cockatoo (CBC; Zanda *latirostris*): ranked as Endangered under the *Biodiversity Conservation Act 2016* (BC Act) and EPBC Act.
- Baudin's Black Cockatoo (BBC; *Zanda baudinii*): ranked as Endangered under the BC Act and EPBC Act.
- Forest Red-tailed Black Cockatoo (FRTBC; *Calyptorhynchus banksia naso*): ranked as Vulnerable under the BC Act and EPBC Act.
- Quenda (Isoodon fusciventer): ranked as Priority 4 by the DBCA.

3.4.1 Black Cockatoo Habitat Assessment

To assess the value of vegetation along Orton Road as habitat for black cockatoos, a dedicated assessment was undertaken by Bamford Consulting Ecologists (BCE 2023; Appendix 1). The assessment was undertaken of the areas proposed for clearing to facilitate road upgrades, as well as the remainder of the road corridor to provide a contextual understanding of black cockatoo habitat in the area. The assessment involved examining the availability of foraging, breeding and roosting habitat for all three species of black cockatoos which could be potentially occur within the project area.

As part of a black cockatoo habitat assessment, Vegetation and Substrate Associations (VSAs) were identified and mapped across the project area and broader road corridor (collectively, the survey area) to provide a contextual understanding of environmental values within the area. While traditionally used to identify and map fauna habitat, VSAs provide a greater level of information than vegetation types alone, by also considering soils, other substrates and landforms.

Generally, VSAs across the survey area were considered to be typical of rural areas, including open grassy areas and patches of remnant and planted vegetation with weedy understories. A total of eight VSA's were identified within the survey area. A description of these VSA's as well as the extent of each within the survey area and proposed clearing area are presented in Table 5 and Figure 7.

Table 5: Vegetation and Substrate Associations (VSAs) and their extent

VSA	Description	Extent (ha) within survey area	Maximum extent (ha) proposed to be cleared
1	**Banksia Woodland.** Closed remnant woodland of *Banksia attenuata* and *Banksia menziesii* with scattered *Eucalyptus todtiana* over mixed midstory and understorey on grey sands. Dominant midstory species consisted of *Kunzea sp.* and Woolly Bush (*Adenanthos sp.*), with understorey dominated by introduced grasses with scattered native small shrubs on grey sand.	0.43 ha	0.11 ha
2	**Marri Woodland.** Open remnant woodland with Marri (*Corymbia calophylla*) over open midstorey of *Xanthorrhoea preissii* and understory of exotic grasses on grey sand.	0.72 ha	0.09 ha
3	**Mixed Woodland.** Open remnant woodland with a mix of Flooded Gum (*Eucalyptus rudis*) and Marri (*Corymbia calophylla*) over open midstory of *Xanthorrhoea preissii* and understory of exotic grasses on grey sand.	1.81 ha	0.02 ha
4	**Sheoak Stands.** Closed dense stands of Sheoak (*Allocasuarina fraseriana*) with no midstory and understory consisting of invasive grasses and weeds	6.08 ha	0.86 ha
5	**Melaleuca Dampland.** Closed dampland of *Melaleuca rhaphiophylla* with midstorey of scattered *Kunzea* and understory of invasive weeds and grasses on dark grey sand. Appears to be seasonally inundated.	3.04 ha	0.66 ha
6	**Planted Eucalypts.** Open woodland of scattered planted mature trees such as *Eucalyptus camaldulensis* over a grassy understory on grey to white sand.	0.23 ha	0.05 ha
7	**Revegetated Shrubland.** Open low shrubland of native vegetation consisting of *Grevillea* and other shrubs, with scattered eucalypts and a grassy understory on grey to white sand.	0.84 ha	0.4 ha
8	**Open Areas.** Disturbed open areas ranging from introduced grasses scattered with disturbance species of plants and weeds with occasional *Acacia saligna* on grey to white sand.	2.57 ha	0.45 ha
Total		**15.72 ha**	**2.64 ha**

It is important to note that of the VSAs listed in Table 5, some may not qualify as native vegetation as per its definition under the EP Act and *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (EP Regulations). These include VSA 6 (Planted Eucalypts), VSA 7 (Revegetation Shrubland), and VSA 8 (Open Areas), which collectively comprise 0.9 ha of the area proposed to be cleared. Omitting these areas, it can be considered that the proposed road widening works will result in the clearing of, at most, 1.74 ha of native vegetation.

3.4.1.1 Foraging habitat

In terms of foraging habitat, vegetation types and substrates within the survey area were categorised as Vegetation and Substrate Associations (VSAs), which were assigned a foraging habitat score out of ten for each black cockatoo species based on the vegetation composition, site context, and foraging species density. A total of eight VSA's were identified within the survey area (Table 5; Figure 7). These VSA's, their foraging habitat score for each species, and the extent of each within the survey area and proposed clearing area are presented in Table 6 below.

Table 6: Black Cockatoo foraging habitat based on Vegetation and Substrate Associations (VSAs)

VSA	Foraging score for CBC	Foraging score for BBC	Foraging score for FRTBC	Area (ha) within survey area	Maximum extent (ha) proposed to be cleared
1: Banksia Woodland	8	2	3	0.43 ha	0.11 ha
2: Marri Woodland	6	7	7	0.72 ha	0.09 ha
3: Mixed Woodland	4	4	4	1.81 ha	0.02 ha
4: Sheoak Stands	2	2	6	6.08 ha	0.86 ha
5: Melaleuca Damplands	2	2	2	3.04 ha	0.66 ha
6: Planted Eucalypts	2	2	2	0.23 ha	0.05 ha
7: Revegetated Shrublands	3	3	3	0.84 ha	0.4 ha
8: Open Areas	1	1	1	2.57 ha	0.45 ha

As per the foraging habitat methodology presented in Appendix 1, VSA's with a foraging habitat score of less than 3 are considered to have no to low foraging habitat value for black cockatoos. Examples of habitat which may score as such include urban areas with scattered trees, open paddocks with known food source weeds, and areas with foliage cover of less than 5% (such as bare ground or surface water bodies). On this basis, VSA's scoring 2 or less out of 10 are not considered to represent suitable foraging habitat for the respective species.

Omitting these areas, the proposed road upgrade works are anticipated to result in the clearing of vegetation representing:

- 0.62 ha of foraging habitat for CBC (VSA's 1, 2, 3 and 7)
- 0.51 ha of foraging habitat for BBC (VSA's 2, 3 and 7)
- 1.48 ha of foraging habitat for FRTBC (VSA's 1, 2, 3, 4 and 7)

It should be noted that the above areas represent the maximum foreseeable extent of clearing required to facilitate the proposed works. Opportunities for the retention of individual trees (including significant trees) which provide valuable foraging habitat will be investigated as works progress, and every effort will be made by the proponent to retain such trees where possible.

3.4.1.2 Potential breeding habitat

A total of 44 trees with a Diameter at Breast Height (DBH) greater than 500 mm were identified within the survey area. These included 28 Marri, two Flooded Gums, one Swamp Paperbark and 13 planted Eucalypts. Of these, two trees were identified as 'category 3' in that they contained hollows suitable for black cockatoos but which had no evidence of use. Seven trees were identified as 'category 4' in that they contained hollows large enough to support black cockatoos, but that these were not at an angle suitable for breeding.

