# Kensington Bushland Management Plan

Prepared for
**Town of Victoria Park**

22 December 2017

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- Friends of Kensington Bushland
- Adele Scarfone of the City of South Perth
- Rebecca Ong from the Department of Biodiversity, Conservation and Attractions
- Mary Gray from the Urban Bushland Council.

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# Abbreviations

| Abbreviation | Description |
|---|---|
| BAM Act | *Biosecurity and Agriculture Management Act 2007* |
| DBCA | Department of Biodiversity Conservation and Attractions |
| DBH | Diameter at Breast Height |
| DEC | Department of the Environment and Conservation |
| DFES | Department of Fire and Emergency Services |
| DotEE | Department of the Environment and Energy |
| DPIRD | Department of Primary Industries and Regional Development |
| DTS | Dieback Treatment Services |
| DWER | Department of Water and Environmental Regulation |
| DWG | Dieback Working Group |
| ELA | Eco Logical Australia |
| EP Act | *Environmental Protection Act 1994* |
| EPA | Environmental Protection Authority |
| EPBC Act | *Environment Protection and Biodiversity Conservation Act 1999* |
| ESA | Environmentally Sensitive Areas |
| EWCP | Environmental Weed Census and Prioritisation |
| FCT | Floristic Community Types |
| the Friends Group | Friends of Kensington Bushland |
| ha | Hectare/s |
| IBRA | Interim Biogeographic Regionalisation for Australia |
| IPM | Integrated Pest Management |
| kL | Kilolitre |
| km | Kilometre/s |
| LGA | Local Government Area |
| LNA | Local Natural Area |
| mAHD | Elevation in metres with respect to Australian Height Datum |
| MoU | Memorandum of Understanding |
| NIASA | Nursery Industry Accreditation Scheme Australia |
| NRM | Natural Resource Management |
| P | Priority flora/fauna listed by the DBCA |
| PCYC | Police and Citizens Youth Centre |

| Abbreviation | Description |
|---|---|
| PMST | Protected Matters Search Tool |
| POS | Public Open Space |
| SCC | Swan Catchment Council |
| SERS | Site Environmental and Remediation Services |
| SOP | Standard Operating Procedure |
| T | Threatened flora/fauna listed under the EPBC Act |
| the Town | Town of Victoria Park |
| ToVP | Town of Victoria Park |
| TEC | Threatened Ecological Community |
| WA | Western Australia |
| WAH | Western Australian Herbarium |
| WALGA | Western Australian Local Government Association |
| WAM | Western Australian Museum |
| WAOL | Western Australian Organism List |
| WC Act | *Wildlife Conservation Act 1950* |
| WONS | Weed of National Significance |

# 1 Introduction

## 1.1 Background

Kensington Bushland Reserve (the Reserve) is an approximate 9 hectare (ha) area of remnant bushland, located in the Town of Victoria Park, approximately 3 kilometres (km) east of Perth in Western Australia (WA; **Figure 1**). The Reserve is surrounded by a number of land parcels including:

- Kensington Secondary School to the north-west
- Kensington Police Station, DFES and George Street Reserve to the north
- Kensington Police and Citizens Youth Centre (PCYC) to the north-east
- Harold Rossiter Park and Kent Street Senior High School to the east
- Kent Street Sand Pit to the south-east
- Baron-Hay Court and the Department of Primary Industries and Regional Development – Department of Agriculture and Food to the south-west.

In 2015, the area incorporating the Reserve, George Street Reserve and the Kent Street Sand Pit were merged into one area by the Town of Victoria Park, called the Jirdarup Bushland Precinct (**Figure 1)**. The creation of the Precinct recognised that these three areas do not function independently from each other, and that they are all linked to provide a valuable natural asset that needs to be protected. The Reserve provides an example of an intact *Banksia* woodland that the Jirdarup Bushland Precinct revegetation structure and diversity can be modelled against.

The Reserve and part of the adjoining Kent Street Sand Pit have been recognised as regionally significant by being designated as Bush Forever Site 48 (Government of Western Australia 2000). In addition, the Reserve is considered to be locally significant as it is the only sizeable bushland remnant remaining in the Town of Victoria Park Local Government Area (LGA).

In recognition of the significance of the Reserve, the Council of the Town of Victoria Park (the Town) commissioned the development of the Kensington Bushland Protection Study in 2005 (Ecologia 2005). This served to guide the management of the land and surrounds to ensure protection of the Reserve.

In February 2016, a bushfire occurred within the Reserve, burning approximately 70% of the native vegetation. In light of this incident and the broader community interest to enhance and protect the Reserve, the Town commissioned the preparation of this Management Plan.

## 1.2 Purpose and scope

The purpose of this Management Plan is to provide for the long-term rehabilitation, protection and enhancement of the Reserve, which would build upon the Kensington Bushland Protection Study (Ecologia 2005).

This Management Plan is intended to be reviewed and updated after five years in 2022.

# Figure 1: Kensington Bushland Reserve and surrounds


**Legend**

- Reserve boundary
- Cadastre
- Jirdarup Bushland Precinct

0 50 100 200
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

N

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## 1.3 Management Plan structure

This Management Plan has been prepared as a functional document, to allow adaptability and flexibility in management of the Reserve depending on the circumstances at the time. Following an initial introductory section (Section 1), the context of the Reserve (Section 2) is described and the threatening processes to those identified values (Section 3) are summarised. The last section (Section 4) outlines the Reserve management, providing a summary of previous actions that have occurred as well as outlining future management objectives and actions. There is some information included regarding future land development and surrounding land use management, however, this is addressed in more detail in other documents and is provided as an overview of options that are available in the context of protecting the Reserve rather than management actions for the surrounding areas (this Management Plan is not intended to provide management actions for areas surrounding the Reserve).

In regards to future management actions for the Reserve, some actions are specific and others are higher level. The higher level actions primarily relate to revegetation and weed control, as the Town and its contractors manage this specifically each year determining a plan based on the resources, circumstances and objectives for different areas across the municipality. There are, however, some standards that are required in regard to revegetation and weed control at all times (e.g. utilising local provenance propagation material (seed/cuttings) that is sourced from Kensington Bushland Reserve is a requirement for all revegetation activities at all times).

## 1.4 Associated documents

There are a number of other management initiatives, policies, guidelines and documents that have been prepared for the Town that are relevant to this Management Plan, including:

- Kensington Bushland Protection Strategy (Ecologia 2005)
- Remnant Vegetation Management Plan (Ecoscape 2003)
- George Street Management Plan (2014
- Environmental Plan 2013 - 2018
- Strategic Community Plan 2017 - 2032
- Healthy Vic Park Plan 2017 - 2022
- Public Open Space Plan (in preparation)
- Urban Forest Strategy (in preparation).

Broader State Government documents are also relevant to the Reserve, including the draft Perth and Peel @ 3.5 million suite of documents.

# 2 Reserve context

## 2.1 Tenure and land use

Kensington Bushland Reserve forms part of Reserve 3694, which is Council controlled land, zoned as Parks and Recreation under both the Local Planning Scheme and Metropolitan Regional Scheme. The Kensington Bushland Reserve, along with part of adjoining Kent Street Sand Pit, was designated as Bush Forever Site 48 due to the high quality of remnant vegetation present (Government of Western Australia WA 2000).

The Reserve is used for passive recreation such as walking, dog exercise and bike riding, and provides an opportunity for bushland appreciation and education for nearby schools and others in the community.

The Reserve is classified in the Municipal Heritage Inventory within Management Category A, which is 'worth the highest level of protection'. These areas are: '*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; and provide maximum encouragement to the owner under the Town of Victoria Park Planning Scheme to conserve the significance of the place*'. The Reserve was added to the Municipal Heritage Inventory due to its aesthetic and scientific heritage significance.

## 2.2 Bioregion

The Interim Biogeographical Regionalisation for Australia (IBRA) Version 7 recognises 89 geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The 89 bioregions are further refined into 419 subregions which are more localised and homogenous geomorphological units in each bioregion (Department of the Environment and Energy [DotEE] 2017a).

The Reserve lies within the Perth subregion of the Swan Coastal Plain bioregion, which comprises *Banksia*-Jarrah-Marri woodland on sandy soils. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah woodland. The outwash plains, once dominated by *Casuarina obesa*, *Corymbia calophylla* (Marri) woodlands and *Melaleuca* shrublands, are only found extensively in the south (Mitchell et al. 2002).

## 2.3 Geology, soils and landform

The geology of the Reserve comprises the Bassendean Sands and is situated on the permeable Bassendean Dune System (Government of Western Australia 2000), which occurs as a varying thickness of 15 metres (m) to 90 m. The Bassendean Dune System lies in the centre of the Swan Coastal Plain and is the oldest of the Aeolian dune systems. The Bassendean Dunes consist of poor grey humic sands, are relatively flat, and generally support low shrubland with *Banksia* species often dominant (Government of Western Australia 2000). The Bassendean Dunes are underlain by the Pinjarra Plain and wetlands to the west, which comprise a clay base and can be generally associated with peaty sands formed between the dunes. The Bassendean Dune System is generally characterised by leached, infertile and acidic sands (Government of WA 2000).

The topography of the Reserve is gently sloping to the south-east, with elevation ranging from approximately 20 m above sea level in the south-east and south-west to 25 m above sea level in the north-west.

## 2.4 Hydrology

Superficial groundwater occurs beneath the site at around 5 mAHD, which means that the groundwater table occurs between 11 m and 22 m below ground level. The base of the aquifer is estimated to occur between -20 and -25 mAHD (Government of WA and Department of Water and Environmental Regulation [DWER] 2017). The Perth Groundwater Atlas indicates that regional groundwater flows in a west north-westerly direction towards the Swan River (Government of WA and DWER 2017).

There are no occurrences of surface water on the site or in the immediate surrounding areas.

## 2.5 Vegetation

The *Banksia* woodlands of the Swan Coastal Plain constitute the typical vegetation of much of the Perth area and are now highly fragmented by urban development (Stevens et al 2016) with the medium patch size estimated at 1.6 hectares (ha) (DotEE 2016a).

The vegetation of the Reserve is situated in the Bassendean Dunes geomorphic unit, as described by Heddle et al (1980), and is mapped as the Bassendean Complex – Central and South. The Bassendean Dune System stretches discontinuously for the whole length of the Swan Coastal Plain from Moore River to Dunsborough. The complex is described as vegetation ranging from woodland *of Eucalyptus marginata - Allocasuarina fraseriana - Banksia* spp. to low woodland of *Melaleuca* spp. and sedgelands on the moister sites. The Bassendean Complex – Central and South vegetation complex currently has 21.6% of its pre-European extent remaining within the Perth IBRA region (EPA 2015). In addition to the broad Heddle et al (1980) mapping of the Perth metropolitan region, vegetation of the Swan Coastal Plan has also been systematically surveyed and defined into Floristic Community Types (FCTs) by Gibson et al. (1994). One FCT is inferred to occur in the Reserve: FCT 23a – *Central Banksia attenuata – B. mensiesii woodlands* (Government of WA 2000).

Three vegetation types have previously been identified as occurring within the Reserve including (Cranfield and Parker 1992):

- Low *Banksia* Woodland of *Banksia attenuata*, *Banksia menziesii* and *Banksia ilicifolia*
- Low *Banksia*/*Eucalyptus* Woodland containing the above-mentioned *Banksia* species as well as *Eucalyptus marginata*, *Eucalyptus todtiana* and *Allocasuarina fraseriana*
- Low Shrubland of *Allocasuarina humilis*.

