TECHNICAL MEMORANDUM

Flora, Vegetation and Fauna Survey

Belmont Transit Orientated Development (TOD) Precinct – Stage 1

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PROJECT NAME	Belmont Park Redevelopment	**CLIENT**	
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1. INTRODUCTION

1.1. Background

Emerge Associates (Emerge) has been engaged by Golden Group to provide environmental consultancy services to support the construction of a water pressure main and distribution main in accordance with the Belmont Transit Orientated Development (TOD)—Stage 1 plan. Construction of the water pressure main and distribution main may result in impacts to areas of native vegetation within Lot 800 on DP 31953, Belmont. The location and extent of the proposed works footprint (the site) is shown in **Figure 1**.

The site is 1.32 hectares (ha) in size and zoned 'Parks and Recreation' and 'Primary Regional Roads' under the Metropolitan Region Scheme (MRS) and the City of Belmont Local Structure Plan (LSP) No.15. It is located to the south east of the Belmont Peninsular within the City of Belmont, adjacent to Balbuk Way and Balbuk Park, and bound by Graham Farmer Freeway to the west and the Swan River to the east.

This technical memorandum has been prepared to provide information on flora, vegetation and fauna values within the site for provision to the Water Corporation for information purposes.

1.2. Scope of work

In accordance with the Environmental Protection Authority's (EPA's) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b), a flora and vegetation assessment was undertaken by Emerge to the standard required of a 'reconnaissance' survey. This including the following tasks:

- Desktop review of background information.
- Compilation of a representative list of flora species recorded as part of the field survey.
- Compilation of a list of conservation significant fauna species potentially using the site.
- Mapping of plant communities and vegetation condition.
- Documentation of the desktop assessment, survey methodology and results into a technical memorandum.

The flora and vegetation survey also included a fauna assessment, undertaken to the standard of a part 'level 1' survey (desktop assessment) in accordance with the Environmental Protection Authority's (EPA's) *Technical Guidance – Terrestrial fauna Surveys* (EPA 2016a).

2. BACKGROUND

2.1. Regional landforms and soils

Landform and soils influence vegetation types at regional and local scales. The site occurs on the Swan Coastal Plain, which is the geomorphic unit that characterises much of the Perth Metropolitan Region.

Examination of broad scale mapping places the site within the Swan association which consists of alluvial terraces with red earths and duplex soils (Churchward and McArthur 1980). Finer scale mapping by Gozzard (2011) places the site in the Swan River floodplain. The Swan River is a permanently open estuary system that supports fresh/brackish conditions during winter to spring and salty conditions during summer to autumn.

The site is not known to contain any restricted landforms or unique geological features.

2.2. Hydrology and Wetlands

Wetlands include "areas of seasonally, intermittently or permanently waterlogged soils or inundated land, whether natural or otherwise, fresh and saline, e.g. waterlogged soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries" (Wetlands Advisory Committee 1977). Wetlands can further be recognised by the presence of vegetation associated with waterlogging or the presence of hydric soils such as peat, peaty sand or carbonate mud (Hill *et al*. 1996).

Wetlands of national or international significance may be afforded special protection under Commonwealth or international agreements. The following lists of important wetlands were checked as part of this assessment:

- *Ramsar List of Wetlands of International Importance (DSEWPaC 2013)*
- *A Directory of Important Wetlands in Australia (Environment Australia 2001a).*

No Ramsar listed wetlands are located within or near the site. Adjacent to the site, the Swan River is listed as an 'important wetland' and a 'conservation' category wetland (UFI 13316) under the Department of Parks and Wildlife (DPaW) *Geomorphic Wetlands of the Swan Coastal Plain* dataset.

2.3. Regional vegetation

Native vegetation is described and mapped at different scales in order to illustrate patterns in its distribution. At a continental scale the Interim Biogeographic Regionalisation of Australia (IBRA) divides the Swan Coastal Plain into two floristic subregions (Environment Australia 2000). The site is contained within the 'SWA02' or Perth subregion, which is characterised by Banksia low woodland on leached sands with Melaleuca swamps where ill-drained; and woodland of *Eucalyptus gomphocephala* (tuart), *E. marginata* (jarrah) and *Corymbia calophylla* (marri) on less leached soils (Beard 1990). This subregion is recognised as a biodiversity hotspot and contains a wide variety of endemic flora and vegetation types.

Vegetation mapping undertaken by Heddle (1980) indicates the area is a part of the Bassendean complex - central and south, which is described as ranging from woodland of *Eucalyptus marginata - Allocasuarina fraseriana - Banksia* spp. to low woodland of *Melaleuca* spp. and sedgelands on the moister sites.

2.4. Conservation significant flora species

A search was conducted for threatened and priority flora within a 10 km radius of the site using the *Protected Matters Search Tool* (DoEE 2018), the Department of Biodiversity, Conservation and Attractions (DBCA) *NatureMap* (DBCA 2018) and DBCA's *Threatened and priority flora database* (reference no. 05-1216FL). Search results are summarized in in **Table 1**.

Due to the history of disturbance, modification and revegetation within the site, none of these threatened or priority flora species were considered likely to occur. Detailed information on conservation codes for threatened and priority flora are provided in **Appendix A.**

Table 1: Significant flora species known or likely to occur within 5 km of the site.

Species	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	State	EPBC Act				
Andersonia gracilis	T	E		Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep - Nov	Unlikely
Angianthus micropodioides	P3		A	Saline sandy soils on edge of rivers, depressions and clay pans.	Nov-Dec/Jan-Feb	Unlikely
Anigozanthos viridis subsp. terraspectans	T	V	P	Grey sand, clay loam. Winter-wet depressions.	Aug-Sep	Unlikely
Byblis gigantea	P3		P	Sandy-peat swamps. Seasonally wet areas.	Sept-Jan	Unlikely
Conostylis bracteata	P3		P	Sand, limestone. Consolidated sand dunes	Aug-Sep	Unlikely
Cyathochaeta teretifolia	P3		P	Grey sand, sandy clay in swamps and creek edges.	Oct-Jan	Unlikely
Dampiera triloba	P3		P	Occurs in the Swan Coastal Plain (SWA) and Avon Wheatbelt (AW) IBRA Region(s), of the South West (SW) Botanical Province.	Aug-Dec	Unlikely
Diuris micrantha	T	V		Dark grey-black sandy clay-loam in winter wet depressions or swamps. Often in shallow standing water.	Aug/Sept	Unlikely
Diuris purdiei	T	E		Sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath	Sept/Oct	Unlikely
Dodonaea hackettiana	P4			Sand, outcropping limestone.	July-Oct	Unlikely
Drakaea elastica	T	E		Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps.	Sept/Oct	Unlikely

