Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10945/1
Permit type:	Area permit
Applicant name:	Shire of Serpentine Jarrahdale
Application received:	12 February 2025
Application area:	25 native trees
Purpose of clearing:	Road upgrades
Method of clearing:	Mechanical
Property:	Karnup Road Reserve (PINs 11608039 and 11608040)
Location (LGA area/s):	Shire of Serpentine Jarrahdale
Localities (suburb/s):	Hopeland

1.2. Description of clearing activities

The proposal is to selectively clear native trees along Karnup Road, Hopeland (see Figure 1 and Figure 2, Section 1.5).

The Shire of Serpentine Jarrahdale has received funding approval through the Main Roads WA State Black Spot Program to upgrade a section of the road and shoulder of Karnup Road (Shire of Serpentine Jarrahdale, 2025a). Karnup Road is Regional Distributor Road with a posted speed of 100 km/h. There have been five recorded crashes in the section of Karnup Road between SLK 8.65 to SLK 11.15 (Shire of Serpentine Jarrahdale, 2025a). The Shire is proposing to expand both sides of the road by 1.5 metres to improve driver safety and road conditions.

The application was revised during the assessment to include an additional four trees that had been incorrectly excluded from the original application area (Shire of Serpentine Jarrahdale, 2025b).

1.3. Decision on application

Decision:	Granted
Decision date:	24 October 2025
Decision area:	25 native trees, as depicted in Section 1.5, below.

1.4. Reasons for decision

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

In making this decision, the Delegated Officer had regard for:

- the site characteristics (see Appendix A),
- relevant datasets (see Appendix E.1.),

- the findings of a tree survey and black cockatoo assessment (Ecology Matters Australia Pty Ltd, 2024),
- the clearing principles set out in Schedule 5 of the EP Act (see Appendix B),
- relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The Delegated Officer took into consideration the purpose of the project is for public road upgrades to improve road safety and the project is part of the Main Roads WA State Black Spot Program.

The assessment identified that the proposed clearing will result in:

- the loss of 10 native trees that provide suitable foraging habitat for black cockatoos in an extensively cleared landscape, and
- the loss of 25 native trees that are representative of an extensively cleared vegetation complex (Southern River Complex) and are a significant remnant within an extensively cleared landscape.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the above impacts remain significant even after the application of minimisation measures, and that this impact constitutes a significant residual impact.

The Delegated Officer considered the extent of environmental impact, the necessity for clearing, and the applicant's adherence to the mitigation hierarchy, and determined that it was appropriate to grant a clearing permit requiring management measures and an adequate environmental offset.

The applicant has provided an adequate environmental offset, consistent with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), to counterbalance the significant residual impacts of the proposed clearing. The offset involves rehabilitation of 0.63 hectares of native vegetation within Yangedi Reserve (Reserve 25911) and infill planting of 14 (fourteen) marri (Corymbia calophylla) trees within Clem Kentish Reserve (Reserve 9157). The suitability of the offset is summarised in Section 4.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- undertake avoid and minimise measures to reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds,
- undertake infill planting of *Corymbia calophylla* (marri) trees within a 0.63-hectare area of native vegetation within Yangedi Reserve (Reserve 25911),
- undertake rehabilitation of a 0.34-hectare area that is representative of the Southern River Complex within Yangedi Reserve (Reserve 25911),
- undertake planting of 14 (fourteen) *Corymbia calophylla* (marri) trees within Clem Kentish Reserve (Reserve 9157).

