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Aquinas College Boatshed Upgrade

Native Vegetation Clearing Permit Supporting Document

Prepared for
Aquinas
by Strategen

July 2019

Aquinas College Boatshed Upgrade

Native Vegetation Clearing Permit Supporting Document

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July 2019

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Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
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1. Introduction

1.1 Purpose and scope

This document provides supporting information for a Native Vegetation Clearing Permit (NVCP) application for an area permit to clear native vegetation along a section of 58 Mount Henry Rd, Salter Point in the City of South Perth (the City).

Aquinas College is proposing to undertake clearing of a maximum of 0.1 ha of native vegetation as part of the upgrade to the existing boatshed (the Project).

This document has been prepared to support the NVCP application for the Project, for assessment under s51E of the *Environmental Protection Act 1986* (EP Act), and includes the following information relating to clearing impacts:

- an overview of the existing environmental conditions of the Project Area
- an evaluation of the proposed clearing against the '10 Clearing Principles' listed under Schedule 5 of the EP Act
- environmental approvals and management requirements.

1.2 Project background and description

Aquinas College are proposing to replace their existing boat shed complex at 58 Mount Henry Rd, Salter Point (the project area) in the City of South Perth. The proposed development will involve the construction of a new boat shed along with improvements to existing vehicular access infrastructure.

The project will involve the following components (Figure 1):

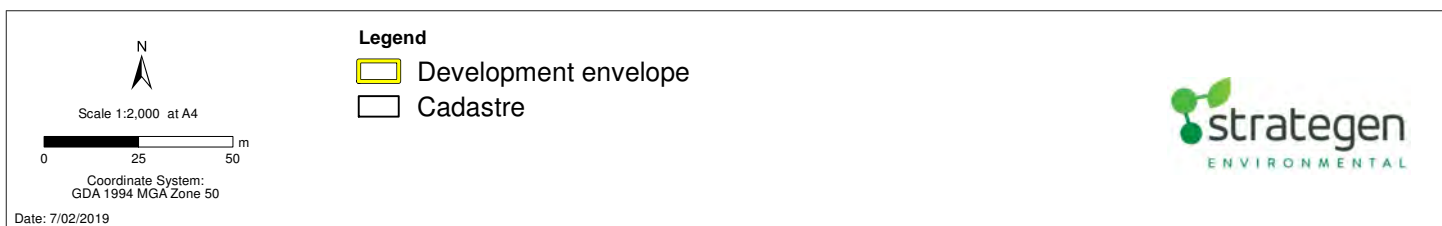
- boat storage area
- exercise and storage area, and
- ablution area.

1.3 Clearing footprint

The project will require clearing no more than 0.2 ha of native vegetation, representing the Bassendean Complex – Central and South. Native vegetation within the Project Area ranges from Very good to Completely Degraded.



Figure 1: Site location



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2. Overview of existing environment

2.1 Geomorphology and topography

Regional geological mapping (DAFWA 2012) indicates that the Project Area is within the Spearwood dune system, underlain by Tamala limestone. The Spearwood dune system is typified by slightly calcareous aeolian sands. Sub-systems of the Spearwood dune system mapped within the Project Area are described below in Table 1.

Table 1 : Soil sub-systems mapped within the Project Area (Source: DAFWA 2012)

Sub-system	Description
Spearwood S7 Phase (211Sp_S7)	Sand – pale and olive yellow, medium to coarse-grained, sub-angular to sub-rounded quartz, trace of feldspar, moderately sorted, of residual origin.
Spearwood LS1 Phase (211Sp_LS1)	Limestone – light, yellowish brown, fine to coarse-grained, sub-angular to well rounded, quartz, trace of feldspar, shell debris, variably lithified, surface kankar, or eolian origin. Minor heavy minerals.

Topography of the Project Area ranges from a maximum 8 m on the Australian Height Datum (AHD) to 2m AHD in a north to south direction.

2.2 Acid sulfate soil

Acid sulfate soil (ASS) risk mapping conducted by the Department of Water and Environmental Regulation (DWER) identifies that there is no known risk of disturbing potentially acid-forming material less than 3 m from the ground surface within the Project Area (DWER 2016).

2.3 Hydrology

2.3.1 Groundwater

The Project Area is situated within the Perth groundwater area and is underlain by three aquifers, listed below in descending order of depth from the natural surface:

- Superficial Swan
- Leederville (Confined)
- Yarragadee North (Confined)

Regional historical maximum groundwater contour mapping indicates that the groundwater level may reach approximately 1 m AHD (DWER n.d.). Based on regional topographic contour mapping, the depth to groundwater is approximately 6.5 m below the ground surface.

The Project Area is not situated within a Public Drinking Water Source Area.

2.3.2 Surface water and wetlands

Wetlands of the Swan Coastal Plain are afforded varying degrees of protection and management based upon the management category to which they have been assigned. These management categories and their management objectives are listed in Table 2.

No geomorphic wetlands are mapped within the Project Area. Canning River is mapped as a 'Conservation' category wetland (CCW) (DBCA 2015) and is situated immediately to the south of the Project Area.

Table 2 : Wetland management categories and management objectives

Management category	Management objective
Conservation category wetlands (CCWs)	To preserve wetland (natural) attributes and functions. No development or clearing is considered appropriate.
Resource Enhancement wetlands (REWs)	To restore wetlands through maintenance and enhancement of wetland functions and attributes. Protection is recommended.
Multiple Use wetlands (MUWs)	To use, develop and manage wetlands in the context of water, town and environmental planning. Use, development and management should be considered in the context of ecologically sustainable development and best practice management practices.

2.4 Vegetation and flora

2.4.1 Vegetation system associations and vegetation complexes

Vegetation mapping produced by JS Beard provides state-wide, broad scale, native vegetation mapping at a scale of 1:1 000 000, depicting vegetation type and extent as it may have occurred at the time of European settlement (i.e. pre-European). Vegetation types are classified according to their association, which is determined by the dominant growth form, height, cover and species for the upper, mid and ground vegetation strata. This dataset formed the basis of several regional mapping systems, including the biogeographical region dataset (Interim Biogeographic Regionalisation for Australia) for Western Australia (DEE 2017), physiographic regions defined by Beard (1981), and System 6 Vegetation Complex mapping undertaken by Heddle et al. (1980).

The Project Area comprises one Beard (1981) vegetation association (Table 3). Remnant vegetation within the Project Area is mapped as vegetation association 6 (VA 6) which is described as Medium woodland; tuart and jarrah, of which 23.61% remains within the Swan Coastal Plain IBRA region.

Table 3 : Beard vegetation associations occurring within the Project Area (Source: Beard 1981; GoWA 2018a)

Pre-European Vegetation association in	Pre-European (ha)	Current extent (ha)	% Remaining of pre-European extent
IBRA Region Vegetation Association No. 6 in the Swan Coastal Plain IBRA region	56,343.01	13,304.11	23.61
Local Government Authority Vegetation Association No. 6 in the City of South Perth	1,397.18	29.54	2.11

2.4.2 Conservation significant flora

A desktop assessment was conducted using the EPBC Protected Matters Search Tool (PMST) and NatureMap database to identify conservation significant, threatened and priority flora with potential to occur within a 5km radius of the Project Area (Table 4; Appendix 1 and 2).