Species	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	State	EPBC Act				
Drakaea micrantha	T	V		Open sandy patches often adjacent to winter-wet swamps.	Sept/Oct	Unlikely
Eleocharis keigheryi	T	V		Clay or sandy loam in freshwater creeks and transient waterbodies such as seasonally wet clay pans.	Aug/Dec	Unlikely
Eucalyptus x balanites	T	E		Light coloured sandy soils over laterite. Habitat consists of gently sloping heathlands; open mallee woodland over shrubland (Population 2) or heathland with emergent mallees (population 1)	Oct-Feb	Unlikely
Hibbertia spicata subsp. leptotheca	P3			Sand. Near-coastal limestone ridges, outcrops & cliffs	July-Oct	Unlikely
Isopogon drummondii	P3		P	White, grey or yellow sand, often over laterite.	Feb-June	Unlikely
Jacksonia sericea	P4			Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb	Unlikely
Lepidosperma rostratum	T	E		Peaty sand and clay amongst low heath, in winter-wet swamps.	May-June	Unlikely
Stylidium aceratum	P3		A	Sandy soils in swamp heathland.	Oct-Nov	Unlikely
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	T	CE	P	Low woodland on grey, clayey sand with lateritic pebbles (Pinjarra Plain) near winter wet flats.	Sept-Nov	Unlikely
Thelymitra dedmaniarum	T	E	G	Red brown sandy loam with dolerite and granite outcrops.	Oct-Nov	Unlikely
Thelymitra stellata	T	E	G	Sandy loam, clay or gravel over laterite or gravel.	Sept-Nov	Unlikely
Thelymitra variegata	P2		P	Sandy clay, sand, laterite.	June-Sept	Unlikely
Verticordia lindleyi subsp. lindleyi	P4			Sand and sandy clay in winter wet areas.	May-Nov	Unlikely

Note: T=threatened, CE=critically endangered, E=endangered, V=vulnerable, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4, P=perennial, PG=perennial geophyte, A=annual. Species considered to potentially occur within the site are shaded green. Detailed information on conservation codes are provided in ***Appendix A.***

2.5. Conservation significant vegetation

An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. An ecological community's structure, composition and distribution are influenced by environmental factors such as soil type, position in the landscape, altitude, climate and water availability (DoEE 2017).

'Threatened ecological communities' (TECs) are ecological communities that are recognised as rare or under threat and therefore warrant special protection. TECs are protected under the *Biodiversity Conservation Act 2016* and considered during State approval processes. A plant community that is under consideration for listing as a TEC in Western Australia, but does not yet meet survey criteria or has not been adequately defined, may be listed as a 'priority ecological community' (PEC). PECs are similarly considered during State approval processes.

Known locations of TECs and PECs within 10 km of the site were searched for using the publicly available *Protected Matters Search Tool* (DoEE 2018) and DBCA's *Threatened and priority ecological communities' database* (reference no. 11-0818EC). These search results indicate that a patch of the 'banksia woodlands of the Swan Coastal Plain' TEC is mapped as occurring over the entirety of the site. An additional 13 TECs occur within 10 km of the site as listed in **Table 2.**

Table 2: TECs and PECs known to occur within 10 km of the site.

Code	Community name	TEC/PEC	Level of significance	
			State	EPBC Act
SCP07	Herb rich saline shrublands in clay pans	TEC	Vulnerable	Critically Endangered (Clay Pans of the Swan Coastal Plain)
SCP3a	*Eucalyptus calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain	TEC	Critically Endangered	Endangered
Muchea Limestone	Shrublands and woodlands on Muchea Limestone	TEC	Endangered	Endangered
SCP02	Southern wet shrublands, Swan Coastal Plain	TEC	Endangered	-
SCP20b	*Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain	TEC	Endangered	Endangered (Banksia Woodlands of the Swan Coastal Plain)
SCP20a	*Banksia attenuata* woodlands over species rich dense shrublands	TEC	Endangered	
SCP22	*Banksia ilicifolia* woodlands	TEC/PEC	Priority 2	
SCP21c	Low lying *Banksia attenuata* woodlands or shrublands	TEC/PEC	Priority 3	
SCP24	Northern Spearwood shrublands and woodlands	TEC/PEC	Priority 3	
Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh	TEC/PEC	Priority 3	Vulnerable
Wooded waterbird wetlands	Wooded wetlands which support colonial waterbird nesting areas	PEC	Priority 2	-
SCP02	Southern wet shrublands, Swan Coastal Plain	TEC	Endangered	-

Code	Community name	TEC/PEC	Level of significance	
			State	EPBC Act
SCP18	Shrublands on calcareous silts of the Swan Coastal Plain	TEC	Vulnerable	-
CENTRAL GRANITE SHRUBLANDS (COM 5, MARKEY)	Central northern Darling Scarp granite shrubland community	PEC	Priority 4	-

Detailed information on conservation codes are provided in ***Appendix A.***

2.6. Conservation significant fauna species

A search was conducted for threatened and priority fauna within a 5 km radius of the site using the *Protected Matters Search Tool* (DoEE 2018), *NatureMap* (DBCA 2018) and *DBCA's Threatened and priority fauna database*. As advised by the EPA in the T*echnical Guidance Terrestrial Fauna Surveys* (EPA 2016a), taxonomy and nomenclature for fauna species was taken from the current "Checklist of the Terrestrial Vertebrate Fauna of Western Australia" (Western Australian Museum 2018).

Of the fauna species potentially occurring in the local area, only those with preferences for riverine and wetland habitats were deemed likely to occur in the site.

Three conservation significant fauna species were identified as having potential to utilise the habitat within the site: the Australian little bittern, water-rat and southwestern brown bandicoot (shaded green in **Table 3**).

