



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8595/1
Permit Holder:	Honey West
Duration of Permit:	20 February 2020 to 20 February 2025

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

- Purpose for which clearing may be done**
Pruning, slashing or scrub-rolling for the purpose of *apiary site* establishment and maintenance.
- Land on which clearing is to be done**

Apiary Site No.	Longitude	Latitude	DBCA District	Tenure
6930	121.69504	-32.09128	Esperance	Crown Reserve (R 22465) - AAPA
6931	121.50100	-32.20300	Esperance	Land Administration Act - Unallocated Crown Land (UCL)
6932	121.39790	-32.60291	Esperance	Land Administration Act - Unallocated Crown Land (UCL)
6933	121.34468	-32.58454	Esperance	Land Administration Act - Unallocated Crown Land (UCL)
750	121.18843	-31.06140	Kalgoorlie	Calooli Pastoral Lease (LPL N050390)
5439	121.53400	-31.21949	Kalgoorlie	Kambalda Timber Reserve (O 199 25) - CCWA
5476	121.50681	-31.31076	Kalgoorlie	Woolibar Pastoral Lease (LPL N050023)
5779	121.06432	-31.20698	Kalgoorlie	Land Administration Act - Unallocated Crown Land (UCL)
5780	121.08339	-31.18164	Kalgoorlie	Land Administration Act - Unallocated Crown Land (UCL)
5781	121.14233	-31.10627	Kalgoorlie	Calooli Pastoral Lease (LPL N050390)
5782	121.15395	-31.07553	Kalgoorlie	Calooli Pastoral Lease (LPL N050390)
8015	121.03700	-31.18400	Kalgoorlie	Land Administration Act - Unallocated Crown Land (UCL)
3106	114.99393	-29.36984	Moora	Beekeepers Nature Reserve (R 24496) - CCWA
3107	115.00729	-29.41110	Moora	Beekeepers Nature Reserve (R 24496) - CCWA
3140	115.27208	-29.54219	Moora	Land Administration Act - Unallocated Crown Land (UCL)
3141	115.32049	-29.54546	Moora	Land Administration Act - Unallocated Crown Land (UCL)
3142	115.25306	-29.58477	Moora	Land Administration Act - Unallocated Crown Land (UCL)
3156	115.67493	-30.05114	Moora	Alexander Morrison National Park (R 29804) - CCWA
3159	115.46015	-30.06281	Moora	Alexander Morrison National Park (R 29800) - CCWA
6852	115.36800	-30.02700	Moora	Crown Reserve (R 29801)

Apiary Site No.	Longitude	Latitude	DBCA District	Tenure
2891	115.61533	-33.71623	Blackwood	Millbrook State Forest (F 33) - CCWA
3446	115.74327	-33.81996	Blackwood	Jarrahood State Forest (F 28) - CCWA
2888	115.77688	-34.25619	Donnelly	Barlee Brook State Forest (F 35) - CCWA
4472	115.99850	-34.04966	Donnelly	North Donnelly State Forest (F 34) - CCWA
6143	115.80686	-34.13474	Donnelly	Barlee Brook State Forest (F 35) - CCWA
8017	115.79984	-34.11228	Donnelly	South East Nannup State Forest (F 57) - CCWA
6847	116.54057	-32.96506	Perth Hills	Timber Reserve (O 171 25) - CCWA
6882	115.99800	-32.88613	Perth Hills	Dwellingup State Forest (F 14) - CCWA
2291	116.22485	-33.15637	Wellington	Lane Poole Reserve (R 39821) - CCWA
2546	116.25884	-33.16280	Wellington	Lane Poole Reserve (R 39821) - CCWA
2932	116.22885	-33.21603	Wellington	Lane Poole Reserve (R 39821) - CCWA
2933	116.24599	-33.19013	Wellington	Lane Poole Reserve (R 39821) - CCWA
3698	116.46437	-33.36124	Wellington	Muja State Forest (F 24) - CCWA
6848	116.41000	-32.99600	Wellington	Harris River State Forest (F 15) - CCWA
2847	115.46541	-33.60737	Blackwood	Ludlow State Forest (F 2) - CCWA
3162	115.56338	-33.48052	Blackwood	Tuart Forest National Park (R 43059) - CCWA
2622	115.51022	-30.86726	Moora	Land Administration Act - Unallocated Crown Land (UCL)
2623	115.54526	-30.86715	Moora	Crown Reserve (R 31223)
3104	115.54984	-30.82955	Moora	Land Administration Act - Unallocated Crown Land (UCL)
8018	115.55700	-30.84000	Moora	Land Administration Act - Unallocated Crown Land (UCL)
2846	116.04465	-34.26105	Donnelly	Donnelly State Forest (F 36) - CCWA
5928	115.97789	-34.29663	Donnelly	Donnelly State Forest (F 36) - CCWA
6119	116.13442	-34.34861	Donnelly	Donnelly State Forest (F 36) - CCWA
6854	116.13759	-34.33614	Donnelly	Donnelly State Forest (F 36) - CCWA
8016	116.13173	-34.35712	Donnelly	Donnelly State Forest (F 36) - CCWA
3201	116.57751	-34.92487	Frankland	Mount Frankland South National Park (R 47889) - CCWA
3202	116.66255	-34.84487	Frankland	Mount Frankland South National Park (R 47889) - CCWA
3204	116.62665	-34.94215	Frankland	Mount Frankland South National Park (R 47889) - CCWA
5080	116.44151	-34.87428	Frankland	D'entrecasteaux National Park (R 36996) - CCWA
5081	116.41870	-34.86049	Frankland	D'entrecasteaux National Park (R 36996) - CCWA
5767	116.63973	-34.91664	Frankland	Mount Frankland South National Park (R 47889) - CCWA
5952	116.60970	-34.91173	Frankland	Mount Frankland South National Park (R 47889) - CCWA

3. Area of Clearing

- (a) The Permit Holder must not clear more than 2.6 hectares of native vegetation in total over the 52 *apiary sites* described in Condition 2 of this Permit.
- (b) The Permit Holder must not clear more than 0.05 hectares for each of the *apiary sites* described in Condition 2 of this Permit.
- (c) The clearing described in Conditions 3(a) and 3(b) of this Permit may only occur within a 500 metre radius of the coordinates of each *apiary site* described in Condition 2 of this Permit, subject to the Permit Holder having the power to clear native vegetation for those activities under any written law.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation within *apiary sites* described in Condition 2 and the area of clearing in Condition 3 of this Permit to the extent of activities permitted under an authority granted to the Permit Holder under Part 8A of the *Conservation and Land Management Regulations 2002*.

