GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9448/1
Permit Holder:	Commissioner of Main Roads Western Australia
Duration of Permit:	From 8 January 2026 to 8 January 2040

ADVICE NOTE

Land transfer

The land transfer referred to in condition 13 of this permit is intended to contribute towards the purchase and conservation in perpetuity of:

- at least 137.55 hectares of *native vegetation* within the *Cowalla Offset Site* that comprises the Banksia Woodlands of the Swan Coastal Plain ecological community, the Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c as originally described in Gibson et al. 1994), significant foraging habitat for Carnaby's cockatoo (*Zanda latirostris*), and *native vegetation* that is growing in association with a wetland containing values that are commensurate with a Conservation Category Wetland; and
- at least 86.6 hectares of *native vegetation* within the *Crossman Offset Site* that comprises significant foraging habitat for Baudin's cockatoo (*Zanda baudinii*), Carnaby's cockatoo (*Zanda latirostris*), and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).

Executed change in purpose

The executed changes in purpose referred to in condition 14 of this permit is intended to contribute to the conservation in perpetuity of:

- at least 5.28 hectares of *native vegetation* within the *Hartfield Park Offset Site* that comprises the *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) and significant habitat for *Conospermum undulatum*; and
- at least 42.8 hectares of *native vegetation* within the *Mirrabooka Offset Site* that comprises the *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994).

Revegetation and rehabilitation offset

The *Revegetation Management Plans* referred to in condition 15 of this permit are intended to facilitate the *revegetation* and *rehabilitation* of:

- a total of 0.85 hectares of *native vegetation* within the *Hartfield Park Offset Site* that is representative of the *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) from a Very Good (Keighery, 1994) condition to a Very Good to Excellent (Keighery, 1994) condition;

ADVICE NOTE (cont.)

- a total of 42.8 hectares of *native vegetation* within the *Mirrabooka Offset Site* that is representative of the *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994), including 33.3 hectares from a Very Good to Excellent (Keighery, 1994) condition to an Excellent (Keighery, 1994) condition and 9.5 hectares from a Very Good (Keighery, 1994) condition to a Very Good to Excellent (Keighery, 1994) condition; and
- a total of 5.7 hectares of *native vegetation* within the *Neaves Road Offset Site* including 4.05 hectares that is commensurate with a Conservation Category Wetland and 1.65 hectares that provides significant foraging habitat for Baudin's cockatoo (*Zanda baudinii*), Carnaby's cockatoo (*Zanda latirostris*), and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) from a Degraded (Keighery, 1994) condition to a Good (Keighery, 1994) condition.

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of road construction and upgrades associated with the Great Eastern Highway Bypass Interchanges (GEHBI) project.

2. Land on which clearing is to be done

The permit holder is authorised to clear *native vegetation* within the properties described in Table 3 of Schedule 1 of this permit.

3. Clearing authorised

The permit holder must not clear more than 23.31 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 2.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 8 January 2031.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the *clearing* of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of *clearing* on any environmental value.

6. Weed and dieback management

When undertaking any *clearing* authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *dieback* or *weed*-affected soil, *mulch, fill*, or other material is brought into the area to be cleared;

(c) ensure that the boundaries of the *dieback-uninfested protectable* area cross-hatched red in Figure 2 of Schedule 2 are demarcated prior to the commencement of *clearing*;

(d) ensure that the boundaries of *weed*-infested areas dominated by *woody weeds* or *Declared weeds* within the areas cross-hatched red in Figure 3 of Schedule 2 are mapped and demarcated prior to the commencement of *clearing*;

(e) prior to entering the *dieback-uninfested protectable* area demarcated pursuant to condition 6(c), clean earth-moving machinery of soil and vegetation;

(f) prior to leaving *weed*-infested areas demarcated pursuant to condition 6(d), clean earth-moving machinery of soil and vegetation;

(g) only move soils in *dry conditions*;

(h) 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

(i) at least once in each three-month period, remove or kill any *weeds* growing within areas cross-hatched red in Figure 3 of Schedule 2, until road construction and upgrades commence.

7. Demarcation of the clearing area

Prior to undertaking any *clearing* authorised under this permit that is adjacent to other *native vegetation*, the permit holder must demarcate the *clearing* area to avoid inadvertent removal of adjacent *native vegetation*.

8. Directional clearing

The permit holder must, where practicable:

(a) conduct *clearing* activities in a slow, progressive manner towards adjacent *native vegetation*; and

(b) allow a reasonable time for fauna present within the area being cleared to move into adjacent *native vegetation* ahead of the *clearing* activity.

9. Erosion management

The permit holder must commence road construction and upgrades within three (3) months after undertaking the authorised *clearing* activities to reduce the potential for erosion.

10. Ecological linkage management

The permit holder must ensure fauna habitat connectivity is maintained between the areas cross-hatched red in Figure 4 of Schedule 2 by way of:

(a) ensuring there is adequate clearance to maintain sightlines to habitat on either side of the bridges;

(b) installing suitable fauna refugia such as *ground habitat logs* and rocks; and

(c) *revegetating* riparian habitat on both sides of the Helena River.

11. Fauna management

(a) The permit holder must engage a *fauna specialist* to inspect the relevant area cross-hatched yellow on Figure 1 of Schedule 2, immediately prior to, and for the duration of, *clearing* activities, to identify the presence of any native vertebrate fauna.

(b) *Clearing* activities must cease in any area where native vertebrate fauna are identified under condition 11(a) until either:

(i) the individual(s) has moved on from that area to adjoining *native vegetation*; or

(ii) the individual(s) has been moved by the *fauna specialist* to suitable *native vegetation* in the immediate vicinity.

12. Carter's freshwater mussel, watercourse and wetland management

(a) When undertaking any *clearing* authorised under this permit, the permit holder must take the following measures to ensure *clearing* will not result in *adverse impacts* to Carter's freshwater mussel (*Westralunio carteri*) or any adjacent or nearby *watercourses* or *wetlands*:

(i) maintain existing surface water flow;

(ii) install, monitor and maintain appropriate *erosion and sediment control structures* at a suitable location/s within the area cross-hatched red on Figure 5 of Schedule 2 prior to, and for the duration of, *clearing* activities;

(iii) ensure *clearing* activities within 50 metres of the areas cross-hatched red on Figure 6 of Schedule 2 are only undertaken between the period of 1 November and 30 April;

(iv) ensure that no cleared vegetative material or topsoil is stockpiled within 50 metres of the areas cross-hatched red on Figure 6 of Schedule 2; and

(v) engage an *environmental specialist* to undertake *water quality monitoring* within the areas cross-hatched red on Figure 6 of Schedule 2 immediately prior to *clearing* activities and monthly thereafter for a period of 12 months.

(b) Where measures taken in accordance with condition 12(a) indicate that *adverse impacts* to Carter's freshwater mussel or any adjacent or nearby *watercourses* or *wetlands* may result from *clearing* activities, the permit holder must implement *remedial actions*, in consultation with the Department of Biodiversity, Conservation and Attractions and Department of Water and Environmental Regulation if required, to reduce the identified *adverse impacts*.

(c) Within 12 months of undertaking the *clearing* authorised under this permit within the areas cross-hatched red on Figure 5 of Schedule 2, the permit holder must provide the following records to the *CEO*:

(i) the location(s) of *erosion and sediment control structures* pursuant to condition 12(a)(ii), recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(ii) the date(s) *clearing* activities were undertaken within 50 metres of the areas cross-hatched red on Figure 6 of Schedule 2;

(iii) the location(s) of any stockpiles pursuant to condition 12(a)(iv), recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(iv) the results of *water quality monitoring* pursuant to condition 12(a)(v); and

(v) a description of any *remedial actions* undertaken to reduce *adverse impacts* pursuant to condition 12(b).

13. Offset – land transfer

(a) Prior to undertaking any *clearing* authorised under this permit, and no later than 8 January 2031, the permit holder must fund the Department of Biodiversity, Conservation and Attractions with an amount sufficient to purchase:

(i) at least 137.55 hectares of *native vegetation* within the areas cross-hatched red on Figure 7 of Schedule 2 within Lot 87 on Deposited Plan 422467 and Lot 88 on Deposited Plan 422467, Cowalla, to be ceded to the Department of Biodiversity, Conservation and Attractions for conservation in perpetuity; and

(ii) at least 86.6 hectares of *native vegetation* within the area cross-hatched red on Figure 8 of Schedule 2 within Lot 331 on Deposited Plan 424430 (Crown Reserve 54323), Crossman, to be ceded to the Department of Biodiversity, Conservation and Attractions for conservation in perpetuity.

(b) Prior to undertaking any *clearing* authorised under this permit, the permit holder must provide documentary evidence to the *CEO* that the areas referred to in condition 13(a) of this permit have been ceded to the Department of Biodiversity, Conservation and Attractions.

(c) The permit holder must ensure offset implementation involves the construction of a boundary fence around Lot 87 on Deposited Plan 422467 and Lot 88 on Deposited Plan 422467, Cowalla, and Lot 331 on Deposited Plan 424430 (Crown Reserve 54323), Crossman, to the specifications of the Department of Biodiversity, Conservation and Attractions.

14. Offset – Executed change in purpose

Within 24 months of the commencement of *clearing* authorised under this permit, and no later than 8 January 2033, the permit holder must provide to the *CEO*:

(a) a copy of the executed change in purpose of Lot 3003 on Deposited Plan 70568 (Crown Reserve 17098), Forrestfield, from 'Recreation' to 'Conservation' within the areas cross-hatched red in Figure 9 of Schedule 2; and

(b) documentary evidence of the amalgamation of the area cross-hatched red in Figure 10 of Schedule 2 into a Crown Reserve with the executed change in purpose to 'Conservation and passive recreation'.

15. Offset – revegetation and rehabilitation requirements

(a) Within 12 months of the commencement of *clearing* activities authorised under this permit, and no later than 8 January 2033, the permit holder must submit individual *Revegetation Management Plans* to the *CEO* for approval for the *revegetation and rehabilitation* of each of the areas cross-hatched red on Figure 10, Figure 11, and Figure 12 of Schedule 2. The *Revegetation Management Plans* must be developed in accordance with *A Guide to Preparing Revegetation Plans for Clearing Permits* (Department of Water and Environmental Regulation, 2018).

(b) The *Revegetation Management Plans* must be prepared by an *environmental specialist*.

(c) The *Revegetation Management Plans* must include the following:

(i) the location/s of the *revegetation* and *rehabilitation* area/s required under condition 15(a) of this permit, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(ii) *site preparation*;

(iii) *weed* control;

(iv) *regeneration, direct seeding* or *planting*, at an *optimal time*;

(v) a *vegetation establishment period*;

(vi) *revegetation* success completion criteria based on selected *reference sites*, including but not limited to target weed cover, target species diversity, target vegetation condition, target density, and target structure;

(vii) *remedial actions* to be undertaken if completion criteria are not met;

(viii) details of ongoing maintenance and monitoring of the area to be *revegetated* and *rehabilitated* for a minimum of five (5) years;

(ix) timeframes for completion of the activities; and

(x) management commitments that will be achieved.

(d) If the *CEO*, having had regard to conditions 15(b) and 15(c) of this permit, does not approve the *Revegetation Management Plans*, the permit holder must revise and resubmit the *Revegetation Management Plans* within three (3) months of the date of the *CEO*'s decision.

(e) If the *CEO*, having had regard to conditions 15(b) and 15(c) of this permit, does not approve a revised *Revegetation Management Plans* submitted in accordance with condition 15(d) of this permit, the permit holder must again revise and resubmit the *Revegetation Management Plans* in accordance with condition 15(d) of this permit.

(f) The permit holder must obtain the approval of the *CEO*, prior to implementing the *Revegetation Management Plans*.

(g) The permit holder must implement the approved *Revegetation Management Plans* within 12 months of the date of approval by the *CEO*.

PART III - RECORD KEEPING AND REPORTING

16. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; (f) actions taken to demarcate the clearing area in accordance with condition 7; (g) actions taken to undertake directional clearing in accordance with condition 8; (h) actions taken to reduce the potential for erosion in accordance with condition 9; (i) actions taken to manage impacts to native vertebrate fauna, including any details pertaining to the circumstances of any death of, or injury sustained by a native vertebrate fauna individual, in accordance with condition 11; (j) actions taken to manage impacts to Carter's freshwater mussel and adjacent or nearby *watercourses* or *wetlands* in accordance with condition 12; (k) actions taken to implement offsets in accordance with condition 13; and (l) actions taken to implement offsets in accordance with condition 14.
2.	In relation to *weed* and *dieback* management pursuant to condition 6	(a) the boundaries of *weed*-infested areas mapped in accordance with condition 6(d), recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; and (b) other actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 6.
3.	In relation to ecological linkage management	(a) a description of the *revegetation* activities undertaken;

No.	Relevant matter	Specifications
	pursuant to condition 10	(b) the size of the area *revegetated*; (c) the date/s on which *revegetation* was undertaken; (d) the boundaries of the area *revegetated*, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; and (e) any other actions taken in accordance with condition 10.
4.	In relation to the *revegetation* and *rehabilitation* of offset areas pursuant to condition 15	(a) the date/s on which the *Revegetation Management Plans* were approved by the *CEO;* (b) the size of the areas *revegetated* and *rehabilitated*; (c) the date/s on which the *revegetation* and *rehabilitation* was undertaken; (d) a description of the *revegetation* activities undertaken; (e) the boundaries of the areas *revegetated* and *rehabilitated*, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; (f) the results of ongoing maintenance and monitoring under the approved *Revegetation Management Plans* (g) a description of any *remedial actions* undertaken; and (h) any other actions taken to in accordance with condition 15.

17. Reporting

(a) The permit holder must provide to the *CEO* on or before 30 June of each calendar year, a written report containing:

(i) the records required to be kept under condition 16; and

(ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.

(b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this permit has been undertaken must be provided to the *CEO* on or before 30 June of each calendar year.

(c) The permit holder must provide to the *CEO*, no later than 90 days prior to the expiry date of the permit, a written report of records required under condition 16, where these records have not already been provided under condition 17(a).

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

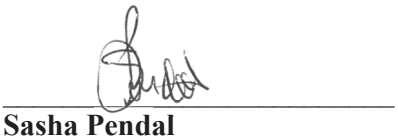
Table 2: Definitions

Term	Definition
adverse impacts	means a negative change that is neither trivial nor negligible that could result in a reduction in health, diversity or abundance of the receptor/s being impacted. For the purpose of this permit, adverse impacts can arise from direct or indirect impacts of *clearing* activities and include but are not limited to a detectable decline in: (a) habitat conditions for Carter's freshwater mussel or mortality of individuals that is attributable to the proposal, pursuant to condition 12; and/or (b) water quality or the health, species diversity, and plant density of *native vegetation* within adjacent or nearby *watercourses* or *wetlands* that is attributable to the proposal, pursuant to condition 12.
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
Cowalla Offset Site	means the environmental offset proposed by the permit holder within Lot 87 on Deposited Plan 422467 and Lot 88 on Deposited Plan 422467, Cowalla, depicted as the areas cross-hatched red on Figure 7 of Schedule 2.
Crossman Offset Site	means the environmental offset proposed by the permit holder within Lot 331 on Deposited Plan 424430 (Crown Reserve 54323), Crossman, depicted as the area cross-hatched red on Figure 8 of Schedule 2.
Declared weeds	means any plant that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 2.
dieback	means the effect of *Phytophthora* species on native vegetation.
dieback-uninfested protectable	means areas determined to be free of plant disease symptoms that indicate the presence of *Phytophthora* species and considered protectable from future infestation due to landscape factors and hygiene measures.
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.
dry conditions	means when soils (not dust) do not freely adhere to rubber tyres, tracks, vehicle chassis or wheel arches.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of 2 years work 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.
EP Act	*Environmental Protection Act 1986* (WA)

Term	Definition
erosion and sediment control structures	means a structure designed to manage erosion and sedimentation and minimise run-off into watercourses and wetlands. These structures may include sediment fences, booms, temporary cut-off drains, and silt fences.
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the *CEO* as a suitable fauna specialist for the bioregion, and who holds an appropriate fauna licence issued under the *Biodiversity Conservation Act 2016*.
fill	means material used to increase the ground level, or to fill a depression.
ground habitat log/s	means a log with a minimum length of 3 metres and a minimum internal hollow diameter of 10 centimetres.
Hartfield Park Offset Site	means the environmental offset proposed by the permit holder within Lot 3003 on Deposited Plan 70568 (Crown Reserve 17098), Forrestfield, depicted as the areas cross-hatched red on Figures 9 and 11 of Schedule 2.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
Mirrabooka Offset Site	means the environmental offset proposed by the permit holder within various properties within Bush Forever Site 385 in the locality of Mirrabooka, depicted as the areas cross-hatched red on Figure 10 of Schedule 2.
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.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
Neaves Road Offset Site	means the environmental offset proposed by the permit holder within Lot 156 on Deposited Plan 56488, Bullsbrook, depicted as the areas cross-hatched red on Figure 12 of Schedule 2.
optimal time	means the period from April to July for undertaking *planting* and *direct seeding*.
planted / planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of desired species.
regenerate / regenerated / regeneration	means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing mulch.
rehabilitate / rehabilitated / rehabilitation	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
remedial actions	means, for the purpose of this permit, any activity that is required to ensure that a specified environmental outcome and/or objective can be met, where it has been identified that the environmental outcome, objective, threshold criteria, or management target is likely to be, or is being, exceeded. Remedial actions may include, but are not limited to: (a) changes to operations, reductions in disturbance, or additional management measures that will reduce *adverse impacts* pursuant to conditions 12 and 13 of this permit; and (b) activities required to ensure successful re-establishment of

Term	Definition
	vegetation to its pre-*clearing* composition, structure and density, and may include a combination of soil treatments and *revegetation*, pursuant to condition 16 of this permit.
revegetate / revegetated / revegetation	means the re-establishment of a cover of *local provenance* native vegetation in an area using methods such as natural *regeneration, direct seeding* and/or *planting*, so that the species composition, structure and density is similar to pre-*clearing* vegetation types in that area.
Revegetation Management Plan/s	means three individual documents prepared by the permit holder, describing the *revegetation* and *rehabilitation* activities proposed within the *Hartfield Park Offset Site*, *Mirrabooka Offset Site*, and *Neaves Road Offset Site* in accordance with condition 16 of this permit and as outlined in the *Great Eastern Highway Bypass Interchanges CPS 9448/1 Offset Strategy, October 2025* (Main Roads Western Australia, 2025).
site preparation	means management of existing site topsoil and preparation of the finished soil surface, for example by ripping or tilling the soil surface and respreading site topsoil and chipped native vegetation.
vegetation establishment period	means a period of at least two summers after the *revegetation* during which time replacement and infill *revegetation* works may be required for areas in which *revegetation* has been unsuccessful and involves regular inspections of *revegetation* sites to monitor the success of *revegetation*.
watercourse/s	has the meaning given to it in section 3 of the *Rights in Water and Irrigation Act 1914*.
water quality monitoring	means a systematic process of making observations and taking measurements that are analysed and reported to provide information about catchments and waterways. Water quality monitoring may include measurements of: (a) dissolved oxygen; (b) nutrients; (c) turbidity; (d) total suspended solids (TSS); (e) total recoverable hydrocarbons; and (f) heavy metals.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.
wetland/s	means an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary.
woody weeds	means *weeds* with tough, woody stems, that can grow large, are difficult to control, and typically form groves.

END OF CONDITIONS



Sasha Pendal
DEPUTY DIRECTOR GENERAL APPROVALS
APPROVALS

Officer delegated under Section 20
of the Environmental Protection Act 1986

15 December 2025

Schedule 1

Table 3. List of properties within which the clearing is authorised in accordance with conditions of this permit.