The vegetation condition across the site is primarily Very Good (based on the Keighery scale), with some reasonable areas in Good condition and Excellent condition (**Figure 2**).

No Priority Ecological Communities have been identified at the site, however, one Threatened Ecological Community (TEC) is considered to occur within the Reserve: *Banksia* Woodlands of the Swan Coastal Plain TEC (DotEE 2016b). This TEC is listed as Endangered under the Australian Government *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The vegetation within the Reserve was determined to represent this TEC as it was formally assessed against and met the criteria and condition thresholds provided in the Conservation Advice (DoEE 2016a). Specifically, the vegetation in the Reserve has a prominent tree layer of *Banksia* and an understorey with a rich mix of sclerophyllous shrubs, graminoids and forbs. In addition, the Reserve contains 94% of key species which occur in the understorey and associated canopy species (e.g. *Eucalyptus marginata* and *Allocasuarina fraseriana)*. Almost all of the vegetation within the Reserve is in Good or better condition and meets the minimum condition threshold and extent (DoEE 2016a). The vegetation within the Reserve has also been inferred to represent FCT 23a, which has a relationship to the TEC. The full assessment of vegetation in the Reserve against criteria set out in the Conservation Advice for the TEC is provided in **Appendix A**.

# Figure 2: Kensington Bushland Reserve vegetation condition

**Legend**

- Reserve boundary
- Track
- Fire scar area

**Vegetation condition (Keighery 1994)**

- Pristine
- Excellent
- Very good
- Good
- Degraded
- Completely degraded

0 25 50 100
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

N

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## 2.6 Flora

Previous surveys (Ecoscape 2003), anecdotal sightings and seed collection records have recorded 207 flora species occurring within the Reserve, represented by 42 families and 111 genera. A preliminary flora species list for the Reserve is provided in **Appendix A**, however, this list is not intended to provide a full inventory of all species.

Based on database searches, 38 conservation significant species, listed as Threatened either under the EPBC Act or State *Wildlife Conservation Act 1950* (WC Act), or listed as Priority species by DBCA, have been recorded within a 5 km radius of the Reserve (DPAW 2007-2017; DotEE 2017b). Based on a review of habitat requirements and previous survey effort it is considered that the 38 conservation significant species are unlikely to occur within the Reserve.

A two-phase weed mapping survey of the Reserve was undertaken in spring 2016 and winter 2017 (ELA 2017), identifying 27 weed species. Of these, one Weed of National Significance (WONS) and Declared Pest under the *Biosecurity and Agriculture Management Act 2007* was recorded from two locations within the Reserve: **Asparagus asparagoides*. Two weed species recorded during the surveys are reported to have the greatest effect on community composition including Perennial Veldt grass and *Gladiolus caryophyllaceus* (DoEE 2016a). Other weeds which occur within the Reserve (but have not been mapped) and have the potential to become problematic include *Ehrharta longiflora* (Annual Veldt), *Ursinia anthemvoides* (Urisinia) and *Misopates orantium* (Lesser Snapdragon) (**Appendix B**).

Weeds within the Reserve were generally widespread, with high densities recorded along tracks edges, at the edges of the Reserve, and in narrow strips of remnant bushland and rehabilitated areas, such as those that occur in the south of the Reserve (ELA 2017).

## 2.7 Terrestrial fauna

Two fauna surveys have been undertaken within the Reserve, including a one-season survey in 1990 (Turpin 1990) and a pitfall trapping survey undertaken in 2017 (ongoing; DPAW 2007-2017). In addition, there are numerous anecdotal records, mainly from observations made by Friends of Kensington Bushland (the Friends Group). The fauna survey undertaken in 1990 recorded a total of 17 birds, 12 reptiles, one amphibian and a number of invertebrates (Turpin 1990; Ecoscape 2003). This survey recorded the White-spotted Ground Gecko (*Lucasium alboguttatum*), which is the only record south of the Swan River in the Metropolitan Area (DPAW 2007-2017). Pitfall trapping surveys undertaken in 2017 recorded eight native reptiles, including, Western bobtail (*Tiliqua rugosa*), Buchanan's Snake-eyed Skink (*Cryptoblepharus buchananii*), Dugite (*Pseudonaja affinis*) and the Western Bearded Dragon (*Pogna minor*). No native mammals have been recorded within the Reserve, either during surveys or from anecdotal evidence.

Conservation significant fauna listed under State and/or Commonwealth legislation that have been observed within the Reserve include:

- *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo) – listed as Endangered under the EPBC Act and Schedule 2 of the WC Act
- *Calyptorhynchus banksii* subsp. *naso* (Forest Red-tailed Black Cockatoo) – listed as Vulnerable under the EPBC Act and Schedule 3 of the WC Act
- *Merops ornatus* (Rainbow Bee-eater) – listed as Schedule 5 under the WC Act.

Significant Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo roosts have previously been recorded in the wider Kensington area (BirdLife and DBCA 2017).

Based on database searches, 51 species of conservation significance have been recorded within a 5 km radius of the reserves (DPAW 2007-2017; DotEE 2017). This includes 45 birds, three mammals and one reptile. In addition to the three conservation significant fauna species that have been observed in the Reserve, four additional conservation significant fauna species are considered to have the potential to occur (Perth Slider, Black-striped Snake, Quenda [Listed as Priority 4 by the Department of Biodiversity, Conservation and Attractions] and Peregrine Falcon) due to the occurrence of suitable habitat, occurrence of nearby records and connectivity to other remnant bushland areas. The remaining 45 species are considered unlikely to occur due to lack of suitable habitat (e.g. marine animals), proximity of previous records to the Reserve or those that are locally extinct.

A Black Cockatoo habitat assessment was conducted within the Reserve and surrounding areas. Potential breeding habitat trees for Black Cockatoos have a Diameter at Breast Height (DBH) over 50 cm and are therefore capable of forming hollows in which Black Cockatoos can potentially nest (SEWPaC 2012). The assessment recorded a total of 91 trees that represent potential breeding and/or roosting habitat for Black Cockatoos; however, none of these occur within the Reserve (**Figure 3**). Known roosting sites and potential breeding trees occur in adjacent areas, such as Harold Rossiter Park. Approximately 31 *Eucalyptus gomphocephala (*Tuart), two *Eucalyptus marginata* (Jarrah) and one *Corymbia calophylla* (Marri) trees were identified as potentially suitable breeding trees during the assessment, and a number of occurrences of other tall planted non-endemic *Eucalypts* and Pine trees provide potential roosting habitat for Black Cockatoos. The Reserve contains suitable foraging habitat for Black Cockatoos in the form of *Banksia* species, which would provide an important food resource to Carnaby's Cockatoo, particularly for birds utilising the adjacent habitat for roosting and/or breeding. It is noted that non-endemic *Eucalypt* seedlings occurring in the Reserve within revegetation areas and have the potential to cause negative impact on native plant species survival and should be considered for removal in these situations.

# Figure 3: Black Cockatoo habitat tree locations at Kensington Bushland Reserve and surrounds


**Legend**

- Reserve boundary
- Cadastre
- Black Cockatoo habitat tree

0 30 60 120
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

N

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## 2.8 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are defined in the Environmental Protection Notice 2005 under section 51B of the *Environmental Protection Act 1994* (EP Act). ESAs include areas declared as World Heritage, included on the Register of the National Estate[1], defined wetlands, and vegetation containing rare (Threatened) flora, TEC's and Bush Forever Sites. ESA values that occur within the Reserve include the TEC "*Banksia* Woodlands of the Swan Coastal Plain" and Bush Forever site 48.

There are no areas listed on the Register of the National Estate or defined wetlands within the Reserve itself. However, the Swan-Canning Estuary, which is listed as a Nationally important wetland, occurs approximately 1.6 km to the north of the Reserve (DBCA 2017b; State of Western Australia 2012). The Swan-Canning Estuary provides important habitat for migratory shorebirds, fish and reptiles. The Reserve provides an ecological linkage to this area.

## 2.9 Ecological linkages

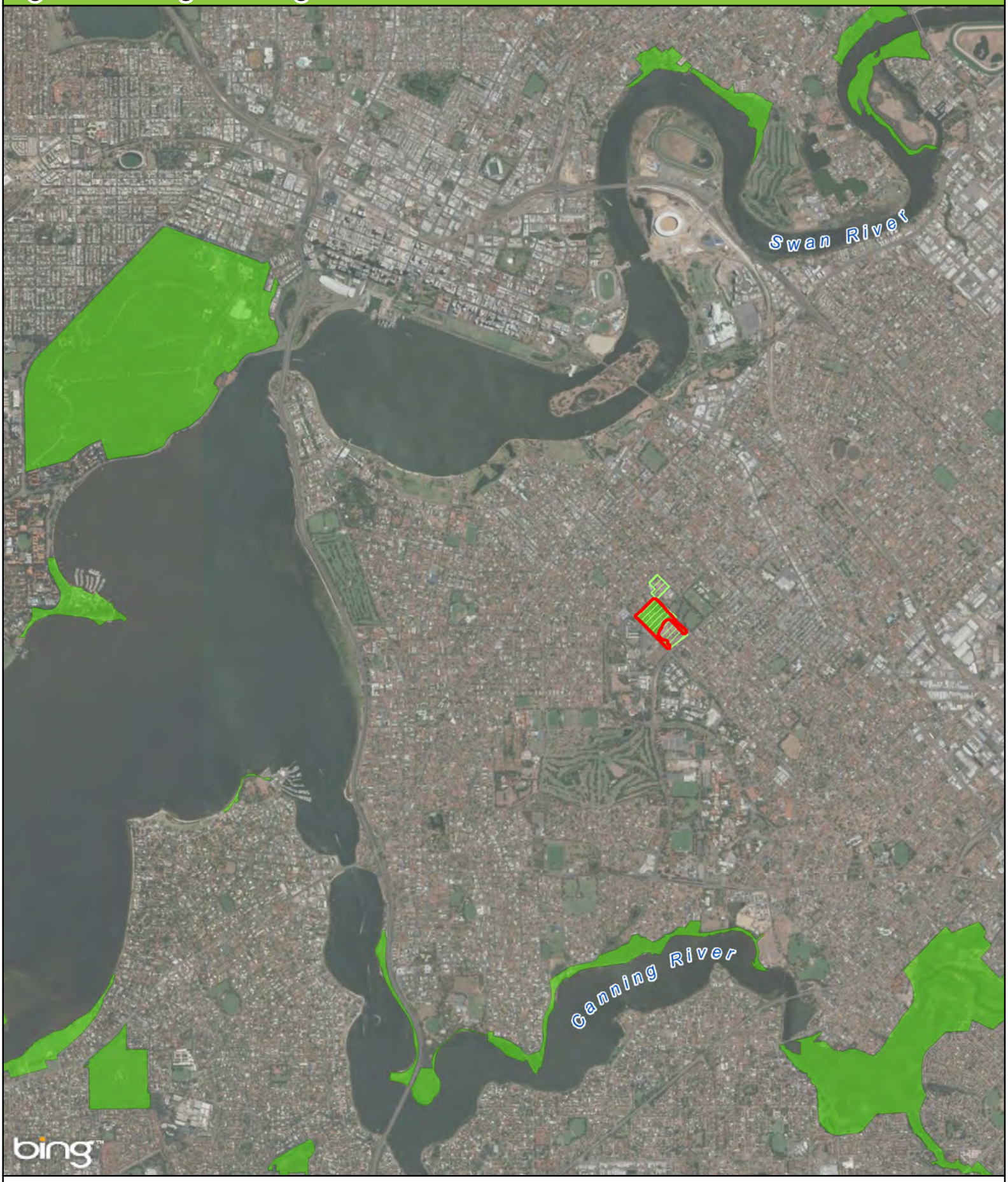
An ecological linkage is defined as 'a series of both continuous and non-continuous patches, which by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes or the movement of organisms within and across the landscape' (Molloy et. al. 2009).