Of the potential breeding trees identified within the survey area, only 10 are located within the area proposed to be cleared. Two of these trees; a planted Eucalypt and a Swamp Paperbark were identified as 'category 4'. All trees with hollows suitable for breeding use by black cockatoos are proposed to be retained. The nearest confirmed black cockatoo breeding activity is located 7 km north east of the survey area in Lambert Lane Native Reserve and Fletcher Park in Byford.

The location of potential breeding trees within the survey area and proposed clearing area are displayed in Figure 8.

3.4.1.3 Potential roosting habitat

There are 48 known roost sites within 15 km of the survey area, with the centre of the closest confirmed roost located approximately 650 m north west of the survey area (Figure 8). This roost (roost code DEC28) is listed as being a roost for CBC. No roosting sites were identified within the survey area (BCE 2023; Appendix 1).

3.5 Conservation Areas, Environmentally Sensitive Areas, and Ecological Linkages

There are no zoned reserves or other conservation areas which intersect with or are adjacent to the project area. The nearest conservation area to the project area is Modong Nature Reserve (R 25886), which is a class A nature reserve managed by the DBCA. Modong Nature Reserve is located approximately 630 m west of the western limit of the project area.

One Environmentally Sensitive Area (ESA) intersects with the site. This ESA is associated with the Conservation Category Wetland located within 657 Orton Road (UFI 14873). This wetland covers approximately 2.39 ha of cleared and vegetated land and is located approximately 30 m north of the project area.

Four ecological linkages intersect the project area boundary, as mapped by the Western Australian Local Government Association (WALGA). These include link ID's 60, 61, 67, and 68. The majority of these linkages run perpendicular to the orientation of Orton Road as opposed to parallel, suggesting that remnant vegetation along Orton Road serves as a stepping stone for avian fauna, as opposed to an intact linkage in its own right. Notwithstanding, the majority of vegetation along Orton Road is proposed to be retained following the proposed upgrade works, resulting in the maintenance of what habitat connectivity Orton Road currently provides.

3.6 Heritage

3.6.1 Indigenous Heritage

Based on a search of the Department of Planning Lands and Heritage (DPLH) Aboriginal Heritage Enquiry System, there are no known Registered Sites or other Aboriginal Heritage Places within the project area. The nearest registered site is located approximately 480 m south east 7 of the project area. This Registered Site (Place ID: 396), named South East Corridor 07/ Cardup Siding is listed as Artefacts / Scatter. Aerial imagery indicates that the project area has been heavily disturbed and is now subject to residential development.

3.6.2 Other Heritage

A review of the State Heritage Office's InHerit database identified no non-aboriginal heritage places within or adjacent to the project area. The nearest non-aboriginal heritage place was identified as Fremnells Dairy, which is listed on the Shire of Serpentine Jarrahdale's Municipal Inventory. Fremnells Dairy is a relatively intact example of an operational dairy farm established in the Serpentine Agricultural area and has historic value in its association with the Orton and Kargotich families. Fremnells Dairy is located approximately 530 m south east of the eastern section of Orton Road.

4 Assessment Against Native Vegetation Clearing Permit Clearing Principles

An assessment of the proposed vegetation clearing against the ten native vegetation clearing principles contained in Schedule 5 of the EP Act is provided in Table 7. Based on the outcomes of the assessment, it is considered that the development is not at variance with seven of the ten clearing principles. The proposed clearing is considered unlikely to be at variance with one of the clearing principles (e), and may be at variance with principles (d) and (f). It should be noted however that while technically at variance with principle (f), the proposed clearing aligns with the intended management objective for a MUW.

Table 7: Assessment Against Clearing Principles

Clearing principle	Discussion	Assessment
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity	All vegetation identified within the project area and broader survey area is considered to be in a degraded condition. There are significant areas of vegetation which have not been historically cleared, in the local area. These include Modong Nature reserve (located less than 1 km from the site), Lot 711 on plan 202730 (located immediately south of the site), and Cardup Nature Reserve (located 2 km south east of the site). Historic aerial imagery dating from 1950 indicates that significant sections of Orton Road have been historically cleared for agricultural purposes. The linearly spaced location of trees along some sections of the road (namely marri trees in the east of the project area) suggests that where vegetation is not regrowth vegetation, it has been planted. None of the individual flora species identified in the project area as part of the VSA assessment or subsequent site inspection or VSA assessment are considered to be conservation significant.	The proposed clearing is not considered to be at variance with this principle.
(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia	Vegetation within the project area is considered to provide the following habitat values for conservation significant fauna: • 0.62 ha of foraging habitat for CBC (VSA's 1, 2, 3 and 7) • 0.51 ha of foraging habitat for BBC (VSA's 2, 3 and 7) • 1.48 ha of foraging habitat for FRTBC (VSA's 1, 2, 3, 4 and 7) • 10 significant trees, of which two are considered category 4 and 8 are considered category 5 • 2.64 ha of potential habitat for Quenda. Given the degraded condition of this vegetation, its limited extent, and the prevalence of suitable habitat in proximity to Orton Road, this habitat is considered to provide habitat connectivity values, only. Recognising that significant vegetation will be retained within the public road lots following the proposed clearing, Orton Road's habitat connectivity value will be maintained. On this basis, no significant habitat for native fauna is considered to be present within the project area.	The proposed clearing is not considered to be at variance with this principle.
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of rare flora	No Threatened flora listed under either the *Biodiversity Conservation Act 2016* (BC Act) or EPBC Act, nor Priority flora listed by DBCA were identified within the survey area during the flora and vegetation assessment (Ecoedge 2023; Appendix 2). In considering the results of the survey, including the generally degraded nature of the site and mapped vegetation units, it was determined that all of the 36 potentially occurring conservation significant flora were unlikely to persist within the survey area. On this basis, the proposed clearing will not result in the clearing of rare flora.	The proposed clearing is not considered to be at variance with this principle.
(d) Native vegetation should not be cleared if it comprises the whole, or a part of, or is necessary for the maintenance of, a threatened ecological community	There are no Threatened Ecological Communities listed at a State level which occur within the project area or broader survey area (Ecoedge 2023). Two vegetation units mapped within the survey area are potentially representative of federally listed TECs, these being VU2 (potentially corresponding to the Banksia Woodlands of the Swan Coastal Plain TEC) and VU5 (potentially corresponding to *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain TEC). Approximately 0.0854 ha and 2.912 ha was considered to represent these TECs within the survey area, respectively. No more than 0.0009 ha of the Banksia Woodlands TEC and 0.051 ha of the Corymbia/Xanthorrhoea TEC is anticipated to be directly impacted by the proposed development. By avoiding occurrences of mapped TECs where possible, no more than 1% and 1.8% of the mapped extent of the Banksia Woodlands TEC and Corymbia/Xanthorrhoea TEC will be directly impacted by the proposed development, respectively. Retained and intact native vegetation in protected areas in proximity to the project area are considered likely to contain occurrences of these TECs. For example, the flora and vegetation assessment (Ecoedge 2023) confirmed that the Banksia Woodland patch occurring within the survey area extends across at least 20 ha to the south in lot 711. Further, retained Marri and Xanthorrhoea in rural residential properties to the south of the survey area may also represent occurrences of the TEC, indicating that the extent of clearing required represents a small fraction of the overall extent. All mapped occurrences of the Corymbia/Xanthorrhoea TEC are considered to be in a degraded condition. Potential indirect impacts associated with dust emissions during the construction phases of the proposal will be mitigated through the availability and use of a water cart. Topsoil disturbance and water runoff will be mitigated by the activities being undertaken during the warmer months of October to February. Potential impacts to these TECs associated with the proposal were referred to the DCCEEW under the EPBC Act (EPBC 2023/09680). Based on the insignificance of potential impacts, the proposed action was deemed 'Not a Controlled Action' in the department's decision dated 16 February 2024.	The proposed clearing may be at variance with this principle.

