

Document Reference: EP21-041(04)—0010 TAA

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21 October 2022

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Dear [REDACTED]

FLORA, VEGETATION AND FAUNA ASSESSMENT – LOT 1499 STIRLING CRESCENT, HAZELMERE

This letter provides a summary of flora, vegetation and fauna values within Lot 1499 Stirling Crescent in Hazelmere (referred to hereafter as the 'site').

1 INTRODUCTION

The site is approximately 4.3 hectares (ha) in size and is located approximately 14 kilometres east of the Perth Central Business District within the City of Kalamunda, as shown in **Figure 1**.

No environmental assessments are known to have previously been prepared for the site. Therefore, Hesperia engaged Emurge to undertake an assessment of the flora, vegetation and fauna values within the site.

2 FIELD SURVEY

An ecologist from Emurge visited the site on 31 August 2022 to conduct the flora, vegetation and fauna field survey. During the surveys the site was traversed on foot and the composition of vegetation was recorded. Vegetation condition was mapped using the Keighery (1994) scale.

Habitat values for conservation significant flora species and plant communities and fauna species was assessed, with particular attention to vegetation that may provide habitat for threatened species of black cockatoo (DCCEEW 2022)¹.

Following the survey, a list of native species and a limited selection of the non-native species recorded was compiled. Plant communities, vegetation condition and black cockatoo habitat was mapped across the site.

¹ *Zanda latirostris* (Carnaby's cockatoo), *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) and *Zanda baudinii* (Baudin's cockatoo).

3 RESULTS

3.1 General

Review of historical aerial imagery indicates that approximately half of the site was cleared of native vegetation prior to 1953 and almost all native vegetation was cleared by 1965 (WALIA 2022). Successive episodes of regrowth and re-clearing appear to have occurred from that period until present. Scattered native trees and understorey plants now occur across the central and western portions of the site, in conjunction with a variety of non-native trees, shrubs and understorey plants. Non-native trees, shrubs and understorey plants dominate the remainder of the site.

3.2 Flora

A total of 45 flora taxa were recorded within the site comprising 15 native and 30 non-native species. A species list is provided as **Attachment 1**.

No threatened or priority flora were recorded in the site and none are considered likely to occur due to a lack of suitable habitat.

Two of the non-native species recorded are listed as a declared pest (C3) pursuant to the *Biosecurity and Agriculture Management Act 2007*:

- **Moraea flaccida* (one-leaf cape tulip)
- **Zantedeschia aethiopica* (arum lily)².

Notable non-native shrubs within the site include **Leptospermum laevigatum* (Victorian tea-tree), *Schinus terebinthifolius* (Brazilian pepper) and **Cytisus proliferus* (tree lucerne).

3.3 Vegetation

Three plant communities were identified within the site:

- **EB**
- **As**
- **Non-native.**

A description and the area of each plant community is provided in **Table 1** and representative photos of each community are provided in **Plate 1** to **Plate 2**. The location of each plant community is shown in **Figure 1**.

Table 1: Description and extent of plant communities identified within the site

Plant community	Description	Area (ha)
EB	Open woodland of <i>Eucalyptus marginata</i> , <i>E. todtiana</i> over <i>Banksia attenuata</i> , <i>B. illicifolia</i> and <i>B. menziesii</i> or <i>*Leptospermum laevigatum</i> and <i>*Schinus terebinthifolius</i> over low open shrubland of <i>Scholtzia involucreta</i> over sedgeland <i>Lyginia barbata</i> or (most commonly) low open to closed grassland and forbland of predominately non-native species (Plate 1)	0.98
As	Very open tall shrubland of <i>Acacia saligna</i> over low closed grassland and forbland of non-native species.	0.02
Non-native	Low open to closed grassland and forbland of predominately non-native species or tall shrubland of <i>*Leptospermum laevigatum</i> <i>*Cytisus proliferus</i> over low open grassland and forbland of predominately non-native species.	3.26

² Asterisk ‘*’ denotes species not native / introduced to site



Plate 1: Plant community EB in 'degraded' condition



Plate 2: Plant community As in 'degrade to competently degraded' condition



Plate 3: **Non-native** in 'completely degraded' condition

Plant community **EB** comprises a canopy layer of native trees over non-native understorey and was mapped as being in 'degraded' and 'degraded to completely degraded' condition according to the Keighery (1994) scale. Plant community **As** comprises scattered native shrub small trees of *Acacia saligna* over non-native understorey and was mapped as being in 'degraded to completely degraded'. The **non-native** plant community was mapped as being in 'completely degraded' condition as it is highly disturbed and comprised of predominately non-native species. The extent of vegetation by condition category is shown in **Figure 2**.