The Reserve is currently the best-preserved area of remnant bushland between the Swan and Canning Rivers and is therefore considered highly important as an ecological and cultural asset to the Town. Along with street-scaping and nearby parks, the Reserve forms ecological linkages with a number of smaller parks and reserves (**Figure 4**).

Whilst the Reserve does lie directly adjacent to George Street Reserve and Harold Rossiter Park, it is not physically connected to many of the smaller natural area reserves in the region. The Reserve, however, is still ecologically linked to these areas through movement from fauna (such as birds and insects) and flora (such as seeds and pollen) and, as such, provides important wildlife corridors or stepping stones for many species in an otherwise highly urbanised, fragmented landscape.

[1] The Register of National Estate was closed in 2007 and is no longer a statutory list. The Register of National Estate has been replaced by the National Heritage List under the EPBC Act.

# Figure 4: Ecological linkages




**Legend**

- Reserve boundary
- Bush Forever site
- Jirdarup Bushland Precinct

0 0.5 1 2

Kilometres

Datum/Projection:
GDA 1994 MGA Zone 50

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## 2.10 Heritage

The Town is within the Whadjuk state of the Bibbulumun nation of the Nyoongah people (Ecoscape, 2003). A search of the Department of Indigenous Affairs Aboriginal Sites Register did not identify any sites within the Reserve or surrounding area.

A search of the Heritage Council of WA's State Register of Heritage Places did not identify any areas of heritage significance within or surrounding the Reserve. The Reserve and the Kent Street Senior High School are both listed on the Town's Municipal Inventory. This is a list of places that in the opinion of the local government are, or may become, of local cultural heritage significance. Local governments are required under Section 45 of the *Heritage of Western Australia Act 1990* to prepare such a list. A place's entry in a Municipal Inventory is recognition of its heritage importance to the community. There are no statutory implications other than a requirement for the list to be sent to the Heritage Council for public information.

## 2.11 Infrastructure and amenities

Providing adequate infrastructure within the Reserve is important to minimise the spread of dieback, disease and weeds and to reduce trampling of flora and fauna habitat by visitors. Infrastructure generally provides access for unstructured recreation, pedestrians, dog walkers and authorised off-road activity. Infrastructure within the Reserve comprises fences, formal paths and tracks, gate and other access points, seats/benches, picnic areas, dieback cleaning stations, natural appreciation views and informative or educational signage (**Figure 5** and **Figure 6**).

a) Limestone track and fencing

b) Wire and post fencing

c) Pedestrian and vehicle access

d) Kensington Bushland sign

e) Noticeboard

f) Metal bench


g) Dieback signage

h) Phytofighter dieback cleaning station

**Figure 5: Examples of infrastructure at Kensington Bushland Reserve**

# Figure 6: Existing infrastructure and access within Kensington Bushland Reserve

## Legend

- Reserve boundary
- Track

**Infrastructure**

- Dieback cleaning station
- Sign
- Bench
- Drinking fountain
- Rubbish bin
- Pedestrian access
- Vehicle gate

0 25 50 100
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

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## 2.12 Surrounding land parcels and use

A brief overview of the land parcels surrounding the Kensington Bushland Reserve is provided below (Ecologia 2005) (**Table 1**). It should be noted that these land parcels do not form part of this Management Plan but are relevant to the area as a whole, and so a brief description is provided here for context.

**Table 1: Land parcels and their use**

| Land Parcel | Description |
|---|---|
| Kent Street Sand Pit | The Kent Street Sand Pit occurs on Council controlled land and forms part of Reserve 3694, and is zoned as 'Parks and Recreation' under both the Local Planning Scheme and Metropolitan Regional Scheme. The site was used as a landfill location between 1962 and 1990, and then subsequently used by the Council for the storage of construction materials, street sweepings and vehicle washing until 2006 (SERS 2015). The site has remained vacant and unused since and is currently classified under the *Contaminated Sites Act 2003* as 'Remediated for Restricted Use' (Department of Water and Environmental Regulation [DWER] 2017).'<br>In July 2000, the Town resolved that the future use of the Kent Street Sand Pit site would be reserved for passive recreation and cultural purposes (ToVP 2004). Since then, numerous investigations have been undertaken to assess the site and to determine if the site is suitable for passive recreational use. SERS reported that once some identified data gaps and uncertainties were addressed, the site would be able to be reclassified as 'Contaminated – restricted use' based on the identified impacts in the fill material beneath the site (Site Environmental and Remediation Services [SERS] 2015). |
| George Street Reserve | George Street POS lies on Council controlled land within Reserve 7682, and is reserved 'Public Purpose' under the Local Planning Scheme and 'Urban' under the Metropolitan Region Scheme. This site consists of a 0.8 ha grassed area with a few single large trees and a small area in the southern corner of mature grass trees (*Xanthorrhoea preissii*). George Street Reserve is used primarily for passive recreation and provides access to Harold Rossiter Park and the Reserve.<br>George Street Reserve is contaminated from historical use as an uncontrolled landfill and as such is classed as 'Contaminated – Restricted Use' by the Department of Environment and Conservation (DEC; now known as Department of Water and Environmental Regulation; ToVP 2011). |
| Harold Rossiter Park | Harold Rossiter Park (the Park) lies on Council controlled land within Reserve 3694. The Park is zoned 'Parks and Recreation' under the Local Planning Scheme and 'Urban' under the Metropolitan Region Scheme, and is predominantly used for active and passive recreation and consists of a grass cricket pitch, cricket practice nets, two grass soccer pitches, clubhouse, dog exercise area, playground, picnic tables and car park with 86 parking bays. The Park contains a number of mature *Eucalyptus* and *Corymbia* trees which are considered of high value as they provide protection from the elements, shade for park users, buffer for the Reserve, a visual screen to the surrounding residents and habitat and food sources for native fauna including Threatened Black Cockatoos. |

| Land Parcel | Description |
|---|---|
| Kensington Police and Citizens Youth Centre (PCYC) | The Kensington Police and Citizens Youth Centre (PCYC) lies on Council controlled land within Reserve 7682, and is zoned 'Public Purpose' under the Local Planning Scheme and 'Urban' under the Metropolitan Region Scheme. The PCYC consists mainly of buildings, basketball courts, barbeque areas, automotive workshops and an out of school care facility. There is a small area of unused remnant bushland (approximately 0.8 ha), on the south-east side which adjoins the Reserve. This vegetation is in poor condition with various weeds, bamboo, castor oil plants and several grasses, having invaded the remnant vegetation. However, several native species have been retained including *Corymbia calophylla* (Marri), *Banksia attenuata* (Candle Banksia), *Banksia menziessii* (Fire Wood *Banksia*) and *Adenanthos cygnorum* (Woolly bush). |
| Kensington Secondary School | The Kensington Secondary School lies on State Government controlled land, within Reserve 23941 and is zoned as 'Special Use – Education' under the Local Planning Scheme and as 'Urban' under the Metropolitan Region Scheme. This land parcel has a small area, <1 ha, of remnant bushland on the south-east boundary that lies adjacent to the Reserve. This vegetation is in fair condition despite having previously been used as a BMX track and rubbish and grass-cutting dumping ground. There are a number of weeds present within the area (Ecologia 2005). |
| DFES/Police Station | The St Johns Ambulance Station, Kensington Fire Station and Kensington Police Station occur on State Government controlled land. This land parcel is zoned 'Public Purpose – civic use' under the Local Planning Scheme and 'Urban' under the Metropolitan Region Scheme. This area of land is used for civic purposes. There is no remnant bushland on these sites or vegetation of significance. |
| Kent Street Senior High School | It occurs on Reserve 22151, on Government controlled land, and is reserved 'Public Purpose' under the Local Planning Scheme and 'Public Purpose – High School' under the Metropolitan Region Scheme. The school playing fields lie adjacent to Harold Rossiter Park with the two areas being delineated with a row of highly valued mature Eucalyptus trees. |
| Baron-Hay Court Road Reserve | The Baron-Hay Court Road Reserve occurs on Council controlled land and is part zoned 'Parks and Recreation' and 'Special Use – educational facilities' under the Local Planning Scheme, and as 'Urban' under the Metropolitan Region Scheme. Baron-Hay Court is a boundary road with the City of South Perth. There is a car park and entrance point on Baron-Hay Court for the Reserve. Baron-Hay Court is currently closed at the Kent Street end and is only used to access the Department of Agriculture Precinct on the west and the Reserve on the east. The court is used by bike riders and walkers as a thoroughfare between Kent and George Streets. Revegetation and weed management programs have been undertaken on the eastern side of Baron-Hay Court to improve the vegetation and to provide a buffer for the Reserve (Brendan Nock pers. comms. Town of Victoria Park 2017). |

| Land Parcel | Description |
|---|---|
| Department of Primary Industries and Regional Development – Department of Agriculture and Food | The Department of Primary Industries and Regional Development – Department of Agriculture and Food occurs on Government controlled land, located within the City of South Perth. |

# 3 Threatening processes

Threatening process are processes that occur that threaten or may threaten the survival, abundance or evolutionary development of a native species or ecological community. It is important to be aware of threatening processes present within natural areas to be able to manage and monitor accordingly. Threatening processes relevant to the Reserve include:

- weeds
- dieback
- arson
- trampling of native flora / vegetation
- introduced fauna / pests
- vandalism and rubbish dumping
- dumping garden refuse
- soil dumping and excavation
- changes to hydrological regimes
- edge effects from surrounding land parcels
- development of surrounding land parcels.

The main threats to the *Banksia Woodlands of the Swan Coastal Plain* TEC are fragmentation, Dieback, invasive species, inappropriate fire regimes, hydrological changes and climate change (DotEE 2016a).

Some of these threats are described in more detail below.

## 3.1 Weeds

*Banksia* woodlands are highly vulnerable to weed invasion (Rokish and Newton 2016). Weeds may impact on the biodiversity values across the Reserve by out-competing native species for nutrients, water, space and sunlight, reducing the natural diversity by smothering native plants or preventing them from growing back, reducing habitat for native animals and altering fire regimes (DoTEE 2016a).

There are many vectors for the introduction and spread of weeds, such as edge effects from roads/cleared areas (weed invasion and human impacts), dumping of rubbish, escape of garden plants, human and animal transport and fire. Fire promotes weed growth and allows an opportunity to effectively control weeds after fire events.

## 3.2 Dieback

*Phytophthora cinnamomi* (Phytophthora dieback) is a water mould that causes dieback disease in plants and is known to occur across the Swan Coastal Plain (CALM 2003). Dieback spreads through the movement of *Phytophthora cinnamomi* spores in soil. Spores are also spread via root to root contact from susceptible species (research suggests approximately 1 metre per year; Dieback Working Group [DWG] 2017). Any activities that result in the movement of soil can potentially spread dieback including:

- walking off track
- vehicle movement
- earthworks / construction activities
- soil / garden refuse dumping
- rubbish dumping
- water flows in sloping areas.

