



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7282/1
Permit Holder:	Shire of West Arthur
Duration of Permit:	31 December 2016 – 31 December 2021

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

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purpose of road upgrades.

2. Land on which clearing is to be done

Darkan Road South road reserve (PINs 1388830, 1388831, 1388832 and 188833), Moodiarrup
Ranjander Road reserve (PINs 11244386 and 11244389), Darkan
Cordering Road North road reserve (PIN 11244394), Darkan

3. Area of Clearing

The Permit Holder must not clear more than 0.85 hectares of native vegetation within the areas cross-hatched yellow on attached Plan 7282/1(a), Plan 7282/1(b) and Plan 7282/1(c).

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 for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for those activities under the *Local Government Act 1995* or any other written law.

PART II – MANAGEMENT CONDITIONS

6. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

- clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
- restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

7. Avoid, minimise etc 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. Fauna management

- (a) Prior to undertaking any clearing authorised under this Permit, the areas cross-hatched yellow on attached Plan 7282/1(a), Plan 7282/1(b) and Plan 7282/1(c) shall be inspected by a *fauna specialist* who shall identify *habitat tree(s)* suitable to be utilised by the fauna species listed below:
 - (i) forest red-tailed black-cockatoo (*Calyptorhynchus banksii* subsp. *naso*);
 - (ii) Baudin's cockatoo (*Calyptorhynchus baudinii*);
 - (iii) Carnaby's cockatoo (*Calyptorhynchus latirostris*);
 - (iv) southern brush-tailed phascogale (*Phascogale tapoatafa* subsp. *tapoatafa*); and
 - (v) red-tailed phascogale (*Phascogale calura*).
- (b) Prior to clearing, any *habitat trees* identified by condition 8(a) shall be inspected by a *fauna specialist* for the presence of fauna listed under condition 8(a).
- (c) Within one week prior to undertaking any clearing authorised under this Permit, the Permit Holder shall engage a *fauna clearing person* to remove and relocate any fauna identified under condition 8(b).

DEFINITIONS

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

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

fauna clearing person means a person who has obtained a licence from the Department, issued pursuant to the *Wildlife Conservation Regulations 1970* authorising them to take fauna;

fauna specialist means a person with training and specific work experience in fauna identification or faunal assemblage surveys of Western Australian fauna;

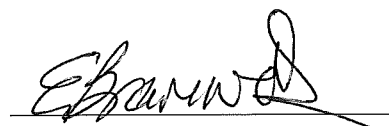
fill means material used to increase the ground level, or fill a hollow;

habitat tree(s) means trees that have a diameter, measured at 1.5m above the ground, of 50cm or greater, healthy but with dead limbs and broken crowns that are likely to contain hollows and roosts suitable for native fauna, or where these are not present then healthy but with the potential to contain hollows and roosts;

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;

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 Parks and Wildlife Regional Weed Rankings Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



Emma Bramwell
A/ MANAGER
CLEARING REGULATION

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

1 December 2016

Plan 7282/1 (a)

116°47'24.000"

116°48'0.000"

116°48'36.000"

-33°34'48.000"

-33°34'48.000"

-33°35'24.000"

-33°35'24.000"

116°47'24.000"

116°48'0.000"

116°48'36.000"



Legend

— Roads

□ LGA

□ Cadastre

Virtual Mosaic (LGATE-V001)



Areas approved to clear



1:8,000

MGA 94
Geocentric Datum of Australia 1994

E Branwell Date 01/12/16
E Branwell

Officer with delegated authority under Section 20
of the Environmental Protection Act 1986

