



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9313/1
File Number: DWERVT8066
Duration of Permit: From 31 August 2021 to 31 August 2023

PERMIT HOLDER

City of Wanneroo

LAND ON WHICH CLEARING IS TO BE DONE

Lot 418 on Deposited Plan 52130 (Crown Reserve 49111), Butler

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.116 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- (a) avoid the *clearing* of *native vegetation*;
- (b) minimise the amount of *native vegetation* to be cleared; and
- (c) reduce the impact of *clearing* on any environmental value.

2. Weed and dieback management

When undertaking any *clearing* authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known dieback or weed-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

3. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised <i>clearing</i> activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the <i>clearing</i> occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of <i>clearing</i> in accordance with condition 1; and (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 2.

4. Reporting

The permit holder must provide to the *CEO* the records required under condition 3 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

6 August 2021

SCHEDULE 1

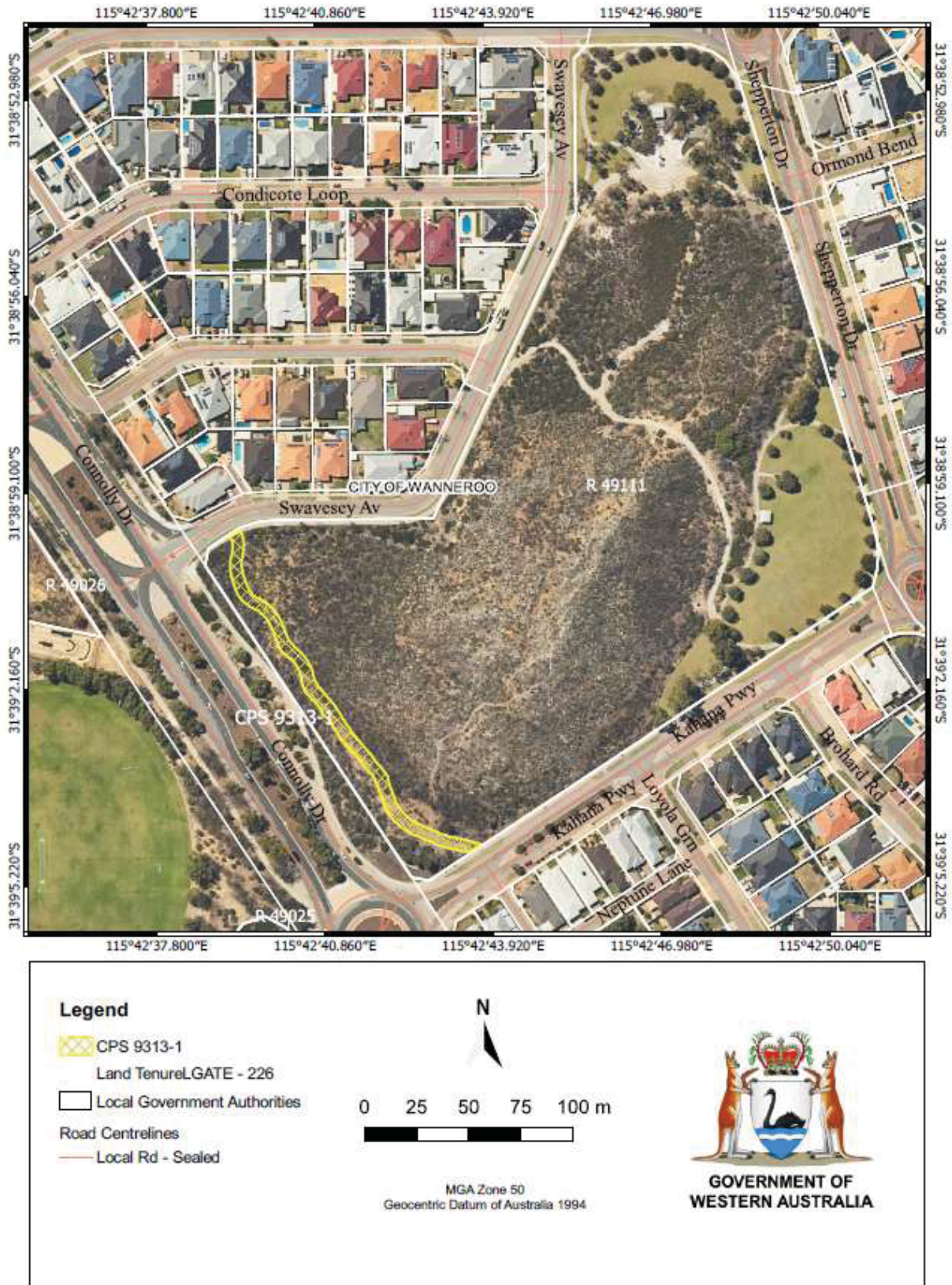


Figure 1: Map of the boundary of the area within which *clearing* may occur



Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 9313/1
Permit type:	Area Permit
Applicant name:	City of Wanneroo
Application received:	8 June 2021
Application area:	0.116 hectares of native vegetation
Purpose of clearing:	Constructing an access track for fire mitigation, fire-fighting, and maintenance activities.
Method of clearing:	Mechanical removal
Property:	Lot 418 on Deposited Plan 52130 (Crown Reserve 49111)
Location (LGA area):	City of Wanneroo
Localities (suburb):	Butler

1.2. Description of clearing activities

The City of Wanneroo is proposing to undertake the clearing of vegetation within Kahana Park in Butler. The proposed clearing will facilitate the construction of an access track in order to provide access to the larger portion of the park for maintenance and fire mitigation and fire-fighting activities. The proposed access track will be three metres wide, running from the southern side of the park with an existing gate, through a degraded area to the northern side of the park.

Vegetation clearing is proposed to take place one week prior to track construction. Clearing will be undertaken with chainsaws and brush-cutters. The track alignment has accumulated sand from the slope above. Some sand will require removal to provide a box to lay a limestone track, however, the amount of sand removed will be kept to a minimum.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	6 August 2021
Decision area:	0.116 hectares of native vegetation within Kahana Park, on the east side of Connolly Drive, Butler, as depicted Figure 1 in Section 1.5 below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for public comment for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix H2), the findings of a flora and vegetation assessment (Appendix A), the clearing principles set out in Schedule 5 of the EP Act (Appendix C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments, and any other matters considered relevant to the assessment (Section 3.3). The Delegated Officer also took into consideration the purpose of the clearing to facilitate the construction of an access track for fire mitigation, fire-fighting, and maintenance activities within Kahana Park.

The access track alignment has been positioned to align with a previously cleared area and to avoid significant vegetation to the north-east. The native vegetation within the application area is predominantly in a degraded condition. The assessment identified that the flora survey results are likely to have been affected by a recent fire that impacted the area, but that the area required for clearing was minor, and that the risk of proposed clearing to flora of conservation significance, significant fauna habitats, and significant ecological communities is low. Twenty-eight non-

native (weed) species were recorded within, or immediately adjacent to, the application area. The proposed clearing has the potential to introduce or spread weeds and dieback disease into adjacent native vegetation which could impact on the quality of that vegetation.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (Section 3.1), the Delegated Officer decided to grant a clearing permit subject to a condition to implement weed and dieback management strategies to minimise the risk to adjacent native vegetation.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.