The potential impacts of dieback on the values of the Kensington Bushland includes:

- Death of up to 20% of the species diversity through direct susceptibility of these species to dieback (Ahmedi 2015).
- Death of species not directly susceptible to dieback but susceptible to changes in biophysical conditions resulting from death of susceptible species.
- Changed habitat availability due to changes in vegetation structure and diversity leading to loss of fauna and fungi diversity.
- Changed trophic relationships due to changes in vegetation structure and diversity leading to loss of fauna diversity.
- Loss of heritage values.
- Loss of visual and landscape values.
- Water table elevation due to the loss of vegetation resulting from deleterious effect to water sensitive species.

Previous dieback studies undertaken in the Reserve have recorded the presence of low dieback inoculum levels (i.e. zoospores, cysts, sporangia) and/or DNA from dead dieback (Ahmedi 2015). However, a recent dieback assessment was undertaken within the Reserve, with sampled sites testing negative for presence of dieback (Dieback Treatment Services [DTS] 2017). The assessment included field observations in combination with the collection of two soil and tissue samples in areas consisting of dead *Allocasuarina humilis* and/or *Banksia attenuata* trees (both susceptible species). Both sites tested negative for dieback (DTS 2017).

Host or indicator species that could be expected to reliably express disease symptoms within the Reserve include *Adenanthos cygnoram, Allocasuarina humilis, Banksia attenuata and B. illicifolia, Eucalyptus marginata, Jacksonia species, Macrozamia reidlei, and Xanthorrhea preissii* (DTS 2017).

Other dieback species in WA that may have the potential to impact the bushland include *P. cryptogea* and *P. nicotianae*.

### 3.3 Introduced fauna/pests

Feral (and domestic) fauna are a significant problem in the management of native fauna populations and can impact upon native flora and fauna, either through grazing, predation or direct competition for resources such as nesting hollows (DoEE 2016).

It is currently unknown to what extent introduced (feral) fauna may be utilising the Reserve. *Mus musculus* (House Mouse) and foxes are known to occur and it is considered likely that domestic (and possibly feral) cats and feral bees also occur within the Reserve.

### 3.4 Alteration of hydrological regimes

Alteration of hydrological regimes affects both the quantity and quality of surface and groundwater, upon which natural areas may be depending. Changes in surface water flows alters the drainage of an area, specifically some areas may receive more water and others may receive less. Groundwater abstraction for development and residential use lowers the water table and has the potential to cause a reduction in water available to plants, such as mature *Banksia* sp. Lowering groundwater levels have been suggested as the cause of some loss of *Banksia's* in the Reserve to date.

# 4 Reserve management

## 4.1 Overview of current management initiatives

An overview of the implementation status of various management activities undertaken at the Reserve is provided in **Table 2**.

**Table 2: Status of previously recommended management actions for Kensington Bushland Reserve and surrounds**

| Previous Management Plan recommendation / other initiatives | Status (ongoing, complete or incomplete) |
|---|---|
| Protect and revegetate the remnant vegetation on the Police and Citizens Youth Club, George Street Reserve and Kensington Secondary School sites | Commenced 2010; Ongoing (in Stage 3 of a five stage project) |
| Reclaim the remnant vegetation on the Kensington Secondary School site into council land by purchase or land swap | Feasibility yet to be investigated |
| Incorporate the remnant bushland surrounding the Kensington Bushland into a buffer between any future development and the bushland to ensure its long-term protection | Complete |
| If possible, expand the boundary of the Kensington Bushland Bush Forever boundary to include the remnant vegetation on the Police and Citizens Youth Club, George Street Reserve and Kensington Secondary School sites | To be investigated |
| Close Baron-Hay Court to vehicles beyond the Kensington Bushland car park and develop a shared path in place of the road. As part of developing the shared path expand the buffer between the shared path and the Kensington Bushland | Limited ability to close road given current access to DAFWA site. |
| Infill plant the area between Harold Rossiter Park and the Kensington Bushland | Commenced 2009; Ongoing expansion of buffer |
| Revegetate the buffer between Kent St and the Kent St Sand Pit | Commenced 2009; Ongoing |
| Revegetate the Kent St Sand Pit site with local native species that can be utilised as a seed production area for revegetation programs within the Town. Ensure that any revegetation is undertaken in a manner that does not preclude the future use of the area for an education / cultural centre | Commenced 2009; Surrounds ongoing, rest of site, to be confirmed |
| Ensure that the area of public open space within the study area is maintained so that pressure is not put on the Kensington Bushland Reserve for activities such as dog walking and bike riding | Ongoing |
| Restrict the number of trails through remnant vegetation areas by rehabilitating minor trails and providing set shared path for access between Kent St and George St | Commenced 2016; Complete (though constantly reviewed) |

| Previous Management Plan recommendation / other initiatives | Status (ongoing, complete or incomplete) |
|---|---|
| Ensure that any development proposals to the land surrounding the Kensington Bushland Reserve develop an environmental management plan to address potential impacts to the bushland from the development before approval is obtained | No definitive plans to develop the immediate surrounds to the Kensington Bushland Reserve has occurred to date |
| **Other management initiatives undertaken by the Town** | **Status (ongoing, complete or incomplete)** |
| Two boot cleaners (Phytofighter 1000) were installed at the Baron-Hay Court and the George St Reserve entrances to Kensington Bushland | Initial installation 2015, second installation occurred in 2016 |
| Intensive weed control program within the bushfire area of Kensington Bushland focussing on grass and broadleaf weeds | Commenced 2016; Ongoing |
| A weed wiping / target spray / hand weed program has been implemented to control an extensive Gladiolus infestation throughout the Kensington Bushland | Commenced 2016; Ongoing (part of a staged 3-5 year program) |
| In collaboration with Brendon Nock (EO) and the Town's Coordinator of Ranger Services (Alan Bancroft) a Memorandum of Understanding has been reached with Kensington Secondary School to manage land adjacent to Kensington Bushland Reserve to reduce the immediate fire risk. This process has included initial discussions, review and negotiation of a revised fire response plan | MoU complete with implementation ongoing; MOU to be reviewed on an annual basis |
| Direct seeding project was undertaken by the Town where degraded areas in the 2016 bushfire zone were identified by vegetation condition mapping and 6.5 kg of seed was hand cast into site prepared revegetation zones. A monitoring program has been undertaken by a consultant to measure the success of the project | Commenced 2017; Ongoing |
| The Town of Victoria Park's natural areas operations has coordinated with the Western Australian Museum, Murdoch University students and the Friends of Kensington Bushland to conduct a pit trapping survey of the reptiles of the Reserve. This is the first pit trapping survey undertaken at Reserve since pit trapping was undertaken by the WA Naturalist Club in 1990. The Town of Victoria Park aims to build on the survey data collected to implement reptile conservation management initiatives to preserve the diversity of reptiles in the Reserve. | Completed 2017, ongoing management initiative. |

## 4.2 Future management

### 4.2.1 Objectives

**Table 3** outlines the objectives for the Kensington Bushland Reserve Management Plan.

**Table 3: Objectives of the Management Plan**

| Topic | Objectives |
|---|---|
| Revegetation and buffer management | Improve the overall condition of the Kensington Bushland Reserve, improve native species cover and diversity. |
| | Maintain vegetation considered to be in Very Good or better condition. |
| | Undertake revegetation within Kensington Bushland Reserve to enhance and support the Jirdarup Bushland Precinct linkages. |
| | Reduce the threatening processes for the rehabilitation sites. |
| Weed management | Remove or reduce existing weed infestations. |
| | Minimise the spread of weeds. |
| | Prevent introduction of additional weed species. |
| | Prevent further encroachment of weeds into bushland areas. |
| | Minimise any detrimental effects of the weed control programme on the native biota by following best practice guidelines. |
| Fire management | Maintain biodiversity and conservation values of the bushland. |
| | Minimise the bushfire risk to conservation values, lives, properties and assets. |
| | Reduce the incidence of unplanned fire / arson attacks. |
| Dieback management | Reduce the risk of introduction and/or spread of dieback. |
| | Educate the community about dieback and ways to reduce the risk of introduction and/or spread. |
| | No new dieback infestations to occur as a result of contractors', volunteers or community activities. |
| Fauna management | Conserve and enhance habitat to increase diversity and numbers of native fauna, and to improve connectivity for terrestrial fauna. |
| | Control feral animals where possible to reduce predation / competition with native fauna. |
| | Ensure that feral animal control measures do not adversely impact on the native biota of the reserves or on people visiting the area. |
| Infrastructure and access management | Protect the local biodiversity values from human degradation and impacts. |
| | Provide the local community with natural areas that are easily accessible, informative, enjoyable and safe. |
| | Enhance the social and built environment. |
| Community use and education management | Reduce the associated risks of community use to the biodiversity values of the Reserve. |
| | Provide a safe and enjoyable resource for the local community. |
| | Enhance community use and interest in the bushland reserves. |

### 4.2.2 Management actions

To assist in decision making and in prioritising recommendations to address key issues, a priority ranking system has been developed and is shown in **Table 4**. Management actions for the Kensington Bushland Reserve are outlined in **Table 5** and **Figure 7**. It is noted that some actions outlined for particular features (e.g. weeds, fire) could also benefit other features (e.g. fauna).

The resources required to undertake the management actions are:

- $40 per hour of the Town's officer time
- $120 per hour of consultant time
- $1.50 per seedling
- Accredited dieback free mulch, weed control chemicals, fencing materials, signage, nest boxes and dog-poo bag dispenser charged at cost
- $6000 of consultant time for weed mapping
- Fencing contractor and nest-box installation costs as per industry rates
- Purchase and installation of water tank charged at cost

**Table 4: Priority rankings for implementation of management**

| Priority ranking | Definition and justification | Recommended timing |
|---|---|---|
| High | High priority recommendations are an essential requirement and should be implemented immediately or as soon as practical. These recommendations will enable effective management decisions to be made and guide future management. | Effective immediately (i.e. within the next year) and/or applicable throughout life of plan on an annual basis |
| Medium | Medium priority recommendations are important and could also be implemented when additional funding and opportunities exist. | Within the next two to three years |
| Low | If suitable funding and opportunities exist, these recommendations should be investigated and implemented as additional value adding components and/or to gain additional knowledge and understanding of biodiversity values. | Within the next four to five years |