Table 4 : Conservation significant and priority flora with potential to occur within a 5km radius of the Project Area

Species	Common name	Commonwealth conservation status (EPBC Act)	State conservation status (BC Act)
<i>Acacia horridula</i>	-	Not listed	Priority 3
<i>Angianthus micropodioides</i>	-	Not listed	Priority 3
<i>Andersonia gracilis</i>	Slender Andersonia	Endangered	Threatened – Rare or likely to become extinct
<i>Caladenia huegelii</i>	Grand Spider Orchid	Endangered	Threatened – Rare or likely to become extinct
<i>Cyathochaeta teretifolia</i>	-	Not listed	Priority 3
<i>Dillwynia dillwynioides</i>	-	Not listed	Priority 3
<i>Diuris micrantha</i>	Dwarf Bee-orchid	Vulnerable	Threatened – Rare or likely to become extinct
<i>Diuris purdiei</i>	Purdie's Donkey-orchid	Endangered	Threatened – Rare or likely to become extinct
<i>Drakaea elastica</i>	Glossy-leafed Hammer Orchid	Endangered	Threatened – Rare or likely to become extinct
<i>Drakaea micrantha</i>	Dwarf Hammer-orchid	Vulnerable	Threatened – Rare or likely to become extinct
<i>Dodonaea hackettiana</i>	Hackett's Hopbush	Not listed	Priority 4
<i>Eremophila glabra</i> subsp. <i>chlorella</i>	-	Endangered	Threatened – Rare or likely to become extinct
<i>Haloragis scoparia</i>	-	Not listed	Priority 1
<i>Hibbertia spicata</i> subsp. <i>leptotheca</i>	-	Not listed	Priority 3
<i>Hydrocotyle lemnooides</i>	Aquatic Pennywort	Not listed	Priority 4
<i>Hydrocotyle striata</i>	-	Not listed	Priority 1
<i>Jacksonia sericea</i>	Waldjumi	Not listed	Priority 4
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>	-	Not listed	Priority 2
<i>Lepidosperma rostratum</i>	Beaked Lepidosperma	Endangered	Threatened – Rare or likely to become extinct
<i>Macarthuria keigheryi</i>	Keighery's Macarthuria	Endangered	Threatened – Rare or likely to become extinct
<i>Stylidium paludicola</i>	-	Not listed	Priority 3
<i>Styphelia filifolia</i>	-	Not listed	Priority 3
<i>Synaphea</i> sp. Fairbridge Farm (D. Papenfus 696)	Selena's Synaphea	Critically Endangered	Threatened – Rare or likely to become extinct
<i>Thelymitra dedmaniarum</i>	Cinnamon Sun Orchid	Endangered	Threatened – Rare or likely to become extinct
<i>Thelymitra stellata</i>	Star Sun-orchid	Endangered	Threatened – Rare or likely to become extinct
<i>Thelymitra variegata</i>	Queen of Sheba	Not listed	Priority 2
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	-	Not listed	Priority 4

2.4.3 Conservation significant vegetation

Threatened and Priority Ecological Communities

A search of the EPBC PMST with a 5km search buffer returned two Threatened Ecological Communities (TECs) listed as 'Endangered' and 'Vulnerable' respectively, namely the 'Banksia Woodlands of the Swan Coastal Plain' and 'Subtropical and Temperate Coastal Saltmarsh'.

Environmentally Sensitive Areas

The Project Area is located within an Environmentally Sensitive Area (ESA) due to its proximity to the Canning River.

Bush Forever

Bush Forever is a 10-year strategic plan that aims to protect and retain at least 10% of each of the original 26 vegetation complexes that have been identified on the Swan Coastal Plain. Bush Forever sites are the specific localities that have been recognised as containing regionally significant vegetation and are endorsed for protection and retention under Bush Forever.

Bush Forever site 227 (BF 227) comprises 11.9 ha of bushland within Mount Henry Bushland, Salter Point, and intersects the southern portion of the Project Area. This portion is cleared and consists of lawn and concrete boat ramp with no native vegetation present. Floristic Community Types (FCTs) that have been identified within BF 227 include:

- Woodlands and shrublands on Holocene dunes

A further three FCTs are inferred to be present within BF 227, including:

- Highly saline seasonal wetlands
- Northern woodlands to forests over tall sedgeland alongside permanent wetlands
- Spearwood *Banksia attenuata* or *B. attenuata* – *Eucalyptus* woodlands.

2.4.4 On-site vegetation

A vegetation and flora survey was conducted over an area of 0.78 ha within the Project Area by a Senior Botanist from Strategen on 6 December 2018 (appendix 1), which involved:

- determining Vegetation Types (VTs) and condition
- determining the potential presence of conservation significant flora species
- determining the potential presence of Threatened Ecological Communities/Priority Ecological Communities.

Vegetation types and condition

The field survey identified two native VTs within the survey area, as described in Table 5 and shown in Figure 2. The survey area shows signs of having been degraded over a long period of time as a result of clearing for roads, buildings and managed grass areas. Native vegetation within the survey area has been impacted by weed species and historical clearing. Vegetation condition within the survey area ranged from 'Very Good' to 'Completely Degraded' (Keighery 1994), being predominantly 'Completely Degraded' as shown in Table 6 and Figure 3.

Table 5 : Vegetation types identified within the survey area and area of coverage

Vegetation Type	Description	Area (ha) within project/survey area	% of survey area
VT 1	<i>Agonis flexuosa</i> low forest over <i>Jacksonia furcellata</i> open shrubland over <i>Cenchrus clandestinus</i> , <i>Bromus diandrus</i> and <i>Briza maxima</i> grassland.	0.11	13.81
VT 2	<i>Banksia menziesii</i> , <i>Allocasuarina fraseriana</i> and <i>Eucalyptus marginata</i> low woodland over <i>Kunzea glabrescens</i> , <i>Hakea prostrata</i> and <i>Xanthorrhoea preissii</i> shrubland over <i>Hibbertia hypericoides</i> , <i>Acacia alata</i> var. <i>alata</i> and <i>Dasypogon bromeliifolius</i> low shrubland/ herbland.	0.17	22.06
P	Planted.	0.09	11.35
C	Cleared areas – including managed grassland, infrastructure and bare ground.	0.41	52.77
Total		0.78	100

Table 6 : Area (ha) covered by each vegetation condition category within the survey area

Vegetation Condition	Area (ha)	Percentage of the survey area
Very Good	0.13	17.29
Good	0.05	6.19
Degraded	0.04	4.77
Completely Degraded	0.35	44.65
N/A - Not vegetated	0.21	27.10
Total	0.78	100

Flora

A total of 22 native vascular plant taxa from 20 plant genera and 13 plant families were recorded during the field survey (Table 7). A relatively low number of plant genera were recorded during the survey, which is likely to be reflective of the disturbed nature of the survey area. The majority of taxa recorded were from the Myrtaceae (5 taxa) and Fabaceae (3 taxa) families.

Table 7 : Native vascular taxa collected within the survey area

Family	Taxa
Casuarinaceae	<i>Allocasuarina fraseriana</i>
Colchicaceae	<i>Burchardia congesta</i>
Cyperaceae	<i>Cyathochaeta avenacea</i>
	<i>Lepidosperma</i> sp.
Dasypogonaceae	<i>Dasypogon bromeliifolius</i>
Dilleniaceae	<i>Hibbertia hypericoides</i>
Fabaceae	<i>Acacia alata</i> var. <i>alata</i>
	<i>Hovea trisperma</i> var. <i>trisperma</i>
	<i>Jacksonia furcellata</i>
Hemerocallidaceae	<i>Dianella revoluta</i> var. <i>divaricata</i>
Juncaceae	<i>Juncus pallidus</i>
Myrtaceae	<i>Agonis flexuosa</i>
	<i>Corymbia calophylla</i>
	<i>Eucalyptus camaldulensis</i>
	<i>Eucalyptus gomphocephala</i>

Family	Taxa
	<i>Eucalyptus marginata subsp. marginata</i>
Myrtaceae	<i>Kunzea glabrescens</i>
Proteaceae	<i>Banksia menziesii</i>
	<i>Hakea prostrata</i>
Restionaceae	<i>Alexgeorgea nitens</i>
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>
Zamiaceae	<i>Macrozamia riedlei</i>

No conservation significant flora species pursuant to Section 178 of the EPBC Act or Section 19(1) of the BC Act were recorded during the field survey. No priority flora species as listed by the Western Australian Herbarium (1998-) were recorded during the field survey. Apart from *Caladenia huegelii*, the timing of the field survey was optimal for identification of all conservation significant species identified in the desktop assessment as having potential to occur within the Project Area. The survey was conducted outside of the flowering period for *Caladenia huegelii*, and as such, its presence within the survey area cannot be conclusively confirmed.