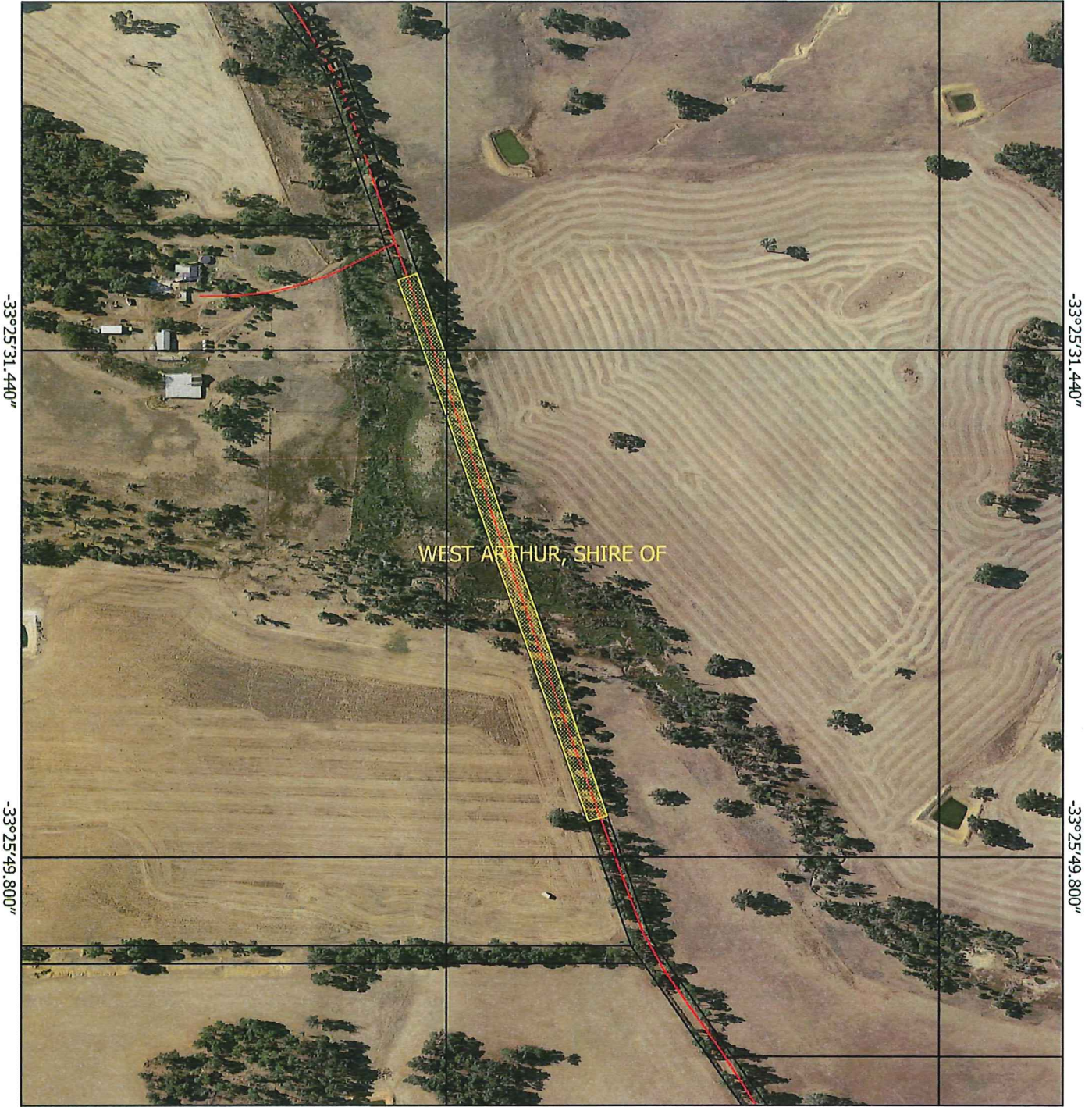


GOVERNMENT OF
WESTERN AUSTRALIA

Plan 7282/1 (b)

116°41'6.000"






116°41'24.000"



116°41'6.000"

116°41'24.000"

Legend

-  Roads
-  LGA
-  Cadastre
- Virtual Mosaic (LGATE-V001)
- 
-  Areas approved to clear



1:4,000

MGA 94
Geocentric Datum of Australia 1994

E Banwell Date 01/12/16
E Banwell

Officer with delegated authority under Section 20
of the Environmental Protection Act 1986



GOVERNMENT OF
WESTERN AUSTRALIA

Plan 7282/1 (c)

116°37'30.000"

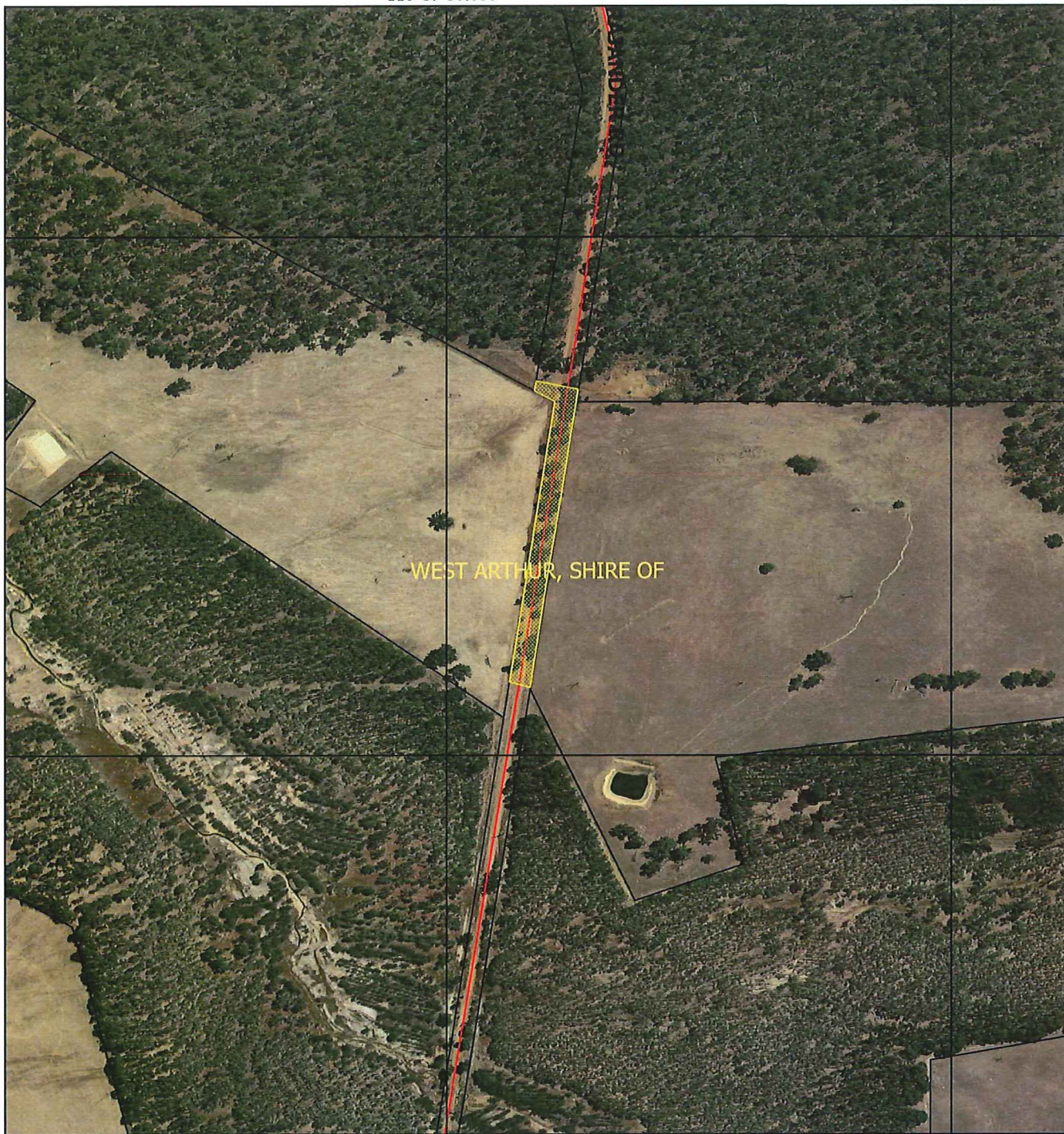
116°37'48.000"

