



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8859/1
Permit Holder:	Shire of Dandaragan
Duration of Permit:	21 August 2020 to 21 August 2030

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 is for the purpose of gravel extraction.

2. Land on which clearing is to be done

Lot 11268 on Plan 182862 (R 35593), Hill River, Shire of Dandaragan, Western Australia.

3. Area of Clearing

The Permit Holder must not clear more than 5 hectares within the area cross-hatched yellow on attached Plan 8859/1.

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

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

6. 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:

- avoid the clearing of native vegetation;
- minimise the amount of native vegetation to be cleared; and
- reduce the impact of clearing on any environmental value.

7. 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;

- (b) ensure that no known *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;
- (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; and
- (e) at least once in each 12-month period, the Permit Holder must remove or kill any *weeds* growing within areas cleared under this Permit.

8. Limitation of clearing

The Permit Holder must:

- (a) not clear more than two hectares at any given time within the area crossed hatched yellow on the attached Plan 8859/1 for the purpose authorised under this Permit; and
- (b) not clear more than five hectares total within the area crossed hatched yellow on attached Plan 8859/1.

9. Duration of clearing

The Permit does not authorise the Permit Holder to clear native vegetation within the area crossed hatched yellow on attached Plan 8859/1 for the purpose authorised under this Permit after 21 August 2025.

10. Direction of clearing

The Permit Holder shall conduct clearing in a slow progressive manner from one direction to the other (e.g. west to east) to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

11. Fencing

The Permit Holder must:

- (a) prior to commencing clearing authorised under this Permit, construct or install a fence fully enclosing the area cross-hatched yellow on the attached Plan 8859/1 for the duration of this Permit.
- (b) the fence is to be constructed to allow fauna to pass through.

12. Revegetation

The Permit Holder shall:

- (a) Retain the vegetative material and topsoil removed by clearing authorised within the area crossed hatched yellow on attached Plan 8859/1 and stockpile the vegetative material and topsoil in an area that has already been cleared.
- (b) At an *optimal time* within 12 months following completion of material extraction, *revegetate* the areas not required for the authorised purpose for which they were cleared under this Permit, by:
 - (i) ripping the ground on the contour to remove soil compaction; and
 - (ii) laying the vegetative material and topsoil retained under condition 12(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 12(b) of this Permit the Permit Holder shall:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated*; and
 - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 12(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 12(c)(ii) of this Permit, the Permit Holder shall repeat condition 12(c)(i) and 12(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* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 12(c)(i)

and condition 12(c) (ii) of this Permit, that determination shall be submitted for the *CEO's* consideration. If the *CEO* does not agree with the determination made under condition 12(c)(ii), the *CEO* may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under condition 12(c)(ii).

PART III – RECORD KEEPING AND REPORTING

13. 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 direction that clearing was undertaken;
- (d) the size of the area cleared (in hectares);
- (e) the date that gravel extraction ceased within each two hectare cell;
- (f) the date that clearing ceased;
- (g) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of this Permit;
- (h) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 7 of this Permit;
- (i) actions taken to fence the extent of clearing in accordance with condition 11 of this Permit; and
- (j) in relation to the *revegetation* of areas pursuant to condition 12 of this Permit
 - (i) the size of the area *revegetated*;
 - (ii) the date(s) on which the area *revegetated* was undertaken;
 - (iii) the *revegetation* activities undertaken;
 - (iv) the date(s) where additional *planting* or *direct seeding* of native vegetation was undertaken; and
 - (v) the boundaries of the area *revegetated* (recorded digitally as a shapefile).

14. Reporting

The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:

- (a) of records required under condition 13 of this Permit; and
- (b) concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding calendar year.
- (c) 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.
- (a) Prior to 21 May 2030 the Permit Holder must provide to the *CEO* a written report of records required under condition 13 of this Permit where these records have not already been provided under condition 14(a) of this Permit.

DEFINITIONS

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

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;

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, or who is approved by the *CEO* as a suitable environmental specialist.

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 25 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;

optimal time means the period from July to September;

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

revegetation, revegetate, revegetated means the re-establishment of a cover of native vegetation in an area such that the species composition, structure and density is similar to pre-clearing vegetation types in that area, and can involve regeneration, direct seeding and/or planting;

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
NATIVE VEGETATION REGULATION

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

29 July 2020

Plan 8859/1

115°8'24.00000"E

115°8'29.40000"E

115°8'34.80000"E

115°8'40.20000"E

30°10'4.80000"S

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115°8'24.00000"E

115°8'29.40000"E


115°8'34.80000"E

115°8'40.20000"E

8859/1

LOT 11268 ON DEPOSITED PLAN 182862

CPS layers

 CPS areas approved to clear

base layers

Cadastre - LGATE 218

Map Layers


 Land Tenure LGATE - 226

 Local Government Authorities



0 50 100 150 200 m




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Gannaway
2020.07.29
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Officer delegated under section 20 of the
Environmental Protection Act 1986

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MGA Zone 50
Geocentric Datum of Australia 1994



GOVERNMENT OF
WESTERN AUSTRALIA



Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 8859/1
Permit type:	Purpose permit
Applicant name:	Shire of Dandaragan.
Application received:	2 April 2020
Application area:	5 hectares of native vegetation
Purpose of clearing:	Gravel extraction
Method of clearing:	Mechanical clearing
Property:	Lot 11268 on Plan 182862 (Reserve R 35593)
Location (LGA area/s):	Shire of Dandaragan
Localities (suburb/s):	Hill River 6521

1.2. Description of clearing activities

The vegetation applied to be cleared is contained within a single contiguous area (see Figure 1, Section 1.5). The application area is approximately five hectares adjacent to a previous gravel extraction site permitted under CPS 2063/1.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	29 July 2020
Decision area:	5 hectares of native vegetation as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Water and Environmental Regulation (DWER) on 2 April 2020.

In undertaking their assessment, and in accordance with section 51O of the EP Act, the Delegated Officer has given consideration to the Clearing Principles in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments, surveys undertaken by the applicant, and any other pertinent matters deemed relevant to the assessment (see Section 3.3). The Delegated Officer also took into consideration the purpose of the clearing to obtain a gravel resource for local road maintenance.

The assessment identified that the proposed clearing will result in the following:

- may impact fauna utilising the application area at the time of clearing
- impact priority flora known to occur within the application area
- may lead to land degradation in the form of wind erosion
- may increase the risk of weeds and dieback impacting an area of land vested for conservation adjacent to the application area.

After consideration of the available information, as well as the applicants avoidance and minimisation measures (see Section 3.1), the Delegated Officer has determined that with appropriate management conditions, the proposed clearing is not likely to lead to an unacceptable risk to the environment. The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise and reduce the impacts and extent of clearing

- minimise any gravel extraction period to no more than two hectares in size, to minimise the long term impacts of the proposed clearing, in particular to the conservation reserve
- clearly demarcate approved clearing areas prior to clearing to minimise impacts to priority flora
- progressively revegetate all cleared areas within six months of the area no longer being required for the purpose of gravel extraction, to minimise wind erosion and long term impacts
- take steps to minimise the introduction and spread of weeds and dieback to minimise impact to the surrounding vegetation
- slow, directional clearing to allow fauna to escape into the surrounding vegetation
- record keeping and reporting requirements.