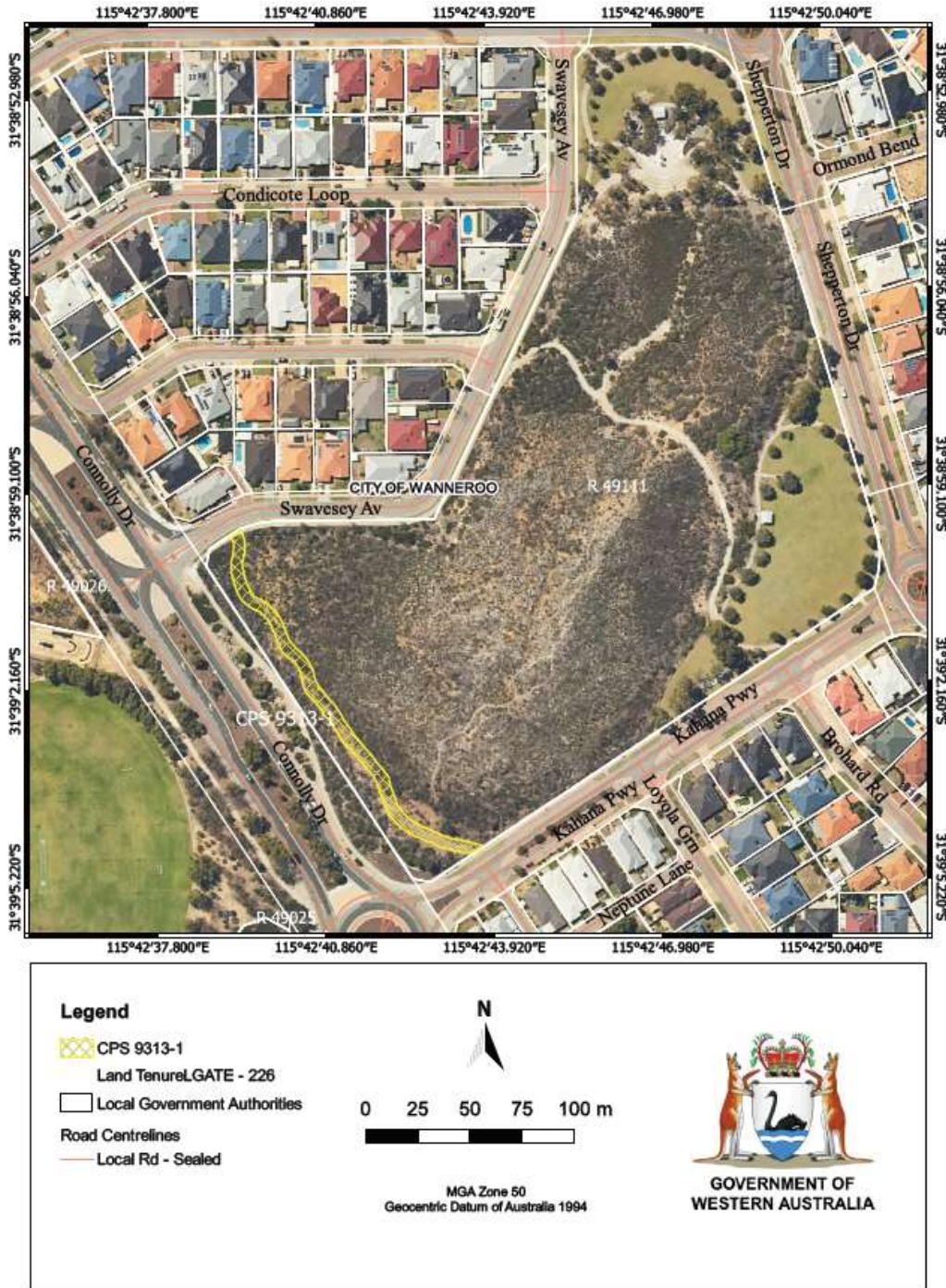


Figure 1: Map of the application area CPS 9313/1. The area cross-hatched yellow indicates the area within which 0.116 hectares of native vegetation is authorised to be cleared under the granted clearing permit.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (Section 3), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle;
- the principle of intergenerational equity; and
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act);
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act); and
- *Rights in Water and Irrigation Act 1914* (RIWI Act).

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013);
- *Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016); and
- *Procedure: Native vegetation clearing permits* (DWER October 2019).

3. Detailed assessment of application

3.1 Avoidance and mitigation measures

The construction of an access track in Kahana Park has been prioritised by the City of Wanneroo as part of the City's Capital Works Program. In March 2020, a fire caused by arson occurred within Kahana Park, burning a large portion of the western side of the Park (Figure 2). The fire started from Kahana Parkway near Shepperton Drive. Due to the lack of an access track within the western section of the park, Emergency Services were unable to effectively access the area to contain and control the fire, resulting in the burning of a large portion of native vegetation within the Kahana Park (City of Wanneroo 2021b).



Figure 2: Map of arson fire within Kahana Park, occurring on 3 March 2020. (Red line is the boundary of the park. Orange hatch is the arson burn area) (City of Wanneroo 2021b).

A fire break and access track is already present in the eastern section of Kahana Park (Figure 1). The aim of the proposed clearing is to facilitate an access track within the larger western portion of Kahana Park, to act as a fire break against any fires initiating from Connolly Drive, Kahana Parkway or Swavesey Avenue and allow effective vehicular access for fire mitigation, prevention and fighting activities, as well as for park maintenance. The access track proposed is three metres wide with a base of crushed limestone (Appendix G).

Proposed clearing is within an area where native vegetation is predominantly degraded (Figure 3) due to the existence of a former track and the impacts of an uncontrolled fire. Works will occur within a clearly defined area (Appendix G). The design of the track has taken into consideration significant trees, shrubs, and grasses (*Xanthorrhoea preissii*) that are present within the alignment and will be avoided. Utilising this area of Kahana Park will reduce the amount of native vegetation in good or better condition. The track also avoids the steeper topography of a limestone ridge immediately to the east and the occurrence of a mapped significant ecological community associated with this ridge. Construction of the track will also allow for more effective maintenance of the western portion of Kahana Park, which may result in an increased quality of vegetation (City of Wanneroo 2020b).



Figure 3: Proposed clearing of 1,165m² for the construction of a fire access track on the western side of Kahana Park, Butler (City of Wanneroo 2021b).

3.2 Assessment of environmental impacts

In assessing the application, the Delegated Officer has had regard for the site characteristics (Appendix B) and the extent to which the impacts of the proposed clearing present a potential risk to flora and vegetation, fauna habitat, and Threatened Ecological Communities. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1 Environmental value: biological values (flora and vegetation) – Clearing Principles (a) and (c)

Assessment: The application area consists of a minor portion of approximately 4.84 hectares of native vegetation within the Kahana Park reserve (R 49111). City of Wanneroo Environmental Officers undertook two assessments of the track alignment during Spring 2020 (City of Wanneroo 2021a; 2021b). A total of 71 flora taxa were identified during the surveys that included 43 native flora. Twenty-eight weed species were recorded, representing almost 40 per cent of the total flora species richness. A fire that impacted the area in March 2020 is likely to have affected

survey results. The proposed clearing alignment follows an informal track and vegetation condition ranges from completely degraded to good, with the majority of the vegetation (approximately 70 per cent) in a degraded condition.

The floral diversity of Kahana Park is not known. However, due to the application area being close to the edge of Kahana Park, with an alignment along an existing track, and the proximity of the Connolly Drive road verge, it is likely to incur edge effects. This is reflected in the degraded vegetation condition, with a high weed load as evidenced by the results of the survey (City of Wanneroo 2021b).

Three Threatened flora taxa have been recorded within ten kilometres of the application area. The Endangered *Melaleuca* sp. Wanneroo (G.J. Keighery 16705) generally occurs on low hills and ridges with bare limestone or shallow siliceous or calcareous sand over limestone, often in dense patches with other *Melaleuca* species (WAH 1998-). The Endangered *Marianthus paralius* has a coastal distribution on white sand (Quindalup system) over limestone and low coastal cliffs. The Vulnerable *Eucalyptus argutifolia* also has a coastal distribution on shallow soils over limestone, or slopes and gullies of limestone ridges and outcrops (WAH 1998-). The habitats above do not occur over the application area which has yellow Karrakatta sands representative of the Spearwood system (Seddon 1972), occurring inland from the white sands of the Quindalup system. Due to the soil type and habitat present, the degraded nature of the application area, the lack of identification during surveys, and separation distances to known records, it is unlikely that Threatened flora species occur over the application area.

Seventeen Priority (P) flora taxa have been recorded within ten kilometres of the application area; two P1, three P2, seven P3 and five P4 (Appendix B2). Eleven of the Priority flora taxa are species or subspecies within genera identified by the City of Wanneroo (2020b) to species level (*Acacia*, *Conostylis*, *Hibbertia*, *Jacksonia*, *Leucopogon* and *Stylidium*). None of the identifications within these genera were of Priority species (Appendix F3).

Of the remainder, the P1 *Baeckea* sp. Limestone (N. Gibson & M.N. Lyons 1425) generally occurs on limestone breakaways (WAH 1998-). *Baeckea* species are generally conspicuous and no *Baeckea* species were identified during surveys. The P2 *Poranthera moorokatta* generally occurs on grey sands of the Bassendean system (Seddon 1972) with the closest record over 9.5 kilometres to the south-east. The P2 *Fabronia hampeana* is a moss that grows on trunks of plants and in particular *Macrozamia riedlei* which is not present in the application area. The P3 *Pimelea calcicole* occurs on white sands on coastal limestone ridges, and *Sarcozona bicarinata* occurs on white sands of the Quindalup system (Seddon 1972) in coastal areas. *Tripterococcus* sp. *Brachylobus* (A.S. George 14234) occurs in a variety of soil types and habitats (WAH 1998-) with the closest record over 9.5 kilometres to the east.

No Threatened or Priority flora taxa were recorded by the City of Wanneroo (2021b) and there are no records of flora of conservation significance in the broader Kahana Park. A recent fire over the survey area may have affected the survey results. However, the majority of Priority flora species recorded within a radius of 10 kilometres occur in different soil types, vegetation types or habitats than that occurring over the application area. Noting the survey results (City of Wanneroo 2021b), the structure and condition of the vegetation, the size and the linear nature of proposed clearing, as well as similar habitat in a better condition located to the east of the application area, the proposed clearing is considered a low risk to Priority flora taxa.