-33°22'46.200"

-33°22'46.200"

-33°23'4.560"

-33°23'4.560"



116°37'30.000"

116°37'48.000"

Legend

— Roads

□ LGA

□ Cadastre

Virtual Mosaic (LGATE-V001)

∧

▨ Areas approved to clear



1:4,000

MGA 94
Geocentric Datum of Australia 1994

E Bramwell Date *01/12/16*
E Bramwell

Officer with delegated authority under Section 20
of the Environmental Protection Act 1986



GOVERNMENT OF
WESTERN AUSTRALIA



1. Application details

1.1. Permit application details

Permit application No.: 7282/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Shire of West Arthur

1.3. Property details

Property: Darkan Road South road reserve (PINs 1388830, 1388831, 1388832 and 188833), Moodiarrup
Ranjander Road reserve (PINs 11244386 and 11244389), Darkan
Cordering Road North road reserve (PIN 11244394), Darkan

Colloquial name:

Local Government Authority: WEST ARTHUR, SHIRE OF

DER Region: Greater Swan

DPaW District: GREAT SOUTHERN and WELLINGTON

Localities: MOODIARRUP and DARKAN

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.85		Mechanical Removal	Road construction or upgrades

1.5. Decision on application

Decision on Permit Application: Grant

Decision Date: 1 December 2016

Reasons for Decision: The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*, and it has been concluded that the proposed clearing may be at variance to Principles (b) and (f) and is not likely to be at variance to the remaining Principles.

The Delegated Officer determined that the proposed clearing may impact upon breeding habitat of Baudin's cockatoo (*Calyptorhynchus baudinii*), Carnaby's cockatoo (*Calyptorhynchus latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*), and habitats of red-tailed phascogale (*Phascogale calura*) and southern brush-tailed phascogale (*Phascogale tapoatafa* subsp. *tapoatafa*), and may impact on riparian vegetation.

In respect to riparian vegetation, the Delegated Officer considered that given the linear shape of the application area, the extent of the proposed clearing, and the largely degraded (Keighery, 1994) condition of the vegetation within the application area, the proposed clearing is unlikely to significantly impact any watercourses or riparian environments.

To minimise the potential impacts to black cockatoo and phascogale habitats, the clearing permit will include a condition requiring the Permit Holder to engage a fauna specialist to identify habitat trees and check for the presence of black cockatoos and phascogales and engage a fauna clearing person to remove any such fauna prior to clearing.

The clearing permit will also include a condition requiring the Permit Holder to implement weed and dieback management measures to minimise potential impacts to adjacent or nearby conservation areas and remnant vegetation.

Relevant State policies and other relevant policies have been taken into consideration in the decision to grant a clearing permit.