The Delegated Officer noted that priority flora will be impacted by the proposed clearing. It is considered that the loss of priority flora as a result of the clearing will not impact the conservation status of the species, and will not significantly impact their local or regional occurrence.

1.5. Site map

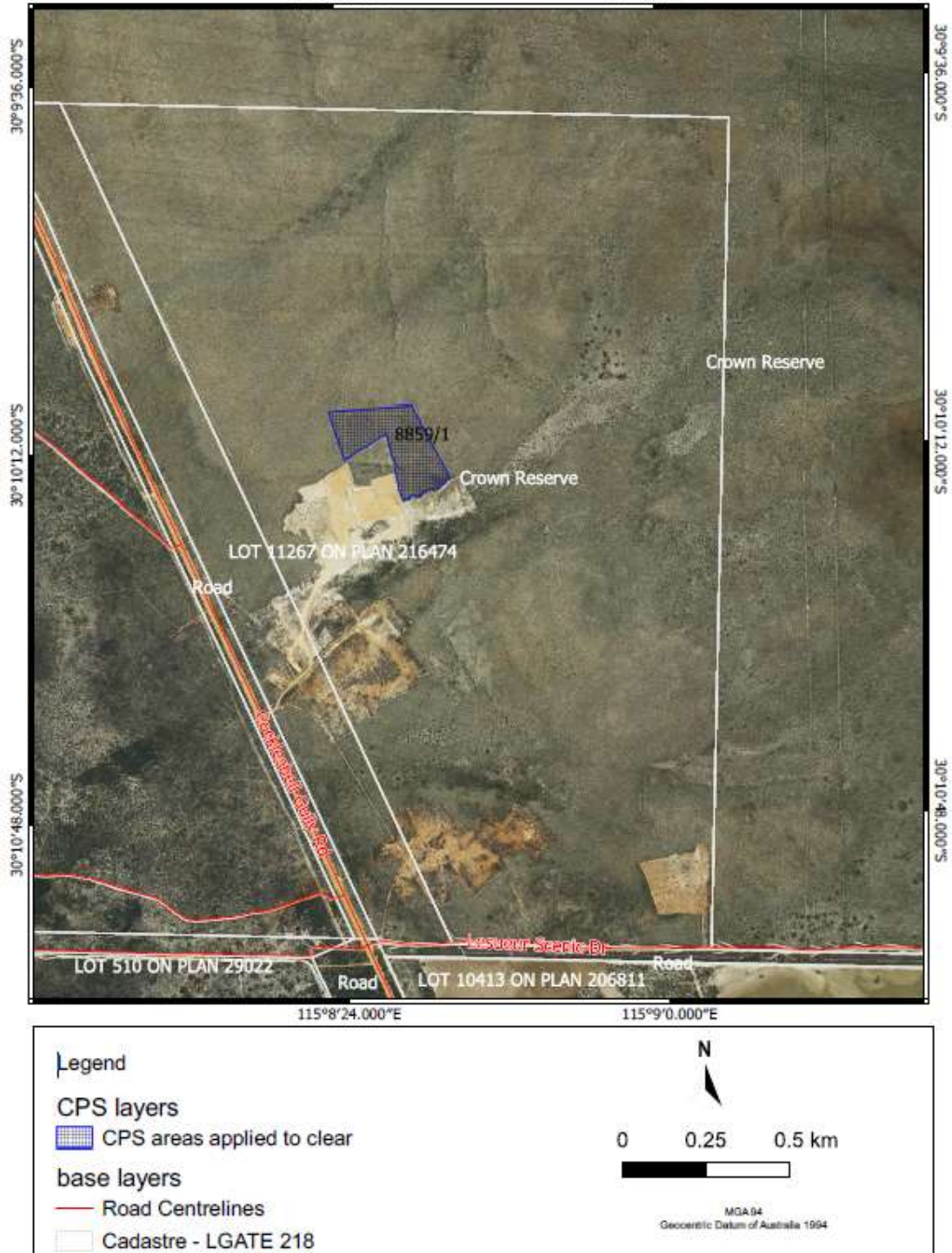


Figure 1. Map of application area (CPS 8859/1).

2. Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 3.2), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

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

Other legislation of relevance for this assessment include:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Biodiversity Conservation Act 2016* (BC Act);
- *Local Government Act 1995* (LG Act) and
- *Conservation and Land Management Act 1984* (WA) (CALM Act).

The key guidance documents which inform this assessment are:

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

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Avoidance

The Shire of Dandaragan (the Shire) sources gravel required for road works from a number of gravel pits within the Shire. The Shire has an ongoing program of looking for alternative gravel resources in already cleared areas. Evidence was submitted by the applicant, demonstrating that alternative sources of gravel are not close enough to usage areas. If more local sources of gravel are found in the future, and made accessible to the Shire, these alternative sources would be used in preference to Reserve R 35593 (Shire of Dandaragan 2020c).

The Shire commissioned Maia (2020a) to undertake targeted flora, vegetation and fauna surveys over Reserve R 35593, the site of the application area, and subsequently commissioned Maia (2020b) to investigate three clearing polygons and their impacts to Priority flora taxa present. Survey data was used to assess the three clearing options, with the irregularly shaped 'Option 3' chosen to minimise clearing of Priority flora species, and to reduce regional and local impacts to Priority species, in particular the Priority 2 species *Synaphea lesueurensis* by avoiding the majority of records (Shire of Dandaragan 2020c). The shape and extend of the application area has been chosen to minimise impacts to conservation significant flora species located in a broader survey area (Figure 2).

Minimisation and mitigation

The application area considered for the proposed clearing is the minimum area required for the quantity of gravel needed for forward-planned road works. A previous native vegetation clearing permit granted to the Shire for the purpose of gravel extraction in Reserve R 35593 permitted the clearing of 13.4 hectares of vegetation. The Shire has reduced the area applied for to five hectares (Shire of Dandaragan 2020c).

The Shire plans to mitigate impacts associated with the proposed vegetation clearing and gravel extraction by progressively revegetating the area once gravel has been extracted, and clearing no more than two hectares at any one time (Maia 2020b). The Shire will store topsoil from cleared areas for use on areas to be revegetated thereby increasing the likelihood of the return of significant flora species. The Shire will also construct a temporary fence around the perimeter of any approved clearing area prior to any clearing to ensure that any Priority flora located close to the boundary of the application area are avoided. Appropriate weed and dieback management strategies will also be implemented by the Shire to minimise impacts to surrounding vegetation (Shire of Dandaragan 2020c).

The Shire have adequately demonstrated that all reasonable efforts had been taken to avoid and minimise potential impacts of the clearing on environmental values.