Property	Locality	Local Government Authority
Roe Highway road reserve (PIN 11574273)	Bellevue and Helena Valley	Shire of Mundaring
Lot 2 on Diagram 48364 (Unnamed road reserve PIN 184482)	Hazelmere	City of Swan
Lot 100 on Diagram 66238	Hazelmere	City of Swan
Lot 14428 on Deposited Plan 30138	Hazelmere	City of Swan
Unallocated Crown Land (PIN 202510)	Hazelmere	City of Swan
Great Eastern Highway Bypass road reserve (PIN 11452245)	Hazelmere	City of Swan
Great Eastern Highway Bypass road reserve (PIN 11472531)	Hazelmere	City of Swan
Midland Road reserve (PIN 11452249)	Hazelmere	City of Swan
Midland Road reserve (PIN 11452283)	Hazelmere	City of Swan
Midland Road reserve (PIN 11841091)	Hazelmere	City of Swan
Midland Road reserve (PIN 12273030)	Hazelmere	City of Swan
Military Road reserve (PIN 1341350)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 184483)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 1287699)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 11414881)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 11569684)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 11842461)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 12682255)	Hazelmere	City of Swan

Property	Locality	Local Government Authority
Roe Highway road reserve (PIN 12682256)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 12682257)	Hazelmere	City of Swan
Roe Highway road reserve (PIN 12682258)	Hazelmere	City of Swan
Talbot Road reserve (PIN 11841098)	Hazelmere	City of Swan
Unnamed road reserve (PIN 11841093)	Hazelmere	City of Swan
Unnamed road reserve (PIN 11841094)	Hazelmere	City of Swan
Unnamed road reserve (PIN 12682259)	Hazelmere	City of Swan
Lot 56 on Plan 14124	Helena Valley	Shire of Mundaring
Lot 240 on Diagram 3207	Helena Valley	Shire of Mundaring
Midland Road reserve (PIN 11841090)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 11569312)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 11569673)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 11569674)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 11574272)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 12272928)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 12272929)	Helena Valley	Shire of Mundaring
Roe Highway road reserve (PIN 12273029)	Helena Valley	Shire of Mundaring
Lot 604 on Deposited Plan 422318	Maida Vale	City of Kalamunda
Roe Highway road reserve (PIN 11841795)	Maida Vale	City of Kalamunda

Schedule 2

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

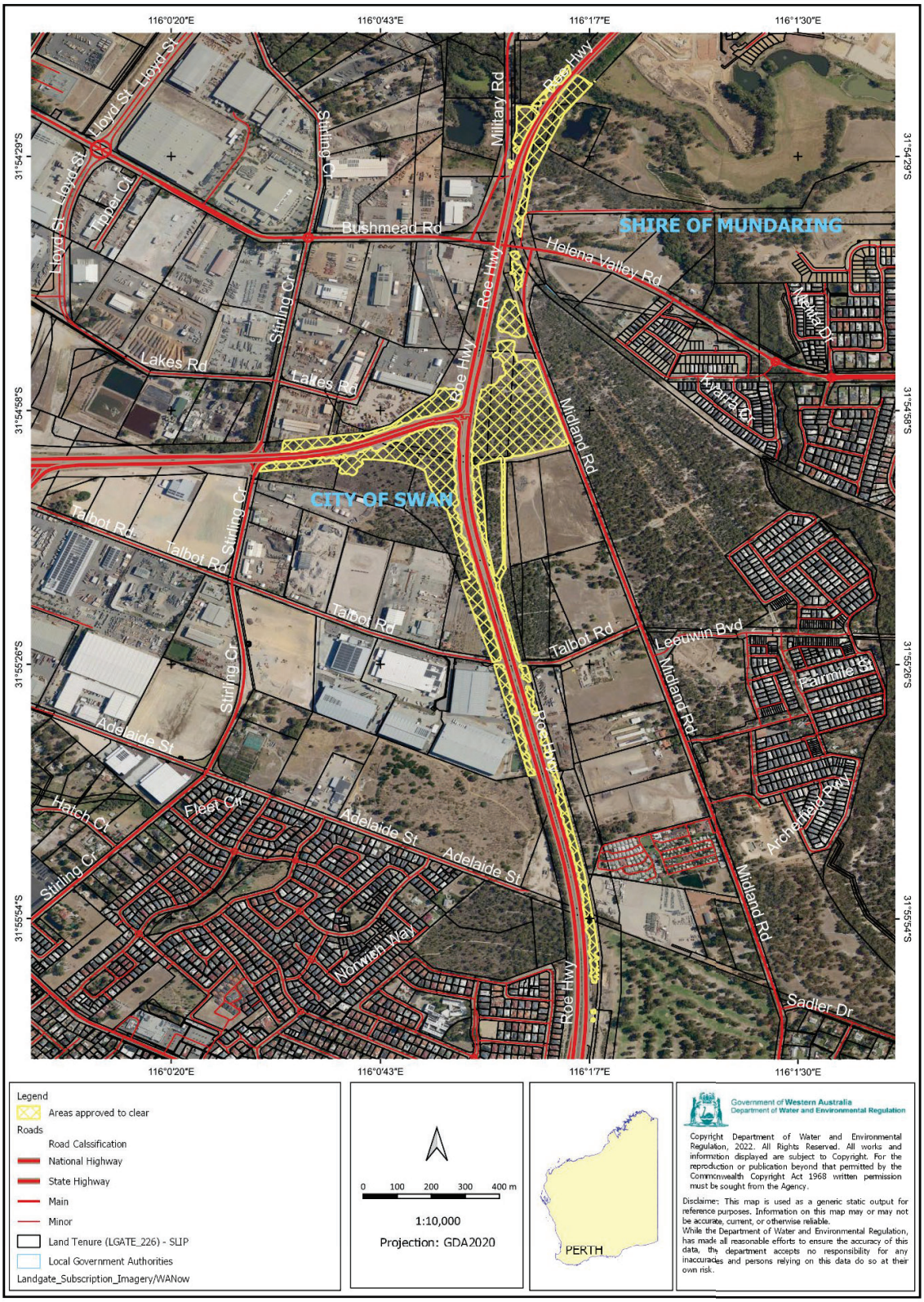


Figure 1: Map of the boundary of the area within which clearing may occur

The boundary of the areas subject to conditions are shown in the maps below (Figures 2-12).

Figure 2: Map of the boundary of the area subject to additional dieback management measures pursuant to condition 6 of this permit.

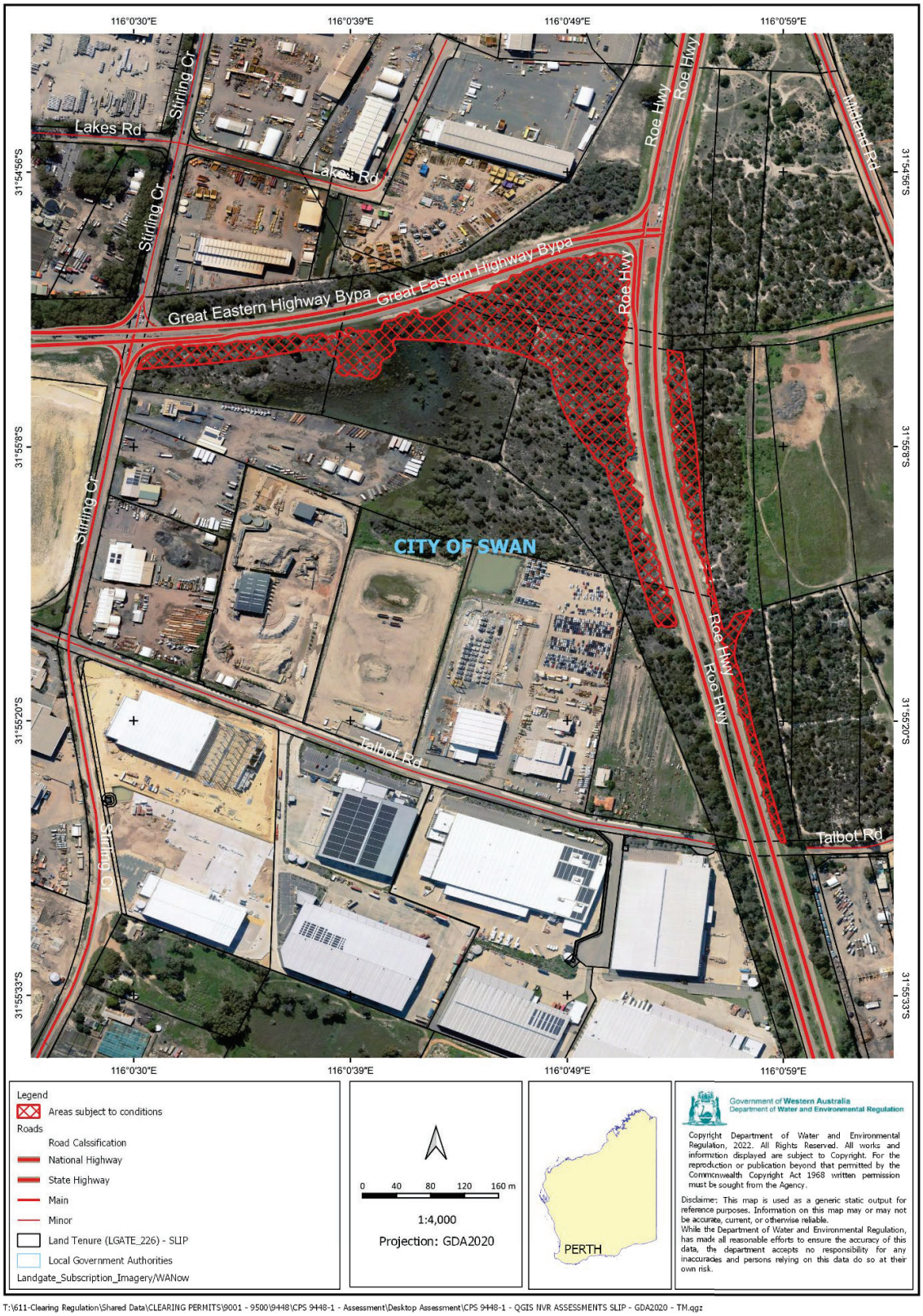


Figure 3: Map of the boundary of the area subject to additional weed management measures pursuant to condition 6 of this permit.

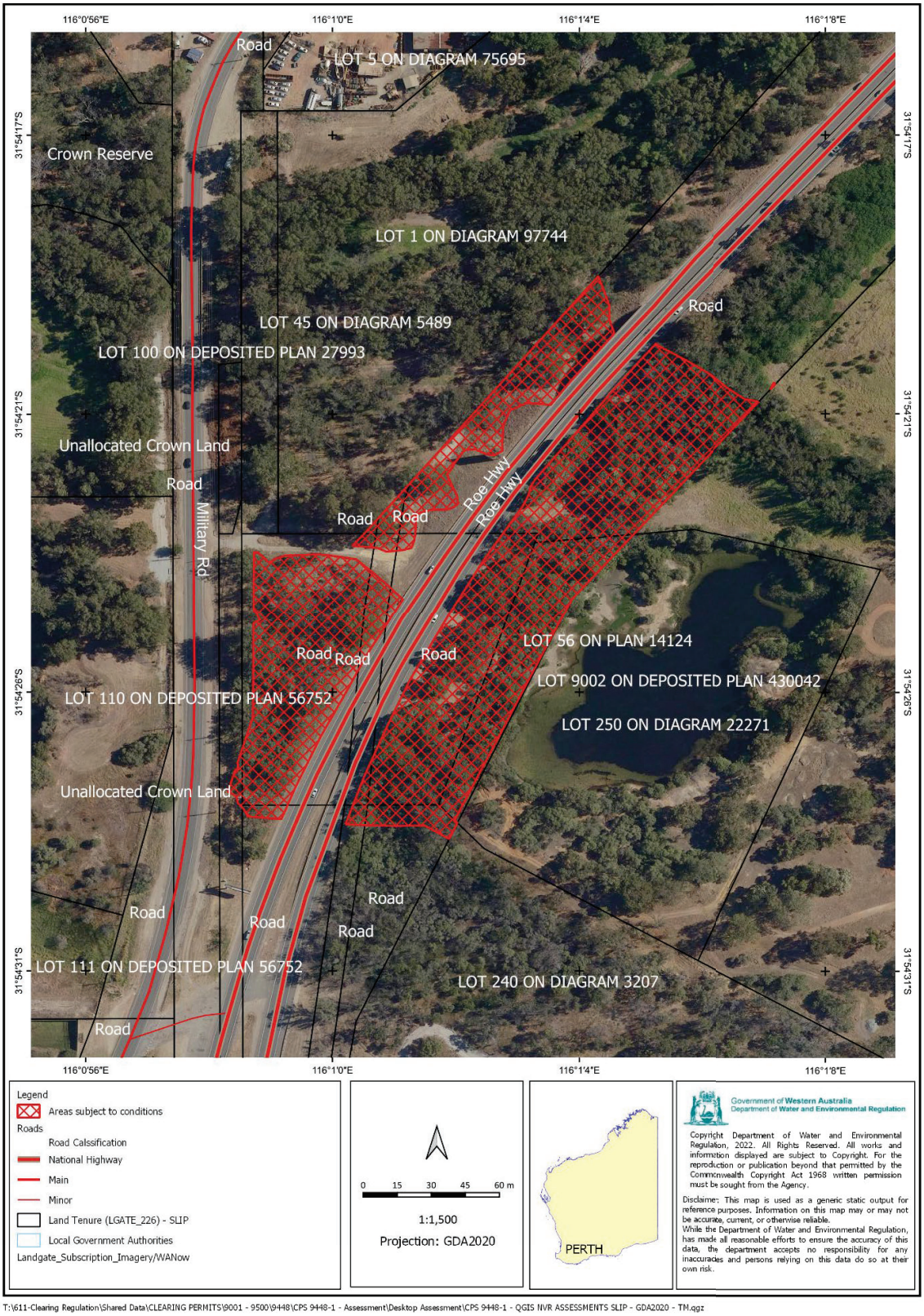


Figure 4: Map of the boundary of the area subject to ecological linkage management pursuant to condition 10 of this permit

Figure 5: Map of the boundary of the area in which appropriate erosion and sediment control structures must be installed pursuant to condition 12 of this permit

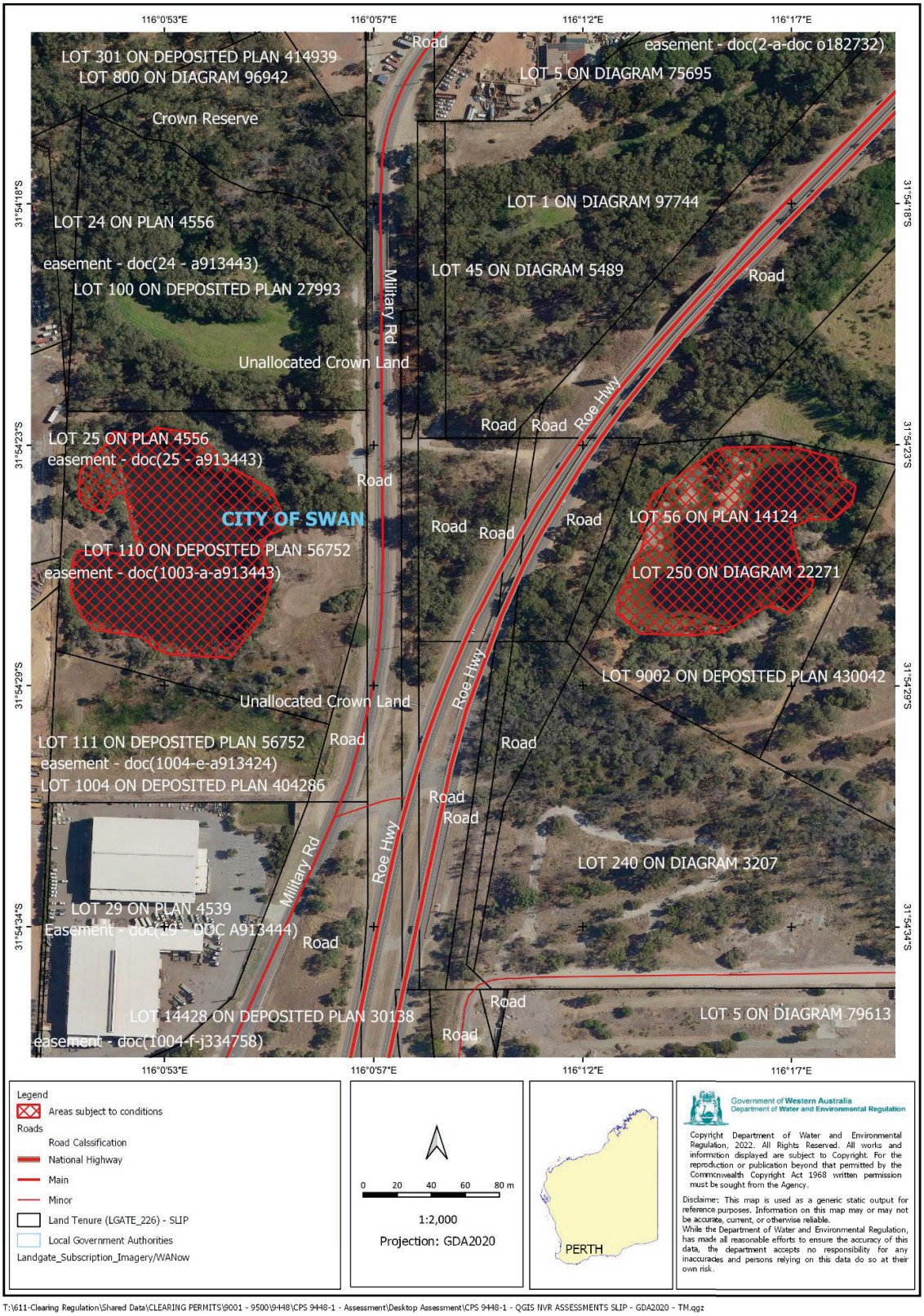


Figure 6: Map of the boundary of the area subject to additional Carter's freshwater mussel, watercourse, and wetland management pursuant to condition 12 of this permit