6. Clearing not authorised

- (a) This Permit does not authorise the Permit Holder to clear trees that have a diameter, at average adult human chest height, of ten centimetres or greater.
- (b) This Permit does not authorise the Permit Holder to clear within any *reservoir protection zones for public drinking water source areas*.
- (c) This Permit does not authorise the Permit Holder to clear known locations of *priority flora* as listed by the Department of Biodiversity, Conservation and Attractions, or *threatened flora* referred to under Part 2 of the *Biodiversity Conservation Act 2016*.

PART II – MANAGEMENT CONDITIONS

7. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in 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.

8. Method of clearing

- (a) The Permit Holder must comply with the directions of the relevant District Apiary Officer of the Department of Biodiversity, Conservation and Attractions prior to undertaking clearing within *apiary sites* described in Condition 2 and the area of clearing in Condition 3 of this Permit.
- (b) The Permit Holder must at all times comply with the '*General Conditions for using Apiary Authorities on Crown Land in Western Australia*.'
- (c) The Permit Holder may only clear native vegetation within *apiary sites* described in Condition 2 and the area of clearing in Condition 3 of this Permit using minimal impact methods such as pruning, slashing or scrub rolling.

9. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must at all times abide by the '*General Conditions for using Apiary Authorities on Crown Land in Western Australia*' and take the following steps to minimise the risk of the 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 *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.

10. Flora management

- (a) The Permit Holder must comply with the directions of the relevant District Apiary Officer of the Department of Biodiversity, Conservation and Attractions prior to undertaking clearing within *apiary sites* described in Condition 2 and the area of clearing in Condition 3 of this Permit.
- (b) Where known locations of *priority flora* as listed by the Department of Biodiversity, Conservation and Attractions or *threatened flora* referred to under Part 2 of the *Biodiversity Conservation Act 2016* are identified, the Permit Holder shall ensure that clearing is greater than 50 metres distance from any locations of *threatened flora*, and greater than 10 metres distance from any locations of *priority flora*.

PART III – RECORD KEEPING AND REPORTING

11. Record keeping

The Permit Holder must maintain the following records in relation to the clearing of native vegetation authorised under this Permit:

- (a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (b) the date(s) that the area was cleared;
- (c) the size of the area cleared (in hectares);
- (d) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 5 of this Permit; and
- (e) actions taken to minimise the risk of the introduction and spread of *dieback* and *weeds* in accordance with condition 6 of this Permit.

12. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
 - (i) of records required under condition 11 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 20 November 2024, the Permit Holder must provide to the *CEO* a written report of records required under condition 11 of this Permit where these records have not already been provided under condition 12(a) of this Permit.

DEFINITIONS

The following meanings are given to terms used in this Permit:

Apiary site/s means the land specified in an apiary authority as the land to which an apiary licence granted under Part VIII Division 2 of the CALM Act, or an apiary permit granted under Part VIII Division 1 of the CALM Act;

CALM Act means the *Conservation and Land Management Act 1984*;

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

dieback means the effect of *Phytophthora* species on native vegetation;

fill means material used to increase the ground level, or fill a hollow;

General Conditions for using Apiary Authorities on Crown Land in Western Australia means the publication released by the former Department of Parks and Wildlife (now Department of Biodiversity, Conservation and Attractions) by the same title in July 2013;

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

Public drinking water source areas means surface water catchments and groundwater areas that provide drinking water to cities, towns and communities proclaimed under the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*;

priority flora means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions Threatened and Priority Flora List for Western Australia (as amended);

reservoir protection zones means the areas defined by the former Department of Water (now Department of Water and Environmental Regulation's) within drinking water source protection reports delineating reservoir protection zones within public drinking water source areas;

Threatened flora means those plant taxa referred to under Part 2 of the *Biodiversity Conservation Act 2016*.

weed/s means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*;
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.



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

21 January 2020



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8595/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Honey West
Application received date: 24 June 2019

1.3. Property details

Property:

Fifty-two apiary sites located on various properties throughout the South West and Goldfields of Western Australia within the 16 Local Government Areas detailed in the table below.

Local Government Authority:

Local Government Authority	DBCA District	No. of apiary Sites
City of Busselton	Blackwood	2
Shire of Boddington	Perth Hills	2
Shire of Bridgetown-Greenbushes	Donnelly	1
Shire of Capel	Blackwood	1
Shire of Collie	Wellington	4
Shire of Coolgardie	Kalgoorlie	8
Shire of Coorow	Moora	3
Shire of Dandaragan	Moora	4
Shire of Dundas	Esperance	2
Shire of Esperance	Esperance	2
Shire of Irwin	Moora	3
Shire of Manjimup	Donnelly	5
Shire of Manjimup	Frankland	7
Shire of Nannup	Blackwood	1
Shire of Nannup	Donnelly	3
Shire of Three Springs	Moora	2
Shire of Waroona	Perth Hills	1
Shire of West Arthur	Wellington	1
Total		52

1.4. Application

Clearing Area (ha): 2.6
No. Trees: None
Method of Clearing: Pruning, slashing or scrub-rolling
Purpose category: Apiculture site establishment and maintenance

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 21 January 2020

Reasons for Decision:

The clearing permit application received on 24 June 2019 has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*. Proposed clearing is up to 2.6 hectares over 52 apiary sites, equating to approximately 0.05 hectares (500m²) per site. It has been concluded that the proposed clearing may be at variance with Principles (a), (c), (f) and Principle (h), and is not likely to be at variance with the remaining Principles.