Table 3: Significant fauna species known or likely to occur within 5 km of the site

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		State	EPBC Act		
Birds					
Botaurus poiciloptilus	Australasian Bittern	EN	EN	Beds of tall dense Typha,spp., Baumea spp. and sedges in freshwater swamps (Johnstone and Storr 1998).	Unlikely
Calidris acuminata	Sharp-tailed Sandpiper	IA	MI	Mainly shallows of estuaries and near-coastal saltlakes (including saltwork ponds) and drying near-coastal freshwater lakes and swamps. Also beaches and near-coastal sewage ponds (Johnstone and Storr 1998).	Unlikely
Calidris ferruginea	Curlew Sandpiper	VU (IA)	CR (MI)	Mainly shallows of estuaries and near-coastal saltlakes (including saltwork ponds) and drying near-coastal freshwater lakes and swamps. Also beaches and near-coastal sewage ponds (Johnstone and Storr 1998).	Unlikely
Calidris melanotos	Pectoral Sandpiper	IA	MI	Mainly fresh waters (swamps, lagoons, river pools, irrigation channels and sewage ponds); also samphire flats	Unlikely

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		State	EPBC Act		
				around estuaries and saltlakes (Johnstone and Storr 1998).	
Calidris ruficollis	Red-necked Stint	IA	MI	Tidal mudflats, saltmarshed, sandy or shelly beaches, saline and freshwater wetlands (coastal and inland), salt fields, sewage ponds (Pizzey and Knight 2012).	Unlikely
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	Eucalypt forests. Attracted to seeding Corymbia calophylla, Eucalyptus marginata, E. patens, E. staeri, E. diversicolor, Allocasuarina fraseriana and Persoonia longifolia (Johnstone and Storr 1998).	Unlikely
Calyptorhynchus baudinii	Baudin's cockatoo	EN	EN	Mainly eucalypt forests. Attracted to seeding Corymbia calophylla, Banksia spp., Hakea spp., Erodium botyrs, and to fruiting apples and pears (Johnstone and Storr 1998).	Unlikely
Calyptorhynchus latirostris	Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of Pinus spp. Attracted to seeding Banksia, Dryandra, Hakea, Eucalyptus, Corymbia, Grevillea, Pinus and Allocasuarina spp. Roosting in flat-topped yates Eucalyptus occidentalis (Johnstone and Storr 1998).	Unlikely
Dasyornis longirostris	Western Bristlebird	EN	EN	Dense, low, closed coastal heaths. Open heaths with dense clumps of shrubs, eucalypt thickets and tall swampy heaths. Much reduced by fire, draining for agriculture, but may need fire for optimal status over 50-10+ years. Current range in WA confined to south coast from Albany to Hopetoun (Pizzey and Knight 2012).	Unlikely
Falco hypoleucos	Grey falcon	VU	-	Lightly wooded coastal and riverine plains (Johnstone and Storr 1998).	Unlikely
Falco peregrinus	Peregrine Falcon	S		Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	Unlikely
Falco peregrinus macropus	Australian Peregrine Falcon	S	-	Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes (Johnstone and Storr 1998).	Unlikely
Sterna caspia	Caspian tern	IA	MI	Mainly sheltered areas, estuaries (when not laden with silt) and tidal creeks; occasionally near-coastal saltlakes (including saltwork ponds)	Unlikely

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		State	EPBC Act		
				and brackish pools in lower courses of rivers; rarely fresh waters (Johnstone and Storr 1998).	
Ixobrychus dubius	Australian Little Bittern	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of Typha spp., Baumea spp. and tall rushes in freshwater swamps around lakes and along rivers (Johnstone and Storr 1998).	Possible
Ixobrychus flavicollis australis	Black Bittern (southwest subpop.), Australian Black Bittern	P2	-	Freshwater pools, swamps and lagoons, well-screened with trees. Occasionally feeding by day but mainly sheltering in dense waterside vegetation (Melaleuca spp., Eucalyptus camaldulensis, Pandanus spp. and long grass) (Johnstone and Storr 1998).	Unlikely
Numenius madagascariensis	Eastern Curlew	VU (IA)	CR (MI)	Mainly tidal mudflats; also reef flats, sandy beaches and rarely near-coastal lakes (including saltwork ponds) (Johnstone and Storr 1998).	Unlikely
Oxyura australis	Blue-billed duck	P4	-	Mainly deeper freshwater swamps and lakes; occasionally saltlakes and estuaries freshened by flood waters (Johnstone and Storr 1998).	Unlikely
Pandion heliaetus	Osprey	IA	MI	Moderately to very common in sheltered seas around north and west-coast islands south to 31°S; uncommon to common on mainland coasts, estuaries and larger rivers north of tropic; rare to uncommon elsewhere (Johnstone and Storr 1998).	Unlikely
Pluvialis squatarola	Grey Plover	IA	MI	Mudflats, saltmarsh, tidal reefs and estuaries, rarely inland (Pizzey and Knight 2012).	Unlikely
Puffinus pacificus	Wedge-tailed shearwater	IA	MI	Pelagic, marine bird known from tropical and subtropical waters. Tolerates a range of surface-temperatures and salinities, but is most abundant where temperatures are greater than 21 °C and salinity is greater than 34.6 % (Reid et al. 2002).	Unlikely
Sterna bergii	Crested tern	IA	MI	Mainly blue-water seas (especially within 3 km of land), including southern estuaries in summer and autumn (when free of silt); also tidal creeks in north, but not penetrating far into larger estuaries (Johnstone and Storr 1998).	Unlikely

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		State	EPBC Act		
Tringa glareola	Wood Sandpiper	IA	MI	Mainly shallow fresh waters (lagoons, swamps, claypans, river pools, dams, bore overflows and sewage ponds); occasionally brackish swamps, rarely saltlakes and estuaries (Johnstone and Storr 1998).	Unlikely
Tringa hypoleucos	Common sandpiper	IA	MI	Edge of sheltered waters salt or fresh, e.g. estuaries, mangrove creeks, rocky coasts, near-coastal saltlakes (including saltwork ponds), river pools, lagoons, claypans, drying swamps, flood waters, dams and sewage ponds. Preferring situations where low perches are available (Johnstone and Storr 1998).	Unlikely
Tringa nebularia	Common Greenshank, greenshank	IA	MI	Shallow fresh waters (claypans, lagoons, swamps, river pools, dams and sewage ponds) and salt waters (estuaries, mangrove creeks, lakes, samphire flats, reef flats and saltwork ponds) (Johnstone and Storr 1998).	Unlikely
Tyto novae-hollandiae novaehollandiae	Masked Owl (southwest)	P3	-	Forests, woodlands, timbered waterways and open country on the fringe of these areas (Pizzey and Knight 2012).	Unlikely
			Mammals		
Dasyurus geoffroii	Chuditch, Western Quoll	VU	VU	Wide range of habitats from woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. Appears to utilise native vegetation along road sides in the wheatbelt (DEC 2012a).	Unlikely
Dasyurus hallucatus	Northern Quoll	EN	EN	Most abundant in rocky eucalypt woodland but occurs in range of vegetation types, mostly within 200 km of the coast (Menkhorst and Knight 2011).	Unlikely
Hydromys chrysogaster	Water-rat, Rakali	P4	-	Areas with permanent water, fresh, brackish or marine. Likely to occur in all major rivers and most of the larger streams as well as bodies of permanent water in the lower south west (Christensen and Strahan 1984).	Possible
Isoodon fusciventer	Quenda, southwestern brown bandicoot	P4	-	Dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC 2012b).	Possible
Myrmecobius fasciatus	Numbat, Walpurti	EN	EN	Generally dominated by Eucalyptus spp. that provide hollow logs and branches for shelter and termites for food (Van Dyck and Strahan 2008).	Unlikely

