



COTERRA
ENVIRONMENT



Hillview Bushland Reserve
Management Plan

Lot 4 Berwick Street, East Victoria Park

Rev 1, October 2019

CALIBRE | COMMITMENT | COLLABORATION

Hillview Bushland Reserve Management Plan

Rev 1, October 2019

This report was prepared by:

Coterra Pty Ltd trading as COTERRA ENVIRONMENT
ABN: 92 143 411 456

Our Ref: TVPHBM01
Author(s): K. Cooper / S. Harley
Reviewer: S. Harley / K. Watts
Report Version: Revision 1
Date: October, 2019

This report was prepared for:

Town of Victoria Park
99 Shepperton Road
Victoria Park WA 6101

Notice

This document is and shall remain the property of Coterra Environment. The document may only be used for the purposes for which it was commissioned. Unauthorised copying or use of this document is prohibited.

EXECUTIVE SUMMARY

Hillview Bushland (the site) covers approximately 1.01 ha and is located at 386 (Lot 4) Berwick Street East Victoria Park (Figure 1). The site is currently zoned 'Urban' under the Metropolitan Region Scheme (MRS) and 'Parks and Recreation' under the Town of Victoria Park's (ToVP) Town Planning Scheme No. 1.

The engagement of stakeholders during the development of this management plan was vital to identifying the main threats influencing the condition of the bushland, and an opportunity to develop a shared vision and future management direction for the area. A community workshop was undertaken in January 2019, in where there was an overwhelming response to the conservation value of the site.

A number of threatening processes were identified during the community consultation processes which may influence the condition and diversity of flora and fauna within the Hillview bushland. The key threatening processes included:

- Potential developments surrounding the site – further infrastructure works (Main Roads WA) and the redevelopment of the neighbouring national trust site.
- Potential development of the site given the current MRS zoning (Urban).
- Lack of/ insufficient management on site.
- Human disrespect (i.e. rubbish dumping).
- Presence of weed species.
- Small size of the site - impact of edge effects on maintaining genetic diversity in the Banksia woodland (species present and condition).

Based on the existing biophysical environment and the outcomes of the community consultation, there was a strong consensus that conservation of the biodiversity and aesthetic values of the site should be given priority in the development of the management plan. In terms of usage of the site, passive activities (i.e. bird watching, walking trails) were supported.

The following vision goals have been developed for the site following the consultation process:

- Conservation
 - Protect and enhance the sites natural values including biodiversity through the implementation of appropriate management measures such as weed control, revegetation and monitoring programs.*
- Education
 - Facilitate informed appreciation of the sites biophysical environs amongst the community through the provision of appropriate facilities (i.e. education signage and formalised pedestrian access).*

- Social

Promote community ownership of the site through liaison and coordinated management, and creation of a 'sense of place' for the local community.

A Concept Plan has been developed for the site to provide direction for the management of the site to achieve these visions. Management Actions and the roles and responsibilities for implementation of the Concept Plan have been developed. It is recommended that this management plan be reviewed every five years.

TABLE OF CONTENTS		Page
1.0	BACKGROUND.....	1
1.1	Overview.....	1
1.2	Location and Classification.....	1
1.3	Purpose of Management Plan	1
1.4	Associated Documents	1
2.0	STAKEHOLDER CONSULTATION	2
2.1	Consultation Process.....	2
2.1.1	Overview	2
2.1.2	Community Consultation and Workshop	2
2.1.3	Consultation Workshop Outcomes	2
3.0	BIOPHYSICAL AND SOCIAL ENVIRONMENT	3
3.1	Surrounding land-uses.....	3
3.2	Climate	3
3.3	Topography, Geology and Landforms	3
3.4	Hydrology.....	3
3.4.1	Groundwater	3
3.4.2	Surface Water.....	4
3.5	Vegetation and Flora	4
3.5.1	Overview	4
3.5.2	Flora and Vegetation Survey.....	6
3.5.3	Banksia Woodlands Swan Coastal Plan Threatened Ecological Community	8
3.6	Dieback.....	8
3.7	Fauna and Habitat.....	8
3.8	Ecological Linkage and Local Natural Area(s)	9
3.9	Fire risk.....	10
3.10	Heritage	10
4.0	MANAGEMENT DIRECTION.....	12



4.1	Threatening Processes	12
4.2	Ecological Restoration	13
4.3	Concept Plan	14
4.3.1	Bushfire Risk Considerations.....	14
4.3.2	Controlled Access, Fencing and Signage	14
4.3.3	Weed Control	15
4.3.4	Areas Proposed for Revegetation	16
4.3.5	Recommended Species List	16
4.3.6	Planting Requirements	16
4.3.7	Performance Targets.....	17
4.3.8	Monitoring, Assessment and Reporting	17
4.3.9	Contingency.....	17
5.0	IMPLEMENTATION.....	20
5.1	Partnerships.....	20
5.2	Term of Management Plan	20
5.3	Prioritisation and Management Protocols (Implementation Table).....	20
6.0	REFERENCES	23

TABLES (Compiled within the report)	Page
Table 1: Likelihood of Threatened and Priority Flora species occurring within the vicinity of the site.....	4
Table 2: Vegetation condition scale (Keighery, 1994)	7
Table 3: Area (ha) covered by each vegetation condition category within the site.....	7
Table 4: Likelihood of Threatened and Priority Fauna species occurring within the vicinity of the site.....	8
Table 5: Contingency Actions	17
Table 6: Indicative Rehabilitation Schedule	19
Table 7: Implementation of Management Actions	21

PLATES (Compiled within the report)	Page
Plate 1: <i>Anigozanthos manglesii</i> (Mangles Kangaroo Paw)	7
Plate 2: <i>Banksia attenuata</i> (Candlestick Banksia)	7
Plate 3: Designed sculpture located within the north west section of the site.	11
Plate 4: Area of Kensington Bushland affected by fire (23/02/2016) Source: TVP-Backheuer	14
Plate 5: Area of Kensington Bushland affect by fire (17/02/2019) Source: TVP-Backheuer	14
Plate 6: Example of ‘conservation’ style fencing	14
Plate 7: Example of Environmental Education Signage (source: Interpretive Design 2018)	15

FIGURES (Compiled at the end of the report)

- Figure 1: Site Location
- Figure 2: Topography and geology
- Figure 3: Regional Groundwater
- Figure 4: Vegetation Unit and Condition Mapping
- Figure 5: Ecological Linkage and Local Natural Areas
- Figure 6: Concept Plan

APPENDICES

- Appendix A: Consultation Workshop Outcomes
- Appendix B: DBCA and DEE Flora and Fauna Database Results
- Appendix C: Native Flora Species List
- Appendix D: Introduced (Exotic) Taxa
- Appendix E: Key diagnostic criteria for the Banksia woodlands of the Swan Coastal Plain TEC
- Appendix F: Perth Biodiversity Project inventory of the bird species
- Appendix G: Bushfire Management Strategies
- Appendix H: Recommended Weed Management
- Appendix I: Recommended Species List (APACE)

1.0 BACKGROUND

1.1 Overview

The Town of Victoria Park (ToVP) Strategic Environmental Management Plan (EMP) 2013-2018 was developed by the town as a primary planning document to guide decision making for land management and natural areas and biodiversity within its jurisdiction. One of the EMPs strategic objectives is to:

“Ensure the effective maintenance, protection and enhancement of the Towns biodiversity”

Remnant vegetation is an ecologically and culturally valuable asset to the ToVP. In 2002, Council resolved to develop a Remnant Vegetation Management Plan for remnant native vegetation within the Town to ensure that it is protected and enhanced for the benefit of future generations¹.

In 2005, a management plan was developed for the Hillview Bushland (the site) by E.A Griffins and Associates for the Friends of Hillview Community Bushland, which created the foundations for proposed environmental management within the site.

1.2 Location and Classification

Hillview Bushland (the site) is located at 386 (Lot 4, Vol. 2139 Fol.791) Berwick Street East Victoria Park and covers an area of approximately 1.01 ha (Figure 1). The site is currently zoned ‘Urban’ under the Metropolitan Region Scheme (MRS) and ‘Parks and Recreation’ under the Town of Victoria Park’s (ToVP) Town Planning Scheme No. 1.

The site is entered by The National Trust of Australia (WA) in its register of important places and is of significant environmental and scientific value to the community.

1.3 Purpose of Management Plan

The purpose of preparing this management plan is to:

1. identify current and future potential risks and pressures; and
2. to develop management strategies and recommendations for the site.

1.4 Associated Documents

The ToVP has several reports, guidelines and policies which are relevant in the support of this management plan, which include:

- Environmental Plan (2013-2018) (ToVP, 2013).
- Urban Forest Strategy (ToVP, 2018).

¹ It is noted that 2002, Remnant Vegetation Management Plan will be reviewed in the near future.

2.0 STAKEHOLDER CONSULTATION

2.1 Consultation Process

2.1.1 Overview

The engagement of stakeholders during the development of this management plan was vital to identifying the main threats influencing the condition of the bushland, and an opportunity to develop a shared vision and future management direction for the area.

Consultation was intended to capture input from all relevant parties, allowing the process to be inclusive of the local community. Importantly, consultation sought to ensure that the community, as well as the ToVP, had an opportunity to contribute and have a sense of ownership over the recommendations made for the management of the site.

2.1.2 Community Consultation and Workshop

The ToVP's Environmental Officer, Community Liaison Officer and Coterra Environment, met with two representatives from the Community Forum Victoria Park in November 2018, to discuss the project and the objectives of developing the management plan for the site. An outline for a community workshop was presented to the representatives. Feedback on the workshop outline was received from the President of the Community Forum Victoria Park on 13 December 2018.

The ToVP via their 'Your thoughts' internet community consultation portal, advertised a survey request which concluded on 4 February 2019.

A community workshop was held at the ToVP council office on 31 January 2019. Participation of the workshop was invited through local newspaper advertisements and 'Your thoughts' internet community consultation portal. Three main group exercises were completed during the workshop as described below:

- First phase - aimed at identified the matters currently influencing or threatening the bushland area.
- Second phase - aimed at discussing the 5-year vision for the bushland area.
- Third phase - discussed how do we achieve the 5-year vision for the bushland (based on no money or timeframe limitations)

2.1.3 Consultation Workshop Outcomes

Consultation undertaken with community stakeholders overwhelming highlighted the conservation value of the site. As such there was a strong desire to preserve the bushland and enhance its existing condition and level of biodiversity. In terms of usage of the site, passive activities (i.e. bird watching, walking trails) were supported.

A summary of the exercises of the workshop are provided within Appendix A.

3.0 BIOPHYSICAL AND SOCIAL ENVIRONMENT

3.1 Surrounding land-uses

The site is located within an urban context with existing urban development (R30) located north, east and south of the site. The National Archives of Australia is adjacent to the site. There is a Western Power high voltage easement within the eastern portion of the site. The National Archives of Australia is proposed to be redeveloped to accommodate urban development. The site is located between several recreational parks; Higgins Park (0.5km south), Fraser Park (0.5km west) and Edward Millian Reserve (0.1km north east).

3.2 Climate

The site experiences a Mediterranean climate characterised by cool, wet winters and warm to hot, dry summers. The nearest Bureau of Meteorology (BoM) weather station at Perth Metro (Station No. 9225) provides average monthly temperature and rainfall statistics. Average annual rainfall recorded at Perth Metro since 1994 is 733.2 mm (BoM 2019). While rainfall may occur at any time of year; most occurs in winter (June [124.5mm], July [145.9mm] and August [126.0mm]).

Highest temperatures occur between December and March, with average monthly maximums ranging from 29.1°C in December to 31.6°C in February (BoM 2019). Lowest temperatures occur between June and August, with average monthly minimums ranging from 18.4 °C in July to 19.4 °C in June (BoM 2019).

3.3 Topography, Geology and Landforms

The topography on site ranges from approximately 28mAHD in the south to 26mAHD in the north (Figure 2).

The site is located within the Bassendean Dune System which is generally consists of low relief, often with broad swales or relatively flat sand sheets between low dunes. Soils are predominantly deep grey leached quartz sands (DPaW, no date). Regional environmental geology mapping indicates that the site consists of sand (S₈) (Gozzard 1986) (Figure 2).

3.4 Hydrology

3.4.1 Groundwater

The Department of Water and Environmental Regulation (DWER) Perth groundwater Atlas indicates that groundwater is approximately 18-20m below ground level (bgl) and that regional groundwater flows in a south west direction toward the Canning/Swan River interface (Figure 3).

There are three aquifers of significance underlying the site; each assigned the name of the major geological unit in which the aquifer occurs (DWER 2018), which includes:

- Perth- Superficial Swan Aquifer (Town of Vic Park) (unconfined)- allocation available.
- Perth - Leederville Aquifer (Perth south confined) - fully allocated.
- Perth Yarragadee North (Perth south confined) - fully allocated (DWER, 2019).

There are currently no groundwater licences issued for the site.

The site is not within a Public Drinking Water Source Area (PDWSA).

3.4.2 Surface Water

There are no geomorphic wetlands or other surface water features within or adjacent to the site (WALGA, 2018).

3.5 Vegetation and Flora

3.5.1 Overview

The site is located within the within the Drummond Botanical Subdistrict (Beard 1990), within the Swan Coastal Plain 2 IBRA subregion (SWA02) (Mitchell *et al*, 2002). Regionally, Beard (1980) vegetation association mapping indicates that the site is within the 1001- Medium very sparse woodland; jarrah, with low woodland; banksia and casuarina.

Heddle *et al* (1980) broadly mapped vegetation complexes across the Swan Coastal Plain. The site comprises the Bassendean Complex - Central and South which is characteristic of vegetation which ranges from woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. This area includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth (Heddle *et al* 1980).

WALGA (2018) estimates that there is approximately 0.8ha of remnant vegetation within the site, and that in regard to the Bassendean Complex - Central and South vegetation complex there is less than 30% of pre-European extent remaining and less than 10% being protected within the Swan Coastal Plain and Jarrah Forest IBRA region.

The Department of Biodiversity Conservation and Attractions (DBCA) NatureMap and the Department of Environment and Energy (DEE) Environment Protection and Biodiversity Conservation (EPBC) Act Protected Matters Report with 1km buffers was searched for threatened and priority flora and communities which may occur within the vicinity of the site (Appendix B).