Clearing principle	Discussion	Assessment
	On this basis, while the proposed clearing may be at variance with this principal, the potential impacts are not considered to be significant at a local or regional scale.	
(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	Two vegetation complexes mapped across the project area are identified as having a remaining extent of less than the 10% target, these being Beermullah Complex (6.67%) and Guildford Complex (5.02%) (Table 3). However, the proposed clearing of 2.64 ha in total, which also represents the Bassendean Complex – Central and South, is not considered to significantly impact the extents remaining of either Complex. Further, it is noted that of this 2.64 ha, a significant portion comprises Planted Eucalypts (VSA 6), Revegetated Shrubland (VSA 7) and Open Areas (VSA 8), none of which are considered to qualify as 'native vegetation' under the EP Act or associated EP Regulations. Omitting these areas, only 1.74 ha of native vegetation is proposed to be cleared. Noting the degraded condition of this native vegetation, its limited biodiversity (in some cases only one species is mapped in the VSA, such as VSA 4), and the significant remnant native vegetation in protected areas in proximity to the project area, the area proposed to be cleared is not considered to represent significant remnant native vegetation. On this basis, the proposed clearing is considered unlikely to be at variance with this principle.	The proposed clearing is considered unlikely to be at variance with this principle.
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland	The project area intersects two MUWs as defined by the DBCA, these being the Armadale Palusplain (UFI 15797) and an unnamed dampland (UFI 14704) (Figure 3). The proposed road upgrade works are anticipated to align with the management objectives for MUWs. Two artificial watercourses intersect the project area, these being the Birriga Main Drain and the Beenyup Brook Drain (Figure 3). The proposed road upgrade works will necessitate the widening of bridges along Orton Road which cross each of these drains, which will require the limited clearing of vegetation. Recognising the artificial nature of these drains, and the limited extent and degraded nature of vegetation growing in and in association with them, the proposed clearing is not considered to be significant.	The proposed clearing may be at variance with this principle, however it should be noted that the proposed works align with the intended management objective for a MUW.
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	Historical aerial imagery dating from 1950 shows an extensive record of clearing and land alteration for agricultural purposed within the area. The resulting road verge is one dominated by introduced weeds and grasses, which is consistent with the open paddocks adjacent to Orton Road. The proposed clearing of native vegetation is not anticipated to result in any further appreciable land degradation. Notwithstanding the above, the proponent has committed to undertaking the proposed works in the warmer months of September to May, thereby minimizing the risk of unnecessary topsoil disturbance and water runoff.	The proposed clearing is not considered to be at variance with this principle.
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area	Indirect impacts on proximal conservation areas resulting from the proposed road upgrade works are anticipated to be limited to dust emissions and water runoff, only. To minimise these impacts, the proponent has committed to the availability and use of a water cart as works progress, to minimise dust emissions to the fullest extent possible. Further, works are proposed to only occur in the warmer months of September to May, thereby limiting the likelihood of excessive topsoil disturbance and detrimental water runoff.	The proposed clearing is not considered to be at variance with this principle.
(i) Native vegetation should not be cleared if the clearing of vegetation is likely to cause deterioration in the quality of the surface or underground water	The proposed works are limited to the construction of road infrastructure, only. No changes to surface water flows, or emissions to the environment (including groundwater) of any kind are anticipated.	The proposed clearing is not considered to be at variance with this principle.
(j) Native vegetation should not be cleared if the clearing of vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding	The proposed works are limited to the construction of road infrastructure, only, No changes to surface water flows or groundwater levels of any kind are anticipated.	The proposed clearing is not considered to be at variance with this principle.

5 Conclusion

The proposed upgrades to Orton Road will ensure the safety of road users in the Shire of Serpentine Jarrahdale, and will aid in future-proofing the local road network as urban residential development in the Shire progresses.

Native vegetation which will be cleared to facilitate the proposed upgrades is generally degraded in nature and dominated by introduced grasses and other weed species. While this vegetation provides limited foraging and potential breeding habitat for black cockatoos, the lack of species diversity and prevalence of large, intact conservation areas in the vicinity of the project area mean that these values are not considered to be significant. Habitat connectivity value provided by this vegetation is anticipated to be maintained following the proposed upgrades.

The proponent has endeavoured to minimise the extent of clearing necessitated by the proposed upgrades, and has committed to the further retention of significant trees within the project area where construction activities permit. The implementation of mitigation measures which will prevent and/or minimise dust emissions, water runoff and topsoil disturbance will ensure that potential indirect impacts will be minimised to the fullest extent possible.

An assessment against the ten clearing principles demonstrates that the proposed clearing is considered to not be at variance with seven of the principles, is unlikely to be at variance with one principle (e) and may be at variance with two (d and f). However, it is noted that the potential variance with principle (f) relates to the presence of MUWs, and the proposed clearing is considered to align with the management objective for MUWs.

Based on the above, the proposed clearing is not anticipated to be significant at a local or regional scale.

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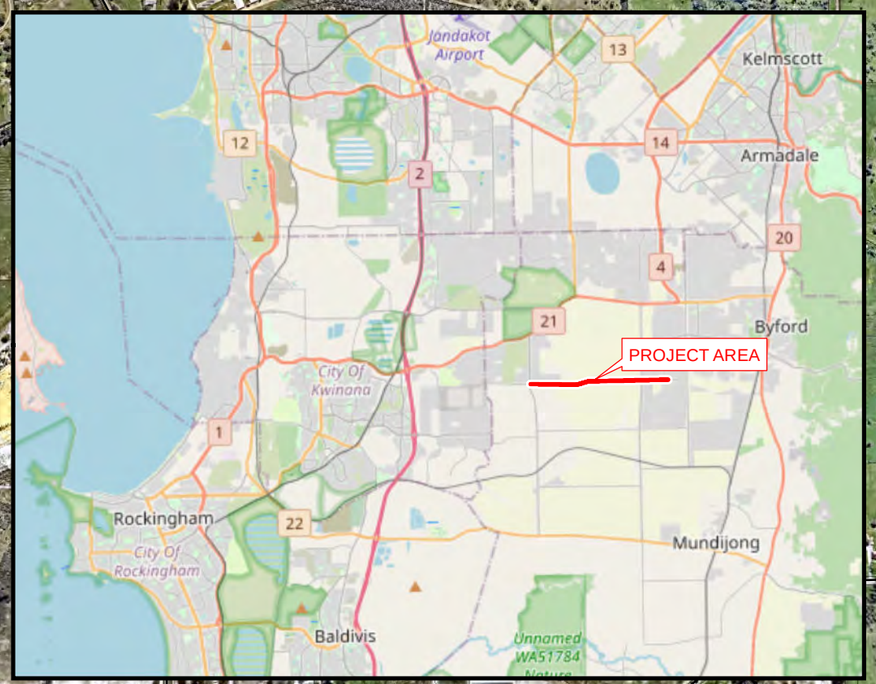
Figures

