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# Native Vegetation Clearing Permit Application - Supporting Documentation

South Metropolitan Crop Research Hub

Prepared for  
Murdoch University  
by Strategen

March 2018





# **Native Vegetation Clearing Permit Application - Supporting Documentation**

**South Metropolitan Crop Research Hub**

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March 2018

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## **Client: Murdoch University**

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## 1. Introduction

Murdoch University are proposing to develop the South Metropolitan Crop Research Hub (SMCRH) at their South Street campus, for the purpose of agricultural chemical research. The Project Area is located approximately 13 km south of the Perth Central Business District in the suburb of Murdoch, within the City of Melville (Figure 1).

The proposed development will necessitate the clearing of a small area of native vegetation and several additional trees within the Project Area (Figure 1). Strategen consider that the eastern portion of the Project Area will be exempt from requiring a Native Vegetation Clearing Permit (NVCP) under Regulation 5, Item 1 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004, once the submitted Development Application (Application number 17-18522-76) has been granted approval. The Regulation 5 Item 1 exemption relates to:

*'Clearing of a site for the lawful construction of a building or other structure on a property, being clearing which does not, together with all other limited clearing on the property in the financial year in which the clearing takes place, exceed 5 ha, if —*

*(a) the clearing is to the extent necessary; and*

*(b) the vegetation is not riparian vegetation.'*

The exemption applies subject to other relevant approvals being obtained for the building/structure, including any planning approvals and building licence.

Clearing of 0.40 ha of native vegetation and up to 15 additional native trees within the western portion of the Project Area (the Clearing Footprint; Figure 1) will require Murdoch University to obtain a NVCP to facilitate lawful clearing of native vegetation. The area permit application form (form C1) is provided in Appendix 1.

This supporting document has been prepared to support the granting of a NVCP under s 51 E of the *Environmental Protection Act 1986* (EP Act). The supporting document includes the following information:

- an overview of the existing environmental conditions of the site
- an evaluation of potential impacts of the vegetation clearing
- an evaluation of compliance of the proposed clearing against the ten clearing principles listed under Schedule 5 of the EP Act
- environmental approvals and management requirements.

The information provided within this supporting document is based on survey of the Project Area as documented in *Flora, vegetation and fauna habitat survey– South Metropolitan Crop Research Hub* (Strategen 2018, see Appendix 2).

### 1.1 Location, ownership and tenure

The Project Area is located within Murdoch University's South Street Campus. Site identification details for the Project Area are provided in Table 1.

Table 1: Site identification details

Subject	Detail
Lot address	Lot 820 on Plan 404596
Street address	90 South Street, Murdoch 6150
Current site owner	Murdoch University, statutory body corporate, S4 Uni Act 1973
Local Government Authority	City of Melville

Subject	Detail
Current MRS zoning	Public Purposes - University
Current Local Planning Scheme No. 6 Zoning	Public Purposes - University





**Figure 1: Project area**

Scale 1:1,000 at A3

0 10 20 30 m

Coordinate System: GDA 1984 MGA Zone 50  
Note that positional errors may occur in some areas  
Date: 7/03/2018  
Author: J.Crute

Legend

- Project area
- Clearing footprint

Path: C:\Comarc\2017\MURKIN\UN174591\_T\_05\_documents\avalog\_documents\MUN1745\_E\_0008\_Rev0.mxd

## 2. Overview of existing environment

### 2.1 Topography

The Project Area is relatively flat, however very gently slopes (<0.05%) towards the Chelodina Wetland to the north-west. The elevation of the Project Area is 22 m Australian Height Datum (AHD) at the southern boundary, and 18 m AHD at the northern boundary based on regional topographic contour data (DAFWA 2011).

### 2.2 Landform and Geology

The Project Area is located within the Swan Coastal Plain bioregion (SWA2 – Swan Coastal Plain subregion) of Western Australia (Mitchell et al. 2002). The Swan Coastal Plain comprises five major geomorphologic systems that lie parallel to the coast, namely (from west to east) the Quindalup Dunes, Spearwood Dunes, Bassendean Dunes, Pinjarra Plain and Ridge Hill Shelf (Churchward & McArthur 1980; Gibson *et al.* 1994). Each major system is composed of further subdivisions in the form of detailed geomorphologic units (Churchward & McArthur 1980; Semeniuk 1990; Gibson *et al.* 1994). Beard (1990) describes the Swan Coastal Plain as a low-lying coastal plain, often swampy, with sandhills also containing dissected country rising to the duricrusted Dandaragan plateau on Mesozoic, mainly sandy, yellow soils. The Survey Area is situated within the Bassendean Dunes formation.