Approvals to establish apiary sites in Western Australia are managed under the *Conservation and Land Management Act 1984* (CALM Act). As part of this process, authority to access lands is obtained from the relevant land manager; that is the Department of Biodiversity, Conservation and Attractions (DBCA). The DBCA assesses potential impacts of clearing native vegetation prior to approving and issuing an apiculture permit or licence (DBCA, 2013). The applicant has current (CALM Act) approval for apiculture on all 52 sites within the application area (DBCA, 2019a).

The proposed pruning, slashing or scrub-rolling of native vegetation for apiary sites within the application area may include vegetation growing in association with a wetland or

watercourse, including areas mapped within the Directory of Important Wetlands. Clearing may also impact the environmental values of several conservation areas managed by the DBCA through the potential to introduce or spread weeds and dieback, or facilitate erosion. Priority flora are known from two of the 52 sites and one threatened flora species is known from one of the 52 sites.

The Delegated Officer took into consideration that all sites on Crown land have current authorisations for apiculture under the CALM Act, and that standard access, weed and dieback hygiene management measures stipulated in the *'General Conditions for using Apiary Authorities on Crown Land in Western Australia'* (DBCA, 2013) will minimise impacts to the surrounding vegetation. The administration of these authorisations minimises the impacts identified in the assessment against the clearing principles.

In order to minimise the impact of the clearing, the Delegated Officer has imposed conditions, including weed and dieback management conditions, prohibiting the clearing of native trees with diameter at breast height (DBH) greater than ten centimetres, and exclusion areas around known locations of any flora of conservation significance. Limiting clearing to 0.05 hectares (500 m²) within a 78.54 hectare area per site (that is, 500 metre radius) facilitates the avoidance of key environmental values.

The Delegated Officer determined that, given the small extent of the proposed clearing at any one location, the clearing is not likely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description:

Honey West has applied for a Purpose Permit to clear up to 2.6 hectares of native vegetation across 52 sites for the purpose of apiculture (beekeeping) within various crown lease tenure including state forests, timber reserves, nature reserves, national parks, Crown leases, Crown reserves and unallocated Crown land across the South West of Western Australia.

Each of the 52 apiary sites is located centrally within a circular polygon of 500 metres radius equating to approximately 78.54 hectares per site. The polygons combined is defined as the 'application area'. Each of the individual polygons are referred to as a 'site' throughout the Decision Report, followed by the four digit apiary reference number.

Up to 0.05 hectares (or 500 m²) of clearing within an individual apiary site (of approximately 78.54 hectares) may be necessary for vehicle access and placement of beehives. Clearing may be in the form of either pruning, scrub-rolling or slashing vegetation. The establishment of a firebreak may also be required, and has been factored into the 0.05 hectares applicable to each apiary site.

Vegetation Description:

The 52 individual sites occur within five broad bioregions (Thackway and Cresswell, 1995): Coolgardie, Geraldton Sandplains, Swan coastal Plain, Jarrah forest and Warren (**Figure 1**).

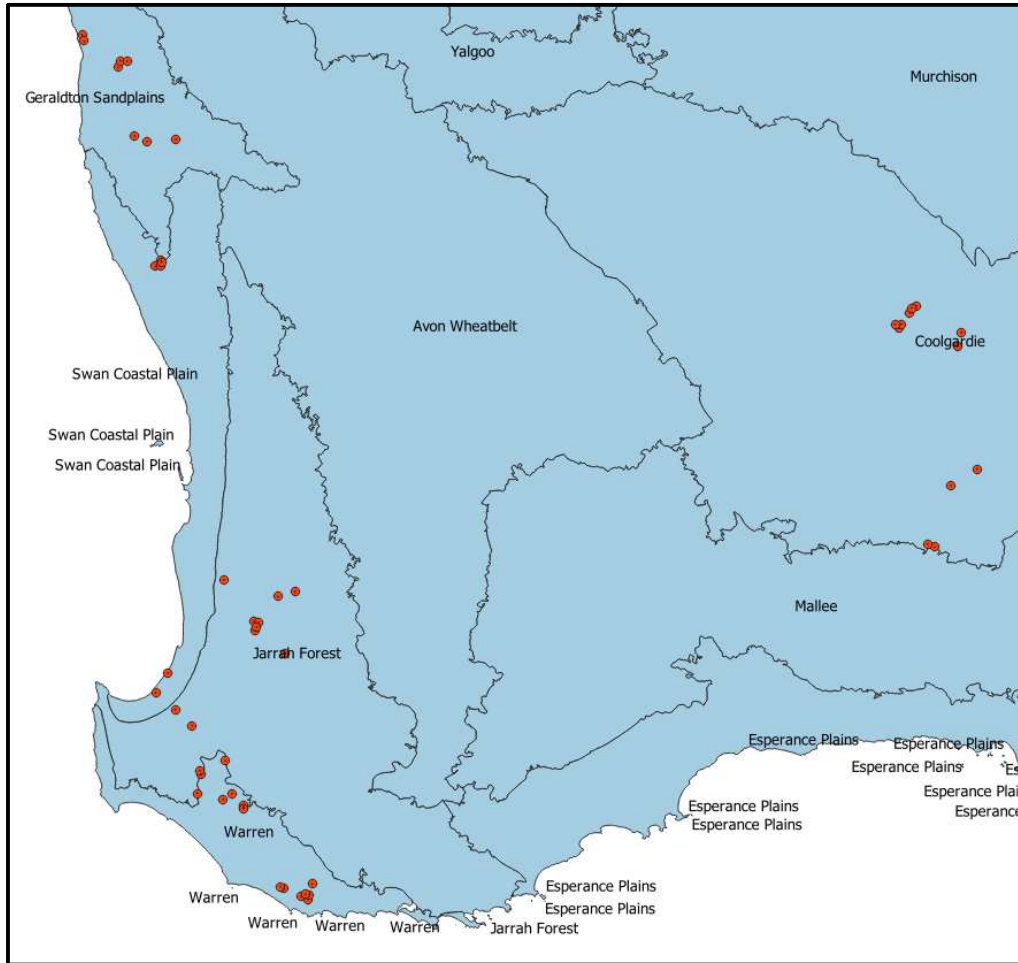


Figure 1: Site locations

Vegetation has been mapped over the 52 sites (Shepherd *et al*, 2001; Mattiske and Havel, and 1999; Heddle *et al*, 1980). Thirty-two vegetation associations have been mapped across the 52 sites and are summarised in the table below.