Table 1: Likelihood of Threatened and Priority Flora species occurring within the vicinity of the site

Species	Conservation status		Habitat	Likelihood of presence within the site
	WC Act	EPBC Act		



Species	Conservation status		Habitat	Likelihood of presence within the site
	WC Act	EPBC Act		
<i>Andersonia gracilis</i> (Slender Andersonia)	T	E	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps. Distribution: Canning, Dandaragan, Gingin, Gosnells (FloraBase, 2018).	Unlikely - no suitable habitat on site. Not recorded within the site survey (Coterra, 2018).
<i>Diuris micrantha</i> (Dwarf Bee-orchid)	T	V	Dwarf Bee-orchid is known from seven populations, from east of Kwinana and south towards the Frankland area, Western Australia. It is found in small populations, on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps. The bases of the flowering plants are often covered with shallow water (EBPC Conservation Advice, 2008). Distribution within Harvey, Kwinana, West Arthur, Williams.	Unlikely - no suitable habitat on site. Not recorded within the site survey (Coterra, 2018).
<i>Drakaea elastica</i> (Glossy-leafed Hammer Orchid)	T	E	White or grey sand. Low-lying situations adjoining winter-wet swamps (florabase, 2018). Distribution within Busselton, Capel, Dandaragan, Harvey, Kwinana, Murray, Rockingham.	Unlikely - no suitable habitat on site. Not recorded within the site survey (Coterra 2018).
<i>Drakaea micrantha</i> (Dwarf Hammer-orchid)	T	V	White-grey sand. The Dwarf Hammer-orchid occurs in infertile grey sands, in Banksia, Jarrah (<i>Eucalyptus marginata</i>) and Common Sheoak (<i>Allocasuarina fraseriana</i>) woodland or forest. It is often found under thickets of Spearwood (<i>Kunzea ericifolia</i>) with Flying Duck orchid (<i>Paracaleana nigrita</i>) and other <i>Drakaea</i> species Distribution within Albany, Armadale, Augusta-Margaret River, Busselton, Canning, Capel, Denmark, Harvey, Manjimup, Murray, Nannup, Plantagenet	Unlikely - no suitable habitat on site Not recorded within the site survey (Coterra, 2018).
<i>Dodonaea hackettiana</i> (Hackett's Hoppbush)	P4	-	Sand. Outcropping limestone. Distribution: Cockburn, Fremantle, Gingin, Kwinana, Perth, Rockingham, South Perth.	Likely - suitable habitat on site <i>Dodonaea ?hackettiana</i> recorded within the site survey (Coterra, 2018).
<i>Diuris purdiei</i> (Purdie's Donkey-orchid)	E	V	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>Eucalyptus calophylla</i> , <i>E. marginata</i> and <i>Nuytsia floribunda</i>	Unlikely - not suitable habitat on site. Not recorded within the site survey (Coterra, 2018).
<i>Eremophila glabra</i> subsp. <i>Chlorella</i> (Emu Bush)	T	E	Sandy clay. Winter-wet depressions. Distribution: Canning, Carnamah, Dandaragan, Gingin, Gosnells, Moora, Victoria Plains (FloraBase)	Unlikely - not suitable habitat on site. Not recorded within the site survey (Coterra, 2018).
<i>Grevillea curviloba</i> subsp. <i>Incurve</i> (Narrow curved-leaf Grevillea)	T	E	Sand, sandy loam. Winter-wet heath. Distribution: Chittering, Gingin, Swan (FloraBase, 2018)	Unlikely - not suitable habitat on site. Not recorded within the site survey (Coterra, 2018).
<i>Lepidosperma rostratum</i> (Beaked Lepidosperma)	T	E	Peaty sand, clay. Distribution: Armadale, Gingin, Gosnells, Serpentine-Jarrahdale, Victoria Plains (FloraBase, 2018).	Unlikely - not suitable habitat on site. Not recorded within the site survey (Coterra, 2018).
<i>Macarthuria keigheryi</i>	T	E	White or grey sand. Belmont, Canning, Dandaragan, Gingin, Kalamunda (FloraBase, 2018).	Potential suitable habitat on site.



Species	Conservation status		Habitat	Likelihood of presence within the site
	WC Act	EPBC Act		
<i>Synaphea</i> sp. Fairbridge Farm (Selena's Synaphea)	T	CE	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses. Distribution: Canning, Dardanup, Murray, Serpentine-Jarrahdale.	Unlikely - not suitable habitat on site.
<i>Thelymitra dedmaniarum</i> (Cinnamon Sun Orchid)	T	E	Granite. Distribution: Gingin, Swan.	Unlikely - not suitable habitat on site and outside distribution area.

3.5.2 Flora and Vegetation Survey

A flora and vegetation survey was conducted according to standards set out in the EPA's Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016). The assessment of flora and vegetation within the site was undertaken by Coterra's Senior Botanist on 26 September 2018.

The site was traversed on foot to record changes in vegetation structure and type, and three 10m x 10m vegetation quadrats were surveyed to assess vegetation type of site.

A total of 61 native vascular plant taxa from 28 plant families were recorded from quadrats within the survey area. The majority of taxa were recorded within the Fabaceae, Myrtaceae and Proteaceae families (Appendix C) (Plates 1 and 2).

No Threatened flora species as listed under the EPBC Act were recorded within the survey area. No Threatened flora species pursuant to Biodiversity and Conservation Act 2016 (previously Schedule 1 of the Wildlife Conservation Act 1950) and as listed by DBCA. One priority species, *Dodonaea ?hackettiana* (P4) was recorded within the site.

A total of 27 introduced (exotic) taxa were recorded within the site (Appendix D). One species **Moraea flaccida* (One-leaf Cape Tulip) is a 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 Primary Industries and Regional Development (2019).

One vegetation unit was defined within the site and is described as:

- Low Open Woodland to Low Open Forest of *Banksia attenuata* and/or *Banksia menziesii* often with *Nuytsia floribunda*, over Open Shrubland to Shrubland of *Hibbertia hypericoides* and *Allocasuarina humilis*, often with *Stirlingia latifolia* and *Melaleuca seriata*, over Sedgeland of *Lyginia imberbis*, *Desmocladius flexuosus*, and *Laxmannia squarrosa*, sometimes with Open Grassland of introduced grasses, in grey sands.

The site comprises both disturbed and undisturbed vegetation. Weed invasion is the principle evidence of disturbance with heavier infestations present along remnant vegetation and road/firebreak interface due to edge effects within an urban context. As such, vegetation condition within the survey area ranged from 'Good' to 'Very Good' to 'Degraded' (Keighery 1994; Figure 4; Table 2).

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.
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.

Approximately, 13% of the site has been recorded in 'Good' condition, 42.8% in 'Good' to 'Degraded' condition, and 19.3% in 'Degraded' condition (Figure 4, Table 3).

Table 3: Area (ha) covered by each vegetation condition category within the site

Vegetation Condition	Area (ha)	Percentage (%) of the site
Good to Very Good	0.08	7.92
Good	0.13	12.87
Good to Degraded	0.42	41.58
Degraded	0.19	18.81
Cleared	0.19	18.81
Grand Total	1.01	100



Plate 1: *Anigozanthos manglesii* (Mangles Kangaroo Paw)



Plate 2: *Banksia attenuata* (Candlestick Banksia)

3.5.3 Banksia Woodlands Swan Coastal Plan Threatened Ecological Community

WALGA (2018) indicates that Banksia Woodlands of the Swan Coastal Plain (SCP) Threatened Ecology Community (TEC) is likely to occur within the site. The Vegetation and flora survey observations and quadrat data collected indicates that the inferred Floristic Community Type (FCT) 23a occurs within the site. This FCT can be described as FCT 23a - Central *Banksia attenuata* - *Banksia menziesii* woodlands (Gibson et al., 1994) which is representative of the Banksia Woodlands SCP TEC. FCT 23a is not listed as threatened or priority in WA (TSSC, 2016).

Vegetation within the site was assessed against the key diagnostic criteria for the Banksia woodlands of the Swan Coastal Plain TEC (TSSC 2016). The vegetation type within the site was found to meet most of the diagnostic criteria provided in the approved conservation advice for the Banksia woodlands of the SCP TEC (refer to Appendix E). TSSC (2016) notes that for a remnant Banksia Woodlands area to be considered as part of the EPBC TEC a patch should meet at least the 'Good' condition category (2ha - e.g. 200m x 100m). As the remnant area only includes 0.21ha of vegetation in 'Good' or better condition, the patch would not qualify as Banksia Woodlands SCP TEC.

3.6 Dieback

A Dieback (*Phytophthora cinnamomi*) assessment has not been completed for the reserve, hence the status on site is currently unknown. A survey can be undertaken to determine whether dieback is present.

3.7 Fauna and Habitat

The DBCA NatureMap and DEE EPBC Act Protected Matters Report with 1km buffers was searched for threatened and priority flora and communities which may occur within the vicinity of the site (Table 4; Appendix B).

As per Section 3.4, there are no geomorphic wetlands or open water bodies within the site, and therefore due to lack of appropriate habitat migratory bird wetland species have not been considered.

Table 4: Likelihood of Threatened and Priority Fauna species occurring within the vicinity of the site

Species	Conservation status		Habitat	Likelihood of presence within the site
	WC Act	EPBC Act		
<i>Carnaby's Cockatoo</i> (<i>Calyptorhynchus latirostris</i>)	T	E	Typically occurs in woodlands and scrubs of semiarid interior of Western Australia, in non-breeding season wandering in flocks to coastal areas, especially pine plantations and Banksia woodlands. Food includes the flowers, nectar and seeds of Banksia, Dryandra, Hakea, Eucalyptus, Corymbia, Grevillea, also seeds of Pinus.	Possible/likely-however no foraging evidence by CBC was observed during the Coterra 2018 surveys.



Species	Conservation status		Habitat	Likelihood of presence within
	T	V		
Forest Red-tailed Black Cockatoo (<i>Calyptorhynchus banksii</i> subsp. <i>naso</i>)	T	V	It inhabits the dense <i>Eucalyptus marginata</i> (Jarrah), <i>E. diversicolor</i> (Karri) and <i>Corymbia calophylla</i> (Marri) forests receiving more than 600mm of annual average rainfall.	Possible/likely- however no foraging evidence by CBC was observed during the Coterra 2018 surveys.
Chuditch, Western Quoll (<i>Dasyurus geoffroi</i>)	T	V	Forest, mallee shrublands, woodland and desert. The most dense populations have been found in riparian jarrah forest.	Unlikely- outside of known distribution area and habitat not present on site.

In 2004, the Perth Biodiversity Project undertook an inventory of the bird species of selected reserves vested in local governments in the Perth Metropolitan Region, which included the site. Sixteen bird species were recorded in the survey period, refer to Appendix F. Carnaby's Black Cockatoo has been reported feeding on Candlestick Banksia (*Banksia attenuata*). New Holland and White-cheeked Honeyeater were also reported feeding on native vegetation in the site.

The site has been identified by WALGA (2018) as supporting habitat for the Quenda (*Isoodon obesulus*) and is within a possible Black cockatoo breeding area buffer and a confirmed roosting area buffer.

During the flora and vegetation survey (October 2018) the following fauna species were observed:

- New Holland Honeyeater;
- Red Wattle Bird;
- Brown Honeyeater;
- Singing Honeyeater;
- Hobby;
- Rainbow lorikeet;
- Black Cockatoos (flying over site);
- Bobtail lizard; and
- Skink.

Rabbit droppings were also observed within the site.

3.8 Ecological Linkage and Local Natural Area(s)

According to Del Marco *et al.* (2004) the importance of ecological linkage is to connect natural areas, preferably with continuous corridors of native vegetation, which assists in fauna movement between the areas to access resources and habitats. The protection, management and buffering of existing natural areas within an ecological linkage is a higher priority than revegetation of cleared portions within a link. While the site has not been identified within a Perth Regional Linkage, it



provides a local 'stepping stone' in association with Higgins Parks and Edward Millen Reserve (Figure 5). A green corridor linkage between Hillview Bushland and Edward Millen Reserve is being considered within the proposed master plan design for Edward Millen Reserve.

The site is not identified as a Bush Forever site however, it is mapped as a Local Natural Area (LNA). LNA(s) have been identified for priority of retention, protection and management. These areas are usually the responsibility of the Local Government Area (Del Marco *et al.* 2004).

Environmentally Sensitive Areas (ESAs) are areas that have been identified for protection due to their environmental significance as outlined in the Western Australian *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* under Section 51B of the *Environmental Protection Act 1986*. ESAs include the following:

- World Heritage areas.
- Areas included on the National Estate Register.
- Defined wetlands and associated buffers.
- Vegetation within 50 m of a listed Threatened species.
- TECs.

The site is not currently identified as an ESA (WALGA, 2018).

3.9 Fire risk

Based on regional Bush Fire Prone Mapping (Department of Fire and Emergency Services, 2017) the site is mapped within the designated bushfire prone area. State Planning Policy (SPP) 3.7 stipulates that to reduce vulnerability to bushfire, the identification of bushfire risks should be considered in decision making at all stages of the planning and development process. While development is not proposed within the site, an assessment of potential risks to surrounding residents and properties based on the sites current (steady state fuel load) condition, and how this risk would change through implementing management recommendations, was completed (refer to Section 4.3.1).

3.10 Heritage

The Department of Planning Lands and Heritage (2018) Aboriginal Heritage Inquiry System was searched and there are currently no registered or other heritage Aboriginal Sites within or adjacent to the site.

In early 2000, a community art project (in conjunction with the Perth City Council, the National Trust and a local community group) collated Aboriginal stories of the area. The Aboriginal artist Toogarr designed a sculpture and paths relating to these stories (Griffins and Associates, 2005). The sculpture is depicted in Plate 3.



Plate 3: Designed sculpture located within the north west section of the site.

The State Heritage Office (2018) InHerit data base was searched and Hillview Terrace Bushland is registered under the following:

- ToVP Municipal Inventory (July 1998) Category A which is the highest level of protection. Recommended for entry into the State Register of Heritage Places which gives legal protection; development requires consultation with the Heritage Council of WA and the local government. Incentives to promote conservation should be considered.
- Register of the National Estate (Indicative Place).
- Classified by the National Trust (October 1995).

4.0 MANAGEMENT DIRECTION

4.1 Threatening Processes

The site is located within a developed urban area, whilst it is small (>1ha) in size and isolated, it does provide a 'stepping stone' and is part of the Urban Forest corridor as presented within the Urban Forest Strategy Working Group (2018) Town of Victoria Park Urban Forest Strategy. However, the site is given a low scoring in the Urban Forest mapping within the Strategy (0-5% cover) due to a lack of large mature canopy species greater than 5m, which cast a 7m² shade area or greater (Urban Forest Strategy Working Group, 2018).

The key threatening processes that were identified during the community consultation which may influence the condition and diversity of plant species and potential fauna habitat include:

- Potential developments surrounding the site - further infrastructure works (Main Roads WA) and the redevelopment of the neighbouring national trust site.
- Potential development of the site given the current MRS zoning (Urban).
- Lack of/ insufficient management on site.
- Human disrespect (ie rubbish dumping).
- Presence of weed species.
- Small size of the site - impact of edge effects on maintaining genetic diversity in the Banksia woodland (species present and condition) (refer to Section 3.5).