**Table 5: Kensington Bushland Reserve management actions**

| Item no. | Management action | Timing | Priority |
|---|---|---|---|
| Revegetation and Buffer Management | | | |
| 1.1 | Utilise local provenance propagation material (seed/cuttings) that is sourced from Kensington Bushland Reserve. | Ongoing | High |
| 1.2 | Revegetate using flora species that have previously been recorded in Kensington Bushland Reserve (**Appendix A**). | Ongoing | High |
| 1.3 | Where seedlings are to be planted, ensure seedlings are produced from a nursery accredited by the Nursery Industry Accreditation Scheme Australia (NIASA), | Ongoing | High |

| Item no. | Management action | Timing | Priority |
|---|---|---|---|
| | specifically to reduce the risk of dieback introductions and weeds. | | |
| 1.4 | Species selected for inclusion in rehabilitation of sites which have been noted to have known or inferred resistance to dieback, if future surveys identify dieback presence | Ongoing | High |
| 1.5 | Use accredited dieback free mulch (Australian Standard AS4454) from authorised suppliers. Mulch is required to be large chip/hot composted for three days and tested for dieback batch by batch prior to being transported to site. | Ongoing | High |
| 1.6 | Undertake a revegetation program to improve native species cover and diversity | Annually | High |
| 1.7 | Engage the local community (including Friends of Kensington Bushland) to assist in undertaking the planting for any revegetation projects, through distribution of informative material or open planting days. | Ongoing | High |
| 1.8 | Consider watering seedlings through the first summer to increase survival rates | Ongoing | High |
| 1.9 | Undertake annual monitoring of revegetation sites to assess survival rates and requirement for follow up works. | Annually | High |
| 1.10 | Investigate the potential impacts of groundwater draw down on mature *Banksia* sp | Every three years | Medium |
| | Weed management | | |
| 2.1 | Undertake weed control works to assist and maintain vegetation in Very Good or better condition (starting in areas of higher quality bushland and working outwards) as per Bradley (1997) method, to facilitate natural recruitment of native species. Undertake removal of non-endemic Eucalypt species prior to revegetation activities. | Annually | High |
| 2.2 | Implement a weed control program to remove or reduce weed species cover and distribution, as per weed timing schedule based on growth form provided in **Appendix C**. | Ongoing | High |
| 2.3 | Undertake weed control efforts on tracks/paths, disturbed areas and potential revegetation sites. If hand-weeding, remove all flowering and fruiting material from the site. | Ongoing | High |
| 2.4 | Implement an ongoing weed monitoring/mapping program to identify new weed infestations and to record weed species cover and distribution. From this, the success of the weed control management actions can be evaluated/measured and recommendations made using an adaptive management framework. Recommendations shall also be made on whether weed management actions | Every three years | Medium |

| Item no. | Management action | Timing | Priority |
|---|---|---|---|
| | need to be updated to be consistent with best practice principles. | | |
| 2.5 | Undertake monitoring and where required, weed control activities following disturbances such as fires. | Ongoing | High |
| 2.6 | Prevent introduction of weeds by removing dumped rubbish and minimising soil disturbance through maintaining pathways. | Ongoing | High |
| 2.7 | Ensure weed control contractors are following best practice guidelines and using correct herbicides for weed species. | Ongoing | High |
| 2.8 | Inspect vehicles and machinery prior to site entry to ensure it is free from soil/organic material. | Ongoing | High |
| 2.9 | Engage with surrounding landholders to promote an integrated weed management approach to reduce weed encroachment into the Reserve. | Ongoing | High |
| 2.10 | Undertake the removal of non-endemic *Eucalypt* species across the Reserve. | Ongoing | Medium |
| | Fire Management | | |
| 3.1 | Restrict the use of machinery and tools that have the potential to ignite fires, such as angle grinders and welders, when the fire danger rating is Very High or above (e.g. during any maintenance works). | Ongoing | High |
| 3.2 | Ensure fire extinguishers are present on site during operations which are likely to start a fire (e.g. works requiring angle grinders or welders). | Ongoing | High |
| 3.3 | Undertake manual fuel reduction within the Reserve itself (e.g. removal of dead plant material in the understorey where required, weed control etc.). Dead trees will be prioritised for retention were appropriate. | Ongoing | Medium |
| 3.4 | Investigate the benefits of a mosaic burn regime for the Reserve towards the end of the five year plan. | Year 5 | Low |
| 3.5 | Undertake regular maintenance of grassy areas adjacent to the Reserve (e.g. mowing of grass etc.) to maintain available fuel loads within 5 t/ha. | Ongoing | High |
| 3.6 | Ensure all firebreaks are cleared and maintained prior to the onset of fire season. | Ongoing | High |
| 3.7 | Install a firebreak along the northwest boundary of the Reserve. | Year 1 | High |
| 3.8 | Install water tanks in the Reserve to aid in fire suppression activities, tank size a minimum of 10-50 Kilolitre (kL) | Year 1 | High |

| Item no. | Management action | Timing | Priority |
|---|---|---|---|
| 3.9 | Install temporary Fire Danger Rating signs on days of Catastrophic Fire Danger to warn the public not to enter the Reserve and help reduce the risk of ignition. | Ongoing | High |
| 3.10 | Encourage community reporting of suspicious behaviour, especially on days of high fire danger or above. | Ongoing | High |
| 3.11 | Provide a public education/community awareness program highlighting the dangers of lighting fires and the penalties that may apply if caught. | Ongoing | High |
| 3.12 | Develop a comprehensive Fire Management Plan for the Reserve | Ongoing | Medium |
| | Dieback Management | | |
| 4.1 | Monitor for fresh deaths of susceptible species to trigger dieback assessment and mapping. | Ongoing | High |
| 4.2 | Implement an ongoing dieback assessment, testing and mapping program. | Every three years | Medium |
| 4.3 | Undertake phosphite treatment program of susceptible species if surveys identify dieback presence. | As required | Medium |
| 4.4 | Undertake regular inspections of infrastructure such as fencing, limestone tracks, dieback hygiene stations, informative signage and dumped rubbish, soil and / or garden refuse. Repair / remove as required | Ongoing | High |
| 4.5 | Remove dumped rubbish, soil and garden refuse from locations shown in **Figure 7**. | Ongoing | High |
| 4.6 | Ensure all staff, contractors and volunteers are informed of and comply with the Town's Dieback Management Procedures and Protocols handbook (Town of Victoria Park 2012) through regular training and if possible Green Card Training | Ongoing | High |
| 4.7 | Use only accredited suppliers, contractors and nurseries in line with the Town's Dieback Management Procedures and Protocols handbook (ToVP 2012). | Ongoing | High. |
| 4.8 | Review the locations and integrity of boot-cleaning stations and signage to suit any changes in dieback occurrence within the Reserve. | Ongoing | Medium |
| 4.9 | Facilitate and encourage research in soil science in an effort to find out why active *Phytophthora cinnamomi* has not yet revealed itself. | As required | Low |
| | Fauna Management | | |

| Item no. | Management action | Timing | Priority |
|---|---|---|---|
| 5.1 | All potential breeding habitat trees for Black Cockatoos should be retained and prohibited from clearing. Leave dead trees standing. | Ongoing | High |
| 5.2 | Install a minimum of six artificial nest boxes in the large mature eucalypt trees surrounding the Reserve to encourage use by native fauna. Nest boxes should incorporate large (entrance hole size 14-19 cm), medium (entrance hole size 6.5-10 cm) and small sizes (entrance hole size 4.5-5 cm), which target different bird species, such as parrots, kingfishers, ducks, nightjars, owl and pardalotes. Purpose-built bat boxes should also be installed to encourage bat nesting and roosting. | Year 1 | High |
| 5.3 | Undertake monitoring of nest boxes every 2 years to establish the extent to which native and feral fauna are utilising the boxes, and to address any issues (fallen or vandalised nest boxes, etc.). | Every two years | Medium |
| 5.4 | Raise awareness within the community about domestic cat use within the Bushland. | Ongoing | High |
| 5.5 | Undertake feral fauna monitoring within Kensington Bushland Reserve, which could include monitoring for scats, dens or burrows and diggings, or with the use of remote-sensor cameras. | Every three years | Medium |
| 5.6 | Undertake feral bee control in nest boxes as required. | Ongoing | High |
| 5.7 | Ensure that dogs are on leads at all times when walking through the Bushland | Ongoing | High |
| Infrastructure and Access Management | | | |
| 6.1 | Repair damaged fencing located at the corner of Baron-Hay Court and the boundary of Kensington Secondary School (**Figure 7**). | Ongoing | High |
| 6.2 | Inspect all signage, fencing (including internal), dieback cleaning stations, benches and access infrastructure on a regular basis for damage by fire or vandalism and upgrade when necessary. | Ongoing | High |
| 6.3 | Monitoring is undertaken for all tracks and that maintenance of these tracks be undertaken as required. | Ongoing | High |
| 6.4 | Replace 4 rehabilitation signs (**Figure 7**). | Year 1 | High |
| 6.5 | Re-attach dieback sign located at the Baron-Hay Court entrance (**Figure 7**). | Year 1 | High |
| 6.6 | Install 'No Parking – Keep Clear' signs on vehicle access gates at the Etwell Street and George Reserve entrances (**Figure 7**). | Year 1 | High |

| Item no. | Management action | Timing | Priority |
|---|---|---|---|
| 6.7 | Replace or trim vegetation surrounding two 'Keep Out – Deep Excavation' and one 'Trespassers Will Be Prosecuted' signs installed on the fence surrounding the excavated sand pit area. Alternatively, remove signs if they are no longer considered necessary (**Figure 7**). | Year 1 | High |
| 6.8 | Repair or replace drinking fountain located inside the Etwell Street entrance (**Figure 7**). | Year 1 | High |
| 6.9 | Install a dog-poo bag dispenser at the Baron-Hay Court entrance and inspect on a regular basis for damage by fire or vandalism and upgrade when necessary (**Figure 7**). | Year 1 and ongoing | High |
| 6.10 | Remove all occurrences of dumped rubbish and undertake regular inspections and subsequent clean ups for rubbish removal (**Figure 7**). | Ongoing | High |
| Community Use and Education Management | | | |
| 7.1 | Organise community and/or school participation days such as wildlife or wildflower walks, fungi surveys, nest box building events, revegetation, weeding events, participating in the Great Cocky Count or involving the community in nest box or fauna monitoring programs. | Ongoing | High |
| 7.2 | Advertise community participation days through the Town's and the Friends Group website and social media pages. | Ongoing | High |
| 7.3 | Raise community awareness through updates to the Town's and the Friends Group website and social media pages. This could include promoting responsible pet ownership (dogs on leads), use of dieback stations, advising of legislation in relation to domestic dogs and cats, prohibiting the dumping of garden refuse and rubbish, lists of suitable species for gardens to provide habitat and complement natural areas, lists of invasive plant species to avoid planting in gardens and the consequences of arson. | Ongoing | High |
| 7.4 | Consider developing an interpretational trail linked to the website about the Reserve, its biodiversity values and the Friends Group/community involvement (and requirement for members. Develop the trail so that it is interactive and can be available on personal mobile devices, such as smart phones. | Ongoing | Medium |

### 4.2.3 Contingencies, review and reporting

Annual reviews of the Management Plan will identify the progress and efficacy of projects, and have the ability to adapt to emergent issues, reconsidering the priority and scope of projects to ensure major

benefits for the Reserve are achieved in the years of implementation. A range of contingency actions will be implemented by the Town where objectives are not met (**Table 6**).