Apiary Ref.	Bioregion	Vegetation Mapping	Description
6933	Coolgardie	Shepherd <i>et al</i> , 2001	1413. Shrublands; acacia, casuarina & melaleuca thicket
6931	Coolgardie	Shepherd <i>et al</i> , 2001	522. Medium woodland; redwood (<i>Eucalyptus transcidentalis</i>) & merrit (<i>E. floctoniae</i>)
6932	Coolgardie	Shepherd <i>et al</i> , 2001	522. Medium woodland; redwood (<i>Eucalyptus transcidentalis</i>) & merrit (<i>E. floctoniae</i>)
6930	Coolgardie	Shepherd <i>et al</i> , 2001	8. Medium woodland; salmon gum & gimlet
5781	Coolgardie	Shepherd <i>et al</i> , 2001	128. Bare areas; Rock outcrops
5782	Coolgardie	Shepherd <i>et al</i> , 2001	2009. Medium woodland; redwood & goldfields blackbutt
5779	Coolgardie	Shepherd <i>et al</i> , 2001	522. Medium woodland; redwood (<i>Eucalyptus transcidentalis</i>) & merrit (<i>E. floctoniae</i>)
5439	Coolgardie	Shepherd <i>et al</i> , 2001	9. Medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E. le souffi</i>)
5780	Coolgardie	Shepherd <i>et al</i> , 2001	9. Medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E. le souffi</i>)
750	Coolgardie	Shepherd <i>et al</i> , 2001	936. Medium woodland; salmon gum
5476	Coolgardie	Shepherd <i>et al</i> , 2001	936. Medium woodland; salmon gum
8015	Coolgardie	Shepherd <i>et al</i> , 2001	936. Medium woodland; salmon gum
3106	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	129. Bare areas; dune sand
3107	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	17. Shrublands; <i>Acacia rostellifera</i> thicket

3159	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	379. Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region
6852	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	379. Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region
3142	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	379. Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region
3140	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	379. Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region
3141	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	379. Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region
3156	Geraldton Sandplain	Shepherd <i>et al</i> , 2001	694. Shrublands; scrub-heath on yellow sandplain banksia-xyloelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions
2847	Swan Coastal Plain	Shepherd <i>et al</i> , 2001	2. Tall woodland; tuart (<i>Eucalyptus gomphocephala</i>)
3162	Swan Coastal Plain	Hedde <i>et al</i> , 1980	Open Forest and Woodland: Karrakatta Complex-Central And\South
2622	Swan Coastal Plain	Shepherd <i>et al</i> , 2001	1030. Low woodland; <i>Banksia attenuata</i> & <i>B. menziesii</i>
2623	Swan Coastal Plain	Shepherd <i>et al</i> , 2001	1030. Low woodland; <i>Banksia attenuata</i> & <i>B. menziesii</i>
3104	Swan Coastal Plain	Shepherd <i>et al</i> , 2001	1030. Low woodland; <i>Banksia attenuata</i> & <i>B. menziesii</i>
8018	Swan Coastal Plain	Shepherd <i>et al</i> , 2001	1030. Low woodland; <i>Banksia attenuata</i> & <i>B. menziesii</i>
3446	Jarra Forest	Mattiske and Havel, 1998	BK. Open forest of <i>Corymbia calophylla-Eucalyptus marginata</i> subsp. <i>marginata</i> on the variable slopes in perhumid and humid zones.
2891	Jarra Forest	Mattiske and Havel, 1998	KI. Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata-Corymbia calophylla-Allocasuarina fraseriana-Banksia grandis-Xyloelum occidentale</i> on lateritic uplands in perhumid and humid zones.
2888	Jarra Forest	Mattiske and Havel, 1998	BE1. Tall open forest of <i>Corymbia calophylla-Eucalyptus marginata</i> subsp. <i>marginata</i> on uplands in perhumid and humid zones.
6143	Jarra Forest	Mattiske and Havel, 1998	BE1. Tall open forest of <i>Corymbia calophylla-Eucalyptus marginata</i> subsp. <i>marginata</i> on uplands in perhumid and humid zones.
8017	Jarra Forest	Mattiske and Havel, 1998	Q. Mosaic of low open woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata-Banksia ilicifolia-Nuytsia floribunda</i> and low open woodland of <i>Eucalyptus patens-Melaleuca preissiana-Nuytsia floribunda</i> on less undulating flats in hyperhumid and perhumid zones.
4472	Jarra Forest	Mattiske and Havel, 1998	YN1. Mixture of tall open forest of <i>Eucalyptus diversicolor</i> and tall open forest of <i>Corymbia calophylla-Eucalyptus patens-Eucalyptus marginata</i> subsp. <i>marginata</i> over <i>Agonis flexuosa</i> and <i>Agonis juniperina</i> on valleys in perhumid and humid zones.
6848	Jarra Forest	Mattiske and Havel, 1998	Mi. Open woodland of <i>Eucalyptus wandoo</i> over <i>Acacia acuminata</i> with some <i>Eucalyptus loxophleba</i> on valley slopes, with low woodland of <i>Allocasuarina huegeliana</i> on or near shallow granite outcrops in arid and perarid zones.
6847	Jarra Forest	Mattiske and Havel, 1998	Ck. Woodland of <i>Eucalyptus wandoo</i> with mixtures of <i>Eucalyptus patens</i> , <i>Eucalyptus marginata</i> subsp. <i>thalassica</i> and <i>Corymbia calophylla</i> on the valley slopes in arid and perarid zones.
6882	Jarra Forest	Mattiske and Havel, 1998	D1. Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata-Corymbia calophylla</i> on lateritic uplands in mainly humid and subhumid zones.
2932	Jarra Forest	Mattiske and Havel, 1998	G. Mosaic of open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> (humid zones) and <i>Eucalyptus marginata</i> subsp. <i>thalassica</i> (semiarid to perarid zones) on the sandy-gravels, low woodland of <i>Banksia attenuata</i> on the drier sandier sites (humid to perarid zone)
2933	Jarra Forest	Mattiske and Havel, 1998	G. Mosaic of open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> (humid zones) and <i>Eucalyptus marginata</i> subsp. <i>thalassica</i> (semiarid to perarid zones) on the sandy-gravels, low woodland of <i>Banksia attenuata</i> on the drier sandier sites (humid to perarid zone)
3698	Jarra Forest	Mattiske and Havel, 1998	Pn. Open forest of <i>Eucalyptus marginata</i> subsp. <i>thalassica-Corymbia calophylla</i> on slopes and open woodland of <i>Eucalyptus wandoo</i> with some <i>Eucalyptus patens</i> on the lower slopes in semiarid and arid zones.
2291	Jarra Forest	Mattiske and Havel, 1998	S. Mosaic of low open woodland of <i>Melaleuca preissiana-Banksia littoralis</i> , closed scrub of Myrtaceae spp., closed heath of Myrtaceae spp. and sedgeland of <i>Baumea</i> and <i>Leptocarpus</i> spp. on seasonally wet or moist sand, peat and clay soils on valley floors in
2546	Jarra Forest	Mattiske and Havel, 1998	S. Mosaic of low open woodland of <i>Melaleuca preissiana-Banksia littoralis</i> , closed scrub of Myrtaceae spp., closed heath of Myrtaceae spp. and sedgeland of <i>Baumea</i> and <i>Leptocarpus</i> spp. on seasonally wet or moist sand, peat and clay soils on valley floors in
5928	Warren	Mattiske and Havel, 1998	BE1. Tall open forest of <i>Corymbia calophylla-Eucalyptus marginata</i> subsp. <i>marginata</i> on uplands in perhumid and humid zones.
2846	Warren	Mattiske and Havel, 1998	CRb. Tall open forest of <i>Corymbia calophylla-Eucalyptus diversicolor</i> on upper slopes with <i>Allocasuarina decussata-Banksia grandis</i> on upper slopes in hyperhumid and perhumid zones.