1.5. Site maps

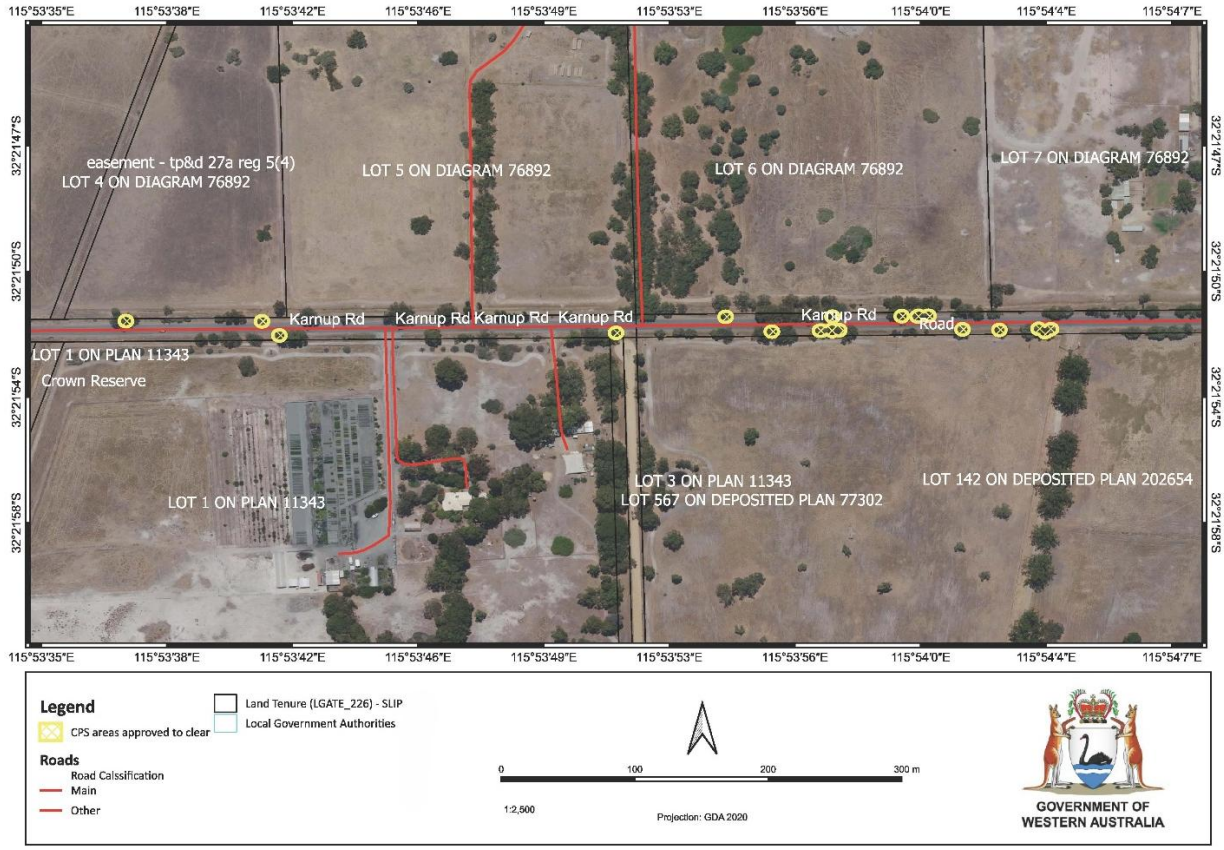

Figure 1. Map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

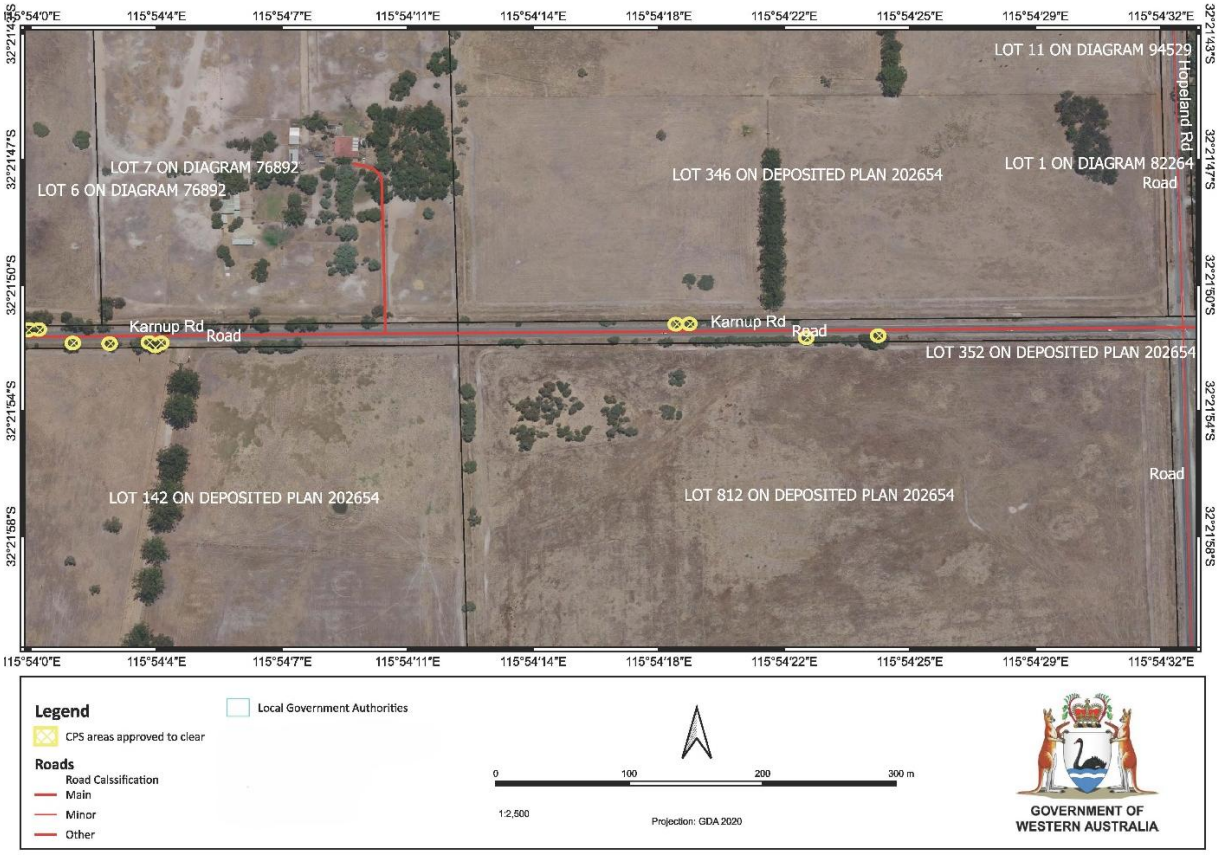

Figure 2. Map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)
- Technical guidance – *Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant submitted supporting information (Shire of Serpentine Jarrahdale, 2025a) demonstrating actions taken to avoid and minimise the impacts of the proposed clearing, including:

- reducing the clear zone either side of the road from the recommended 5 metres to 1.5 metres to avoid clearing of an additional 312 trees,
- undertaking minor pruning of trees that would not impede construction to reduce the number of trees required to be cleared,
- avoiding the potential black cockatoo breeding hollow identified by Ecology Matters Australia Pty Ltd (2024),
- undertaking dieback and weed management during earth works, including ensuring machinery is clean prior to use and using dieback and weed-free materials,
- undertaking works in dry conditions where possible to reduce topsoil disturbance,
- demarcating trees proposed to be cleared prior to undertaking clearing.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

After consideration of avoidance and mitigation measures, it was determined that an offset was necessary to counterbalance the significant residual impacts to black cockatoo foraging habitat and significant remnant native vegetation. In accordance with the Government of Western Australia's *Environmental Offsets Policy* and *Environmental Offsets Guidelines*, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the impacts of the proposed clearing present a risk to biological values (fauna) and significant remnant vegetation. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (fauna) - Clearing Principle (b)

Assessment

A fauna likelihood assessment was conducted based on:

- the preferred habitat and vegetation types of conservation significant fauna species recorded in the local area (10-kilometre radius from the application area),
- the site characteristics (see Appendix A.1), and
- known species distribution.

The likelihood analysis identified seven fauna species which may occur in the application area (see Appendix A.3.). Of these, three species were considered likely to occur: Carnaby's cockatoo (*Zanda latirostris*; EN), Baudin's cockatoo (*Zanda baudinii*; EN) and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*; VU).