No Declared Pest species pursuant to Section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act) were identified during the field survey.

Threatened Ecological Communities/Priority Ecological Communities

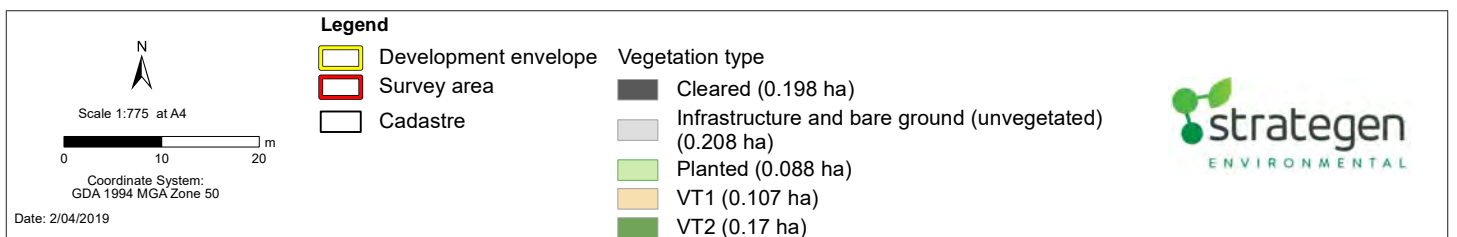
Site observations and quadrat data collected during the field survey indicated that one TEC is potential by vegetation type within the survey area. This is *Banksia Woodlands of the Swan Coastal Plain* TEC, potentially represented by VT2.

This vegetation type was not found to meet the diagnostic criteria provided in the approved conservation advice for the *Banksia Woodlands of the Swan Coastal Plain* TEC, based on insufficient coverage according to vegetation condition. VT2 was considered to be in 'Very Good' condition, although did not meet the minimum patch size of 1 ha as per the key diagnostic criteria (TSSC 2016), even when considering continuity with the same VT outside of the Project Area.

No other occurrence of TECs or PECs was recorded during the field survey.



Figure 2: Vegetation type



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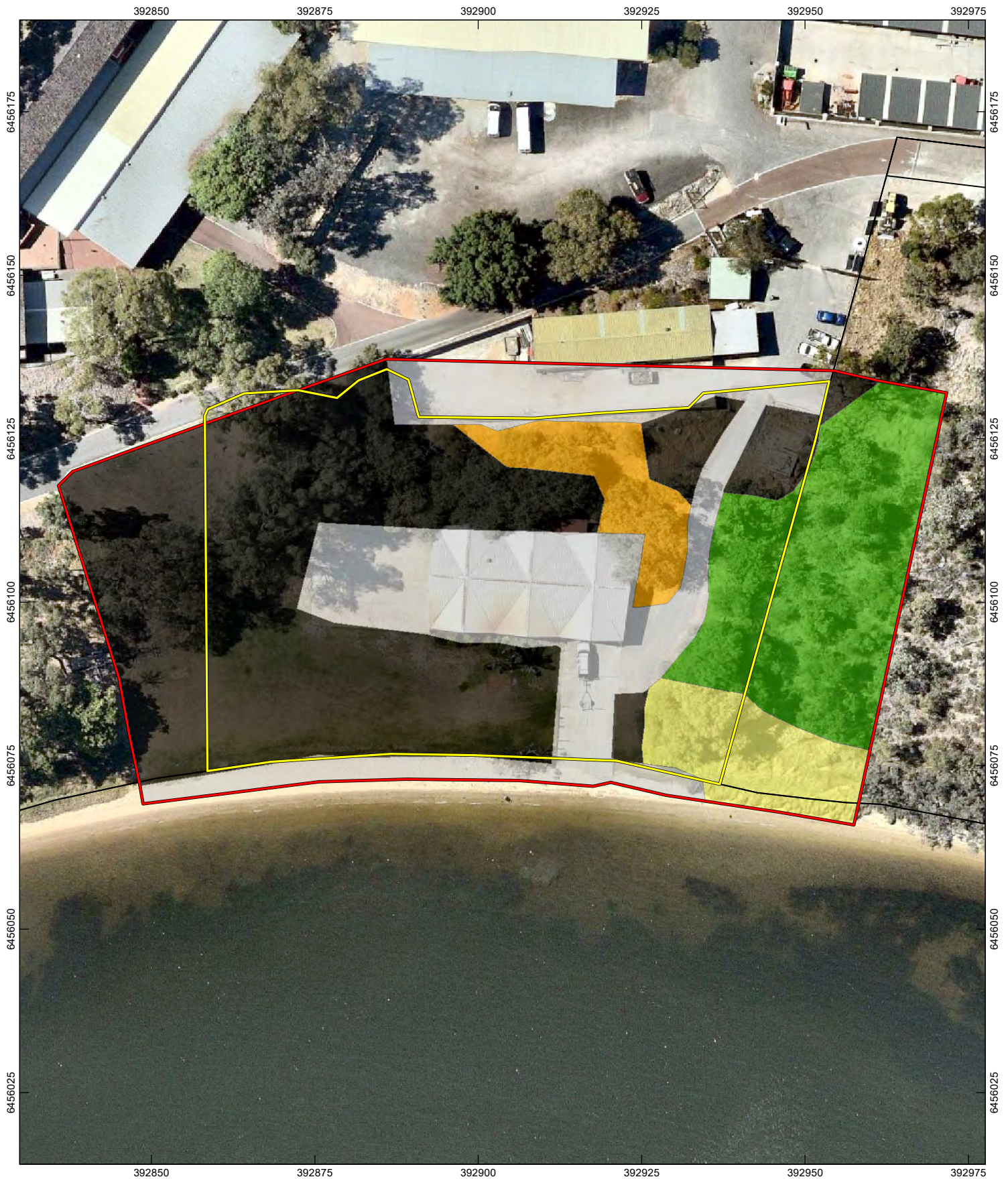
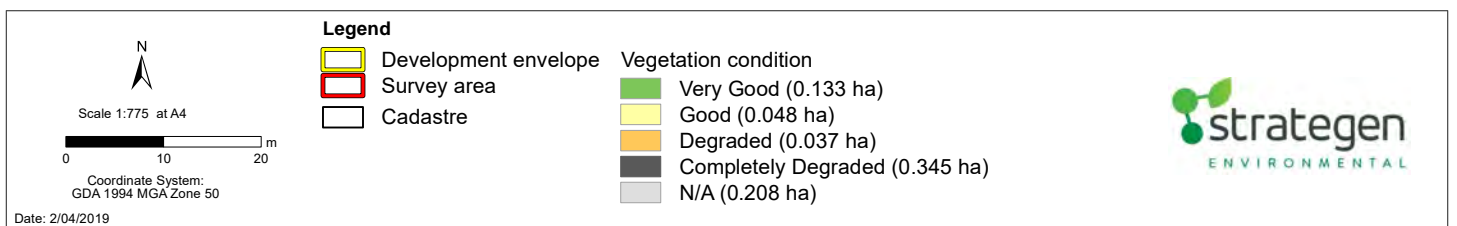


Figure 3: Vegetation condition



2.5 Fauna and habitat

2.5.1 Conservation significant fauna

A desktop assessment was conducted using the EPBC Protected Matters Search Tool (PMST) and NatureMap database to identify conservation significant, threatened and priority fauna with potential to occur within a 5km radius of the Project Area (Table 8; Appendix 1 and 2).

A number of migratory species were returned from the desktop assessment. Given the terrestrial setting of the proposed action, these species will not be adversely impacted by the action, and have been omitted from further discussion within this report.