It is the Town's understanding that there is currently no further plans for resumption and encroachment into the Hillview Bushland site by Main Roads WA. The Town is cognisant of protecting the bushland from any adjoining development, and will assess and place conditions on any development approvals to ensure that the Hillview Bushland is protected from direct and indirect environmental impacts.

In addition, the Town proposes to investigate changing the Hillview Bushland zoning to be more commensurate with its proposed conservation use as outlined within this Plan.

Vision

Based on the existing biophysical environment and the outcomes of the community consultation, there was a strong consensus that conservation (biodiversity value), aesthetic and passive activities (i.e. bird watching) should be given priority in the development of the management plan. The following vision goals have been developed for the site:

- Conservation

Protect and enhance the sites natural values including biodiversity through the implementation of appropriate management measures such as weed control, revegetation and monitoring programs.

- Education

Facilitate informed appreciation of the sites biophysical environs amongst the community through the provision of appropriate facilities (i.e. education signage and formalised pedestrian access).

- Social

Promote community ownership of the site through liaison and coordinated management, and creation of a 'sense of place' for the local community.

4.2 Ecological Restoration

As identified in the community workshop, increasing the biodiversity within the site is part of the site's conservation goal (refer to Section 0). The regeneration and restoration of a remnant bushland is typically a long-term process and can involve more than weed control and tree planting. By exploring options for the natural regeneration potential of the native vegetation, weed species can be controlled in such a way that they are replaced by native species rather than by other weeds.

To assist in the site natural regeneration, there is a possible option of a controlled burn to eliminate aggressive weeds and to stimulate native seeds within the top layer of the soil profile. While uncontrolled fire(s) was addressed as a threatened process for the reserve, a controlled burn may potentially be used as a restoration tool. Bush Heritage Australia (2019) notes that "when burning is skilfully carried out in the correct season it can reinvigorate ageing vegetation communities, encourage flowering and seeding, and provide a flush of new green shoots". The Department of Primary Industries and Regional Development (2019a) discussed that light fires can:

- Assist the seed release from damaged plants;
- Provide smoke to increase the potential germination viability of many native species; and
- Provides an ash bed with suitable for germination.

A study by Burrows (2008:2396) presented that a fire regime of bushland areas can promote biodiversity by influencing species assemblages, composition, vegetation structure and habitat characteristics and processes such as nutrient cycling.

Before determining if this is a viable option for the site, further discussion with several Government agencies is needed. Consultation with DFES is required regarding controlled burns in an urban area, as well as Western Power regarding the high voltage powerline easement. Consultation with DWER is also required regarding the potential need for a Native Vegetation Clearing Permit. These consultations will establish the necessary approvals and permits required to undertake a controlled burn.

In February 2016, a bushfire occurred within the Kensington Bushland Reserve, burning approximately 70% of the native vegetation. Since the fire, there has been a monitoring program for the reserve, which has indicated a significant increase of plant species regenerating (biodiversity) and density coverage within this section of the reserve (refer to Plates 4 and 5). Based on the regeneration outcomes at

Kensington Bushland Reserve, the Town is supportive of investigating the option of a controlled burn with a rehabilitation consultant/specialist for the site.



Plate 4: Area of Kensington Bushland affected by fire (23/02/2016) Source: TVP-Backheuer



Plate 5: Area of Kensington Bushland affected by fire (17/02/2019) Source: TVP-Backheuer

4.3 Concept Plan

A Concept Plan has been developed for the site to provide direction for the management of the site to achieve these visions (refer to Section 4.1). The Concept Plan for the site is shown on Figure 6.

4.3.1 Bushfire Risk Considerations

Bushfire Safety Consultants (2019) have provided the following bushfire management strategies in relation to the spatial representation of the site (Appendix G), which are presented within Section 5.3.

4.3.2 Controlled Access, Fencing and Signage

Along the site boundary along Berwick Street and Hillview Terrace a ‘conservation’ style fencing is proposed within the Concept Plan, refer to Plate 6.



Plate 6: Example of ‘conservation’ style fencing

A limestone pathway has been proposed which traverses the site (within the ‘Good’ to ‘Degraded’ area-refer to Figure 4) leading to a meeting point area with a park bench (or equivalent). Access within the bushland core is not planned or recommended to minimise clearing of the better-quality vegetation and to minimise edge effects that could result, such as further weed invasion. A limestone access path has also been proposed to provide access to the Aboriginal sculpture display (Figure 6).

Interpretative education signs are recommended at strategic access point locations, with the proposed locations depicted within Figure 6. Based on the outcomes of community liaison it is recommended that the interpretative signs:

- Identify importance of the site;
- Explain the biodiversity value;
- Detail how the community can help manage the site; and
- Contain obligations of dog owners entering the site under the ToVP (2019) *Dog Local Law 2018*.



Plate 7: Example of Environmental Education Signage (source: Interpretive Design 2018)

4.3.3 Weed Control

As presented in Section 3.5.2, a total of 27 introduced (exotic) taxa were recorded within the site (Appendix C), one of which is a declared weed species-*Moraea flaccida* (One-leaf Cape Tulip). Weed control is recommended for the whole site in accordance with Table 6 and Appendix H. Weed control preference is manual however, is subject to recommended eradication methods as per Appendix H and ToVP resourcing/labour.

4.3.4 Areas Proposed for Revegetation

4.3.4.1 General

Remnant vegetation within the site covers approximately 0.82ha of which 0.19ha is 'Degraded' (refer to Figure 4 and Table 3). The core of the site has been recorded in 'Good' to 'Good to Very good' condition 0.21ha. Revegetation within 'Degraded' and cleared areas within 'Good to Degraded' areas are recommended (refer to Concept Plan).

It is recommended that dead wood remain on site unless removal is required for public safety, as this material may contribute habitat for native fauna. If visible dead wood is deemed by the Town to create an amenity or anti-social issue, it can be relocated to the more central areas of the site.

4.3.4.2 Bushfire requirements

If revegetation is to take place between the northern firebreak and the adjacent residential housing, it should be compliant with Asset Protection Zones (APZ) standards.

4.3.5 Recommended Species List

The native plant species recorded within the site are identify in Appendix C, and these species are recommended to be used in the Priority Revegetation Areas proposed within the Concept Plan (Figure 6). Further to this list APACE have identified species which typically occur within the Bassendean Complex-Central and South vegetation complex (APACE, 2009) which are also recommended, these species are presented within Appendix I.

4.3.6 Planting Requirements

Planting will take place following weed control within the Priority Revegetation Areas as described in Section 4.3.3 and shown in the Revegetation Schedule (Table 6). To facilitate tubestock planting establishment, planting will take place in late autumn/early winter and supplementary infill planting (if required) will occur at the same time the following year, refer to Table 6.

No irrigation is proposed within the bushland.

The following is to be included in the planting process:

- Assorted tube stock (pre-watered) supplied and installed.
- Slow release native fertiliser tablets.
- Tree guards supplied and assembled (each with 3 bamboo stakes 10-12mm thick by 750mm long) (as required).
- Hydro beads, Terracottem, Dry Water or equivalent water retention aids/soil conditioners installed to manufacturers recommendations (if required).

- Planting of a combination of species (list presented in Appendix C and I) of tubestock size will be undertaken. Where possible tubestock will be locally sourced from nurseries.

4.3.7 Performance Targets

In regards to planting densities and weed coverage the following has been proposed as a guide for the site:

- Trees installed at a rate of 0.5 per m² and have a diversity of at least 3 species per 10m².
- Weed coverage less than 30%.

4.3.8 Monitoring, Assessment and Reporting

Assessments into rehabilitation success will be undertaken in spring during the monitoring period following completion of planting within the revegetation areas (refer to Figure 6 and Table 6). The following indicators will be assessed:

- Range of species present in revegetation area and health of planted vegetation.
- Presence of weeds in the revegetation area (including an estimated density / percentage cover).
- Estimated mortality and survival rates for planted vegetation.
- Photo-point monitoring will be undertaken from designated locations to build up a photographic record of rehabilitation progress for the site.
- A 10m x 10m quadrat within the buffer area will be established using wooden stakes. Species diversity, plant density and weed cover will be assessed and recorded. Quadrat location will also be recorded by GPS in the event stakes are removed.

This assessment will determine whether any infill planting is required to achieve the Key Performance Indicators. A coordinated management approach for the site in partnership with the ToVP and a community ('friends') group is recommended for the future management of the site.

4.3.9 Contingency

Assessment of rehabilitation during the monitoring period may trigger additional management measures to aid vegetation establishment i.e. weed control, infill planting. Contingency actions, outlined in Table 5, will be implemented if monitoring and reporting indicates that rehabilitation sites are not achieving completion criteria up until the final year of monitoring (4th year).

Table 5: Contingency Actions

Trigger	Action
>30% cover of exotic/ weed species growing in rehabilitation areas	<ol style="list-style-type: none"> 1. Review Table 6 Rehabilitation Schedule- frequency of removing/ spraying weeds. 2. Identify any additional specific actions which may assist with weed removal/ prevention.



Trigger	Action
Plant density less than completion criteria	<ol style="list-style-type: none">1. Identify cause.2. Implement approach to remedy cause, which could include:<ul style="list-style-type: none">• Watering.• application of fertilisers or wetting agents etc.• replanting.• replacement of tree guards.• pest control.• installation of signage.

Table 6: Indicative Rehabilitation Schedule

Action	2019 /20 (Year 0)	2020 (Year 1)				2021 (Year 2)				2022 (Year 3)				2023 (Year 4)				2024 (Year 5)				
	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	
Order/Source tubestock/ seedlings																						
Initial weed control																						
Mulching or brushing																						
Planting of tubestock and fence installation																						
Formal quadrat monitoring																						
Maintenance weed control (as required in accordance with Appendix H) and fencing maintenance																						
Maintenance watering and/or mulching/brushing (as required)																						
Maintenance planting																						
Reporting																						

5.0 IMPLEMENTATION

5.1 Partnerships

There is significant benefit of developing partnerships between Local Government and local community stakeholder groups, such as the 'Friends of Kensington Bushland', particularly in relations to the ongoing success and implementation of a bushland management plan.

There was a strong interest in the community over the 'structured' planning and management of the site, which under council leadership could create the opportunity for the establishment of a 'friends group' or the extension of the 'Friends of Kensington Bushland' to incorporate the site within their directorate.

The Town's community consultation platform 'Your Thoughts' can be used as a platform to share future updates and opportunities relating to the Hillview Bushland. In addition initiatives and opportunities for the community to be involved can also be shared through the Town's social media, website and newsletter.

5.2 Term of Management Plan

It is recommended that this management plan be reviewed by the ToVP every five years.

5.3 Prioritisation and Management Protocols (Implementation Table)

Roles and responsibilities for implementation of the management actions are summarised on Table 7. The management plan aims to provide actions and strategies which can be met within budgetary, time and volunteer labour constraints. As such, priority ratings have been recommended to actions/strategies depending on the urgency of implementation. The priority ratings given from the management plans finalisation are:

- High: within 1 year.
- Medium: 1 to 2 years.
- Low: between 3 to 5 years.
- Ongoing: over 5 years.

Table 7: Implementation of Management Actions

No.	Management Action/Strategy	Priority	Responsibility	Approximate Budget Required (ex GST)
Ecological Restoration				
E1	Investigate whether the restoration tool (controlled burn) is a viable option for the reserve. If so, develop a restoration plan which identifies the restoration goal and predicted outcomes of the tool and detailed procedures for undertaking proposed works. Monitoring and assessment should reflect Sections 4.4.7 and 4.4.8	High	Rehabilitation consultant/ ToVP	\$3,800
E2	Undertake weed control in accordance with Table 5 and Appendix H	Ongoing	Licensed contractor/ Friends group	\$5,900
E3	Complete a Dieback Survey to identify whether present on site	High	Accredited Dieback interpreter/contractor	\$3,000
E4	The following is to be included in the planting process: <ul style="list-style-type: none"> Assorted tube stock (pre-watered) supplied and installed Slow release native fertiliser tablets Tree guards supplied and assembled (each with 3 bamboo stakes 10-12mm thick by 750mm long) (as required). Hydro beads, Terracottem, Dry Water or equivalent water retention aids/soil conditioners installed to manufacturers recommendations (if required) Planting of a combination of species (list presented in Appendix C and I) of tubestock size will be undertaken. Where possible tubestock will be locally sourced from accredited nurseries. 	Ongoing	Rehabilitation consultant/ ToVP/ Friends group	\$7,500
E5	Undertake annual quadrat monitoring (Table 5) against identified KPI. Assessment outcomes to be provided to the ToVP Environmental Officer for reference.	Ongoing	Rehabilitation consultant/ ToVP/ Friends group	\$2,800
E6	Note relevant vegetation requirements within high voltage Western Power easements. Refer to Department of Mines, Industry Regulation and Safety (2012) Guidelines for the management of Vegetation near powerlines.	Ongoing	ToVP	No cost
E7	Implement Rehabilitation Schedule (Table 6)	Ongoing	ToVP/Friends Group	ToVP in house and volunteer resourcing
E8	Allowance for infill planting in year 2			\$2,350
Bushfire Management				
B1	Remove the "Bushfire Prone" Declaration from the site and surrounding 100 metre area. Refer to Appendix G.	High	ToVP in consultation with DFES	No cost
B2	Any re-vegetation with the Asset Protection Zone on the north-east boundary is compliant with Schedule 1: Standards for Asset Protection Zones in the Guidelines for Planning in Bushfire Prone Areas.	Ongoing	ToVP	No cost
B3	Maintain perimeter vehicular access is provided on public roads, a 5.5 sealed wide Fire Service Access Route on the north east perimeter and a trafficable firebreak on the north west perimeter	Ongoing	ToVP	Existing maintenance budget covers this item
B4	Fire break gate access keys available to the ToVP and DFES	Ongoing	ToVP/DFES	\$60
B5	Fire hydrants are spaced according to DFES and Water Corporation Standards in the surrounding public	Ongoing	ToVP/DFES	DFES to provide

	road reserves.			
Controlled Access, Fencing and Signage				
C1	Installation of conservation style fencing along site boundary- Berwick Street and Hillview terrace (Figure 6)	High	ToVP	\$11,650
C2	Installation of limestone paths (Figure 6)	High	ToVP	\$22,510
C3	Maintenance of limestone paths (Figure 6)	Ongoing	ToVP	\$300/year
C4	Installation of environmental education signs (1 to 2)	Medium	ToVP/Friends Group	\$3,750 per sign
C5	Assess (public safety, crime prevention risk) whether a park bench or similar can be installed within the site and whether there is a requirement for a litter bin.	Medium	ToVP	\$3,000 per seat \$2,000 per bin
C6	Approach community group/artist for potential artwork (painting) along the limestone retaining wall along Berwick Street and Hillview Terrace, and whether feasible option for the wall.	Low	ToVP/Friends Group	Allow \$2,000
C7	Remove dumped rubbish from the reserve and dispose of through the appropriate waste system.	High (then ongoing as required)	ToVP/Friends Group	Allow \$500
Other				
O1	Investigate whether the current 'Urban' Zoning under the MRS is appropriate for the site's future use and long-term vision.	Low	ToVP	Existing ToVP resources
O2	Provide support to establish and maintain a community ('Friends') group for the site.	High-Ongoing	ToVP	Existing ToVP resources
O3	Once community group is established, use the ToVP website site (Public notices or Your Thoughts portal) and Community Forum Victoria Park Inc. to advertise community participation and annual tours of the site.	Ongoing	ToVP/ Friends Group	Existing ToVP resources
O4	Ensure adequate funding is provided to council to conduct a staged implementation of the Concept Plan	Ongoing	ToVP	Existing ToVP resources
O5	Encourage community ('Friends') group to apply for community grants/programs. Such as: <ul style="list-style-type: none"> Lottery west: Protecting Sustainable Ecosystems. Supporting community to sustain and enhance our unique species and environments State Natural Resource management (NRM) Program Grants (Community Stewardship Grants) 	Ongoing	ToVP/Friends Group	Existing ToVP resources and volunteer resourcing