Black cockatoos

Habitat critical for the recovery of Carnaby's cockatoo, Baudin's cockatoo, and forest red-tailed black cockatoo (herein referred to as black cockatoos) includes foraging habitat (including remnant patches of vegetation), night roosting habitat and nesting trees for breeding (DAWE, 2022). Suitable breeding habitat includes trees with a suitable nest hollow or of a suitable diameter at breast height (DBH) to develop a nest hollow (DAWE, 2022). Night roosting sites are often located near food and water resources.

According to available databases, the closest recorded confirmed breeding site is about 10 kilometres from the application area. There are 15 known roost sites in the local area, the closest is about two kilometres from the application area.

There are ten marri (*Corymbia calophylla)* trees in the application area that provide suitable foraging habitat for black cockatoos. The remaining 15 trees in the application area are not considered to provide suitable foraging habitat. The black cockatoo survey (Ecology Matters Australia Pty Ltd, 2024) identified evidence of foraging on marri by forest red tailed black cockatoos in the survey area. There are no trees with hollows in the application area (Ecology Matters Australia Pty Ltd, 2024). A potentially suitable breeding hollow was identified 400 metres from the application area (Ecology Matters Australia Pty Ltd, 2024). The applicant excluded this tree from the application (see section 3.1).

Given the above, ten native trees in the application area provide suitable foraging habitat for black cockatoos. As the application area is within an extensively cleared landscape, the proposed clearing is considered to have a cumulative impact on black cockatoo foraging habitat in the local area (see section 3.2.2).

Other fauna

Other fauna which may be transient visitors to the application area are listed in Appendix A.3. Given the lack of dense understorey, extent and condition of the vegetation, and that it comprises isolated trees along a road, the vegetation within the application area is not likely to provide significant habitat for these species.

Ecological linkage

The application area is in an extensively cleared landscape (see Section 3.2.2). As the local area is highly fragmented and the vegetation contributes to a linear corridor, the application area is considered significant as part of an ecological linkage for fauna moving through the landscape.