Being degraded floristic analysis was not undertaken to classify the vegetation to a local floristic community type (FCT). However, the **EB** plant community is inferred to most likely be a remnant of FCT 23a ((Gibson *et al.* 1994; Keighery *et al.* 2012). The **As** plant community is not representative of any floristic community type.

No threatened or priority ecological communities occur within the site and none are considered likely to occur due to historical disturbance³.

3.4 Fauna Habitat

The fauna habitat values within the site have been compromised by the removal of native vegetation and historical land use. The site provides habitat that would be of low value to native ground dwelling species due to lack of remnant native understory vegetation. However, native and non-native trees within the site provide woodland type habitat that is likely to primarily be utilised by widespread and common bird species.

No black cockatoo breeding habitat was recorded in the site. There are no trees with hollows in the site and so no 'suitable nesting trees'⁴. A number of *Eucalypt tottiana* were observed that have diameter at breast height (DBH) greater than 500 mm. These trees tended to be relatively low in

³ Specifically, the vegetation is not representative of the 'banksia woodlands of the Swan Coastal Plain' threatened ecological community (TEC) or priority ecological community (PEC) or any other TEC or PEC.

⁴ 'Suitable nesting trees' are defined by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2022, Referral guideline for 3 WA threatened black cockatoo species. as, as "trees with suitable nesting hollows present, although no evidence of use. DCCEEW (2022) notes that any species of tree may develop suitable hollows for breeding".

height (approx. 5-10m) and typically had a bifurcated and / or low branching structure. Due to the structure these trees are considered unlikely to ever support a suitable hollow and so they were not recorded as 'potential nesting trees'⁵.

Native and non-native trees and shrubs within the site provide a foraging resource for black cockatoos. Native foraging habitat predominantly comprises banksia and eucalypt trees. Non-native (exotic) foraging habitat predominantly comprises **Melia azedarach* and **Pinus* sp. trees. No evidence of foraging by black cockatoos was detected during the survey. Approximately 0.90 ha of native foraging habitat and 0.01 ha of exotic foraging habitat occurs in the site as shown in **Figure 3**.

Summary and closing

The site contains limited flora and vegetation and fauna habitat values as follows:

- The majority of the site has been historically cleared.
- Two native plant communities **EB** and **As** are present within the site in 'degraded' or 'degraded to completely degraded' condition.
- The remainder of the site supports **non-native** vegetation in 'completely degraded' condition.
- Native trees in the site provide habitat that is primarily suitable for common and widespread native fauna species and particular birds.
- Trees in the site provide a foraging resource for threatened species of black cockatoo comprising approximately 0.90 ha of native foraging habitat and 0.01 ha of non-native (exotic) foraging habitat.
- No other threatened or priority fauna species are considered likely to occur due to lack of suitable habitat.

We trust that this letter provides a sufficient summary of the flora, vegetation and fauna habitat values within the site. Should you have any questions regarding the content of this report, please do not hesitate to contact the undersigned.

Yours sincerely
Emerge Associates




PRINCIPAL ENVIRONMENTAL CONSULTANT

Encl: Figure 1: Plant Communities
Figure 2: Vegetation Condition
Figure 3: Black Cockatoo Foraging Habitat
Attachment 1 – Flora Species List

⁵ 'Potential nesting trees' for black cockatoos are defined by DCCEEW (2022) as trees that "have a suitable diameter at breast height (DBH) to develop a nest hollow, but do not have hollows. For most species of trees, suitable nest hollows are only found in live trees with a DBH of at least 500 mm. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH".

General References

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2022, *Referral guideline for 3 WA threatened black cockatoo species*.