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Broad scale vegetation mapping classifies the application area as:</p> <p>Beard vegetation association 3: Medium forest; jarrah-marri (Shepherd et al., 2001).</p> <p>Beard vegetation association 4: Medium woodland; marri & wandoo (Shepherd et al., 2001).</p> <p>Mattiske vegetation complex 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 (Mattiske & Havel, 1998).</p> <p>Mattiske vegetation complex Dk4: Woodland of <i>Eucalyptus wandoo-Allocasuarina huegeliana-Acacia acuminata</i> on slopes and woodland of <i>Eucalyptus rudis</i> on lower slopes in the arid zone (Mattiske & Havel, 1998).</p> <p>Mattiske vegetation complex Dk5: Low woodland of <i>Casuarina obesa-Melaleuca</i> spp. on low lying moister soils, and woodland of <i>Banksia prionotes</i> with occasional <i>Corymbia calophylla</i> and <i>Eucalyptus rudis</i> over <i>Acacia acuminata</i> on sandy lunettes in the arid zone (Mattiske & Havel, 1998).</p> <p>Mattiske vegetation complex Dk2: Mixture of open woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata-Banksia attenuata</i> and low open woodland of <i>Eucalyptus wandoo</i> and stands of <i>Eucalyptus drummondii</i> (northern) and <i>Eucalyptus decipiens</i> (southern) on lower slopes in the arid zone (Mattiske & Havel, 1998).</p>	<p>The application is to clear 0.85 hectares of native vegetation for the purpose of road widening.</p> <p>The total clearing consists of 0.6 hectares within Darkan Road South road reserve (PINs 1388830, 1388831, 1388832 and 188833), Moodiarrup, 0.15 hectares within Ranjander Road reserve (PINs 11244386 and 11244389) and 0.1 hectares within Cordering Road North road reserve (PIN 11244394), Darkan.</p>	<p>Good; Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).</p> <p>To</p> <p>Degraded; Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).</p>	<p>A site inspection undertaken by Department of Environment Regulation (DER) officers identified that the vegetation structure and condition changes between the road reserves comprising the application area, as described below (DER, 2016):</p> <p><u>Darkan Road South road reserve:</u></p> <ul style="list-style-type: none"> The vegetation is considered to be in good (Keighery, 1994) to degraded (Keighery, 1994) condition. The vegetation community transitions from open forest of jarrah / marri (north), into low woodland of casuarina with <i>Banksia</i> sp. and <i>Acacia</i> sp. (central) prior to transitioning into jarrah / wandoo (south). The jarrah / marri community understorey is weed impacted, and the condition and structure increases within the casuarina / banksia community. Minor, non-perennial tributaries flow under the road reserve via culverts. Water flows from lakes located to the west of the application area into the Arthur River located to the east. <p><u>Ranjander Road reserve:</u></p> <ul style="list-style-type: none"> The vegetation is considered to be in degraded (Keighery, 1994) condition. The vegetation is characterised by mature jarrah / marri / wandoo with minimal understorey and no middle storey. This area is highly impacted by the surrounding land use, with the western portion of road reserve predominantly cleared. <p><u>Cordering Road North road reserve:</u></p> <ul style="list-style-type: none"> The vegetation is considered to be in good (Keighery, 1994) to degraded (Keighery, 1994) condition with the majority in a degraded (Keighery, 1994) condition. The understorey is dominated by weeds Tree species are mature, with few juveniles. The southern portion of application area is characterised by <i>Acacia</i> sp. prior to transitioning to low open shrubland dominated by wetland species. The northern section is characterised by <i>Acacia</i> sp. prior to transitioning to open jarrah / marri woodland. The road is utilised as a school bus route.

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposed clearing is not likely to be at variance to this Principle

The application is to clear 0.85 hectares of native vegetation for the purpose of road widening. The applicant advised that the proposed clearing is limited to small, linear extents within the wider road reserve which contain habitat that is largely in a degraded (Keighery, 1994) condition. The applicant advised that the application area has been reduced to avoid clearing vegetation in good (Keighery, 1994) condition where practicable. The application area is comprised of native vegetation within three road reserves as follows:

- 0.6 hectares within Darkan Road South road reserve;
- 0.15 hectares within Ranjander Road reserve; and
- hectares within Cordering Road North road reserve.

Broad scale vegetation mapping classifies vegetation complexes within the application area as a mixture of jarrah, marri and wandoo woodland and low woodland of casuarina and banksia (Shepherd et al., 2001). The application area is in a degraded (Keighery, 1994) to good (Keighery, 1994) condition. A site inspection of the application area conducted by Department of Environment Regulation (DER) officers identified (DER, 2016):

- Darkan Road South road reserve: The vegetation community transitions from open forest of jarrah / marri (north), into low woodland of casuarina with *Banksia* sp. and *Acacia* sp. (central) prior to transitioning into jarrah / wandoo (south). The jarrah / marri community understorey is weed impacted and covers the majority of the application area. The condition and structure increases within the *Casuarina* / *Banksia* community with this area containing vegetation in a good (Keighery, 1994) condition.
- Ranjander Road reserve: The vegetation is characterised by mature jarrah / marri / wandoo with minimal understorey and no middle storey. This area is highly impacted by the surrounding land use, with the western portion of the road reserve predominantly cleared.
- Cordering Road North road reserve: The southern portion of application area is characterised by *Acacia* sp. prior to transitioning to low open shrubland dominated by wetland species. The northern section is characterised by *Acacia* sp. prior to transitioning to open jarrah / marri woodland.