### 2.3 Soils

Regional geological mapping (1:1,000,000) identified one geological unit within the Project Area; Bassendean Sand (Qdcb) which is characterised by 'basal conglomerate overlain by dune quartz sand with heavy mineral concentrations' (Geoscience Australia 2008).

### 2.4 Acid Sulfate Soils

Acid Sulfate Soils (ASS) are naturally occurring, iron-sulphide rich soils, sediments or organic substrates, formed under waterlogged conditions. If exposed to air, these sulphides can oxidise and release sulphuric acid and heavy metals. This process can occur due to drainage, dewatering or excavation.

A search of the Swan Coastal Plain ASS risk mapping (DBCA 2004) indicates that there is a 'moderate to low' risk of ASS occurring within 3 m of natural soil surface within the Project Area.

### 2.5 Hydrology

#### 2.5.1 Surface water

No surface water features have been identified within the Project Area.

The Geomorphic Wetlands, Swan Coastal Plain mapping (DBCA 2015) identifies two Conservation Category Wetlands (CCWs) within 200 m of the Project Area. These are:

- UFI 6513 (Chelodina Wetland), approximately 66 m to the north of the Project Area, and
- UFI14645, approximately 190 m south of the Project Area.

#### 2.5.2 Groundwater

Groundwater and surface water monitoring was undertaken by Strategen over a 12 month period in 2016/17. The results of the groundwater monitoring indicate that depth to groundwater across the Project Area is estimated at 0.5 to greater than 2 m, with a westerly to north-westerly groundwater flow direction towards Chelodina Wetland.

## 2.6 Vegetation and flora

On behalf of Murdoch University, Strategen undertook a Reconnaissance Flora and Vegetation Survey of the Project Area in November 2017, fulfilling the requirements of the Environmental Protection Authority (EPA) (2016), *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*. The results of the Reconnaissance Survey are detailed under the following sub-sections and a copy of the report is provided in Appendix 2.

### 2.6.1 Regional vegetation

#### System 6 and vegetation association mapping

Vegetation occurring within the region was initially mapped at a broad scale (1: 1 000 000) by Beard during the 1970s. This dataset has formed the basis of several regional mapping systems, including physiographic regions defined by Beard (1981); System 6 Vegetation Complex mapping undertaken by Heddle et al. (1980); the biogeographical region dataset (Interim Biogeographical Regionalisation for Australia) for Western Australia (DEE 2015a).

The Project Area is situated within vegetation association Bassendean 1001 – *Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina* (Beard 1990; Figure 2).

Based on regional vegetation complex mapping (Heddle et al. 1980) the Survey Area contains the Bassendean Central and South and Karrakatta Central and South vegetation complexes.

Vegetation statistics for the above vegetation system association and complexes are displayed in Table 2. As outlined in Section 2.6.4, the majority of the Project Area is in a 'Completely Degraded' condition and only contains 0.40 ha of intact vegetation potentially representative of Pre-European vegetation associations and complexes.

Table 2: Pre-European and current extent vegetation system association and complexes (Government of Western Australia 2017; 2017a)

Vegetation system association/ complex	Pre-European extent (ha)	Current extent (ha)	% remaining	% Current Extent Protected for Conservation
1001	57 410	12 791 (as at 2016)	22.28	2.8
Bassendean Central and South	87 476	22 462 (as at 2015)	25.68	1.86
Karrakatta Central and South	53 080	12 531 (as at 2015)	23.61	3.87