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		State	EPBC Act		
Phascogale tapoatafa subsp. wambenger	South-western Brush-tailed Phascogale, Wambenger	CD	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover (Triggs 2003).	Unlikely
			Reptiles		
Ctenotus ora	Coastal Plains Skink	P3	-	Sandy substrates with low vegetation (including heath) in open Eucalyptus spp. and Corymbia calophylla woodland over Banksia spp. (Kay and Keogh 2012).	Unlikely
Lerista lineata	Perth Slider, Lined Skink	P3	-	Sandy coastal heath and low scrubland. Banksia spp. woodland, Eucalyptus gomphocephala open woodland over deep sands, and coastal dunes immediately adjacent to the beach (Wilson and Swan 2008).	Unlikely
Neelaps calonotos	Black-striped Snake, black-striped burrowing snake	P3	-	Coastal and near-coastal dunes, sandplains supporting heathlands and Banksia spp. woodlands (Bush *et al.* 2002).	Unlikely

Detailed information on conservation codes are provided in ***Appendix A.***

2.7. Historic land use

A review of historical aerial imagery of the site identified the eastern portion has remained relatively undisturbed since 1953 (Landgate 2019). In 2001 the southern portion of the site was cleared for the construction of a foot path (Balbuk way) which provides access along the Swan River foreshore. The cleared areas adjacent to the footpath were then subsequently revegetated. Revegetation or restoration (native species planting and weed management) is also known to have been conducted in the eastern portion of the site amongst remnant native vegetation in 2006.

2.8. Environmentally sensitive areas

'Environmentally sensitive areas' (ESAs) are prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and have been identified to protect native vegetation values of areas surrounding significant, threatened or scheduled flora, vegetation communities or ecosystems. Within an ESA none of the exemptions under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* apply.

The site occurs within a large ESA that extends the length of the Swan River. The location of this ESA is shown in **Figure 2.**

2.9. Ecological linkages

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. The movement of fauna and the exchange of genetic material between vegetation remnants improve the viability of those remnants by allowing

greater access to breeding partners and food sources, refuge from disturbances such as fire and maintenance of genetic diversity of plant communities and populations. Ecological linkages are ideally continuous or near-continuous as the more fractured a linkage is, the less ease flora and fauna have in moving within the corridor (Alan Tingay and Associates 1998).

According to an assessment of ecological linkages undertaken 21 February 2019, one ecological linkage occurs over the north portion of the site, and extends beyond the site to the east and west. The location of this ecological linkage within the site is shown in **Figure 2**.

2.10. Previous surveys

Two previous flora and vegetation surveys are known to have occurred over or adjacent to the site:

- Adjacent to the site, a targeted vegetation assessment of the Belmont Peninsular (Emerge, 2016) identified areas of the threatened ecological community (TEC) 'subtropical and temperate coastal saltmarsh' (coastal saltmarsh TEC) in 'very good', 'good' and 'degraded' condition. The remainder of the site contained non-native vegetation in 'very good' condition.
- A flora and vegetation survey of Balbuk Park which encompasses the site, was conducted by Ecologia but was not made publically available (Ecologia, Jan 2004).

3. METHODS

3.1. Field survey

One ecologist from Emerge visited the site on 10 January, 2019 to conduct the reconnaissance flora and vegetation survey.

The site was traversed on foot and the composition and condition of vegetation was recorded. Searches were conducted for threatened and priority flora species in particular, both within and adjacent to the proposed earthworks footprint.

Plant taxa were recorded opportunistically as the botanist traversed the site and identified in accordance with requirements of the Western Australian Herbarium. Flora species not native to Western Australia are denoted by an asterisk ('*') in text and raw data. Photographs were taken throughout the field visit to show particular site conditions.

No formal sampling was conducted. Plant community type and vegetation condition was mapped across the site. The condition of the vegetation was assessed using methods from Keighery (1994) (as shown in **Table 4**).

Table 4: Vegetation condition scale applied during the field assessment

Condition	Definition (Keighery 1994)
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very good	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	Vegetation structure significantly altered by very 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 and grazing.
Degraded	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	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.

3.2. Mapping and data analysis

3.2.1.1. Plant communities description

Plant communities were described according to the dominant species present using the structural formation descriptions of the *National Vegetation Inventory System* (NVIS) (ESCAVI 2003). The identified plant communities were mapped on aerial photography (1:8,000) and boundaries were interpreted from aerial photography and notes taken in the field. Vegetation condition was mapped on aerial photography (1:8,000) based on the locations recorded during the field survey to define areas with differing condition, as shown in **Figure 5.**

3.3. Survey limitations

It is important to note the specific constraints imposed on surveys and the degree to which these may have limited survey outcomes. An evaluation of the survey methodology against standard constraints outlined in the EPA document *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) is provided in **Table 5**.

Table 5: Evaluation of survey methodology against standard constraints outlined in EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment

Constraint	Degree of limitation	Details
Availability of contextual information	No limitation	The broad scale contextual information and previous surveys described in **Section 2** is adequate to place the site and vegetation in context.
Experience level of personnel	No limitation	The flora and vegetation assessment was undertaken by a qualified ecologist with over 15 years' experience in Western Australia.
Suitability of timing	Minor Limitation	The survey was conducted in January and thus outside of the main flowering season for the region. As a consequence, some flora species, in particular annual and geophytic types, are likely to have been undetectable during the survey. However, given that vegetation within the site is largely cleared or modified/revegetated and remnant native vegetation is wetland vegetation with a lower proportion of annual species, the timing of the survey did not pose a significant constraint on the validity of survey outcomes.
Temporal coverage	Limitation	The single visit was suitable for a reconnaissance level survey.
Spatial coverage and access	No limitation	Site coverage was comprehensive.
	No limitation	All parts of the site could be accessed as required.
Sampling intensity	Limitation	Due to the relatively small area of native vegetation within the site, sampling was not required to accurately define separate plant communities. Given the focus of the survey was identifying native vegetation, the species list was representative and in particular may not include all non-native and planted species that occur within the site.
Influence of disturbance	Minor limitation	Time since fire is greater than 20 years as interpreted from aerial imagery and therefore short lived species more common after fire may not have been visible.
	No limitation	Historical ground disturbance and revegetation (planting and weed control) was evident in the vegetation. The disturbance history of the site was considered when undertaking field sampling.
Adequacy of resources	No limitation	All resources required to perform the survey were available.