A DER site inspection identified that the application area has the potential to provide suitable habitat for conservation significant fauna species, including Baudin's cockatoo (*Calyptorhynchus baudinii*), Carnaby's cockatoo (*Calyptorhynchus latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*), southern brush-tailed phascogale (*Phascogale tapoatafa* subsp. *tapoatafa*), red-tailed phascogale (*Phascogale calura*), chuditch (*Dasyurus geoffroyi*), barking owl (*Ninox connivens* subsp. *connivens*), and masked owl (*Tyto novaehollandiae* subsp. *novaehollandiae*) (Parks and Wildlife, 2007-; DER, 2016). Black cockatoos breed in large hollow-bearing trees, generally within woodlands or forests (Commonwealth of Australia, 2012). The DER site inspection identified trees within each road reserve with hollows that may be a suitable size to provide breeding habitat for black cockatoos (DER, 2016).

Noting the extent of the proposed clearing and the linear shape of the application area, it is considered that the application area is unlikely to constitute significant habitat for indigenous fauna, however may comprise significant habitat for the abovementioned black cockatoo and phascogale species.

According to available datasets, no rare or priority listed flora species have been recorded within the application area. Four priority (P) flora species have the potential to occur within the Darkan Road South road reserve, based upon the preferred habitat of these species and surrounding records:

- *Banksia acanthopoda* (P2);
- *Logania sylvicola* (P2);
- *Tetratheca exasperata* (P3); and
- *Acacia ataxiphylla* subsp. *ataxiphylla* (P3)

The Department of Parks and Wildlife (Parks and Wildlife) advised that the proposed clearing has potential to impact upon on one rare flora species and the four priority flora species listed above, that the P3 species are known from a greater numbers of locations than the rare or P2 species but are only known from a low number of locations overall, that there have not been any recent collections of *A. ataxiphylla* subsp. *ataxiphylla* (P3) and there have only been small populations of *T. exasperata* (P3) recorded (Parks and Wildlife, 2016).

Parks and Wildlife advised that a population of conservation significant flora "located near the application area has been recorded as occurring on a swamp plain, this species has also been recorded occurring on creek banks and within road reserves. The application area is located between Towerinning Lake and Arthur River. The DER inspection report also notes numerous tributaries flow past the road reserve via culverts. There is thus the potential for this species to occur within the application area" (Parks and Wildlife, 2016).

Parks and Wildlife advised "*Logania sylvicola* (P2), *Tetratheca exasperata* (P3), and *Acacia ataxiphylla* subsp. *ataxiphylla* (P3) have all been reordered in Jarrah/Marri/Wandoo forest. The DER inspection report describes the vegetation in the northern and southern sections of the Darkan Road application area as Jarrah/Marri and Jarrah/Wandoo respectively. There is thus the potential for these species to occur within the application area, however these areas were also described as having an understorey highly impacted by weeds. *Tetratheca exasperata* (P3) has been recorded on roadsides and in highly degraded areas and so still has the potential to occur within the application area. There is some potential, but a lower likelihood due to impacts to the understorey, that *Logania sylvicola* (P2) and *Acacia ataxiphylla* subsp. *ataxiphylla* (P3) could occur within the application area" (Parks and Wildlife, 2016).

Parks and Wildlife advised "*Banksia acanthopoda* (P2) has been recorded with Jarrah and Wandoo however appears from specimen collections to be associated more with heath vegetation, the record nearby to the application area has been recorded as occurring in shrubland and ... there is a low likelihood that this species could occur within the application area" (Parks and Wildlife, 2016).

Parks and Wildlife advised "Some sections of the application area appear from photographs and aerial photography to have intact remnant vegetation. The application area ranges between 25m to 65m wide for approximately 2.3km long. These wider areas of the application area coincide with the areas of intact vegetation which are also adjacent to areas of vegetation. The requirement for a flora survey could be avoided if the wider areas of the Darkan Road reserve application area are reduced, with the aim of minimising clearing of vegetation in a good condition" (Parks and Wildlife, 2016).

DER's site inspection identified vegetation in a good (Keighery, 1994) condition within the wider sections of the Darkan Road South road reserve, where remnant banksia community is retained (DER, 2016). The applicant advised that the application area has been reduced to avoid clearing vegetation in good (Keighery, 1994) condition where practicable, in line with Parks and Wildlife's advice. Remaining sections of this road reserve are considered to be in a degraded (Keighery, 1994) condition, based upon the weed presence and historical disturbance (DER, 2016). As such, avoidance of vegetation in a good (Keighery, 1994) condition will reduce potential impacts to priority flora species.

There are no mapped threatened ecological communities (TEC) within the local area. The closest priority ecological community (PEC) is the Priority 1 'Wild Horse Swamp', with its buffer located approximately 7.5 kilometres south west of the Darkan Road South road reserve.

Based on the above information, it is considered that the application area is unlikely to comprise a high level of biodiversity and the proposed clearing is not likely to be at variance to this Principle.