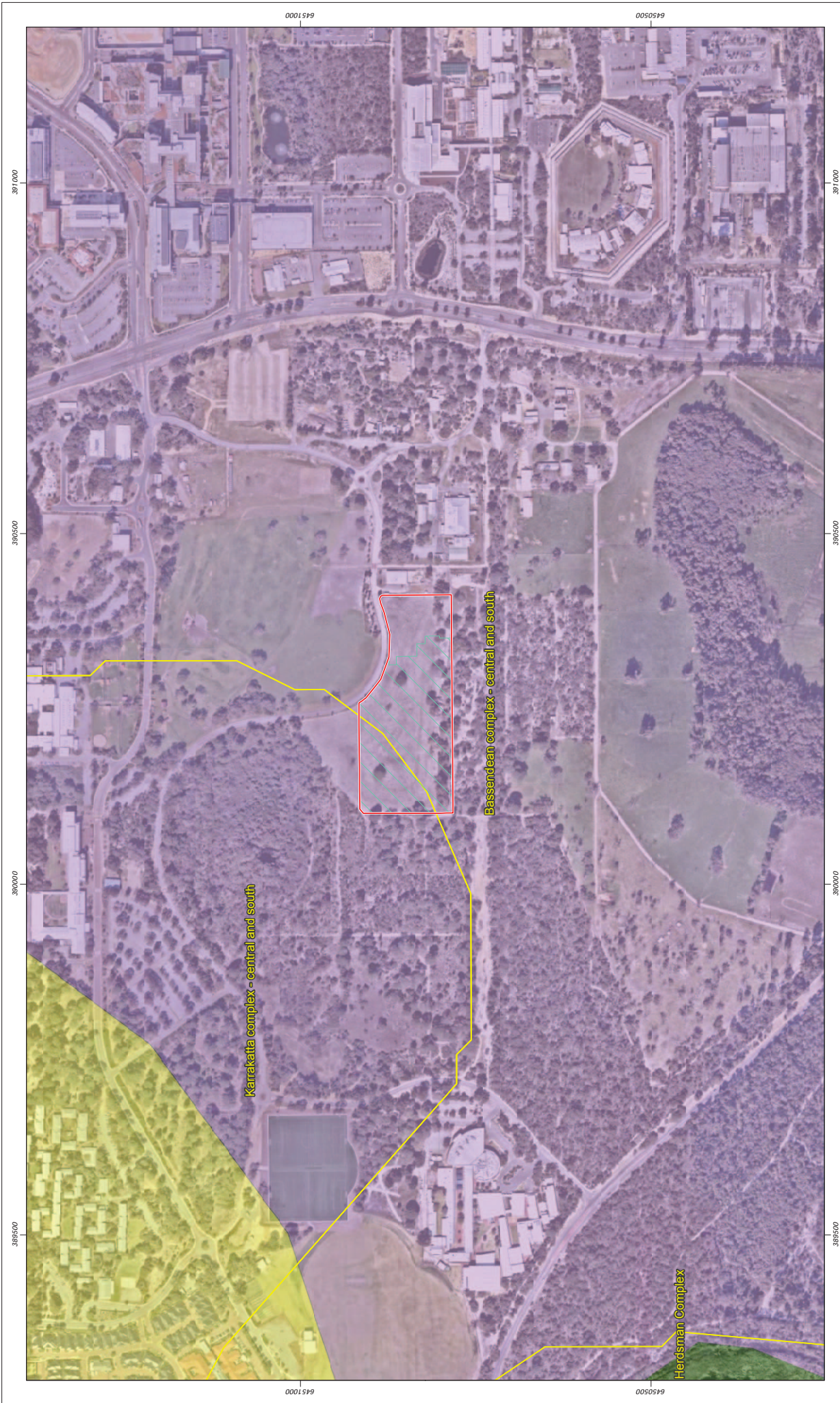


Figure 2: Regional vegetation mapping











Scale 1:5,000 at A3

0 50 100 150 m

Coordinate System: GDA 1984 MGA Zone 50  
 Note that positional errors may occur in some areas  
 Date: 7/03/2018  
 Author: J.Crute

Source: Topography: Geoscience Australia, 2011.  
 Path: C:\Comar\2017\MUN\UN174591\_T\_05\_documents\collap\_documents\UN1745\_E\_0004\_Beard.mxd

**Legend**

	Project area		Vegetation Class (Hedde)
	Clearing footprint		System association (Beard)
			Bassendean 1001
			Bassendean 125
			Speenwood 6

## 2.6.2 Native flora

A total of 16 native vascular plant taxa from 10 plant families were recorded within the Project Area. The majority of taxa were recorded within the Fabaceae (four taxa) and Myrtaceae (four taxa) families (see Appendix 2).

## 2.6.3 Threatened and Priority flora

The desktop assessment component of the Reconnaissance Survey (Appendix 2) identified seven Threatened flora and four Priority flora species that have been recorded in the regional area. Table 3 presents the Threatened and Priority flora potentially occurring within the Project Area, based on the desktop assessment.

