



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7891/1
Permit Holder:	Shire of Esperance
Duration of Permit:	1 June 2018 to 1 June 2028

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 sand extraction.

2. Land on which clearing is to be done

Lot 5 on Deposited Plan 61342, Bandy Creek.

3. Area of Clearing

The Permit Holder must not clear more than 22.1 hectares of native vegetation within the area hatched yellow on attached Plan 7891/1.

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

The Permit Holder shall not clear any native vegetation after 1 June 2023.

6. Type of clearing authorised

The Permit Holder must ensure that extraction activities occur within two months of the authorised clearing being undertaken.

7. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 3 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.

8. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for activities to the extent that the Permit Holder has the right to access land under the *Land Administration Act 1997* or any other written law.

PART II –MANAGEMENT CONDITIONS

9. 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.

10. 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*:

- (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;
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared; and
- (d) where *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is to be removed from the area to be cleared, ensure it is transferred to areas of comparable *soil disease status*.

11. Retain vegetative material and topsoil, revegetation and rehabilitation

The Permit Holder shall:

- (a) retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil in an area that has already been cleared.
- (b) within 2 months following clearing authorised under this permit, *revegetate* and *rehabilitate* the area(s) that are no longer required for the purpose for which they were cleared under this Permit by:
 - (i) re-shaping the surface of the land so that it is consistent with the surrounding 5 metres of uncleared land; and
 - (ii) ripping the pit floor and contour batters within the extraction site; and
 - (iii) laying the vegetative material and topsoil retained under condition 11(a) on the cleared area(s).
- (c) within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 11(b) of this Permit:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
 - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 11(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.
- (d) Where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with condition 11(c)(ii) of this permit, the Permit Holder shall repeat condition 11(c)(i) and 11(c)(ii) within 24 months of undertaking the additional *planting* or *direct seeding* of native vegetation.
- (e) Where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 11(c)(i) and (ii) of this permit, that determination shall be submitted to the *CEO*.

PART III - RECORD KEEPING AND REPORTING

12. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
 - (i) 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;
 - (ii) the date that the clearing commenced;
 - (iii) the date the extraction operations ceased;
 - (iv) the size of the area cleared (in hectares);
 - (v) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 9 of this Permit; and
 - (vi) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 10 of this Permit.
- (b) In relation to the *revegetation and rehabilitation* of areas pursuant to condition 11 of this Permit:
 - (i) the location of any areas *revegetated* and *rehabilitated*, 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;
 - (ii) a description of the *revegetation and rehabilitation* activities undertaken;
 - (iii) the size of the area *revegetated* and *rehabilitated* (in hectares);
 - (iv) the species composition, structure and density of *revegetation and rehabilitation*, and
 - (v) a copy of the environmental specialist's report.

13. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before the 30 June each year, a written report:
 - (i) of records required under condition 12 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 a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before the 30 June of each year.

Definitions

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

CEO means the definition given within the *Environmental Protection Act 1986*;

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

dry conditions means when soils (not dust) do not freely adhere to rubber tyres, tracks, vehicle chassis or wheel arches;

direct seeding means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species;

environmental specialist: means a person who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit;

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

local provenance means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared;

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;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

regenerate/ed/ion means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing **mulch**;

rehabilitate/ed/ion means actively managing an area containing native vegetation in order to improve the ecological function of that area;

revegetate/ed/ion means the re-establishment of a cover of **local provenance** native vegetation in an area using methods such as natural **regeneration**, **direct seeding** and/or **planting**, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area;

soil disease status means soil types either infested, not infested, uninterpretable or not interpreted with a pathogen;

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



Mathew Gannaway
MANAGER
CLEARING REGULATION

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

2 May 2018

Plan 7891/1

121°57'36"

121°58'12"

-33°49'12"

-33°49'12"



121°57'36"

121°58'12"

-33°49'48"

-33°49'48"

Legend

-  Areas approved to clear
-  Roads
-  Local Government Authority cadastre
-  Cadastre
- WANow_Imagery



MGA 94
Geocentric Datum of Australia 1994
Mathew Gannaway Date *2/5/15*
Mathew Gannaway

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.: 7891/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Shire of Esperance
Application received date: 29 November 2017

1.3. Property details

Property: Lot 5 on Deposited Plan 61342, Bandy Creek
Local Government Authority: Esperance, Shire of
Localities: Bandy Creek

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
22.1		Mechanical Removal	Extractive industry

1.5. Decision on application

Decision on Permit Application: Granted

Decision Date: 2 May 2018

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* (EP Act). It has been concluded that the proposed clearing may be at variance to (g) and is not likely to be at variance to the remaining principles.