Methodology References:
Commonwealth of Australia (2012)
Keighery (1994)
Parks and Wildlife (2007-)
Parks and Wildlife (2016)
Shepherd et al., (2001)

GIS Databases:
SAC Bio Datasets

(b) 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 indigenous to Western Australia.

Comments Proposed clearing may be at variance to this Principle

Broad scale vegetation mapping classifies vegetation complexes as a mixture of jarrah, marri and wandoo woodland and low woodland of casuarina and banksia (Shepherd et al., 2001). The application area is in a degraded (Keighery, 1994) to good (Keighery, 1994) condition. The applicant advised that the application area has been reduced to avoid clearing vegetation in good (Keighery, 1994) condition where practicable.

Within the local area (surrounding 10 kilometre radius) there are records of 24 conservation significant fauna species (Parks and Wildlife, 2007-).

The proposed clearing is limited to small portions of the wider road reserve that contain habitat within similar or better condition. This habitat is largely in a degraded (Keighery, 1994) condition, and is linear, allowing continued connectivity of habitat. As such the application area is not likely to constitute significant habitat for the abovementioned fauna, except black cockatoos, red-tailed phascogale and southern brush-tailed phascogale, which may utilise some larger trees containing hollows identified on site (DER, 2016).

A DER site inspection identified trees within each road reserve that are a suitable size to be considered suitable breeding habitat for black cockatoos (karri, marri or jarrah species with a diameter at breast height (DBH) greater than 50 centimetres, or salmon gum and wandoo with a DBH greater than 30 centimetres). Some trees identified had hollows greater than 10 centimetres in diameter (DER, 2016). All trees of suitable age and size are potentially important for maintaining breeding habitat (Commonwealth of Australia, 2012).

The trees with hollows identified may also provide suitable habitat for red-tailed phascogale and southern brush-tailed phascogale.

Given the above the proposed clearing may be at variance to this Principle. Fauna management measures requiring the applicant to engage a fauna specialist to check hollows for the presence of black cockatoos and phascogales prior to the commencement of any clearing will assist in minimising the potential impact to these species.

Methodology References:
Commonwealth of Australia (2012)

DER (2016)
Keighery (1994)
Parks and Wildlife (2007-)
Shepherd et al., (2001)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposed clearing is not likely to be at variance to this Principle

According to available datasets there are no declared rare flora species recorded within the application areas. Furthermore, no rare flora species have been identified within the local area of the Cordering Road North road reserve or Ranjander Road reserve. Two rare flora species have been identified within the local area of Darkan Road South road reserve and one of these species has the potential to occur within the application area.

Parks and Wildlife advised that a population of conservation significant flora "located near to the application area has been recorded as occurring on a swamp plain, this species has also been recorded occurring on creek banks and within road reserves. The application area is located between Townerinning Lake and Arthur River. The DER inspection report also notes numerous tributaries flow past the road reserve via culverts. There is thus the potential for this species to occur within the application area" (Parks and Wildlife, 2016).

Parks and Wildlife advised "Some sections of the application area appear from photographs and aerial photography to have intact remnant vegetation. The application area ranges between 25m to 65m wide for approximately 2.3km long. These wider areas of the application area coincide with the areas of intact vegetation which are also adjacent to areas of vegetation. The requirement for a flora survey could be avoided if the wider areas of the Darkan Road reserve application area are reduced, with the aim of minimising clearing of vegetation in a good condition" (Parks and Wildlife, 2016).

The applicant advised that the application area has been reduced to avoid clearing vegetation in good (Keighery, 1994) condition where practicable, in line with Parks and Wildlife's advice. Remaining sections of this road reserve are considered to be in a degraded (Keighery, 1994) condition, based upon the limited understorey, weed presence and historical disturbance (DER, 2016). As such, the proposed clearing is not expected to impact on the abovementioned rare flora species.

Given the above, the proposed clearing is not likely be at variance to this clearing principle.

Methodology References:
DER (2016)
EPA (2004)
Keighery (1994)
Parks and Wildlife (2016a)
Parks and Wildlife (2016b)

(d) 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.

Comments Proposed clearing is not likely to be at variance to this Principle

According to available datasets, there are no mapped TECs within the local area. The closest TEC is located over 18 kilometres east of Cordering Road North road reserve. Due to the distance, it is considered that the application area is not necessary for the maintenance of this TEC.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Databases:
SAC Bio Datasets (Accessed October 2016)

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposed clearing is not likely to be at variance to this Principle

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-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

Remnant native vegetation within the surrounding 10 kilometers of the application area is approximately:

- Darkan Road South road reserve: 20 per cent vegetation;
- Cordering Road North road reserve: 35 per cent vegetation; and
- Ranjander Road reserve: 50 per cent vegetation.

The application area is located within the Jarrah Forrest Interm Biogeographic Regionalisation for Australia (IBRA) Bioregion and the Shire of West Arthur, which retain approximately 54 and 30.76 per cent respectively of their pre-European vegetation extents (Government of Western Australia, 2015).