4. RESULTS AND DISCUSSION

4.4. Flora

A total of 18 native and 9 non-native (weed) species were recorded within the site during the field survey, representing 13 families and 21 genera. The dominant family recorded was *Cyperaceae* (eight native taxa) and *Myrtaceae* (four native taxa and two non-native taxa).

A complete species list is provided in **Appendix B.**

4.5. Threatened and priority flora

No threatened or priority flora species were found to occur within the site.

4.6. Plant communities

The vegetation within the site was determined to represent one native plant community as described in **Table 6**. The remaining vegetation does not constitute a native vegetation community and is mapped as non-native parkland cleared.

Table 6: Plant communities present within the site

Plant community	Description	Area (ha)
Er	Open forest of *Eucalyptus rudis* over closed sedgeland of *Baumea articulata*, *Lepidosperma longitudinale* and *Centella asiatica*, including planted (revegetated) native species (**Plate 1**)	0.304
Non-native parkland cleared	Predominantly non-native trees over landscaped areas or pavement (**Plate 2)**	1.018

Plate 1: Plant Community Er in 'very good' condition.

Plate 2: Non-native parkland cleared in 'completely degraded' condition.

4.7. Vegetation condition

The condition of the vegetation within the site was determined to range from 'very good' to 'completely degraded'.

The eastern portion of the vegetation in the site was mapped as largely being in 'very good' condition, due to the high cover of native species and low weed cover with the presence of planted native species. Weed cover was very low which was assumed to be a result of effective management. A higher condition rating, such as excellent, was not assigned as it is unknown how well all planted species match the composition of a natural, pre-disturbance community for the site.

The extent of vegetation by condition category is detailed in **Table 7** and shown in **Figure 5**.

Table 7: Vegetation condition categories within the site

Condition category (Keighery (1994))	Size (ha)
Pristine	0
Excellent	0
Very good	0.304
Good	0
Good – degraded	0
Degraded	0
Completely degraded	1.018

4.2. Conservation significant vegetation

None of the plant communities identified within the site represent TECs and PECs.

The site is mapped within a patch of banksia woodlands on the DBCA database, listed as floristic community type; SCP21c 'low lying *Banksia attenuata* woodlands or shrublands'. However, the flora and vegetation survey has confirmed that there is no vegetation present within the site or adjacent to the site representative of a banksia woodland community. There are therefore no banksia woodlands of the Swan Coastal Plain TEC within the site.

4.3. Fauna

Although vegetation in very good condition occurs in part of the site, the habitat present for fauna species within the site is limited in size. Consequently the site is not considered to provide important habitat to native fauna including conservation significant species.

5. CONCLUSIONS

The flora, vegetation and fauna survey undertaken over the site identified the following:

- No threatened or priority flora were recorded within the site.
- One native plant community (Er) occurs within the site (including planted (revegetated) native species), with the remaining vegetation consisting of landscaped areas that contain predominantly non-native trees over paved surfaces.
- No TECs or PECs occur within the site.
- The vegetation within the proposed works area does not represent habitat for any conservation significant fauna species.