Abernethy Rd
King Rd
OAKFORD
Kargotich Rd
Orton Rd
OLDBURY
CARDUP
Gossage Rd



Source: Cadastre - Landgate
Orthophoto - NearMaps, 30.08.23

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Shire of Serpentine Jarrahdale
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

PROJECT AREA LOCATION

Figure 1

LEGEND

- Project Area
- Cadastre
- Contour (mAHD)

Soils

- Cs: SANDY CLAY - white-grey to brown, fine to coarse-grained, subangular to rounded sand, clay of moderate plasticity gravel and silt layers near scarp.
- Sp1: PEATY SAND - grey to black, fine to medium-grained, moderately sorted quartz sand, slightly peaty, of lacustrine origin.
- S8: SAND - white to pale grey at surface, yellow at depth, fine to medium-grained, moderately sorted, subangular to subrounded, minor heavy minerals, of eolian origin.
- S10: SAND - as S8 over sandy clay to clayey sand of the Guildford Formation, of eolian origin.

N

0 75 150 300 450 600 m

Scale: 1:15,000 @ A3
GDA2020 MGA Zone 50

Kargotich Rd
King Rd
Orton Rd
Gossage Rd

Source: Cadastre - Landgate
Orthophoto - NearMaps, 30.08.23
Hydrological / Contours - DWER
Geology - DoIR: Geological Survey of W.A., 1999

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Shire of Serpentine Jarrahdale
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

TOPOGRAPHY AND SOILS

Figure 2

LEGEND

- Project Area
- Cadastre
- Watercourse - minor, non-perennial
- Drain - major
- Swamp - perennial
- Area Subject to Inundation
- Earth Dam

Wetlands

- Conservation
- Resource Enhancement
- Multiple Use

N

0 75 150 300 450 600 m

Scale: 1:15,000 @ A3
GDA2020 MGA Zone 50

Abernethy Rd
King Rd
Kargotich Rd
Orton Rd
Gossage Rd

UFI: 14494
UFI: 7180
UFI: 7181
UFI: 7182
UFI: 14872
UFI: 7184
UFI: 7096
UFI: 7097
UFI: 7239
UFI: 15797
UFI: 14838
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UFI: 14863
UFI: 14862
UFI: 16021
UFI: 16021

Source: Cadastre - Landgate
Orthophoto - NearMaps, 30.08.23
Hydrological - DWER Wetlands - DBCA

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NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

HYDROLOGY AND WETLANDS

Figure 3

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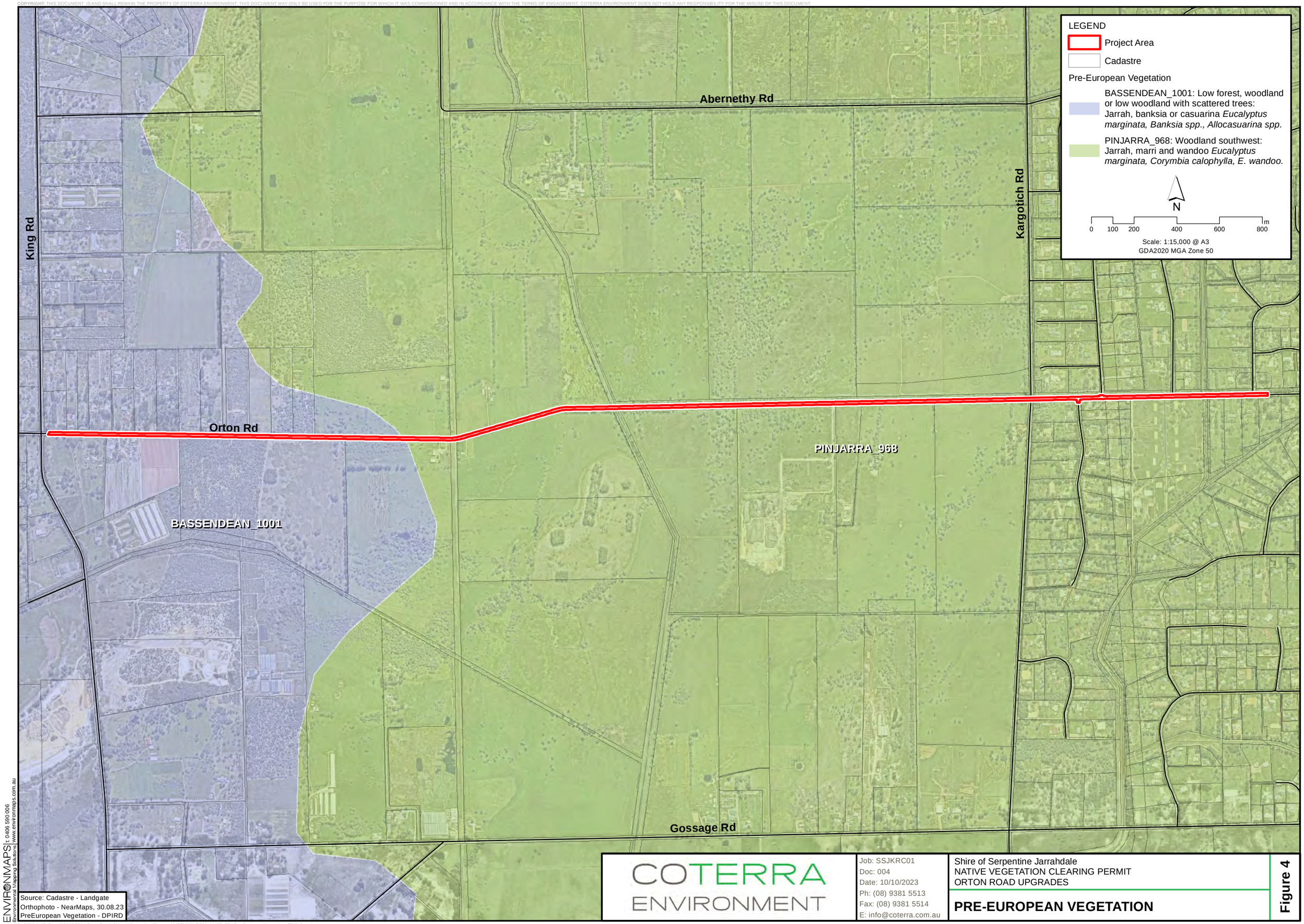

Source: Cadastre - Landgate
Orthophoto - NearMaps, 30.08.23
PreEuropean Vegetation - DPIRD