Department of Sustainability Environment Water Populations and Communities (DSEWPaC) 2012, *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii* and Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso**, Commonwealth of Australia, Canberra.

Gibson, N., Keighery, B., Keighery, G., Burbidge, A. and Lyons, M. 1994, *A Floristic survey of the southern Swan Coastal Plain*, Department of Conservation and Land Management and the Conservation Council of Western Australia, Perth.

Keighery, B. 1994, *Bushland Plant Survey: A guide to plant community survey for the community*, Wildflower Society of WA (Inc), Nedlands.

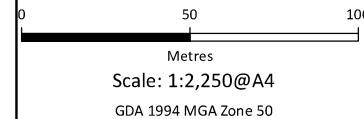
Keighery, B. J., Keighery, G. J., Longman, V. M. and Clarke, K. A. 2012, *Weed and Native Flora Data for the Swan Coastal Plain*, Departments of Environmental Protection and Conservation and Land Management, Western Australia.

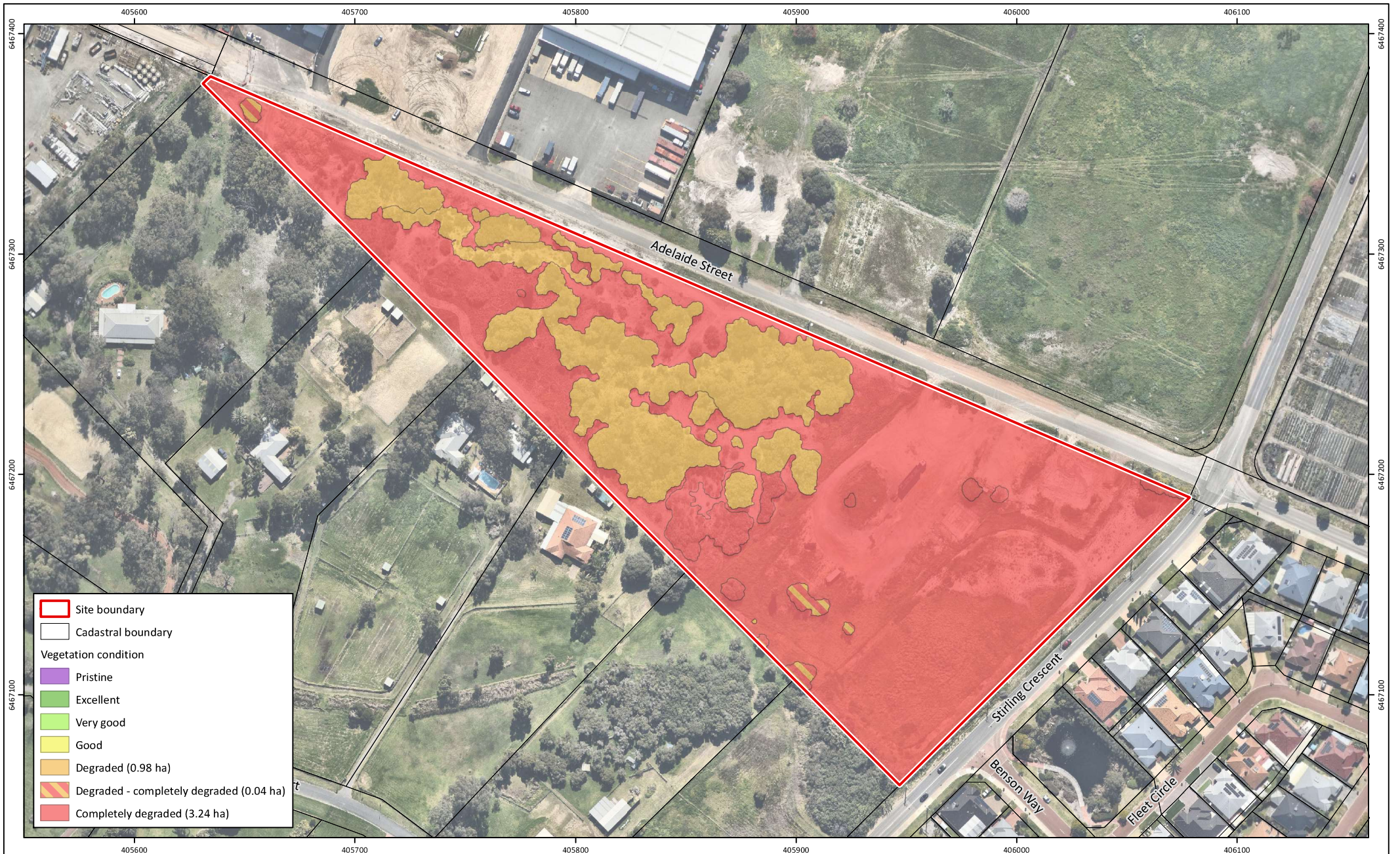


Figure 1: Plant Communities

Project: Due Diligence
 Lot 1499 Stirling Crescent, Hazelmere
Client: Client

Plan Number:
 EP21-041(04)-F06a
Drawn: GAR
Date: 20/10/2022
Checked: TAA
Approved: TAA
Date: 20/10/2022



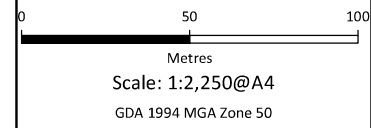


Project: Due Diligence
 Lot 1499 Stirling Crescent, Hazelmere

Client: Client

Plan Number:
 EP21-041(04)--F07

Drawn: GAR
 Date: 14/09/2022
 Checked: TAA
 Approved: TAA
 Date: 15/09/2022



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Figure 3: Black Cockatoo Foraging Habitat

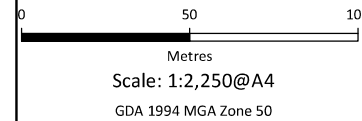