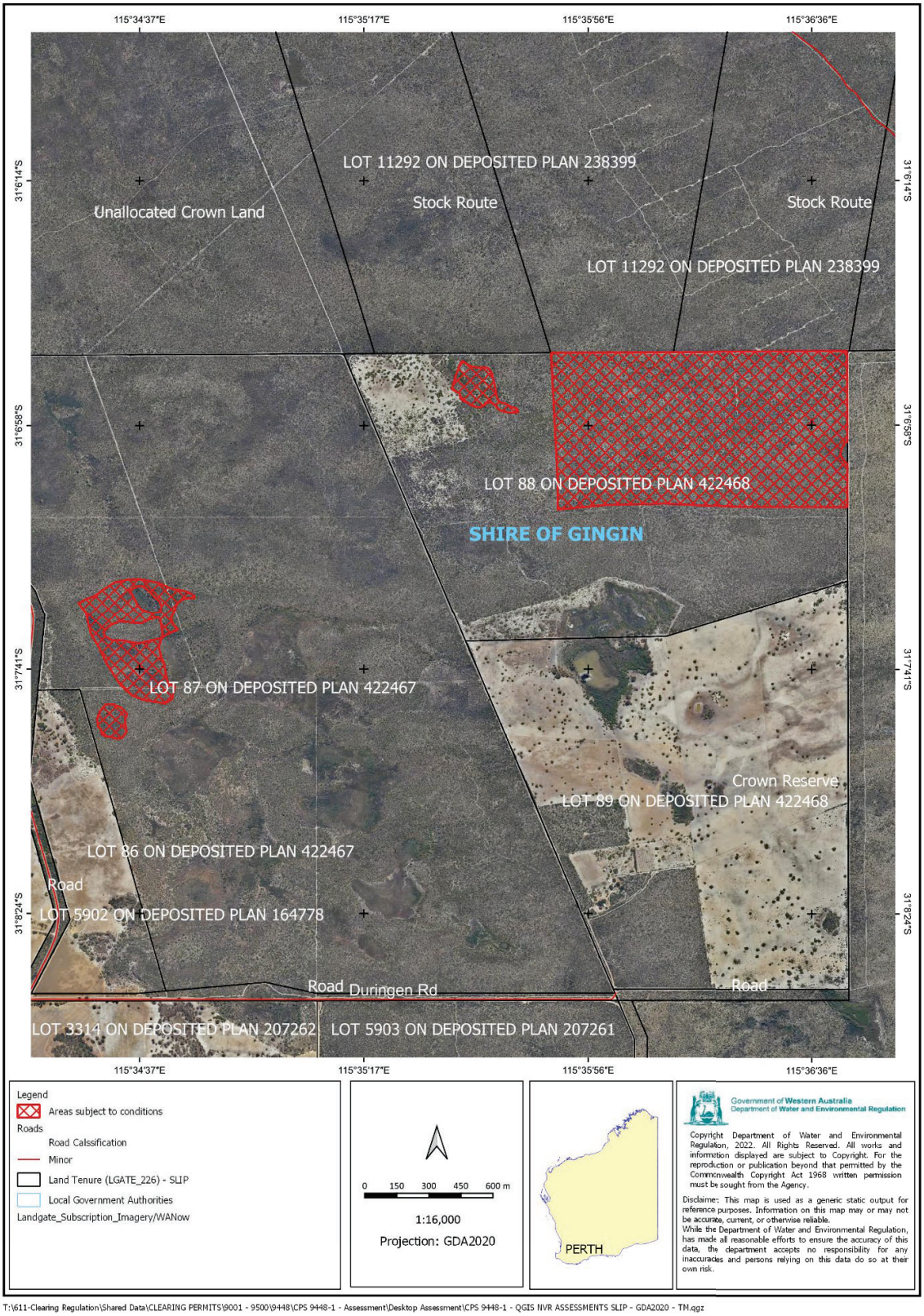


Figure 7: Map of the boundary of the *Cowalla Offset Site* pursuant to condition 13 of this permit

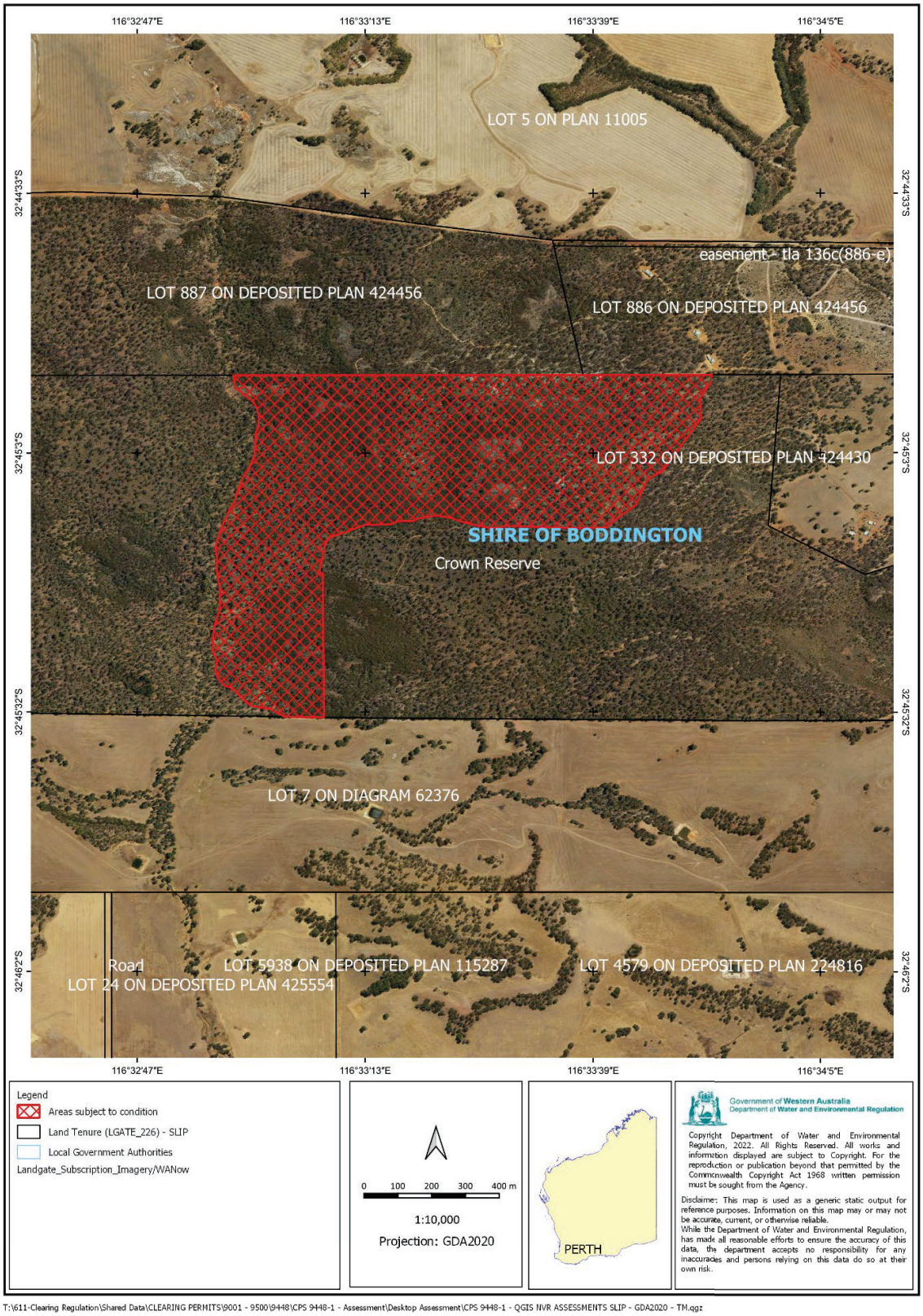


Figure 8: Map of the boundary of the *Crossman Offset Site* pursuant to condition 13 of this permit

Figure 9: Map of the boundary of the *Hartfield Park Offset Site* pursuant to condition 14 of this permit

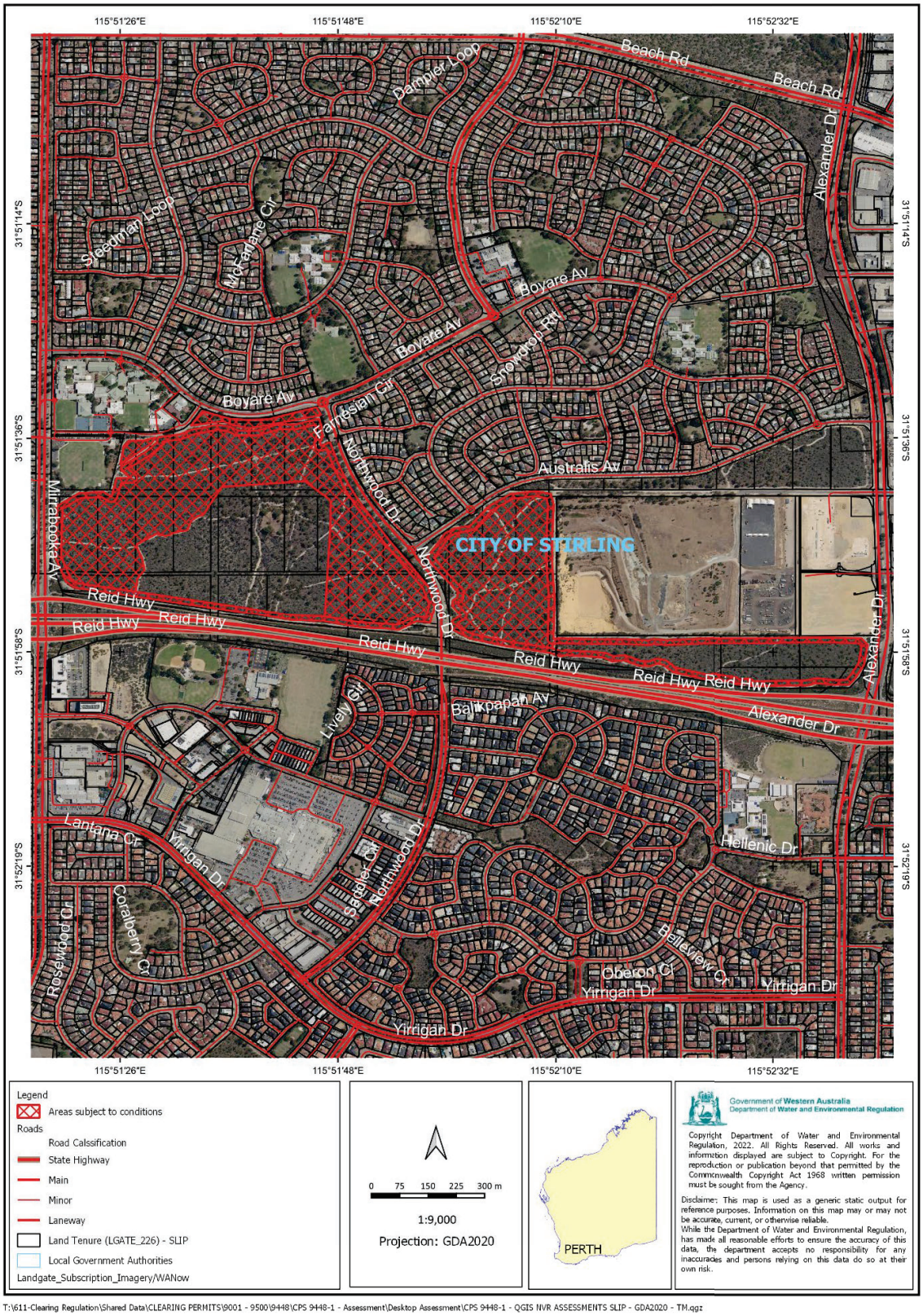


Figure 10: Map of the boundary of the *Mirrabooka Offset Site* pursuant to conditions 14 and 15 of this permit

Figure 11: Map of the boundary of the revegetation area within the *Hartfield Park Offset Site* pursuant to condition 15 of this permit

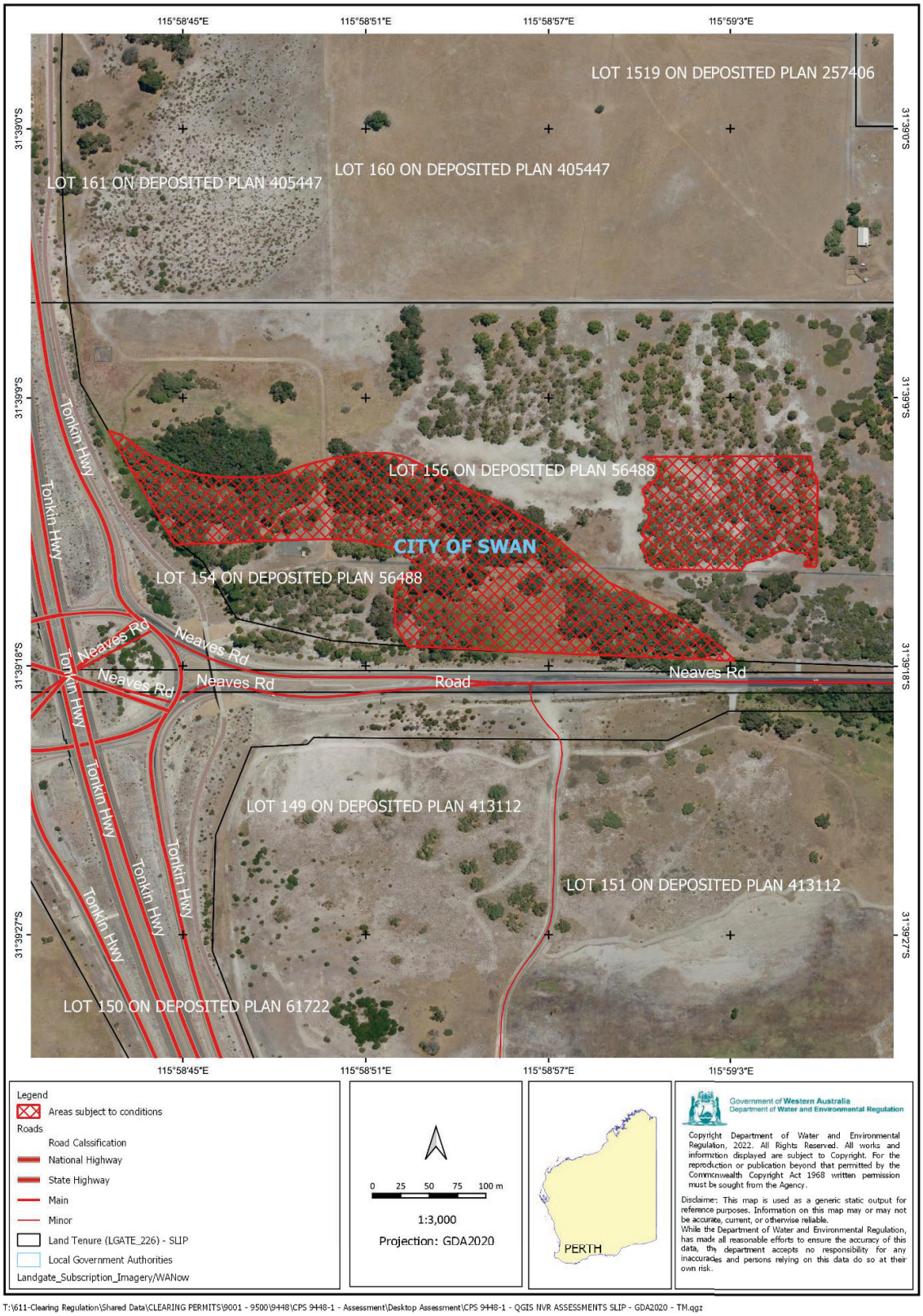


Figure 12: Map of the boundary of the revegetation area within the *Neaves Road Offset Site* pursuant to condition 15 of this permit

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 9448/1
Permit type:	Area permit
Applicant name:	Commissioner of Main Roads WA (MRWA)
Application received:	6 October 2021
Application area:	23.31 hectares (ha) of native vegetation
Purpose of clearing:	Great Eastern Highway Bypass Interchanges (GEHBI) Project
Method of clearing:	Mechanical
Property:	Multiple properties in the suburbs of Bellevue, Hazelmere, and Helena Valley
Location (LGA area/s):	City of Swan, City of Kalamunda, Shire of Mundaring

1.2. Description of the application and necessity of clearing

MRWA is proposing to clear 23.31 hectares (ha) of native vegetation within multiple properties in the City of Swan (majority), City of Kalamunda, and Shire of Mundaring, to facilitate the Great Eastern Highway Bypass Interchanges (GEHBI) Project. The application area is in a highly developed portion of the Perth Subregion and sits around three kilometres (km) west of the edge of the Darling Scarp. The application extends over a largely linear area of about 3.35 km.

MRWA has advised that the broader GEHBI project includes the following proposed works:

- two major interchanges at Great Eastern Highway Bypass (GEHB) and Roe Highway, and at GEHB and Abernethy Road,
- an extension of Lloyd Street from its current end point to the south of Clayton Street to GEHB, including a new bridge over the Helena River,
- upgrades to GEHB, including the removal of the existing intersection at Stirling Crescent,
- upgrades to parts of Abernethy Road,
- upgrade of Roe Highway between Talbot Road and Clayton Street, including a bridge duplication over Helena River,
- completion of the 30 km principal shared path (PSP) network on Roe Highway between Great Eastern Highway and Kwinana Freeway,
- modification of existing utilities and services to enable construction, and
- landscaping (MRWA, 2025c).

It should be noted that the clearing permit application relates specifically to clearing associated with the new grade separated interchange at Roe Highway and GEHB and the extension of the PSP network, which comprise part of the broader GEHBI Project.

MRWA has advised that GEHB provides a critical connection between Roe Highway and Tonkin Highway (GCA), 2022c). GEHB is currently a limited-access two lane dual carriageway that links Great Eastern Highway and Roe Highway. This network provides connection to the Perth Airport, the industrial areas of High Wycombe, Forrestfield, and Kewdale to the south and the industrial suburb of Hazelmere to the north (GCA, 2022c).

MRWA note that the intersections of GEHB with Roe Highway, Stirling Crescent, and Abernethy Road have become increasingly congested due to large volumes of heavy vehicles moving in a north-south direction between the

Forrestfield, High Wycombe, and Hazelmere industrial areas, and Perth hills residents and heavy vehicles seeking to avoid traffic through Midland and Guildford (GCA, 2022c). Subsequently, the Roe Highway-GEHB intersection is ranked as the 22nd most congested intersection in the Australian Road Research Board (ARRB) *Network Performance Analysis for Perth Congestion Response 2016* report (GCA, 2022c).

MRWA note that with the recent grade-separation of the Roe Highway-Kalamunda Road intersection, the Roe Highway-GEHB intersection is the last remaining at grade intersection on Roe Highway between Great Eastern Highway and Kwinana Freeway (GCA, 2022c).

MRWA has advised that the project will deliver the following community benefits:
- improve traffic safety and traffic flows,
- time travel savings for over 60,000 road users per day,
- remove traffic lights from congestion hot spots,
- complete the 'missing link' in the 30 km shared path between Midland and Jandakot,
- provide hundreds of construction jobs and opportunities for local suppliers,
- provide support for commercial development in Midland,
- improve key links to Hazelmere, Forrestfield, Kewdale, and Perth Airport industrial areas, and
- improve access to south of Midland (MRWA, 2025a).

On 18 February 2022, the applicant requested to reduce the application area from 31 ha to 23.29 ha based on design refinements to reduce the extent of environmental impacts (see Section 3.1 for further information). On 26 August 2025, the application area was revised again to increase the proposed clearing area by 0.02 ha, from 23.29 ha to 23.31 ha.

1.3. Decision on application

Decision:	Granted
Decision date:	15 December 2025
Decision area:	23.31 ha of native vegetation, 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 a total of 49 days across three advertising periods between 2021 and 2025 (see Section 3.3). Six submissions were received across these advertisement periods and consideration of the matters raised in the public submissions are summarised in Appendix B.

In making this decision, the Delegated Officer had regard for:
- the site characteristics (see Appendix C),
- relevant datasets (see Appendix F.1),
- the findings of biological surveys of the application area and surrounds (see Section 3 below for details),
- the clearing principles set out in Schedule 5 of the EP Act (see Appendix D),
- expert advice received from the Department of Biodiversity, Conservation and Attractions (DBCA),
- internal advice from DWER's River Science Section (RSS) and Water Allocation Planning South branch,
- the applicant's efforts to avoid, minimise, mitigate and offset the environmental impacts of the proposed clearing in accordance with the *WA Environmental Offsets Guidelines* (2014) mitigation hierarchy,
- the applicant's approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to undertake the proposed action,
- planning instruments and other relevant matters (see Section 3 below), and
- the necessity of clearing to facilitate the GEHBI project, which is a high priority State Government project (see Section 1.2 above).