**Table 6: Contingency actions**

| Topic | Contingency actions |
|---|---|
| Revegetation and buffer management | • Review the revegetation process (e.g. timing, techniques, selected species) and make changes where required.<br>• Implement supplementary revegetation efforts.<br>• Amend revegetation methods to address identified faults in the revegetation process<br>• Increase monitoring to determine if revised revegetation methods are effective and to identify any future revegetation issues as soon as possible.<br>• Review mitigation measures (e.g. weed control, feral animal control, grazing) to protect juvenile plants. |
| Weed management | • Review the weed control process (e.g. timing, techniques, methods, chemicals) and make changes were required.<br>• Implement supplementary weed control efforts.<br>• Increase monitoring to determine if revised mitigation methods are effective and to identify any future issues as soon as possible. |
| Fire management | • Review the fire control processes (e.g. timing, techniques, community awareness programs) and make changes were required.<br>• Implement supplementary fire control efforts.<br>• Monitor to determine if revised mitigation methods are effective and to identify any future issues as soon as possible. |
| Dieback management | • Implement supplementary Dieback assessments and treatments.<br>• Review Town's Dieback Management Procedures and Protocols handbook and make changes were required.<br>• Identify cause/source of dieback.<br>• Implement measures to rectify and/or prevent further occurrence of dieback.<br>• Monitor success of rectification or prevention measures and implement additional measures if required. |
| Fauna management | • Review effectiveness of next boxes and make changes in design if required<br>• Implement supplementary installation of nest boxes<br>• Amend approach to community cat awareness<br>• Increase monitoring to determine if management is effective and to identify any future threatening issues as soon as possible. |
| Infrastructure and access management | • Increase vandalism monitoring and make changes to reduce incidents of damage to infrastructure.<br>• Increase available budget to allow for installation of appropriate signage and to remove any dumped rubbish |
| Community use and education management | • Review community awareness strategies and make changes to approach and/or methods to increase participation.<br>• Update social media pages to increase awareness. |

### 4.3 Future land development and surrounding land use management

The Town has a number of documents that provide for local biodiversity conservation and are considered throughout the planning process (e.g. scheme amendments, structure plans, and subdivision or development applications), including the Environmental Plan and Strategic Community Plan. There are a range of avenues for protection of the Kensington Bushland Reserve in the context of surrounding land uses and any potential future development, in addition to this Management Plan, including:

- acquisition and management by the Town
- amending zoning to one that is more sympathetic to protection (e.g. Public Open Space; this could be undertaken at the time of land zoning changes or assessment of structure plans, subdivision or development applications)
- conservation covenants/covenants on titles
- development control provisions within Local Planning Scheme
- conditions on planning applications (e.g. requirement for vegetated buffer strips along lot boundaries adjoining the Reserve, in structure plans or subdivision applications).

In addition to the local planning processes, there are a range of other legislative and planning policy documents that can protect and manage potential impacts to Kensington Bushland Reserve. Some of these include:

- Part IV and V of the *Environmental Protection Act 1986* (assessment of significant proposals and clearing)
- *Planning and Development Act 2005*
    - State Planning Strategy
    - State Planning Policies
    - Sub-regional planning framework
    - Planning Bulletins
    - Guidelines (e.g. Better Urban Water Management Guidelines)
- Federal Government *Environment Protection and Biodiversity Conservation Act 1999*.

For the land surrounding the Reserve that is within the Town's control and management, maintaining a native-vegetated buffer to mitigate edge effects and increase linkages, is the key action that can be undertaken. Progressive rehabilitation/revegetation of the Kent St Sand Pit site would enhance this buffer. It is recommended that these activities initially be focused on areas that are immediately adjacent to the Reserve to provide the maximum buffer, however, relocation of fencing to accommodate these new rehabilitation areas will also limit costs associated with the work.

# Figure 7: Kensington Bushland Reserve future management actions

**Legend**

- Reserve boundary
- Track

**Future management**

- Revegetation
- Firebreak
- Dumped rubbish
- Install 'No Parking - Keep Clear' signage
- Install dog-poo bag dispenser
- Repair / replace drinking fountain
- Repair / replace signage
- Repair fencing

0 25 50 100
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

N

ecological AUSTRALIA
www.ecoaus.com.au

Prepared by: SM Date: 19/12/2017

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# Appendix A Banksia Woodlands TEC assessment

| Step | Key diagnostic characteristics (DotEE 2016) | Outcome |
|---|---|---|
| 1 | **Location and physical environment**<br>The Banksia Woodlands ecological community primarily occurs in the Swan Coastal Plain IBRA bioregion. | The study area is located on the Swan Coastal Plain. |
| | **Soil and landform**<br>The Banksia Woodlands typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands. | The study area is located on Bassendean Dune System. |
| | **Structure**<br>The structure of the Banksia Woodlands is a low woodland to forest with these features:<br>• 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 under composition<br>• Emergent trees of medium or tall (>10 m) height *Eucalyptus* or *Allocasuarina* species may sometimes be present above the Banksia canopy<br>• An often highly species-rich understorey that consists of:<br>o a layer of sclerophyllous shrubs of various heights; and,<br>o a herbaceous ground layer of cord rushes, sedges and perennial and ephemeral forbs, that sometimes includes grasses. The development of a ground layer may vary depending on the density of the shrub layer and disturbance history. | Three vegetation types have been identified within the Reserve (Cranfield and Parker 1992):<br>• Low Banksia Woodland of *Banksia attenuata*, *Banksia menziesii* and *Banksia ilicifolia*<br>• Low Banksia/Eucalyptus Woodland containing the above-mentioned Banksia species as well as *Eucalyptus marginata*, *Eucalyptus todtiana* and *Allocasuarina fraseriana*.<br>• Low Shrubland of *Allocasuarina humilis*<br>The understorey contains a diverse array of sclerophyllous shrubs and herbaceous species with 94% of the species comprising key species of the TEC.<br>In addition, the FCT 23a – Central *Banksia attenuata – B. menziesii* woodlands has been inferred to occur within the Reserve (Government of WA 2000).<br>Vegetation within the Reserve contains *Banksia attenuata* and *B. menziesii* as a dominant species in the upper layer as well as other associated emergent species of *Eucalyptus* and *Allocasuarina* |

| Step | Key diagnostic characteristics (DotEE 2016) | Outcome |
|---|---|---|
| | | species. Vegetation within the Reserve contains all of the structural elements which define the TEC. |
| | **Composition**<br>• The canopy is most commonly dominated or co-dominated by *Banksia attenuata* (candlestick banksia, slender banksia) and/or *B. menziesii* (firewood banksia). Other Banksia species that dominate in some examples of the ecological community are *B. prionotes* (acorn banksia) or *B. ilicifolia* (holly-leaved banksia); and<br>• The patch must include at least one of the following diagnostic species:<br>o *Banksia attenuata* (candlestick banksia)<br>o *Banksia menziesii* (firewood banksia)<br>o *Banksia prionotes* (acorn banksia)<br>o *Banksia ilicifolia* (holly-leaved banksia).<br>• If present, the emergent tree layer often includes *Corymbia calophylla* (marri), *E. marginata* (jarrah), or less commonly *Eucalyptus gomphocephala* (tuart); and<br>• Other trees of a medium height that may be present, and may be codominant with the Banksia species across a patch, include *Eucalyptus todtiana* (blackbutt, pricklybark), *Nuytsia floribunda* (Western Australian Christmas tree), *Allocasuarina fraseriana* (western sheoak), *Callitris arenaria* (sandplain cypress), *Callitris pyramidalis* (swamp cypress) and *Xylomelum occidentale* (woody pear); and<br>• The understorey typically contains a high to very high diversity of shrub and herb species that often vary from patch to patch***<br>• Contra-indicators:<br>o Patches clearly dominated by *Banksia littoralis* are not part of the Banksia Woodlands ecological community but indicates a different, dampland community is present.<br>o Patches clearly dominated by *Banksia burdettii* are not part of the Banksia Woodlands ecological community but indicates a tall shrubland and not the Banksia Woodlands ecological community.<br>o FCT 20c – Eastern shrublands and woodlands, corresponds with a separate EPBC ecological community listing, Shrublands and Woodlands of the eastern Swan Coastal Plain. Occurrences of this FCT should be considered under that separate listing. | Two of the vegetation communities within the Reserve are dominated by the diagnostic species *Banksia attenuata and Banksia menziesii*. *Banksia ilicifolia* is also present in one of the vegetation communities. There is the presence of *Eucalyptus marginata* and other codominant species, such as *Allocasuarina fraseriana, Eucalyptus todtiana* and *Nuytsia floribunda*. The remaining vegetation community low shrubland of *Allocasuarina humilis* is considered part of the *Banksia* communities. The understorey contains a high diversity of species and includes 94% of key species defining the sclerophyllous and herbaceous layers of the TEC. To date 205 flora species have been noted in the Reserve from 41 families. The contra-indicators of *Banksia littoralis* and *Bankia burdettii* were not recorded. The community does not represent FCT 20c – Eastern shrublands and woodlands.<br>Vegetation within the Reserve contains all of the key composition elements which define the TEC. |

| Step | Key diagnostic characteristics (DotEE 2016) | Outcome |
|---|---|---|
| 2 | **Condition thresholds**<br>• Assessments of a patch should initially be centered on the area of highest native floristic diversity and/or cover, i.e. the best condition area of the patch.<br>• 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.<br>• The 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.<br>• 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; refer to Table 1 in the Approved Conservation Advice (DotEE 2016).<br>• A relevant expert (e.g. ecological consultant, local NRM or environment agency) may be useful to help identify the ecological community and its condition. | Vegetation sampling was undertaken by Cranfield and Parker (1992). The vegetation condition is almost entirely in Good or better condition. |
| 3 | **Minimum patch size**<br>Minimum patch sizes apply for consideration of a patch as part of the listed ecological community for EPBC Act referral, assessment and compliance purposes. Where patches meet different levels of condition, different minimum patch sizes apply:<br>• 'Pristine' – no minimum patch size applies<br>• 'Excellent' – 0.5 ha or 5,000 m2 (e.g. 50 m x 100 m)<br>• 'Very Good' – 1 ha or 10,000 m2 (e.g. 100 m x 100 m)<br>• 'Good' – 2 ha or 20,000 m2 (e.g. 200 m x 100 m).<br>Note: To be considered as part of the EPBC Act ecological community, a patch should meet at least the Good Condition category. | The extent of vegetation within the reserve in Good or better condition is as follows:<br>Excellent – 1.1 ha<br>Very Good – 5.5 ha<br>Good – 2.2 ha<br>Vegetation within the Reserve meets the minimum condition requirements of 2 ha of Good condition when considered in isolation from surrounding vegetation. |
| 4 | **Further information to assist in determining the presence of the ecological community and significant impacts.**<br>• The landscape position of the patch, including its position relative to surrounding vegetation also influences how important it is in the broader landscape. For example, if it enables movement of native fauna or plant material or supports other ecological processes. | The vegetation within the Reserve represents an occurrence of the Banksia Woodlands of the Swan Coastal Plain TEC as it meets all of the key diagnostic characteristics. |

| Step | Key diagnostic characteristics (DotEE 2016) | Outcome |
|---|---|---|
| | • A patch is a discrete and mostly continuous area of the ecological community. A patch may include small-scale (<30 m) variations, gaps and disturbances, such as tracks, paths or breaks. Where there is a break in native vegetation cover, from the edge of the tree canopy of 30 m or more (e.g. due to permanent artificial structures, wide roads or other barriers; or due to water bodies typically more than 30m wide) then the gap typically indicates that separate patches are present.<br>• Variation in canopy cover, quality or condition of vegetation across a patch should not initially be considered to be evidence of multiple patches. Patches can be spatially variable and are often characterised by one or more areas within a patch that meet the key diagnostic characteristics and condition threshold criteria amongst areas of lower condition. Average canopy cover and quality across the broadest area that meets the general description of the ecological community should be used initially in determining overall canopy cover and vegetation condition. Also note any areas that are either significantly higher or lower in quality, gaps in canopy cover and the condition categories that would apply across different parts of the site respectively. Where the average canopy cover or quality falls below the minimum thresholds, the next largest area or areas that meet key diagnostics (including minimum canopy cover requirements) and minimum condition thresholds should be specified and protected. This may result in multiple patches being identified within the overall area first considered.<br>• A buffer zone is a contiguous area immediately adjacent to a patch of the ecological community that is important for protecting its integrity. The purpose of the buffer zone is to help protect and manage the national threatened ecological community. The edges of a patch are considered particularly susceptible to disturbance and the presence of a buffer zone is intended to act as a barrier to further direct disturbance.<br>• The recommended minimum buffer zone for the ecological community is 20–50 metres from the outer edge of a patch, and the appropriate size depends on the nature of the buffer and local context (e.g. slope). A larger buffer zone should be applied, where practical, to protect patches that are of particularly high conservation value, or if patches are down slope of drainage lines or a source of nutrient enrichment, or groundwater drawdown. | |