8016	Warren	Mattiske and Havel, 1998	CRb. Tall open forest of <i>Corymbia calophylla</i> - <i>Eucalyptus diversicolor</i> on upper slopes with <i>Allocasuarina decussata</i> - <i>Banksia grandis</i> on upper slopes in hyperhumid and perhumid zones.
6119	Warren	Mattiske and Havel, 1998	Cry. Tall open forest of <i>Corymbia calophylla</i> with mixture of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Eucalyptus diversicolor</i> on uplands in hyperhumid and perhumid zones.
6854	Warren	Mattiske and Havel, 1998	PM1. Tall open forest of <i>Eucalyptus diversicolor</i> with mixtures of <i>Corymbia calophylla</i> on valley slopes and low forest of <i>Agonis juniperina</i> - <i>Banksia seminuda</i> - <i>Callistachys lanceolata</i> on valley floors in the perhumid zone.
3204	Warren	Mattiske and Havel, 1998	A. Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Banksia ilicifolia</i> - <i>Nuytsia floribunda</i> with some <i>Eucalyptus diversicolor</i> on gently sloping sandy terrain in hyperhumid and perhumid zones.
5080	Warren	Mattiske and Havel, 1998	BWp. Mosaic of low open woodland of <i>Melaleuca preissiana</i> , low open woodland of <i>Melaleuca cuticularis</i> , open heath of Myrtaceae-Proteaceae spp. and sedgelands of <i>Restionaceae</i> spp. on low lying flats in hyperhumid and perhumid zones.
5081	Warren	Mattiske and Havel, 1998	BWp. Mosaic of low open woodland of <i>Melaleuca preissiana</i> , low open woodland of <i>Melaleuca cuticularis</i> , open heath of Myrtaceae-Proteaceae spp. and sedgelands of <i>Restionaceae</i> spp. on low lying flats in hyperhumid and perhumid zones.
3201	Warren	Mattiske and Havel, 1998	Cob. Tall open forest of <i>Eucalyptus diversicolor</i> - <i>Corymbia calophylla</i> on crests of hills arising above the southern coastal plain in the hyperhumid zone.
5767	Warren	Mattiske and Havel, 1998	Cob. Tall open forest of <i>Eucalyptus diversicolor</i> - <i>Corymbia calophylla</i> on crests of hills arising above the southern coastal plain in the hyperhumid zone.
3202	Warren	Mattiske and Havel, 2015	Q. Mosaic of low open woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Banksia ilicifolia</i> - <i>Nuytsia floribunda</i> and low open woodland of <i>Eucalyptus patens</i> - <i>Melaleuca preissiana</i> - <i>Nuytsia floribunda</i> on less undulating flats in hyperhumid and perhumid zones.
5952	Warren	Mattiske and Havel, 2016	Q. Mosaic of low open woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Banksia ilicifolia</i> - <i>Nuytsia floribunda</i> and low open woodland of <i>Eucalyptus patens</i> - <i>Melaleuca preissiana</i> - <i>Nuytsia floribunda</i> on less undulating flats in hyperhumid and perhumid zones.

Vegetation Condition:

Vegetation condition was determined through aerial imagery. Given the sites are located in close proximity to cleared, previously cleared or disturbed access areas, the vegetation is likely to range in condition from very good to degraded condition (Keighery, 1994).

Vegetation condition ratings are defined as follows:

- Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).
- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbance; retains basic structure or ability to regenerate (Keighery 1994).
- Degraded: Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching Good condition without intensive management (Keighery 1994).