The assessment identified that the proposed clearing would result in the following environmental impacts:
- the loss of:
  - 20.83 ha of significant foraging habitat for state and federally listed threatened fauna species Carnaby's cockatoo (*Zanda latirostris*),
  - 20.38 ha of significant foraging habitat for state and federally listed threatened fauna species' forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) and Baudin's cockatoo (*Zanda baudinii)*,

  - 1.43 ha that comprises significant habitat for state and federally listed threatened flora species *Conospermum undulatum* (including removal of five individuals),
  - suitable habitat for priority (P) flora species, including the removal of one individual of *Hypolaena robusta* (P4), 27 individuals of *Isopogon autumnalis* (P3), and one individual of *Johnsonia pubescens* subsp. *Cygnorum* (P2),
  - 14.94 ha of native vegetation that is representative of the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Banksia Woodlands Community) federally listed threatened ecological community (TEC) and priority ecological community (PEC) in WA,
  - 5.78 ha of native vegetation that is representative of the *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994)) (SCP20a) state-listed TEC and component of the federally listed Banksia Woodlands Community,
  - 2.53 ha of native vegetation that is representative of the Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c as originally described in Gibson et al. (1994)) (SCP21c) PEC in WA and component of the federally listed Banksia Woodlands Community,
  - native vegetation growing in association with a watercourse (Helena River),
  - 3.15 ha of significant wetland vegetation that has values commensurate with a Conservation Category Wetland (CCW),
  - 11.07 ha of regionally significant bushland within Bush Forever Site 481, and
  - native vegetation that provides locally significant habitat for quenda (*Isoodon fusciventer*) (P4).
- the potential for direct impacts and injury to ground-dwelling vertebrate fauna (e.g., quenda) utilising the application area at the time of clearing,
- the potential for indirect impacts to an adjacent population of state and federally listed threatened fauna species Carter's freshwater mussel (*Westralunio carteri*),
- the exacerbation of existing barriers to fauna movement and ecological linkages associated with the Helena River,
- the potential for indirect impacts to significant wetland vegetation and remaining patches of the Banksia Woodlands Community, SCP20a, and state and federally listed Shrublands and woodlands of the eastern Swan Coastal Plain (floristic community type 20c as originally described in Gibson et al. 1994) (SCP20c) TEC adjacent to the application area through hydrological changes,
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values, including nearby significant wetland vegetation, conservation areas (Bush Forever), and the abovementioned TECs and PECs, and
- the potential for wind erosion, water erosion, and subsurface acidification.

After consideration of the available information, the Delegated Officer determined that the loss of suitable habitat for priority flora does not represent a significant risk to the ongoing maintenance of these species. The Delegated Officer considered that direct impacts to fauna through machinery strike, exacerbation of ecological linkage barriers, and the potential for land degradation can be appropriately managed through conditions on the clearing permit. In addition, permit conditioning was considered appropriate to manage the potential indirect impacts of the proposed clearing to adjacent patches of significant ecological communities, wetland vegetation, conservation areas, and Carter's freshwater mussel (CFM) habitat.

The Delegated Officer determined that impacts to significant foraging habitat for Carnaby's, Baudin's and forest red-tailed black cockatoos, significant habitat for *Conospermum undulatum*, native vegetation representative of SCP20a, SCP21c, and the Banksia Woodlands Community, wetland vegetation commensurate with a CCW, and regionally significant bushland within Bush Forever Site 481, remained significant after the application of the mitigation hierarchy. These impacts therefore constitute significant residual impacts.

The Delegated Officer determined that, given the extent of the significant residual environmental impacts, the applicant's implementation of the mitigation hierarchy, necessity of clearing, and public benefit that would be derived from the GEHBI project, it was appropriate to consider offsets to counterbalance the significant residual impacts of clearing in this instance.

The applicant has provided several environmental offsets to counterbalance the above significant residual impacts. The offsets proposed are consistent with the *WA Environmental Offsets Policy* (2011) and *WA Environmental Offsets Guidelines* (2014) and have been quantified using the WA Environmental Offsets Metric. The Delegated Officer has determined that the offsets proposed adequately counterbalance the significant residual impacts of clearing (see Section 4 below for details).

The proposed offsets include (detailed further in Section 4):

- **Cowalla Offset Site**, involving the conservation in perpetuity (ceded to DBCA) and MRWA funded management of at least 137.55 ha of native vegetation within Lot 87 on Deposited Plan 422467 and Lot 88 on Deposited Plan

422467, Cowalla (see Figure 9), that comprises native vegetation representative of the Banksia Woodlands Community, SCP21c, significant foraging habitat for Carnaby's cockatoo, and wetland vegetation containing values commensurate with a CCW.

- **Crosman Offset Site,** involving the conservation in perpetuity (ceded to DBCA) and MRWA funded management of at least 86.6 ha of native vegetation within Lot 331 on Deposited Plan 424430 (Crown Reserve 54323), Crossman (see Figure 10), that contains significant foraging habitat for Carnaby's, Baudin's and forest red-tailed black cockatoos.
- **Hartfield Park Offset Site**, involving the conservation in perpetuity (executed change in reserve vesting to Conservation) and MRWA funded management (including rehabilitation) of a total of 5.28 ha of native vegetation within Lot 3003 on Deposited Plan 70568 (Crown Reserve 17098), Forrestfield (see Figure 11), comprising significant habitat for *Conospermum undulatum* and at least 2.92 ha of native vegetation representative of SCP20a.
- **Mirrabooka Bushland Offset Site**, involving the conservation in perpetuity (change from freehold properties to a reserve vested for Conservation and Passive Recreation) and MRWA funded management (including rehabilitation) of a total of 42.8 ha in various properties within Bush Forever Site 385 in the locality of Mirrabooka (see Figure 12), that contains vegetation representative of SCP20a.
- **Neaves Road Offset Site**, involving the intensive revegetation of a total of 5.7 ha of native vegetation within Lot 156 on Deposited Plan 56488, Bullsbrook (see Figure 13) that contains at least 1.65 ha foraging habitat for forest red-tailed black cockatoo and Carnaby's cockatoo and at least 4.05 ha of wetland vegetation containing values commensurate with a CCW.

Given the above, the Delegated Officer considered that, on balance, it was appropriate to grant a clearing permit subject to conditions to:

- avoid, minimise, and reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback, including additional protocols for clearing adjacent to dieback-uninfested protectable areas and weed-infested areas adjacent to significant environmental values,
- demarcate the application area to avoid the inadvertent clearing of adjacent significant environmental values,
- undertake slow, one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity, where practicable,
- commence construction activities within three months of clearing to minimise the risk of wind erosion,
- ensure habitat connectivity and ecological linkage values are maintained under the Roe Highway-Helena River bridge,
- engage a fauna specialist to traverse the clearing area immediately prior to and for the duration of clearing, where clearing must cease until any identified native vertebrate fauna have moved out of the application area into suitable habitat in the immediate vicinity,
- implement clearing controls, management measures, and water quality monitoring to reduce indirect impacts to CFM, watercourses (Helena River), and significant wetland vegetation adjacent to the application area, and undertake remedial actions where monitoring indicates adverse impacts are possible,
- implement environmental offsets (land transfer, executed change in purpose, and revegetation and rehabilitation), as outlined above.

The Delegated Officer notes that the assessment against Clearing Principles (a), (b) and (d) has determined that the proposed clearing is seriously at variance with these clearing principles (see Section 3.2 for the detailed assessment). Under Section 51O(3) of the EP Act, the DWER's Chief Executive Officer may approve clearing which is seriously at variance with a clearing principle if, and only if, in the CEO's opinion there is a good reason for doing so.

In this instance, the CEO considers that the following good reasons exist for granting a clearing permit:

- The project will:
  - improve traffic safety and traffic flows and result in time travel savings for over 60,000 road users per day,
  - complete the 'missing link' in the 30 km PSP between Midland and Jandakot,
  - create hundreds of construction jobs and opportunities for local suppliers,
  - provide support for commercial development in Midland,
  - improve key links to Hazelmere, Forrestfield, Kewdale and Perth Airport industrial areas, and
  - improve access to south of Midland.
- The impacts of clearing have been avoided, minimised, and mitigated to the extent practicable (see Section 3.1), and
- The significant residual impacts of the clearing have been appropriately offset in accordance with the *WA Offsets Policy 2011*, *WA Environmental Offsets Guidelines 2014*, and WA State Environmental Offsets Metric and will result in the protection and/or rehabilitation of at least 277.93 ha of native vegetation.

In making this decision the CEO also considered the cumulative impacts associated with this application and nearby development approved and proposed under Part IV and Part V of the EP Act. The Delegated Officer considered that the cumulative impacts to the above environmental values are not at a level that would warrant a decision to allow no further clearing of these values, subject to these impacts being appropriately addressed and managed.

1.5. Site map

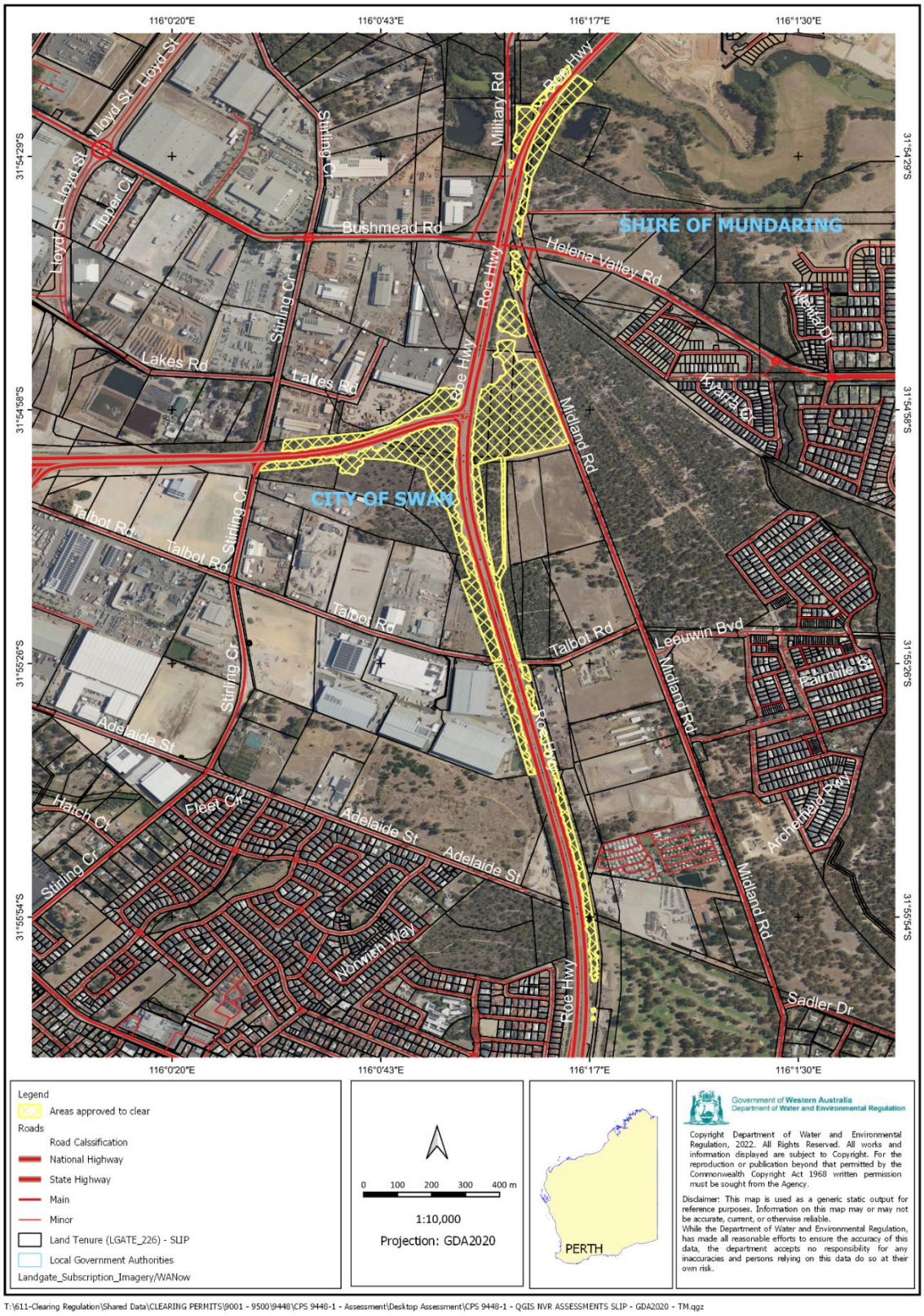


Figure 1. Map of the application area. The areas cross-hatched yellow indicate the areas authorised to clear under the granted clearing permit.

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*.

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, and
- 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)
- EPBC Act
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Rights in Water and Irrigation Act 1914* (WA) (RIWI Act)
- *Swan and Canning Rivers Management Act 2006*

Relevant policies considered during the assessment include:

- *WA Environmental Offsets Policy* (Government of Western Australia, 2011)
- *State Planning Policy 2.8 - Bushland Policy for the Perth Metropolitan Region* (2010) (SPP 2.8)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (Government of Western Australia, August 2014)
- *Environmental Guidance for Planning and Development* (EPA, 2018)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3 Detailed assessment of application

3.1. Avoidance, minimisation and mitigation measures

Avoidance and minimisation measures

Supporting information provided by MRWA indicates that the proposed clearing is required to provide free flowing traffic movement between Roe Highway and GEHB (GCA, 2022c). Historical land use planning constrains MRWA to undertaking works within the existing road reserve, with the land surrounding the proposed interchange location being in private tenure and generally developed for urban, industrial, and rural purposes (GCA, 2022c). As a result, there are limited alternatives to the clearing of native vegetation that will achieve the objective (GCA, 2022c).

While the application area includes 23.31 ha of native vegetation within a development envelope (DE), MRWA have advised that this indicates a worst-case scenario of clearing and is intended to allow for flexibility of design on-ground (GCA, 2022c). In practice, the final road design will achieve the project objectives with the minimum impact to native vegetation practicable (GCA, 2022c).

The supporting information indicates that significant design reviews were undertaken during the planning phase of the proposal to balance the needs of improving safety performance with avoiding significant environmental values (GCA, 2022c). In general, the following design measures have been considered to avoid and minimise clearing impacts:

- ensuring that site access will be facilitated from within the construction alignment to avoid temporary clearing for access tracks,
- locating construction laydown and stockpile areas within existing cleared areas to avoid clearing for these purposes,
- using retaining walls and steeper batter slopes in design,
- locating noise barriers adjacent to the road infrastructure rather than setback to the edge of the road reserve, and
- installing drainage basins within loop ramps, which are likely to be more heavily impacted by clearing and edge effects than outside the loops (GCA, 2022c).

In addition, MRWA advised that the original concept design proposed to impact 3.8 ha of the Shrublands and Woodlands of the Eastern Swan Coastal Plain (SCP20c) TEC and additional areas of other conservation significant flora species and ecological communities (GCA, 2022c). Prior to the submission of the clearing permit application, MRWA subsequently implemented the following re-design initiatives to avoid and minimise clearing impacts:

- tightening the radius of the ramp carrying movements from Roe Hwy northbound to GEHB westbound, which completely avoids clearing of the SCP20c TEC and avoids an area potentially representing the Southern Wet Shrublands of the Swan Coastal Plain (SCP02) TEC. To achieve this, MRWA has also reduced the design speed of this movement from 90 km/hr to 80 km/hr,
- shifting the interchange northwards which reduced the amount of overall clearing of the Banksia Woodlands Community,
- tightening the radius of the ramp that carries movements from Roe Highway southbound to GEHB westwards and movements from GEHB eastbound to Roe Highway southbound to reduce the extent of clearing of SCP21c, and
- modifying the DE boundary to ensure there is no design creep into the SCP20c TEC (GCA, 2022c).

During the assessment of the application, MRWA implemented further project design changes to reduce the extent of clearing (see Figure 2 below). The revised application was received in February 2022 and resulted in the following impacts being minimised:

- Native vegetation clearing – reduced from 31.03 ha to 23.31 ha (24.9% reduction),
- SCP20a TEC – reduced from 9.49 ha to 5.78 ha (39.1% reduction),
- Banksia Woodlands Community – reduced from 21.77 ha to 14.94 ha (31.4% reduction),
- Black cockatoo foraging habitat – reduced from 31.02 ha to 20.83 ha (32.8% reduction),
- Trees with a diameter at breast height of greater than 500 millimetres (mm) – reduced from 211 to 119 (43.6% reduction),
- Vegetation growing in association with wetlands commensurate with a CCW – reduced from 4.23 ha to 3.15 ha (25.5% reduction),
- Bush Forever Site 481 – reduced from 15.95 ha to 11.07 ha (30.5% reduction), and
- *Isopogon autumnalis* (Priority 3) – reduced from 112 to 27 individuals (75.9% reduction) (GCA, 2022c).

Regarding minimising the extent of impact to the SCP20a TEC, MRWA also advised that (GCA, 2022c):

- the PSP has been realigned to follow the boundary of an existing rural property, connecting back to the highway further south from the intersection,
- the design widths south of the PSP connection have been tightened to avoid a larger (3.01 ha) area of SCP20a south of the intersection,
- the disturbance width for the PSP has been narrowed from 30 metres (m) to 10 m and will allow SCP20a on either side of the PSP to represent a single resilient patch of this community of about 4.78 ha, and
- while the PSP bisects SCP20a, it is a better environmental outcome than the alternative which would involve additional clearing of SCP20a and retention of small patches exposed to greater edge effects (GCA, 2022c).

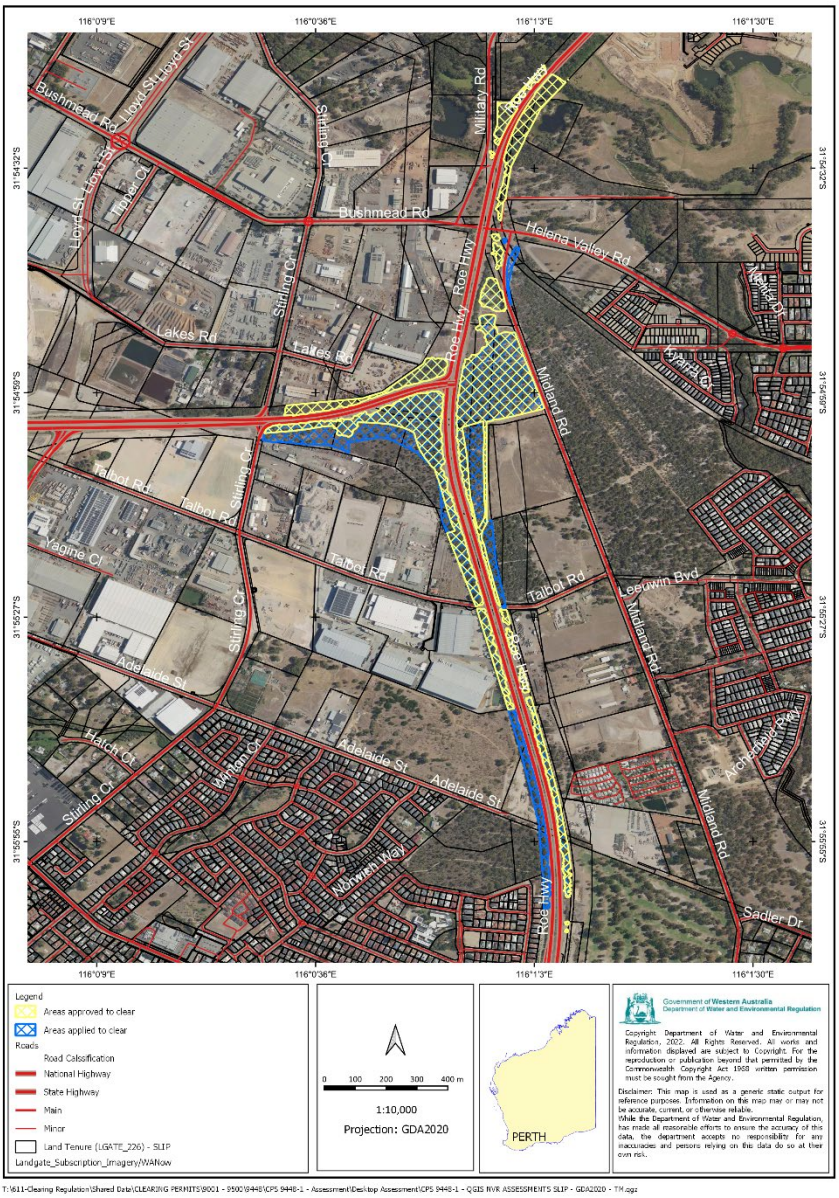


Figure 2. Comparison of the original application area (cross-hatched blue) and revised application area (cross-hatched yellow).