Conclusion

Based on the above assessment, the application area provides significant foraging habitat for black cockatoos in an extensively cleared landscape. Environmental offsets are required to counterbalance this impact (see Section 4).

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- avoidance and minimisation to reduce the impacts and extent of clearing,
- environmental offsets (as detailed in Section 4 below).

3.2.2. Significant remnant vegetation - Clearing Principle (e)

Assessment

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 (i.e., pre-European settlement), below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The application area is in the Swan Coastal Plain IBRA Bioregion which retains about 39 per cent of the pre-European vegetation extent (Government of Western Australia, 2019). According to available databases, the vegetation extent in the local area falls below national targets, with about 17 per cent of the pre-European vegetation remaining (see Appendix A.2) The application area is broadly representative of the Southern River Complex, which retains about 18 per cent of the pre-European vegetation extent.

The extent of vegetation remaining in the local area and the Southern River Complex falls below national targets. Given this, the application area is considered significant as a remnant of native vegetation in an extensively cleared landscape.

Conclusion

Based on the above, the application area is representative of an extensively cleared vegetation complex in an extensively cleared landscape. The impact of the proposed clearing on significant remnant vegetation constitutes a significant residual impact and environmental offsets are required (see Section 4).

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- avoidance and minimisation to reduce the impacts and extent of clearing,
- environmental offsets (as detailed in Section 4 below).

3.3. Relevant planning instruments and other matters

The portions of the application area in the southern Karnup Road reserve intersect a revegetation offset area for CPS 1724/1, which was granted to the Shire of Serpentine Jarrahdale in 2007 and permitted the clearing of 17 native trees. The revegetation offset under CPS 1724/1 required the planting of 40 *Corymbia calophylla* (marri) and *Eucalyptus rudis* (flooded gum) trees within the southern portion of Karnup Road reserve between Manning Road and Hopeland Road. It is possible that up to 14 of the trees proposed to be cleared under CPS 10945/1 were planted to satisfy the offset requirements for CPS 1724/1. Given the following, the clearing of up to 14 trees established under an offset for CPS 1724/1 is considered to be justified:

- CPS 10945/1 will be granted to the same applicant as CPS 1724/1, demonstrating the applicant has adequate authority to clear the offset area,
- the purpose of the clearing the offset area is for public road upgrades to improve road safety and the project is part of the Main Roads WA State Black Spot Program,
- a revegetation offset is required for CPS 10945/1, which will require revegetation of more than double the area of the offset area being cleared (see Section 4).

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

In addition to CPS 10945/1, the Shire of Serpentine Jarrahdale has three concurrent clearing permit applications with DWER: CPS 8908/3, CPS 10600/2 and CPS 11081/1. The cumulative impact of the clearing proposed under these applications has been accounted for during the assessment of CPS 10945/1.

4 Suitability of offsets

Significant residual impacts

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- the loss of ten native trees that provide suitable foraging habitat for black cockatoos in an extensively cleared landscape, and
- the loss of 25 native trees that are representative of an extensively cleared vegetation complex (Southern River Complex) and are a significant remnant within an extensively cleared landscape.

The applicant has proposed an environmental offset to address the above impact, as detailed below. The Delegated Officer determined in this instance it is appropriate to consider an offset to counterbalance the significant residual impacts given the extent of the proposed impact, the necessity of the proposed clearing, and the applicant's efforts to avoid, minimise and mitigate the environmental impacts of the proposed clearing, in accordance with the WA Environmental Offsets Guidelines (2014).

Proposed offset

The applicant proposed an environmental offset consisting of:

- infill planting of *Corymbia calophylla* (marri) trees within a 0.63-hectare area of native vegetation within Yangedi Reserve (Reserve 25911),
- rehabilitation of a 0.34-hectare area that is representative of the Southern River Complex within Yangedi Reserve (Reserve 25911), and
- planting of 14 (fourteen) marri (*Corymbia calophylla*) trees within Clem Kentish Reserve (Reserve 9157).

Yangedi Reserve

The applicant has proposed two rehabilitation areas within a larger 0.63 hectares of open marri woodland in Yangedi Reserve, comprising:

- infill planting of *Corymbia calophylla* (marri) trees within a 0.63-hectare area of remnant marri woodland, and
- rehabilitation of a 0.34 hectare area from a Degraded to Good to a Very Good (Keighery, 1994) condition, through infill planting (including understorey species), weeding and watering.

Yangedi Reserve (Lot 164 on Deposited Plan 202726; Reserve 25911) is located four kilometres southwest of the application area. The proposed offset area is within Bush Forever Site 378. A site inspection undertaken by the applicant (Shire of Serpentine Jarrahdale, 2025c) identified the proposed offset area comprises open marri woodland in Degraded to Good (Keighery, 1994) condition and is representative of the Southern River Complex. The site inspection identified some of the marri trees present in the proposed offset area are senescing and there was little evidence of juvenile marri recruitment.