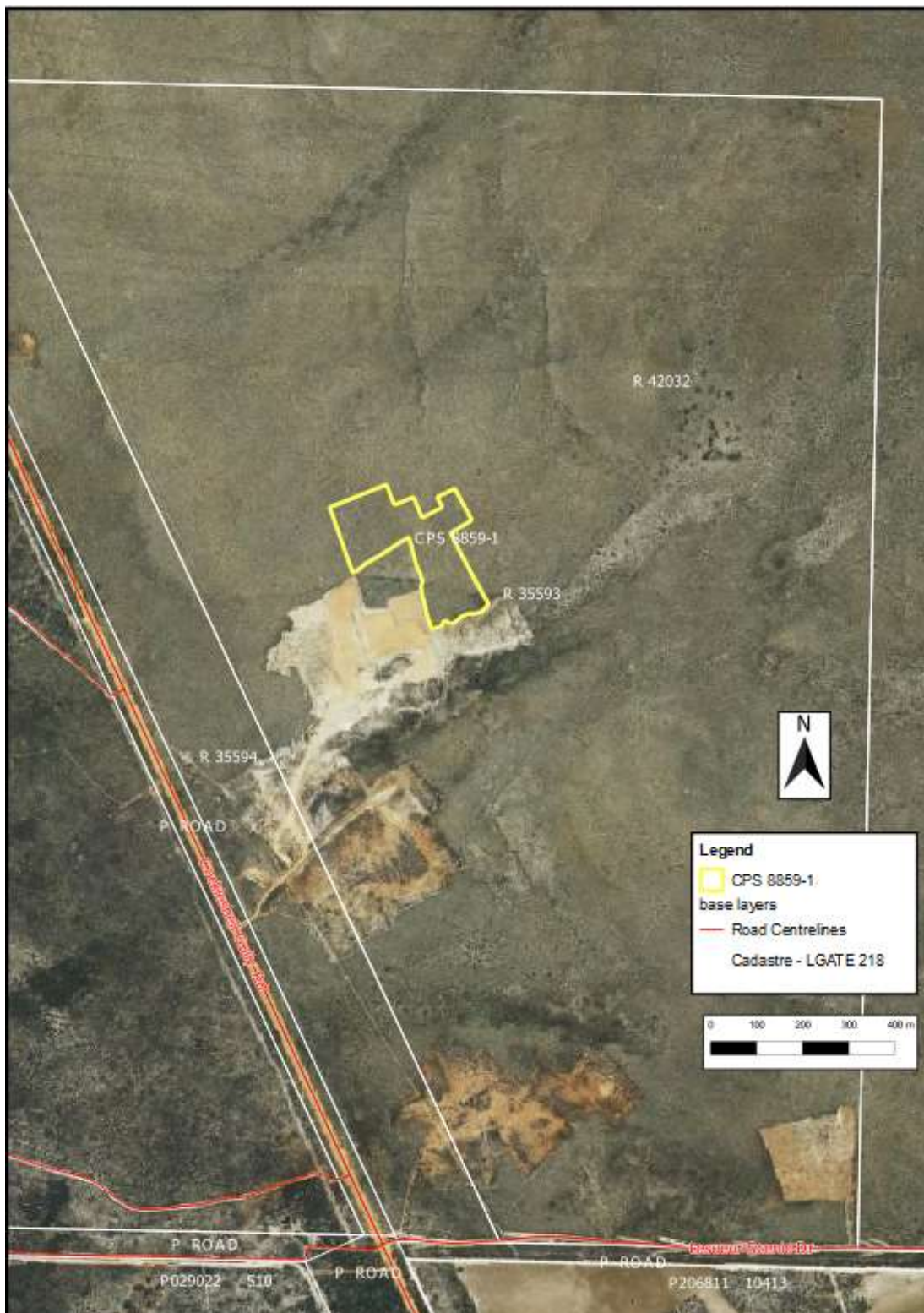


Figure 2. Map of revised application area (CPS 8859/1).

3.2. Assessment of environmental impacts

In assessing the application in accordance with section 510 of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix B), findings of a flora and fauna survey (Maia 2020a) (Appendix E) and considered whether the clearing poses a risk to environmental values. The assessment against the Clearing Principles is contained in Appendix C.

This assessment identified that the clearing may pose a risk to the environmental values of conservation significant flora and fauna, and conservation areas, and that these required further consideration. The detailed consideration and assessment of the clearing impacts against the specific environmental values is provided below. Where the assessment found that the clearing presents an unacceptable risk to environmental values, conditions aimed at controlling and/or ameliorating the impacts have been imposed under sections 51H and 51I of the EP Act. These are also identified below.

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

Assessment: A desktop study and targeted vertebrate fauna reconnaissance survey was undertaken over the application area as well as a greater area immediately surrounding the application area by Western Wildlife on March 31, 2020 (Maia 2020a). Of the conservation significant fauna identified in the area the Threatened Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and Malleefowl (*Leipoa ocellata*) have the potential to occur over the application area, as well as the Priority 4 Western Brush Wallaby (*Notamacropus irma*) (Maia 2020).

The application area is within the known range of the Endangered Carnaby's Cockatoo. No night roosting or breeding habitat occurs over the application area (Maia 2020a) (Appendix E). However, a known breeding site is located approximately 7.6 kilometres to the north of the application area, and a known night roost is located approximately 9.3 kilometres to the south, within the potential foraging distance of Carnaby's Cockatoo (DSEWPac 2012). Foraging habitat is present within the application area, as potential food genera such as Banksia and Hakea occur. The foraging habitat occurring is considered to be low quality (Maia 2020a) as the vegetation is very low in height, and although proteaceous species are present, they are not the key species known to be favoured by Carnaby's Cockatoo which occur in taller proteaceous shrublands and woodlands in the region (Maia 2020a). No evidence of foraging activity was observed in the application area during the survey (Maia 2020a) and the application area represents 0.03% of the potential foraging habitat represented locally within the conservation estate (that is, within 10 kilometres based on vegetation association mapping).

The closest known records of the Vulnerable Malleefowl are historical records (from the year 1959) located approximately 4.4 kilometres to the north-west of the application area. The application area is unlikely to provide breeding habitat, as the vegetation is too low, and litter-forming shrublands within which the species constructs its distinctive nesting mounds are absent (Maia 2020a). No evidence of the Malleefowl was recorded (Maia 2020a). If they still persist in the region they would occur intermittently as foraging visitors, however the likelihood of this is considered low (Maia 2020a).

Vegetation within the application area represents potential habitat for the Priority 4 Western Brush Wallaby (*Notamacropus irma*). The Survey Area is likely to represent the home-range of a single individual, as home-range size has been estimated at about 9.9 hectares for males and 5.3 hectares for females (Bamford and Bamford 1999). While this represents a loss of potential habitat, the vegetation within the application area is well represented locally (75 per cent retained), much of it protected within conservation lands. There remains a minor risk for the presence of Western Brush Wallabies within the application area at the time of clearing, however, the application area is surrounded by large tracts of native vegetation and any individual is likely to disperse into surrounding areas at the time of clearing.

The application area does not represent a significant loss of potential habitat or foraging extent for Carnaby's Cockatoo, or a significant loss of potential habitat for the Malleefowl or Western Brush Wallaby. The applicant's commitment to undertake post-extraction revegetation (see Sections 3.2.2 and 3.2.3 below) has the objective of no long-term loss of vegetation extent, and no long-term impacts to vertebrate fauna habitat.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered **acceptable subject to relevant conditions** in relation to this environmental value.