Based upon the available habitat, the below conservation significant species are considered likely to occur within the Project Area:

- Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*)
- Carnaby's Black Cockatoo (CBC) (*Calyptorhynchus latirostris*).

Table 8 : Conservation significant and priority fauna with potential to occur within a 5km radius of the Project Area

Species	Common name	Commonwealth conservation status (EPBC Act)	State conservation status (BC Act)
<i>Actitis hypoleucos</i>	Common Sandpiper		Protected under international agreement
<i>Anous tenuirostris melanops</i>	Australian Lesser Noddy	Vulnerable	Threatened – Rare or likely to become extinct
<i>Arenaria interpres</i>	Ruddy Turnstone		Protected under international agreement
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	Threatened – Rare or likely to become extinct
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper		Protected under international agreement
<i>Calidris canutus</i>	Red Knot, Knot	Endangered	Protected under international agreement
<i>Calidris ferruginea</i>	Curler Sandpiper	Critically Endangered	Threatened – Rare or likely to become extinct
<i>Calidris ruficollis</i>	Red-necked Stint		Protected under international agreement
<i>Calidris subminuta</i>	Long-toed Stint		Protected under international agreement
<i>Calidris tenuirostris</i>	Great Knot	Critically Endangered	Threatened – Rare or likely to become extinct
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo, Karrak	Vulnerable	Threatened – Rare or likely to become extinct
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo, Short-billed Black-Cockatoo	Endangered	Threatened – Rare or likely to become extinct
<i>Caretta caretta</i>	Loggerhead Turtle	Endangered	Threatened – Rare or likely to become extinct
<i>Charadrius leschenaultii</i>	Greater Sand Plover, Large Sand Plover	Vulnerable	Threatened – Rare or likely to become extinct
<i>Charadrius mongolus</i>	Lesser Sand Plover, Mongolian Plover	Endangered	Threatened – Rare or likely to become extinct
<i>Chelonia mydas</i>	Green Turtle	Vulnerable	Threatened – Rare or likely to become extinct
<i>Dasyurus geoffroi</i>	Chuditch, Western Quoll	Vulnerable	Threatened – Rare or likely to become extinct
<i>Dermochelys coriacea</i>	Leatherback Turtle	Endangered	Threatened – Rare or likely to become extinct

Species	Common name	Commonwealth conservation status (EPBC Act)	State conservation status (BC Act)
<i>Diomedea amsterdamensis</i>	Amsterdam Albatross	Endangered	Not listed
<i>Diomedea epomophora</i>	Southern Royal Albatross	Vulnerable	Not listed
<i>Diomedea exulans</i>	Wandering Albatross	Vulnerable	Threatened – Rare or likely to become extinct
<i>Diomedea sanfordi</i>	Northern Royal Albatross	Endangered	Not listed
<i>Falco peregrinus</i>	Peregrine Falcon		Protected under international agreement
<i>Hydromys chrysogaster</i>	Water-rat		Priority 4
<i>Hydroprogne caspia</i>	Caspian Tern		Protected under international agreement
<i>Idiosoma sigillatum</i>	Sw an Coastal Plain shield-backed trapdoor spider		Priority 3
<i>Isoodon fusciventer</i>	Quenda		
<i>Leipoa ocellata</i>	Malleefowl	Vulnerable	Threatened – Rare or likely to become extinct
<i>Lerista lineata</i>	Perth Slider		Priority 3
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit	Vulnerable	Protected under international agreement
<i>Limosa lapponica menzbieri</i>	Northern Siberian Bar-tailed Godwit	Critically Endangered	Not listed
<i>Limosa limosa</i>	Black-tailed Godwit		Protected under international agreement
<i>Limosa limosa</i> subsp. <i>melanuroides</i>	Black-tailed Godwit		Protected under international agreement
<i>Macronectes giganteus</i>	Southern Giant Petrel	Endangered	Protected under international agreement
<i>Macronectes halli</i>	Northern Giant Petrel	Vulnerable	Protected under international agreement
<i>Natator depressus</i>	Flatback Turtle	Vulnerable	Threatened – Rare or likely to become extinct
<i>Neelaps calonotos</i>	Black-striped Snake		Priority 3
<i>Neophoca cinerea</i>	Australian Sea Lion	Vulnerable	Threatened – Rare or likely to become extinct
<i>Numenius madagascariensis</i>	Eastern Curlew, Far Eastern Curlew	Critically Endangered	Threatened – Rare or likely to become extinct
<i>Oxyura australis</i>	Blue-billed Duck		Priority 4
<i>Pachyptila turtur subantarctica</i>	Fairy Prion	Vulnerable	Not listed
<i>Pandion cristatus</i>	Osprey		Protected under international agreement
<i>Plegadis falcinellus</i>	Glossy Ibis		Protected under international agreement
<i>Pluvialis fulva</i>	Pacific Golden Plover		Protected under international agreement
<i>Pluvialis squatarola</i>	Grey Plover		Protected under international agreement
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	Critically Endangered	Threatened – Rare or likely to become extinct
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	Threatened – Rare or likely to become extinct

Species	Common name	Commonwealth conservation status (EPBC Act)	State conservation status (BC Act)
<i>Sternula nereis</i> subsp. <i>nereis</i>	Australian Fairy Tern	Vulnerable	Threatened – Rare or likely to become extinct
<i>Synemon gratiosa</i>	Graceful Sunmoth		Priority 4
<i>Thalassarche cauta cauta</i>	Shy Albatross	Vulnerable	Not listed
<i>Thalassarche cauta steadi</i>	White-capped Albatross	Vulnerable	Not listed
<i>Thalassarche impavida</i>	Campbell Albatross	Vulnerable	Not listed
<i>Thalassarche melanophris</i>	Black-browed Albatross	Vulnerable	Threatened – Rare or likely to become extinct
<i>Thalasseus bergii</i>	Crested Tern		Protected under international agreement
<i>Thinornis rubricollis</i>	Hooded Plover		Priority 4
<i>Tringa brevipes</i>	Grey-tailed Tattler		Priority 4
<i>Tringa glareola</i>	Wood Sandpiper		Protected under international agreement
<i>Tringa nebularia</i>	Common Greenshank		Protected under international agreement
<i>Tringa stagnatilis</i>	Marsh Sandpiper		Protected under international agreement
<i>Westralunio carteri</i>	Carter's Freshwater Mussel	Vulnerable	Threatened – Rare or likely to become extinct
<i>Xenus cinereus</i>	Terek Sandpiper		Protected under international agreement

2.5.2 Habitat

Black Cockatoos

A Black Cockatoo habitat assessment was undertaken by a Senior Botanist from Strategen on 6 December 2018 to determine the extent and quality of habitat for FRTBC and CBC, and presence of potential breeding habitat. During the survey, CBCs were sighted actively foraging on Banksia species.

VT1 and VT2 were identified to form potential foraging habitat for FRTBC and CBC; the value of these VTs is described below in Table 9. Based on the results of the foraging assessment, the survey area is considered to contain 0.17 ha of excellent quality foraging habitat, 0.11 ha of moderate quality foraging habitat for CBC, and 0.17 ha of poor quality foraging habitat for FRTBC (Figure 4). Justification for how foraging habitat quality has been defined is provided in Table 10.

The field survey determined that no suitable breeding habitat is present within the Project Area for the CBC or FRTBC.