# Appendix B Native flora species list

| Family | Species^ | Common name |
|---|---|---|
| Anarthriaceae | *Lyginia barbata* | - |
| Apiaceae | *Xanthosia huegelii* | - |
| Araliaceae | *Trachymene pilosa* | Native Parsnip |
| Asparagaceae | *Chamaescilla corymbosa* | Blue Squill |
| | *Laxmannia squarrosa* | - |
| | *Lomandra caespitosa* | Tufted Mat Rush |
| | *Lomandra hermaphrodita* | - |
| | *Lomandra nigricans* | - |
| | *Lomandra odora* | Tiered Mat Rush |
| | *Lomandra preissii* | - |
| | *Lomandra suaveolens* | - |
| | *Sowerbaea laxiflora* | Purple Tassels |
| | *Thysanotus manglesianus* | Fringed Lily |
| | *Thysanotus sparteus* | - |
| | *Thysanotus tenellus* | - |
| | *Thysanotus triandrus* | - |
| Asteraceae | *Brachyscome bellidioides* | - |
| | *Hyalosperma cotula* | - |
| | *Lagenophora huegelii* | - |
| | *Olearia paucidentata* | Autumn Scrub Daisy |
| | *Podolepis gracilis* | Slender gracilis |
| | *Podotheca angustifolia* | Sticky Longheads |
| | *Podotheca chrysantha* | Yellow Podotheca |
| | *Podotheca gnaphalioides* | Golden Long-heads |
| | *Siloxerus humifusus* | Procumbent Siloxerus |
| | *Waitzia suaveolens* | Fragrant Waitzia |
| Campanulaceae | *Lobelia tenuior* | Slender Lobelia |
| | *Wahlenbergia gracilenta* | Annual Bluebell |
| Casuarinaceae | *Allocasuarina fraseriana* | Sheoak |
| | *Allocasuarina humilis* | Dwarf Sheoak |

| Family | Species^ | Common name |
|---|---|---|
| Celastraceae | *Stackhousia monogyna* | - |
| | *Tripterococcus brunonis* | Winged Stackhousia |
| Colchicaceae | *Burchardia congesta* | Kara |
| Crassulaceae | *Crassula colorata*[2] | Dense Stonecrop |
| Cyperaceae | *Lepidosperma angustatum* | - |
| | *Lepidosperma squamatum* | - |
| | *Mesomelaena pseudostygia* | Semophore Sedge |
| | *Mesomelaena stygia*[2] | - |
| | *Schoenus brevisetis*[2] | - |
| | *Schoenus curvifolius* | - |
| | *Schoenus lanatus* | Woolly Bog-rush |
| | *Schoenus latitans* | - |
| | *Calectasia narragara* | - |
| | *Dasypogon bromeliifolius* | Pineapple Bush |
| Dilleniaceae | *Hibbertia huegelii* | - |
| | *Hibbertia hypericoides* | Yellow Buttercups |
| | *Hibbertia racemosa* | Stalked Guinea Flower |
| | *Hibbertia subvaginata*[2] | - |
| Droseraceae | *Drosera erythrorhiza* | Red Ink Sundew |
| | *Drosera huegelii* | Bold Sundew |
| | *Drosera macrantha* | Bridal Rainbow |
| | *Drosera menziesii* | Pink Rainbow |
| | *Drosera menziesii* subsp. *penicillaris*[2] | - |
| | *Drosera pallida*[2] | Pale Rainbow |
| | *Drosera stolonifera* | Leafy Sundew |
| Ericaceae | *Astroloma macrocalyx* | Swan Berry |
| | *Astroloma pallidum* | Kick Bush |
| | *Conostephium pendulum* | Pearl Flower |
| | *Conostephium preissii* | - |
| | *Leucopogon conostephioides* | - |
| | *Leucopogon parviflorus* | Coast Beard-heath |
| | *Leucopogon propinquus*[2] | - |

| Family | Species^ | Common name |
|---|---|---|
| | *Leucopogon* sp.[2] | - |
| | *Lysinema ciliatum* | Curry Flower |
| | *Styphelia tenuiflora* | Common Pinheath |
| Euphorbiaceae | *Monotaxis grandiflora* | Diamond of the Desert |
| | *Stachystemon vermicularis* | - |
| Fabaceae | *Acacia huegelii* | - |
| | *Acacia pulchella* | Prickly Moses |
| | *Acacia rostellifera*[2] | Summer-scented Wattle |
| | *Acacia saligna* | Orange Wattle |
| | *Acacia sphacelata* | - |
| | *Acacia stenoptera* | Narrow-winged Wattle |
| | *Acacia willdenowiana* | Grass Wattle |
| | *Bossiaea eriocarpa* | Common Brown Pea |
| | *Daviesia divaricata* | Marno |
| | *Daviesia nudiflora* | - |
| | *Daviesia triflora* | - |
| | *Gastrolobium capitatum* | - |
| | *Gompholobium tomentosum* | Hairy Yellow Pea |
| | *Hardenbergia comptoniana* | Native Wisteria |
| | *Hovea trisperma* | Common Hovea |
| | *Isotropis cuneifolia* | Granny Bonnets |
| | *Jacksonia furcellata* | Grey Stinkwood |
| | *Jacksonia lehmannii* | - |
| | *Jacksonia sternbergiana* | Stinkwood |
| | *Johnsonia pubescens* | Pipe Lily |
| | *Kennedia prostrata* | Scarlet Runner |
| Goodeniaceae | *Dampiera linearis* | Common Dampiera |
| | *Scaevola canescens* | Grey Scaevola |
| | *Scaevola repens* | - |
| | *Scaevola* sp. | - |
| Haemodoraceae | *Anigozanthos humilis* | Catspaw |
| | *Anigozanthos manglesii* | Mangles Kangaroo Paw |

| Family | Species^ | Common name |
|---|---|---|
| | *Conostylis aculeata* | Prickly Conostylis |
| | *Conostylis aculeata* subsp. *aculeata* | - |
| | *Conostylis aurea* | Golden Conostylis |
| | *Conostylis juncea* | - |
| | *Conostylis setigera* | Bristly Cottonhead |
| | *Haemodorum spicatum* | Mardja |
| | *Phlebocarya ciliata* | - |
| Hemerocallidaceae | *Arnocrinum preissii* | - |
| | *Corynotheca micrantha* | Sand Lily |
| | *Dianella revoluta* | Blueberry Lily |
| | *Dianella revoluta* var. *divaricata* | - |
| | *Dianella revoluta* var. *revoluta* | - |
| | *Tricoryne elatior* | Yellow Autumn Lily |
| Iridaceae | *Patersonia occidentalis* | Purple Flag |
| Lamiaceae | *Hemiandra pungens* | Snakebush |
| Lauraceae | *Cassytha racemosa* | Dodder Laurel |
| Loranthaceae | *Nuytsia floribunda* | Christmas Tree |
| Macarthuriaceae | *Macarthuria australis* | - |
| Montiaceae | *Calandrinia corrigioloides* | Strap Purslane |
| | *Calandrinia granulifera* | Pygmy Purslane |
| Myrtaceae | *Calothamnus sanguineus* | Silky-leaved Blood Flower |
| | *Calytrix angulata* | Yellow Starflower |
| | *Calytrix flavescens* | Summer Starflower |
| | *Calytrix fraseri* | Pink Summer Calytrix |
| | *Calytrix* sp. | - |
| | *Eremaea pauciflora* | - |
| | *Eremaea pauciflora* var *pauciflora* | - |
| | *Eucalyptus marginata* | Jarrah |
| | *Eucalyptus todtiana* | Coastal Blackbutt |
| | *Hypocalymma robustum* | Swan River Myrtle |
| | *Leptospermum spinescens* | - |
| | *Melaleuca seriata* | - |

| Family | Species^ | Common name |
|---|---|---|
| | *Regelia inops* | - |
| | *Scholtzia involucrata* | Spiked Scholtzia |
| | *Taxandria linearifolia* | - |
| | *Verticordia densiflora* | Compacted Featherflower |
| Orchidaceae | *Caladenia discoidea* | Dancing Orchid |
| | *Caladenia ferruginea* | Rusty Spider Orchid |
| | *Caladenia filifera* | Blood Spider Orchid |
| | *Caladenia flava* | Cowslip Orchid |
| | *Caladenia latifolia* | Pink Fairy Orchid |
| | *Caladenia longicauda* | Common White Spider Orchid |
| | *Caladenia longiclavata* | Clubbed Spider Orchid |
| | *Caladenia macrostylis* | Leaping Spider Orchid |
| | *Caladenia* sp. | - |
| | *Cyanicula sericea* | - |
| | *Diuris brumalis* | - |
| | *Diuris magnifica* | - |
| | *Eriochilus dilatatus* subsp. *dilatatus*[2] | - |
| | *Microtis media* | Tall Mignonette Orchid |
| | *Microtis* sp. | - |
| | *Pheladenia deformis* | Blue Fairy Orchid |
| | *Pterostylis pyramidalis* | Snail Orchid |
| | *Pterostylis dilatata* | - |
| | *Pterostylis recurva* | Jug Orchid |
| | *Pterostylis sanguinea* | - |
| | *Pterostylis vittata* | Banded Greenhood |
| | *Thelymitra graminea* | Shy Sun Orchid |
| | *Thelymitra macrophylla* | - |
| Phyllanthaceae | *Poranthera microphylla* | Small Poranthera |
| Pittosporaceae | *Billardiera fraseri* | Elegant Pronaya |
| | *Billardiera fusiformis* | Australian Bluebell |
| | *Billardiera heterophylla* | Gumug |
| | *Billardiera* sp.[2] | - |