Soil Description:

A wide variety of soil types is represented over the 52 sites. However, as sites are located in close proximity to cleared, previously cleared, or disturbed areas no access or significant erosion issues are expected.

Comments:

The 52 apiary sites are permitted for apiculture under the CALM Act by multiple apiary authorities (permits or licences). Assessment of the environmental values of the 52 sites was considered at a local scale given the minimal extent of proposed clearing at each site. That is, less than 500m² within a 78.54 hectare area per site. Intersect data (that is, environmental data recorded within the application area) were predominately used to determine impact, in conjunction with threatened flora and fauna records within 1,000m of each of the 52 sites.

3. Minimisation and mitigation measures

Apiarists have a preference of using existing cleared areas for apiary site locations and existing tracks and/or firebreaks to access them. However, in some cases apiary sites may need to be established in new or, revised locations, or an existing site may not have been used for a number of years and clearing of regrowth may be required.

Approvals to establish apiary sites are managed under the CALM Act. As part of this process, authority to access lands is obtained from the relevant land managers. The DBCA assess apiary permit applications with criteria to avoid impacts to key environmental values, and if an apiary site is no longer suitable for use the local DBCA officer can request the apiarist to relocate (DBCA, 2013).

Honey West propose to use minimal impact methods to establish or re-establish sites such as pruning, scrub-rolling or slashing vegetation. Limiting clearing to 0.05 hectares (500 m²) within an individual 78.54 hectare area per site facilitates the avoidance of key environmental values. Trees with a diameter at breast height (DBH) greater than ten centimetres will be avoided.

4. Assessment of application against clearing principles

The relevant apiary sites are located at the edge of large tracts of native vegetation largely within lands vested with, or managed by, the DBCA. All 52 sites have been assessed and approved for use for apiculture by the DBCA, and prior to the issuing of an
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apiary permit an evaluation conducted by the DBCA included the consideration of any environmental issues. For example, whether the site requires clearing of native vegetation, the structure of the community and dominant flora species, the presence of threatened flora, Priority 1 or 2 species, or threatened ecological communities (TECs), and vegetation condition. The management of apiary sites by the DBCA is facilitated by the publication '*General Conditions for using Apiary Authorities on Crown Land in Western Australia*' (DPAW, 2013) that stipulates strict management measures.

Of the 52 sites, 12 sites are located in the extensive land-use region of the Coolgardie Bioregion (Thackway and Cresswell, 1995). The remainder are located within the intensive land-use region; with 14 within the Jarrah Forest Bioregion, 12 within the Warren Bioregion, eight on the Geraldton Sandplain Bioregion, and six located on the Swan Coastal Plain Bioregion (**Figure 1**).

Three priority flora taxa have been recorded within two of the 52 sites. *Pertusaria trachyspora* (P2) and *Drosera occidentalis* (P4) were recorded within site 2546 (Jarrah Forest Bioregion - Lane Poole Reserve) (with *Pultenaea skinneri* (P4) recorded just outside this site). *Chamelaucium* sp. Nornalup (N.G. Marchant 76/125) (P2) was recorded within site 3201 (Warren Bioregion - Mount Frankland National Park). Ten metre buffers will be established around locations of priority flora to mitigate potential impacts. Due to the potential impact to priority flora, the proposed clearing may be at variance with Principle (a).

One threatened flora taxon was recorded within site 3159 in Alexander Morrison National Park within the Geraldton Sandplains Bioregion; *Verticordia albida* (listed as Critically Endangered under the *Biodiversity Conservation Act 2016* (BC Act)). *Verticordia albida* is known from several locations in the vicinity of Carnamah and Three Springs (Western Australian Herbarium, 2019). A fifty metre buffer will be established around this known location to mitigate potential impacts. Due to the potential impact to threatened flora, the proposed clearing may be at variance with Principle (c).

Standard regulatory controls for apiary permits include the requirement to have the DBCA District Apiary Officer approve final placements of apiary locations, with the apiarist to contact the relevant DBCA district 10 working days prior to the site being cleared. The DBCA may elect to complete a threatened flora search prior to final apiary site placement. This regulatory control will minimise or avoid any potential environmental impacts associated with the niche placement of apiary sites within DBCA managed lands.

Several sites are located in confirmed mapped Carnaby's Black Cockatoo (listed as Endangered under the BC Act and the *Environment Protection Biodiversity and Conservation Act 1999* (EPBC Act)) breeding areas: One site in the Geraldton Sand Plains (site 3159), five sites in the Swan Coastal Plain (sites 2622, 2623, 3104, 8018, and 2847), and one site in the Warren Bioregion (site 3202). Four of these sites are also located within areas requiring investigation as Carnaby's Black Cockatoo feeding habitat. Forest Red-tail Black Cockatoo (listed as Vulnerable under the BC Act and EPBC Act) records are located within two sites (site 3446 and 6854 in the Jarrah Forest and Warren Bioregions), with Baudin's Black Cockatoo (listed as Endangered under the BC Act and EPBC Act) recorded within at one site (site 3201 in the Warren Bioregion).

Two sites in the southern Swan Coastal Plain are located within mapped Western Ringtail Possum (listed as Critically Endangered under the BC Act and EPBC Act) suitability habitat areas; site 2847 in the Ludlow State Forest, and site 3162 in the Tuart Forest National Park. The Quenda (P4 as listed by DBCA) has been recorded at site 3698 in the Jarrah Forest Bioregion (Muja State Forest).

Clearing methodology (pruning, scrub-rolling or slashing) with standard controls regarding the avoidance of clearing trees with a DBH greater than ten centimetres will avoid impacts to terrestrial fauna breeding and foraging habitat. Large eucalypts that potentially support black cockatoo breeding hollows, and peppermint trees and eucalypts that provide continuous canopy habitat for Western Ringtail Possums will not be impacted. The proposed clearing, therefore, is not likely to be at variance with Principle (b).