Table 9 : Vegetation types and Black Cockatoo foraging species within the survey area

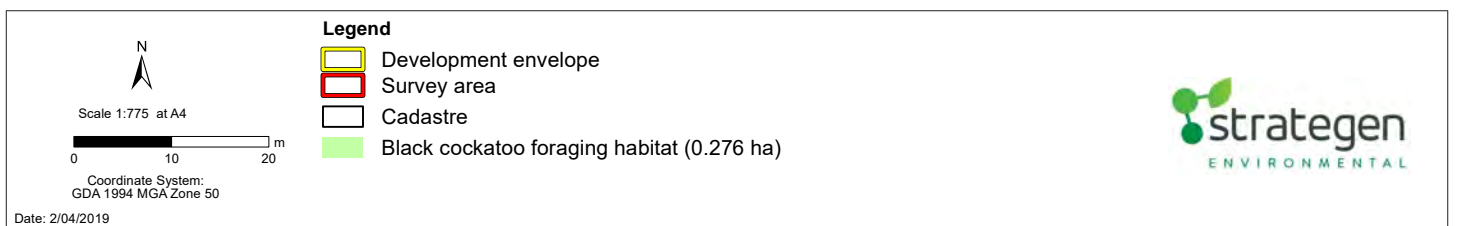
Vegetation type	Black cockatoo foraging species	Foraging quality	Area (ha)
VT1	CBC: <i>Agonis flexuosa</i> . FRTBC: Nil	<ul style="list-style-type: none"> Moderate (CBC) Nil (FRTBC) 	0.11
VT2	CBC: <i>Eucalyptus marginata</i> , <i>Banksia attenuata</i> , <i>Allocasuarina fraseriana</i> , <i>Xanthorrhoea preissii</i> . FRTBC: <i>E. marginata</i> , <i>A. fraseriana</i> .	<ul style="list-style-type: none"> Excellent (CBC) Poor (FRTBC) 	0.17

Table 10 : Definition of Black Cockatoo foraging habitat within the survey area

Foraging quality	Justification
Excellent	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) and presence of food sources at several strata (i.e. canopy, midstorey and understorey).
Good	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) but food sources only present at one or two strata (i.e. canopy and midstorey).
Moderate	Moderate foraging value density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 20-40%) and food sources only present at one or two strata (i.e. canopy and midstorey).
Poor	Low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 10-20%) and presence of food sources at only one stratum (i.e. canopy).
Very poor	Very low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species <10%) and presence of food sources at only one stratum (i.e. canopy).
Nil	Cleared areas - no suitable vegetation present.



Figure 4: Black Cockatoo habitat



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Service Layer Credits: Nearmap: Aerial image, flown 12/2018. Landgate: Cadastre, 07/2018. Client: Aquinas College. Development layout, 1/2019. Created by: h.sullivan

3. Assessment against the ten clearing principles

An assessment of the proposed clearing against the ten clearing principles, as outlined in Schedule 5 of the EP Act, is provided in Table 11. The assessment has been undertaken in accordance with the guidelines set out by the Department of Water and Environmental Regulation (DWER).

Table 11 : Assessment of native vegetation clearing in accordance with the ten clearing principles

Principle	Assessment	Conclusion
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity	<p>Two vegetation units were described and delineated for the surveyed area within the project area. These include one <i>Agonis flexuosa</i> low forest type and one <i>Banksia menziesii</i>, <i>Allocasuarina fraseriana</i> and <i>Eucalyptus marginata</i> low woodland. Vegetation condition ranged from Completely Degraded to Very Good (EPA, 2016), with approximately 44.6% of the surveyed area in a Completely Degraded condition (Strategen, 2018).</p> <p>The Naturemap and DoEE Protected Matters Search Tool database search identified 27 conservation and priority flora species, the field survey identified 22 native vascular plant taxa from 20 plant genera and 13 plant families. No conservation significant flora species were identified during the survey. The degraded nature of the area along with heavy weed infestation makes it unlikely that conservation significant flora will occur within the Project area.</p> <p>The desktop searches identified two conservation significant fauna species may be impacted by the project; <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo) listed as Endangered under the WC Act and EPBC Act, <i>Calyptorhynchus banksii naso</i> (Forest Red-tailed Black Cockatoo) listed as vulnerable under the WC Act and EPBC Act. Clearing as a result of the proposal will lead to the loss of up to 0.15 ha of suitable foraging habitat. No potential breeding trees have been identified within the area. Aquinas College will look to revegetate areas adjacent to the Project area with suitable foraging species.</p> <p>The TEC Banksia Woodlands of the Swan Coastal Plain is known to occur within the area. The field survey determined that the vegetation present within the Project area did not meet the diagnostic criteria for the TEC. No other TEC or PEC are considered to be present.</p> <p>The Project area occurs within a local area that has been heavily degraded due to ongoing development. The vegetation present within the immediate area is not biologically diverse, particularly due to the historical degradation from the construction of the existing boat shed and surrounding school infrastructure. It is considered unlikely that clearing associated with the project will be at variance with this principle.</p>	Unlikely to be at variance
(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	<p>The project area is within the known distribution and predicted breeding range of the Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo. During the survey, evidence of foraging by Carnaby's and Forest Red-tailed Black Cockatoos was identified. Clearing associated with the Project will impact approximately 0.15 ha of vegetation suitable for foraging.</p> <p>No suitable trees of either size or species likely to support breeding were identified within the Project area.</p>	Unlikely to be at variance

Principle	Assessment	Conclusion
	<p>It is considered unlikely that the removal of 0.15 ha of foraging habitat, will significantly impact Black Cockatoos locally or regionally. This is supported further due to the approximately 12 ha of better quality foraging habitat around the neighbouring Mt Henry spit. When considering this vegetation, the foraging habitat that is to be removed for the Project is represents 1.3% of the immediately available habitat in the local area. As the project area is already in a degraded condition, it is unlikely to be critical habitat and as such these cockatoo species are unlikely to be significantly impacted by the project activities.</p>	
<p>(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora</p>	<p>The field survey conducted on 6 December 2018 did not record any Threatened or Priority flora species pursuant to Section 178 of the EPBC Act or Section 19(1) of the BC Act.</p> <p>The field survey was conducted during the flowering period for all conservation significant species identified in the desktop assessment, with the exception of <i>Caladenia huegelii</i>. As such, the presence of <i>Caladenia huegelii</i> within the Project Area cannot be conclusively confirmed.</p> <p>Given that the proposed clearing is relatively small in a broader setting of intact remnant vegetation, and that no Threatened or Priority flora were recorded during the field survey, the proposed action is unlikely to be at variance with this principle.</p>	<p>Unlikely to be at variance</p>
<p>(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</p>	<p>The field survey conducted on 6 December 2018 confirmed that there is no occurrence of a threatened ecological community.</p> <p>While there was potential for VT2 to be associated with the <i>Banksia Woodlands of the Swan Coastal Plain</i> TEC, it was confirmed there is inadequate coverage of 'Very Good' quality vegetation (0.17 ha) for it to meet the key diagnostic criteria (minimum patch size of 1 ha) to be considered part of this TEC.</p> <p>As a result, the proposed clearing is unlikely to be at variance with this principle.</p>	<p>Unlikely to be at variance</p>
<p>(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</p>	<p>The Project will involve clearing of vegetation associated with pre-European vegetation association 6, described as Medium woodland; tuart and jarrah. Vegetation association 6 has 23.61% of its pre-European extent remaining within the Swan Coastal Plain IBRA region and 2.11% of its extent remaining within the City of South Perth.</p> <p>The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).</p> <p>The vegetation that is being cleared is not considered significant as a remnant of native vegetation due to its condition. The vegetation within the Project has been subjected to edge impacts and weed infestation to the degree that it is not representative of the surrounding remnant vegetation at Mt Henry Spit.</p> <p>Noting the above, while the clearing is not considered significant, it is accepted that vegetation being impact is mapped as a vegetation association with less than 30% remaining within the Swan Coastal Plain IBRA region.</p>	<p>Maybe at variance</p>