FIGURES

APPENDICES

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Figures

Figure 1: **Site Location**

Project: Flora, Vegetation and Fauna Survey
Belmont 'TOD' Precinct – Stage 1

Client: Client

Plan Number:
EP14-046(25)--F98

Drawn:	RAO
Date:	13/02/2019
Checked:	BRB
Approved:	TAA
Date:	28/02/2019

N

0 50 100
Metres

Scale: 1:4,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

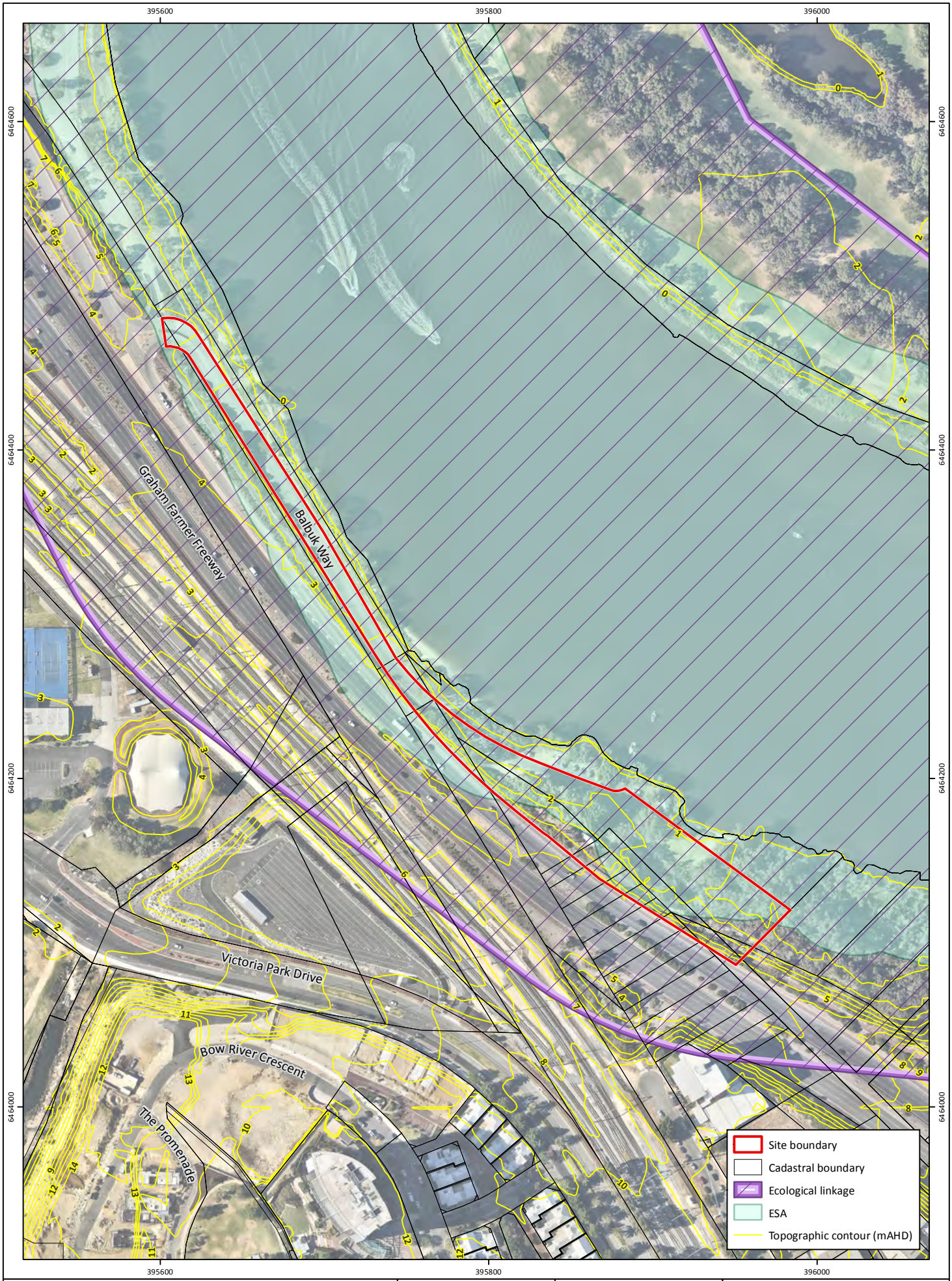

Figure 2: Environmental Features

Project: Flora, Vegetation and Fauna Survey
Belmont 'TOD' Precinct – Stage 1

Client: Client

Plan Number:
EP14-046(25)--F99

Drawn:	RAO
Date:	13/02/2019
Checked:	BRB
Approved:	TAA
Date:	28/02/2019

N

0 40 80
Metres

Scale: 1:3,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

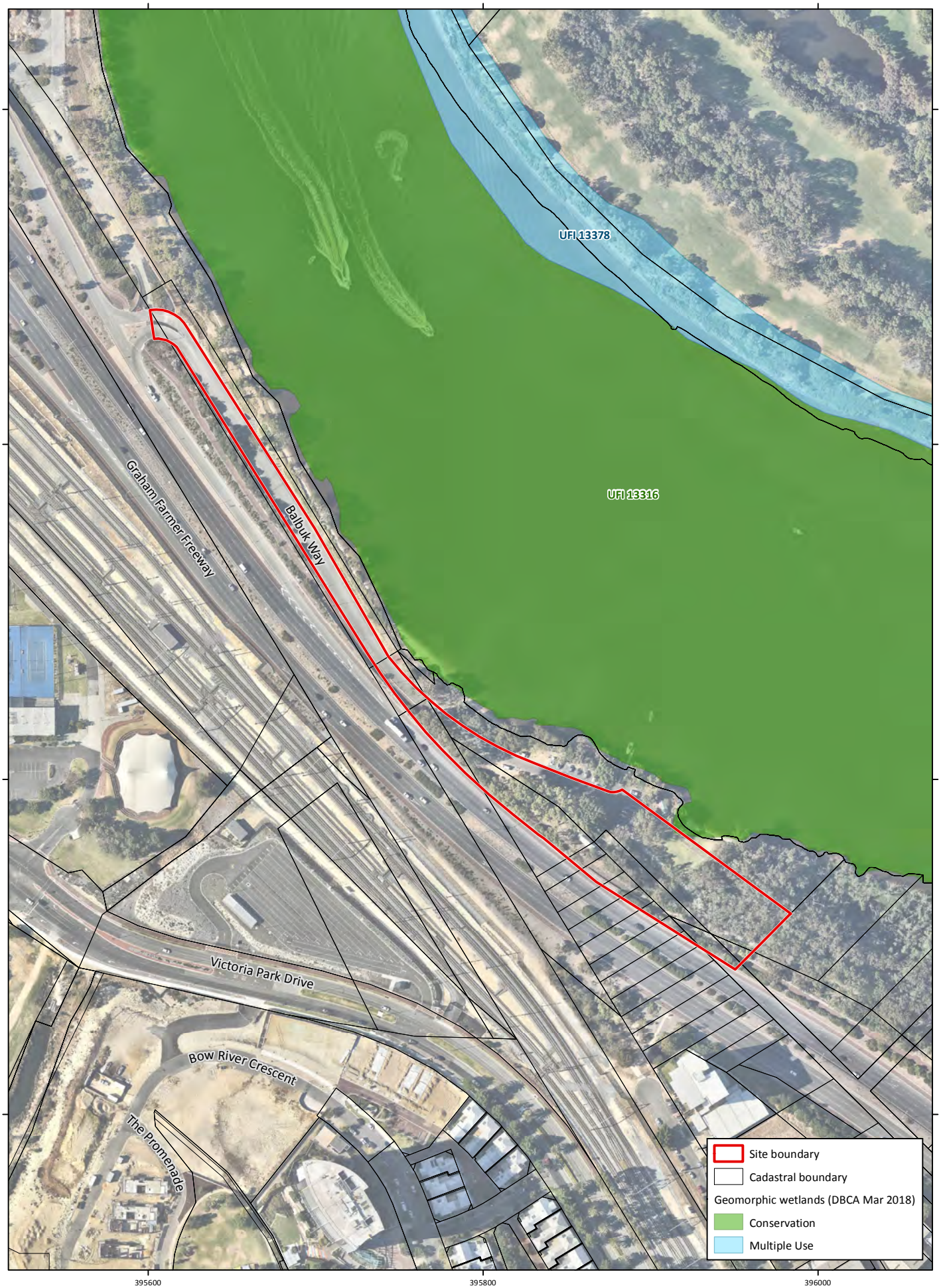

Figure 3: Geomorphic Wetlands

Project: Flora, Vegetation and Fauna Survey
Belmont 'TOD' Precinct – Stage 1

Client: Client

Plan Number:
EP14-046(25)--F100

Drawn:	RAO
Date:	13/02/2019
Checked:	BRB
Approved:	TAA
Date:	28/02/2019

N

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Metres

Scale: 1:3,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Figure 4: Plant Communities