The proposed infill planting of marri is considered to increase the resilience of the marri overstorey present at the proposed offset site. Given the vegetation currently provides preferred foraging habitat for black cockatoos, and the vegetation is to be maintained as open woodland, the proposed planting is considered to have a small increase in the quality of the foraging habitat for black cockatoos.

Clem Kentish Reserve

The applicant has proposed to plant 14 (fourteen) marri trees within Clem Kentish Reserve (Lot 57 on Deposited Plan 120034; Reserve 9157).

Clem Kentish Reserve is located seven kilometres east of the application area. The fourteen marri trees with be planted within areas of bare ground between existing native vegetation in the reserve. The proposed offset area includes portions with established canopy, however the marri trees will be planted in bare ground only. The proposed planting will increase connectivity of existing vegetation within the reserve.

Clem Kentish Reserve is vested for the purpose of recreation. The vesting of the reserve is not proposed to change as part of the offset. The vegetation is managed for conservation in accordance with the Shire's Marri Woodland Management Plan, which has been endorsed by the Council, and is managed under the Shire's Urban and Rural Forest Strategy 2018-2028. The Delegated Officer considers the risk of loss for the proposed offset is acceptable in this instance, given the planting will improve connectivity of remnant vegetation in the reserve and is close to the impact site, which is a preferred environmental outcome.

Offset adequacy

The Delegated Officer considers the proposed offset is consistent with the WA Environmental Offsets Policy (2011) and the WA Environmental Offsets Guidelines (2014) and adequately counterbalances the significant residual impacts of the proposed clearing. The justification for the values used in the offset calculation is provided in Appendix D.

End

Appendix A. Site characteristics

A.1. 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 B.

Characteristic	Details
Local context	The application area is part of a linear strip of native vegetation located along an east-west road. The application area is in the intensive land use zone of Western Australia and is surrounded by areas cleared for rural use. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 17 per cent of the original native vegetation cover.
Ecological linkage	The application area does not intersect a formal ecological linkage. The closest mapped ecological linkage is the Perth Regional Ecological Linkages located two kilometres from the application area.
Conservation areas	The application area does not intersect a mapped conservation area. The closest mapped conservation area is a conservation covenant under the *Soil and Land Conservation Act 1945* located 160 metres from the application area.
Vegetation description	Photographs (Shire of Serpentine Jarrahdale, 2025a) and a tree survey (Ecology Matters Australia Pty Ltd, 2024) indicate the 25 trees proposed to be cleared comprise: • Ten (10) *Corymbia calophylla* (marri) • Seven (7) *Eucalyptus rudis* (flooded gum) • Four (4) *Melaleuca priessiana* • Four (4) *Melaleuca rhaphiophylla* This is broadly consistent with the mapped vegetation type: • Southern River Complex (system 42), described as open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus marginata* (Jarrah) - *Banksia* species with fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca rhaphiophylla* (Swamp Paperbark) along creek beds. The mapped vegetation type retains approximately 18 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Photographs supplied by the applicant (Shire of Serpentine Jarrahdale, 2025a) indicate the vegetation within the proposed clearing area is in Completely Degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix C.
Climate and landform	Available databases indicate the application area receives a mean annual rainfall of 850 – 860 mm. The application area is at an altitude of 25 meters above sea level.
Soil description	The soil is mapped as. • Bassendean B2 Phase (212Bs__B2), described as flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m, and • Bassendean B6 Phase (212Bs__B6), described as sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands (DPIRD, 2019).
Land degradation risk	Land degradation risks are summarised in Table A.4. The application area is mapped as moderate to low acid sulfate soils disturbance risk (<3m from surface).
Waterbodies	The desktop assessment and aerial imagery indicate the application area intersects a multiple use palusplain (seasonally waterlogged flat) and manmade drain.
Hydrogeography	The application area falls within the Serpentine River System and Serpentine Groundwater Area as proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWI

Characteristic	Details
	Act). The groundwater salinity level (total dissolved solids) is mapped as 1000 - 3000 milligrams per litre.
Flora	The desktop assessment identified 36 conservation significant flora species within the local area, comprised of nine threatened and 27 priority flora species. There are no flora records within the application area. The nearest record is the Threatened *Synaphea sp.* Serpentine (G.R. Brand 103), approximately one kilometre from the application area.
Ecological communities	The application area is in the mapped buffer of a Banksia Woodlands of the Swan Coastal Plain TEC occurrence.
Fauna	The desktop assessment identified 30 conservation significant fauna species in the local area. The closest record is a *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale) recorded one kilometre from the application area. The application area is within Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo known distribution zones. There are 15 recorded black cockatoo roost sites within the local area, the closest is two kilometres from the application area. The closest confirmed breeding site is approximately 10 kilometres from the application area.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex**					
Southern River Complex (system 42)	58,781.48	10,832.18	18.43	940.36	1.60
Local area					
10km radius	32,792.16	5,671.23	17.29	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Fauna analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix E.1), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)
south-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*)	CD	Y	Y	1.25
quenda (*Isoodon fusciventer*)	P4	Y	Y	1.74
Carnaby's cockatoo (*Zanda latirostris*)	EN	Y	Y	2.47