Principle	Assessment	Conclusion
	As a result clearing may be at variance to 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 wetland	<p>The proposed clearing will occur immediately adjacent to a watercourse (Canning River); however, as the area of vegetation proposed to be cleared is relatively small within the broader context of intact remnant native vegetation, the proposed clearing is unlikely to have significant impact on watercourse function.</p> <p>Clearing within the Project Area is likely to be at variance with this principle.</p>	Likely to be at variance
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	<p>The proposed clearing will be conducted in isolated patches, surrounded by a broader area of intact remnant native vegetation.</p> <p>In consideration of the above, the clearing is not likely to cause appreciable land degradation due to:</p> <ul style="list-style-type: none"> • the small area of total proposed clearing • the large extent of vegetation that would remain within the local and regional areas • construction environmental management measures being implemented. <p>For the above reasons, the proposed clearing is unlikely to be at variance with this principle.</p>	Unlikely to be at variance
(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	<p>The Project Area does not occur within a conservation area and is isolated from any conservation areas. The relatively small scale of clearing within the broader area of intact remnant native vegetation means indirect impacts to any conservation areas within the region are unlikely.</p> <p>Given the above information, the proposed clearing of vegetation within the Project Area will not directly impact any conservation areas, and is unlikely to have an indirect impact on the environmental values of any conservation areas within the region. As such, the proposed clearing is unlikely to be at variance with this principle.</p>	Unlikely to be at variance
(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water	<p>The relatively small scale of clearing is unlikely to result in a change to the local hydrological regime insofar that the quality of surface or underground water deteriorates.</p> <p>For this reason, the proposed clearing is unlikely to be at variance with this principle.</p>	Unlikely to be at variance
(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	<p>The proposed clearing represents a small fraction of intact remnant vegetation within the local and broader region and will be conducted in small isolated patches.</p> <p>As such, the proposed clearing is unlikely to cause, or exacerbate the incidence of flooding and is therefore considered unlikely to be at variance with this principle.</p>	Unlikely to be at variance

4. Environmental approvals and management

4.1 Environmental approvals

The key approvals identified as being required and/or potentially required to support the proposed clearing include the following:

- Native Vegetation Clearing Permit (NVCP) under Section 51E of the EP Act.

4.2 Environmental management

To manage potential impacts associated with the proposed clearing, the following actions will be undertaken:

- application of the mitigation hierarchy – Aquinas College will aim to avoid and minimise clearing at every opportunity as far as practicable during construction
- development of a Construction Environmental Management Plan – The aim of the Plan will be to minimise environmental impact associated with the proposed works as well as to identify areas of responsibilities required for the implementation of the management strategies
- revegetation – Aquinas College will undertake revegetation of areas nearby the Project area. The revegetation will comprise of species similar to the local area and aim to provide foraging habitat for conservation species.

5. Stakeholder Consultation

Summary of stakeholder consultation is provided in Table 12.

Table 12: Stakeholder Consultation

Agency Group	Purpose of Consultation	Comments
Department of Biodiversity, Conservation and Attractions - Swan River Trust	Pre-referral discussion. Discussion focused on bushfire management and minimising vegetation clearing as far as practicable.	<p>Outcomes from the meeting were:</p> <ul style="list-style-type: none"> Swan River Trust (SRT) will be involved in the decision making process through the Development Application Assessment SRT will provide binding advice for any work that occurs within the Development Control Area The advice can include the need to prepare a CEMP if clearing or earthworks are to occur in the DCA Rehabilitation at the rate of 3:1 is required for the removal of trees within the DCA It would be recommended that Aquinas contact SRT to discuss the project and confirm the extent and nature of works. The NVCP that is being prepared along with the Bushfire Management Plan will be provided as supporting documents with the DA SRT to provide a flow diagram of the assessment process for approval under the Swan and Canning Rivers Management Act 2006 and associated regulations.

The Client received further advice from the Swan River Trust (Appendix 2). This advice was provided as part of the Development Application Assessment process. The advice has been reviewed and the response is provided in Table 13.

Table 13: Swan River Trust Comments

Comment	Response
1. If any vegetation is proposed to be trimmed or removed in the Swan Canning Development Control Area, a landscape plan shall be submitted to, and approved by the Department of Biodiversity, Conservation and Attractions prior to the commencement of works (see Advice Note 1).	Noted. There will be no trimming or removal of vegetation within the Swan Canning Development Control Area for this project.
2. It is requested that alternative bushfire protection measures are considered, such as increasing the construction standard of the building, to minimise or avoid native vegetation clearing, particularly to the northern and eastern portion of the site, which has 'very good to good' condition vegetation and suitable Black Cockatoo foraging habitat. It is understood that an approval from the Department of Water and Environmental Regulation will be required for any native vegetation clearing within the site.	<p>Noted. The only vegetation that is being removed is for the direct construction of the new boat shed, not for bushfire risk reduction.</p> <p>While an Asset Protection Zone (APZ) is required to ensure the new boatshed is not subject to a BAL rating greater than BAL-29, no further vegetation removal is proposed to achieve this. Aquinas College is not seeking to reduce the BAL rating further through vegetation clearing and will construct the new building as per the recommendations of the Bushfire Management Plan (Strategen 2018).</p> <p>Trees that are to be retained can be while ensuring that APZ standards are met as per the Guidelines to State Planning Policy 3.7. Strategen has undertaken the Bushfire Management Plan for the site and can confirm that sufficient separation will exist post development to ensure compliance with acceptable solutions of State Planning Policy 3.7.</p>

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Appendix 1
Flora and Vegetation Reconnaissance
Survey

To: Peter Shaw

Date: 12 February 2019

Company: Aquinas College

Project No: AQU18689.01

Fax/email: peter.shaw@aquinas.wa.edu.au

Inquiries: Euan Sutherland

Reconnaissance Flora and Vegetation Assessment Aquinas College Boat Shed

Background

Aquinas College are proposing to replace their existing boat shed complex at 58 Mount Henry Rd, Salter Point (the project area) in the City of South Perth. The proposed development will involve the construction of a new boat shed along with improvements to existing vehicular access infrastructure.

The proposed development at the project area will also involve the clearing of native vegetation. The clearing of native vegetation is regulated under Part V of the *Environmental Protection Act 1986* and the proposed development will require a Native Vegetation Clearing Permit (NVCP) to undertake the proposed development.

To inform the NVCP application, a Reconnaissance Flora and Vegetation Assessment and Black cockatoo habitat assessment was undertaken.

Scope

The scope of this survey was to undertake a desktop assessment and field assessment within the survey area.

The objectives were to:

- conduct a desktop survey of the survey area to identify potential conservation significant flora and vegetation within the survey area
- collect and identify the vascular plant species present within the survey area
- define and map the native vegetation communities present within the survey area
- map vegetation condition within the survey area
- provide recommendations on the local and regional significance of the vegetation communities
- define and map black cockatoo habitat within the survey area
- prepare a report summarising the findings.

Methods

Desktop assessment

A database search using NatureMap (DPaW 2007 -) was undertaken to generate a list of vascular flora previously recorded within, and nearby the project with an emphasis on species of conservation significance and introduced species. The search were conducted around a central coordinate (50H, 392905 mE, 6456103 mN) and included a 5km buffer.

Field survey – Flora and Vegetation

The field survey was conducted by one Senior Ecologist from Strategen on 6 December 2018 with appropriate qualifications (Table 1). All plants collected were taken under flora collecting permits listed in Table 1, pursuant to WC Act Section 23C and Section 23F.

Table 1: Personnel

Name	Role	Flora collection permit
Tristan Sleigh Associate	Planning, fieldwork, plant identification, data interpretation and report preparation	SL012431

Relevés were sampled to characterise vegetation types and condition, and ensure appropriate representation of the flora and vegetation present.

At each quadrat the following information was recorded:

- GPS co-ordinates (recorded in GDA94 UTM 50H);
- photograph of the vegetation;
- vegetation condition
- brief vegetation description;
- vascular flora taxa present (with average height and total percentage foliage cover of each taxon);
- topography (landform type and aspect)
- soil type and colour
- geology (type, size and cover of any rocks, stones, gravel or outcropping)
- average percentage cover of leaf litter and bare ground; and
- disturbance details including fire history (time since last fire), and physical disturbance including evidence of erosion, grazing and weed invasion.