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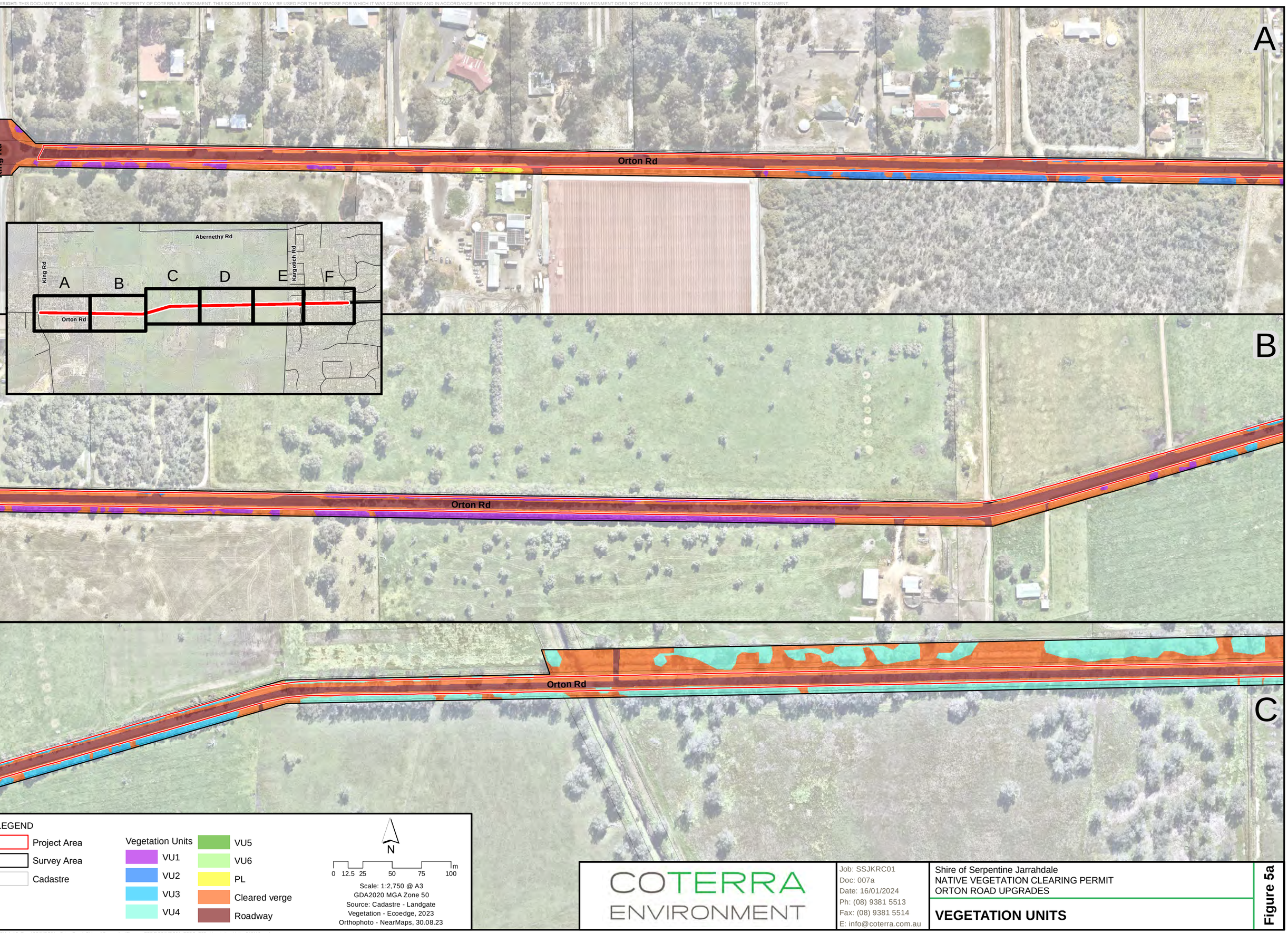
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

PRE-EUROPEAN VEGETATION

Figure 4



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NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

VEGETATION UNITS

Figure 5a

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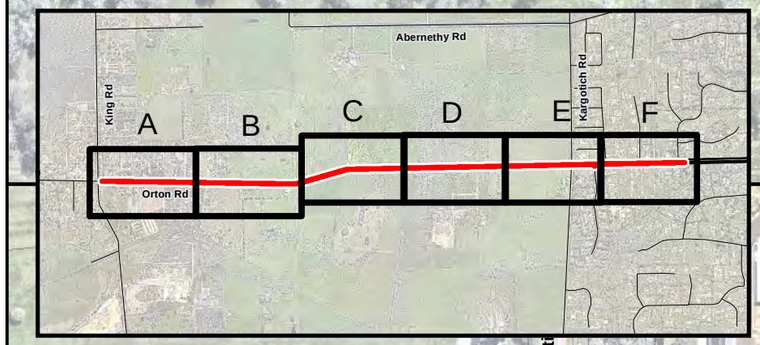

D

E

F

Orton Rd

Florence Pl

Northerly L

Kowin Ct

Bullock Dr

Hopkinson Rd

LEGEND

Project Area

Survey Area

Cadastre

Vegetation Units

VU1

VU2

VU3

VU4

VU5

VU6

PL

Cleared verge

Roadway

N

0 12.5 25 50 75 100 m

Scale: 1:2,750 @ A3
GDA2020 MGA Zone 50
Source: Cadastre - Landgate
Vegetation - Ecoedge, 2023
Orthophoto - NearMaps, 30.08.23

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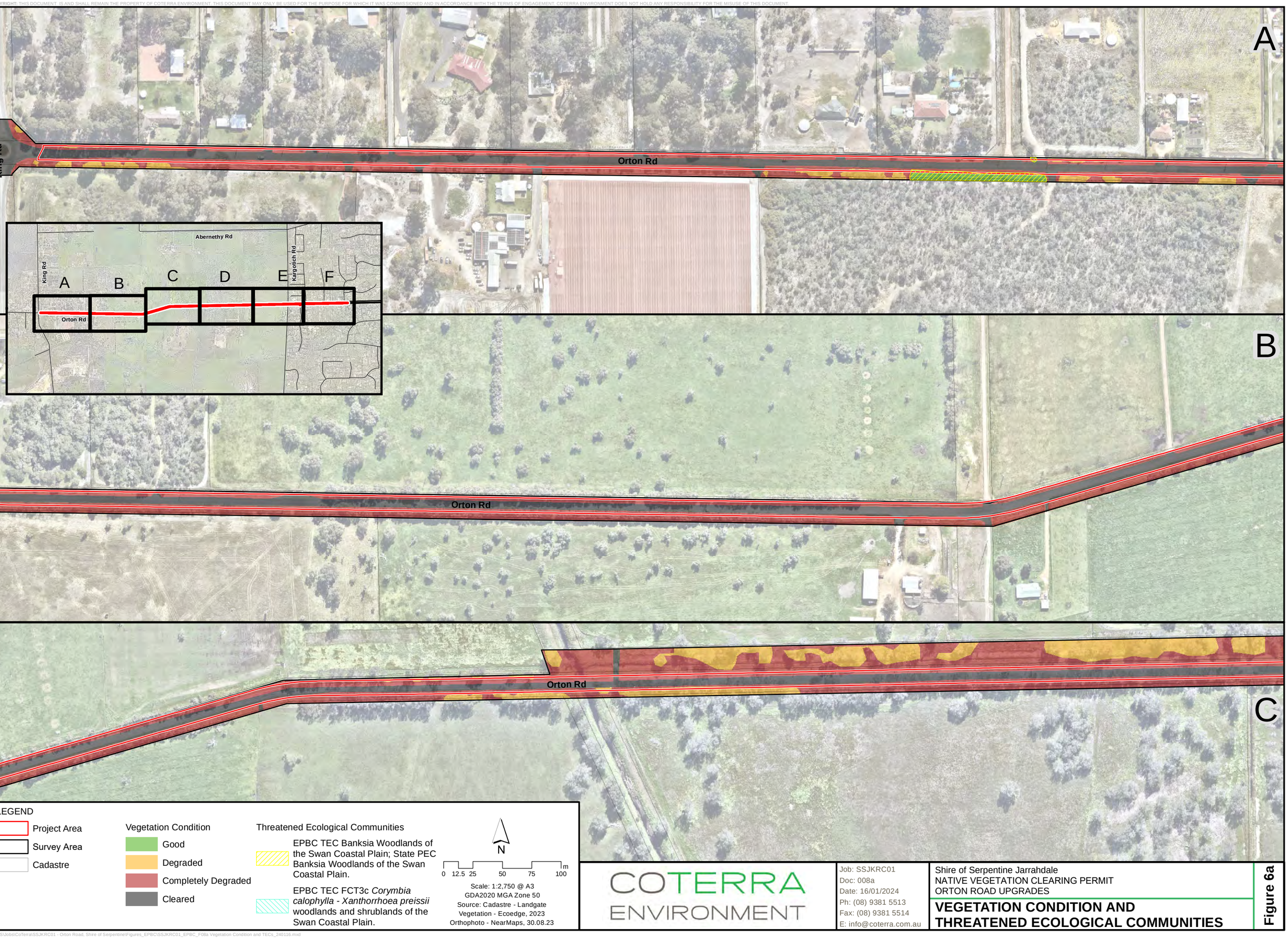
ORTON ROAD UPGRADES