Site 5080 within D'entrecasteaux National Park recorded the native fish Western Dwarf Galaxias (listed as Vulnerable under the BC Act) and Black-striped Dwarf Galaxias (listed as Endangered under the BC Act). Galaxiids spawn in floodplain areas inundated by shallow waters after flooding, and the records were possibly made during such an event as the application area does not appear to support permanent water. Site 5080 (and all other sites) will not be accessed during times of flooding, and aquatic fauna is unlikely to be impacted.

Four sites in Crown lands on the northern Swan Coastal Plain (sites 2622, 2623, 3104, and 8018) are located within mapped Banksia Dominated Woodlands of the Swan Coastal Plain (State listed Priority Ecological Community (PEC) P3 / Commonwealth listed TEC, Endangered under the EPBC Act), and have mapped vegetation that broadly correlates with this description. An additional site (site 2847) is located in the Ludlow State Forest within a mapped association that broadly correlates with Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain (state listed PEC P3 / Commonwealth listed TEC, Critically Endangered under the EPBC Act). These sites are located in large expanses of contiguous native vegetation and the clearing methodology consisting of limiting clearing to 0.05 hectares per site, with pruning, scrub-rolling or slashing only if required, and the avoidance of clearing trees with a DBH greater than ten centimetres will minimise or avoid impacts to the key attributes of potential TECs and PECs. The proposed clearing is not likely to be at variance with Principles (a) or (d).

The National Objectives and Targets for Biodiversity Conservation 2001-2005 include a target to have clearing controls in place that prevent clearance of ecological communities with an extent below 30 per cent of that present pre 1750 (Commonwealth of Australia, 2001). Twelve sites are located in the extensive land-use region of the Coolgardie Bioregion that has 97.96 per cent of pre-European vegetation remaining (Government of WA, 2018). Within the intensive land-use zone the Warren Bioregion has 79.07 per cent remaining, and the Jarrah Forest 53.25 per cent (Government of WA, 2018). Although these broad figures do not take into consideration the actual vegetation associations present at the individual sites, it is unlikely that vegetation associations present represents a significant remnant. The eight sites in the Geraldton Sandplain Bioregion are located in large areas of contiguous native vegetation within unallocated Crown lands, Beekeepers Nature Reserve, and Alexander Morrison National Park. The six sites located on the Swan Coastal Plain Bioregion consist of four sites located in the far northern section of the bioregion, and two in the far south. The four sites located in the north (sites 2622, 2623, 3104, and 8018) are located within large

tracts of unallocated Crown lands contiguous with Namming Nature Reserve to the south and Eneminga Nature Reserve to the north. The two sites located in the south (sites 2847 and 3162) are located within the Ludlow State Forest and Tuart Forest National Park managed by the DBCA. Minimal clearing of up to 0.05 hectares (500 m²) per site is not considered to represent an impact to a significant remnant of native vegetation in an area that has been extensively cleared, and proposed clearing is therefore not likely to be at variance with Principle (e).

Five sites intersect areas listed within the Australian Government's Directory of Important Wetlands. Site 2623 on the northern Swan Coastal Plain intersects Guraga Lake, and sites 5080, 5081, 5952, 3201 intersects the Broke Inlet System in the Warren Bioregion. In addition, seven sites intersect areas mapped as Geomorphic Wetlands. Three sites intersect Wetlands of the Swan Coastal Plain (sumplands and damplands), two intersect Wetlands - Leeuwin Naturalist Ridge and Donnybrook to Nannup (unreviewed), one intersects Wetlands - Augusta to Walpole (seasonally waterlogged slope), and one intersects Wetlands - Manjimup to Northcliffe (Unreviewed). Numerous minor creeklines occur within undulating landscapes of the Warren and Jarrah Forest Bioregions. The application therefore may involve clearing riparian vegetation and therefore the proposed clearing may be at variance with Principle (f). Noting the relatively small scale of the proposed clearing, it is considered that impacts to riparian vegetation and water quality are minimal and short term.

Noting the small scale (approximately 0.05 hectares per location) and wide distribution of the 52 sites proposed to be cleared, and that the sites have been approved for apiculture use by the DBCA, the proposed clearing is unlikely to cause appreciable land degradation, cause deterioration in the quality of surface or ground water, or cause or exacerbate the incidence of flooding. Standard controls implemented by the DBCA minimise risk to lands and water (DBCA 2013). Access to sites must be via pre-existing tracks of an acceptable standard to the DBCA in terms of protecting conservation, drinking water source protection and landscape values, and must be free-draining and of a required width. Standard conditions (DBCA 2013) apply for apiary locations within public drinking water source areas (PDWSA) whereby overnight camping is allowed for one night only for the sole purpose of unloading the hives during the following morning. The apiarist must also follow best practice guidelines for PDWSAs stated within the Department of Water (DoW) endorsed "*Proposal to place beehives in a Public Drinking Water Source Area*" (DBCA and DoW, 2019). Two sites 2846 (Manjimup Dam Catchment - Donnelly district) and 6882 (Samson Brook Catchment - Perth Hills district) are located partially within reservoir protection zones (RPZ) for PDWSA's whereby the positioning of apiary sites is not permitted (DBCA, 2013). The applicant must contact the relevant DBCA District Apiary Officer and agree to the specific access arrangements for each site prior to any bee hive establishment. Note that there is scope for hive placement outside of RPZ zones, but within the application area. If an apiary site is no longer deemed suitable the DBCA officer can request that the apiarist relocate (DBCA, 2013). With these administrative controls in place the proposed clearing is not likely to be at variance with Principles (g), (i), or (j).

The majority of the sites (33 of the 52) are located within lands managed by the DBCA, with 13 of the 52 sites located within Environmentally Sensitive Areas (ESAs). Noting the relatively small scale of the proposed clearing at each site, it is considered that the proposed clearing is unlikely to significantly impact the environmental values of these conservation areas. However, accessing and working within the apiary sites will increase the risk of introduction and spread of weeds and dieback within conservation areas and the proposed clearing may be at variance with Principle (h). Standard conditions for apiculture clearing permits, including weed and dieback management conditions, prohibiting the clearing of native trees with a DBH greater than ten centimetres, and limiting clearing to 0.05 hectares per site will mitigate impacts. Disease Risk Area permits issued for dieback control require the apiarist to obtain a 'green card' prior to entering and operating a particular site (DBCA 2013).