A search of the DBCA Threatened and Priority Flora database indicated that the only records of conservation significant species within the Project Area are fungus species (*Amanita waduwalitu* and *A. preissii*) which fall outside the scope of the Reconnaissance survey, which covers vascular flora species only. No records of either Threatened or Priority vascular flora are known within the Survey Area.

Preferred or potential habitat for two Threatened flora species (*Caladenia huegelii* and *Drakaea micrantha*) was identified within the Survey Area. Although the survey was undertaken in Spring, the timing of the survey (November) was outside of the usual flowering period for these two species and therefore these species may not have been detectable at the time of the survey.

Although the desktop assessment identified potential habitat for *Caladenia huegelii*, the Survey Area was considered likely to be too degraded for this species to be present given the species tends to favour vegetation with dense undergrowth (DEC 2009).

*Drakaea micrantha* is usually found on cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed (Brown *et al.* 1998; Hearn *et al.* 2006). Survey Area is degraded and therefore potentially meets the condition element for *Drakaea micrantha* habitat suitability, however, the paddock grasses and weeds present are likely to outcompete the species. In addition, use of the paddock for grazing purposes also contributes to the conclusion that the species is highly unlikely to be present.

No flora species listed as Threatened under the *Wildlife Conservation Act 1950* (WC Act) or Priority Flora species as listed by the DBCA were recorded during the field survey.

Table 3: Threatened and Priority flora potentially occurring within the Project Area

Species	Conservation status		Description	Potential to occur
	EPBC Act	WC Act		
<i>Andersonia gracilis</i>	Endangered	T	A slender, erect or open straggly shrub, 10 to 100 cm high. Flowers are white to pink to purple from September to November. Habitat for this species occurs in white/grey sand, sandy clay, gravelly loam within winter-wet areas and near swamps (Western Australian Herbarium 1998-). The species occurs in damp black, sandy clay flats near swamps in open low heath with <i>Calothamnus hirsutus</i> (hairy clawflower), <i>Verticordia densiflora</i> (compact featherflower), <i>Kunzea recurva</i> (recurved kunzea) and <i>Banksia telmatiaea</i> over sedges.	<b>Unlikely</b> due to absence of preferred habitat.
<i>Caladenia huegelii</i>	Endangered	T	A slender orchid 30 to 50 cm tall. One or two striking flowers characterised by a greenish-cream lower petal with a maroon tip. Other petals are cream with red or pink suffusions. Habitat for this species occurs within well-drained, deep sandy soils in low mixed <i>Banksia</i> , <i>Allocasuarina</i> and Jarrah woodlands (Western Australian Herbarium 1998-, DEE 2017b).	<b>Possible</b> due to presence of preferred habitat.
<i>Dampiera triloba</i>	Not listed	P3	Erect perennial, herb or shrub, to 0.5 m high. Flowers blue between August and December (Western Australian Herbarium 1998-).	<b>Possible</b> . No information is available for this species, therefore the precautionary principle is applied.
<i>Diuris micrantha</i>	Vulnerable	T	A slender orchid to 60 cm tall. Flowers are yellow with reddish-brown markings and visible from September to October. Habitat for this species occurs within clay-loam substrates in winter-wet depressions or swamps (DEE 2017b).	<b>Unlikely</b> due to absence of preferred habitat.
<i>Diuris purdiei</i>	Endangered	T	A slender orchid to 0.35 m tall. Flowers are yellow and visible from September to October. Habitat for this species is grey-black sand substrates in winter-wet swamps which have high moisture (Western Australian Herbarium 1998-). <i>Diuris purdiei</i> occurs from Perth south to near the Whicher Range, within the Swan (Western Australia) Natural Resource Management Region. It grows on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath with scattered emergent <i>Melaleuca preissiana</i> , <i>Corymbia calophylla</i> , <i>E. marginata</i> and <i>Nuytsia floribunda</i> (DEE 2017b).	<b>Unlikely</b> due to absence of preferred habitat.