6.0 REFERENCES

Bureau of Metrology (2019) Monthly Climate Statistics: Perth Metro [online] available at: http://www.bom.gov.au/climate/averages/tables/cw_009225.shtml

Burrows, N (2008) Linking fire ecology and fire management in south-west Australian forest landscapes. *Forest Ecology and Management* 225(2008) 2394-2406. Doi: 10.1016/j.foreco.2008.01.009

Bush Heritage Australia (2019) Fire management [online] available at <https://www.bushheritage.org.au/what-we-do/landscape-management/fire>

Del Marco, A. Taylor, R. Clarke, K. Savage, K. Cullity, J. and Miles, C. 2004. Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region. Perth Biodiversity Project. Western Australian Local Government Association, Perth.

Department of Water and Environmental Regulation (DWER)(2019) Perth Groundwater Atlas [online] <https://maps.water.wa.gov.au/#/webmap/gwm>

Department of Mines, Industry Regulation and Safety (2012) Guidelines for the management of Vegetation near powerline. Information for Local Government bodies, Landowners/occupiers and State Government agencies.

Department of Parks and Wildlife (no date) Swan Region Strategy for NRM: Major Landform Elements in the Swan Region. Appendix 8.

Department of Planning Lands and Heritage (2018) Aboriginal Heritage Inquiry System [online] <https://maps.daa.wa.gov.au/AHIS/>

Department of Primary Industries and regional Development (2019) Western Australian Organism List [online] <https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>

The Department of Primary Industries and Regional Development (2019a) Bush and revegetation recovery on farms after fire [online] available at <https://www.agric.wa.gov.au/fire/bush-and-revegetation-recovery-farms-after-fire>

Gozzard (1986) Perth Sheet 2034 II and part 2034 III and 2134 III. Perth Metropolitan Region Environmental Geology Series, Geological Survey of Western Australia.

Griffin and Associates (2005) Hillview Community Bushland Management Plan. Prepared for Friends of Hillview Community Bushland.

Hedde EM, Loneragan OW & Havel JJ (1980), Darling System, Vegetation Complexes, Forest Department, Perth.

Interpretive Design Company (2018) [online] available at <https://interpretivedesign.com.au/portfolio/environmental/environmental-interpretive-signs/>

Mitchell D, Williams K & Desmond A 2002, 'Swan Coastal Plain 2 (SWA2 - Swan Coastal Plain subregion)', in *A biodiversity audit of Western Australia's 53 Biogeographical Subregions in 2002*, eds Department of Conservation and Land Management, Perth, pp. 606-623.

Threatened Species Scientific Committee (TSSC) (2016), Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community, [Online], Australian Government, Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf>.

Town of Victoria Park (2013) Environmental Plan 2013-2018



Town of Victoria Park (2019) Dog Local Law 2018. Gazetted 16 January 2019.


Urban Forest Strategy Working Group (2018) Town of Victoria Park Urban Forest Strategy, Town of Victoria Park, WA.

WALGA (2018) Environmental Planning Tool [Online]

FIGURES

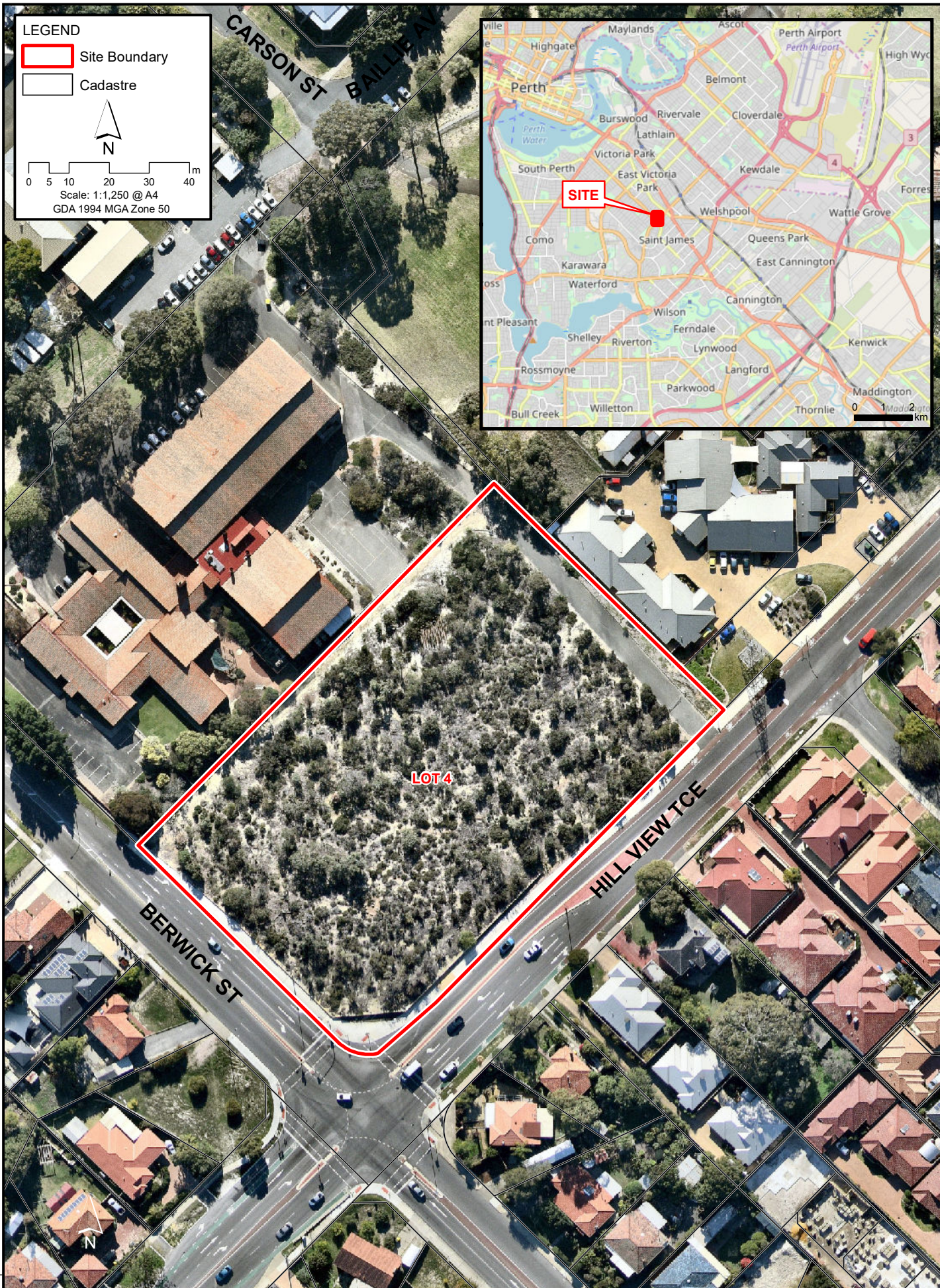
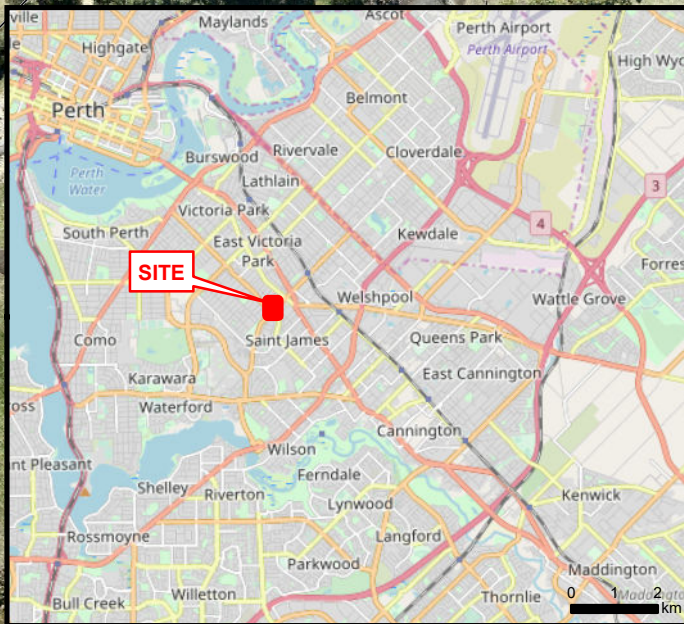
LEGEND

-  Site Boundary
-  Cadastre






0 5 10 20 30 40 m

Scale: 1:1,250 @ A4
GDA 1994 MGA Zone 50





LEGEND

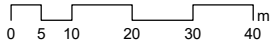
-  Site Boundary
-  Cadastre
-  Contour (mAHD)

Geology

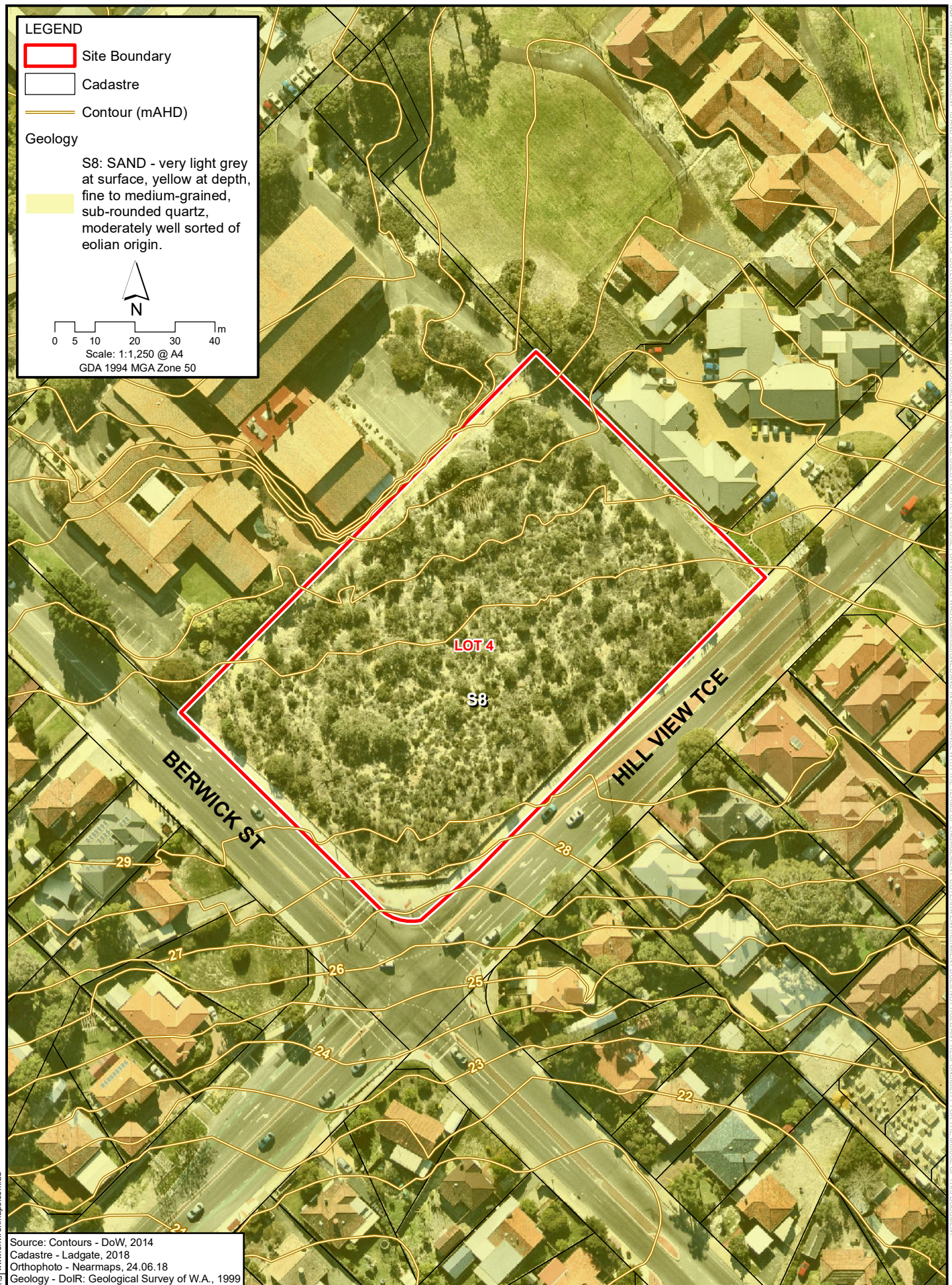
S8: SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin.