Noting the small scale and wide distribution of the areas proposed to be cleared, and that the sites have been approved for apiculture use by the DBCA (with the majority previously used for apiculture), the areas proposed to be cleared are not likely to comprise significant habitat for fauna, comprise a significant part of a TEC or PEC, be significant as a remnant, impact the quality of surface or ground water, cause appreciable land degradation, or cause or exacerbate flooding. Given the above, the proposed clearing is not likely to be at variance with Principles (b), (d), (e), (g), (i), and (j).

Many sites are within 200 metres of creeklines, and several sites intersect areas mapped within the Directory of Important Wetlands, or areas mapped as Geomorphic Wetlands. Two of the 52 sites recorded priority flora and one site recorded threatened flora. The majority of the sites are also located within conservation areas managed by the DBCA and clearing could increase the risk of introduction and/or spread of weeds and dieback. Clearing may therefore be at variance to Principles (a), (c), (f) and (h).

Planning instruments and other relevant matters

The DBCA manage and issue apiary authorities on Crown lands in accordance with Part 8A of the *Conservation and Land Management Regulations 2002* (Apiary Permits and Licences). Crown lands include; national parks, conservation parks, and nature reserves (for Apiary Licences), as well as state forest, timber reserves, pastoral leases, mining tenements and unallocated Crown land (for Apiary Permits).

The DBCA's '*General Conditions for using Apiary Authorities on Crown Land in Western Australia*' (DPAW 2013) state the conditions under which apiarists must abide in respect to establishing and operating apiary sites.

The application was advertised on the Department of Water and Environmental Regulation website for a 21 day public comment period on 22 October 2019. No public submissions were received in relation to this application.

Relevant Local Government Areas (LGAs) were contacted as direct interest parties. No objections relating to the proposed clearing were received.

The Capel Land Conservation District Committee were contacted as a direct interest party. No objections relating to the proposed clearing were received.

All relevant DBCA regional offices were contacted as direct interest parties. A response was obtained from two district offices (Donnelly and Esperance) (DBCA, 2019b and 2019c respectively). The DBCA regional offices advised of the access requirements for sites within the respective regions.

Sites 6930, 6931, 6932, 6933 are located on unallocated Crown land or Crown reserves where Native Title exists. The Ngadju Native Title Aboriginal Corporation RNTBC (NNTAC) were given opportunity to provide comment on the proposed clearing in accordance with section 24LA of the *Native Title Act 1993* (Cth). The Ngadju Native Title Aboriginal Corporation responded (via Castledine Gregory Law and Mediation) with the need for heritage surveys, and concern over the clearing methodology and potential impacts to material artefacts, with a wish to discuss with the applicant the need for such surveys (DWERDT224770). The DBCA (Esperance district) advised that these apiary sites will not be renewed without an Indigenous Land Use Agreement (ILUA) in place (DBCA, 2019d). The applicant is required to meet their obligations under the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Database searches determined that site 5476 (DBCA Kalgoorlie district) is located completely within a registered heritage site (Milbari Nidjuru); sites 2291, 2546 and 2933 (DBCA Wellington district) intersect a registered heritage site (Harris River); site 3446 (DBCA Blackwood district) intersects a registered heritage site (Blackwood River); sites 5952, 3204 and 5767 (DBCA Frankland district) intersect the lodged heritage Site (Deep River); and site 6847 (DBCA Perth Hills district) intersects the Quindanning Forest 24 (stored data).

5. References

- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2013) Department of Parks and Wildlife (Now DBCA). *General Conditions for using Apiary Authorities on Crown Land in Western Australia*. Department of Parks and Wildlife, Western Australia.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2019a) DBCA Apiary Coordinator advice on clearing permit application CPS 8595/1, Department of Biodiversity, Conservation and Attractions (DWER REF: A1816884)
- Department of Biodiversity, Conservation and Attractions (DBCA) (2019b) DBCA Donnelly District advice on clearing permit application CPS 8595/1, Department of Biodiversity, Conservation and Attractions (DWER REF: A1840662)
- Department of Biodiversity, Conservation and Attractions (DBCA) (2019c) DBCA Esperance District advice on clearing permit application CPS 8595/1, Department of Biodiversity, Conservation and Attractions (DWER REF: A1842312)
- Department of Biodiversity, Conservation and Attractions (DBCA) (2019d) DBCA Esperance District further advice on clearing permit application CPS 8595/1, Department of Biodiversity, Conservation and Attractions (DWER REF: A1832215)
- Department of Biodiversity, Conservation and Attractions (DBCA) and Department of Water (DoW) (2019) "*Proposal to place beehives in a Public Drinking Water Source Area*". Application form available from the DBCA website: https://www.dpaw.wa.gov.au/images/documents/plantsanimals/animals/proposal_to_place_beehives_on_a_pdwsa12.pdf
- Government of Western Australia. (2018). 2017 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
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- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Thackway, R and Cresswell, I.D. (eds) (1995) An interim biogeographical regionalisation of Australia. Australian Nature Conservation Agency (now Department of Environment and Energy), Canberra.
- Western Australian Herbarium (2019). FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> Accessed December 2019.

GIS Databases:

- Aboriginal Sites of Significance
- Department of Biodiversity, Conservation and Attractions, Managed Tenure
- Geomorphic Wetlands Management Category
- Hydrography Linear – Linear
- Hydrography WA 250K – Surface Water Lines
- IBRA Australia
- Land Degradation Hazards
- SAC bio datasets
- Threatened and Priority Fauna Data November 2019
- TPFL Data November 2019
- WA Herb Data November 2019
- WA TEC-PEC Boundaries