The application area is mapped as Beard vegetation associations 3 and 4, which retain 81 and 22 per cent respectively of their pre-European extents within the Jarrah Forrest Interm Biogeographic Regionalisation for Australia (IBRA) Bioregion (Government of Western Australia, 2015). The application area is also mapped as Mattiske vegetation complexes Pn, Dk4, Dk5 and Dk2, which retain 76, 15, 35 and 16 per cent respectively of their pre-European extents (Government of Western Australia, 2015).

Three of the mapped vegetation types are below the 30 per cent vegetation threshold. Due to the degraded (Keighery, 1994) condition of the vegetation within the Ranjander Road reserve and Cordering Road North road reserve, it is considered that these portions of the application area are unlikely to represent the mapped vegetation types and are unlikely to comprise significant remnants.

The mapped Mattiske vegetation complexes Dk2 and Dk4 are present within the Darkan Road South road reserve portion of the application area, which contains vegetation considered to be in good (Keighery, 1994) condition. This comprises approximately 20 per cent of the total 4.6 hectares clearing footprint, of which 0.6 hectares is proposed to be cleared. The applicant advised that the application area has been reduced to avoid clearing vegetation in good (Keighery, 1994) condition where practicable.

Given the relatively small linear extent of the proposed clearing and the applicants reduction of the application area to minimise impact to vegetation in a good (Keighery, 1994) condition, will reduce further fragmentation of vegetation or reduction of vegetation considered a significant remnant.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in Parks and Wildlife Managed Lands (%)
IBRA Bioregion				
Jarrah Forest	4,506,660	2,422,783	54	69
Shire				
West Arthur	283,182.02	87,117.82	30	33
Beard Vegetation Association in Bioregion				
3	2,390,591	1,611,061	67	81
4	1,022,712.70	286,845.32	28	22
Mattiske Vegetation Association in Bioregion				
Pn	167,148.85	128,674.47	76	60
Dk4	9,401.17	1,419.95	15	0.40
Dk5	5,216.30	1,839.60	35	0.01
Dk2	18,393.15	2,980.94	16	0.36

Methodology References:
Commonwealth of Australia (2001)
Government of Western Australia (2015)
Keighery (1994)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposed clearing is at variance to this Principle

Numerous surface water bodies are located within or within close proximity to the application area (DoW, 2016):

- Darkan Road South road reserve: alluvial plains flowing from Lake Towerrinning 400 metres to the west, towards the Arthur river, 130 metres to the east;
- Cordering Road North road reserve: non perennial, minor tributary, running along the application areas western boundary and crossing the centre of the application area flowing east towards the Arthur River; and
- Ranjander Road reserve: non perennial, minor tributary located 380 metres to the south.

As the application area includes watercourses, and noting that riparian vegetation was identified within the application area during DER's site inspection of the Darkan Road South and Cordering Road North road reserves, the proposed clearing is at variance to this Principle (DER, 2016). However, noting the linear shape of the application area and the extent of the proposed clearing, and given the regional context of the minor watercourses, it is considered that the proposed clearing is unlikely to result in significant impacts to the watercourse values.

Methodology References:
DER (2016)
DoW (2016)

GIS Databases:
Hydrography, linear
Hydrography, hierarchy

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments **Proposed clearing is not likely to be at variance to this Principle**
Land system mapping by the Department of Agriculture and Food Western Australia (DAFWA) classifies each application area as:

- Darkan Road South road reserve: Darkan 7 subsystem, dunes with yellowish brown deep sands and Darkan 6 ironstone gravel phase, pale sandy gravels and pale sands within very low rises adjacent to alluvial plains;
- Cordering Road North road reserve: Darkan 2 subsystem, moderately deep sandy gravels and grey deep sandy duplex soils; and
- Ranjander Road reserve: Mornington Hill subsystem, laterite overlying granite with sandy soils and loamy gravels and Pindalup downstream valleys phase, loamy gravels, deep sands within swampy floors.

These subsystems are classified as not having a high risk of wind or water erosion, except for Darkan 7 subsystem of which greater than 70 per cent of this unit is considered susceptible to a high to extreme risk of wind erosion. This subsystem is located in the northern 60 per cent of the Darkan Road South road reserve, an area which comprises alluvial plains. Noting the linear shape of the application area and the extent of the proposed clearing, it is considered that the proposed clearing is unlikely to cause appreciable land degradation.

Given the above, the proposed clearing is not likely to be at variance to this clearing Principle.

Methodology References:
DoW (2016)

GIS Databases:
Hydrography, linear
SAC Biodatasets

(h) 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.

Comments **Proposed clearing is not likely to be at variance Principle**
The closest conservation areas to the application area are:

- Darkan Road South road reserve: 400 metres west (A Class Reserve - Towerrining Nature Reserve)
- Cordering Road North road reserve: 4.5 kilometre north west and south west (Timber Reserve (66 25) and (200 25), respectively.
- Ranjander Road reserve: adjacent to the northern boundary (Timber Reserve (66 25).