Conditions: To address the above impacts, the following conditions will be added to the permit:

- Progressively revegetate all cleared areas within six months of the area no longer being required for the purpose of extraction
- slow, directional clearing to allow fauna to escape into the surrounding vegetation.

3.2.2. Environmental value: biological values (flora) – Clearing Principles (a) to (d)

Assessment: A desktop study and targeted flora and vegetation reconnaissance survey was undertaken over the application area, as well as a broader area immediately surrounding the application area, by Maia (2020a). The survey was carried out by three botanists on 14 and 18 October 2019. The survey timing coincided with the flowering times of Threatened, and the majority of Priority flora species, recorded within the local area.

Vegetation within the proposed clearing was recorded to have a mean species richness of 39 species per 100m² (Maia 2020a). A survey conducted by Martinick and Associates (1988) within the local area recorded a mean species richness of between 82.5 and 95.3 species per 100m². While this shows a relatively low level of species richness

within the application area, given the survey timing and coverage, the survey is considered adequate in determining the likelihood of the presence of Threatened and Priority flora, as well as any Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs), within the application area.

The desktop assessment identified two TECs/PECs with the potential to occur within the application area. The 'Banksia dominated woodlands of the Swan Coastal Plain IBRA region' (P3 PEC) (Endangered TEC) is located approximately 0.5 kilometres to the west of the application area, and '*Petrophile chrysantha* low heath on Lesueur dissected uplands (Gp200-170)' (P2 PEC) is located approximately 5.4 kilometres east of the application area. Based upon the composition of the TECs and PECs with the potential to occur, the vegetation described within the application area is not analogous with these or any other conservation significant communities known to occur within the Geraldton Sandplains bioregion of Thackway and Cresswell (1995).

No Threatened flora species were recorded by Maia (2020a) over the broader survey area, including the application area, and the vegetation present is unlikely to include threatened flora (Maia 2020). The desktop assessment of Maia (2020a) identified 19 Priority flora species occurring within the local area that have the potential to occur based on habitat requirements. Of these, five priority species were located within the application area: *Synaphea lesueurensis* (P2), *Haemodorum loratum* (P3), *Patersonia argyrea* (P3), *Verticordia rutilastra* (P3) and *Xanthosia tomentosa* (P4). One *Synaphea* sp. Indet plant was recorded. This specimen could not be confirmed to species level as it had no flowers at the time of survey, but is highly likely to be another record for *Synaphea lesueurensis* (Maia 2020a). The Priority 3 species *Persoonia rudis* was also recorded (Maia 2020a), and two species were identified as representing range extensions; *Banksia bipinnatifida* subsp. *bipinnatifida* and *Petrophile brevifolia* subsp. *brevifolia* (Maia 2020a).

Based on the total known records for and distribution of conservation significant flora species recorded in the application area, the following impacts have been calculated (Maia 2020a):

- *Synaphea lesueurensis* (P2) – 2.0% of total known numbers, 9.09% of known populations
- *Haemodorum loratum* (P3) – 11.49% of total known numbers, 2.33% of known populations
- *Patersonia argyrea* (P3) – 3.70% of total known numbers, 7.69% of known populations
- *Verticordia rutilastra* (P3) – 0.76% of total known numbers, 2.94% of known populations
- *Persoonia rudis* (P3) – 2.3% of total known numbers, 2.1% of known populations
- *Xanthosia tomentosa* (P4) – 0.47% of total known numbers, 3.13% of known populations.

Maia (2020b) undertook an assessment of Priority species identified from the application area to determine local and regional impacts, and an assessment of the relevant protection of associated populations within areas protected for conservation at the local scale.

Impacts were estimated using all plant records for each species using the number of plants occurring within the ten kilometre radius to address local area impacts. Calculations were undertaken using known plant and population numbers, and population boundaries were defined by buffering plant locations by 500 metres, consistent with the method used by the DBCA (Maia 2020b).

The data was used to assess three clearing options, with Option 3 (Figure 2) being the revised application area assessed here (CPS 8859/1). This option maximises the reduction of regional and local impact to Priority species, and in particular the Priority 2 *Synaphea lesueurensis*; with four individuals impacted from a total of 15 identified (Maia 2020b).

In regard to the revised application area, regional impact to populations ranged between 2.3 per cent for *Haemodorum loratum* and 9.1 per cent for *Synaphea lesueurensis* (Maia 2020b). Local impact ranges between 7.7 per cent for *Xanthosia tomentosa* and 25.0 per cent for *Patersonia argyrea* (Maia 2020b).

Significant percentages of Priority flora populations are protected in DBCA Legislated Lands within the local area; ranging between 42.9 per cent (for *Haemodorum loratum*) and 88.9 per cent (for *Verticordia rutilastra*) (Maia 2020b).

Regional impact to the Priority 2 *Synaphea lesueurensis* populations was assessed at 9.1 per cent, and at 12.5 per cent for local impact to populations. Seven of the 11 of the currently known populations of *Synaphea lesueurensis* (or 63.6 per cent) occur within lands managed for conservation with 62.5 per cent of populations protected at the local scale. Four individual *Synaphea lesueurensis* will be impacted (Maia 2020b), from a total of 15 identified in the survey of (Maia 2020a).

Maia Environmental Consultancy have recorded *Synaphea lesueurensis* in the Jurien East Road reserve as well as the area surrounding the application area, and it is likely that more records occur in similar habitat between these records and in the local area (Maia 2020a).

Local population impacts to the Priority 3 *Patersonia argyrea* are high, however, 50 per cent of local populations are located in lands protected for conservation (Maia 2020b), with just 3.70% of total known numbers impacted in the local area (Maia 2020a). Maia Environmental Consultancy have recorded *Patersonia argyrea* in the Jurien East Road

reserve as well as the application area and it is likely that more records occur in similar habitat between these records and in the surrounding area (Maia 2020a).

Most of the Priority species have large distributions (Maia 2020b) (Appendix E), and given that the vegetation type recorded in the application area extends over a large area around and beyond the application area, it is likely that each of these species will occur in similar numbers in surrounding vegetation. Additionally, the application area abuts conservation areas with suitable habitat, and the six Priority flora species are likely to extend into these conservation areas (Maia 2020b).

The Shire has committed to the progressive revegetation of cleared areas utilising topsoil salvaged from cleared areas (Shire of Dandaragan 2020c). Topsoil will include a seed bank and vegetative propagules of locally provenanced taxa, and the use of topsoil will increase the likelihood of the re-establishment of conservation significant flora species over previously cleared areas. The Shire will also construct a temporary fence around the perimeter of any approved clearing area prior to any clearing to ensure that Priority flora located close to the boundary of the application area are avoided (Shire of Dandaragan 2020c). The applicant's commitment to undertake post-extraction revegetation (see Section 3.2.3) has the objective of no long-term loss of vegetation extent, and no long-term impacts to significant flora are anticipated.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered **acceptable subject to relevant conditions** in relation to this environmental value.

Conditions: To address the above impacts, the following conditions will be added to the permit:

- Clearly demarcate clearing areas with temporary fencing prior to clearing to avoid any conservation significant flora taxa.
- Minimise active gravel extraction to no more than two hectares in size at any given time.
- Progressively revegetate all cleared areas within six months of the area no longer being required for the purpose of extraction utilising stored topsoil salvaged from the location.
- Implement weed and dieback management strategies.