Three Priority 3 Ecological Communities (PECs) listed by the Department of Biodiversity, Conservation and Attractions (DBCA) are mapped within a 10 kilometre radius of the application area (Appendix B2). The closest are mapped approximately one kilometre to the east. That is, Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (P3), and the Northern Spearwood shrublands and woodlands (P3). The Tuart Woodlands PEC includes *Eucalyptus gomphocephala* as an integral component, and the Northern Spearwood shrublands and woodlands PEC are heaths with scattered *Eucalyptus gomphocephala*. No eucalypts of any species were recorded during the surveys and vegetation present does not constitute a heath (City of Wanneroo 2021b). The Banksia Dominated Woodlands of the Swan Coastal Plain (P3) have been mapped over five kilometres to the east of the application area. Although *Banksia menziesii* was recorded by the City of Wanneroo (2020b) (Appendix F3), the structure, species composition, and condition of the vegetation present is not likely to meet structure and composition thresholds included in Commonwealth of Australia (2016) to be representative of this PEC. The vegetation described over the application area is not representative of any PEC occurring within the local area.

The City of Wanneroo (2020b) recorded 28 non-native (weed) species over, or immediately adjacent to, the application area including grasses, clovers, lupins, gladioli, and daisy's. Adjacent native vegetation is susceptible to weed invasion and dieback disease (*Phytophthora* spp.) which the clearing process may exacerbate, thereby reducing habitat quality.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the City of Wanneroo (Section 3.1), it is considered that potential impacts of the proposed clearing on significant flora taxa and vegetation can be managed by implementing appropriate weed and dieback control.

Conditions: To address potential impacts to adjacent native vegetation from the proposed access track construction, weed and dieback management measures will be required as a condition on the clearing permit to mitigate impacts to adjacent vegetation.

3.2.2 Environmental value: biological values (fauna) – Clearing Principle (b)

Assessment: Discounting extinct, marine, aquatic, shorebird, and wetland-inhabiting species; five birds, five mammals, one reptile and four invertebrates of conservation significance have been recorded within ten kilometres of the application area (Appendix B2).

Of the birds, the specially protected Peregrine Falcon (*Falco peregrinus*) and migratory Fork-tailed Swift (*Apus pacificus*) may overfly the area without utilising the habitat present. The remaining birds are three species of Threatened black cockatoo. The application area is out of the current distribution of two species, but within the range of the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*). Carnaby's Cockatoo has been recorded regularly within 10 kilometres of the application area, but not within the application area itself, or within Kahana Park.

Black cockatoo habitat can be considered in terms of breeding habitat, night-roosting habitat, and foraging habitat (Commonwealth of Australia 2017). Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia 2017). Within 12 kilometres of the application area, four breeding sites have been recorded, and five artificial hollows have been installed between 10 and 12 kilometres to the south on the western edge of Lake Joondalup (Appendix E – Figure b). Twenty-nine night-roosting sites have also been recorded since 2010. Carnaby's Cockatoo shows some fidelity to night roosts, however, not all night roosts are used in every year (DPaW 2013). Since 2017, three night-roosts have been active within 12 kilometres of the application area. Both roost sites and breeding sites are located to the east of the application area within large tracts of native vegetation associated with Neerabup National Park (Appendix E – Figure b and Figure c).

No eucalypts are present within the application area (Appendix F3), and there are no trees suitable for providing breeding hollows or night-roosting sites for Carnaby's Cockatoo. The floristics of the application area (Appendix F3) provides few species representing foraging resources for Carnaby's Cockatoo (Bamford 2013; DPaW 2013; Groom 2011), with the 0.116 hectares of predominantly degraded vegetation providing negligible to low quality foraging habitat (Commonwealth of Australia 2017). No large areas of Banksias are likely to be cleared. In the broader landscape, approximately 11,785 hectares has been mapped as potential Carnaby's Cockatoo foraging habitat within 12 kilometres of the application area (Appendix E – Figure b). The application area represents just 0.0010 per cent of this area.

Of the five terrestrial mammals of conservation significance recorded from the local area (Appendix B2), the Woylie (*Bettongia penicillata ogilbyi*) (CR) and Black-flanked Rock-wallaby (*Petrogale lateralis lateralis*) (EN) are known from fossil remains only, and are regionally extinct. Records of the Chuditch (*Dasyurus geoffroyi*) (VU) date to the 1970's and it too may be regionally extinct. The Western Brush Wallaby (*Notamacropus Irma*) (P4) and Quenda (*Isoodon fusciventer*) (P4) have been recorded to the east within large tracts of native vegetation associated with Neerabup National Park and Nature Reserve, and Bush Forever Site 383 (Neerabup National Park, Lake Gnowergup Nature Reserve and Adjacent Bushland). The relatively small size (4.84 hectares), and the ecologically isolated location of Kahana Park, inhibits its ability to support populations of these species.

Whilst the Quenda (*Isoodon fusciventer*) (P4) has been recorded within 750 metres of the application area, it can survive in dense vegetation providing protection from introduced predators (van Dyck and Strahan 2008), and is known to maintain a population within relatively small areas. The open and degraded nature of the application area is unlikely to provide the cover that this species requires.

Three records of the Black-striped Burrowing Snake (*Neelaps calonotos*) (P3) occur in the local area, the closest approximately 3.7 kilometres to the south-west of the application area. The Black-striped Burrowing Snake has a limited distribution on the Swan Coastal Plain inhabiting areas with sandy soils that support heathlands and/or Banksia and Eucalypt Woodlands (Storr *et al.* 1999). Due to its cryptic burrowing habit it is rarely recorded during surveys, and due to the sandy habitat present possibly occurs over the application area.

Of the invertebrates of conservation significance recorded from the local area (Appendix B2) the vegetation present and habitat condition is not consistent with their occurrence. Very few records exist for the Spiny Katydid (*Austrosaga spinifer*) (P2), and little is known of its habitat requirements. The cricket is known from dense heathland habitats from Perth to Cervantes. Just two records have been made within ten kilometres of the application area, both at Neerabup National Park in 1982. Due to the paucity of records, condition of the vegetation, distance to known locations, and the duration since recorded, this species is unlikely to occur. The Shield-Backed Trapdoor Spider (*Idiosoma sigillatum*) (P3) is typically found in woodlands. Like most trapdoor spiders the species is slow to recover from disturbance as they do not move far in their lifetime, and the degraded condition of the application area, with high weed loads, is unlikely to support this species. The Graceful Sunmoth (*Synemon gratiosa*) (P4) occurs in coastal locations in association with *Lomandra hermaphrodita* and *Lomandra maritima*, neither of which are present within the application area. The P3 Woolybush Bee (*Hylaeus globuliferus*) is known to be associated with flowering woolybush (*Adenanthos cygnorum*) (Houston 2018) and has been recorded from the locality of Neerabup 8.5

kilometres to the south-east. *Adenanthos cygnorum* occurs in the application area but the predominantly degraded vegetation is not likely to provide quality habitat for this species.

The City of Wanneroo (2020b) recorded 28 non-native (weed) species over, or immediately adjacent to, the application area, and adjacent native vegetation is susceptible to weed invasion and dieback disease.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the City of Wanneroo (Section 3.1), it is considered that potential impacts of the proposed clearing on significant habitat for fauna can be managed by implementing appropriate weed and dieback control.

Conditions: To address potential impacts to adjacent native vegetation from the proposed access track construction, weed and dieback management measures will be required as a condition on the clearing permit to mitigate impacts to adjacent vegetation.

3.2.3 Environmental value: biological values (Threatened Ecological Communities) – Clearing Principle (d)

Assessment: Four mapped Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for the Environment have been mapped within the local area of a ten kilometre radius on the application area. The closest is located within the broader Kahana Park, and approximately 32.5 metres to the east of the application area (Appendix E – Figure d). That is the Endangered community SCP26a of *Melaleuca huegelii* - *Melaleuca systema* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson *et al.* (1994)). The application area is located within a mapped Environmentally Sensitive Area associated with the mapped TEC.

To the north-east of the application area the topography rises ten metres associated with a limestone ridge where the mapped *Melaleuca huegelii* - *Melaleuca systema* shrublands on limestone ridges has been mapped (Appendix E - Figure d). The application area does not occur on a limestone ridge, and *Melaleuca huegelii* and/or *Melaleuca systema* were not recorded by the City of Wanneroo (2020b). The only melaleuca species present was *Melaleuca lanceolata* (Appendix F3). The vegetation occurring within the application area is not representative of the Endangered TEC; SCP26a.