All plant specimens collected during the field surveys were identified using appropriate reference material or through comparisons with pressed specimens housed at the Western Australian Herbarium where necessary. Nomenclature of the species recorded is in accordance with Western Australian Herbarium (1998-).

Vegetation condition was recorded at all quadrats, and opportunistically within the project area during the field assessment where required. Vegetation condition was described using the vegetation condition scale for the South West Botanical Province (Keighery 1994; Table 2). Vegetation condition polygon boundaries were developed using this information in conjunction with aerial photography interpretation, and were digitised as for vegetation type mapping polygon boundaries.

Table 2: Vegetation condition scale (Keighery 1994)

Condition rating	Description
Pristine (1)	Pristine or nearly so, no obvious sign of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good (3)	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 (4)	Vegetation structure significantly altered by obvious signs of multiple disturbances. 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, grazing.
Degraded (5)	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.

Condition rating	Description
Completely Degraded (6)	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Vegetation types were delineated using a combination of results site observations and cluster analysis. Aerial photography interpretation and field notes taken during the survey were then used to develop VT mapping polygon boundaries over the project area. These polygon boundaries were then digitised using Geographic Information System (GIS) software.

Field survey – Foraging Assessment

The survey area was traversed on foot to record any flora species with the potential to provide a food source for black cockatoos. Following the assessment, vegetation units defined as part of the flora and vegetation survey were assigned a foraging value based on the presence and quantity of potential food species and any evidence of foraging by black cockatoos.

Results

Desktop assessment

A total of 17 flora taxa of conservation significance were identified by the database searches. Of these, two species listed as Threatened under the *Biodiversity Conservation Act 2016* (WC Act), or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified.

The potential for these plants to occur within the project area was assessed based on general habitat requirements and distribution. One Threatened, and three Priority flora species were considered to have the potential to occur within the project area:

- *Caladenia huegelii* (T; EN)
- *Angianthus micropodioides* (P3)
- *Cyathochaeta teretifolia* (P3)
- *Jacksonia sericea* (P4).

Field survey

A total of two relevés were sampled across the survey areas. Additional opportunistic sampling was conducted throughout the remainder of the survey area.

Flora

A total of 22 native vascular plant taxa from 20 plant genera and 13 plant families were recorded from quadrats within the survey area. The majority of taxa were recorded within the Myrtaceae (5 taxa) and Fabaceae (3 taxa) families (Table 3). The relatively low number of plant genera recorded reflects the disturbed nature of the survey area.

Table 3: Native vascular taxa collected within the survey area

Family	Taxa
Casuarinaceae	<i>Allocasuarina fraseriana</i>
Colchicaceae	<i>Burchardia congesta</i>
Cyperaceae	<i>Cyathochaeta avenacea</i>
	<i>Lepidosperma</i> sp.
Dasygogonaceae	<i>Dasygogon bromeliifolius</i>
Dilleniaceae	<i>Hibbertia hypericoides</i>
Fabaceae	<i>Acacia alata</i> var. <i>alata</i>
	<i>Hovea trisperma</i> var. <i>trisperma</i>

Family	Taxa
	<i>Jacksonia furcellata</i>
Hemerocallidaceae	<i>Dianella revoluta</i> var. <i>divaricata</i>
Juncaceae	<i>Juncus pallidus</i>
Myrtaceae	<i>Agonis flexuosa</i>
	<i>Corymbia calophylla</i>
	<i>Eucalyptus camaldulensis</i>
	<i>Eucalyptus gomphocephala</i>
	<i>Eucalyptus marginata</i> subsp. <i>marginata</i>
Myrtaceae	<i>Kunzea glabrescens</i>
Proteaceae	<i>Banksia menziesii</i>
	<i>Hakea prostrata</i>
Restionaceae	<i>Alexgeorgea nitens</i>
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>
Zamiaceae	<i>Macrozamia riedlei</i>

No Threatened flora species as listed under section 178 of the EPBC Act or listed under section 19(1) of the BC Act were recorded within the survey area. No Priority flora species as listed by Western Australian Herbarium (1998-). Of the four conservation significant flora species identified by the desktop survey with potential to occur within the survey area, three would have been identifiable at the time of the survey. The remaining species, *Caladenia huegellii*, would not have been identifiable during the time of survey. As such, its presence within the survey area cannot be ruled out.

A total of 13 introduced (exotic) taxa were recorded within the survey area:

- **Briza maxima*
- **Bromus diandrus*
- **Cenchrus clandestinus*
- **Ehrharta calycina*
- **Euphorbia pepus*
- **Fumaria capreolata*
- **Gladiolus caryophyllaceus*
- **Nerium oleander*
- **Pelargonium capitatum*
- **Schinus terebinthifolia*
- **Solanum nigrum*
- **Sonchus oleraceus*
- **Ursinia anthemoides*.

None of these species are Declared Plant species in Western Australia pursuant to section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act) according to the Western Australian Department of Agriculture and Food (DPIRD 2017).

Vegetation

Two native vegetation types (VTs) were defined and mapped within the survey area (Figure 9) and are summarised in Table 3. Areas containing vegetation in parkland cleared or highly degraded state have not been counted as unique native VTs but have been included in Table 3 for area calculation purposes. The total area mapped within the survey area was 0.78 ha which includes parkland cleared, highly degraded and fully cleared areas. The dominant native VT within the survey area was VT2 which can be broadly described as a *Banksia menziesii*, *Allocasuarina fraseriana* and *Eucalyptus marginata* low woodland.

Table 4: Area (ha) covered by each vegetation condition category within the survey area

Vegetation Type	Description	Area (ha) within project/survey area	% of survey area
1	<i>Agonis flexuosa</i> low forest over <i>Jacksonia furcellata</i> open shrubland over <i>Cenchrus clandestinus</i> , <i>Bromus diandrus</i> and <i>Briza maxima</i> grassland.	0.11	13.81

Vegetation Type	Description	Area (ha) within project/survey area	% of survey area
2	<i>Banksia menziesii</i> , <i>Allocasuarina fraseriana</i> and <i>Eucalyptus marginata</i> low woodland over <i>Kunzea glabrescens</i> , <i>Hakea prostrata</i> and <i>Xanthorrhoea preissii</i> shrubland over <i>Hibbertia hypericoides</i> , <i>Acacia alata</i> var. <i>alata</i> and <i>Dasypogon bromeliifolius</i> low shrubland/ herbland.	0.17	22.06
P	Planted	0.09	11.35
C	Cleared areas – including managed grassland, infrastructure and bare ground	0.41	52.77
Total		0.78	100

The survey area shows signs of having been degraded for a long period of time. Clearing for roads and buildings, as well as cleared managed grass areas dominate the survey area. Native vegetation within the survey area has been impacted by weed species and historical clearing. As such, vegetation condition within the survey area ranged from Very Good to Completely Degraded (Keighery 1994).

Table 5 gives a numerical breakdown of the area occupied by each vegetation condition rating within the survey area.

Table 5: Area (ha) covered by each vegetation condition category within the survey area

Vegetation Condition	Area (ha)	Percentage of the survey area
Very Good	0.13	17.29
Good	0.05	6.19
Degraded	0.04	4.77
Completely Degraded	0.35	44.65
N/A - Not vegetated	0.21	27.10
Total	0.78	100

Threatened and Priority Ecological Communities

Site observations and quadrat data collected during the survey indicated that one TEC is potential by vegetation types within the survey area. This is *Banksia woodlands of the Swan Coastal Plain* TEC potentially represented by VT2.

This vegetation type was not found to meet the diagnostic criteria provided in the approved conservation advice for the *Banksia Woodlands of the Swan Coastal Plain* TEC (Table 6).