3.2.3. Environmental value: significant remnant vegetation and conservation areas – Clearing Principles (e) and (h)

Assessment: The application area is located within Reserve R 35593. This reserve abuts the boundaries of Lesueur National Park (R 42032) and Nature Reserve R 35594. Given the close proximity of Lesueur National Park and Nature Reserve R35594, clearing within Reserve R35593 may impact the conservation values of adjacent conservation reserves.

The application area itself has been strategically positioned within Reserve R 35593 to be adjacent to an existing gravel pit and to avoid conservation area boundaries; being located approximately 850 metres from the Lesueur National Park, and 350 metres from Nature Reserve R 35594.

The application area is located within Reserve R 35593 which is vested in the Conservation Commission of WA, and managed by DBCA. The use of the application area for the purposes of gravel extraction by the Shire has been permitted by DBCA under specific lease conditions (see Section 3.3). Proposed clearing has the potential to impact Reserve R 35593. Gravel Lease 176 (CALM Act Lease no. 176/100) stipulates revegetation of all disturbed areas, as well as the implementation of dieback and weed management strategies. The Shire will progressively rehabilitate clearing areas and vegetation will not be permanently lost, and with time there should be no net loss of vegetation. The commitment by the applicant to progressively rehabilitate any cleared areas once gravel extraction is complete minimises potential impacts to the adjacent conservation areas by:

- reducing the potential for long-term wind and water erosion;
- reducing the time topsoil piles are exposed to weeds;
- ensuring topsoil seed viability for use in the revegetation program; and
- re-establishing ecological values that facilitate the movement of fauna.

Implementation of dieback and weed management strategies will also mitigate any potential impact to Reserve R 35593, or the nearby Lesueur National Park and Nature Reserve R 35594.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered **acceptable subject to relevant conditions (see below)** in relation to this environmental value.

Conditions: To address the above impacts, the following conditions will be added to the permit:

- Clearly demarcate clearing areas with temporary fencing prior to clearing to avoid any conservation significant flora taxa.
- Minimise active gravel extraction to no more than two hectares in size at any given time.

- Progressively revegetate all cleared areas within six months of the area no longer being required for the purpose of extraction utilising stored topsoil salvaged from the location.
- Implement weed and dieback management strategies.

3.3. Relevant planning instruments and other matters

The application was advertised on the DWER website for a 21 day public comment period on 27 May 2020. No public submissions were received in relation to this application.

The application area is located within section 5(1) (g) reserve R 35593. The reserve is vested in the Conservation Commission of WA and managed by the DBCA. Under the CALM Act, the Shire of Dandaragan has held a lease over R 35593 for the designated purpose of “gravel resource management, restoration and conservation” (CALM Act Lease no. 176/100). The lease has been renewed on a number of occasions with the current lease expiring on 31 August 2015. The Shire is in the process of extending “Gravel Lease 176” over Reserve R 35593 with DBCA. DBCA is currently awaiting the preparation of a number of new lease templates by the State Solicitor’s Office (SSO) for the leases it manages. DBCA intends to renew the Shire’s lease over the reserve subject to the endorsement of the vesting body for the land; the Conservation and Parks Commission (CPC) being received (Shire of Dandaragan 2020b). Until the lease is renewed, the use of the lease area by the Shire has been permitted by DBCA for the purposes of gravel extraction, as per the expired lease conditions, whilst the department processes a backlog of lease extensions (Shire of Dandaragan 2020b).

The existing Gravel Lease 176 specifies that a maximum area of two hectares to be cleared at any given time followed by rehabilitation, and that dieback and weed management strategies be implemented to the satisfaction of the DBCA District Manager, Moora (CALM 1995).

The application is located within the Jurien Groundwater Area (Review) proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). There is no requirement for a RIWI Act Licence.

The Shire of Dandaragan has advised DWER that no further local government approvals are required, and that the clearing is consistent with the Shire’s Local Planning Scheme.

The application area is located within the boundaries of the Yued Native Title Claimant’s registered area of interest. The Yued Native Title Claimant and the South West Aboriginal Land and Sea Council were given opportunity to provide comment on the proposed clearing in accordance with section 24KA of the *Native Title Act 1993* (Cth). No responses were received.

No Aboriginal Heritage Places have been identified over the application area. An Aboriginal Heritage Place is located 2.75 kilometres south of the application area. It is the Permit Holder’s responsibility to comply with the *Aboriginal Heritage Act 1972* and to ensure that no Aboriginal sites of significance are damaged through the clearing process.

Appendix A – Additional information provided by applicant

Summary	Reference
<p>Included with the CPS 8859/1 application was a targeted flora, vegetation and vertebrate fauna reconnaissance survey report by Maia Environmental Consultancy Pty Ltd (Maia) and Western Wildlife (Maia 2020a). Surveys were undertaken over the application area as well as a broader area immediately surrounding the application area.</p> <p>The flora and vegetation survey was carried out by three botanists on 14 and 18 October 2019. The Botanists assessed two 10 metre by 10 metre quadrats in the application area as well as photo points and walked traverses at approximately 12 metre to 13 metre spacings over the entire application area and surrounds, surveying a band of vegetation approximately six metres to 10 metres wide.</p> <p>Western Wildlife undertook a vertebrate fauna desktop study and reconnaissance survey over the entire application area and surrounds. The vertebrate fauna reconnaissance survey was carried out by one Zoologist on 30 January 2020 (Maia 2020a).</p>	Maia (2020a)
<p>Maia provided DWER additional information pertaining to avoidance strategies to eliminate, reduce or mitigate the impact of proposed clearing, including a revision of the application area to avoid key populations of Priority flora, and in particular the Priority 2 species <i>Synaphea lesueurensis</i> (Maia 2020b).</p> <p>Maia also provided further regional information to determine the local population size and distribution of five Priority listed flora species that will be impacted by the proposed clearing (Maia 2020b).</p>	Maia (2020b)