Mitigation measures

The supporting information indicates that MRWA will also implement the following measures during clearing and construction activities to mitigate the impacts of clearing:

- demarcating the clearing area prior to commencing ground disturbing activities,
- highlighting clearing limits and sensitivities at daily pre-start meetings,
- including environmental and heritage sensitivities and management controls in the site induction and daily pre-start meetings,
- implementing dieback management protocols that ensure dieback is not introduced or spread within the DE,
- retaining large trees where practicable and safe to do so, to provide ongoing fauna habitat and refuge, and
- retaining topsoil for rehabilitation, with dieback infested and non-infested soil stored separately (GCA, 2022c).

MRWA has also developed a series of management plans that set out the environmental control measures and responsibilities to manage impacts during project activities in detail (see Table 1 below). The management plans cover potential adverse environmental impacts and risks from both clearing and construction activities. The control measures relevant to clearing activities are discussed in more detail in relation to the specific environmental risks assessed under Section 3.2 below.

Table 1. Environmental management framework for the Great Eastern Highway Bypass Interchanges (GEHBI) Project.

Management Plan	Relevant Legislation	Environmental Management Outcome
Acid Sulfate Soil (ASS) and Dewatering Management Plan (GCA, 2023c)	*Contaminated Sites Act, 2003* *Environmental Protection Act 1986* *Rights in Water and Irrigation Act 1914*	Present the results of the ASS investigation, summarise the presence and extent of ASS within the project area where disturbance via extraction and/or exposure due to the active lowering of the water table (dewatering) is anticipated to occur, and provide practicable ASS and dewatering management measures to be implemented during construction.
Carter's Freshwater Mussel Management Measures (Biologic, 2025)	*Biodiversity Conservation Act 2016* *Environmental Protection Act 1986*	Provide discussion on the potential direct and indirect impacts to Carter's freshwater mussel from the GEHBI Project and outline planned management measures to mitigate risk of these impacts.
Environmental Management Plan (GCA, 2023a)	*Aboriginal Heritage Act 1972* *Biodiversity Conservation Act 2016* *Biosecurity and Agriculture Management Act 2007* *Bush Fires Act 1954* *Contaminated Sites Act, 2003* *Environmental Protection Act 1986* *Planning and Development Act 2005* *Rights in Water and Irrigation Act 1914* *Soil and Land Conservation Act 1945* *Swan and Canning Rivers Management Act 2006* *Waste Avoidance and Resource Recovery Act 2007* *Waste Avoidance and Resource Recovery Levy Act 2007*	Ensure that the GEHBI Project meets contractual, legal, and environmental requirements including industry codes of practice, environmental risk assessment, risk management and control measures, monitoring, record-keeping and reporting.
Helena River Bridge 1899 – Erosion and Sediment Control Plan (GCA, 2022a)	*Environmental Protection Act 1986* *Planning and Development Act 2005* *Rights in Water and Irrigation Act 1914* *Soil and Land Conservation Act 1945* *Swan and Canning Rivers Management Act 2006*	Set out the framework for the management of erosion and sedimentation risks associated with the construction of Bridge 1899 over the Helena River as part of the GEHBI Project.
M910 – Groundwater 85% Design Report (GCA, 2022b)	*Rights in Water and Irrigation Act 1914*	Document the determination of maximum groundwater levels (MGL) and groundwater controls to inform design decisions for the GEHBI Project.
Topsoil and Hygiene Management Plan (Gambara, 2021)	*Biosecurity and Agriculture Management Act 2007* *Environmental Protection Act 1986*	Address hygiene procedures and topsoil/mulch management to be utilised in the prevention of the spread of dieback (*Phytophthora cinnamomi*) and declared weeds within the DE during works for the GEHBI Project.
Urban and Landscaping Design 100% Report (GCA, 2023b)	*Planning and Development Act 2005*	Detail the minimum parameters and outline the techniques that will be implemented by the contractor within the revegetation, landscaping and urban design works for the GEHBI Project.

Conclusion

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid, minimise and mitigate the potential impacts of the proposed clearing on environmental values. After consideration of these measures, the Delegated Officer determined that it was appropriate to consider an environmental offset to counterbalance the significant residual impact to SCP20a, the Banksia Woodlands Community, SCP21c, wetland vegetation with values

commensurate with a CCW, black cockatoo foraging habitat, *Conospermum undulatum* significant habitat, and Bush Forever Site 481.

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 offsets provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer had regard for the site characteristics (see Appendix C), biological survey findings, 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 D) identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora, and ecological communities), significant remnant vegetation, conservation areas, and land and water resources. 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 Principles (a) and (b)

Assessment

The application area was subject to a Level 1 fauna survey and black cockatoo habitat assessment as part of the Biota (2021) biological survey. The fauna survey was undertaken in accordance with the relevant EPA Technical Guidance (EPA, 2016) at the time of the field survey between 30 October 2019 and 6 May 2020 and involved opportunistic recording of terrestrial fauna and habitats, the use of infrared motion captures at four locations to record significant fauna, and an assessment of the likelihood of occurrence of significant species identified during the desktop study (Biota, 2021). The black cockatoo habitat assessment involved targeted searches for breeding, roosting, and foraging habitat, including the inspection of all individual trees of suitable species and sufficient diameter to provide nesting hollows and further investigation of potential breeding hollows using a camera mounted on an extendable pole (Biota, 2021). The full survey report is available on DWER's website at: http://ftp.dwer.wa.gov.au/permit/9448/.

The biological survey identified five fauna habitat types within the application area which correspond to mapped vegetation types (see Figure 3 below and Appendix C for the full survey descriptions):

- Banksia woodland with scattered Eucalyptus/Marri, which covers a total area of 20.23 ha and includes the P1 (*Allocasuarina* and *Banksia* over *Xanthorrhoea* with Sedges), P2 (Marri over *Kingia australis* with Sedges), P5 (Jarrah over *Xanthorrhoea* with Mixed Shrubs and Herbs), and P7 (Jarrah and *Banksia* over *Xanthorrhoea* with Sedges) vegetation types,
- Flooded gum over grasslands, which covers a total area of 2.35 ha and includes the P3 (Flooded Gum over Weedy Grasses on Floodplain) vegetation type,
- Fabaceous heathland, which covers a total area of 0.45 ha and includes the L5 (*Jacksonia* over *Xanthorrhoea* with Sedges) and P4 (*Eremaea* Open Heath) vegetation types, and
- Wetlands/River, which covers a total area of 0.27 ha and includes the L3 (Marri over *Melaleuca* Low Open Woodland on Clay Pits) and P6 (Flooded Gum over Weedy Understorey on Riverbank) vegetation types (Biota, 2021).

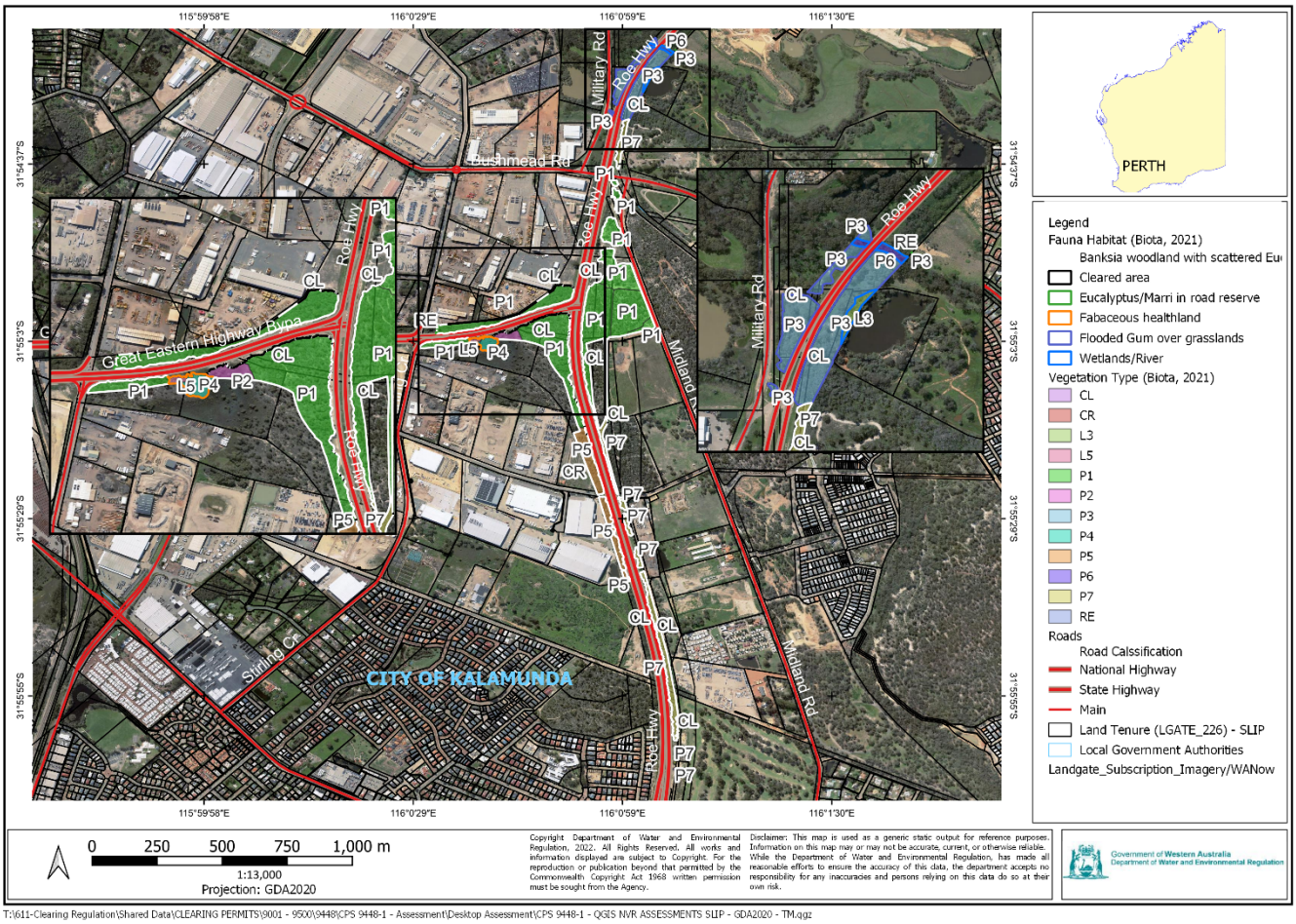


Figure 3. Vegetation types (shaded) and fauna habitat types (outlined) within the application area for CPS 9448/1.

Three conservation significant fauna species were recorded during the biological survey, either through direct observations, infrared motion captures, or indirect evidence (e.g., diggings or foraging evidence):

- Carnaby's cockatoo (*Zanda latirostris*),
- Forest red-tailed black cockatoo (*Calyptorhynchus banksia naso*), and
- Quenda (*Isoodon fusciventer*) (Biota, 2021).

In 2024, MRWA undertook a desktop assessment and gap analysis to identify whether additional environmental values need to be considered, given the length of time elapsed since the original biological surveys were conducted (MRWA, 2024b). This gap analysis identified that the methodology of the fauna survey and black cockatoo habitat assessment remained in line with contemporary Technical Guidance (EPA, 2020) and that the fauna habitat values identified in the survey were unlikely to have changed significantly, noting there was:

- no significant disturbance has occurred within the application area since May 2020 when the previous surveys concluded, and
- no new records of fauna species in the local area that are likely to be regular visitors to the application area (MRWA, 2024b).

With consideration of the biological survey findings (Biota, 2021), the site characteristics (see Appendix C), and the habitat preferences of species recorded from the local area, DWER's assessment identified that 11 conservation significant fauna species have the potential to occur within the application area (see Table 2 below).

Table 2. Conservation significant native fauna species that may occur within the application area for CPS 9448/1.

Species name	Conservation status
Baudin's cockatoo (*Zanda baudinii*)	Endangered; BC Act & EPBC Act
Black-striped snake (*Neelaps calonotos*)	Priority 3; DBCA listed
Carnaby's cockatoo (*Zanda latirostris*)	Endangered; BC Act & EPBC Act
Carter's freshwater mussel (CFM) (*Westralunio carteri*)	Vulnerable; BC Act & EPBC Act
Chuditch (*Dasyurus geoffroii*)	Vulnerable; BC Act & EPBC Act
Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)	Vulnerable; BC Act & EPBC Act
Graceful sun-moth (*Synemon gratiosa*)	Priority 4; DBCA listed
Peregrine falcon (*Falco peregrinus*)	Other specially protected fauna; BC Act
Perth slider (*Lerista lineata*)	Priority 3; DBCA listed
Quenda (*Isoodon fusciventer*)	Priority 4; DBCA listed
Swan Coastal Plain (SCP) shield-backed trapdoor spider (*Idiosoma sigillatum*)	Priority 3; DBCA listed

It is noted that two of the three invertebrate species identified as having the potential to occur in the application area from the biological survey (Biota, 2021) have been included in the above table and discussed in detail further below, being CFM and the SCP shield-backed trapdoor spider. The third species is the Guildford springtail (*Australotomurus morbidus*) (listed as Priority 3 by DBCA). Specific searches for invertebrates were outside of the scope of the biological survey and therefore, the potential for this species to occur within the application area cannot be ruled out based on the available information. However, the Guildford springtail has not been recorded in the local area since 1993 and is known to occur in Banksia heath from only four locations: Guildford Cemetery, Perth Airport, Talbot Road, and Tuart Hill. Therefore, while it is acknowledged that there are survey gaps for this species, the Delegated Officer determined that there is a low likelihood of impact to the Guildford springtail, and further targeted surveys were not necessary to inform the assessment of the clearing permit application.

Black cockatoo species

The application area is located within the modelled distribution of Baudin's cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo, which are collectively referred to as black cockatoo species for the purpose of this assessment.

Foraging habitat

Black cockatoo species are noted to forage on a range of plant species, with the primary foraging resources varying between species (DAWE, 2022). Carnaby's cockatoos forage on the seeds, nuts, and flowers of a variety of plants, including Proteaceous species (*Banksia* spp., *Hakea* spp., and *Grevillea* spp.), as well as Eucalyptus species and marri (*Corymbia calophylla*) (Valentine and Stock, 2008). On the Swan Coastal Plain (SCP), it is noted that Banksia species (predominantly *Banksia attenuata*, *Banksia menziesii* and *Banksia sessilis*) are the most important natural food source for Carnaby's cockatoo, followed by marri (Groom, et al., 2014). Forest red-tailed black cockatoos feed predominantly on the seeds of marri and jarrah (*Eucalyptus marginata*), which comprise approximately 90 per cent of their diet (DEC, 2008). Baudin's cockatoos primarily feed on the seeds of marri, but may also forage on the seeds of jarrah and Proteaceous species (DEC, 2008).

In quantifying the extent of foraging habitat within the application area, this assessment has considered vegetation mapping in favour of the broader scale fauna habitat mapping, noting it provides a more accurate measure of the areas containing preferred foraging species. Based on the mapped vegetation types, most of the application area (20.83 ha) provides high value foraging habitat for Carnaby's cockatoo within the following vegetation types (Biota, 2021):

- L3 – Marri over *Melaleuca* Low Open Woodland on Clay Pits – 0.15 ha
- L5 - *Jacksonia* over *Xanthorrhoea* with Sedges – 0.08 ha
- P1 - *Allocasuarina* and *Banksia* over *Xanthorrhoea* with Sedges – 15.25 ha
- P2 - Marri over *Kingia australis* with Sedges – 0.35 ha
- P4 - Eremaea Open Heath – 0.37 ha

- P5 - Jarrah over *Xanthorrhoea* with Mixed Shrubs and Herbs – 1.99 ha
- P7 - Jarrah and *Banksia* over *Xanthorrhoea* with Sedges – 2.64 ha

Most of the application area (20.38 ha) also provides foraging habitat for forest red-tailed black cockatoo and Baudin's cockatoo within the vegetation types listed above, excluding L5 and P4 (see Figure 4 below).

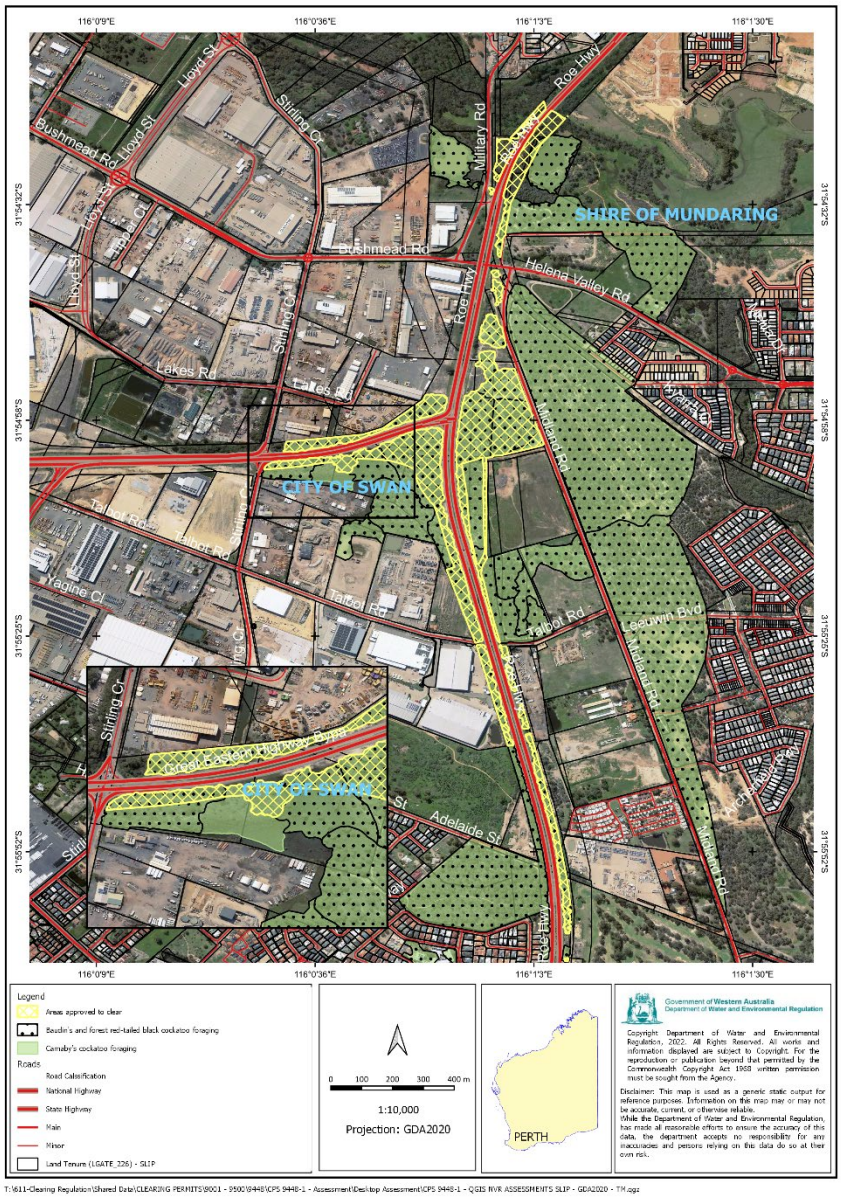


Figure 4. Foraging habitat for Carnaby's cockatoo (shaded green), Baudin's cockatoo and forest red-tailed black cockatoo (dotted black) within the application area for CPS 9448/1 (cross-hatched yellow) (Biota, 2021).