Scale: 1:1,250 @ A4
GDA 1994 MGA Zone 50



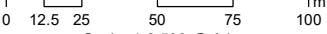
Source: Contours - DoW, 2014
 Cadastre - Ladgate, 2018
 Orthophoto - Nearmaps, 24.06.18
 Geology - DoIR: Geological Survey of W.A., 1999

LEGEND

- Site Boundary
- Cadastre
- Maximum Groundwater Contour (mAHD)

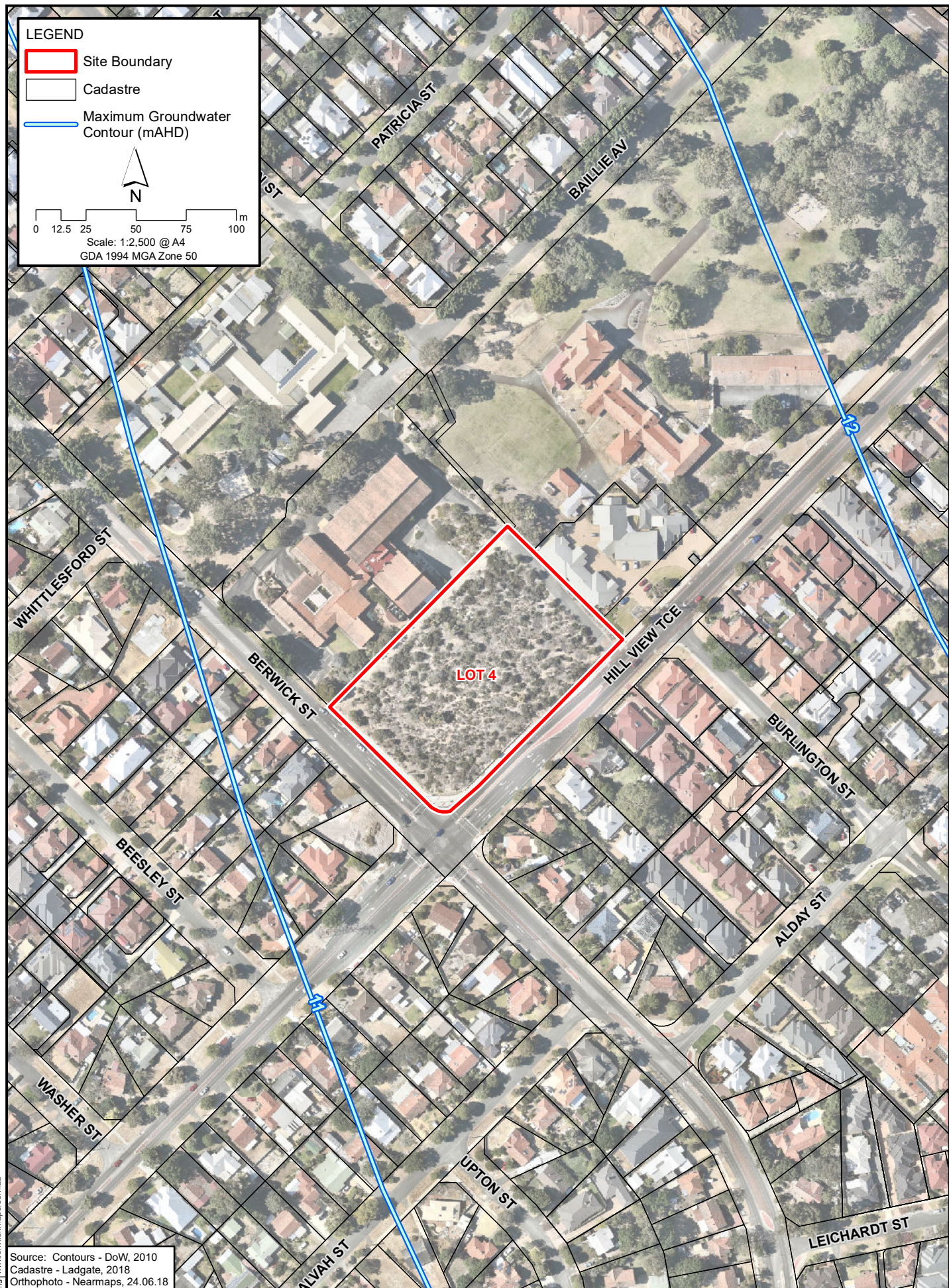


N













0 12.5 25 50 75 100 m


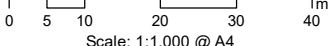
Scale: 1:2,500 @ A4
GDA 1994 MGA Zone 50

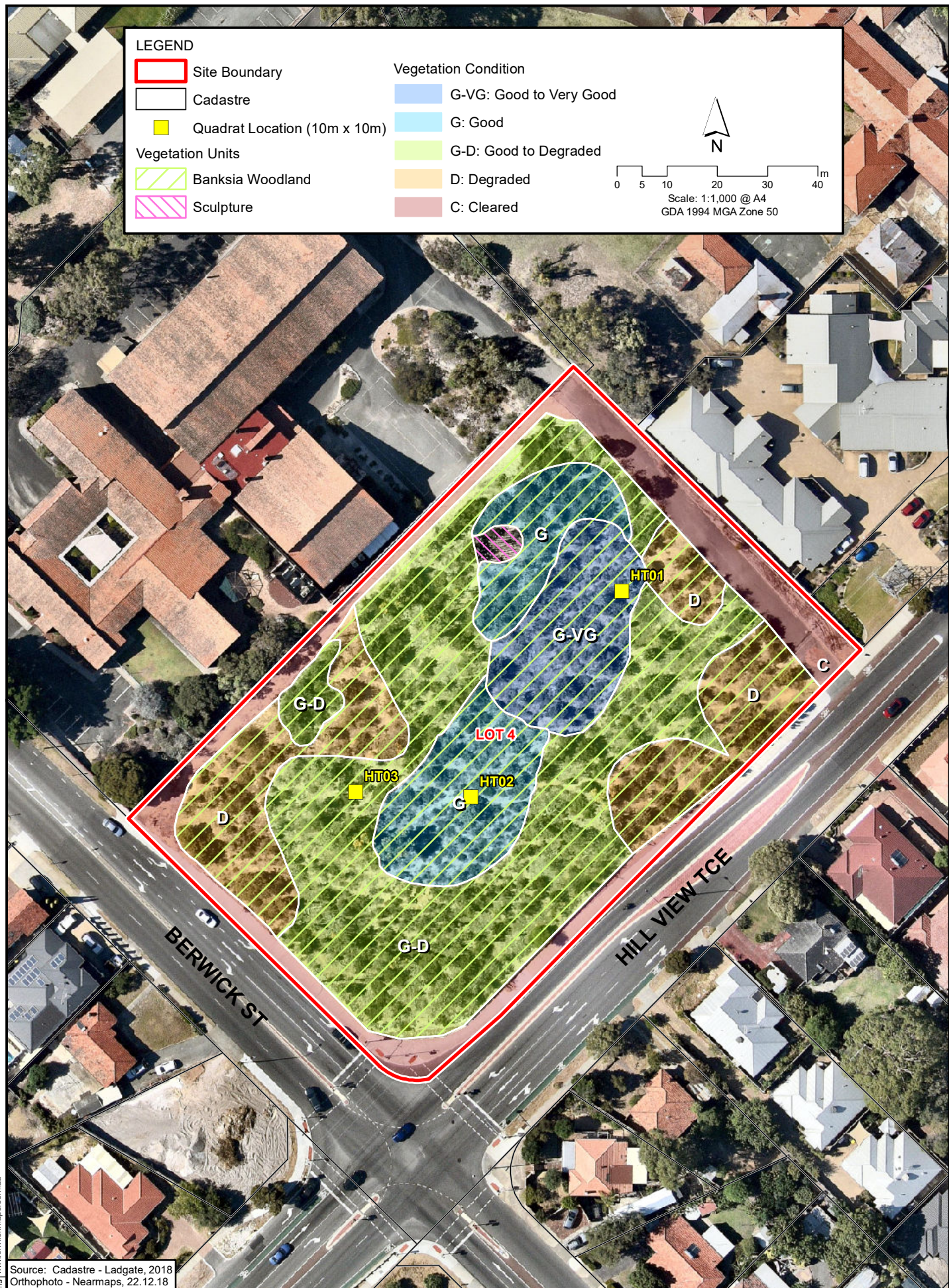


Source: Contours - DoW, 2010
 Cadastre - Ladgate, 2018
 Orthophoto - Nearmaps, 24.06.18

LEGEND

	Site Boundary		G-VG: Good to Very Good
	Cadastre		G: Good
	Quadrat Location (10m x 10m)		G-D: Good to Degraded
	Banksia Woodland		D: Degraded
	Sculpture		C: Cleared



 Scale: 1:1,000 @ A4
 GDA 1994 MGA Zone 50



Source: Cadastre - Ladgate, 2018
 Orthophoto - Nearmaps, 22.12.18

ENVIRONIMAPS | t. 0406 590 006
 Environmental Mapping Solutions | www.environmentmaps.com.au

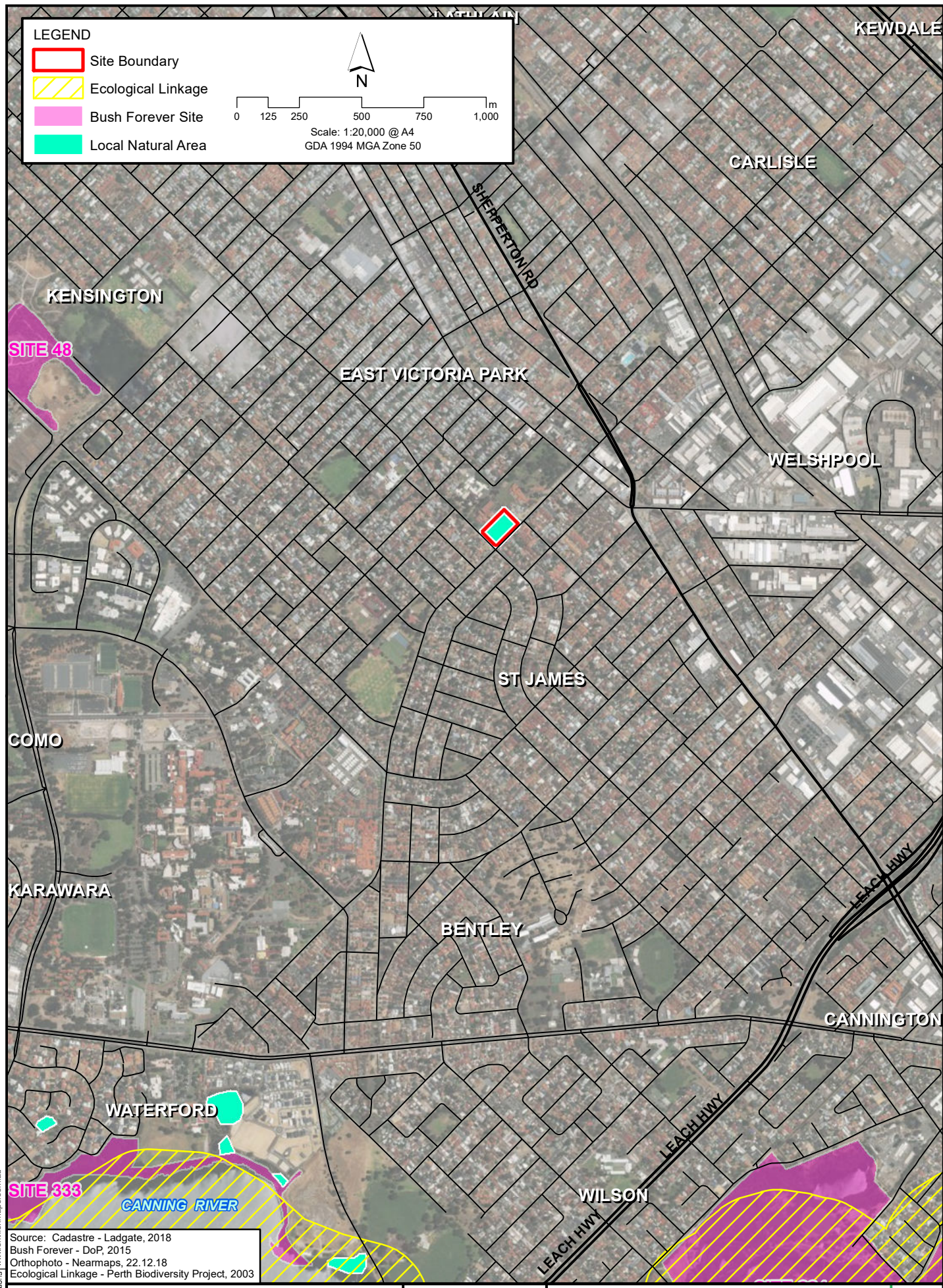
COTERRA
 ENVIRONMENT

Job: TVPHBM01
 Doc: 004
 Date: 9/01/2019
 Ph: (08) 9381 5513
 Fax: (08) 9381 5514
 E: info@coterra.com.au

Town of Victoria Park
 HILLVIEW BUSHLAND MANAGEMENT PLAN
 LOT 4 BERWICK STREET EAST VICTORIA PARK
**VEGETATION UNIT AND
 CONDITION MAPPING**

Figure 4

COPYRIGHT THIS DOCUMENT IS AND SHALL REMAIN THE PROPERTY OF COTERRA ENVIRONMENT. THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT. COTERRA ENVIRONMENT DOES NOT HOLD ANY RESPONSIBILITY FOR THE MISUSE OF THIS DOCUMENT.