The City of Wanneroo (2020b) recorded 28 non-native (weed) species over, or immediately adjacent to, the application area and adjacent native vegetation that is contiguous with a mapped TEC is susceptible to weed invasion and dieback disease.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the City of Wanneroo (Section 3.1), it is considered that potential impacts to the TEC can be managed by implementing appropriate weed and dieback control.

Conditions: To address potential impacts to adjacent native vegetation from the proposed access track construction, weed and dieback management measures will be required as a condition on the clearing permit to mitigate impacts to adjacent vegetation.

3.3 Relevant planning instruments and other matters

The application was advertised on the DWER website for a 21 day public comment period. No public submissions were received in relation to this application.

Proposed clearing will occur within Lot 418 on Deposited Plan 52130 (Reserve R 49111) known as Kahana Park. The City of Wanneroo has management authority over the application area. Reserve R 49111 is zoned conservation (zone no. 566) under the City of Wanneroo District Planning Scheme No. 2 (DPS 2). Reserve R 49111 has a management order from the Department of Planning, Lands and Heritage (DPLH) to the City of Wanneroo with a purpose of public recreation. Additional local government approvals under the *Planning and Development Act 2005*, or any other Act, are not required.

The application area is not located within any *Country Areas Water Supply Act 1947* (CAWS Act) Clearing Control Catchments, Public Drinking Water Source Areas (PDWSA), or within any wellhead or reservoir protection zones. The application area is located within the Perth Groundwater Area (UFI 35) proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). Proposed clearing will not intersect groundwater and no groundwater abstraction is required, and additional permitting under the RIWI Act will not be required.

A Registered Native Title Claim encompasses the application area. That is, the Whadjuk People (WAD242/2011) and the associated Whadjuk People Indigenous Land Use Agreement (ILUA: WI2017/015). Spatial data indicates that the application area is located within an Aboriginal Heritage site. That is, Butler-FS01 (Place ID 20596). This appears to be associated with the natural hill feature to the north-east of the application area. Several additional Registered and other Aboriginal Heritage sites occur within the local area including; Place 20597 approximately 785 metres to the north of the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and to ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Appendix A – Information provided by applicant

Summary		Reference
Form C1	Clearing permit application CPS 9313/1 including a description of clearing activities and five attachments (A-E) below:	City of Wanneroo (2021a)
Attachment A	Environmental Impact Assessment that included interpretation of the data collected during two field assessments over the application area in September 2020 and October 2020.	City of Wanneroo (2021b)
Attachment B	<p>Flora and Vegetation Assessment that included data obtained from the Kahana Fire Track Assessment:</p> <ul style="list-style-type: none"> • 15th September 2020 - Traverse and quadrat data including flora identifications with 163 photographs provided; and • 21st October 2020 - Traverse including additional flora identifications with 43 photographs provided. <p>Representative photographs of the application area are provided in Appendix F1 and Appendix F2. A flora list is provided in Appendix F3.</p>	City of Wanneroo (2021c)
Attachment C	Desktop Assessment Report for Native Vegetation Clearing Application.	(WALGA 2021a)
Attachment D	Environmental Planning Considerations Report.	(WALGA 2021b)
Attachment E	Construction Plan including engineering drawings.	City of Wanneroo (2021d)

Appendix B – Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix C.

1. Site summary

Site characteristic	Details												
Local context	The application area is situated within the Swan Coastal Plain Bioregion of Thackway and Cresswell (1995). The proposed clearing area comprises 0.116 hectares of native vegetation within Kahana Park. Spatial data indicates that the local area (within a ten kilometre radius of the proposed clearing area) retains over 40 per cent of the original native vegetation cover.												
Vegetation description (Hedde et al, 1980)	<p>Hedde <i>et al.</i> (1980) as updated by Webb <i>et al.</i> (2016) described and mapped the application area as the Cottesloe Complex-Central and South (System 6 ID 52), that is:</p> <ul style="list-style-type: none"> A mosaic of woodland of <i>Eucalyptus gomphocephala</i> (Tuart) and open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus marginata</i> (Jarrah) - <i>Corymbia calophylla</i> (Marri); closed heath on the Limestone outcrops. <p>One vegetation complex was identified by the flora and vegetation survey of City of Wanneroo (2021b); vegetation dominated by <i>Banksia sessilis</i>, <i>Hibbertia hypericoides</i> and juvenile <i>Acacia saligna</i>.</p>												
Vegetation condition (Keighery 1994)	<p>The vegetation condition within the proposed clearing area ranges from good to completely degraded, with the majority of the vegetation in a degraded condition (approximately 70%) (City of Wanneroo 2021b).</p> <p>The full Keighery (1994) condition rating scale is in Appendix D.</p>												
Soil description (Schoknecht, et al. 2004)	<p style="text-align: center;">Major portion (north)</p> <table border="1" style="width: 100%;"> <tr> <td>Name</td> <td>Karrakatta Shallow Soils Phase</td> </tr> <tr> <td>Soils</td> <td>211Sp_KIs</td> </tr> <tr> <td>Description</td> <td>Low hills and ridges. Bare limestone or shallow siliceous or calcareous sand over limestone. Dense low shrub dominated by <i>Banksia sessilis</i>, <i>Melaleuca huegelii</i> and species of <i>Grevillea</i>.</td> </tr> </table> <p style="text-align: center;">Minor portion (south)</p> <table border="1" style="width: 100%;"> <tr> <td>Name</td> <td>Karrakatta Sand Yellow Phase</td> </tr> <tr> <td>Soils</td> <td>211Sp_Ky</td> </tr> <tr> <td>Description</td> <td>Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. <i>Banksia</i> spp. woodland with scattered emergent <i>E. gomphocephala</i> and <i>E. marginata</i> and a dense shrub layer.</td> </tr> </table> <p>Karrakatta soils are described as yellow deep sands, pale deep sands and loams, calcareous deep sands, and yellow/brown shallow sands.</p>	Name	Karrakatta Shallow Soils Phase	Soils	211Sp_KIs	Description	Low hills and ridges. Bare limestone or shallow siliceous or calcareous sand over limestone. Dense low shrub dominated by <i>Banksia sessilis</i> , <i>Melaleuca huegelii</i> and species of <i>Grevillea</i> .	Name	Karrakatta Sand Yellow Phase	Soils	211Sp_Ky	Description	Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. <i>Banksia</i> spp. woodland with scattered emergent <i>E. gomphocephala</i> and <i>E. marginata</i> and a dense shrub layer.
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Site characteristic	Details																																							
Land degradation risk (DPIRD 2017)	<p>Land degradation risk ratings are provided in the table below.</p> <table border="1" data-bbox="505 260 1268 814"> <thead> <tr> <th></th> <th>North</th> <th>South</th> </tr> <tr> <th></th> <th>Karrakatta: 211Sp_KIs</th> <th>Karrakatta: 211Sp_Ky</th> </tr> </thead> <tbody> <tr> <td>Wind erosion</td> <td>H1</td> <td>H2</td> </tr> <tr> <td>Water Erosion</td> <td>L1</td> <td>L1</td> </tr> <tr> <td>Salinity risk</td> <td>L1</td> <td>L1</td> </tr> <tr> <td>Phosphorus export</td> <td>L2</td> <td>L2</td> </tr> <tr> <td>Waterlogging</td> <td>L1</td> <td>L1</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>Subsurface acidification</td> <td>M1</td> <td>H2</td> </tr> <tr> <td>Acid Sulphate Soils</td> <td>No</td> <td>No</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>Flooding</td> <td>L1</td> <td>L1</td> </tr> <tr> <td>Floodplains</td> <td>No</td> <td>No</td> </tr> </tbody> </table>		North	South		Karrakatta: 211Sp_KIs	Karrakatta: 211Sp_Ky	Wind erosion	H1	H2	Water Erosion	L1	L1	Salinity risk	L1	L1	Phosphorus export	L2	L2	Waterlogging	L1	L1				Subsurface acidification	M1	H2	Acid Sulphate Soils	No	No				Flooding	L1	L1	Floodplains	No	No
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Waterbodies	<p>The application area does not intersect any watercourses or wetlands. The closest is a Conservation Category Wetland mapped approximately 2.3 kilometres to the west. The Western Australian coastal waterline is approximately 2.4 kilometres to the west.</p>																																							
Hydrogeography	<table border="1" data-bbox="505 1003 1218 1131"> <tr> <td>Hydrological Zone</td> <td>Coastal Plain</td> </tr> <tr> <td>Basin</td> <td>Wanneroo Coastal Lakes (UFI 179)</td> </tr> <tr> <td>Hydrographic Catchment</td> <td>South West</td> </tr> </table> <table border="1" data-bbox="505 1159 1395 1524"> <tr> <td>RIWI Act Surface Water and Irrigation District</td> <td>No</td> <td></td> </tr> <tr> <td>RIWI Act Rivers</td> <td>No</td> <td></td> </tr> <tr> <td>RIWI Act Groundwater Areas</td> <td>Yes</td> <td>Perth Groundwater Area (UFI 35)</td> </tr> <tr> <td>CAWS Act Clearing Control Catchment</td> <td>No</td> <td></td> </tr> <tr> <td>Public Drinking Water Source Areas</td> <td>Yes</td> <td>Perth Coastal and Gwelup Underground Water Pollution Control Area</td> </tr> <tr> <td>Wellhead Protection Zone</td> <td>No</td> <td></td> </tr> <tr> <td>Reservoir Protection Zone</td> <td>No</td> <td></td> </tr> </table> <p>Groundwater has been mapped at 500-1,000 TDS/Mg/L (that is, fresh)</p>	Hydrological Zone	Coastal Plain	Basin	Wanneroo Coastal Lakes (UFI 179)	Hydrographic Catchment	South West	RIWI Act Surface Water and Irrigation District	No		RIWI Act Rivers	No		RIWI Act Groundwater Areas	Yes	Perth Groundwater Area (UFI 35)	CAWS Act Clearing Control Catchment	No		Public Drinking Water Source Areas	Yes	Perth Coastal and Gwelup Underground Water Pollution Control Area	Wellhead Protection Zone	No		Reservoir Protection Zone	No													
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Conservation areas	<p>There are no DBCA managed lands within the vicinity, with the closest being Neerabup National Park approximately 780 metres to the east.</p> <p>Over 35 Bush Forever Sites are located in the local area with Bush Forever Site 383 the closest at 734 metres (Neerabup National Park, Lake Gnowergup Nature Reserve and Adjacent Bushland, Neerabup).</p>																																							
Climate and landform	<p>The climate experienced in the area is a Mediterranean climate, with dry, hot summers and cool, wet winters. Average rainfall is 816 millimetres per annum with the majority falling between June and August (BOM 2021). The predominant wind</p>																																							