Appendix B – Site characteristics

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

1. Site characteristics

Site characteristic	Details															
Local context	<p>The application area is part of an expansive tract of native vegetation. It is located wholly within Gravel Reserve R 35593 (Shire of Dandaragan 2020a). Reserve R 35593 is bounded by Nature Reserve R 35594 to the west, and Lesueur National Park (R 42032) adjacent to the northern and eastern boundaries.</p> <p>Spatial data indicates the local area (10 km radius of the application area) retains approximately 75 per cent of the original native vegetation cover.</p>															
Vegetation description	<p>A vegetation survey (Maia 2020a) indicates the vegetation within the application area consists of Low mixed Heathland mainly of <i>Isopogon dubius</i>, <i>Banksia armata</i> var. <i>armata</i> and <i>Xanthorrhoea</i> sp. Lesueur (G.J. Keighery 16404), with an Open Sedgeland of <i>Caustis dioica</i> and <i>Mesomelaena pseudostygia</i>. Survey descriptions and photography of Maia (2020a) is available in Appendix E.</p> <p>Vegetation descriptions of Maia (2020a) are consistent with the mapped vegetation association 1031, which is described as Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath (Shepherd et al. 2001).</p>															
Vegetation condition	<p>The vegetation survey of Maia (2020a) recorded the vegetation within the application area is in excellent condition (Keighery 1994).</p> <p>The full Keighery condition rating scale is provided in Appendix D. Survey descriptions and photography of Maia (2020a) is available in Appendix E.</p>															
Soil description	<p>The soil is mapped as the Yerramullah 2 Subsystem (Schoknecht et al. 2004) which is described as plateau residuals, very gently to gently inclined hillcrest and hillslopes; pale sandy gravels, shallow gravel over duricrust, gravelly pale deep sand, pale and yellow deep sands.</p>															
Land degradation risk	<p>The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the sub-system level (DPIRD 2017). The project area is located within one subsystem of the Yerramullah soil systems, known as the Yerramullah 2 Subsystem.</p> <p>The table below summaries the soil degradation risk within the project area. The risk of wind erosion over the application area is high.</p> <table border="1"> <thead> <tr> <th rowspan="2">Aspect</th> <th>Degradation risk</th> </tr> <tr> <th>Yerramullah 2 Subsystem</th> </tr> </thead> <tbody> <tr> <td>Wind Erosion</td> <td>89%</td> </tr> <tr> <td>Waterlogging</td> <td>0%</td> </tr> <tr> <td>Water Erosion</td> <td>0%</td> </tr> <tr> <td>Salinity</td> <td>0%</td> </tr> <tr> <td>Flood Risk</td> <td>0%</td> </tr> <tr> <td>Phosphorous Export Risk</td> <td>17%</td> </tr> </tbody> </table>	Aspect	Degradation risk	Yerramullah 2 Subsystem	Wind Erosion	89%	Waterlogging	0%	Water Erosion	0%	Salinity	0%	Flood Risk	0%	Phosphorous Export Risk	17%
Aspect	Degradation risk															
	Yerramullah 2 Subsystem															
Wind Erosion	89%															
Waterlogging	0%															
Water Erosion	0%															
Salinity	0%															
Flood Risk	0%															
Phosphorous Export Risk	17%															
Waterbodies	<p>The desktop assessment and aerial imagery indicated that no geomorphic wetlands occur within, or in the vicinity of, the application area. A minor drainage line occurs approximately 150 metres to the south of the application area.</p>															

Site characteristic	Details
Conservation areas	<p>The application area is located within Section 5(1) (g) reserve R 35593. Under the CALM Act the Shire of Dandaragan has a lease over R 35593 for the designated purpose of "gravel resource management, restoration and conservation" (CALM Act Lease no. 176/100) (see Section 3.3).</p> <p>Bordering the northern and eastern boundaries of R 35593 is Lesueur National Park (R 42032), the border of which is approximately 850 metres east and north of the application area.</p> <p>Bordering the western edge of R 35593 is Nature Reserve R 35594, the border of which is approximately 350 metres west of the application area.</p>
Climate and landform	<p>The Geraldton Sandplain bioregion climate can be described as semi-arid Mediterranean climate with 400 millimetre to 500 millimetre annual rainfall (Desmond and Chant 2001).</p> <p>The landform is described as dissected lateritic sandplain on Cretaceous and Jurassic sediments. Bounded in the east by the Dandaragan Scarp and in the south and west by the Gingin Scarp. Sandy and gravelly soils formed in colluvium and rock weathered <i>in situ</i> (Desmond and Chant 2001).</p>

2. Flora, fauna and ecosystem analysis

With consideration for the site characteristics set out above, relevant datasets (see Appendix F), and biological survey information (Maia 2020a), the following conservation significant flora and fauna species, and ecological communities may be impacted by the clearing. Six Priority flora taxa have been recorded within the application area: One Priority 2 taxa, four Priority 3 taxa and one Priority 4.

Species / Ecological Community	Distance of closest record to application area (kilometres)	Suitable soil type? (flora, ecological community)	Suitable vegetation type? (flora, ecological community)	Suitable habitat features (fauna)	Are surveys adequate to identify? (Y, N, N/A)
Communities					
Banksia dominated woodlands of the Swan Coastal Plain IBRA region (P3) (EN)	0.5	Yes	No		Yes
<i>Petrophile chrysantha</i> low heath on Lesueur dissected uplands (Gp200-170) (P2).	5.4	No	No		Yes
Fauna					
<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo) (EN) (T)	2.1			Yes	Yes
<i>Notamacropus irma</i> (Western Brush Wallaby) (P4)	4.8			Yes	Yes
Flora					
<i>Acacia carens</i> (P2)	4.9	Yes	No		Yes
<i>Acacia epacantha</i> (P3)	7.5	Yes	No		Yes
<i>Acacia forrestiana</i> (VU) (T)	6.3	Yes	No		Yes
<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> Cockleshell Gully variant (E.A. Griffin 2039) (P2)	2.2	Yes	Yes		Yes
<i>Acacia retrorsa</i> (P2)	0.6	Yes	No		Yes
<i>Allocasuarina grevilleoides</i> (P3)	4.6	Yes	No		Yes
<i>Banksia chamaephyton</i> (P4)	6.2	Yes	Yes		Yes
<i>Banksia kippistiana</i> var. <i>paenepeccata</i> (P3)	5.8	Yes	Yes		Yes
<i>Boronia ramosa</i> subsp. <i>lesueurana</i> (P2)	4.7	Yes	Yes		Yes
<i>Calytrix ecalycata</i> subsp. <i>brevis</i> (P3)	8.9	Yes	Yes		Yes

Species / Ecological Community	Distance of closest record to application area (kilometres)	Suitable soil type? (flora, ecological community)	Suitable vegetation type? (flora, ecological community)	Suitable habitat features (fauna)	Are surveys adequate to identify? (Y, N, N/A)
<i>Daviesia debilior</i> subsp. <i>debilior</i> (P2)	3.9	Yes	Yes		Yes
<i>Daviesia pteroclada</i> (P3)	3.9	Yes	No		Yes
<i>Guichenotia alba</i> (P3)	4.3	Yes	Yes		Yes
<i>Haemodorum loratum</i> (P3)	Recorded within application area (Maia 2020a)	Yes	Yes		Yes
<i>Hakea longiflora</i> (P3)	4.1	Yes	Yes		Yes
<i>Hakea neurophylla</i> (P4)	1.7	Yes	Yes		Yes
<i>Hypocalymma gardneri</i> (P3)	3.7	Yes	No		Yes
<i>Lasiopetalum rutilans</i> (P2)	4.0	Yes	No		Yes
<i>Lepidobolus quadratus</i> (P3)	3.2	Yes	No		Yes
<i>Patersonia argyrea</i> (P3)	Recorded within application area (Maia 2020a)	Yes	Yes		Yes
<i>Persoonia filiformis</i> (P3)	3.9	Yes	Yes		Yes
<i>Persoonia rudis</i> (P3)	Recorded within application area (Maia 2020a)	Yes	No		Yes
<i>Stylidium diplotrichum</i> (P2)	6.0	Yes	Yes		Yes
<i>Stylidium nonscandens</i> (P3)	3.4	Yes	No		Yes
<i>Synaphea lesueurensis</i> (P2)	Recorded within application area (Maia 2020a)	Yes	Yes		Yes
<i>Tetradthea remota</i> (P2)	5.9	Yes	Yes		Yes
<i>Thelymitra apiculata</i> (P4)	4.2	Yes	Yes		Yes
<i>Thelymitra pulcherrima</i> (P2)	4.2	Yes	Yes		Yes
<i>Thysanotus anceps</i> (P3)	4.0	Yes	No		Yes
<i>Thysanotus</i> sp. Badgingarra (E.A. Griffin 2511) (P2)	3.2	Yes	No		Yes
<i>Verticordia rutilastra</i> (P3)	Recorded within application area (Maia 2020a)	Yes	Yes		Yes
<i>Xanthosia tomentosa</i> (P4)	Recorded within application area (Maia 2020a)	Yes	Yes		Yes

Note: Threatened and priority status retrieved from Species Profile and Threats Database (Department of the Environment, 2020), and FloraBase (Western Australian Herbarium 1998-).

3. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	% remaining	Current extent in all DBCA managed land (ha)	% current extent in all DBCA managed land (proportion of pre-European extent)
IBRA bioregion (Thackway and Cresswell 1995)					
Geraldton Sandplains (GES)	3,136,038	1,404,424	44.78	568,255	18.24
Vegetation association (Shepherd et al. 2001)					
Assn.1031 in total	269,491	88,668	32.90	36,300	13.47
Assn.1031 within GES	241,350	83,217	34.48	35,527	14.72

Appendix C – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><u>Assessment:</u> Six Priority flora taxa have been recorded within the application area: One Priority 2 taxa, four Priority 3 taxa and one Priority 4 (Maia 2020a).</p>	May be at variance	Further consideration required, see Section 3.2.2
<p><u>Principle (b):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</p> <p><u>Assessment:</u> The application area represents potential habitat for <i>Calyptorhynchus latirostris</i> (Carnaby’s Cockatoo), Malleefowl (<i>Leipoa ocellata</i>) and <i>Notamacropus irma</i> (Western Brush Wallaby) (Maia 2020a).</p>	Not likely to be at variance	Further consideration required, see Section 3.2.1
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u> Based on the flora and vegetation survey conducted and likelihood of assessment, the application area is not likely to contain threatened flora species (Maia 2020a).</p>	Not at variance	Further consideration not required
<p><u>Principle (d):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.”</p> <p><u>Assessment:</u> The application area does not contain species assemblages analogous with any TEC’s as listed by the Western Australia Minister for Environment (Maia 2020a).</p>	Not at variance	Further consideration not required.
Environmental values: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><u>Assessment:</u> The extend of the native vegetation association 1031 in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia 2001). Approximately 75.1 per cent remnant vegetation is retained in the local area. Vegetation in the application area is not considered to be part of a significant ecological linkage in the local area.</p>	Not at variance	Further consideration not required.
<p><u>Principle (h):</u> “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.”</p> <p><u>Assessment:</u> The application area is located approximately 850 metres from Lesueur National Park (R 42032), and 350 metres from Nature Reserve R 35594. The application area itself is located within Reserve R 35593 vested in the Conservation Commission of WA, and managed by DBCA.</p>	May be at variance	Further consideration required, see Section 3.2.3
Environmental values: land and water resources		
<p><u>Principle (f):</u> “Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</p>	Not at variance	Further consideration not required.

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p><u>Assessment:</u> Given there are no defined watercourses, or geomorphic wetlands within the application area, or within the immediate vicinity of the application area, proposed clearing is not likely to impact on or off-site hydrology.</p>		
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The potential for wind erosion over the application area is high (DPIRD 2017) if not managed appropriately. Based on the scale of proposed clearing, and the Shire of Dandaragan’s commitment to progressive rehabilitate post extraction, the proposed clearing is not likely to cause appreciable land degradation.</p>	<p><i>Not likely to be at variance</i></p>	<p>Further consideration not required.</p>
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> The absence of waterbodies within the application area, and the shallow depth of clearing required (1 metre), indicates that the proposed clearing is not likely to impact surface or groundwater quality.</p>	<p><i>Not at variance</i></p>	<p>Further consideration not required.</p>
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> The lack of watercourses in the vicinity of the application area, combined with the permeability of the soils that occur, indicates that proposed clearing is not likely to cause, or exacerbate, the incidence or intensity of flooding or waterlogging.</p>	<p><i>Not at variance</i></p>	<p>Further consideration not required.</p>

Appendix D – Vegetation condition rating scale


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

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

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

Appendix E – Biological survey information excerpts / photographs of the vegetation

The below information is obtained from the targeted flora, vegetation and vertebrate fauna reconnaissance survey report by Maia (2020a) and secondary priority flora impact analysis (Maia 2020b). Surveys were undertaken over the application area as well as a broader area immediately surrounding the application area.

Vegetation type code (broad floristic formation) Full description Area mapped (ha) (percent of Survey Area)	Associated species
<p>MHL (Mixed Heathland)</p> <p>Low mixed Heathland mainly of <i>Isopogon dubius</i>, <i>Banksia armata</i> var. <i>armata</i> and <i>Xanthorrhoea</i> sp. Lesueur (G.J. Keighery 16404) with an Open Sedgeland of <i>Caustis dioica</i> and <i>Mesomelaena pseudostygia</i>.</p> <p>6.85 ha (100% of the Survey Area)</p>	<p><i>Allocasuarina microstachya</i>, <i>Astroloma glaucescens</i>, <i>Babingtonia grandiflora</i>, <i>Banksia sclerophylla</i>, <i>Calothamnus sanguineus</i>, <i>Eremaea violacea</i> subsp. <i>raphiophylla</i>, <i>Georgeantha hexandra</i>, <i>Haemodorum loratum</i> (Priority 3), <i>Hibbertia aurea</i>, <i>Isopogon inconspicuus</i>, <i>Scaevola canescens</i>, <i>Schoenus</i> aff. <i>pleiostemoneus</i> EAG 1991, <i>Stylidium cygnorum</i>.</p>
	