LEGEND

- Site Boundary
- Ecological Linkage
- Bush Forever Site
- Local Natural Area

Scale: 1:20,000 @ A4
GDA 1994 MGA Zone 50

0 125 250 500 750 1,000 m

Source: Cadastre - Ladgate, 2018
 Bush Forever - DoP, 2015
 Orthophoto - Nearmaps, 22.12.18
 Ecological Linkage - Perth Biodiversity Project, 2003

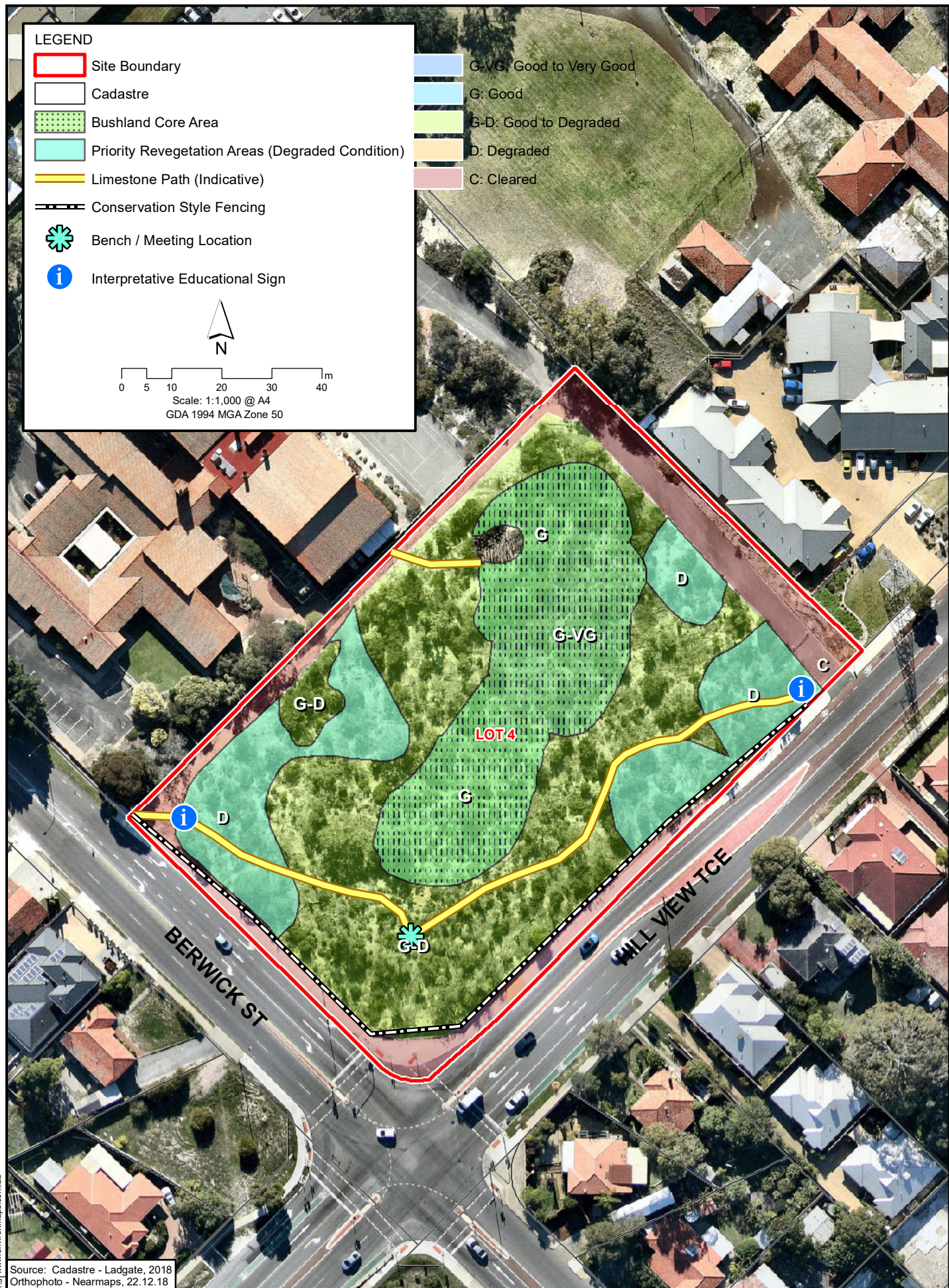
ENVIRONIMAPS | t. 0438 590 006
 Environmental Mapping Solutions | www.environmentmaps.com.au

COTERRA
 ENVIRONMENT

Job: TVPHBM01
 Doc: 005
 Date: 16/01/2019
 Ph: (08) 9381 5513
 Fax: (08) 9381 5514
 E: info@coterra.com.au

Town of Victoria Park
 HILLVIEW BUSHLAND MANAGEMENT PLAN
 LOT 4 BERWICK STREET EAST VICTORIA PARK
**ECOLOGICAL LINKAGE AND
 LOCAL NATURAL AREAS**

Figure 5



APPENDIX A – COMMUNITY CONSULTATION WORKSHOP OUTCOMES

Groups Exercises-Now

The exercises/questions below were discussed within the first phase of the workshop which aimed at identified the matters currently influencing the Bushland area. The top answers are presented below

1. What words would you use to describe the bushland in its current state?
 - Small, fragmentated, isolated.
 - Neglected
 - Degraded
 - Vulnerable
 - Inaccessible/not inviting

2. What are the benefits of having the bushland reserve in your local community?
 - Connection to nature
 - Wildlife corridor
 - Sense of place
 - Local habitat
 - Education focus

3. How many times per month do you think local residents interact with the Bushland?
 - Unknown/never
 - Minimal/infrequent.
 - Daily** (one participant visited the reserve daily)

4. What do you consider to be the main threats to the reserve?
 - Potential development- infrastructure (Main road) and national trust site.
 - Current MRS zoning (Urban)
 - Lack of/ insufficient management on site
 - Human disrespect/rubbish dumping and weeds
 - Banksia woodland and maintaining genetic diversity

Groups Exercises-Future

The exercises/questions below were discussed within the second phase of the workshop which aimed at discussing the 5 year vision for the Bushland area. The top answers are presented below.

1. What two new features would you like to see in the Bushland?
 - Education signage around existing paths
 - A meeting point/place (of which is appropriate design)
 - Revegetation in degraded/ outer perimeter areas of the bushland
 - Increase biodiversity and larger trees
 - Different retaining wall along the intersection of Berwick Street and Hillview terrace- Limestone retaining wall- looks out of place.

2. What words would you like to use to describe Hillview Bushland?
 - Thriving environmental
 - Heathy woodland
 - Connected, loved and appreciated
 - Well maintained and managed

3. What main activities would you like people to do in the reserve in the future?
 - Community involvement
 - Weeding
 - Annual tours (similar to Kensington Bushland)
 - School education and activities
 - Relaxation/passive interaction with bushland
 - Sustainable planting to increase fauna habitat and attraction
 - Fauna observation.

Groups Exercises-Priority Action Items

This exercise involved the discussion of how do we achieve the 5-year vision for the bushland (based on no money or timeframe limitations). The key priority actions included the following:

- Establishment of a 'friends group'/community group (which includes support from the Town of Victoria Park)
- Annual education tours
- Linking street trees to reserve under the Urban Forrest Strategy
- Concept Plan which discusses:
 - Fencing
 - Planting
 - Protection zones
 - Staged restoration
 - Implementation
- Amending the current MRS zoning of the reserve.
- Adopt a tree program
- Acquire land adjacent to the reserve.

APPENDIX B – DBCA AND DEE FLORA AND FAUNA DATABASE RESULTS



EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/09/18 12:01:58

[Summary](#)

[Details](#)

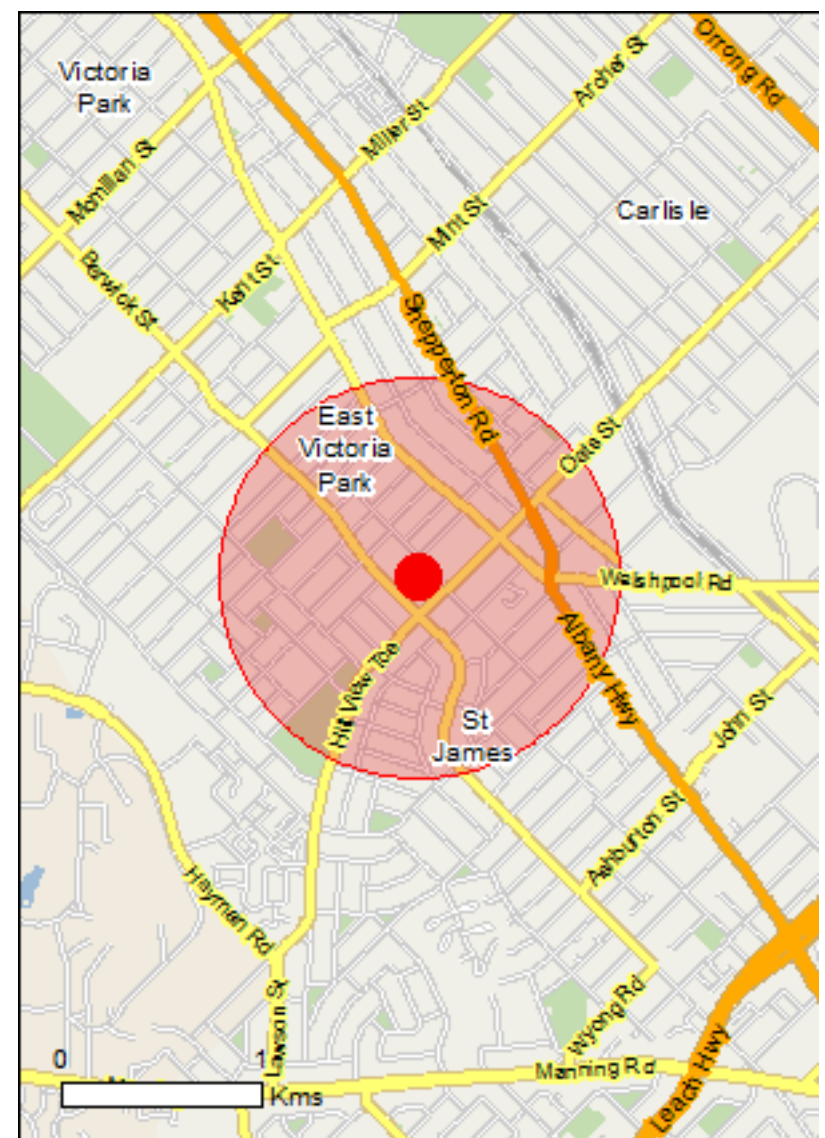
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

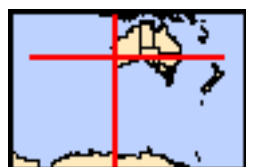
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	20
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	38
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[[Resource Information](#)]

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area

Listed Threatened Species

[[Resource Information](#)]

Name	Status	Type of Presence
------	--------	------------------

Birds

Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
---	------------	---

Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
---	-----------------------	--

Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
--	------------	---

Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
--	------------	---

Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
---	------------	--

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
---	-----------------------	--

Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
--	------------	--

Mammals

Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
---	------------	--

Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
--	-----------------------	--

Plants

Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
---	------------	--

Name	Status	Type of Presence
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat likely to occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat likely to occur within area
Synaphea sp. Fairbridge Farm (D. Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

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

Name
Commonwealth Land -

Listed Marine Species [\[Resource Information \]](#)

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species [\[Resource Information \]](#)

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

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within

Name	Status	Type of Presence area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-31.99383 115.90712

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact Us](#) page.

NatureMap Species Report

Created By Guest user on 13/11/2018

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 54' 26" E, 31° 59' 40" S
Buffer 1km

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
2.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
3.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
4.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
5.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
6.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
7.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
8.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
9.	<i>Badumna insignis</i>			
10.	<i>Barnardius zonarius</i>			
11.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
12.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
13.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
14.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
15.	<i>Chroicocephalus novaehollandiae</i>			
16.	1882 <i>Conospermum stoechadis</i> (Common Smokebush)			
17.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
18.	25592 <i>Corvus coronoides</i> (Australian Raven)			
19.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
20.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
21.	25027 <i>Ctenotus australis</i>			
22.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
23.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
24.	24939 <i>Diplodactylus polyophthalmus</i>			
25.	4763 <i>Dodonaea hackettiana</i> (Hackett's Hopbush)		P4	
26.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
27.	<i>Eolophus roseicapillus</i>			
28.	25727 <i>Fulica atra</i> (Eurasian Coot)			
29.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
30.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
31.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
32.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
33.	25119 <i>Hemiergis quadrilineata</i>			
34.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
35.	<i>Latrodectus hasseltii</i>			
36.	25005 <i>Lialis burtonis</i>			
37.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
38.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
39.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
40.	<i>Microcarbo melanoleucos</i>			
41.	25420 <i>Myobatrachus gouldii</i> (Turtle Frog)			
42.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
43.	<i>Oecobius navus</i>			
44.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
45.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
46.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
47.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
48.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
49.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
50.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
51.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
52.	<i>Purpurecephalus spurius</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
53.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
54.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
55.	30948 <i>Smicromis brevirostris</i> (Weebill)			
56.	<i>Steatoda grossa</i>			
57.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
58.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
59.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
60.	30950 <i>Streptopelia senegalensis subsp. senegalensis</i> (Laughing Turtle-Dove)	Y		
61.	25204 <i>Tiliqua rugosa subsp. aspera</i>			
62.	24309 <i>Todiramphus sanctus subsp. sanctus</i> (Sacred Kingfisher)			
63.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
64.	25526 <i>Varanus tristis</i> (Racehorse Monitor)			
65.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silveryeye)			

Conservation Codes

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

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

APPENDIX C – NATIVE FLORA SPECIES LIST

Appendix C: Native Flora Taxa recorded within Hillview Bushland

FAMILY	TAXA	COMMENTS
ANARTHROCEAE	<i>Lyginia imberbis</i>	
ARALIACEAE	<i>Trachymene pilosa</i>	
ASPARAGACEAE	<i>Laxmannia squarrosa</i>	
	<i>Lomandra caespitosa</i>	
	<i>Lomandra hermaphrodita</i>	
	<i>Thysanotus dichotomous</i>	
	<i>Thysanotus patersonii/manglesii</i>	
ASTERACEAE	Asteraceae sp.	sterile
	?Asteraceae sp.	juvenile
CASUARINACEAE	<i>Allocasuarina fraseriana</i>	
	<i>Allocasuarina humilis</i>	
COLCHICACEAE	<i>Burchardia congesta</i>	
CRASSULACEAE	<i>Crassula colorata</i> var. <i>colorata</i>	
CUPRESSACEAE	<i>Callitris preissii</i>	
CYPERACEAE	<i>Isolepis cernua</i> var. <i>setiformis</i>	
	<i>Mesomelaena pseudostygia</i>	
	<i>Schoenus</i> sp.	sterile
DASYPOGONACEAE	<i>Calectasia narragara</i>	
DILLENACEAE	<i>Hibbertia hypericoides</i>	
DROSERACEAE	<i>Drosera patersonii/manglessii</i>	
ERICACEAE	<i>Astroloma</i> ? <i>compactum</i> (sterile)	sterile
	<i>Conostephium pendulum</i>	
FABACEAE	<i>Acacia pulchella</i>	
	<i>Acacia saligna</i>	
	<i>Bossiaea eriocarpa</i>	
	<i>Daviesia triflora</i>	



	<i>Gompholobium tomentosum</i>	
	<i>Jacksonia furcellata</i>	
	<i>Jacksonia sternbergiana</i>	
GOODENIACEAE	<i>Dampiera linearis</i>	
HAEMODORACEAE	<i>Anigozanthos manglesii</i>	
	<i>Conostylis aculeata</i> subsp. <i>aculeata</i>	
	<i>Conostylis aurea</i>	
	<i>Conostylis setigera</i>	
	<i>Conosylis setigera</i> subsp. <i>setigera</i>	
HEMEROCALLIDACEAE	<i>Arnocrinum preissii</i>	
IRIDACEAE	<i>Patersonia occidentalis</i>	
LORANTHACEAE	<i>Nuytsia floribunda</i>	
MONTIACEAE	<i>Calandrinia corrigioloides</i>	
MYRTACEAE	? <i>Calytrix</i> sp.	sterile
	<i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>	
	<i>Chamelaucium uncinatum</i>	
	<i>Eremaea</i> ? <i>pauciflora</i>	
	<i>Eremaea pauciflora</i>	
	<i>Eucalyptus todtiana</i>	
	<i>Melaleuca</i> ? <i>thymoides</i>	
	<i>Melaleuca seriata</i>	
	<i>Scholtzia involucrata</i>	
	? <i>Scholtzia</i> sp.	sterile
ORCHIDACEAE	<i>Caladenia flava</i>	
POACEAE	Poaceae sp.	sterile
PROTEACEAE	<i>Adenanthos cygnorum</i>	
	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>	
	<i>Banksia attenuata</i>	
	<i>Banksia menziesii</i>	
	<i>Banksia nivea</i> subsp. <i>nivea</i>	
	<i>Conospermum stoechadis</i> subsp. <i>stoechadis</i>	
	<i>Grevillea crithmifolia</i>	
	<i>Stirlingia latifolia</i>	