Critical habitat is defined as any habitat that provides for feeding, watering, regular night roosting, and potential for breeding for Carnaby's cockatoo (DPAW, 2013a). For Baudin's and forest red-tailed black cockatoo, all marri, karri and jarrah forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 mm of annual average rainfall are considered critical habitat (DEC, 2008). Foraging habitat within 12 km of a nesting site and six kilometres of a roosting site is also of particular importance in supporting breeding effort and sustaining populations (DAWE, 2022; EPA, 2019; Le Roux, 2017; Glossop, et al., 2011; DPAW, 2013a; DEC, 2008).

According to available databases, there are 14 Carnaby's cockatoo nesting sites within 12 km of the application area (of which 12 are confirmed sites and two are potential), all of which occur on the Darling Scarp east. There are no recorded Baudin's or forest red-tailed black cockatoo nesting sites within a 12km radius. There are 22 black cockatoo roost sites mapped within 6 km of the application area (a combination of Carnaby's and forest red-tailed black cockatoo records), the majority of which have been confirmed. This indicates the foraging habitat present within the application area may support roosting black cockatoos and breeding effort for Carnaby's cockatoos.

Carnaby's cockatoos were observed directly foraging in *Banksia* trees surrounding the Roe Highway/Great Eastern Highway Bypass intersection (Biota, 2021). Chewed marri nuts were also a common indicator of black cockatoo foraging observed during the black cockatoo habitat assessment. On these, bite marks indicative of both Carnaby's and forest red-tailed black cockatoos were recorded. There was no evidence of Baudin's cockatoo using the application area (Biota, 2021).

The assessment has identified that the proposed clearing will result in the loss of 20.83 ha of critical habitat for Carnaby's cockatoo, being preferred foraging habitat that supports breeding and roosting habitat on the SCP. The proposed clearing will also result in the loss of primary and secondary woodland foraging habitat for the forest red-tailed black cockatoo that is likely to support roosting populations and represents the loss of 20.38 hectares of critical habitat for this species.

The significance of foraging habitat for Baudin's cockatoo within the application area is acknowledged to be less than for other black cockatoo species, noting the limited area of marri woodland proposed for clearing. The proposed clearing will however impact on secondary foraging habitat for this species, largely in the form of *Banksia* and jarrah woodland, and is still considered to represent 20.38 hectares of critical habitat for the species.

The Delegated Officer determined that the proposed clearing of up to 20.83 ha of critical foraging habitat for black cockatoos constitutes a significant residual impact. This determination considered the:

- presence of high-value foraging habitat for black cockatoos within the application area,
- proximity to known roost sites and Carnaby's cockatoo nest sites,
- previous evidence of black cockatoos foraging within the application area, and
- cumulative loss of black cockatoo foraging habitat across these species range and ongoing threats to remaining habitat, particularly in the central and southern Swan Coastal Plain.

Noting the extent of the proposed impact to black cockatoo foraging habitat, and the applicant's adherence to the mitigation hierarchy (avoid, minimise, mitigate), the Delegated Officer determined that it was appropriate to consider an environmental offset to counterbalance this impact.

The applicant has proposed an adequate environmental offset to counterbalance the impact to black cockatoo foraging habitat. This offset is consistent with the key recovery actions outlined in the recovery plan for black cockatoos (see Section 4 for offset details).

Roosting and breeding habitat

Black cockatoo species are known to nest in hollows of live and dead trees, including marri, jarrah, karri (*Eucalyptus diversicolor*), wandoo (*Eucalyptus wandoo*), tuart (*Eucalyptus gomphocephala*), flooded gum (*Eucalyptus rudis*), and other *Eucalyptus* spp. (Commonwealth of Australia, 2022). 'Breeding habitat' for black cockatoos includes trees of these species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow (500 mm for most tree species) (DAWE, 2022).

The habitat assessment identified 111 potential breeding trees with a DBH greater than 500 mm within the application area. Of these, five trees contained one hollow, and a single tree contained three hollows. A detailed investigation of the hollows concluded that none were of suitable size for black cockatoo breeding (Biota, 2021). Therefore, no currently suitable breeding trees occur in the application area (Biota, 2021).

Black cockatoos commonly night roost in tall eucalypts near food and water resources (DAWE, 2022). Noting the presence of tall eucalypts in the application area, and proximity to foraging habitat and the Helena River, the trees proposed to clear may provide roosting habitat for black cockatoos. However, the black cockatoo habitat assessment did not identify any evidence of roosting in the application area (Biota, 2021).

The loss of potential roosting and future breeding habitat is not considered a significant residual impact in this instance, noting the lack of evidence of roosting use and absence of trees with suitably sized breeding hollows in the application area. Therefore, an offset has not been required to counterbalance this impact. However, the Delegated Officer notes that the proposed offset includes conserving in perpetuity and maintaining areas with trees of a suitable DBH to provide potential roosting and breeding habitat.

Peregrine falcon
The peregrine falcon typically nests on rocky ledges in tall, vertical cliff faces and gorges, or in tall trees associated with drainage lines, and can hunt in a range of habitat types including timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings (Australian Museum, 2019).

The application area may transiently be used by the peregrine falcon for hunting, given the species does not rely on specialist niche habitats. However, noting this highly mobile avian species has a large home range and was not identified on site during the biological survey (Biota, 2021), the proposed clearing is not likely to impact on this species.

Swan Coastal Plain shield-backed trapdoor spider (SCP trapdoor spider)
The SCP trapdoor spider is known from Banksia woodland and heathland on sandy soils and is largely restricted to bushland remnants in the Greater Perth Region (Rix et al., 2018). There are 14 records of this species within the local area, including three records within a 5 km radius.

As the application area includes remnant Banksia woodlands on sandy soils within the P1 and P7 vegetation types, and to a lesser extent the P2 and P5 vegetation types, it is possible that the application area provides suitable habitat (20.23 ha) for the SCP trapdoor spider. This is consistent with the fauna survey, which described this species as "may potentially occur" (Biota, 2021). It is also acknowledged that the fauna survey did not specifically search for invertebrates and therefore, the potential for the SCP trapdoor spider to occur within the application area cannot be ruled out.

However, none of the records of this species within the local area were recorded post-1993. Based on the location of the known records of this species, the application also area represents the easternmost extent of the species' range, with most records situated further west of the Darling Scarp in more coastal areas.

Given the largely linear application area, lack of recent records in the local area, and location of the application area on the edge of the Darling Scarp relative to most known records of this species, the SCP trapdoor spider is considered at low risk of occurring within the application area. Given the low risk of impacts, while it is acknowledged that there are survey gaps for this species, the Delegated Officer determined that further targeted surveys were not necessary to inform the assessment of the clearing permit application and that the proposed clearing is unlikely to impact significant habitat for this species.

Graceful sun-moth
The graceful sun-moth occurs within coastal heathland on secondary Quindalup dunes in areas where its preferred host plant, *Lomandra maritima*, is abundant (TSSC, 2013). It is also known from Banksia woodlands on Spearwood and Bassendean dunes, where its second known host plant, *Lomandra hermaphrodita*, is abundant (TSSC, 2013).

Lomandra hermaphrodita was recorded in the P1, P4, and P5 vegetation types during the biological survey (Biota, 2021). This plant was recorded as scattered individuals in a total of 19 quadrats (eight within the application area and 11 in adjacent vegetation), with an estimated cover of 0.1% in all quadrats which it was observed (Biota, 2021). While targeted searches for the species were not undertaken in the biological survey, approximately 100 ha of suitable habitat for the graceful sun-moth occurs within the survey area based on mapping of the P1, P4 and P5 vegetation types, of which 17.61 ha (approximately 18%) is proposed to be cleared. Given the ability to infer suitable habitat based on vegetation mapping, the Delegated Officer determined that further targeted surveys for the graceful sun-moth were not required to inform the assessment of the clearing permit application.

Noting the limited abundance of its preferred host plant, the linear nature of the application area adjacent to road infrastructure, and that the species rarely disperses across areas of unsuitable habitat (TSSC, 2013), it is considered unlikely that the application area provides significant habitat for the graceful sun-moth. Given that host plants will persist in adjacent suitable habitat post-clearing, the proposed clearing is not likely to significantly impact the ongoing maintenance of the species.

Black-striped burrowing snake and Perth slider
The Perth slider is largely restricted to the SCP and is known to occur in several bush remnants near Perth, predominantly in pale sands on coastal plains with *Banksia* or *Eucalyptus* species (TSSC, 2020). The black-striped burrowing snake is also restricted to the SCP and Perth region, typically occurring in *Banksia* woodlands atop soft calcareous sand and, to a lesser extent, coastal heathlands and shrublands (He, 2021). The remnant Banksia woodland habitat type (20.23 ha) within the application area provides suitable habitat for these species.

However, none of the records of these species within the local area were recorded post-1975. Both species are also distributed further west of the Darling Scarp based on existing records, with the application area representing the easternmost extent of their range.

Given the largely linear application area and poor dispersal ability of the species' (He, 2021; TSSC, 2020), lack of recent records in the local area, and location of the application area relative to most known records, the Perth slider and black-striped burrowing snake are considered at low risk of occurring within the application area. Therefore, the proposed clearing is unlikely to impact significant habitat for these species.

Chuditch

Chuditch are present in approximately 5% of their former range, with the major portion of remaining natural populations occurring in varying densities in jarrah forests and woodlands in the southwest corner of WA, and in woodlands, mallee shrublands, and heaths along the south coast, east to the Ravensthorpe area (DEC, 2012a). While the biological survey noted chuditch as 'unlikely to occur' within the application area (Biota, 2021), advice from DBCA indicates that the application area may provide suitable habitat for this species given the number and proximity of records in the local area and that multiple nocturnal survey periods would be required to rule out likelihood of the species completely (DBCA, 2022).

As chuditch have historically used a large variety of habitats, critical habitat for the species is not defined as a set of characteristic vegetation types but rather as a set of key aspects required for chuditch survival (DEC, 2012a). They are adequate den resources (e.g., hollow logs, burrows or rock crevices), adequate prey resources (particularly large invertebrates) and sizeable areas (> 20 000 ha) (DEC, 2012a). Therefore, chuditch require large areas of intact habitat to survive and are rarely found where habitat is severely fragmented by clearing, except as transient visitors (DEC, 2012a).

While it is acknowledged that chuditch have the potential to occur within the application area, it is unlikely to provide critical or significant habitat for the species given the application area:

- is located further west of the Darling Scarp than most existing records in the local area,
- does not include large areas of intact jarrah forest with adequate den resources, and
- has been fragmented by historical clearing and road infrastructure

If chuditch are transient within the application area, it is likely that the riparian woodland along the Helena River (within the L3, P3, P6, and P7 vegetation types) would provide the most suitable habitat for the species, given its connection to other remnants of native vegetation in the local area. Permit conditioning requiring directional clearing, pre-clearance inspections by a fauna specialist, and actions to ensure fauna habitat connectivity is maintained along the Helena River (described in more detail below), are considered appropriate to mitigate impacts to chuditch.

Quenda

The assessment has identified that almost the entire application area (23.01 ha) provides suitable habitat for quenda, within the Banksia woodland with scattered Eucalyptus/Marri, Flooded Gum over grassland, and Fabaceous heathland habitat types (Biota, 2021). This species prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC, 2012b). On the SCP, quenda are often associated with wetlands but may also use adjacent or fringing woodlands and cleared areas lying close to dense cover (Van Dyck and Strahan, 2008).

The biological survey confirmed the presence of quenda within the application area and broader survey area through diggings within the Banksia woodland habitat type and motion camera detection (Biota, 2021). Given the degree of clearing in patches of predominantly linear roadside vegetation that have been historically fragmented and isolated from larger remnants in the local area, the proposed clearing has the potential to further isolate local quenda populations and result in direct impacts to individuals.

However, the application area lacks dense wetland vegetation typically associated with significant habitat for quenda. While the riparian woodland along the Helena River (predominantly within the L3 and P6 vegetation types) is likely to provide the most suitable habitat for the species within the application area, the area is in Degraded (Keighery, 1994) condition and lacks dense ground cover. Therefore, the proposed clearing is not considered likely to significantly impact the ongoing maintenance of the species in the region.

In order to mitigate impacts to local quenda populations and reduce the likelihood of direct impacts to individuals, MRWA will implement directional clearing towards adjacent native vegetation, where practicable, and engage a fauna specialist to undertake an inspection and ensure any individuals have moved on prior to clearing commencing in an area. MRWA will also ensure habitat connectivity for quenda and other ground-dwelling fauna along the Helena River is maintained by way of retaining sightlines, installing fauna refugia, and undertaking revegetation with native riparian vegetation underneath the proposed road bridge. These commitments are enforced as conditions on the clearing permit.

Carter's freshwater mussel (CFM)

CFM is associated with slower flowing freshwater lakes, rivers, and streams where sandy sediments are stable and soft enough for burrowing (TSSC, 2018). The greatest densities of CFM have been found near the banks of freshwater systems with woody debris and overhanging riparian vegetation (TSSC, 2018).

The initial biological survey (Biota, 2021) involved a targeted search for CFM within the Helena River channel and did not identify any individuals. However, internal advice from DWER's River Science Section (RSS) indicated that individuals of CFM had been recorded within the permanent pool immediately upstream and adjacent to the northern portion of the application area, which was not sampled in the biological survey (DWER, 2022a). RSS also advised that the sampling methods used may not have been appropriate to identify CFM, given the use of standard macroinvertebrate nets, the high turbidity of the site making visual searches inappropriate, lack of water quality data, and an assumption that high turbidity is a prerequisite of anoxic conditions when inferring habitat suitability (DWER, 2022a). RSS advised that if CFM occur in this wetland, then the clearing of adjacent riparian vegetation may have a significant impact on this population (DWER, 2022a).

At the request of DWER, MRWA subsequently commissioned a targeted CFM survey of the Helena River and adjacent wetlands in August 2022 (Biologic, 2022). The survey covered around 500 m of the Helena River, upstream and downstream of the application area, as well as two wetlands located adjacent to the application area, referred to as 'Wetland West' (75 m from the northern portion of the application area) and 'Wetland East' (located 0 to 35m upstream, adjacent to the application area). The survey included water quality measurements, a habitat assessment, and mussel sampling (including visual searches, hand searching, mussel raking, and dip nets) (Biologic, 2022), which was consistent with methodology recommended by RSS (DWER, 2022b).

It should also be noted that recent taxonomic research has split *Westralunio carteri* into three distinct taxa, which occurred whilst this assessment was ongoing. The conservation status of all three taxa was recently reassessed and listed under the BC Act on 1 July 2025, as follows:

- *Westralunio carteri* - remains listed as Vulnerable,
- *Westralunio inbisi inbisi* – listed as Vulnerable, and
- *Westralunio inbisi meridiemus* – listed as Endangered (DBCA, 2025).

Based on advice from DBCA, the mussels identified within the application area are likely to be *Westralunio carteri* (DBCA, 2025). Therefore, whilst a formal taxonomic assessment of the individuals identified in the targeted surveys has not been undertaken, the species will be referred to as CFM for the purposes of this assessment.

The targeted CFM survey (Biologic, 2022) identified that:

- the surveyed section of the Helena River:
    - does not provide suitable habitat for CFM as it does not hold permanent water, and
    - does not contain evidence of CFM.
- Wetland West:
    - provides suitable habitat for CFM, except for a north-eastern portion where the substrate was too soft and anoxic, and a north-western portion where acidic pH was recorded, and
    - contained evidence of two live and three dead CFM individuals.
- Wetland East:
    - provides suitable habitat for CFM, except for the western edge where the substrate was too soft and anoxic, and
    - contained evidence of 46 live individuals (no juveniles).

Based on the targeted CFM survey, the application area does not directly intersect any suitable habitat for CFM and direct impacts to individuals are highly unlikely to result from the proposed clearing. However, clearing of riparian vegetation will occur within 50 m of suitable CFM habitat and identified individuals within Wetland East (see Figure 5 below).

Figure 5. Suitability of surveyed Carter's freshwater mussel (CFM) habitat in relation to the application area for CPS 9448/1 (outlined green) (Biologic, 2025).

Advice from DBCA indicates that the proposed clearing and construction activities within 50 m of Wetland East have the potential to result in significant indirect impacts to the CFM population, including:

- exacerbation of localised anoxic conditions, noting the cause of these conditions at present is not clear,
- reduction in riparian vegetation and thus shading, resulting in increased water temperatures and reduced ability for CFM to persist when water levels recede,
- erosion and sedimentation resulting from earthworks during construction,
- contamination and/or water quality impacts from stockpiled cleared vegetative material and construction activities,
- increased water turbidity resulting from disturbed sediments may lead to liberation of sediment analytes which are detrimental to CFM, and
- alteration of hydrological regimes resulting from vegetation clearing and construction operations (DBCA, 2024).

In order to address the potential indirect impacts identified by DBCA, MRWA commissioned Biologic (2025) to produce a memorandum which sets out the CFM management commitments for clearing and construction activities under the GEHBI Project (see Table 3 below).

Table 3. Potential impacts to Carter's freshwater mussel (CFM) and proposed management measures to mitigate risks (Biologic, 2025).

Potential Impacts	Proposed management measures
Direct impact to individuals	• Highly unlikely given all suitable habitat has been avoided. • Clearing and excavation adjacent to Wetland East will be timed to occur in summer (1 November to 30 April) where water levels are at their lowest and the possibility of CFM interacting with project-related activities is considerably reduced.
Exacerbation of pre-existing anoxic conditions	• Vegetation to be felled in a manner that ensures vegetative debris is directed away from Wetland East. • No cleared vegetation to be stockpiled within 50 m of the high-water mark of nearby wetlands.
Reduction in riparian vegetation and shading	• Increasing the vegetative buffer on the western edge of Wetland East is not possible, as the Roe Highway duplication design has already been refined to minimise environmental impacts as far as practicable. • Clearing has been minimised on the western edge of Wetland East which currently provides minimal shading in the late afternoon and evening only, largely over the western edge of Wetland East which is unsuitable for CFM. The minor reduction in shading and vegetative buffer to Wetland East is not expected to significantly increase water temperature or reduced habitat availability for CFM.
Erosion and sedimentation	• Installation of erosion and sediment control structures during clearing and construction (sediment fences, booms and silt fences). • Clearing and excavation adjacent to Wetland East will be timed to occur in summer (1 November to 30 April). • Disturbed areas to be stabilised as soon as is practicable after ground disturbing activities are completed. • Daily inspection of erosion and sediment control structures, to verify proper installation and effectiveness. • Daily inspection of disturbed areas and stockpiles for appropriate installation of erosion and sediment control features. • Monthly water quality monitoring at Wetland East, compared to control and baseline and water quality guidelines to identify project related water quality impacts. • Adhere to the measures outlined in the Erosion and Sediment Control Plan (GCA, 2022a).
Turbidity and liberation of analytes	• Installation of appropriate barriers or bunds to manage for unlikely accidental spills. • Monthly water quality monitoring at Wetland East, compared to control and baseline and water quality guidelines to identify project related water quality impacts, including of measures of dissolved metals and hydrocarbons.
Altered hydrological regimes	• Existing surface water flow will be maintained through design measures. • GEHBI design will redirect stormwater discharge to a basin on the western side of Roe Highway and there will be no drainage discharge to Wetland East from Roe Highway.