Species	Conservation status		Description	Potential to occur
	EPBC Act	WC Act		
<i>Drakaea elastica</i>	Endangered	T	A slender orchid to 30 cm tall with a prostrate, round to heart shaped leaf. Singular, bright green, glossy flower. <i>Drakaea elastica</i> is currently known only from the Swan Coastal Plain over a range of approximately 350 km between Cataby in the north and Busselton in the south. The species is known to grow on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps (DEE 2017b). The species typically grows in Banksia ( <i>Banksia menziesii</i> , <i>B. attenuata</i> and <i>B. ilicifolia</i> ) woodland or Spearwood ( <i>Kunzea glabrescens</i> ) thicket vegetation.	<b>Unlikely</b> due to absence of preferred habitat.
<i>Drakaea micrantha</i>	Vulnerable	T	A tuberous, terrestrial herb which has a diminutive red and yellow flower, 1.2–2.5 cm long, on a stem that grows to 30 cm. Flowering occurs from September to October. Its heart-shaped leaf, about 1.5 cm long, is silvery grey with prominent green veins. Habitat for this species occurs within cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed (Western Australian Herbarium 1998-, DEE 2017b).	<b>Possible</b> due to presence of preferred habitat.
<i>Eleocharis keigheryi</i>	Vulnerable	T	A rhizomatous, tufted/clumped perennial herb, reaching a maximum diameter of 40 cm. It has erect, smooth, green stems that are 20–40 cm tall and hollow, supporting cross bars that are 2 mm in diameter. This species grows in small clumps in a substrate of clay or sandy loam. This species is emergent in freshwater creeks, and transient waterbodies such as drainage lines and claypans in water to approximately 15 cm deep. Fringing woodland species and associated species include Swamp Sheoak ( <i>Casuarina obesa</i> ), Flooded Gum ( <i>Eucalyptus rudis</i> ), Red Robin Bush ( <i>Melaleuca lateritia</i> ), Swamp Paperbark ( <i>M. raphiophylla</i> ), Common Spike-sedge ( <i>Eleocharis acuta</i> ), <i>Aponogeton hexatepalus</i> , Veined Swamp Wallaby Grass ( <i>Amphibromus nervosus</i> ) and herbs such as Wurmbea, Tribonanthes and Leptocarpus spp. (Western Australian Herbarium 1998-, DotE 2015d).	<b>Unlikely</b> due to absence of preferred habitat.
<i>Jacksonia gracillima</i>	Not listed	P3	A spreading, compact shrub 100 cm tall and 100 cm wide. Flower buds are very angular and wings are orange with a darker orange keel. Habitat for this species occurs within winter wet Bassendean sands and littered, grey, peaty, loamy sand (Western Australian Herbarium 1998-).	<b>Unlikely</b> due to absence of preferred habitat.

Species	Conservation status		Description	Potential to occur
	EPBC Act	WC Act		
<i>Lepidosperma rostratum</i>	Endangered	P4	A rhizomatous, tufted perennial, grass-like or herb (sedge), 50 cm tall. Flowers are brown and flowering occurs from May to June. Habitat for this species occurs in peaty sand or clay and within seasonally wet swamps (Western Australian Herbarium 1998-, DEE 2017b).	<b>Unlikely</b> due to absence of preferred habitat.
<i>Styphelia filifolia</i>	Not listed	P3	No habitat information available.	<b>Possible</b> . No information is available for this species, therefore the precautionary principle is applied.
<i>Synaphea</i> sp. Fairbridge Farm	Critically Endangered	T	A dense, clumped sub-shrub 25–65 cm tall by 20–80 cm wide. Habitat for the species occurs on grey, clayey sand with lateritic pebbles in low woodland areas near winter-wet flats. Associated species include Running Postman ( <i>Kennedia prostrata</i> ), Grass Tree ( <i>Xanthorrhoea preissii</i> ), Cone Flowers ( <i>Conostylis</i> sp.) and Dwellingup Synaphea ( <i>Synaphea stenoloba</i> ). Two subpopulations occur in seasonally wet Swamp Teatree ( <i>Pericalymma ellipticum</i> ) dominated shrubland, with Teatrees ( <i>Leptospermum</i> sp.), Blue Lechenaultia ( <i>Lechenaultia biloba</i> ), Semaphore Sedge ( <i>Mesomelaena tetragona</i> ), <i>Adenanthos meisneri</i> , White Myrtle ( <i>Hypocalymma angustifolium</i> ) and Dwarf Sheoak ( <i>Allocasuarina humilis</i> ).	<b>Unlikely</b> due to absence of preferred habitat.



## 2.6.4 Vegetation type and condition

Two vegetation types were recorded within the Project Area (Table 4; Figure 3).