RESTIONACEAE	<i>Desmocladius flexuosus</i>	
SAPINDACEAE	<i>Dodonaea ?hackettiana P4</i>	Priority 4, juvenile fruits
STYLIDIACEAE	?Stylidiaceae sp.	
VIOLACEAE	<i>Hybanthus calycinus</i>	

APPENDIX D – INTRODUCED (EXOTIC) TAXA

Introduced Flora Taxa Recorded on Site

TAXA	Comments
* denotes introduced species	
* <i>Aira caryophyllea</i>	
* <i>Arctotheca calendula</i>	
? <i>Asteraceae</i> sp.	juvenile leaves
* <i>Avena barbata</i>	
* <i>Briza maxima</i>	
* <i>Bromeliaceae</i> sp.	garden escapee
* <i>Conyza bonariensis</i>	
? <i>Eremaea</i> sp.	planted, non local
* <i>Ehrharta calycina</i>	
* <i>Freesia</i> sp.	unopened flower
* <i>Fumaria capreolata</i>	
* <i>Galium murale</i>	
* <i>Gladiolus caryophyllaceus</i>	
*? <i>Gladiolus</i>	sterile, leaf only
* <i>Heliophila pusilla</i>	
* <i>Hypochaeris glabra</i>	
* <i>Lagurus obovatus</i>	
* <i>Monoculus monstrosus</i>	
* <i>Moraea flaccida</i>	
*? <i>Moraea</i> sp.	sterile, leaf only
*? <i>Moraea</i> sp.	yellow flower unopened
* <i>Raphanus raphanistrum</i>	
* <i>Senecio vulgaris</i>	
* <i>Silene gallica</i> var. <i>gallica</i>	
* <i>Sonchus oleraceus</i>	
* <i>Ursinia anthemoides</i>	
* <i>Vulpia bromoides</i>	
* <i>Wahlenbergia capensis</i>	

**APPENDIX E – KEY DIAGNOSTIC CRITERIA FOR THE BANKSIA
WOODLANDS OF THE SWAN COASTAL PLAIN TEC**



Banksia Woodlands SCP TEC Assessment



Characteristics of the Banksia woodland within the site compared to the key diagnostic criteria as per TSSC (2016)

Key diagnostic criteria (TSSC 2016)	Outcome
Step 1: Key Diagnostic Characteristics	
<p><u>Location:</u></p> <ul style="list-style-type: none"> Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions. 	Yes. Banksia woodlands within the project area occur on the Swan Coastal Plain.
<p><u>Soils and landform:</u></p> <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. Banksia woodlands within the site occur on Bassendean sands (S ₃).
<p><u>Structure:</u></p> <p>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 (layer of sclerophyllous shrubs of various heights and herbaceous ground layer of cord rushes, sedges and perennial and ephemeral forbs, that sometimes includes grasses). 	<p>Yes. Low Open Woodland to Low Woodland of <i>Banksia attenuata</i> and/or <i>Banksia menziesii</i>, (emergent <i>Nuytisa floribunda</i>).</p> <p>Yes. Understorey contains sclerophyllous shrubs and rushes/sedges, including the following species considered typical of this ecological community: <i>Hibbertia hypericoides</i>, <i>Stirlingia latifolia</i>, <i>Gompholobium tomentosum</i>, <i>Lyginia imberbis</i>, <i>Desmocladius flexuosus</i>, <i>Allocasuarina humilis</i>, <i>Mesomelaena pseudostygia</i>, <i>Bossiaea eriocarpa</i>, <i>Conostylis setigera</i>, and <i>Adenanthos cygnorum</i>. <i>Trachymene pilosa</i> and also <i>Laxmannia squarrosa</i> and <i>Melaleuca seriata</i>.</p>
<p><u>Composition:</u></p> <ul style="list-style-type: none"> Commonly dominated or co-dominated by <i>Banksia attenuata</i> (candlestick banksia, slender banksia) and/or <i>B. menziesii</i> (firewood banksia). Other Banksia species that dominate in some examples of the ecological community are <i>B. prionotes</i> (acorn banksia) or <i>B. ilicifolia</i> (holly-leaved banksia); Contains at least one of the following species: <ul style="list-style-type: none"> <i>Banksia attenuata</i> <i>Banksia menziesii</i> <i>Banksia prionotes</i> <i>Banksia ilicifolia</i>. Emergent tree layer often includes <i>Corymbia calophylla</i> (marri), <i>E. marginata</i> (jarrah), or less commonly <i>Eucalyptus gomphocephala</i> (tuart) understorey typically contains a high to very high diversity of shrub and herb species that often vary from patch to patch. 	<p>Yes. Low Open Woodland to Low Woodland of <i>Banksia attenuata</i> and/or <i>Banksia menziesii</i>, (emergent <i>Nuytisa floribunda</i>).</p> <p>Yes. Understorey contains sclerophyllous shrubs and rushes/sedges, including the following species considered typical of this ecological community: <i>Hibbertia hypericoides</i>, <i>Stirlingia latifolia</i>, <i>Gompholobium tomentosum</i>, <i>Lyginia imberbis</i>, <i>Desmocladius flexuosus</i>, <i>Allocasuarina humilis</i>, <i>Mesomelaena pseudostygia</i>, <i>Bossiaea eriocarpa</i>, <i>Conostylis setigera</i>, and <i>Adenanthos cygnorum</i>. <i>Trachymene pilosa</i> and also <i>Laxmannia squarrosa</i> and <i>Melaleuca seriata</i>.</p>
Step 2: Condition thresholds	



Key diagnostic criteria (TSSC 2016)	Outcome
<p><u>Condition (Keighery 1994):</u> Meet at least good condition category.</p> <ul style="list-style-type: none"> Assessments of a patch should initially be centred on the area of highest native floristic diversity and/or cover, i.e. the best condition area of the patch. Consideration must be given to the timing of surveys and recent disturbance. Ideally surveys should be undertaken in spring with two sampling periods to capture early and late flowering species. surrounding context of a patch must also be taken into account when considering factors that add to the importance of a patch that meets the condition thresholds. Certain vegetation components of the Banksia Woodlands ecological community merit consideration as critical elements to protect. Three components are recognised as threatened in their own right in WA and, as such, are priorities for protection. They are detailed in Table 1 and in Appendix B. A relevant expert (e.g. ecological consultant, local NRM or environment agency) may be useful to help identify the ecological community and its condition. 	<p>In parts- condition of patches of Banksia woodland within the site ranges from Good-Very Good, to Degraded. Sampling was undertaken in Spring 2018, with adequate sampling (3 10x10m quadrats established and assessed, and targeted searching) undertaken.</p>
<p>Step 3: minimum patch size</p>	
<p>Pristine': no minimum patch size 'Excellent': 0.5 ha (e.g. 50m x 100m) 'Very Good': 1 ha (e.g. 100m x 100m) 'Good': 2 ha. (e.g. 200m x 100m)</p>	<p>Banksia Woodlands Patch does meet the minimum criteria.</p> <ul style="list-style-type: none"> Vegetation Condition Area (ha) Good to Very Good 0.08 Good 0.13 Good to Degraded 0.42 Degraded 0.19 Cleared 0.16 Grand Total 0.98
<p>Step 4: Further information to assist in determining the presence of the ecological community and significant impacts</p>	
<ul style="list-style-type: none"> Landscape positioning Patch (discrete or continuous) <30m variations/gaps Variation in canopy cover Buffer zone: minimum buffer for the ecological community 20-50m from the outer patch. 	<p>The landscape position is on upper to middle slopes of Bassendean dunes. Buffer zones are greater than 50m from the outer sides of the patch, and the patch is continuous, with Banksia canopy density ranging from <1-35% within the site. It's small size in an urban landscape requires adequate management to protect it.</p>

APPENDIX F – PERTH BIODIVERSITY PROJECT INVENTORY OF THE BIRD SPECIES

		Site Name Hillview Bushland			
Site Location East Victoria Park		Local Government Authority Town of Victoria Park		Area (ha) 1.0ha	
Vegetation Complex Bassendean Complex – Central and South			Bird Survey Information <i>Survey period reported:</i> Oct 2003-Sept 2004 <i>Survey frequency:</i> monthly <i>Total no. surveys:</i> 12		
Natural Area ID no: 8898		Bush Forever Site no: N/A			

Bird species recorded in survey period <small>* denotes introduced species</small>	Breeding on survey site	Maximum number recorded <small>(water dependent species only)</small>	Frequency of occurrence		Significant species (Bush Forever)
			No. <small>(number surveys in which recorded)</small>	% of surveys	
Laughing Turtle-Dove*			12	100	
Spotted Turtle-Dove*			3	25	
Short-billed Black-Cockatoo			2	17	Category 1,4
Rainbow Lorikeet*			1	8	
Australian Ringneck			1	8	
Red Wattlebird			11	92	
Singing Honeyeater			12	100	
Brown Honeyeater			10	83	
New Holland Honeyeater			7	58	Category 4
White-cheeked Honeyeater			11	92	Category 4
Magpie-lark			2	17	
Grey Butcherbird			1	8	
Australian Magpie			1	8	
Australian Raven			8	67	
Welcome Swallow			1	8	
Silvereye			6	50	
Total = 16	Total = 0				Total = 3

Observers: Jay Barnett.

Other sources of bird survey information

Turpin (1991): 8 species.

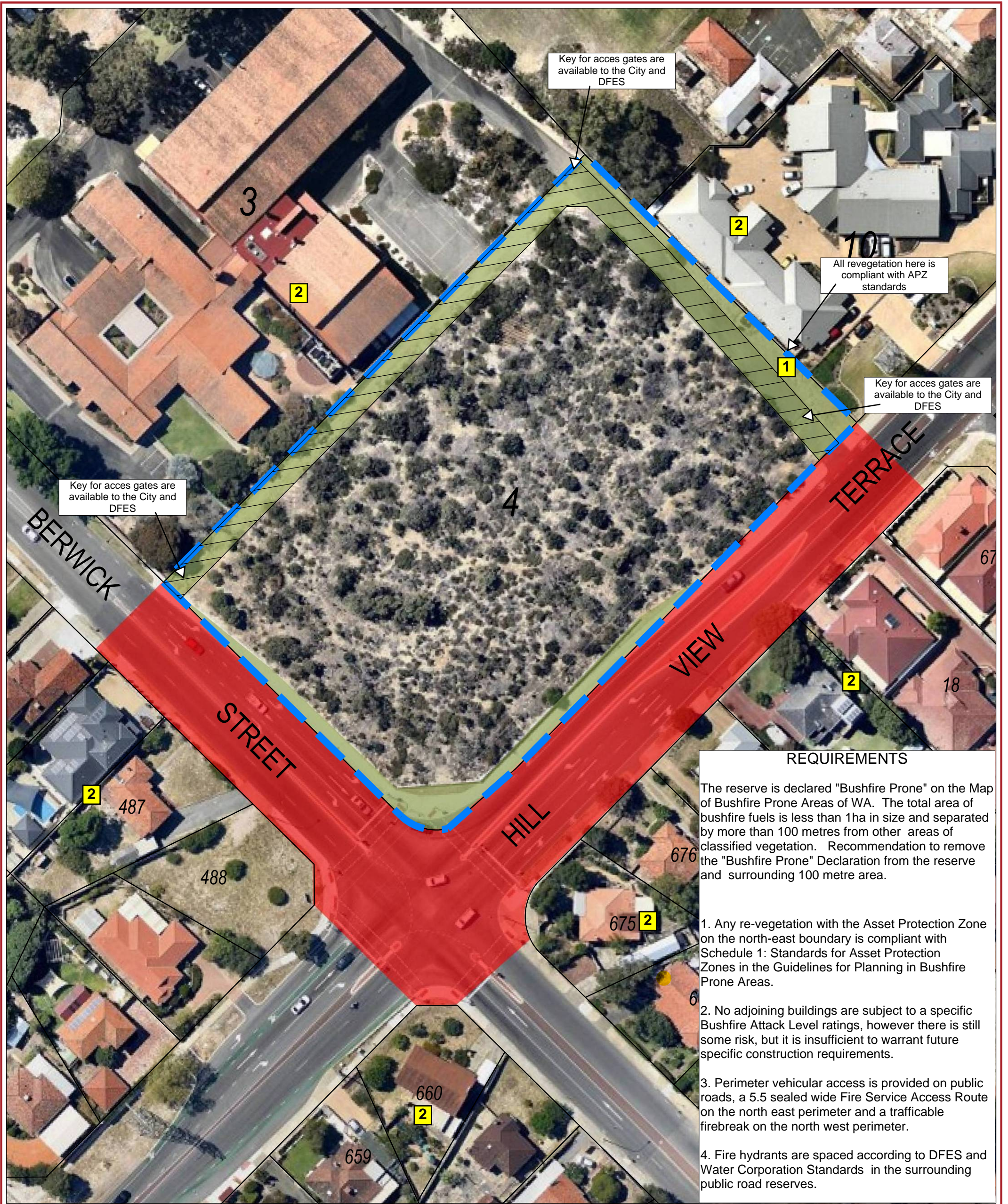
Additional significant bird species recorded in other sources

Nil.

GENERAL COMMENTS

This extremely small (1ha) and isolated remnant has boundaries with two busy urban roads and other urban infrastructure. Despite these disturbances, it has a relatively high profile in the local community, and of the 16 bird species recorded in the survey period, three are significant under Bush Forever. Carnaby's Black-Cockatoo has been reported feeding on Candlestick Banksia *Banksia attenuata*. New Holland and White-cheeked Honeyeater were also reported feeding on native vegetation in the reserve. The retention of networks of Banksia woodland remnants may be important for the future survival of Carnaby's Black-Cockatoo on the Swan Coastal Plain. Appropriate management of this reserve to ensure the long-term viability of its natural vegetation will be important.