Project: Flora, Vegetation and Fauna Survey
Belmont 'TOD' Precinct – Stage 1

Client: Client

Plan Number:
EP14-046(25)--F101

Drawn:	RAO
Date:	13/02/2019
Checked:	BRB
Approved:	TAA
Date:	28/02/2019

N

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Metres

Scale: 1:2,500@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

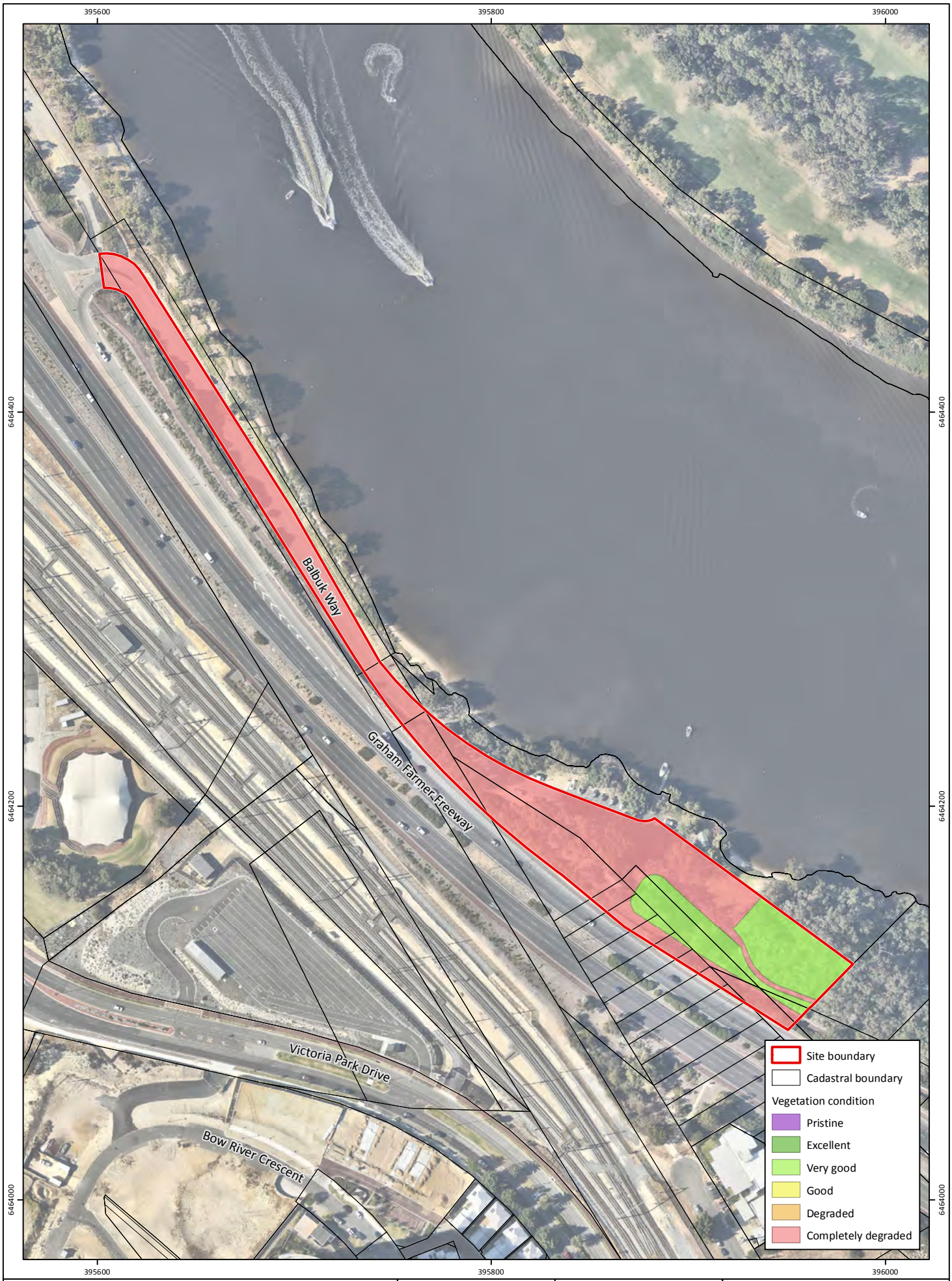

Figure 5: Vegetation Condition

Project: Flora, Vegetation and Fauna Survey
Belmont 'TOD' Precinct – Stage 1

Client: Client

Plan Number:
EP14-046(25)--F102

Drawn:	RAO
Date:	13/02/2019
Checked:	BRB
Approved:	TAA
Date:	28/02/2019

N

0 20 40 60
Metres

Scale: 1:2,500@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Appendix A

Conservation Codes

Conservation Significant Flora, Vegetation and Fauna

Threatened and priority flora

Flora species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. At the Commonwealth level, flora species can be listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Flora species considered 'threatened' pursuant to Schedule 1 of the EPBC Act are assigned categories according to their conservation status, as outlined in **Table 1**.

In Western Australia, plant taxa may be classed as 'threatened' under the *Biodiversity Conservation Act 2016* (BC Act) which is enforced by Department of Biodiversity Conservation and Attractions (DBCA). Threatened flora species are listed under sections 19(1) and 26(2) of the BC Act. It is an offence to 'take' or disturb threatened flora without Ministerial approval. Section 5(1)1 of the Act defines to take as including "… to gather, pluck, cut, pull up, destroy, dig up, remove, harvest or damage flora by any means" or to cause or permit the same to be done. The definition of threatened flora under the BC Act is provided in **Table 1**.

Section 43 of the BC Act requires that an occurrence of a threatened species or threatened ecological community is reported to DBCA where the occurrence has been identified as part of field work completed:

- as part of an assessment under Part IV of the *Environmental Protection Act 1986*; or
- in relation to an application for a clearing permit under the *Environmental Protection Act 1986* section 51E(1)(d).

Penalties apply to individuals and organisations that fail to provide accurate reports of threatened species or communities.

The *Biodiversity Conservation Regulations 2018* (BC Regulations 2018) came into effect on January 1 2019. The BC Regulations include provisions for licencing, charges, penalties and other provisions associated with the BC Act.

Flora species that may be threatened or near threatened but lack sufficient information to be listed under the BC Act may be added to the DBCA's *Priority Flora List* (DBCA 2018c). Priority flora species are considered during State approval processes. Priority flora categories and definitions are listed in **Table 1**.

Table 1: Definitions of conservation significant flora species pursuant to the EPBC Act and BC Act and on DBCA's Priority Flora List (DBCA 2018c)

Conservation code	Description
EX[+]	Threatened Flora – Presumed Extinct Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.
T^[+]	Threatened Flora – Extant

	Taxa which are declared to be likely to become extinct or is rare, or otherwise in need of special protection.
CR^	Threatened Flora – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN^	Threatened Flora – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.
VU^	Threatened Flora – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
P1	Priority One – Poorly Known Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verges, urban areas, farmland, active mineral leases etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two – Poorly Known Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey.
P3	Priority Three – Poorly Known Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but needs further survey.
P4	Priority Four – Rare Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

^pursuant to the EPBC Act, †pursuant to the BC Act, on DBCA's *Priority Flora List*

Threatened and priority ecological communities

'Threatened ecological communities' (TECs) are recognised as ecological communities that are rare or under threat and therefore warrant special protection. Selected TECs are afforded statutory protection at a Commonwealth level under section 181 of the EPBC Act. TECs nominated for listing under the EPBC Act are considered by the Threatened Species Scientific Committee and a final decision is made by the Commonwealth Minister for the Environment and Energy. Once listed under the EPBC Act, communities are categorised as either 'critically endangered', 'endangered' or 'vulnerable' as defined in **Table 2**. Any action likely to have a significant impact on a community listed under the EPBC Act requires approval from the Minister for the Environment and Energy.