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)
forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)	VU	Y	Y	3.24
Baudin's cockatoo (*Zanda baudinii*)	EN	Y	Y	6.18
peregrine falcon (*Falco peregrinus*)	OS	Y	Y	6.38
western brush wallaby (*Notamacropus irma*)	P4	Y	Y	6.64

A.4. Land degradation risk table

Risk categories	*Land Unit 1*
Phosphorus export risk	H2: >70% of map unit has a high to extreme phosphorus export risk
Subsurface Acidification	H2: >70% of map unit has a high subsurface acidification risk or is presently acid
Water repellence	H2: >70% of map unit has a high water repellence risk
Wind erosion	H2: >70% of map unit has a high to extreme wind erosion risk M2: 30-50% of map unit has a high to extreme wind erosion risk
Water logging	M2: 30-50% of map unit has a moderate to very high waterlogging risk L2: 3-10% of map unit has a moderate to very high waterlogging risk
Flood risk	L1: <3% of the map unit has a moderate to high flood risk
Salinity	L1: <3% of map unit has a moderate to high salinity risk or is presently saline
Water erosion	L1: <3% of map unit has a high to extreme water erosion risk

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: Given the size, condition and location of the application area, it is not likely to comprise a high level of biodiversity. A flora likelihood assessment was conducted based on habitat and soil preferences, vegetation in the application area, and known species distribution. Given the extent of proposed clearing and degraded condition of the vegetation, the application area is unlikely to provide habitat for conservation significant flora.	Not likely to be at variance	No
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."* Assessment: The application area contains suitable foraging habitat for black cockatoos.	At variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: A flora likelihood assessment was conducted based on habitat and soil preferences, vegetation in the application area, and known species distribution. The assessment did not identify suitable habitat for threatened flora species in the application area, given the extent of proposed clearing and degraded condition of the vegetation.	Not likely to be at variance	No
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."* Assessment: The application area is in the buffer of a mapped occurrence of the Banksia Woodlands TEC. The application area is separated from the TEC occurrence by approximately 100 metres of cleared land. Given this, and the size and condition of the application area, the proposed clearing is unlikely to alter the functioning of the TEC patch.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
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."* Assessment: The extent of the mapped vegetation type and native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The application area is significant as a remnant in an extensively cleared landscape.	At variance	Yes *Refer to Section 3.2.2, above.*
Principle (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."* Assessment:	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Given the distance to the nearest conservation area, and the small extent and degraded condition of vegetation in the application area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.		
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: The application area is within a mapped multiple use palusplain. It is likely hydrological flows in the application area have been significantly altered by existing road infrastructure. Given this, the extent of clearing proposed, and the condition of the vegetation, the proposed clearing is unlikely to significantly increase existing impacts to hydrology.	At variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are highly susceptible to phosphorus export, subsurface acidification, water repellence and wind erosion. Noting the extent and condition of the vegetation in the application area, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	No
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."* Assessment: The application area is within a mapped multiple use palusplain. It is likely hydrological flows in the application area have been significantly altered by existing road infrastructure. Given this, the extent of clearing proposed, and the condition of the vegetation, the proposed clearing is unlikely to significantly increase existing impacts to surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The application area is within a mapped palusplain (seasonally waterlogged flat). Given the small extent and degraded condition of the vegetation proposed to be cleared, it is unlikely the proposed clearing will exacerbate existing seasonal waterlogging.	Not likely to be at variance	No

Appendix C. 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.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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 D. Offset calculator value justification

Offset calculation and justification for significant residual impact to black cockatoos (Yangedi Reserve).