Subsequent DBCA advice noted that the proposed management measures appear to be sufficient, given the installation of sediment traps to minimise run-off into the Helena River and Wetland East and suitable surface water sampling sites and water parameters are included in the Erosion and Sediment Control Plan (DBCA, 2025; DBCA, 2024). The Delegated Officer noted that MRWA has committed to the installation of sediment fences along the Helena River (MRWA, 2024a). Parameters for water quality monitoring will be considered based on Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018) for the protection of aquatic ecosystems in the South West, as well as known tolerance limits for CFM, in consultation with DBCA, if required (Biologic, 2022).

The key management measures related to the indirect impacts associated with clearing activities outlined in the memorandum (Biologic, 2025), including commitments for timing of clearing, installation of erosion and sediment control structures, minimum stockpile distances, and monthly water quality monitoring, will be enforced as conditions

of the clearing permit. If water quality monitoring identifies adverse impacts to CFM habitat, the permit holder will be required to implement remedial actions to reduce or counterbalance the adverse impacts, in consultation with DWER and DBCA.

DBCA has advised that the water sampling parameters will allow early detection of any degradation of CFM habitat variables which may precede the need to relocate individuals (DBCA, 2024). DBCA noted that whilst relocations have been undertaken successfully (temporarily) at other locations, due to the associated risk and uncertainty, relocation is not recommended as a mitigation measure unless the water quality is impacted to such a level that it made the wetland uninhabitable for CFM (DBCA, 2024).

Given suitable habitat for CFM will be avoided from clearing and management measures will be implemented to minimise indirect impacts to CFM habitat adjacent to the clearing area, the Delegated Officer considered that the risk of significant impacts to CFM has been minimised and managed to be environmentally acceptable.

It is acknowledged that the proposed road construction activities also have the potential to result in adverse impacts to CFM habitat adjacent to the clearing area. However, given the risk of impacts to a listed species, MRWA are required to obtain a section 40 authorisation under the BC Act to take threatened fauna for the proposed works. DBCA has noted that under the s.40 authorisation, some specific management measures associated with the construction and post construction impacts can be imposed to minimise these risks (DBCA, 2025). Therefore, the scope of the clearing permit assessment and conditioning has been limited to direct and indirect impacts associated with clearing activities.

Fauna strike risk

Any individuals using the site at the time of clearing may be impacted through fauna strike. Fauna management measures that require slow, one directional, progressive clearing and engaging a fauna specialist to traverse the application area immediately prior to and during clearing would assist to minimise this risk.

Fauna linkage values

The application area intersects two mapped Perth Regional Ecological Linkages (PREL) identified by Western Australian Local Government Association's Biodiversity Projects (Del Marco et al., 2004). The PREL dataset identifies regional ecological linkages mapped to broadly represent a link between patches of remnant vegetation judged to be of regional significance in the Perth Metropolitan Region (PMR) Scheme Area (Del Marco, et al., 2004).

One mapped PREL linkage (ID 134) runs east-west and is associated with Helena River, connecting remnants along the river. The other PREL linkage (ID 33) runs northwest to southeast and connects remnants of native vegetation within Bush Forever Sites 213, 216 and 481. The vegetation within the application area is likely to contribute to the movement of fauna and ecological processes between these areas.

However, it is noted that the existing Roe Highway alignment has already severed vegetation connectivity along PREL linkages 134 and 33. Given the existing fragmentation between remnants of native vegetation within PREL linkage 33 and that a more intact north-south linkage between Bush Forever Site 213 and local Crown Reserves (51186, 51520, and 53439) exists less than 1 km east of the application area, the proposed clearing is not considered likely to significantly impact north-south fauna movement in the local area. However, the proposed clearing will result in a minor increase in degree of separation between vegetation on either side of Roe Highway and create a larger barrier for fauna movement east-west along the PREL linkage 134.

MRWA has indicated that the design of the Roe Highway bridge over the Helena River will act as a fauna underpass and allow the safe movement of fauna between remnants of native vegetation along the Helena River within PREL linkage 134 (MRWA, 2024a). MRWA has advised that the following actions will be undertaken:

- aligning the Roe Highway bridges and providing adequate clearance to maintain sightlines to habitat on either side,
- installing fauna refugia (e.g., habitat log, rocks) under the bridge to encourage use by small mammals and reptiles and provide shelter, and
- revegetating and re-instating riparian habitat on both sides of the Helena River, using indigenous species mixes selected to recreate the existing riparian, riparian edge, floodplain, and embankment zones (MRWA, 2025a; MRWA, 2024a; GCA, 2023b).

Given the existing fragmentation and that fauna linkage values along the Helena River will be maintained through the management measures conditioned on the clearing permit, the Delegated Officer determined that the proposed clearing is unlikely to significantly impact the movement of fauna through the landscape.

Conclusion
Based on the above assessment, the proposed clearing will result in:
- the loss of 20.83 ha of significant foraging habitat for Carnaby's cockatoo,
- the loss of 20.38 ha of significant foraging habitat for Baudin's cockatoo and forest red-tailed black cockatoo,
- the potential for direct impacts to ground-dwelling vertebrate fauna (e.g., quenda) utilising the application area at the time of clearing,
- the potential for indirect impacts to CFM populations adjacent to the application area, and
- the exacerbation of existing barriers to fauna movement along mapped PREL linkages.

For the reasons set out above, it is considered that the potential direct impacts of the proposed clearing on vertebrate fauna, indirect impacts to CFM, and impacts to ecological linkages for fauna movement can be managed to be environmentally acceptable through the applicant's management commitments and permit conditioning and does not constitute a significant residual impact.

However, for the reasons set out above, the loss of significant foraging habitat for black cockatoo species constitutes a significant residual impact. In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), these significant residual impacts have been addressed through the conditioning of environmental offset requirements, as outlined under Section 4.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:
- Directional clearing, which requires the permit holder to undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity,
- Ecological linkage management, which requires the permit holder to take specific measures to ensure fauna habitat connectivity is maintained along the Helena River,
- Fauna management, which requires the permit holder to engage a fauna specialist to traverse the clearing area immediately prior to and for the duration of clearing, where clearing must cease until any identified native vertebrate fauna have moved out of the application area,
- CFM management, which requires the permit holder to implement clearing controls, management measures and monitoring to reduce indirect impacts to CFM, as well as to undertake remedial actions where monitoring indicates adverse impacts are possible,
- Offset – land transfer, which requires the permit holder to provide documentary evidence of the transfer of the Cowalla and Crossman Offset Sites (defined in Section 4) containing significant habitat for black cockatoo species to DBCA to be managed for conservation in perpetuity, and
- Offset – revegetation and rehabilitation, which requires the permit holder to prepare a Revegetation Management Plan for the Neaves Road Offset Site (defined in Section 4), including measures to improve the quality of foraging habitat for black cockatoo species.

3.2.2. Biological values (flora) - Clearing Principles (a) and (c)

Assessment
The application area has been subject to two flora and vegetation surveys:
- Biological Survey (Biota, 2021), involving:
  - a 12-day field survey by four botanists over several visits between early October 2019 and early May 2020,
  - additional sampling and resampling of selected quadrats was undertaken over a four-day field survey in early November 2020,
  - a detailed vegetation survey including quadrat sampling, relevés, mapping of vegetation types, and vegetation condition,
  - targeted searches for significant flora, during which significant weeds (Declared Pests and Weeds of National Significance) were also recorded, and
  - floristic analysis to identify TECs and PECs and validate vegetation types.
- Targeted Flora Survey (FVC, 2025b), involving:
  - field surveys by four botanists over two visits on 15 October and 4 December 2024, and
  - targeted searches for three priority and one threatened flora species by traversing areas of suitable habitat, based on survey gaps identified by DWER through desktop assessment and MRWA's (2024b)

gap analysis, which identified new records of flora species in the local area since the original biological survey.

The flora and vegetation surveys referred to above are considered consistent with the EPA's *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) and appropriate to identify any conservation significant flora within the application area. The full survey reports are available on DWER's website at: http://ftp.dwer.wa.gov.au/permit/9448/.

The biological survey (Biota, 2021) identified that the vegetation within the application area ranges from Excellent-Very Good to Completely Degraded (Keighery, 1994) condition and contains nine vegetation types (see Appendix C for full survey descriptions):

- L3 – Marri over *Melaleuca* Low Open Woodland on Clay Pits – 0.15 ha
- L5 - *Jacksonia* over *Xanthorrhoea* with Sedges – 0.08 ha
- P1 - *Allocasuarina* and *Banksia* over *Xanthorrhoea* with Sedges – 15.25 ha
- P2 - Marri over *Kingia australis* with Sedges – 0.35 ha
- P3 - Flooded Gum over Weedy Grasses on Floodplain – 2.35 ha
- P4 - Eremaea Open Heath – 0.37 ha
- P5 - Jarrah over *Xanthorrhoea* with Mixed Shrubs and Herbs – 1.99 ha
- P6 - Flooded Gum over Weedy Understorey on Riverbank – 0.12 ha
- P7 - Jarrah and *Banksia* over *Xanthorrhoea* with Sedges – 2.64 ha

The biological survey identified four conservation significant flora species within the application area, which are outlined in Table 4 and assessed in detail below.

Table 4. Threatened and priority flora species that may occur within the application area for CPS 9448/1.

Species name	Conservation status
Conospermum undulatum	Vulnerable; BC Act & EPBC Act
Hypolaena robusta	Priority 4; DBCA listed
Isopogon autumnalis	Priority 3; DBCA listed
Johnsonia pubescens subsp. *cygnorum*	Priority 2; DBCA listed

DWER's desktop assessment identified that an additional three priority flora species, which were not targeted by the biological survey (Biota, 2021), may also occur within the application area: *Levenhookia preissii* (Priority 1), *Bolboschoenus fluviatilis* (Priority 1) and *Schoenus benthamii* (Priority 3). The targeted flora survey in Spring 2024 involved targeted searches of suitable habitat for these species within the application area (FVC, 2025b). The targeted flora survey did not identify these species (FVC, 2025b) and it is considered unlikely that they occur within the application area or will be impacted by the proposed clearing.

Conospermum undulatum

Conospermum undulatum is an erect shrub that produces white woolly flowers and occurs on sand and sandy clay soils, often over laterite, on flat or gently sloping sites in *Banksia* and jarrah/marri woodland between the Swan and Canning Rivers (DEC, 2009). Critical habitat for *C. undulatum* is defined as the area of occupancy of important populations, areas of similar habitat surrounding important populations, and additional occurrences of similar habitat that may contain important populations of the species or be suitable sites for future translocations (DEC, 2009).

The application area intersects two verified populations of *C. undulatum* (Population Numbers 21 and 23), according to DBCA data. The populations are included in the list of important populations set out in the species' recovery plan (DEC, 2009) and it is noted that they represent the northernmost occurrence of the species (DBCA, 2022).

One individual of *C. undulatum* was confirmed to occur within the application area during the biological survey in 2019 (Biota, 2021). The individual was recorded at the mapped location of Population 23 and was within Very Good to Excellent (Keighery, 1994) condition jarrah and *Banksia* woodland (P7 vegetation type) on the eastern side of the Roe Highway alignment (Biota, 2021). Two additional individuals were identified in native vegetation on the western side of Roe Highway alignment (Biota, 2021), but the area containing these individuals were removed from the application area during the 2022 revision (see Section 3.1).

Noting the time since the initial biological survey (in 2019) and the potential for changes in population size over time, MRWA commissioned a targeted flora survey of suitable habitat for *C. undulatum* within the application area in Spring 2024, at the request of DWER. The targeted flora survey identified five *C. undulatum* individuals within the application area (FVC, 2025b). The recorded individuals are all within 50 m of the mapped populations and the previously recorded individual (Biota, 2021).

The five individuals occur within a larger vegetated patch of 1.43 ha of the P7 vegetation type adjacent to the existing Roe Highway alignment, all of which is proposed for clearing under CPS 9448/1. Noting the patch includes the area of occupancy of an important population and an area of similar habitat surrounding this population, it is likely to meet the definition of critical habitat for the species. Therefore, the proposed clearing will result in the loss of five individuals and 1.43 ha of critical habitat for *C. undulatum*.

In 2024, MRWA commissioned a population survey of all known accessible *C. undulatum,* to assess the number of individuals, subpopulation status, and extent of the species across its range (GHD, 2025). The population survey involved field surveys of 70 known subpopulations of *C. undulatum* (out of a total of 135) through targeted searches, relevé sampling, and soil sampling between October 2023 and February 2024 (GHD, 2025). Historical data was used to estimate the number of individuals present for the remaining 65 subpopulations where field surveys were not possible due to access constraints (GHD, 2025). Based on the survey results and historical data, the total estimated count for *C. undulatum* is 16,780 individuals across 104 subpopulations (GHD, 2025).

Based on the population survey, the loss of five individuals represents an approximately 0.03% reduction in the overall population of *C. undulatum*, which is unlikely to impact the continuation of the species overall. However, the proposed clearing will result in the loss of an entire patch containing an important population and is likely to significantly impact the species at a local and regional level. This is consistent with advice received from DBCA, which states “the take of all five individuals and associated soil stored seed bank is likely to impact the persistence of this subpopulation at the local level and may result in minor but measurable risks at the regional level due to increased fragmentation, loss of genetic diversity and connectivity, and overall reduced reproductive potential. Cumulative impacts to this species and its habitat across its extent of occurrence should also be considered as it has a restricted distribution within an urban area subject to development” (DBCA, 2025).

The Delegated Officer determined that the loss of five individuals and 1.43 ha of supporting habitat for *C. undulatum* represents a significant residual impact, noting:

- the habitat supports an important population and provides critical habitat,
- the limited and restricted extent of the species,
- the cumulative impacts of past and proposed clearing on this species, and
- the ongoing threats and pressures on existing subpopulations.

Noting the extent of the proposed impact to *C. undulatum*, and the applicant’s adherence to the mitigation hierarchy (avoid, minimise, mitigate), the Delegated Officer determined that it was appropriate to consider an environmental offset to counterbalance this impact. The applicant has proposed an adequate environmental offset which is consistent with the key recovery actions outlined in the recovery plan for *C. undulatum* (see Section 4 for offset details).

Given the proposed clearing of *C. undulatum*, it is also noted that MRWA are required to obtain a section 40 authorisation under the BC Act to take threatened flora for the proposed works. On-ground management measures relevant to the take of *C. undulatum* individuals will likely be assessed and conditioned as part of the s.40 authorisation and therefore, clearing permit conditioning has been limited to implementing a suitable environmental offset to counterbalance clearing impacts to the species.

Hypolaena robusta

Hypolaena robusta is a rhizomatous, perennial herb which flowers in September and October and occurs on white sands in *Banksia* woodlands (WA Herbarium, 1998-). The species is known from 49 herbarium records within the Geraldton Sandplains, Jarrah Forest, and SCP Interim Biogeographic Regionalisation of Australia (IBRA) bioregions, with a distribution of approximately 470 km north-south and 95 km east-west (WA Herbarium, 1998-).

One individual was identified within the application area during the biological survey in Very Good (Keighery, 1994) condition *Allocasuarina* and *Banksia* woodland (P1 vegetation type) south of the existing Great Eastern Highway Bypass (Biota, 2021). The occurrence of *H. robusta* within the application area represents a regionally significant range extension, noting the nearest record is 17 km north. However, advice from DBCA indicates that the occurrence

within the application area is not likely to represent a viable population, given it has been recorded as a single isolated individual (DBCA, 2022).

Therefore, the proposed clearing of one individual of *H. robusta* will not significantly impact the conservation status of this species.

Isopogon autumnalis
Isopogon autumnalis is a shrub, up to one meter high, which flowers between February and June and typically occurs on sandy soils in *Banksia* woodland (WA Herbarium, 1998-). The species is known from 62 herbarium records within the Geraldton Sandplains, Jarrah Forest, and SCP IBRA bioregions, with a distribution of approximately 250 km north-south and 90 km east-west (WA Herbarium, 1998-).

The biological survey identified a total of 128 individuals of *I. autumnalis*, of which 112 occurred within the original application area (Biota, 2021). In revising the application area, MRWA reduced the extent of impacts to 27 individuals (see Section 3.1). The 101 individuals outside of the clearing footprint maintain a minimum 13 m vegetated buffer from the revised application area and are not expected to be indirectly impacted by the proposed clearing. The remaining individuals within the application area are located within Very Good to Excellent (Keighery, 1994) condition jarrah and *Banksia* woodland (P7 vegetation type) on the eastern side of the Roe Highway alignment (Biota, 2021).

The proposed clearing will impact approximately 21 per cent of individuals identified within the survey area which may be significant for the local population through increased fragmentation and reduced genetic diversity and connectivity. However, DBCA advised that the impacts of the proposed clearing at the regional scale or species level are unlikely to be significant, noting the spatial distribution of *I. autumnalis* and that a viable population will remain adjacent to the application area (DBCA, 2022).

***Johnsonia pubescens* subsp. cygnorum**
Johnsonia pubescens subsp. *cygnorum* is a tufted perennial herb which flowers in September and inhabits grey-white-yellow sands in seasonally-wet areas (WA Herbarium, 1998-). The species is known from 14 herbarium records within the SCP IBRA bioregion, with a spatial distribution of approximately 80 km north-south and 20 km east-west (WA Herbarium, 1998-).

The biological survey identified a total of 10 individuals of *J. pubescens* subsp. *cygnorum*, of which two individuals occurred within the original application area (Biota, 2021). The subsequent revisions to the application area reduced the extent of impacts to one individual, which occurs within Very Good to Excellent (Keighery, 1994) condition Eremaea Open Heath (P7 vegetation type) south of the existing Great Eastern Highway Bypass (Biota, 2021). To mitigate the impacts on this species, MRWA revised the application area. The nine individuals avoided from clearing maintain a minimum 40 m vegetated buffer from the revised application area (Biota, 2021) and are not expected to be indirectly impacted by the proposed clearing.

The proposed clearing will impact approximately 10 per cent of individuals identified within the survey area which may be significant for the local population through increased fragmentation and reduced genetic diversity and connectivity. However, noting the distribution of *J. pubescens* subsp. *cygnorum* records in the local area and that a population will remain adjacent to the application area, the proposed clearing is not likely to impact this species at a regional or species level.

Conclusion
Based on the above assessment, the proposed clearing will result in the loss of:
- five individuals and 1.43 ha of significant habitat for *C. undulatum*,
- one individual of *H. robusta*,
- 27 individuals of *I. autumnalis*, and
- One individual of *J. pubescens* subsp. *cygnorum*.

For the reasons set out above, it is considered that the proposed clearing of *H. robusta*, *I. autumnalis*, and *J. pubescens* subsp. *cygnorum* do not represent a significant impact at a species level and are environmentally acceptable.

However, the loss of individuals and significant habitat for *C. undulatum* constitutes a significant residual impact. In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental*

Offsets Guidelines (2014). The significant residual impact has been addressed through the conditioning of environmental offset requirements, as outlined under Section 4.

Conditions

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

- Offset – Executed change in purpose, requiring the permit holder to provide documentary evidence of the executed vesting change to include 'Conservation', of the Hartfield Park Offset Site (defined in Section 4) containing significant habitat for *C. undulatum*, and
- Offset – Revegetation and rehabilitation requirements, which requires the permit holder to prepare a Revegetation Management Plan for the Hartfield Park Offset Site (defined in Section 4), including measures to improve the quality of significant habitat for *C. undulatum*.