APPENDIX G – BUSHFIRE MANAGEMENT STRATEGIES



Key for access gates are available to the City and DFES

Key for access gates are available to the City and DFES

All revegetation here is compliant with APZ standards

Key for access gates are available to the City and DFES

REQUIREMENTS

The reserve is declared "Bushfire Prone" on the Map of Bushfire Prone Areas of WA. The total area of bushfire fuels is less than 1ha in size and separated by more than 100 metres from other areas of classified vegetation. Recommendation to remove the "Bushfire Prone" Declaration from the reserve and surrounding 100 metre area.

1. Any re-vegetation with the Asset Protection Zone on the north-east boundary is compliant with Schedule 1: Standards for Asset Protection Zones in the Guidelines for Planning in Bushfire Prone Areas.
2. No adjoining buildings are subject to a specific Bushfire Attack Level ratings, however there is still some risk, but it is insufficient to warrant future specific construction requirements.
3. Perimeter vehicular access is provided on public roads, a 5.5 sealed wide Fire Service Access Route on the north east perimeter and a trafficable firebreak on the north west perimeter.
4. Fire hydrants are spaced according to DFES and Water Corporation Standards in the surrounding public road reserves.

Location details: Lot 4 Berwick Street
East Victoria Park

Assessment date: November 2018

Prepared by: Bushfire Safety Consulting

Accreditation level: Level 3 BPAD Practioner

Accreditation number: BPAD 23160

Accreditation expiry date: 31st January 2019

Date aerial photo: September 2018

SPATIAL REPRESENTATION OF BUSHFIRE MANAGEMENT STRATEGIES

0 5 10 15 20 25m

SCALE 1:750 @ A3

DATE: JANUARY 2019

NORTH

LEGEND

- SUBJECT LAND
- INTERNAL ASSET PROTECTION ZONE
- EXTERNAL PUBLIC ROADS PROVIDE ACCESS AND ADDITIONAL PROTECTION TO ASSETS
- EMERGENCY VEHICULAR ACCESS ON 3m LIMESTONE FIREBREAK AND 5.5m SEALED DRIVEWAY

SOURCE OF PHOTOGRAPHY: NEARMAP




Bushfire Safety
CONSULTING

BUSHFIRE SAFETY CONSULTING

PO BOX 84 STONEVILLE WA 6081
Mbl: 0429 949 262
www.bushfiresafety.net

APPENDIX H – RECOMMENDED WEED MANAGEMENT




Appendix H: Introduced species (weeds) recorded as occurring within the site





Botanical and Common Name	Photograph ¹	WAOL	Method of Control ²	Timing of Control ³	Weed Removal Technique
<i>Aira caryophyllea</i> (Silver hairgrass)		S11	Physical control of individual plants or small numbers of plants can easily be achieved. Herbicides like glyphosate give good control of <i>A. caryophyllea</i> , but unless more competitive species well-suited to the habitat are established in its place, it will reinvade very quickly.	July to October	Manual and herbicide application
<i>Arctotheca calendula</i> (Cape Weeds)		S11	Chip out small infestations, ensuring root is severed well below ground level to prevent re-sprouting from the crown. For large infestations apply Lontrel® 6 ml/10 L (300 ml/ha) in early growth stages. Glyphosate at 0.2% will provide some selective control if the plants are young or at the budding stage, otherwise spot spraying glyphosate at 10 ml/L will control capeweed at all growth stages. A combination of chemical and physical control with follow up treatment provides optimal control.	June to November	Herbicide.
<i>Avena barbata</i> (Bearded Oat)		S11	Spray at 3-5 leaf stage with Fusilade® Forte at 16 ml/10 L + wetting agent or for generic fluazifop-p (212g/L active ingredient) 10ml/10L or 0.5L/ha + wetting agent. Repeat over the following 2 years. Aim to prevent seed production	July to October	Herbicide





¹ Photographs sources from Flora Base (DPaW) <https://florabase.dpaw.wa.gov.au/search/advanced>




² DBCA Swan Region Management Notes(Flora Base) <https://florabase.dpaw.wa.gov.au/search/advanced>

³ Recommendations from Flora Base (DPaW) <https://florabase.dpaw.wa.gov.au/search/advanced>

Botanical and Common Name	Photograph ¹	WAOL	Method of Control ²	Timing of Control ³	Weed Removal Technique
<i>Briza maxima</i> (Blowfly grass)		S11	Hand pull or spray at 3-5 leaf stage with Fusilade® Forte at 16 ml/10 L or 800 ml/ha (based on 500 L water/ha) + wetting agent or for generic fluzafop-p (212g/L active ingredient) 10ml/10L or 500ml/ha + wetting agent. Repeat treatment for 2 - 3 years.	June to September	Manual and herbicide application
<i>Conyza bonariensis</i> (Flaxleaf Fleabane)		S11	Hand remove small and/or isolated infestations prior to seed set. Resprouts from basal buds after top removal. Timing of application is key to the efficacy of any herbicide treatment. Most susceptible to glyphosate at the rosette stage and least susceptible at flowering. Apply glyphosate when plants are small (at rosette stage <10cm across) 25 ml/ 10L after stem elongation and before flowering and actively growing. Otherwise 50% glyphosate can be used to wipe the stems of plants	June to September (Herbicide) All year (manual)	Manual and herbicide application
<i>Ehrharta calycina</i> (Perennial Veldt Grass)		S11	For small infestations, cut out plants ensuring crown removal. Do not slash. Alternatively spray with Fusilade® Forte 13 ml/L or 6.5 L/ha + wetting agent on actively growing and unstressed plants. For generic fluzafop-p (212g/L active ingredient) 8ml/L or 4L/ha +wetting agent. Follow-up in subsequent years.	Herbicide: June to September Manual: November to February	Manual and herbicide application

Botanical and Common Name	Photograph ¹	WAOL	Method of Control ²	Timing of Control ³	Weed Removal Technique
<i>Fumaria capreolata</i> (Whiteflower Fumitory)		S11	Spray metsulfuron methyl at 0.1 g/15 L (2.5 g/ha) + wetting agent or glyphosate 0.5%	July to September	Herbicide
<i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)		S11	Wipe individual leaves with glyphosate 10 % or spray dense infestations in degraded areas with 1% glyphosate just on flowering at corm exhaustion	July to September	Herbicide
<i>Hypochaeris glabra</i> (smooth cats-eat)		S11	Hand remove small infestations and/or isolated plants, ensuring the taproot is removed. Alternatively wipe rosettes with glyphosate at 30%. For dense infestations, apply Lontrel® 10 ml /10 L + wetting agent. Apply herbicide regularly to prevent seeding	Herbicide: May to September Manual: May to October	Manual and herbicide application
<i>Lagurus ovatus</i> (Hare's Tail Grass)		S11	Prevent seed set. Hand removal small isolated infestations. In selective situations spray with 16 ml/10 L (800 ml/ha) Fusilade® Forte + spray oil or for generic fluazifop-p (212g/L active ingredient) 10ml/10L or 500ml/ha + spray oil any time before flowering. A lower rate of 13 ml/10 L Fusilade® Forte or for generic fluazifop-p (212g/L active ingredient) 8ml/10L can be used in winter at the 2-8 leaf stage before stem elongation	Herbicide: June to October Manual: July to December	Manual and herbicide application

Botanical and Common Name	Photograph ¹	WAOL	Method of Control ²	Timing of Control ³	Weed Removal Technique
<i>Monoculus monstrosus</i>		S11	Hand remove small populations and/or isolated plants prior to flowering. Try spot spraying with glyphosate at 0.5% before flowering	Herbicide: June to October Manual: June to October	Manual and herbicide application
<i>Moraea flaccida</i> (One-leaf Cape Tulip)		Declared (s22)	Spot spray metsulfuron methyl 0.2 g/15 L or chlorsulfuron 0.2 g/15 L + Pulse® or 2.5-5 g/ha + Pulse® or 2,2 DPA 55 g/10 L + Pulse®. Apply just on flowering at corm exhaustion	July to August	Herbicide
<i>Raphanus raphanistrum</i> (Wild radish)		S11	Hand remove isolated plants several times throughout the year. Spot spray 1% glyphosate before flowering. A combination of approaches is usually most successful	Herbicide: All year Manual: all year	Manual and herbicide application
<i>Senecio vulgaris</i> (Common Groundsel)		S11	Hand remove small/isolated populations. Apply Lontrel® at 10 ml/10 L + wetting agent before stem elongation in late spring.	Herbicide: September to November Manual: all year	Manual and herbicide application

Botanical and Common Name	Photograph ¹	WAOL	Method of Control ²	Timing of Control ³	Weed Removal Technique
<i>Sonchus oleraceus</i> (Common Sowthistle)		S11	Remove small and/or isolated populations manually prior to seed set. Slashing is often ineffective as flowers continue to be produced. Spot spray Lontrel® 10 ml/10 L + wetting agent preferably at the rosette stage.	Herbicide: June to September Manual: June to November	Manual and herbicide application
<i>Vulpia bromoides</i> (Squirrel Tail Fescue)		S11	Hand pull plants or spray with Select® 10 ml/10 L (500 ml/ha) prior to boot stage. It is important to minimise bare ground through autumn and winter to suppress annual weed population growth	Herbicide: July to September	Manual and herbicide application
<i>Wahlenbergia capensis</i> (Cape bluebell)		S11	Manually remove small populations before seeding. Wipe leaves with 1:2 glyphosate to water.	Herbicide: August to December	Manual and herbicide application

APPENDIX I – RECOMMENDED SPECIES LIST (APACE)

Species (Adapted from APACE)	Description and Habitat (Florabase, 2019)
<i>Acacia sessilis</i>	Diffuse, often straggling, pungent shrub, 0.3-1(-1.5) m high. Fl. yellow, Jul to Oct. White/grey or yellow sand, lateritic sand, gravelly clay.
<i>Anigozanthos humilis</i> (Catspaw)	Rhizomatous, perennial, herb, 0.1-1 m high. Fl. yellow-red-orange, Jul to Oct. Sand, sandy loam, clay, laterite, limestone. Winter-wet swamps, creek banks, alluvial flats, well drained areas.
<i>Banksia grandis</i> (Bull Banksia)	Tree or shrub (in south coastal areas), 1.5-10 m high, with epicormic buds. Fl. yellow-green, Sep to Dec or Jan. White or grey sand, laterite.
<i>Beaufortia elegans</i> (Elegant Beaufortia)	Erect shrub, 0.3-1(-2) m high. Fl. red/purple/pink/white, Aug to Dec or Jan to Feb. White, grey or yellow sand, often over laterite. Plains, winter-wet depressions.
<i>Calothamnus sanguineus</i> (Silky Leaved Blood Flower)	Erect to open spreading shrub, 0.2-2 m high. Fl. red, Mar to Nov. Sandy or lateritic soils. Sandplains, limestone ridges, rocky outcrops.
<i>Corymbia calophylla</i> (Marri)	Tree or (mallee, rarely), to 40(-60) m high, bark rough, tessellated. Fl. white/pink, Dec or Jan to May. Red-brown clay loam, orange-brown sandy clay, gravel, grey sand over limestone, granite, laterite. Flats, hills, slopes, breakaways, wetlands, fringing salt marches, beside drainage lines.
<i>Dodonaea hackettiana</i> (Hacketts Hopbush)	Erect shrub or tree, 1-5 m high. Fl. yellow-green/red, mainly Jul to Oct. Sand. Outcropping limestone.
<i>Eucalyptus marginata</i> (Jarrah)	Tree, to 40 m high, bark rough fibrous. Fl. white-cream/pink, Jun to Dec or Jan. Grey sand, clay or sandy loam, laterite. Hills, rises.
<i>Gastrolobium capitatum</i>	Prostrate to low, bushy shrub, to 1 m high. Fl. orange-yellow, Jun to Sep. Sandy to loamy soils, laterite, granite. Slopes, outcrops, swampy areas, plains.
<i>Gompholobium scabrum</i>	Erect to spreading shrub, (0.2-)0.4-2.3 m high. Fl. pink-purple, Aug to Nov. Sandy soils, sometimes over laterite. Undulating plains.
<i>Hakea ruscifolia</i> (Candle Hakea)	Lignotuberous shrub, 0.5-3 m high. Fl. white, Dec or Jan to Apr or Jun. White, grey or red/brown sand, gravelly clay, laterite.
<i>Hemiandra pungens</i>	Prostrate to ascending shrub, 0.05-1 m high. Fl. white/blue-purple/pink, Jan to Dec. Sand, clay and loam, gravel, laterite, granite. Rock outcrops.
<i>Jacksonia sericea</i>	Low spreading shrub, to 0.6 m high. Fl. orange, usually Dec or Jan to Feb. Calcareous & sandy soils.
<i>Kennedia prostrata</i>	Prostrate or twining shrub. Fl. red, Apr to Nov. Usually sandy gravelly soils.
<i>Leptospermum spinescens</i>	Spinescent shrub, 0.3-1.5 m high. Fl. cream-white, Sep to Dec. Sandy & lateritic soils. Hills, sandplains.
<i>Melaleuca trichophylla</i>	Straggly or rounded shrub, 0.15-1 m high. Fl. pink-purple, Aug to Dec. White/grey/orange sand, gravel, laterite. Sandplains, hillsides.
<i>Neurachne alopecuroidea</i>	Rhizomatous, tufted perennial, grass-like or herb, 0.15-0.5(-0.8) m high. Fl. green-other, Jul to Nov. White, yellow, grey/brown or lateritic sand, clay, loam, granite. Sandplains, hillslopes, outcrops.
<i>Opercularia vaginata</i>	Decumbent, spreading or erect perennial, herb or shrub, (0.04-)0.1-0.45 m high. Fl. green/green-yellow, Jul to Dec. Sandy, lateritic or granitic soils, coastal limestone.
<i>Orthrosanthus laxus</i>	Rhizomatous, tufted perennial, herb, 0.2-0.55 m high. Fl. blue, Aug to Nov. Laterite, sandy loam, sand, gravel.
<i>Philotheca spicata</i>	Slender, erect shrub, 0.2-0.6(-1.2) m high. Fl. pink-purple-blue/white, Jun to Nov. Variety of soils.
<i>Xanthorrhoea preissii</i>	Perennial tree-like monocot, to 5 m high, trunk to over 3 m, scape length 0.6-1.0 m, spike length 1.5-2.5 m. Fl. white-cream, Jun or Aug to Dec. Grey to black sands, grey-brown loam, brown gravelly sandy clay, laterite, granite. Ranges, coastal plain, near watercourses.

COTERRA ENVIRONMENT

Level 3, 25 Prowse Street
West Perth WA 6005

T (08) 9381 5513

www.coterra.com.au
info@coterra.com.au