Table 6: Characteristics of the *Banksia* woodland within the project area compared to the key diagnostic criteria as per TSSC (2016)

Key diagnostic criteria (TSSC 2016)	<i>Banksia</i> woodlands within the project area
<u>Location:</u> Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions.	Yes. <i>Banksia</i> woodlands within the survey area occur on the Swan Coastal Plain.
<u>Soils and landform:</u> Occurs on: <ul style="list-style-type: none"> well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands sandy colluviums and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau transitional substrates and sandflats. 	Yes. <i>Banksia</i> woodlands within the project area occur on Bassendean Sands.

Key diagnostic criteria (TSSC 2016)	Banksia woodlands within the project area
<p><u>Structure:</u> Low woodland to forest with:</p> <ul style="list-style-type: none"> • a distinctive upper sclerophyllous layer of low trees (occasionally large shrubs more than 2 m tall), typically dominated or co-dominated by one or more of the banksia species identified below • emergent trees of medium or tall (>10 m) height. <i>Eucalyptus</i> or <i>Allocasuarina</i> species may sometimes be present above the banksia canopy • an often highly species-rich understorey. 	Yes. VT2 represents a low woodland structure.
<p><u>Composition:</u> Contains at least one of the following species:</p> <ul style="list-style-type: none"> • <i>Banksia attenuata</i> • <i>Banksia menziesii</i> • <i>Banksia prionotes</i> • <i>Banksia ilicifolia</i>. 	Yes. VT2 contains <i>Banksia attenuata</i> and <i>Banksia menziesii</i> .
<p><u>Condition (Keighery 1994):</u> 'Pristine': no minimum patch size 'Excellent': 0.5 ha 'Very Good': 1 ha 'Good': 2 ha.</p>	No. Banksia woodland vegetation within the survey area is in Very Good condition. Vegetation within VT2 that represents the TEC has an area of 0.17 ha in the survey area. While this is part of a larger remnant of native vegetation to the east, the entire patch size is less than 0.5 ha. As such, the Banksia woodland vegetation does not meet this criteria.

No other occurrences of TECs or PECs within the survey area were recorded.

Black Cockatoo Habitat

Foraging habitat for black cockatoos is generally defined as the availability of plant food sources within an area (Finn 2012). Food availability for black-cockatoos is a function of the diversity, abundance, distribution, energetic and nutritional qualities, and seasonality (phenology) of the food sources within a particular area.

Table 7 summarises the value of each VT in terms of the quality of foraging habitat provided for black cockatoos. Table 8 provides a justification for how foraging values were defined. Vegetation Types 1 and 2 form potential foraging habitat for two Black Cockatoo species. The threatened Carnaby's black cockatoo was also sighted within the survey area actively foraging on Banksia species.

Based on the results of the foraging assessment, the survey area is considered to contain 0.17 ha of excellent quality foraging habitat, and 0.11 ha of moderate quality foraging habitat for Carnaby's black cockatoo. The survey area also contains 0.17 ha of poor quality foraging habitat for the Forest red-tailed black cockatoo.

No potential breeding habitat was recorded within the survey area.

Table 7: Vegetation types and black cockatoo foraging species within the survey area

Vegetation type	Black cockatoo foraging species	Foraging quality	Area (ha)
1	<u>CBC</u> – <i>Agonis flexuosa</i> . <u>FRTBC</u> – Nil.	<ul style="list-style-type: none"> • Moderate (CBC) • Nil (FRTBC) 	0.11
2	<u>CBC</u> – <i>Eucalyptus marginata</i> , <i>Banksia attenuata</i> , <i>Allocasuarina fraseriana</i> , <i>Xanthorrhoea preissii</i> . <u>FRTBC</u> – <i>E. marginata</i> , <i>A. fraseriana</i> .	<ul style="list-style-type: none"> • Excellent (CBC) • Poor (FRTBC) 	0.17

Table 8: Definition of black cockatoo foraging habitat within the survey area

Foraging quality	Justification
Excellent	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) and presence of food sources at several strata (i.e. canopy, midstorey and understorey).
Good	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) but food sources only present at one or two strata (i.e. canopy and midstorey).
Moderate	Moderate foraging value density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 20-40%) and food sources only present at one or two strata (i.e. canopy and midstorey).
Poor	Low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 10-20%) and presence of food sources at only one stratum (i.e. canopy).
Very poor	Very low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species <10%) and presence of food sources at only one stratum (i.e. canopy).
Nil	Cleared areas - no suitable vegetation present.

Conclusion

The survey area contains 0.78 ha of native vegetation. The remainder of the survey area consisted of planted or completely cleared areas. No flora or vegetation of conservation significance was recorded during the survey. The survey timing was outside of the survey period for one species, *Caladenia huegelii* (T; EN). This species has the potential to occur within the survey area. As it was not identifiable during the survey, the presence of this species cannot be excluded.

The survey area contains up to 0.17 ha of excellent quality Black cockatoo foraging habitat. The majority of the survey area is unlikely to support foraging or breeding.

Appendix 2
Comments from Swan River Trust



Department of **Biodiversity,
Conservation and Attractions**



**CLAUSE 30A(2)a(i) – REPLACEMENT OF A BOATSHED AND ACCESS ROAD – LOT 503
MOUNT HENRY ROAD, SALTER POINT – AQUINAS COLLEGE**

Thank you for providing the Swan River Trust (the Trust) with the opportunity to comment on the above-mentioned application received on 30 May 2019.

The proposal is being process pursuant to Clause 30A(2)a(i) of the *Metropolitan Region Scheme*, as the proposed development is on land that is partially within the Swan Canning Development Control Area (DCA). It is understood that the City of South Perth will forward the application, including advice received from referral agencies such as the Trust, to the Western Australian Planning Commission (WAPC) for determination following its assessment.

The Department of Biodiversity, Conservation and Attractions (the department) has assessed the application on behalf of the Trust, and you are advised the department has no objections to the proposed development subject to the following conditions:

1. If any vegetation is proposed to be trimmed or removed in the Swan Canning Development Control Area, a landscape plan shall be submitted to, and approved by the Department of Biodiversity, Conservation and Attractions prior to the commencement of works (see **Advice Note 1**).
2. Prior to the commencement of works, all significant vegetation in and adjacent to the proposed work site shall be identified and protected from harm, unless approved for trimming or removal.
3. Stormwater runoff from constructed impervious surfaces generated by small rainfall events (i.e. the first 15 mm of rainfall) must be retained and/or detained and treated (if required) at-source as much as practical and will not be permitted to enter the river untreated.
4. The applicant shall take appropriate preventative measures during the works to ensure that no construction material, soil, rubbish, or deleterious matter is allowed to enter the river, foreshore reserve, or stormwater system.

Rivers and Estuaries Branch
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
Phone: (08) 9219 9000 Email: rivers.planning@dbca.wa.gov.au
www.dbca.wa.gov.au

5. Prior to any fill and/or topsoil being brought onto the site, the applicant shall ensure that all material is certified clean, uncontaminated, and free from rubble, weeds and disease and is geotechnically suitable for the proposed works.
6. The new boat shed shall be connected to reticulated sewer.

ADVICE TO THE APPLICANT

1. The landscape plan should include the following details:
 - a. A plan showing the number of plants (and species) to be trimmed or removed in the Swan Canning Development Control Area (DCA); and
 - b. A plan showing the number of replacement plants (and species) to be planted in the vicinity. Any plants removed in the DCA will need to be replanted at a 3:1 ratio.It is noted that one significant tree in the south-east corner of the lot (and within the DCA) has been marked for retention in the development plans. This is supported by the Department of Biodiversity, Conservation and Attractions.
2. It is requested that alternative bushfire protection measures are considered, such as increasing the construction standard of the building, to minimise or avoid native vegetation clearing, particularly to the northern and eastern portion of the site, which has 'very good to good' condition vegetation and suitable Black Cockatoo foraging habitat. It is understood that an approval from the Department of Water and Environmental Regulation will be required for any native vegetation clearing within the site.

If you have any queries regarding this matter, please contact [REDACTED] or [REDACTED] and quote the above reference number.

[REDACTED]

17 July 2019