Site characteristic	Details
	directions include morning easterlies and south-westerly sea breezes during the summer months. The application area is located within aeolian deposits of the Swan Coastal Plain (Schoknecht <i>et al.</i> 2004). A limestone ridge rises to the east of the application area.

2. Ecosystem, flora, and fauna analysis

With consideration for the site characteristics set out above, and relevant datasets (Appendix H2), an analysis of relevant ecosystem, flora, and fauna factors are presented below.

2a) Ecological Linkages

There are no formal Regional Ecological Linkages within the local area.

2b) Ecological Communities

There are four mapped Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for the Environment that have been mapped within the local area of a ten kilometre radius on the application area. The closest (SCP26a) is mapped approximately 32.5 metres to the east of the application area within Kahana Park.

There are three mapped Priority Ecological Communities (PECs) listed by DBCA within the local area of a ten kilometre radius on the application area. The closest are mapped approximately one kilometre to the east of the application area. That is, Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain and Northern Spearwood shrublands and woodlands.

ID	Common name	Status (WA)	Status (EPBC)
CAVES SCP01	Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal Plain	CR	EN
SCP19b	Woodlands over sedgeland in Holocene dune swales of the southern Swan Coastal Plain (original description; Gibson <i>et al.</i> (1994).	CR	EN
SCP20a	<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson <i>et al.</i> (1994))	EN	EN
SCP26a	<i>Melaleuca huegelii</i> - <i>Melaleuca systema</i> shrublands on limestone ridges (floristic community type 26a as originally described in Gibson <i>et al.</i> (1994))	EN	
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	P3	EN
SCP24	Northern Spearwood shrublands and woodlands	P3	
Tuart woodlands	Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain	P3	CR

2c) Conservation significant flora recorded within ten kilometres of the application area

Three Threatened flora taxa have been recorded within ten kilometres of the application area.

Threatened Taxon	Status	No. of records	Closest distance
<i>Marianthus paralius</i>	EN	3	3.54
<i>Melaleuca</i> sp. Wanneroo (G.J. Keighery 16705)	EN	16	1.95
<i>Eucalyptus argutifolia</i>	VU	16	3.12

Seventeen Priority flora taxa have been recorded within ten kilometres of the application area; two P1, three P2, seven P3 and five P4.

Priority Taxon	Status	No. of records	Closest distance
<i>Baeckea</i> sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1	6	0.59
<i>Leucopogon maritimus</i>	P1	3	9.02
<i>Acacia benthamii</i>	P2	2	2.82
<i>Fabronia hampeana</i>	P2	8	5.01
<i>Poranthera moorokatta</i>	P2	1	9.63
<i>Conostylis bracteata</i>	P3	1	3.17
<i>Hibbertia leptotheca</i>	P3	6	5.79
<i>Jacksonia gracillima</i>	P3	1	3.29
<i>Leucopogon</i> sp. Yanchep (M. Hislop 1986)	P3	1	0.59
<i>Pimelea calcicola</i>	P3	1	2.01
<i>Sarcozona bicarinata</i>	P3	5	4.83
<i>Stylidium maritimum</i>	P3	9	3.29
<i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>	P4	5	5.93
<i>Conostylis pauciflora</i> subsp. <i>pauciflora</i>	P4	2	7.97
<i>Jacksonia sericea</i>	P4	9	3.74
<i>Stylidium longitubum</i>	P4	1	9.83
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	P4	2	9.81

No threatened or priority species were recorded by the site assessment of City of Wanneroo (2021b).

2d) Conservation significant fauna recorded within ten kilometres of the application area:

Discounting extinct, marine, aquatic, shorebird and tern species; five birds, five mammals, one reptile and four invertebrates of conservation significance have been recorded within ten kilometres of the application area

Common name	Scientific name	Status	No. of records	Closest distance	Comment
BIRDS					
Baudin's Cockatoo	<i>Calyptorhynchus baudinii</i>	EN	1	9,485	
Carnaby's Cockatoo	<i>Calyptorhynchus latirostris</i>	EN	404	457	
White-tailed Black Cockatoo	<i>Calyptorhynchus</i> sp.	EN	25	2,090	
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	VU	1	8,291	
Peregrine Falcon	<i>Falco peregrinus</i>	OS	6	8,445	
Fork-tailed Swift	<i>Apus pacificus</i>	MI	4	8,445	
Curlew Sandpiper	<i>Calidris ferruginea</i>	CR	3	8,445	Shorebird
Great Knot	<i>Calidris tenuirostris</i>	CR	1	8,558	Shorebird
Red Knot	<i>Calidris canutus</i>	EN	1	8,558	Shorebird
Ruddy Turnstone	<i>Arenaria interpres</i>	MI	1	8,558	Shorebird
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	MI	2	8,547	Shorebird
Red-necked Stint	<i>Calidris ruficollis</i>	MI	4	8,445	Shorebird
Long-toed Stint	<i>Calidris subminuta</i>	MI	2	8,547	Shorebird
Bar-tailed Godwit	<i>Limosa lapponica</i>	MI	2	8,445	Shorebird
Grey Plover	<i>Pluvialis squatarola</i>	MI	2	8,558	Shorebird
Crested Tern	<i>Thalasseus bergii</i>	MI	12	5,142	Shorebird
Common Greenshank	<i>Tringa nebularia</i>	MI	4	3,299	Shorebird
Fairy Tern	<i>Sternula nereis nereis</i>	VU	2	8,558	Tern
Caspian Tern	<i>Hydroprogne caspia</i>	MI	2	8,558	Tern
Flesh-footed Shearwater	<i>Ardenna carneipes</i>	VU	1	3,724	Coastal
Australasian Bittern	<i>Botaurus poiciloptilus</i>	EN	3	8,445	Wetlands
Blue-billed Duck	<i>Oxyura australis</i>	P4	22	2,630	Wetlands

Common name	Scientific name	Status	No. of records	Closest distance	Comment
Glossy Ibis	<i>Plegadis falcinellus</i>	MI	4	8,445	Wetlands
MAMMALS					
Woylie	<i>Bettongia penicillata ogilbyi</i>	CR	1	6,079	Fossil
Boodie (Inland)	<i>Bettongia lesueur graii</i>	EX	1	6,079	Extinct
Black Flanked Rock Wallaby	<i>Petrogale lateralis lateralis</i>	EN	1	6,079	Fossil
Quenda	<i>Isoodon fusciventer</i>	P4	96	749	
Western Brush Wallaby	<i>Notamacropus irma</i>	P4	9	1,762	
Chuditch	<i>Dasyurus geoffroi</i>	VU	2	6,079	
Southern Right Whale	<i>Eubalaena australis</i>	VU	1	2,046	Marine
Sperm Whale	<i>Physeter macrocephalus</i>	VU	1	2,043	Marine
Humpback Whale	<i>Megaptera novaeangliae</i>	CD	1	3,558	Marine
REPTILES					
Loggerhead Turtle	<i>Caretta caretta</i>	EN	2	3,724	Marine
Green Turtle	<i>Chelonia mydas</i>	VU	4	3,019	Marine
Black-striped Snake	<i>Neelaps calonotos</i>	P3	3	3,724	
INVERTEBRATES					
Carter's Freshwater Mussel	<i>Westralunio carteri</i>	VU	1	6,079	Aquatic
Spiny Katydid (SCP)	<i>Austrosaga spinifer</i>	P2	2	4,955	
Woolybush Bee	<i>Hylaeus globuliferus</i>	P3	5	8,607	
Shield-Backed Trapdoor Spider (SCP)	<i>Idiosoma sigillatum</i>	P3	2	3,866	
Graceful Sunmoth	<i>Synemon gratiosa</i>	P4	266	2,398	