Table 4: Vegetation type within Clearing Footprint

Vegetation type	Description	Area (ha) within Survey Area
VT1	Open woodland of <i>Pinus</i> spp. and <i>Eucalyptus camaldulensis</i> over mixed native and introduced species	0.40
VT2	Closed grassland of planted pasture grasses with scattered <i>Pinus</i> sp., <i>Eucalyptus camaldulensis</i> , <i>Eucalyptus gomphocephala</i> and <i>Corymbia calophylla</i> .	2.50
<b>Total</b>		<b>2.90</b>

## 2.6.5 Vegetation condition

Vegetation condition ranged from Degraded (VT1) to Completely Degraded (VT2) (Figure 3). Vegetation condition appeared to have been affected by historical clearing, replanting with non-native species and invasion of weed species, in particular grasses (Keighery 1994). The area breakdown of vegetation condition is presented in Table 5.

Table 5: Area (ha) covered by each vegetation condition category within the Clearing Footprint

Condition rating	Area (ha) within Survey Area	Percentage of Survey Area
Degraded	0.40	14 %
Completely Degraded	2.50	86 %
<b>Total</b>	<b>2.90</b>	<b>100</b>

## 2.6.6 Threatened and Priority Ecological Communities

Table 6 presents the Threatened and Priority Ecological Communities identified within 5 km of the Survey Area.

Table 6: Threatened and Priority Ecological Communities identified within 5 km of the Survey Area

Community identifier	Description	Conservation status	
		WC Act	EPBC Act
Banksia woodlands of the Swan Coastal Plain	Woodland community associated with the Swan Coastal Plain of southwest Western Australia. A key diagnostic feature is a prominent tree layer of Banksia, with scattered eucalypts and other tree species often present among or emerging above the Banksia canopy. The understorey is a species rich mix of sclerophyllous shrubs, graminoids and forbs. The ecological community is characterised by a high endemism and considerable localised variation in species composition across its range.	Various listings depending on floristic community type	Endangered
Subtropical and Temperate Coastal Saltmarsh	Variable community of salt-tolerant vegetation including grasses, herbs, sedges, rushes and shrubs, occurring within a relatively narrow margin of the Australian coastline within the subtropical and temperate climatic zones.	Priority 3	Vulnerable
SCP21c / component of broader Banksia woodlands of the Swan Coastal Plain community	Low lying <i>Banksia attenuata</i> woodlands or shrublands	Priority 3	Vulnerable

Community identifier	Description	Conservation status	
SCP22 / component of broader Banksia woodlands of the Swan Coastal Plain community	<i>Banksia ilicifolia</i> woodlands	Priority 3	Vulnerable
Wooded waterbird wetlands	Wooded wetlands that support colonial waterbird nesting areas. Located at Chandala, Booragoon Lake, unnamed wetland near Pinjarra, McCarleys Swamp.	Priority 2	Not listed

Database records indicate that the buffers of several instances of the Banksia Woodlands of the Swan Coastal Plain TEC overlap the Project Area; however, field survey results indicated the community was not present. The nearest location of the community lies immediately to the south of the Project Area.

No other PECs or TECs were considered to be represented by the vegetation within the Project Area.



Figure 3: Vegetation types, condition and Black Cockatoo habitat trees

Scale 1:1,000 at A3  
 0 10 20 30 m  
 Coordinate System: GDA 1984 MGA Zone 50  
 Note that positional errors may occur in some areas  
 Date: 7/03/2018  
 Author: DWhite  
 Source: Topography: Geoscience Australia, 2011.  
 Path: C:\Comar\2017\MURKUN\174891\_06\_documents\acklag\_documents\MU1748\_0018\_revA.mxd

## 2.7 Terrestrial fauna

Database searches of *NatureMap* and the Australian Department of the Environment and Energy (DEE) Protected Matters Database were undertaken as part of the flora vegetation and fauna habitat survey to determine the likelihood of any Threatened or Priority fauna species within the Project Area, including a buffer around the boundary. The likelihood of these species occurring within the Project Area is presented in Table 6 of Appendix 2.

The following species of State conservation significance were considered likely to occur within the Project Area based on the habitat assessment:

- *Calyptorhynchus banksii* subsp. *naso* (Forest Red-tailed Black-Cockatoo [FRTBC]; Threatened)
- *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo [CBC], short-billed black-cockatoo; Threatened))
- *Isodon obesulus* (Southern Brown Bandicoot; P4).

*Lerista lineata* (Perth Slider, Lined Skink; P3) was considered to potentially occur within the Project Area.

### 2.7.1 Black cockatoo habitat

The vegetation types identified within the Project Area were considered to provide minimal foraging habit for black cockatoos.