Project: Due Diligence
 Lot 1499 Stirling Crescent, Hazelmere

Client: Client

Plan Number:
 EP21-041(04)--F08

Drawn: GAR
 Date: 14/09/2022

Checked: TAA
 Approved: TAA
 Date: 15/09/2022



Status	Species
	<i>Acacia saligna</i>
	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>
*	<i>Arctotheca calendula</i>
*	<i>Avena barbata</i>
	<i>Banksia attenuata</i>
	<i>Banksia grandis</i>
	<i>Banksia ilicifolia</i>
	<i>Banksia menziesii</i>
*	<i>Brassicaceae</i> sp.
*	<i>Briza maxima</i>
*	<i>Bromus diandrus</i>
	<i>Conostylis ?aculeata</i>
*	<i>Cytisus proliferus</i>
	<i>Desmocladius flexuosa</i>
*	<i>Ehrharta calycina</i>
*	<i>Ehrharta longiflora</i>
*	<i>Eragrostis curvula</i>
*	<i>Erodium ?botrys</i>
*	<i>Eucalyptus ?camaldulensis</i>
	<i>Eucalyptus marginata</i> subsp. <i>marginata</i>
	<i>Eucalyptus todtiana</i>
*	<i>Euphorbia terracina</i>
*	<i>Freesia alba</i> × <i>leichtlinii</i>
*	<i>Fumaria capreolata</i>
*	<i>Gladiolus caryophyllaceus</i>
*	<i>Hypochaeris glabra</i>
	<i>Hypolaena exsulca</i>
*	<i>Leptospermum laevigatum</i>
*	<i>Lupinus ?angustifolius</i>
	<i>Lyginia barbata</i>
	<i>Melaleuca ?seriata</i>
*	<i>Melia azedarach</i>
*	<i>Moraea flaccida</i>
	<i>Nuytsia floribunda</i>
*	<i>Oxalis pes-caprae</i>
*	<i>Pelargonium capitatum</i>
*	<i>Pinus</i> sp.
*	<i>Romulea rosea</i>
*	<i>Schinus terebinthifolius</i>
	<i>Scholtzia involucrata</i>
*	<i>Sonchus oleraceus</i>
*	<i>Trifolium</i> sp.
*	<i>Ursinia anthemoides</i>
*	<i>Washingtonia filifera</i>
*	<i>Zantedeschia aethiopica</i>