3. Vegetation extent

3a) Regional vegetation mapping

	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	Current extent in all DBCA managed land (ha)	Current extent in all DBCA managed land (%)
IBRA bioregion:					
Swan Coastal Plain (SWA)	1,501,222	579,813	38.62	222,917	38.45
SCP vegetation complex:					
Cottesloe Complex-Central and South (ID 52)	45,300	14,568	32.16	6,606	14.58

Local Area	Pre-European extent (ha)	Current extent (ha)	Remaining (%)
10 km radius	21,457	9,015	42.0

Appendix C – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><u>Assessment:</u> A total of 71 flora taxa were identified during the surveys of City of Wanneroo (2021b), including 43 native flora and 28 weed species. The application area alignment follows an informal track. Vegetation condition ranges from completely degraded to good, with the majority of the vegetation (approximately 70 per cent) in a degraded condition. No Threatened or Priority flora taxa were recorded by the City of Wanneroo (2021b) and there are no records of flora of conservation significance in the broader Kahana Park. Three mapped Priority Ecological Communities (PECs) listed by DBCA occur within the local area. The vegetation of the application area does not align with any of the mapped PECs.</p>	Not likely to be at variance	Yes See Section 3.2.1
<p><u>Principle (b):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</p> <p><u>Assessment:</u> Discounting extinct, marine, aquatic, shorebird, and tern species; five birds, five mammals, one reptile and four invertebrates of conservation significance have been recorded within ten kilometres of the application area. Of the remaining birds, three are Threatened black cockatoo species. The application area is not within the current distribution of two species, but within the range of Endangered Carnaby’s Cockatoo (<i>Calyptorhynchus latirostris</i>) with breeding sites and night roosts known from the local area. No native vegetation suitable for providing breeding hollows, night-roosting or significant foraging habitat is present over the application area.</p>	Not likely to be at variance	Yes See Section 3.2.2
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u> Three Threatened flora taxa have been recorded within ten kilometres of the application area. The application area alignment follows an informal track. Vegetation condition ranges from completely degraded to good, with the majority of the vegetation (approximately 70 per cent) in a degraded condition. No Threatened flora taxa were recorded by the City of Wanneroo (2021b) and there are no records of flora of conservation significance in the broader Kahana Park.</p>	Not likely to be at variance	Yes See Section 3.2.1
<p><u>Principle (d):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.”</p> <p><u>Assessment:</u> Four mapped Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for the Environment have been mapped within the local area of a ten kilometre radius on the application area. The closest occurs within the broader Kahana Park, approximately 32.5 metres to the east of the application area. That is the Endangered community SCP26a of <i>Melaleuca huegelii</i> - <i>Melaleuca systema</i> shrublands on limestone ridges (floristic community type 26a as originally described in Gibson <i>et al.</i> (1994)). The vegetation of the application area does not align with the TEC SCP26a.</p>	Not likely to be at variance	Yes See Section 3.2.3
Environmental values: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p>	Not at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p><u>Assessment:</u> The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). The extent of native vegetation retained can be considered at different scales. The application area is located within the Swan Coastal Plain Bioregion which retains approximately 38.62 per cent of its original extent (Government of Western Australia 2019a) (Appendix B3).</p> <p>The mapped Cottesloe Complex-Central and South (ID 52) retains approximately 14,568 hectares, representing approximately 32 per cent of the its original extent (Government of Western Australia 2019b).</p> <p>Utilising remnant native vegetation mapping data, approximately 9,000 hectares of native vegetation is retained within the local area of a ten kilometre radius of the application area, representing approximately 42 per cent of the original occurrence (Appendix E - Figure a).</p> <p>The application area is predominantly degraded (Keighery 1994) and is not considered significant as a remnant of native vegetation in an area that has been extensively cleared.</p>		
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> There are no DBCA managed lands within the vicinity of the application area with the closest being Neerabup National Park approximately 780 metres to the east, associated with Bush Forever Site 383 (Neerabup National Park, Lake Gnowergup Nature Reserve and Adjacent Bushland) at approximately 734 metres to the east (Appendix E - Figure c).</p> <p>Due to the separation distance, the proposed clearing is unlikely to impact environmental values of any adjacent or nearby conservation area.</p>	Not at variance	No
Environmental values: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> No watercourses or wetlands occur within the vicinity of the application area. The application area does not support riparian vegetation (City of Wanneroo 2021b). The native vegetation proposed for clearing is not growing in, or in association with, an environment associated with a watercourse or wetland.</p>	Not at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The Karrakatta soils of the application area have a low risk of water erosion, salinity, phosphorus export, subsurface acidification, or potential for exposing acid sulphate soils (Appendix B1).</p> <p>Due to the unconsolidated nature of the Karrakatta sands wind erosion is rated at a high risk. The final land use will be a crushed limestone track that will negate the risk of wind erosion. Vegetation clearing will take place within a week prior to track construction commencing (City of Wanneroo 2020a). The small scale of proposed clearing and the implementation standard and staged construction methodologies, including strategies for dust control and wind erosion, will mitigate the risk of wind erosion occurrence during the construction period window. The amount of clearing</p>	Not likely to be at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
required for the final track is small and soils will not be excavated at depth and proposed clearing is not likely to cause appreciable land degradation.		
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> No watercourses, wetlands, or drainage lines intersect the application area. Proposed clearing will not intersect groundwater and no groundwater abstraction is required. Soils will not be excavated at depth and proposed clearing of native vegetation is not likely to cause any deterioration in the quality of surface water or groundwater.</p>	Not at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> The Karrakatta soils of the application area have a low risk of flooding (Appendix B1) due to the unconsolidated nature of the soils. There are no FPM (Flood Plain Management) floodplains mapped in the vicinity, nor in the local area of a 10 kilometre radius of the application area. Standard construction methodologies will be implemented including strategies for drainage controls and water erosion and any potential for flooding can be managed through appropriate design (Appendix G). Given the small scale and linear nature of the proposed clearing, and the standard construction methodologies employed, the proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of flooding.</p>	Not at variance	No

Appendix D – Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Measuring Vegetation Condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very Good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E – Figures (a to d)



Figure (a) Mapped remnant vegetation in the local area

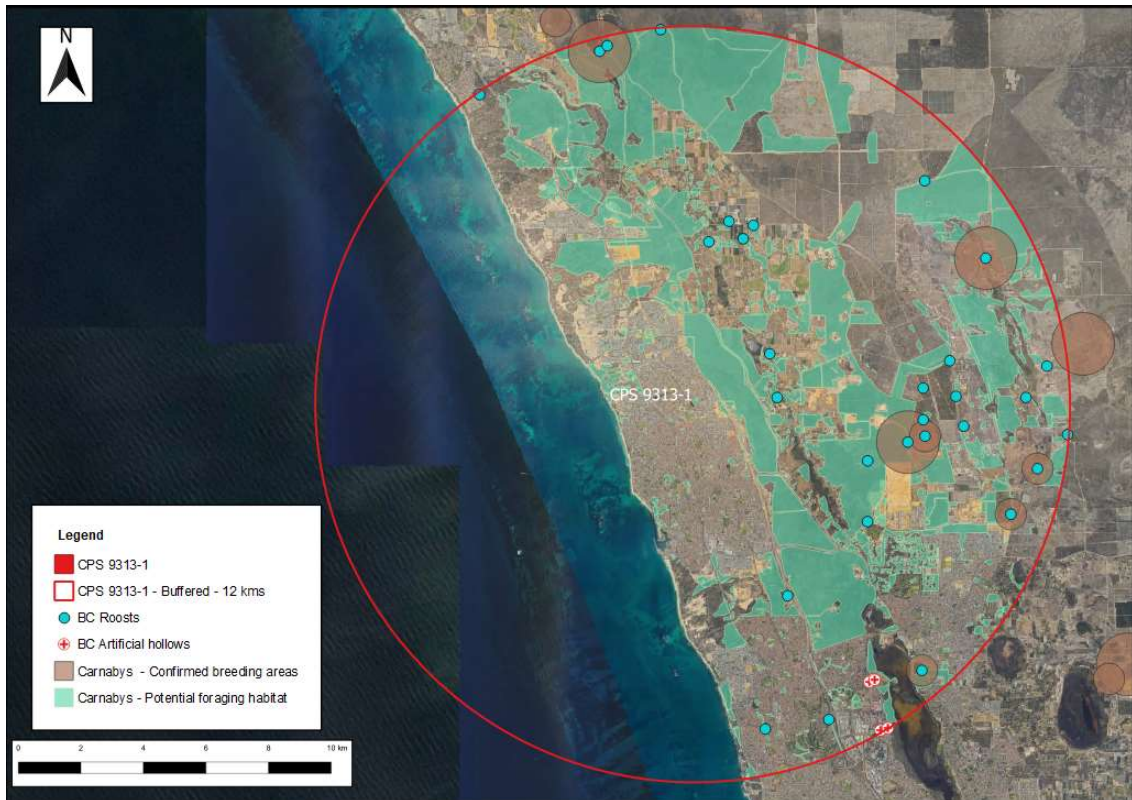


Figure (b) Mapped black cockatoo foraging habitat, roosts, and breeding sites within 12 kilometres