Based on the assessment, the Delegated Officer determined that the proposed clearing may cause appreciable land degradation in the form of wind and soil erosion between clearing and extraction activities.

To minimise the potential for appreciable land degradation, the clearing permit contains a condition requiring:

- Extraction activities must occur within two months of clearing; and
- Where extraction activities cease, revegetation is required to be undertaken within two months.

A revegetation condition has been placed on the clearing permit requiring the applicant to revegetate to the pre-clearing vegetation type to ensure no permanent loss of the vegetation type under application will occur.

The proposed clearing may result in the spread of weeds and dieback into adjacent areas of remnant vegetation. A weed and dieback management condition has been placed on the clearing permit to minimise this risk.

In determining to grant a clearing permit subject to conditions, the Delegated Officer found that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description

The application is to clear 22.1 hectares of native vegetation within Lot 5 on Deposited Plan 61342, Bandy Creek, for the purpose of sand extraction. The applicant proposes to extract sand material in order to undertake restoration of the Esperance foreshore.

Vegetation Description

Two mapped Beard vegetation associations occur within the application area:

- 42: Shrublands; mallee and acacia scrub on south coastal dunes; and
- 129: Bare areas; drift sand (Shepherd et al. 2001).

Vegetation Condition

The condition and description of the application area was determined via a Level 1 flora and vegetation survey conducted in December 2017 by the Shire of Esperance (Shire of Esperance, 2017).

The application area was found to be in a degraded to very good condition:

Degraded: Structure severely disturbed; regeneration to good condition requires intensive

management (Keighery 1994).

To

Very Good; Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).

Comments

The local area considered in this assessment of this application is defined as a 10 kilometre radius measured from the perimeter of the application area.



Figure 1: Map of the application area

3. Minimisation and mitigation measures

The applicant has advised that they propose to conduct the same rehabilitation practices within the application area post clearing and sand extraction as conducted for adjoining Clearing Permit CPS 5692/1 which were found to be effective. Additionally, the Shire of Esperance proposes to retain a vegetative buffer of approximately 20 metres wide along the roadside and tracks to deter the public from entering the site and impacting on adjoining vegetation.

4. Assessment of application against clearing principles

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

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

A Level 1 flora survey conducted by the Shire of Esperance during December 2017 identified the vegetation within the application area comprises of one plant community being *Acacia* shrubland in a degraded to very good (Keighery, 1994) condition, with the majority of the application area in a very good (Keighery, 1994) condition. The areas that occur along the perimeter of the application area and adjacent to the current tip site have been impacted by edge effects from previous human activities, and are considered to be in a degraded (Keighery, 1994) condition.

According to available databases, a total of 37 priority flora and one rare flora species have been recorded within the local area. One priority three flora species '*Leucopogon rotundifolius*' was recorded within the application area during the Level 1 flora survey conducted by the applicant (Shire of Esperance, 2017). This species typically grows in sandy soils around coastal granite outcrops and in coastal scrub/heaths (Department of Biodiversity, Conservation and Attractions (DBCA), 2017). The species is reported to be very common, known from a number of locations at nearby Cape Le Grand National Park and occurring mostly on granite outcrops (DBCA, 2017). DBCA advised that the application area occurs within the known range of the species and the impact of the proposed clearing is not likely to result in a significant impact to the conservation status of this species.

As discussed under Principle (b), the application area is not likely to provide significant habitat for any conservation significant fauna that has been recorded within the local area given the extensive vegetation that adjoins the application area.

As discussed under Principle (c), one rare flora species has been recorded 15.4 kilometres from the application area. Noting the habitat requirements for this species, it is not likely that suitable habitat occurs within the application area. There were no rare flora species identified during the flora survey undertaken by the Shire of Esperance (2017). Therefore, the proposed clearing is not likely to impact rare flora. DBCA advised that the application area is not considered likely to provide significant habitat for any conservation significant flora of concern (DBCA, 2018).