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Black cockatoo foraging habitat	The application area provides black cockatoo foraging habitat in an extensively cleared landscape
Type of environmental value	Species (flora/fauna)	Foraging habitat for black cockatoos
Conservation significance of environmental value	Rare/threatened species – endangered	Carnaby's black cockatoo and Baudin's black cockatoo are listed as endangered under the BC Act (state) and EPBC Act (federal); forest red-tailed black cockatoo is listed as vulnerable under the BC Act (state) and EPBC Act (federal). The highest attribute was used for the calculation.
Landscape level value impacted	Yes/No	Yes
Significant impact		
Description	Clearing of suitable foraging habitat for black cockatoos	Proposed clearing of native vegetation considered suitable foraging habitat for all three species of black cockatoos, within an extensively cleared landscape
Significant impact (hectares)	10 marri trees	The application is to clear 10 native trees considered to provide foraging habitat for black cockatoos. The canopy area of each tree has been averaged and an area calculation considered for the offset, noting the canopy provides the foraging values.
Quality (scale)	8	The application area is within ten kilometres of 15 mapped roost sites, the closest confirmed roost site is 2 kilometres away. The closest confirmed breeding site is 10 kilometres away. The application area is within an extensively cleared part of the species range. The trees are preferred foraging species for black cockatoos. Given the habitat attributes and site context of the application area, the vegetation under application is considered to provide high quality foraging habitat for black cockatoos. The

Calculation	Score (Area)	Rationale
		quality score is based on the habitat quality and site context of the application area.
Rehabilitation credit		
N/A	N/A	Onsite revegetation will not be taking place.
Offset		
Description	Infill planting of marri trees	The infill planting of native trees (marri) considered preferred foraging species for all three black cockatoos
Proposed offset (area in hectares)	0.63	The area required to counterbalance 48.9% of significant residual impacts (SRI) of the proposed clearing. In addition, the applicant proposed to plant 14 marri trees within Clem Kentish reserve, which is considered to counterbalance 51.4% of the SRI. Combined, the two sites are considered to counterbalance 100% of the SRI.
Current quality of offset site	6	The site currently comprises open marri woodland with senescing marri trees and limited juvenile recruitment (as identified in a site visit by the Shire). The vegetation currently provides preferred foraging habitat for black cockatoos. The quality score is based on the habitat quality and site context of the proposed offset area.
Future quality WITHOUT offset	6	It is considered unlikely the habitat quality will increase without active revegetation.
Future quality WITH offset	7	The proposed planting will aid marri recruitment in the area, which will improve the resilience of the marri overstorey. Given the site already provides preferred foraging habitat for black cockatoos, and it is to be managed as an open woodland, the proposed planting will increase the habitat quality for black cockatoos to a small extent.
Time until ecological benefit (years)	17	Average time until planted vegetation can be used as foraging habitat by black cockatoos. An extra two years has been added to account for the delay in commencement of the revegetation (assumed to commence within two years of the permit start date).
Confidence in offset result (%)	80	High level of confidence that the quality within the rehabilitated areas will improve with best practice revegetation techniques and appropriate completion criteria.
Duration of offset implementation (maximum 20 years)	20	Maximum value applied noting the vegetation is not to be cleared in the future.
Time until offset site secured (years)	0	The offset area is within land tenure currently held by the applicant.
Risk of future loss WITHOUT offset (%)	5%	The offset area is a Bush Forever site and is considered to have a low risk of loss
Risk of future loss WITH offset (%)	5%	The offset area will continue to be managed for conservation purposes and will remain at a low risk of loss.

Offset calculation and justification for significant residual impact to black cockatoos (Clem Kentish Reserve).

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Black cockatoo foraging habitat	The application area provides black cockatoo foraging habitat in an extensively cleared landscape
Type of environmental value	Species (flora/fauna)	Foraging habitat for black cockatoos

Calculation	Score (Area)	Rationale
Conservation significance of environmental value	Rare/threatened species – endangered	Carnaby's black cockatoo and Baudin's black cockatoo are listed as endangered under the BC Act (state) and EPBC Act (federal); forest red-tailed black cockatoo is listed as vulnerable under the BC Act (state) and EPBC Act (federal). The highest attribute was used for the calculation.
Landscape level value impacted	Yes/No	Yes
Significant impact		
Description	Clearing of suitable foraging habitat for black cockatoos	Proposed clearing of native vegetation considered suitable foraging habitat for all three species of black cockatoos, within an extensively cleared landscape
Significant impact	10 marri trees	The application is to clear 10 native trees considered to provide foraging habitat for black cockatoos. The canopy area of each tree has been averaged and an area calculation considered for the offset, noting the canopy provides the foraging values.
Quality (scale)	8	The application area is within ten kilometres of 15 mapped roost sites, the closest confirmed roost site is 2 kilometres away. The closest confirmed breeding site is 10 kilometres away. The application area is within an extensively cleared part of the species range. The trees are preferred foraging species for black cockatoos. Given the habitat attributes and site context of the application area, the vegetation under application is considered to provide high quality foraging habitat for black cockatoos. The quality score is based on the habitat quality and site context of the application area.
Rehabilitation credit		
N/A	N/A	Onsite revegetation will not be taking place.
Offset		
Description	Planting marri trees over bare ground	The planting of native trees (marri) considered preferred foraging species for all three black cockatoos, over bare ground within an extensively cleared landscape
Proposed offset	14 marri trees	The area required to counterbalance 51.4% of significant residual impacts (SRI) of the proposed clearing. In addition, the applicant proposed to infill plant marri trees within Yangedi reserve, which is considered to counterbalance 48.9% of the SRI. Combined, the two sites are considered to counterbalance 100% of the SRI.
Current quality of offset site	1	Trees will be planted in areas comprised of bare ground with no existing vegetation canopy, within the wider offset area.
Future quality WITHOUT offset	1	It is considered unlikely the habitat quality will increase without active revegetation
Future quality WITH offset	6	The habitat quality of the areas of bare ground in the offset area is considered to increase to high quality foraging habitat by planting trees that are suitable foraging species for black cockatoos.
Time until ecological benefit (years)	17	Average time until planted vegetation can be used as foraging habitat by black cockatoos. An extra two years has been added to account for the delay in commencement of the revegetation (assumed to commence within two years of the permit start date).
Confidence in offset result (%)	80	Moderate to high level of confidence that the quality within the rehabilitated areas will improve with best practice revegetation techniques and appropriate completion criteria.