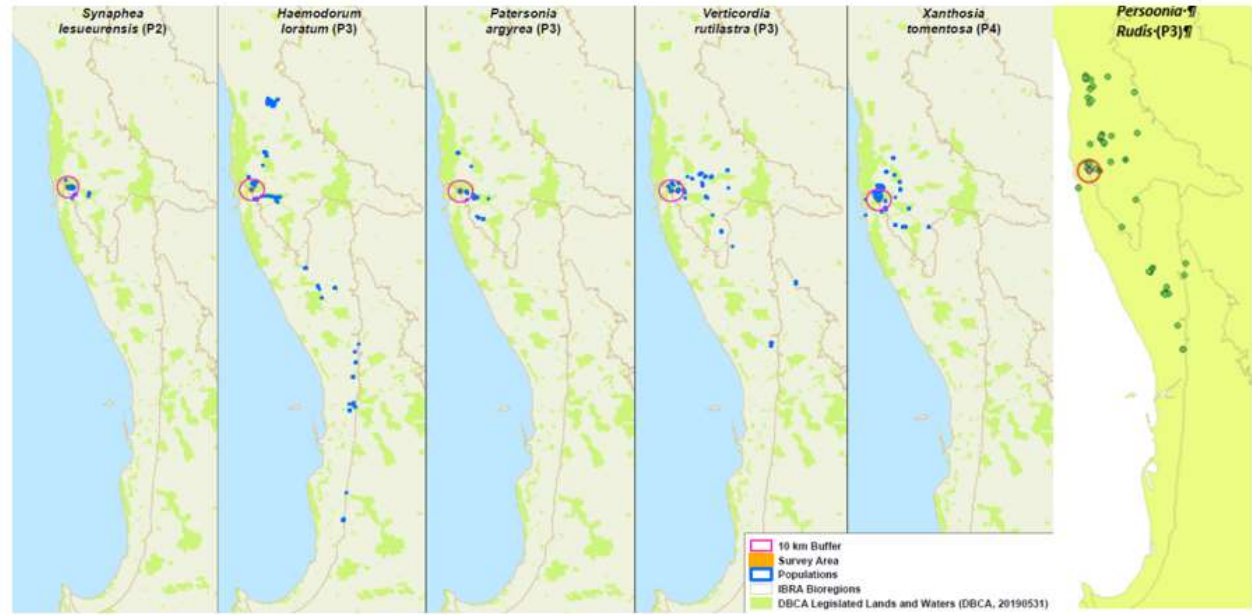
Note: aff. = affinity with, sp. = species, subsp. = subspecies, var = variety,

Table 3: Known records for plants and populations of conservation significant flora species recorded in the Survey Area and regional and local impacts for Option 3 clearing area

Species	Rank	Plants						Populations						
		WA records known to Maia (#)	Local area records (#)	Gravel pit survey area records (#)	Option 3 clearing area records (#)	Regional impact from Option 3 (%)	Local area impact from Option 3 (%)	WA known to Maia (#)	Local area known to Maia (#)	Survey area (#)	Option 3 clearing area (#)	Regional impact from Option 3 (%)	Local area impact from Option 3 (%)	Local area populations protected in DBCA Legislated Lands and Waters (IUCN I-IV only) (%)
<i>Synphea lesueurensis</i> and <i>Synphea</i> sp. Indet.	P2	351	338	18	4	1.7	1.8	11	8	1	1	9.1	12.5	62.5
<i>Haemodorum loratum</i>	P3	618	193	111	63	10.2	32.6	43	7	1	1	2.3	14.3	42.9
<i>Patersonia argyrea</i>	P3	81	11	4	3	3.7	27.3	13	4	1	1	7.7	25.0	50.0
<i>Verticordia rutilastra</i>	P3	916	21	8	7	0.8	33.3	34	9	1	1	2.9	11.1	88.9
<i>Xanthosia tomentosa</i>	P4	4,718	1,664	36	15	0.3	0.9	32	13	1	1	3.1	7.7	76.9

Note: Regional and local area plant impacts include 2 *Synphea lesueurensis* plants that are outside of but very close to the clearing boundary and will likely not be avoided.

Regional distribution of the five priority species assessed by Maia (2020b) and *Persoonia rudis*



Appendix F – References and databases

1. References

- Bamford, M. J., and Bamford, A. R. (1999). A study of the brush or black-gloved wallaby *Macropus irma* (Jourdan 1837) in Whiteman Park. Western Australian Planning Commission, Perth.
- CALM (1995) Department of Conservation and Land Management (Now the Department of Biodiversity, Conservation, and Attractions) Gravel Lease 175, Shire of Dandaragan (RDS 20). Gravel Lease under the *Conservation and Land Management Act 1984* (DWER Ref: A1916585).
- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Department of Environment and Conservation (DEC) (2011). *Plants used by Carnaby's Black Cockatoo*. Department of Environment and Conservation. Available from: https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/carnabys/Plants_used_by_Carnabys_black_cockatoo_20110415.pdf
- Department of Primary Industries and Regional Development (DPIRD) (2017). *NRInfo Digital Mapping*. Accessed at <https://maps.agric.wa.gov.au/nrm-info/> Accessed September 2018. Department of Primary Industries and Regional Development. Government of Western Australia.
- Department of the Environment (2020). Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2012) EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (Endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (Vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (Vulnerable) *Calyptorhynchus banksii naso*. Department of Sustainability, Environment, Water, Population and Communities (now the Department of Agriculture, Water and Environment), Canberra.
- Department of Water and Environmental Regulation. (2019). *Native vegetation clearing permits Application, assessment, and management requirements under Part V Division 2 of the Environmental Protection Act 1986*. Department of Water and Environmental Regulation, Western Australia.
- Department of Water Environmental Regulation. (2014). *A guide to the assessment of applications to clear native vegetation Under Part V Division 2 of the Environmental Protection Act 1986*. Department of Environmental Regulation, Western Australia.
- Desmond, A., & Chant, A. (2001). *Geraldton Sandplains 2 (GS2 - Geraldton Hills subregion)*. Department of Conservation and Land management.
- Environmental Protection Authority. (2019). *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Environmental Protection Authority, Western Australia.
- Government of Western Australia. (2019). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Maia Environmental Consulting Pty Ltd. (2020a). Shire of Dandaragan: R35593 Gravel Pit, Reconnaissance and Targeted Flora and Vegetation Survey and Reconnaissance Fauna Survey. Unpublished report for the Shire of Dandaragan. (DWER Ref A1896179).
- Maia Environmental Consulting Pty Ltd. (2020b). CPS 8859/1 – Request for Further Information Shire of Dandaragan, proposed clearing of 5 ha of native vegetation, for gravel extraction, in Crown Reserve 35593 (Reserved for Gravel Resource Management, Restoration and Conservation) – Version 1. (DWER Ref A1916534).
- 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 Dandaragan (2020a) Supporting Information for clearing permit application CPS 8859/1. Shire of Dandaragan. Received by DWER on 02 March April 2020 (DWER Ref: A1881539).

Shire of Dandaragan (2020b). Email correspondence from applicant with evidence from DBCA stating that the Shire of Dandaragan is permitted for the purposes of gravel extraction as per the expired lease conditions (Lease no. 176/100) whilst DBCA is processing the lease extension. Received by DWER on 30 April 2020 (DWER Ref: A1895507).

Shire of Dandaragan (2020c) Response from the Shire of Dandaragan to a request for additional information from DWER. Received by DWER on 02 March April 2020 (DWER Ref: A1913719).

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.

van Dyck, S., and Strahan, R. (2008). 'The Mammals of Australia.' 3rd edition. Reed New Holland: Sydney. ISBN-13: 978-1877069253.

van Gool, D., Tille, P. J., and Moore, G. A. (2005) Land evaluation standards for land resource mapping: assessing land qualities and determining land capability in south-western Australia. Department of Agriculture and Food, Western Australia, Perth. Report 298.

Western Australian Herbarium (1998-). FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> Accessed May 2018.

2. GIS datasets

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

- Aboriginal Heritage Places (DPLH-001)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Regional Parks (DBCA-026)
- Soil and Landscape Mapping – Best Available

Restricted GIS Databases used:

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