Habitat foraging quality of each vegetation type is shown in Table 8 and was determined using the scale described in Table 7.

Table 7: 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.

Table 8: Vegetation types and black cockatoo foraging species within the Clearing Footprint

Vegetation type	Black cockatoo foraging species	Foraging quality	Area (ha) within Survey Area
VT1	<u>CBC</u> – <i>Acacia saligna</i> , <i>Banksia attenuata</i> , <i>Corymbia calophylla</i> , <i>Eucalyptus marginata</i> , <i>Xanthorrhoea preissii</i> <u>FRTBC</u> - <i>Corymbia calophylla</i> , <i>Eucalyptus marginata</i> .	<u>CBC</u> - Very poor <u>FRTBC</u> – Very poor	0.40
VT2	<u>CBC</u> – <i>Corymbia calophylla</i> , <i>Eucalyptus marginata</i> , <i>Eucalyptus gomphocephala</i> , <i>Xanthorrhoea preissii</i> <u>FRTBC</u> – <i>Corymbia calophylla</i> , <i>Eucalyptus marginata</i> .	<u>CBC</u> - Very poor <u>FRTBC</u> – Very poor	2.50
<b>TOTAL</b>			<b>2.90</b>

Three potential breeding habitat trees were recorded within or near the Survey Area (*Corymbia calophylla* and *Eucalyptus gomphocephala*) (Figure 3). No hollows were observed in any of the three trees.

### 3. Assessment against the ten clearing principles

An assessment of the proposed clearing against the ten clearing principles is provided in Table 9. The ten clearing principles are outlined in Schedule 5 of the EP Act and assessment is in accordance with Department of Water and Environmental Regulation guidelines (DER 2014).

This assessment demonstrates that the proposed removal of 0.40 ha of intact native vegetation and up to 15 additional native trees, is not at variance with the any of the clearing principles.

Table 9: Assessment of native vegetation clearing in accordance with the ten clearing principles

Clearing principle	Assessment	Outcome
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p>A total of 16 native vascular plant taxa from 10 plant families were recorded within the Project Area (Strategen 2018). The relatively low number of taxa recorded was attributed to the small size and the degraded nature of the Project Area.</p> <p>No flora species listed as Threatened under the WC Act or Priority Flora species as listed by the DBCA were recorded during the field survey. However, the surveyed identified the potential for <i>Caladenia huegelii</i> (T), <i>Drakaea micrantha</i> (T), <i>Dampiera triloba</i> (P3), <i>Styphelia filifolia</i> (P3) based on preferred habitat and survey timing.</p> <p>The vegetation within the Project Area is not considered representative of any PECs or TECs. The Pre-European vegetation system association and complexes within which the Project Area is mapped, each have above 20% remaining which is above the 10% threshold for 'constrained areas'.</p> <p>Given the information above, vegetation within the Project Area is not considered to comprises a high level of biological diversity and as such clearing is not expected to be at variance to this principle.</p>	Not 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 broader Murdoch University campus is known to provide breeding, foraging and roosting habitat for black cockatoos and habitat for the Southern Brown Bandicoot.</p> <p>The flora, vegetation and fauna survey (Strategen 2018) identified 2.90 ha of 'Very Poor' potential foraging habitat for FRTBC and CBC within the Project Area. Of this vegetation only 0.40 ha comprises intact vegetation which may provide preferable habitat for the Southern Brown Bandicoot in comparison to the remaining 2.50 ha of open and degraded area which comprises scattered native and exotic trees over a managed grass understory.</p> <p>The Project Area is not considered to provide favourable habitat in relation to the surrounding area, which includes intact vegetation in conservation areas such as Chelodina reserve.</p> <p>The survey also identified three potential breeding trees within the Project Area, however no hollows were evident and therefore breeding is not expected to occur within the Project Area. These trees are located within the eastern portion of the Project Area within the proposed building footprints and thus lie in the area exempt under Regulation 5 Item 1 from the requirement for a NVCP.</p> <p>The Project Area is not considered to represent or be necessary for the maintenance of significant habitat critical for fauna species. Therefore clearing of 0.40 ha of intact vegetation and several scattered paddock trees (including exotic species) is unlikely to be at variance to this principle.</p>	Not at variance.
c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	<p>No rare flora was recorded in the Project Area during the flora and vegetation assessment which was undertaken during the prime flowering time for majority of species within the region (Strategen 2018).</p> <p>The field survey was undertaken outside of the usual flowering period of <i>Caladenia huegelii</i> (T) and <i>Drakaea micrantha</i> (T), however these species were not considered likely to occur within the Project Area based on their preferred habitat, and competition with other weed/ grass species.</p> <p>Given that the clearing area is small and unlikely to provide favourable habitat for rare flora, and that no rare flora were recorded during the field survey or have previously been recorded in the Survey Area, the proposed clearing is unlikely to be at variance with this principal.</p>	Not at variance.