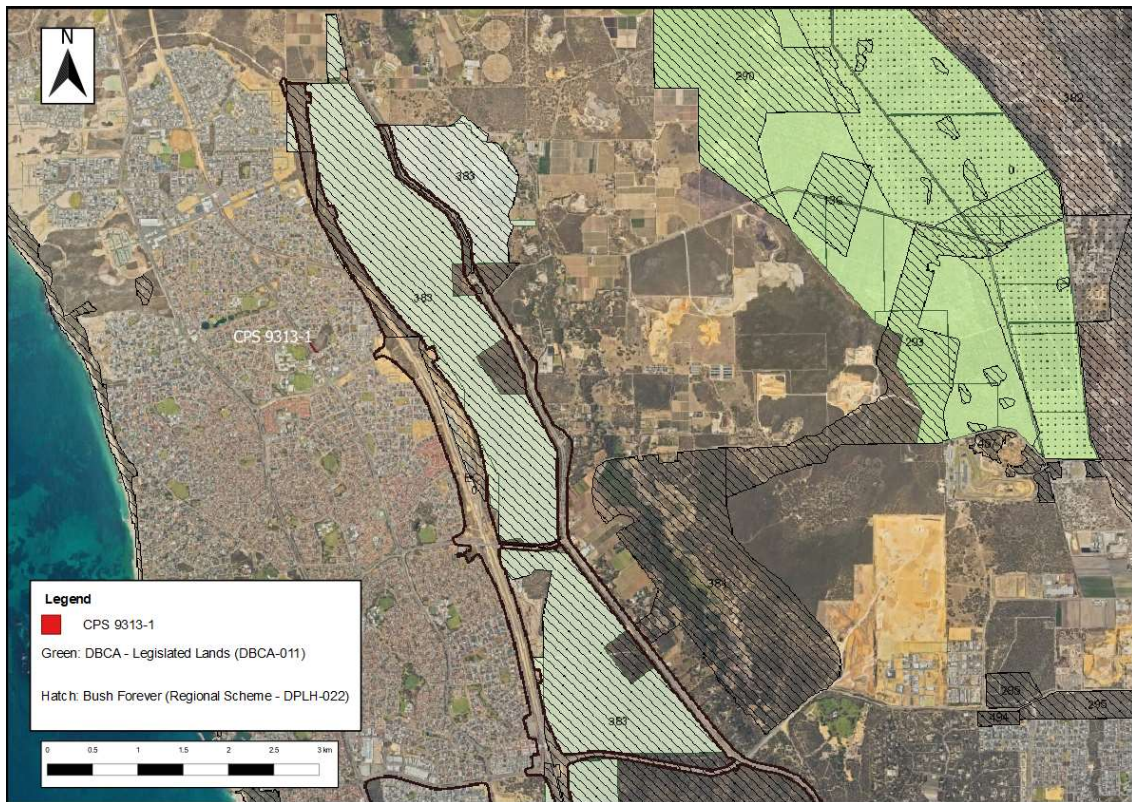


Figure (c) Conservation areas within the vicinity of CPS 9310-1



Figure (d) Mapped Threatened Ecological Community SCP26a

Appendix F – Biological survey information

1. Representative site photographs (City of Wanneroo 2021b)

Kahana Fire Track Assessment



Kahana Populated Places Local Government Authority State Roads Other Roads



3 -
Date: 2020:09:15 10:59:27
Latitude: -31.651128, Longitude: 115.711686, Direction: 268 degrees
Comments:



3 -
Track looking north
Date: 2020:09:15 10:59:02
Latitude: -31.651183, Longitude: 115.7118, Direction: 316.7 degrees
Comments:



9 -

Date: 2020:09:15 10:59:35
Latitude: -31.651086, Longitude: 115.711656, Direction: 306.4 degrees
Comments:



20 -

Date: 2020:09:15 11:01:02
Latitude: -31.650989, Longitude: 115.71116, Direction: 344.7 degrees
Comments:



39 -

Date: 2020:09:15 11:03:00
Latitude: -31.650769, Longitude: 115.711425, Direction: 327 degrees
Comments:



63 -

Date: 2020:09:15 11:07:11
Latitude: -31.65055, Longitude: 115.711242, Direction: 159.9 degrees
Comments:



70 -

Date: 2020:09:15 11:08:57
Latitude: -31.650494, Longitude: 115.711228, Direction: 310.4 degrees
Comments:



74 -

Date: 2020:09:15 11:09:12
Latitude: -31.650428, Longitude: 115.711136, Direction: 11.3 degrees
Comments:



115 -

Date: 2020:09:15 11:14:40
Latitude: -31.650094, Longitude: 115.711022, Direction: 343.5 degrees
Comments:



128 -

Date: 2020:09:15 11:15:51
Latitude: -31.650061, Longitude: 115.710997, Direction: 75 degrees
Comments:

2. Quadrat photographs (City of Wanneroo 2021b)

Date: 15/09/2020
Quadrat size: 10m x 10m
Vegetation condition: Good
Location: Latitude: -31.650169, Longitude: 115.711106
Soil: Karrakatta yellow sand over limestone
Fire Age: 1 year
Habitat: ~~XpHhAs~~
Vegetation: Cottlesloe Complex – Central and South
Litter: >10%



3. Flora list (City of Wanneroo 2021b)

KAHANA PARK, BUTLER VEGETATION ASSESSMENT - FLORA LIST

	Genus	Species	Opportunistic		
			Quadrat 1 15/09/2020	15/09/2021	1/10/2021
	<i>Acacia</i>	<i>cyclops</i>	✓	✓	
	<i>Acacia</i>	<i>pullchella</i>	✓	✓	
	<i>Acacia</i>	<i>rostelifera</i>	✓	✓	✓
	<i>Acacia</i>	<i>saligna</i>	✓	✓	✓
	<i>Adnenanthos</i>	<i>cygornum</i>	✓		
	<i>Alexgeorga</i>	<i>nitens</i>	✓	✓	
	<i>Allocasaurina</i>	<i>hugelii</i>	✓		
*	<i>Arctotheca</i>	<i>calendula</i>		✓	
*	<i>Asparagus</i>	<i>asparagoides</i>		✓	
*	<i>Asteraceae</i>	<i>sp.</i>			✓
	<i>Atriplex</i>	<i>isatidea</i>	✓	✓	
	<i>Banksia</i>	<i>menziesii</i>	✓		
	<i>Banksia</i>	<i>sessilis</i>	✓	✓	✓
	<i>Burchardia</i>	<i>congesta</i>	✓		
	<i>Calothamnus</i>	<i>quadrifidus</i>	✓		✓
*	<i>Cenchrus</i>	<i>clandestinus</i>		✓	
	<i>Conostylis</i>	<i>aculeata</i>	✓		✓
*	<i>Crassula</i>	<i>alata</i>		✓	
*	<i>Crassula</i>	<i>exserta</i>		✓	✓
*	<i>Crassula</i>	<i>glomerata</i>	✓	✓	✓
	<i>Davesia</i>	<i>divaricata</i>	✓		✓
	<i>Davesia</i>	<i>nudiflora</i>			✓
	<i>Desmocladius</i>	<i>asper</i>	✓		✓
	<i>Desmocladius</i>	<i>flexuosus</i>	✓	✓	✓
	<i>Dianella</i>	<i>revoluta</i>	✓	✓	
*	<i>Ehrharta</i>	<i>calycina</i>		✓	
*	<i>Erharta</i>	<i>longiflora</i>		✓	✓
*	<i>Euphorbia</i>	<i>peplus</i>		✓	
*	<i>Euphorbia</i>	<i>terraccina</i>	✓	✓	✓
*	<i>Gladiolus</i>	<i>caryophyllaceus</i>	✓	✓	✓
	<i>Haemodorum</i>	<i>spicatum</i>	✓		✓
	<i>Hakea</i>	<i>trifurcata</i>	✓		
	<i>Hardenbergia</i>	<i>comptoniana</i>	✓	✓	✓
	<i>Hibbertia</i>	<i>hypercoides</i>	✓	✓	✓
*	<i>Hypochaeris</i>	<i>glabra</i>	✓	✓	✓
	<i>Isolepsis</i>	<i>ceruna var. setiformis</i>	✓		
	<i>Jacksonia</i>	<i>calcicola</i>	✓		
	<i>Jacksonia</i>	<i>sternbergiana</i>			✓
*	<i>Lactua</i>	<i>serriola</i>		✓	