As discussed under Principle (d), the application area is mapped within the Commonwealth listed 'Proteaceae dominated Kwongan Shrublands of the southeast coastal floristic province of Western Australia' threatened ecological community (TEC). The flora survey undertaken by the applicant identified that the vegetation within the application area is not representative of

this TEC.

The disturbance caused by the proposed clearing may introduce or spread weeds and dieback into adjacent areas of remnant vegetation. Weed and dieback management practices will assist to minimise this risk.

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

(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.

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

According to available databases, 46 fauna species of conservation significance have been recorded within 20 kilometres of the application area (DBCA, 2007-). The majority of these species are waterbird species that utilise the Lake Warden wetland suite located 1.6 kilometres north of the application area. The Lake Warden wetland suite is recognised internationally via the Ramsar convention and nationally via the ANCA Directory of Important Wetlands in Australia.

The Lake Warden wetland suite is located within the Bandy Creek Catchment. The majority of the application area is not located within the Bandy Creek Catchment. The portion of application area that is located within the Bandy Creek Catchment is located downstream of the Lake Warden wetland suite, therefore the proposed clearing is not likely to significantly impact upon the wetland suite and its associated fauna values.

The application area is not likely to provide significant habitat for other fauna recorded in the local area given the extensive native vegetation surrounding the application area that is in a similar or better condition.

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

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

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

A search of DBCA's rare flora database revealed that there is one record of rare flora species mapped within the local area (20 kilometre radius). The closest rare flora species is mapped approximately 15.4 kilometres from the application area and occurs within sandy soils that have a preference for granite outcrops and hills (Western Australian Herbarium, 1998-).

Noting the habitat requirements for this species and that DBCA have advised the application area is not likely to provide habitat for conservation significant flora, it is unlikely this species would be present at the site (DBCA, 2018).

There were no rare flora species recorded within the application area during the applicant's Level 1 flora and vegetation survey (Shire of Esperance, 2017). DBCA advised that the application area is not likely to provide habitat for conservation significant flora recorded within the local area (DBCA, 2018).

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

(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.

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

According to available databases, the majority of the application area intersects the Commonwealth listed 'Proteaceae dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia' TEC (Kwongkan Shrublands TEC). This TEC is listed as endangered under the EPBC Act.

The applicant's Level 1 flora and vegetation survey confirmed that the vegetation within the application area is not representative of the Kwongkan Shrublands TEC due to the absence of key indicator species and noting the vegetation type under application is a coastal *Acacia* shrubland (Shire of Esperance, 2017).

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

(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.

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).

As indicated in Table 1, the Esperance Plains bioregion and the mapped Beard vegetation retain greater than 30 per cent of their pre-European extents (Government of Western Australia, 2017).

The local area retains approximately 26.2 per cent of native vegetation (32,911 hectares remaining) within a 20 kilometre radius. Therefore, the application falls within an extensively cleared landscape.

The application area is surrounded by a larger remnant of native vegetation 350 hectares in size and is of a similar type and

condition as that proposed to be cleared. While in an extensively cleared landscape, the vegetation under application is not considered a significant remnant as it does not provide a linkage between remnants of native vegetation and due to the well represented vegetation types within the local area. In addition, the requirement to revegetate the cleared areas once extraction activities cease will ensure no permanent loss of native vegetation will occur.

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 DBCA Managed Lands (%)
IBRA Bioregion*				
Esperance Plains	2,899,941	1,495,046	51.6	54.9
Beard Vegetation Association in Bioregion*				
42	135,420	128,053	94.6	56.8
129	32,453	31,058	95.7	60.4

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

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

According to available databases, there are no wetlands or watercourses mapped within the application area. The closest hydrological feature is the Lake Warden wetland system, which is a RAMSAR and ANCA listed wetland, located approximately 1.6 kilometres north of the application area. A major river known as the Bandy Creek river is also mapped approximately 1.6 kilometres north of the application area.

Noting the distance to these hydrological features, it is considered that the proposed clearing is unlikely to impact upon riparian vegetation growing in association to this wetland and watercourse.