VEGETATION UNITS

Figure 5b



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NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

VEGETATION CONDITION AND THREATENED ECOLOGICAL COMMUNITIES

Figure 6a

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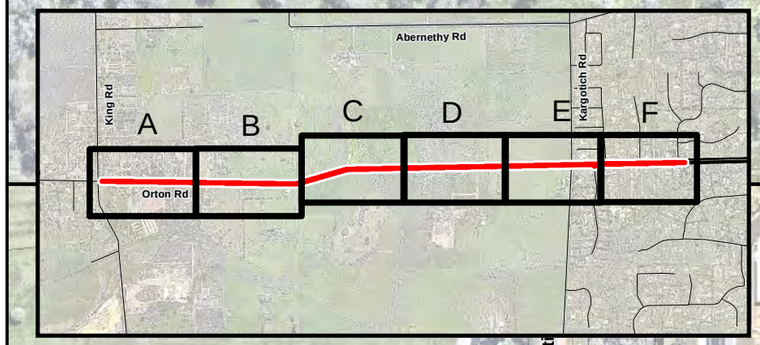

D

E

F

Orton Rd

Florence Pl

Northerly L

Kargoti

Kowin Ct

Bullock Dr

Hopkinson Rd

LEGEND

Project Area

Survey Area

Cadastre

Vegetation Condition

Good

Degraded

Completely Degraded

Cleared

Threatened Ecological Communities

EPBC TEC Banksia Woodlands of the Swan Coastal Plain; State PEC Banksia Woodlands of the Swan Coastal Plain.

EPBC TEC FCT3c *Corymbia calophylla - Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain.

N

0 12.5 25 50 75 100 m

Scale: 1:2,750 @ A3
GDA2020 MGA Zone 50
Source: Cadastre - Landgate
Vegetation - Ecoedge, 2023
Orthophoto - NearMaps, 30.08.23

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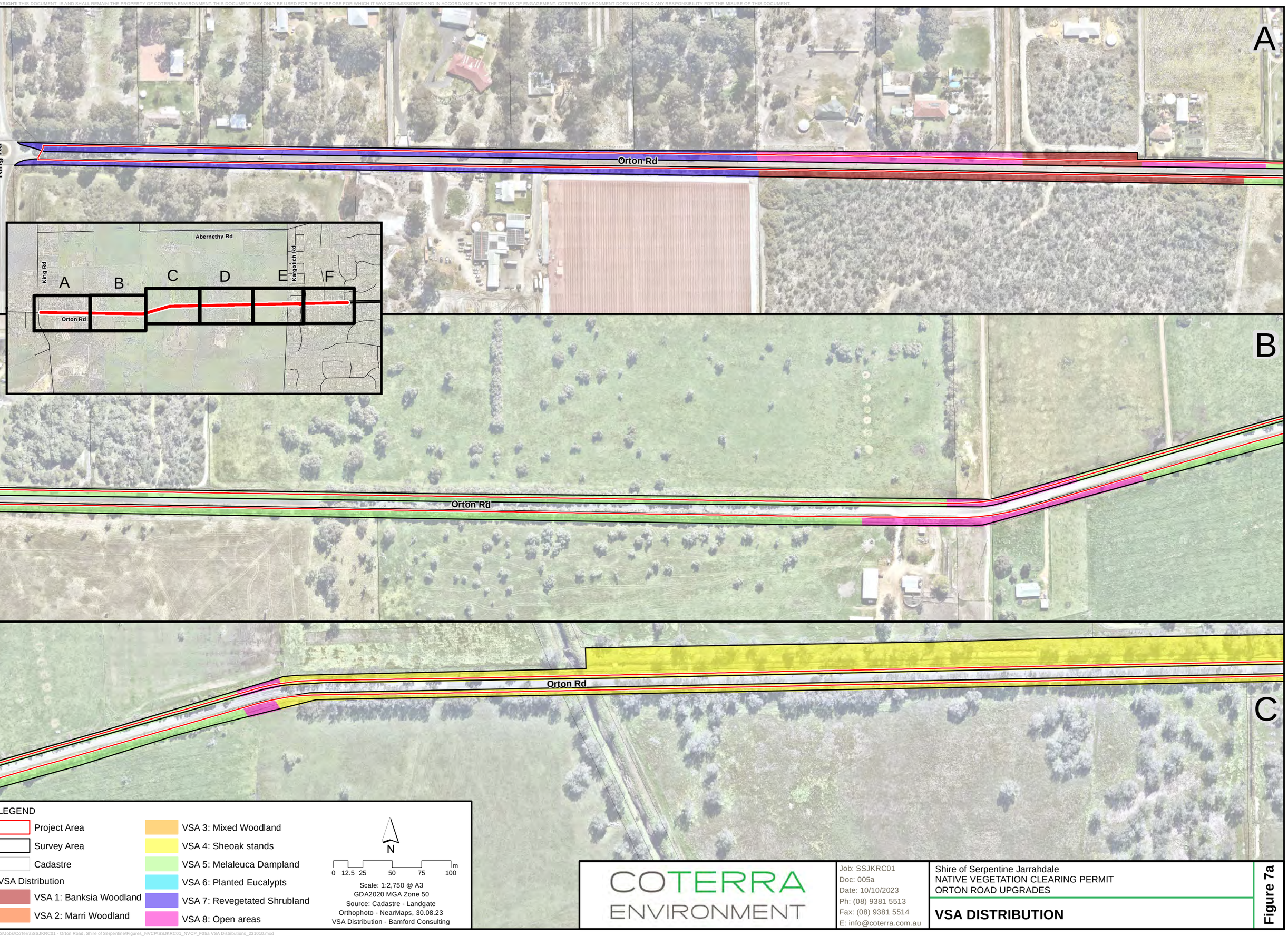
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