Calculation	Score (Area)	Rationale
Duration of offset implementation (maximum 20 years)	20	Maximum value applied noting the vegetation is not to be cleared in the future.
Time until offset site secured (years)	0	The offset site is within land tenure currently held by the applicant.
Risk of future loss WITHOUT offset (%)	10%	The reserve is vested for the purpose of recreation. However, the vegetation is managed for conservation in accordance with the Shire's Marri Woodland Management Plan, endorsed by the Council. The vegetation is also managed under the Shire's Urban and Rural Forest Strategy 2018-2028.
Risk of future loss WITH offset (%)	10%	The risk of loss is not considered to change with the proposed offset.

Offset calculation and justification for significant residual impact to Southern River Complex and extensively cleared remnant vegetation (Yangedi Reserve).

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Extensively cleared vegetation complex	The application is to clear vegetation considered representative of the Southern River Complex, and that is significant vegetation in an extensively cleared landscape.
Type of environmental value	Vegetation/habitat	Extensively cleared vegetation complex
Conservation significance of environmental value	Terrestrial native vegetation complex - <30% extent remaining in bioregion	The Southern River Complex retains approximately 18.43 per cent of the original extent of native vegetation (Government of Western Australia, 2019). The local area retains approximately 17.29 per cent of the original extent of native vegetation
Landscape level value impacted	Yes/No	Yes
Significant impact		
Description	Vegetation representative of the Southern River Complex	Proposed clearing of 25 native trees considered representative of the Southern River Complex
Significant impact (hectares)	25 native trees	Applicant is proposing to selectively clear 25 native trees considered representative of the Southern River Complex. A conversion of 1 tree = 0.01ha has been used.
Quality (scale)	3	The application area is in Degraded to Completely Degraded condition comprising scattered trees over grass. The vegetation is present along a road reserve and provides significant linkage value within an extensively cleared landscape. The quality score is based on the vegetation condition and site context of the application area.
Rehabilitation credit		
N/A	N/A	Onsite revegetation will not be taking place.
Offset		
Description	Rehabilitation	Rehabilitation (infill planting of marri and weeding) of vegetation representative of the Southern River Complex, within Yangedi Reserve.
Proposed offset (area in hectares)	0.34	The area required to counterbalance 100% of the significant residual impact (SRI) of the proposed clearing.

Calculation	Score (Area)	Rationale
Current quality of offset site	3	Rehabilitation is proposed within vegetation ranging from Degraded to Good condition. The quality score is based on the vegetation condition and site context of the proposed offset area.
Future quality WITHOUT offset	3	It is considered unlikely the vegetation quality will increase without active revegetation
Future quality WITH offset	6	The vegetation condition is considered to increase to a Good to Very Good condition, through infill planting and weeding activities.
Time until ecological benefit (years)	12	Average time until planted vegetation matures. An extra two years has been added to account for the delay in commencement of the revegetation (assumed to commence within two years of the permit start date).
Confidence in offset result (%)	80	Moderate to high level of confidence that the quality within the rehabilitated areas will improve with best practice revegetation techniques and appropriate completion criteria.
Duration of offset implementation (maximum 20 years)	20	Maximum value applied noting the vegetation is not to be cleared in the future.
Time until offset site secured (years)	0	The offset site is within land tenure currently held by the applicant.
Risk of future loss WITHOUT offset (%)	5%	The offset area is a Bush Forever site and is considered to have a low risk of loss
Risk of future loss WITH offset (%)	5%	The offset area will continue to be managed for conservation purposes and will remain at a low risk of loss.

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- 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)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas

- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

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)

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