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

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

Proposed clearing may be at variance to this Principle

The application area is situated within mapped soil type 'Tooregullup System' described as Holocene coastal sand dunes with some remnants of Pleistocene Formations (Schoknecht et al., 2004). Soils are calcareous deep sands and calcareous shallow sands (Schoknecht et al., 2004). The sandy soils within the application area are highly susceptible to wind erosion.

Noting the extent and location of the application area that is situated on a dune system and the soil type under application, the proposed clearing is likely to result in land degradation in the form of wind and soil erosion.

It is unlikely that land degradation in the form of water erosion would result from the proposed clearing, given the highly permeable soils within the application area and the low annual rainfall of 700 millimetres per annum.

Given the above, the proposed clearing may be at variance to this Principle.

To minimise the risk of wind erosion, the applicant will be required to undertake extraction activities within two months of the date of clearing and revegetate cleared areas within two months post extraction. This will prevent the prolonged exposure of bare sandy soils and maintain soil stabilisation.

(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.

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

The closest conservation area is Mullet Lake Nature Reserve (A class) located approximately 1.2 kilometres to both the north and east of the application area.

The application area forms part of a larger remnant of native vegetation (350 hectares) and includes the Mullet Lake Nature Reserve. Noting the application area is surrounded by intact native vegetation and the distance to this reserve, it is not likely the proposed clearing will impact upon the environmental values of this reserve, nor will it fragment an ecological corridor necessary for the movement of fauna between conservation reserves.

The proposed clearing may increase the risk of weeds and dieback spreading into adjacent remnant vegetation. Weed and dieback management measures will assist in mitigating this risk.

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

(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.

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

As discussed under Principle (f), there are no wetlands or watercourses mapped within the application area. The closest hydrological feature is the Lake Warden wetland system located 1.6 kilometres north of the application area.

Noting the vegetative buffer that occurs between the application area and this hydrological feature and the porous nature of the soils under application, the proposed clearing is not likely to impact upon surface or groundwater quality.

Groundwater salinity within the application area has been mapped as 500-1000 milligrams per litre Total Dissolved Solids. This level of groundwater salinity is considered to be marginal. The proposed clearing of 22.1 hectares within a vegetated remnant of 350 hectares in size is not likely to lead to a perceptible rise in the water table and thus an increase in groundwater salinity levels.

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

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

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

As discussed under Principle (g), the soils within the application area have been mapped as 'Tooregullup System' and are described as calcareous deep sands and calcareous shallow sands (Schoknecht et al., 2004). The Department of Primary Industries and Regional Development has mapped the flood risk for the application area as less than three per cent of the map unit with a moderate to high flood risk, the lowest risk category (Schoknecht et al., 2004). Given the mapped low level of flood risk, the extensive vegetation surrounding the application area and that no watercourses are present within the application area, it is unlikely that the proposed clearing will cause or exacerbate flooding.

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

Planning instruments and other relevant matters.

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 17 January 2018 with a 21 day submission period. No public submissions have been received in relation to this application.

5. References

- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra. Department of Biodiversity, Conservation and Attractions (DBCA) (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. URL: <http://naturemap.dec.wa.gov.au/>. Accessed 23/03/2018
- Department of Biodiversity, Conservation and Attractions (2018) Species and Communities Flora advice received in relation to clearing permit application CPS 7891/1, received 27 February 2018, Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: A1640424).
- Government of Western Australia (2017) 2016 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of April 2018. 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.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs' Resource Management Technical Report No. 280. Department of Agriculture.
- 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.
- Shire of Esperance (2017) Level 1 Flora Survey Report –Wylie Bay Sand Extraction. Report prepared by Julie Waters. December 2017. Shire of Esperance, Western Australia (DER Ref: A1577506).
- Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Parks and Wildlife. <http://florabase.dpaw.wa.gov.au/> (Accessed 23/03/2018).

GIS Database:

- Aerial imagery
- Remnant vegetation
- SAC bio datasets (accessed April 2018)
- Pre-European Vegetation
- Hydrography, linear
- Soils, statewide
- Groundwater salinity, statewide
- Land Degradation datasets
- DPaW estate
- Aboriginal Sites of Significance