Clearing principle	Assessment	Outcome
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.	The vegetation identified within the Strategen (2018) survey area did not resemble a known TEC or PEC. As a result the proposed clearing will not be at variance with this principle.	Not at variance.
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.	A total 0.40 ha of intact vegetation and several (<10) additional scattered trees will be cleared to facilitate development, which is not considered to be a significant remnant. The Pre-European vegetation system association and complexes within which the Project Area is mapped, each have above 20% remaining which is above the above the 10% threshold for 'constrained areas'. The proposed clearing is not expected to result in a significant impact at the local or regional scale due to the small scale of clearing and Degraded condition of vegetation. Furthermore, the proposed clearing area encompasses previously disturbed areas, further reducing impacts on native vegetation. Given the above, the proposed clearing is not expected to be at variance to this principle.	Not at variance.
f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	The proposed clearing will not occur within or immediately adjacent to a watercourse or wetland. The closest wetland is located approximately 66 m to the north of the proposed clearing area. Therefore the proposed clearing is not considered at variance to this principle.	Not at variance.
g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The proposed clearing will be limited to a small, Degraded patch of vegetation (0.40 ha, plus up to 10 native trees). The Project Area has a very low grade and will be covered by buildings, pavements and other formalised and maintained areas associated with the SMCRH, posing a low risk of water or wind based erosion. In consideration of the above, the clearing is not likely to cause appreciable land degradation due to: <ul style="list-style-type: none"> <li>• the small and degraded area of total proposed clearing</li> <li>• the large extent of vegetation that would remain within the local and regional areas</li> <li>• general construction environmental management measures being implemented.</li> </ul>	Not 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.	The Project Area occurs within a mapped regional ecological linkage (link identification 50). However, the Project Area comprises a very small component of vegetation in the local area in comparison to intact vegetation to the west and removal of vegetation within the Project Area is unlikely to impact on the viability of the regional ecological linkage. The Project Area is not located within a Bush Forever Site or other conservation area. The nearest Bush Forever Site (244) is located approximately 550 m to the south-west of the site. Chelodina Reserve is located to the north of the Project Area. No clearing is proposed within or immediately adjacent to this Reserve. Given the above information the proposed clearing is not considered to be at variance to principle h.	Not 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.	No surface water features have been identified within the Project Area, and stormwater readily filtrates through the porous, sandy soils of the Bassendean Sands. The vegetation proposed to be cleared is minimal (0.40 ha, plus up to 15 native trees) and in a Degraded condition. As such, the proposed clearing is not expected to affect surface water or groundwater quality given the remaining areas of intact native vegetation in the local area. Given the above information, the proposed clearing is not expected to be at variance to this principle.	Not at variance.

Clearing principle	Assessment	Outcome
<p>j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.</p>	<p>Depth to groundwater across the Project Area is estimated at 0.5 to greater than 2 m. Given the porous, sandy nature of the soils within the Project Area, stormwater readily infiltrates.</p> <p>In addition to the stormwater and groundwater characteristics above, the small scale of the proposed clearing, is highly unlikely to cause, or exacerbate, the incidence of flooding and therefore is not considered to be at variance to this principle.</p>	<p>Not at variance.</p>

## **4. Environmental approval 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 s 51 E of the EP Act
- Development Application in accordance with City of Melville's requirements, including an associated Bushfire Management Plan in accordance with State Planning Policy 3.7.

### **4.2 Environmental mitigation and management**

The location of the proposed clearing area has been selected with consideration of the existing environment and quality of native vegetation. As such, the development has been located in an area that is largely disturbed (Figure 3), particularly in comparison to the large areas of intact vegetation in the surrounding area including Chelodina Reserve and Bush Forever Site 244.

In order to manage potential impacts associated with the proposed clearing, Murdoch University will implement general construction environmental management measures, including but not limited to clear demarcation of the clearing boundary as to not impact upon adjacent vegetation, and site inductions for all contractors to inform of construction environmental management measures.



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