VEGETATION CONDITION AND THREATENED ECOLOGICAL COMMUNITIES

Figure 6b

C:\GIS\Jobs\CoTerra\SSJKRC01 - Orton Road, Shire of Serpentine\Figures_EPBC\SSJKRC01_EPBC_F08b Vegetation Condition and TECs_240116.mxd



LEGEND

- Project Area
- Survey Area
- Cadastre

VSA Distribution

- VSA 1: Banksia Woodland
- VSA 2: Marri Woodland
- VSA 3: Mixed Woodland
- VSA 4: Sheoak stands
- VSA 5: Melaleuca Dampland
- VSA 6: Planted Eucalypts
- VSA 7: Revegetated Shrubland
- VSA 8: Open areas

N

0 12.5 25 50 75 100 m

Scale: 1:2,750 @ A3
GDA2020 MGA Zone 50
Source: Cadastre - Landgate
Orthophoto - NearMaps, 30.08.23
VSA Distribution - Bamford Consulting

ENVIRONMAPS | t: 0406 590 006
Environmental Mapping Solutions | www.environmaps.com.au

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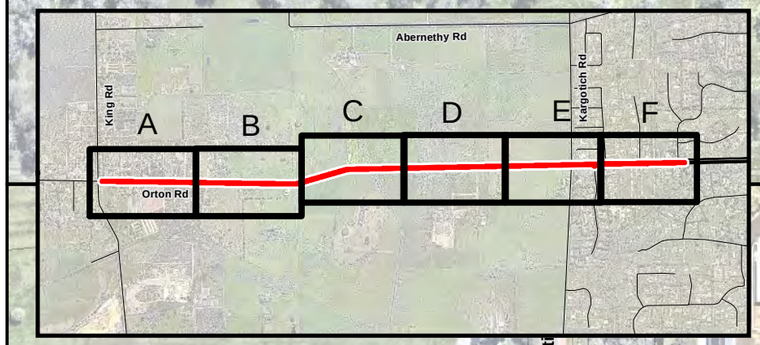
Shire of Serpentine Jarrahdale
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

VSA DISTRIBUTION

Figure 7a



D

E

F

Orton Rd

Florence Pl

Northerly L

Kowin Ct

Bullock Dr

Hopkinson Rd

LEGEND

- Project Area
- Survey Area
- Cadastre

VSA Distribution

- VSA 1: Banksia Woodland
- VSA 2: Marri Woodland
- VSA 3: Mixed Woodland
- VSA 4: Sheoak stands
- VSA 5: Melaleuca Dampland
- VSA 6: Planted Eucalypts
- VSA 7: Revegetated Shrubland
- VSA 8: Open areas

N

0 12.5 25 50 75 100 m

Scale: 1:2,750 @ A3
GDA2020 MGA Zone 50
Source: Cadastre - Landgate
Orthophoto - NearMaps, 30.08.23
VSA Distribution - Bamford Consulting

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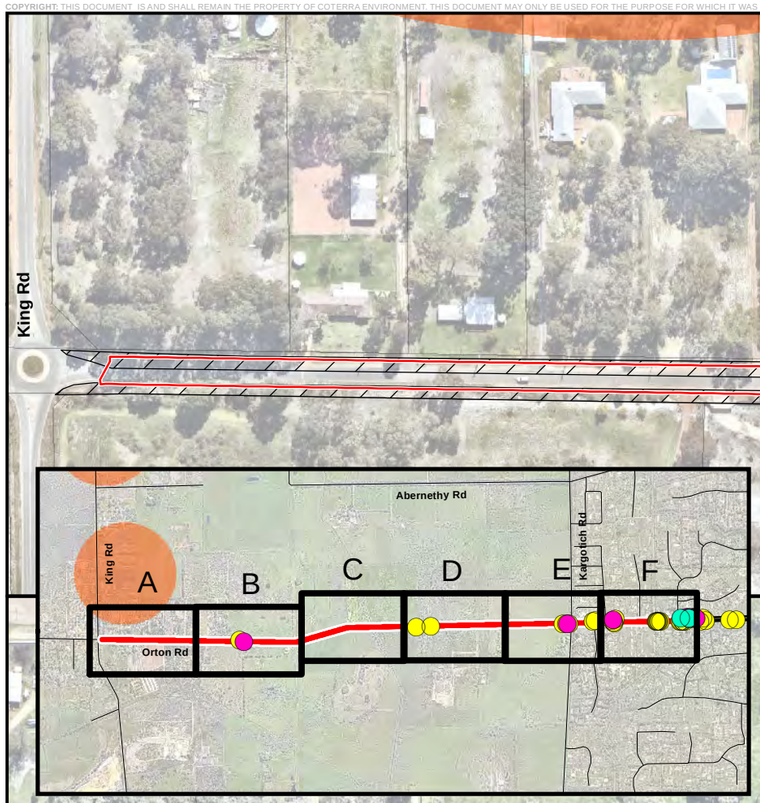
Shire of Serpentine Jarrahdale
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

VSA DISTRIBUTION

Figure 7b



A

King Rd

Orton Rd

B

Orton Rd

C

Orton Rd

LEGEND

- Project Area
- Survey Area
- Cadastre
- Carnany Cockatoo Confirmed Roosting Site
- Tree Located Inside Proposed Clearing Area

Tree Rank

- 1
- 2
- 3
- 4
- 5

N

0 12.5 25 50 75 100 m

Scale: 1:2,750 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Carnaby Roosting Sites - DBCA
Orthophoto - NearMaps, 30.08.23
Tree Ranking - Bamford Consulting

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Shire of Serpentine Jarrahdale
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

BLACK COCKATOO POTENTIAL BREEDING TREES

Figure 8a

C:\GIS\Jobs\CoTerra\SSJKRC01 - Orton Road, Shire of Serpentine\Figures_NVCP\SSJKRC01_NVCP_F06a Black Cockatoo Potential Breeding Trees_231010.mxd

D

E

F

Orton Rd

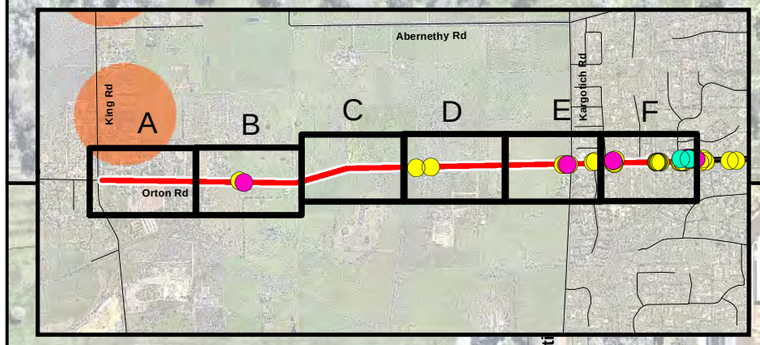
Florence Pl

Northerly L

Kowin Ct

Bullock Dr

Hopkinson Rd



LEGEND

- Project Area
- Survey Area
- Cadastre
- Carnany Cockatoo Confirmed Roosting Site
- Tree Located Inside Proposed Clearing Area