| Family | Species^ | Common name |
|---|---|---|
| Poaceae | *Amphipogon amphipogonoides*[2] | - |
| | *Amphipogon turbinatus* | - |
| | *Rytidosperma caespitosum*[2] | - |
| | *Austrostipa compressa* | - |
| | *Austrostipa elegantissima* | - |
| | *Austrostipa flavescens* | - |
| | *Austrostipa hemipogon* | - |
| | *Austrostipa mollis* | - |
| | *Neurachne alopecuroidea* | Foxtail Mulga Grass |
| Polygalaceae | *Comesperma calymega* | Blue-spike Milkwort |
| Proteaceae | *Adenanthos cygnorum* | Common Woollybush |
| | *Banksia attenuata* | Slender Banksia |
| | *Banksia ilicifolia* | Holly-leafed Banksia |
| | *Banksia menziesii* | Firewood Banksia |
| | *Persoonia saccata* | Snottygobble |
| | *Petrophile linearis* | Pixie Mops |
| | *Petrophile macrostachya* | - |
| | *Stirlingia latifolia* | Blueboy |
| | *Synaphea spinulosa* | - |
| Restoniaceae | *Alexgeorgea nitens* | - |
| | *Desmocladus flexuosus* | - |
| | *Hypolaena exsulca*[2] | - |
| | *Lepidobolus preissianus* | - |
| Rutaceae | *Philotheca spicata* | Pepper and Salt |
| Santalaceae | *Leptomeria cunninghamii* | - |
| | *Leptomeria empetriformis*[2] | - |
| Stylidiaceae | *Levenhookia stipitata* | Common Stylewort |
| | *Stylidium amoenum* | Lovely Triggerplant |
| | *Stylidium androsaceum*[3] | - |
| | *Stylidium brunonianum* | Pink Fountain Triggerplant |
| | *Stylidium calcaratum* | Book Triggerplant |
| | *Stylidium carnosum* | Fleshy-leaved Triggerplant |

| Family | Species^ | Common name |
|---|---|---|
| | *Stylidium diuroides* | Donkey Triggerplant |
| | *Stylidium junceum* | Reed Triggerplant |
| | *Stylidium neurophyllum* | Coastal Plain Triggerplant |
| | *Stylidium piliferum* | Common Butterfly Triggerplant |
| | *Stylidium repens* | Matted Triggerplant |
| | *Stylidium schoenoides* | Cow Kicks |
| | *Stylidium* sp.[4] | Triggerplant |
| Thymelaeaceae | *Pimelea suaveolens*[4] | Scented Banjine |
| | *Pimelea sulphurea* | Yellow Banjine |
| Violaceae | *Hybanthus calycinus* | Wild Violet |
| Xanthorrhoeaceae | *Xanthorrhoea brunonis* | - |
| | *Xanthorrhoea preissii* | Balga, Grass Tree |
| | *Xanthorrhoea* sp.[4] | - |
| Zamiaceae | *Macrozamia riedlei* | Zamia |

^Species provided by the Town of Victoria Park from various sources including seed collection, Friends of Kensington Bushland and Report for Town of Victoria Park Management Plan (Ecoscape 2003).

*CR = listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) List of Threatened Flora

EN = listed as Endangered under the EPBC Act

P4 = Priority 4: Rare, Near Threatened and other species in need of monitoring but not currently threatened; could become threatened if present circumstances change. Listed by Department of Biodiversity, Conservation and Attractions.

[1]Species collected 1995

[2]Species collected 1993-1995

[3]Species collected 1985

[4]Species collected 1990.

# Appendix C Weed species list

Weed species recorded within the Reserve were assessed and a priority ranking for control and management was determined through consideration of the following:

- Status under the BAM Act by DPIRD (2017);
- Rating assigned in *Environmental Weed Census and Prioritisation* (EWCP) by the Swan Natural Resource Management (2008);
- Weeds of National Significance (DotEE 2017c); and
- The representation of a species across the Reserve including density and distribution and consideration of the nature of a species and potential to affect remnant vegetation (e.g. its potential to become highly invasive).

| **Bulbous Weeds** |
|---|
| **Gladiolus caryophyllaceus* (Wild Gladiolus) |
| **Oxalis pes-caprae* (Soursob) |
| **Romulea rosea* (Guildford Grass) |
| **Grass Weeds** |
| **Avena barbata* (Bearded Oat) |
| **Briza maxima* (Blowfly Grass) |
| **Bromus diandrus* (Great Brome) |
| **Ehrharta calycina* (Perennial Veldt Grass) |
| **Ehrharta longiflora/brevifolia?* (Annual Veldt Grass) |
| **Eragrostis curvula* (African Lovegrass) |
| **Hordeum glaucum* (Northern Barley Grass) |
| **Other Weeds** |
| **Asparagus asparagoides* (Bridal Creeper) |
| **Brassica tournefortii* (Mediterranean Turnip) |
| **Conyza bonariensis* (Flaxleaf Fleabane) |
| **Euphorbia terracina* (Geraldton Carnation Weed) / *E. peplus* (Petty Spurge) |
| **Fumaria capreolata* (Whiteflower Fumitory) |
| **Fumaria muralis* (Wall Fumitory) |
| **Fumaria bastardii* |
| **Lupinus sp.* (Lupin) |
| **Malva parviflora* (Marshmallow) |
| **Medicago sp.* (Medic) |
| **Misopates orantium* (Lesser Snapdragon) |

| |
|---|
| **Pelargonium capitatum* (Rose Pelargonium) |
| **Raphanus raphanistrum* (Wild Radish) |
| **Solanum nigrum* (Black Berry Nightshade) |
| **Sonchus asper* (Rough Sowthistle) |
| **Sonchus oleraceus* (Common Sowthistle) |
| **Ursinia anthemoides* (Ursinia) |
| **Woody Weeds** |
| **Chamelaucium uncinatum* (Geraldton Wax) |
| **Corymbia citriodora* (Lemon-scented Gum) |
| **Corymbia maculata* (Spotted Gum) |
| **Eucalyptus camaldulensis* (River Gum) |

# Appendix D Weed timing schedule based on growth form

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| Bulbous Weeds | **Gladiolus caryophyllaceus* | Dormant | ■ | ■ | | | | | | | | | | ■ | Jul-Sep | Jul-Sep |
| | | Active growth | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | | | | |
| | | Fruiting | | | | | | | | | ■ | ■ | ■ | | | |
| | **Oxalis pes-caprae* | Dormant | ■ | ■ | ■ | | | | | | | | ■ | ■ | Jun-Jul | Jun-Jul |
| | | Active growth | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| | | Flowering | | | | | | ■ | ■ | ■ | ■ | | | | | |
| | **Romulea rosea* | Dormant | ■ | ■ | ■ | | | | | | | | | ■ | Jul-Aug | Jul-Aug |
| | | Active Growth | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Germination | | | | | ■ | ■ | ■ | | | | | | | |

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| | | Flowering | | | | | | | | ■ | ■ | ■ | | | | |
| Grass Weeds | **Avena barbata* | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | Jul-Oct | Jul-Oct |
| | | Germination | | | | | ■ | ■ | | | | | | | | |
| | | Flowering | | | | | | | | | ■ | ■ | ■ | | | |
| | | Fruiting | | | | | | | | | | | | ■ | | |
| | **Briza maxima* | Active growth | | | | | ■ | ■ | ■ | ■ | | | | | Jul-Aug | Jul-Aug |
| | | Germination | | | | | ■ | ■ | ■ | ■ | | | | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | | | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | ■ | | |
| | **Bromus diandrus* | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | Jun-Aug | Jun-Aug |
| | | Germination | | | | | ■ | ■ | | | | | | | | |
| | | Flowering | | | | | | | | | ■ | ■ | ■ | | | |
| | | Fruiting | | | | | | | | | | | ■ | ■ | | |

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| | **Ehrharta calycina* | Active growth | | | | | | | ■ | ■ | ■ | ■ | ■ | | Jun-Aug | Jan-Feb, Nov-Dec |
| | | Germination | | | | | | ■ | ■ | ■ | ■ | | | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | | | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | | | |
| | **Eragrostis curvula* | Active growth | ■ | ■ | ■ | ■ | ■ | | | | ■ | ■ | ■ | ■ | Nov-May | Nov-May |
| | | Flowering | ■ | ■ | ■ | ■ | ■ | | | | | | ■ | ■ | | |
| | | Fruiting | ■ | ■ | ■ | ■ | ■ | | | | | | | ■ | | |
| | **Hordeum glaucum* | Active growth | | | | | ■ | ■ | ■ | ■ | ■ | | | | Jun-Aug | Jun-Aug |
| | | Germination | | | | | ■ | ■ | ■ | | | | | | | |
| | | Flowering | | | | | | | | | ■ | ■ | ■ | | | |
| Other Weeds | **Asparagus asparagoides* | Dormant | ■ | ■ | | | | | | | | | ■ | ■ | Jul-Aug | Jul-Aug |
| | | Active growth | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| | | Germination | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | |

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| | | Flowering | | | | | | | | | ■ | ■ | | | | |
| | **Brassica tournefortii* | Germination | | | ■ | ■ | ■ | ■ | | | | | | | Jul-Sep | Jul-Sep |
| | | Flowering | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | **Conyza bonariensis* | Germination | | | | | ■ | ■ | ■ | | | | | | Jun-Sep | Jun-Sep |
| | | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | ■ | ■ | ■ | ■ | ■ | | | | ■ | ■ | ■ | ■ | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | ■ | | |
| | **Euphorbia terracina* | Dormant | ■ | ■ | ■ | | | | | | | | | ■ | Jun-Aug | Jun-Nov |
| | | Active growth | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Germination | | | | | | ■ | ■ | ■ | | | | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | | | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | ■ | | |
| | **Fumaria* sp. | Germination | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | Jul-Sep | Jul-Sep |

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| | | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | ■ | | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | ■ | | |
| | **Lupinus* sp. | Germination | | | | ■ | ■ | ■ | | | | | | | Jun-Oct | Jun-Oct |
| | | Active Growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | ■ | | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | | | |
| | **Malva parviflora* | Germination | | | | ■ | ■ | ■ | ■ | ■ | | | | | Apr-Jun | Apr-Sep |
| | | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | | | | | | | ■ | ■ | ■ | ■ | ■ | | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | | | |
| | **Medicago* sp. | Germination | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | Jun-Aug | Jun-Aug |
| | | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| | | Flowering | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Fruiting | | | | | | | | ■ | ■ | ■ | ■ | ■ | | |
| | **Pelargonium capitatum* | Germination | | | | | ■ | ■ | ■ | ■ | | | | | Jun-Oct | Jun-Nov |
| | | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | | | | | | | | ■ | ■ | ■ | ■ | ■ | | |
| | | Fruiting | | | | | | | | | | ■ | ■ | ■ | | |
| | **Raphanus raphanistrum* | Germination | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | Jan-Dec | Jun-Dec |
| | | Active growth | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| | | Flowering | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Fruiting | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | **Solanum nigrum* | Germination | | | | | | | | ■ | ■ | ■ | ■ | ■ | Jul-Dec | Jun-Nov |
| | | Active growth | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | Flowering | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |

| Broad Weed Group | Species | Growth form | Month | | | | | | | | | | | | Treatment timing[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Optimum herbicide treatment | Optimum manual removal |
| | | Fruiting | | | | | | | | | | | | | | |
| | **Sonchus* sp. | Germination | | | | | | | | | | | | | Jun-Aug | Jun-Oct |
| | | Active growth | | | | | | | | | | | | | | |
| | | Flowering | | | | | | | | | | | | | | |
| | | Fruiting | | | | | | | | | | | | | | |
| Woody Weeds | **Chamelaucium uncinatum* | Flowering | | | | | | | | | | | | | Jan-Dec | Jan-Dec |
| | | Fruiting | | | | | | | | | | | | | | |
| | **Corymbia citrodora* | Flowering | | | | | | | | | | | | | Jan-Dec | Jan-Dec |
| | **Eucalyptus camaldulensis* | Flowering | | | | | | | | | | | | | | |

[1]Herbicide weed control methods recommended by DBCA 2017b.

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