Within Western Australia TECs are determined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee (WATECSAC) and endorsed by the State Minister for the Environment. The WATECSAC is an independent group comprised of representatives from organisations including tertiary institutions, the Western Australian Museum and DBCA. The TECs endorsed by the State Minister are published by DBCA (DBCA 2018b).

TECs are assigned to one of the categories outlined in **Table 2** according to their status (in relation to the level of threat). TECs are afforded direct statutory protection at a State level under the BC Act and BC Regulations. Ecological communities are listed under Section 27(1) and 33 of the BC Act. Their

significance is also acknowledged through other state environmental approval processes such as 'environmental impact assessment' pursuant to Part IV of the *Environmental Protection Act 1986* (EP Act) and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Table 2: Categories of threatened ecological communities (English and Blyth 1997; DEC 2009).

Conservation code	Description
PD	Presumably Totally Destroyed An ecological community that has been adequately searched for but for which no representative occurrences have been located.
CE	Critically Endangered An ecological community that has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
E	Endangered An ecological community that has been adequately surveyed and is not critically endangered but is facing a very high risk of total destruction in the near future.
V	Vulnerable An ecological community that has been adequately surveyed and is not critically endangered or endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.

An ecological community that is under consideration for listing as a TEC, but does not yet meet survey criteria or has not been adequately defined may be listed as a 'priority ecological community' (PEC). PECs are categorised as priority category 1, 2 or 3 as described in **Table 3**. Ecological communities that are adequately known and are rare but not threatened, or meet criteria for 'near threatened', or that have been recently removed from the threatened list, are placed in 'priority 4'. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in 'priority 5' (DEC 2009). Listed PECs are published by DBCA (DBCA 2017b)

Table 3: Categories of priority ecological communities (DEC 2009).

Priority code	Description
P1	Priority One Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2	Priority Two Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3	Priority Three Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (i) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;

Priority code	Description
	(ii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4	Priority Four Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened or that have been recently removed from the threatened list. These communities require regular monitoring.
P5	Priority Five Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Threatened and priority fauna

Fauna species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. At the Commonwealth level, fauna species can be listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Migratory birds may be recognised under international treaties including:

- *Japan Australia Migratory Bird Agreement 1981* (JAMBA)
- *China Australia Migratory Bird Agreement 1998* (CAMBA)
- *Republic of Korea-Australia Migratory Bird Agreement 2007* (ROKAMBA)
- *Bonn Convention 1979* (The Convention on the Conservation of Migratory Species of Wild Animals).

All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as 'matters of national environmental significance' (MNES) under the EPBC Act. Fauna species considered 'threatened' pursuant to Schedule 1 of the EPBC Act are assigned categories as outlined in **Table 4**.

Table 4: Definitions of conservation significant fauna species pursuant to the EPBC Act

Conservation Code	Category
X	Threatened Fauna –Extinct There is no reasonable doubt that the last member of the species has died.
EW[#]	Threatened Fauna –Extinct in the Wild Taxa which are known only to survive in cultivation, captivity or as a naturalised population outside its past range, or taxa which have not been recorded in its known and/or expected habitat despite appropriate exhaustive surveys.
CR[#]	Threatened Fauna – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN[#]	Threatened Fauna – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.

VU[#]	Threatened Fauna – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
Migratory[#]	Migratory Fauna All migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and All native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Ma	Marine Fauna Species in the list established under s248 of the EPBC Act

[#]matters of national environmental significance (MNES) under the EPBC Act

In Western Australia, fauna taxa may be classed as 'specially protected' under the *Wildlife Conservation Act 1950* (WC Act) which is enforced by Department of Biodiversity Conservation and Attractions (DBCA). Specially protected fauna species are gazetted under subsection 4 of section 14F of the WC Act and are listed under Schedules 1 to 7 according to their conservation status. The definitions of these Schedules are provided in **Table 5**.

Table 5: Definitions of specially protected fauna schedules under the WC Act.

Conservation Code	Definition
CR	Schedule 1 – Critically Endangered Threatened species considered to be facing an extremely high risk of extinction in the wild.
EN	Schedule 2 – Endangered Threatened species considered to be facing a very high risk of extinction in the wild.
VU	Schedule 3 – Vulnerable Threatened species considered to be facing a high risk of extinction in the wild.
EX	Schedule 4 – Presumed extinct Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
IA	Schedule 5 – Migratory birds protected under an international agreement Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
CD	Schedule 6 – Fauna of special conservation need as conservation dependent fauna Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
OS	Schedule 7 – Other specially protected fauna. Fauna otherwise in need of special protection to ensure their conservation.

Fauna species that may be threatened or near threatened but lack sufficient information to be legislatively listed may be added to the DBCA's *Priority Fauna List* (DBCA 2018). Priority fauna species are considered during State approval processes. Priority fauna categories and definitions are listed in **Table 6**.

Table 6: Definitions of priority fauna categories on DBCA's Priority Fauna List

Conservation Code	Category
P1	Priority 1 – Poorly known Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	Priority 2 – Poorly known Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	Priority 2 – Poorly known Species that are known from several locations and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	(a) Priority 4 – Rare species Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Priority 4 – Near Threatened Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (c) Priority 4 – Other Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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Appendix B

Species List

Flora Species List -Water Corp Services Balbuk Way

Note: *=introduced weed species, Pl=planted

Family		Species
Apiaceae		
	?Pl	*Centella asiatica*
Arecaceae		
	*	*Phoenix canariensis*
Asteraceae		
	*	*Hypochaeris glabra*
	*	*Sonchus oleraceas*
Casurinaceae		
	Pl	*Casuarina obesa*
Cyperaceae		
	?Pl	*Baumea articulata*
	?Pl	*Baumea juncea*
	Pl	*Baumea preissii*
	Pl	*Carex fascicularis*
	Pl	*Ficinia nodosa*
	Pl	*Lepidosperma longitudinale*
	?Pl	*Schoenoplectus tabernaemontani*
		Typha orientalis
Dennstaedtiaceae		
		Pteridium esculentum
Fabaceae		
	*	*Trifolium sp.*
Juncaceae		
	?Pl	*Juncus kraussii*
	Pl	*Juncus pallidus*
Lamiaceae		
	*	*Mentha pulegium*
Myrtaceae		
	Pl	*Corymbia calophylla*
	*	*Eucalyptus camaldulensis*
	*	*Eucalyptus* sp.
		Eucalyptus rudis
	Pl	*Melaleuca incana*
		Melaleuca rhaphiophylla

Poaceae

* *Penesetum clandestinum*

Proteaceae

Pl *Hakea prostrata*

Solanaceae

* *Solanum nigrum*