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0 12.5 25 50 75 100 m

Scale: 1:2,750 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Carnaby Roosting Sites - DBCA
Orthophoto - NearMaps, 30.08.23
Tree Ranking - Bamford Consulting

ENVIRONMAPS | t: 0406 590 606 | Environmental Mapping Solutions | www.environmaps.com.au

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Shire of Serpentine Jarrahdale
NATIVE VEGETATION CLEARING PERMIT
ORTON ROAD UPGRADES

BLACK COCKATOO POTENTIAL BREEDING TREES

Figure 8b

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Appendix 1 Bamford Consulting Ecologists (2023). *Black Cockatoo Assessment*: *Orton Road Byford.*

Appendix 2 Ecoedge (2023). Detailed and Targeted Flora and Vegetation Survey: Orton Road, Shire of Serpentine - Jarrahdale

Appendix 3 Desktop Assessment Results

Taxon	Common	Class	WA Status	EPBC Statu
Fauna				
Leioproctus douglasiellus	a short-tongued bee	INVERTEBRATE	EN	CR
Neopasiphae simplicior	a short-tongued bee	INVERTEBRATE	EN	CR
Botaurus poiciloptilus	Australasian bittern	BIRD	EN	EN
Calyptorhynchus baudinii	Baudin's cockatoo	BIRD	EN	EN
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	EN
Myrmecobius fasciatus	numbat, walpurti	MAMMAL	EN	EN
Calyptorhynchus sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	BIRD	EN	EN
Limosa limosa	black-tailed godwit	BIRD	MI	MI
Hydroprogne caspia	caspian tern	BIRD	MI	MI
Tringa nebularia	common greenshank	BIRD	MI	MI
Actitis hypoleucos	common sandpiper	BIRD	MI	MI
Calidris ferruginea	curlew sandpiper	BIRD	CR	MI
Apus pacificus	fork-tailed swift	BIRD	MI	MI
Plegadis falcinellus	glossy ibis	BIRD	MI	MI
Charadrius leschenaultii	greater sand plover, large sand plover	BIRD	VU	MI
Pluvialis squatarola	grey plover	BIRD	MI	MI
Calidris subminuta	long-toed stint	BIRD	MI	MI
Tringa stagnatilis	marsh sandpiper	BIRD	MI	MI
Pluvialis fulva	Pacific golden plover	BIRD	MI	MI
Calidris melanotos	pectoral sandpiper	BIRD	MI	MI
Calidris ruficollis	red-necked stint	BIRD	MI	MI
Arenaria interpres	ruddy turnstone	BIRD	MI	MI
Calidris acuminata	sharp-tailed sandpiper	BIRD	MI	MI
Tringa glareola	wood sandpiper	BIRD	MI	MI
Westralunio carteri	Carter's freshwater mussel	INVERTEBRATE	VU	VU
Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	VU
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	BIRD	VU	VU
Leipoa ocellata	malleefowl	BIRD	VU	VU

Taxon	Common	Class	WA Status	EPBC Statu
Setonix brachyurus	quokka	MAMMAL	VU	VU
Leioproctus contrarius	a short-tongued bee	INVERTEBRATE	P3	
Neelaps calonotos	black-striped snake, black-striped burrowing snake	REPTILE	P3	
Oxyura australis	blue-billed duck	BIRD	P4	
Synemon gratiosa	graceful sunmoth	INVERTEBRATE	P4	
Euoplos inornatus	inornate trapdoor spider (northern Jarrah Forest)	INVERTEBRATE	P3	
Falco peregrinus	peregrine falcon	BIRD	OS	
Lerista lineata	Perth slider, lined skink	REPTILE	P3	
Isoodon fusciventer	quenda, southwestern brown bandicoot	MAMMAL	P4	
Acanthophis antarcticus	southern death adder	REPTILE	P3	
Phascogale tapoatafa wambenger	south-western brush-tailed phascogale, wambenger	MAMMAL	CD	
Idiosoma sigillatum	Swan Coastal Plain shield-backed trapdoor spider	INVERTEBRATE	P3	
Notamacropus eugenii derbianus	tammar wallaby	MAMMAL	P4	
Hydromys chrysogaster	water-rat, rakali	MAMMAL	P4	
Notamacropus irma	western brush wallaby	MAMMAL	P4	
Falsistrellus mackenziei	western false pipistrelle, western falsistrelle	MAMMAL	P4	
Flora				
Caladenia huegelii		PLANT	CR	
Drakaea elastica		PLANT	CR	
Eucalyptus x balanites		PLANT	CR	
Synaphea sp. Serpentine (G.R. Brand 103)		PLANT	CR	
Thelymitra magnifica		PLANT	CR	
Diuris purdiei		PLANT	EN	
Drakaea micrantha		PLANT	EN	
Lepidosperma rostratum		PLANT	EN	
Synaphea sp. Pinjarra Plain (A.S. George 17182)		PLANT	EN	
Thelymitra stellata		PLANT	EN	
Grevillea curviloba		PLANT	EN	

Taxon	Common	Class	WA Status	EPBC Statu
Diuris micrantha		PLANT	VU	
Morelotia australiensis		PLANT	VU	
Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)		PLANT		
Drosera oreopodion		PLANT		
Boronia juncea subsp. juncea		PLANT		
Calytrix simplex subsp. simplex		PLANT		
Ptilotus sericostachyus subsp. roseus		PLANT		
Johnsonia pubescens subsp. cygnorum		PLANT		
Millotia tenuifolia var. laevis		PLANT		
Thelymitra variegata		PLANT		
Amanita wadulawitu		PLANT		
Calectasia grandiflora		PLANT		
Netrostylis sp. Chandala (G.J. Keighery 17055)		PLANT		
Poranthera moorokatta		PLANT		
Babingtonia urbana		PLANT		
Cyathochaeta teretifolia		PLANT		
Dillwynia dillwynioides		PLANT		
Pithocarpa corymbulosa		PLANT		
Schoenus pennisetis		PLANT		
Acacia horridula		PLANT		
Amanita carneiphylla		PLANT		
Amanita fibrillopes		PLANT		
Amanita preissii		PLANT		
Amanita wadjukiorum		PLANT		
Angianthus drummondii		PLANT		
Banksia kippistiana var. paenepeccata		PLANT		
Dampiera triloba		PLANT		
Jacksonia gracillima		PLANT		
Meionectes tenuifolia		PLANT		
Schoenus capillifolius		PLANT		
Schoenus sp. Waroona (G.J. Keighery 12235)		PLANT		
Stylidium aceratum		PLANT		
Stylidium paludicola		PLANT		
Aponogeton hexatepalus		PLANT		
Dodonaea hackettiana		PLANT		
Drosera occidentalis		PLANT		
Ornduffia submersa		PLANT		
Stylidium longitubum		PLANT		
Tripterococcus sp. Brachylobus (A.S. George 14234)		PLANT		
Verticordia lindleyi subsp. lindleyi		PLANT		

Taxon	Common	Class	WA Status	EPBC Statu
Acacia oncinophylla subsp. patulifolia		PLANT		
Kennedia beckxiana		PLANT		
Stylidium ireneae		PLANT		