Noting the linear shape of the application area and the extent of the proposed clearing, and that the vegetation within the application area is in a degraded (Keighery, 1994) to good (Keighery, 1994) condition, it is considered that the proposed clearing is unlikely to significantly impact on the environmental values of the adjacent or nearby conservation areas.

Notwithstanding, given the proximity of the application area to a nature reserve and timber reserves, the proposed clearing may result in the spread of weeds or dieback into these areas. Weed and dieback management measures will assist in minimising the potential for the spread of weeds or dieback from the road reserves into adjacent or nearby conservation areas.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology References:
Keighery (1994)

GIS Databases:
Parks and Wildlife Tenure

(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.

Comments **Proposed clearing is not likely to be at variance to this Principle**
The application area comprises individual sections within the road reserves. Tributaries that cross the application area are classified as minor and non-perennial. Groundwater salinity is mapped as 7,000–14,000 milligrams per litre and greater than 35,000 milligrams per litre.

The proposed clearing may cause minor sedimentation in areas dissected by watercourses, however is not likely to be significant due to the limited linear application area. Noting the linear shape of the application area and the extent of the proposed clearing, and that the vegetation within the application area is in a degraded (Keighery, 1994) to good (Keighery, 1994) condition, it is considered that the proposed clearing is unlikely to impact on ground or surface water quality.

Given the above, the proposed clearing is not likely to be at variance to this clearing Principle.

Methodology References:
Keighery (1994)

GIS Databases:
Hydrography, linear

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments **Proposed clearing is not likely to be at variance to this Principle**
The soils within the application area are mapped as predominantly deep sands. These soil types are typified by high permeability. Noting the linear shape of the application area and the extent of the proposed clearing, it is considered that the proposed clearing is unlikely to increase the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance to this clearing Principle.

Methodology GIS Databases:
Hydrography, linear
SAC Biodatasets (Accessed October 2016)

Planning instruments and other relevant matters.

Comments The application was advertised in *The West Australian* newspaper on 10 October 2016 by DER inviting submissions from the public within a 21 day period. No submissions were received in relation to this application.

The DoW advised on the following potential impacts to ground and surface water:

- Ranjander Road reserve: Located within Zone A of the Wellington Dam Catchment Area as proclaimed under the *Country Areas Water Supply Act 1947* and Collie River Irrigation District as proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWI Act).
- Darkan Road South and Cordering Road north road reserves: Located within a 'non-proclaimed' area for ground water under the RiWI Act. Abstraction of groundwater from artesian aquifers is subject to licencing from the DoW. A licence is not required for abstraction from non-artesian groundwater resources.

The DoW advised that if activities take place within these water courses which require the removal of surface water (i.e. dust suppression) then both a 5c licence to take surface water and a permit to interfere with bed and banks will be required (DoW, 2016). As tributary banks will not be impacted by the proposed clearing, a Bed and Banks permit is not likely to be required. The applicant is advised to consult with the DoW on potential licences required.

The DoW advised that the proposed clearing and road upgrade has the potential for sediment transport via erosion into surrounding waterways, resulting in turbidity (DoW, 2016). There is also a potential for hydrocarbon input into waterways. To manage these risks, the applicant should refer to the DoW's *Water Quality Protection Note (WQPN) 44 – Roads near sensitive water resources* which provide a number of measures. These measures include the following where appropriate/practical (DoW, 2016):

- Clearing and exposed soil working surfaces kept to a minimum, and protected from stormwater erosion.
- During wet seasons, silt fences and sediment traps should be optimally placed to prevent soil export to the waterway.
- The installation of roadside drainage should not be directly to waterways.
- Ideally clearing and road construction near the waterway locations should take place during the dry period of the year when rain is less likely.
- It is recommended that the proponent manage stormwater in accordance with the 'Decision process for stormwater management in WA' and the 'Stormwater Management Manual for Western Australia'.

Methodology References:
DoW (2016)

4. References

- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2012) EPBC Act referral guidelines for three threatened black cockatoo species, Canberra.
- Department of Environment Regulation (DER) (2016) Site Inspection Report Clearing Regulation CPS 7282/1 (DER Ref: A1187585).
- Department of Water (2016) Application to clear native vegetation under the Environmental Protection Act 1986 – proposed clearing for road reserves for widening at Darkan Road South, Ranjander Road and Cordering Road North (DER Ref: A1191003).
- Department of Parks and Wildlife (Parks and Wildlife) (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. URL: <http://naturemap.dpaw.wa.gov.au/>. Accessed October 2016
- Department of Parks and Wildlife (Parks and Wildlife) (2016a) South West Regional Office Advice Request CPS 7282/1 (DER Ref: A1192072).
- Department of Parks and Wildlife (Parks and Wildlife) (2016b) Species and Community Advice Request CPS 7282/1 (DER Ref: A1327208).
- Environmental Protection Authority (2004) Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986) Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia No. 51.
- Government of Western Australia (2015). 2015 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2015. WA Department of Parks and Wildlife, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, 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.
- Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
- 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.
- Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Parks and Wildlife. <http://florabase.dpaw.wa.gov.au/> (Accessed October 2016).