	Genus	Species	Quadrat 1	Opportunistic	
*	<i>Lagarus</i>	<i>ovatus</i>	✓		✓
	<i>Lechenaultia</i>	<i>linaroides</i>	✓	✓	✓
	<i>Leucopogon</i>	<i>propinquus</i>	✓		
	<i>Lomandra</i>	<i>maritima</i>	✓	✓	✓
*	<i>Lupinus</i>	<i>angustifolius</i>		✓	
*	<i>Lupinus</i>	<i>consentinii</i>		✓	✓
*	<i>Lysimachia</i>	<i>arvensis</i>	✓	✓	✓
	<i>Melaleuca</i>	<i>lanceolata</i>		✓	✓
	<i>Mesomelaena</i>	<i>tetragona</i>	✓	✓	
	<i>Microtis</i>	<i>media</i>			✓
*	<i>Moraea</i>	<i>flaccida</i>	✓	✓	
*	<i>Oenothera</i>	<i>drummondii</i>			✓
	<i>Olearia</i>	<i>axillaris</i>		✓	
*	<i>Pelargonium</i>	<i>capitatum</i>	✓		
	<i>Phyllathus</i>	<i>calycinus</i>	✓		
	<i>Podotheca</i>	<i>gnaphaloides</i>			✓
	<i>Ptilotis</i>	<i>manglesii</i>	✓		✓
	<i>Ptilotis</i>	<i>sericostachyus</i>	✓	✓	
*	<i>Raphanus</i>	<i>raphanistrum</i>	✓	✓	
	<i>Rhagodia</i>	<i>baccata</i>			✓
*	<i>Romulea</i>	<i>rosea</i>	✓	✓	✓
	<i>Scaevola</i>	<i>canescens</i>	✓	✓	
*	<i>Solanum</i>	<i>nigrum</i>	✓		✓
*	<i>Sonchus</i>	<i>olearaceus</i>	✓	✓	✓
	<i>Sowerbaea</i>	<i>lexiflora</i>	✓		
	<i>Spyridium</i>	<i>globulosum</i>	✓	✓	
*	<i>Tagetes</i>	<i>minuta</i>	✓	✓	
	<i>Templetonia</i>	<i>retusa</i>	✓	✓	
	<i>Trifolium</i>	<i>arvense</i>		✓	
*	<i>Trifolium</i>	<i>cernuum</i>	✓	✓	✓
*	<i>Ursinia</i>	<i>anthemoides</i>	✓		✓
	<i>Xanthorrhoea</i>	<i>preissii</i>	✓	✓	✓

Appendix H – References and databases

1. References

- Bamford Consulting Ecologists (Bamford) (2013). Plants known to be used for foraging, roosting and nesting by black cockatoos in south-western Western Australia. Data compiled from the literature (Davies, 1966; Saunders, 1974, 1979a, b, 1980; Saunders et al. 1982; Saunders, 1986; Johnstone and Storr, 1998; Higgins 1999; Johnstone and Kirkby, 1999, 2008; Groom, 2011; Johnstone et al. 2011; DSEWPaC, 2012a, b; c, R. Johnstone pers. comm.) in Bamford (2013) Wedgetail Circle, Parkerville Fauna Assessment. Prepared for Coterra Environment. Bamford Consulting Ecologists. Prepared by Jeff Turpin, Simon Cherriman and Mike Bamford. 14th August 2013.
- Bureau of Meteorology (BOM) (2020) Climate classification maps. Available from: http://www.bom.gov.au/jsp/ncc/climate_averages/climate-classifications/index.jsp?maptype=kpn#maps
- City of Wanneroo (2021a) Supporting information for clearing permit application CPS 9313/1 including a description of clearing activities and relevant attachments. City of Wanneroo. Received by DWER on 8 June 2021 (DWER Ref: DWERDT461853).
- City of Wanneroo (2021b) Supporting information for clearing permit application CPS 9313/1 that included an Environmental Impact Assessment. City of Wanneroo. Received by DWER on 8 June 2021 (DWER Ref: DWERDT461853).
- City of Wanneroo (2021c) Supporting information for clearing permit application CPS 9313/1 that included a Flora and Vegetation Assessment incorporated into an Environmental Impact Assessment. City of Wanneroo. Received by DWER on 8 June 2021 (DWER Ref: DWERDT461853).
- City of Wanneroo (2021d) Supporting information for clearing permit application CPS 9313/1 that included a construction plan with engineering drawings. City of Wanneroo. Received by DWER on 8 June 2021 (DWER Ref: DWERDT461853).
- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2016) Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (s 266B) Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community. Conservation Advice approved 26 August 2016. Listing effective 16 September 2016.
- Commonwealth of Australia (2017) Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo. Department of Environment and Energy (DoEE) now the Department of Agriculture, Water and Environment (DAWE), Canberra. ACT.
- Department of Environment and Energy. (2019). Approved Conservation Advice (incorporating listing advice) or the Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain Ecological Community. Retrieved from <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf>
- Department of Parks and Wildlife (DPAW) (2013) Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Western Australian Department of Parks and Wildlife (DPAW) now the Department of Biodiversity, Conservation and Attractions (DBCA). Perth. Western Australia.
- Department of Primary Industries and Regional Development (DPIRD) (2017). NRInfo Digital Mapping. Accessed at <https://maps.agric.wa.gov.au/nrm-info/> Accessed September 2018. Department of Primary Industries and Regional Development. Government of Western Australia.
- Environmental Protection Authority (EPA) (2008) Environmental Guidance for Planning and Development Guidance Statement No 33. Environmental Protection Authority, Western Australia.
- Gibson, N., Keighery, B., Keighery, G., Burbidge, A and Lyons, M. (1994). A floristic survey of the Southern Swan Coastal Plain. Unpublished report for the Australian Heritage Commission prepared by the Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc.).
- Government of Western Australia (2019a). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>.

- Government of Western Australia (2019b) 2018 South West Vegetation Complex Statistics. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>
- Groom, C. (2011). Plants Used by Carnaby's Black Cockatoo. Department of Environment and Conservation, Perth, Western Australia.
- Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- Houston, T.F. (2018) A guide to native bees of Australia. CSIRO Publishing, Clayton South Victoria, 272p.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs' Resource Management Technical Report No. 280. Department of Agriculture. Now the Department of Primary Industries and Regional Development.
- Seddon, G. (1972) Sense of Place. A response to an environment, the Swan Coastal Plain, Western Australia. University of Western Australia Press. 1972
- Storr, G.M., L.A. Smith & R.E. Johnstone (1999). Lizards of Western Australia. I. Skinks. Revised Edition. Perth, Western Australia: Western Australian Museum.
- Thackway, R and Cresswell, I.D. (eds) (1995) An interim biogeographical regionalisation of Australia. Australian Nature Conservation Agency (now Department of Agriculture, Water and the Environment), Canberra.
- van Dyck, S., and Strahan, R. (2008). 'The Mammals of Australia.' 3rd edition. Reed New Holland: Sydney. ISBN-13: 978-1877069253.
- Webb, A., Kinloch, J., Keighery, G. and Pitt, G. 2016. The Extension of Vegetation Complex Mapping to Landform boundaries within the Swan Coastal Plain Landform and Forested Region of South West Western Australia. Department of Parks and Wildlife, Bunbury, WA.
- Western Australian Local Government Association (WALGA) (2021a) Environmental Planning Tool. Desktop Assessment Report for Native Vegetation Clearing Application. Report generated: Wed Apr 07 15:53:34 AEST 2021.
- Western Australian Local Government Association (WALGA) (2021b) Environmental Planning Tool. Environmental Planning Considerations Report. Report generated: Wed Apr 07 15:52:11 AEST 2021.
- Western Australian Herbarium (WAH) (1998-). FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> Accessed July 2021

2. GIS datasets

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)

- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)