3.2.3. Biological values (ecological communities) - Clearing Principles (a) and (d)

Assessment

The flora and vegetation component of the biological survey (see Section 3.2.2 for methodology) also involved floristic analysis of quadrat data to identify threatened and priority ecological communities (TECs and PECs) (Biota, 2021). Floristic analysis was conducted using PATN v4 to compare all quadrats from the survey area to the same Swan Coastal Plain vegetation data set and analysis software utilised by Gibson et al. (1994) (Biota, 2021). The analysis was used to assign a Floristic Community Type (FCT) (as defined by Gibson et al., 1994) to each of the vegetation types within the study area, and to assist with determining the presence of significant vegetation (Biota, 2021).

The Delegated Officer considers that the surveys are consistent with the EPA's *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) and were appropriate to identify listed TECs and PECs within the survey footprint. The full survey report is available on DWER's website at: http://ftp.dwer.wa.gov.au/permit/9448/.

The biological survey identified that the surveyed vegetation types are likely to be representative of four conservation significant ecological communities, which are outlined in Table 5 and assessed in detail below.

Table 5. Threatened and priority ecological communities that may occur within the application area for CPS 9448/1.

Species name	Conservation status
Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994)) (SCP20a)	Critically Endangered; BC Act Endangered (part of the Banksia Woodlands Community); EPBC Act
Low lying *Banksia attenuata* woodlands or shrublands floristic community type 21c as originally described in Gibson et al. 1994) (SCP21c)	Priority 3; DBCA listed Endangered (part of the Banksia Woodlands Community); EPBC Act
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Banksia Woodlands Community)	Priority 3; DBCA listed Endangered; EPBC Act
Shrublands and woodlands of the eastern Swan Coastal Plain (floristic community type 20c as originally described in Gibson et al. 1994) (SCP20c)	Critically Endangered; BC Act Endangered; EPBC Act

A patch of the SCP20c TEC was identified within the P2 vegetation type south of the existing Great Eastern Highway Bypass Road during the biological survey (Biota, 2021). The boundary of the clearing footprint is approximately 4 m from this occurrence (see Figure 6 below). Therefore, the proposed clearing will not result in the direct loss of vegetation representative of SCP20c and impacts to this community have not been assessed in detail. However, the proposed clearing will reduce the vegetated buffer between the patch of SCP20c and the road alignments to the north and east, which may indirectly impact this TEC. The potential for indirect impacts to significant ecological communities adjacent to the clearing footprint, including SCP20c, has been considered in detail below.

Banksia Woodlands Community

The Banksia Woodlands Community is listed as a TEC under the Commonwealth EPBC Act but is considered a PEC by DBCA in WA. The description, patch size, and condition thresholds for the Banksia Woodlands Community are

aligned between the TEC and PEC (DBCA, 2023; DotEE, 2016). The key diagnostic criterion for the community is the presence of at least one of the four diagnostic *Banksia* species and a distinct low woodland to forest structure comprising a canopy co-dominated by *Banksia attenuata* or *Banksia menziesii* over a diverse shrub or herbaceous understorey (DoEE, 2016). A patch of the Banksia Woodlands Community should meet at least Good (Keighery, 1994) condition on average, with minimum patch size dependent on vegetation condition and its overall connectivity and function across the landscape (DotEE, 2016).

A variety of FCTs have relationships to the Banksia Woodlands Community as it supports a rich and diverse array of flora and fauna species and is restricted to well drained, low nutrient soils on sandplain landforms in the Perth and Dandaragan subregions of the SCP (DotEE, 2016). It should also be noted that several of the FCTs that are considered part of the federally listed Banksia Woodlands TEC (e.g., SCP20a and SCP21c discussed below) are also listed independently as TECs in WA under the BC Act or as separate PECs by DBCA (see Figure 6 below).

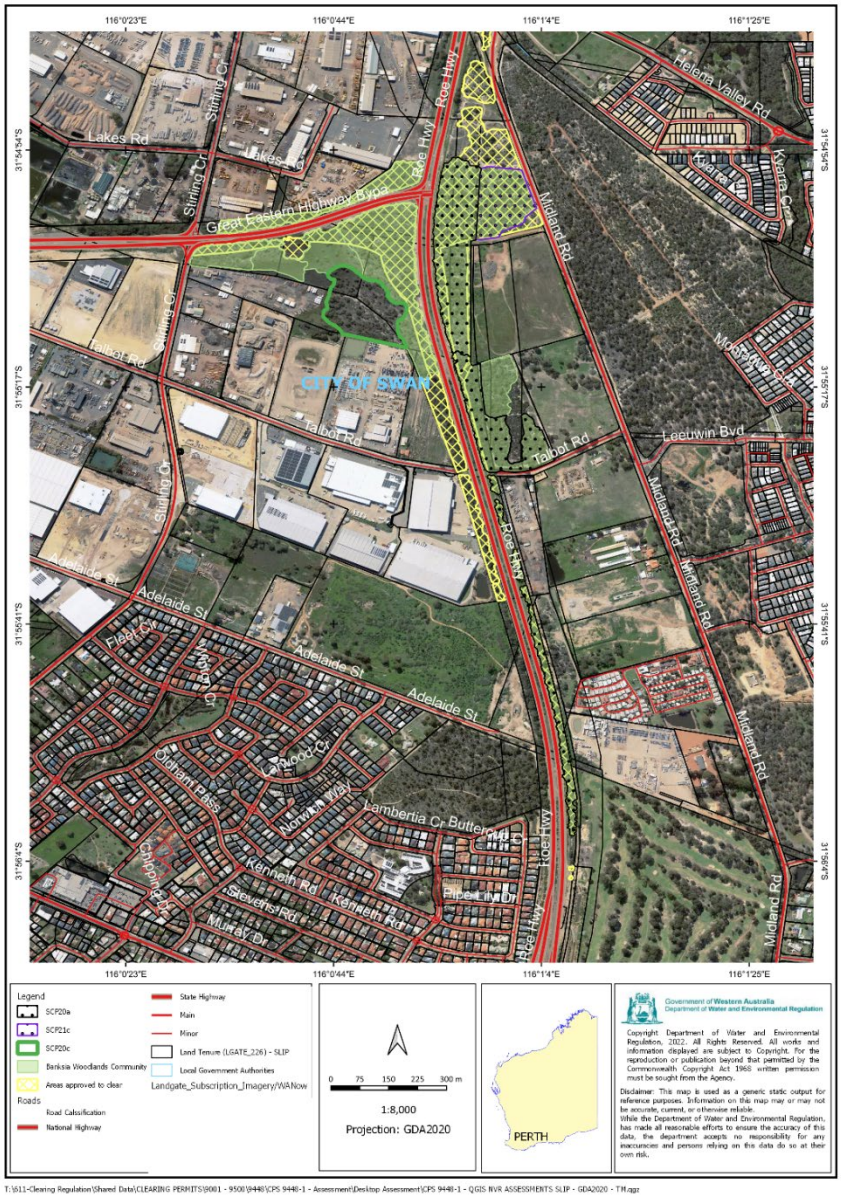


Figure 6. Occurrences of the Banksia Woodlands Community (shaded green), SCP20a (dotted black), SCP 20c (outlined green), and SCP 21c (dotted purple) within the application area for CPS 9448/1 (cross-hatched yellow) (Biota, 2021).

The biological survey's floristic analysis considered the key diagnostic criteria, minimum patch size and condition thresholds, and context, against quadrat data to determine whether the vegetation types recorded were characteristic of the Banksia Woodlands Community (Biota, 2021). The floristic analysis determined that four of the recorded vegetation types (L5, P1, P2, P7) had affinities to the Banksia Woodlands Community (Biota, 2021). Within these

vegetation types, a total of 10 patches of remnant vegetation (totalling 26.37 ha) were considered representative of the Banksia Woodlands Community, of which six patches intersect the application area (Biota, 2021). Based on the survey mapping, these patches range in size from 1.21 ha to 8.72 ha and range from a Degraded to a Very Good to Excellent (Keighery, 1994) condition (Biota, 2021).

A total of 14.94 ha of vegetation representative of the Banksia Woodlands Community (12.34 ha of the P1 vegetation type, 2.23 ha of P7, 0.35 ha of P2, and 0.08 ha of L5) occurs within the application area and is proposed to be cleared. Of the patches identified in the survey, the proposed clearing will remove three patches in their entirety (1.88 ha, 1.87 ha, and 2.55 ha, respectively) and will reduce the remaining three patches by approximately 56% (from 7.7 ha to 3.42 ha), 45% (from 8.72 ha 4.78 ha), and 38% (from 1.21 ha to 0.75 ha), respectively.

The key threats to the Banksia Woodlands Community include clearing for development, fragmentation, dieback, weeds, and hydrological changes (DotEE, 2016). The areas considered critical for the persistence of this community include all patches that meet the key diagnostic characteristics and condition thresholds for the community, plus buffer zones, particularly where this comprises surrounding native vegetation (DotEE, 2016). The description of critical habitat accounts for this community's occurrence in a highly cleared and modified landscape, and that patches of the community are largely small and fragmented (DotEE, 2016).

According to available datasets, about 321,603 ha of the Banksia Woodlands Community is mapped across the SCP, noting this is indicative mapping that requires ground truthing. The proposed clearing therefore represents the loss of about 0.004% of the mapped potential occurrence of the community.

While the proposed clearing would result in a small overall impact to the mapped occurrence of this community, the Delegated Officer determined that the loss of 14.94 ha of native vegetation representative of the Banksia Woodlands Community constitutes a significant residual impact. This determination considered that:

- the patches of Banksia Woodlands Community within the application area would be considered critical for the persistence of the community under the Approved Conservation Advice,
- the patches within the application area represent larger-than-average remnants of the community in the local area and on the SCP, where median patch size is 0.68 ha and 1.6 ha, respectively,
- the proposed clearing will significantly reduce and fragment the remaining patches of the community adjacent to the application area,
- the geographic extent of the community on the SCP has declined by up to 60% since European settlement (DotEE, 2016), and
- there are ongoing threats to the remaining representative patches on the SCP through land clearing and degradation from weeds and dieback.

The residual impact to this community aligns with the definition of 'significant residual impact' in the WA Environmental Offset Guidelines, which includes areas defined as being critically impacted in a cumulative context (Government of Western Australia, 2014).

The Delegated Officer considered the hierarchy of protect, restore, and offset as set out in the Approved Conservation Advice for this community. The applicant has made efforts to minimise impacts to this community by changing the project design which has allowed for the retention of 6.83 ha of this community within surrounding patches (see Section 3.1). Given the applicant's implementation of the mitigation hierarchy, and extent of impact proposed, the Delegated Officer determined that it was appropriate to consider an environmental offset to counterbalance the proposed impact to the Banksia Woodlands Community.

The applicant has proposed an adequate environmental offset to counterbalance the impact to the Banksia Woodlands Community. The nature and suitability of this offset is detailed under Section 4. The offset will provide an environmental outcome consistent with the Approved Conservation Advice for this community (DotEE, 2016).

SCP20a

SCP20a is floristically the richest of any *Banksia* community on the SCP (DPAW, 2016). This community is found on the Bassendean, Forrestfield, Southern River and Karrakatta soil and landform units, is dominated by *Banksia attenuata,* and is differentiated from other subgroups of *Banksia attenuata* woodlands by the occurrence of species such as *Alexgeorgea nitens*, *Daviesia nudiflora*, *Synaphea spinulosa*, *Hibbertia racemosa*, *Stylidium androsaceum* in the understorey (DPAW, 2016). It is very restricted in distribution and regionally rare with remaining areas

comprising highly fragmented occurrences (DPAW, 2016). Detailed groundwater studies suggest that this community is partially groundwater dependent (DPAW, 2016).

SCP20a is a component of the Banksia Woodlands Community listed as a TEC under the Commonwealth EPBC Act (see assessment above) but is also listed independently as a TEC in WA under the BC Act.

The biological survey's floristic analysis identified a total of 10.18 ha of native vegetation representative of SCP20a within the P1 and P7 vegetation types, spread across three patches within the greater survey area. Based on the survey mapping, two of these patches (8.72 ha and 1.87 ha, respectively) intersect the application area and range from a Degraded to a Very Good to Excellent (Keighery, 1994) condition (Biota, 2021).

A total of 5.78 ha of vegetation representative of SCP20a (3.54 ha of the P1 vegetation type and 2.23 ha of P7) occurs within the application area and is proposed to be cleared. Of the patches identified in the survey, the proposed clearing will remove one patch in its entirety (1.87 ha) and will reduce the other by approximately 45% (from 8.72 ha 4.78 ha), separating it into two smaller patches (approximately 1.9 ha and 2.9 ha) either side of the application area.

It is acknowledged that the fragmentation of a larger patch of SCP20a through the proposed clearing will increase the susceptibility of these patches through degradation and edge effects. In assessing the impact of the proposed clearing on SCP20a, the Delegated Officer considered that the ongoing presence of adjacent and adjoining areas of high-quality native vegetation increases the likelihood of these reasonably sized areas of bisected SCP20a persisting long term.

The habitat critical for the survival of SCP20a is the area of occupancy of known occurrences, the sandy soils on which the community occurs, the fresh superficial groundwater that likely helps to sustain key dominant trees, and the catchment for this groundwater (DPAW, 2016). According to DBCA databases, 76 occurrences of SCP20a have been recorded with a total area of 586.8 ha, predominantly in Wanneroo (south)/Stirling, Wanneroo (central), Forrestfield and Chittering. Mapped occurrences range in size from less than 0.5 ha up to 104.6 ha. The interim recovery plan for SCP20a notes that around 366 ha of this community occurs in conservation reserves (165 ha in nature reserves and 201 ha in local government conservation areas) (DPAW, 2016).

The proposed impact to 5.78 ha of SCP20a represents approximately 0.98% of its total known extent. While the proposed clearing would result in a small overall impact to the total known occurrence of SCP20a, the Delegated Officer has assessed the impact as significant. This is due to the patches of SCP20a within the application area meeting the definition of critical habitat for this community, the limited known records and scattered extent of SCP20a, and the threat of ongoing clearing of already fragmented patches on the SCP.

The Delegated Officer considered that all reasonable efforts to avoid and otherwise minimise impacts to SCP20a should be applied, where possible. The Delegated Officer considered the applicant's efforts to minimise impacts to SCP20a to the extent possible through alignment and design, including reducing the proposed impact to this community from 9.49 ha to 5.78 ha (see Section 3.1). Noting these efforts to avoid and minimise impacts, the Delegated Officer considered it appropriate to consider offsets to counterbalance the significant residual impact on SCP20a.

MRWA has proposed an offset to counterbalance the impact to SCP20a. The nature and suitability of this offset is detailed under Section 4. The offset will provide an environmental outcome consistent with the objectives of the interim recovery plan for SCP20a (DPAW, 2016).

DWER notes that modifications to SCP20a would likely require authorisation under section 45 of the BC Act, which may be subject to specific management measures associated with construction and post-construction impacts. Therefore, the scope of the clearing permit assessment and conditioning has been limited to direct and indirect impacts to SCP20a associated with clearing activities.

SCP21c

SCP21c is listed as a Priority 3 PEC by DBCA in WA but also forms a component of the Banksia Woodlands Community listed as a TEC under the Commonwealth EPBC Act (see assessment above). SCP21c is largely restricted to the uplands on the Bassendean system, consisting of low dunes and interwoven wetlands and extends from Gingin to Bunbury (DotEE, 2016). This community is significantly less species rich than the other subgroups of *Banksia attenuata* woodlands, tending to occupy lower lying wetter sites and being variously dominated by *Melaleuca*

preissiana, *Banksia attenuata*, *B. menziesii*, *Regelia ciliata*, jarrah or marri (DBCA, 2023). Structurally, SCP21c may be either a woodland or occasionally a shrubland (DBCA, 2023).

The biological survey's floristic analysis identified one patch of native vegetation representative of FCT21c in Good (Keighery, 1994) condition within the P1 vegetation type (Biota, 2021). The entire patch of 2.53 ha occurs within the application area and is proposed to be cleared.

In 2016, there was approximately 317.5 ha of SCP21c remaining across 27 occurrences from Chittering to Gelorup (DotEE, 2016). However, the boundaries of many point locations were not mapped at this time (DotEE, 2016). According to available databases at the time of the assessment, the community is now known from 14 occurrences with a total extent of approximately 317.68 ha (not including the occurrence within the application area). The proposed clearing of 2.53 ha of SCP21c will therefore result in the reduction of mapped occurrences of this community by approximately 0.79%.

While the proposed clearing would result in a small overall impact to the total known occurrence of SCP21c, there are only two other mapped occurrences of SCP21c within a 10 km radius of the application area. These are patches of approximately 3.84 ha and 1.1 ha, respectively, and both occur within Crown Reserves vested for recreation. Therefore, at a local scale, the proposed clearing will result in a reduction of the mapped occurrences of SCP21c by approximately 51%.

Noting the impacts at a local scale, limited known records and scattered extent of SCP21c, and threat of ongoing clearing of already fragmented patches on the SCP, the Delegated Officer determined that the loss of 2.53 ha of SCP21c represents a significant residual impact.

The Delegated Officer considered that all reasonable efforts to avoid and otherwise minimise impacts to SCP21c should be applied, where possible. The Delegated Officer acknowledged the applicant's advice that further reduction in clearing extent in the vicinity of SCP21c was not possible due to safety requirements for the radius of ramps carrying vehicles from Roe Highway southbound to GEHB westwards and from GEHB eastbound to Roe Highway southbound (MRWA, 2022). On balance, the Delegated Officer determined it appropriate to consider offsets to counterbalance the significant residual impact on SCP21c.

The applicant has proposed an adequate environmental offset to counterbalance the impact to the SCP21c. The nature and suitability of this offset is detailed under Section 4.

Indirect impacts and mitigation

In addition to resulting in the direct loss of native vegetation that is representative of significant ecological communities, this assessment has determined that the proposed clearing may also result in indirect impacts to retained patches of SCP20a, SCP20c, and Banksia Woodlands Community adjacent to the application area, including:

- fragmentation, reduction in vegetative buffers, and associated edge effects from the encroachment of road infrastructure increasing the risk of weed invasion and dieback spread into adjacent and nearby patches of TEC and PEC, and
- altered hydrology associated with the loss of vegetative buffers, altered topography of immediately adjacent land, and a reduction in groundwater availability from construction activities that may impact the structure and species composition of adjacent and nearby patches.

<u>Weeds and dieback</u>

As outlined in the assessment above, the proposed clearing will fragment an existing patch SCP20a, increasing the risk of weed invasion and dieback spread. This risk also exists for the identified patch of SCP20c, which was mapped within 5 m of the application area at its closest point, and for the Banksia Woodlands Community which is contiguous with the application area in the vicinity of the existing GEHB and Roe Highway intersection. The potential for a decline in species richness and condition of these communities as an indirect result of clearing is consistent with advice received from DBCA (2022).

Dieback mapping indicates that the patches of Banksia Woodlands Community and SCP20c west of Roe Highway are largely infested with dieback at present and therefore the proposed clearing is unlikely to significantly increase the risk of spread in this area (Glevan Consulting, 2020). Standard hygiene management practices for the control of dieback-affected soils are considered appropriate to manage risk in these areas.

However, occurrences of the Banksia Woodlands Community and SCP20a east of Roe Highway are mostly uninfested at present and soil disturbance and movement during the proposed clearing has the potential to increase the risk of disease spread (Glevan Consulting, 2020). The increased fragmentation and the introduction of vectors are also likely to increase the spread of dieback into the remaining patches of Banksia Woodlands Community and FCT20a. Proteaceae species are key components of these TECs and are highly susceptible to dieback, meaning that infestation is likely to cause a decline in the species richness and quality of these communities.

The proposed clearing will result in two fragmented patches of FCT20a remaining in remnant vegetation east of Roe Highway; a northern remnant of approximately 1.9 ha and a southern remnant of 2.9 ha. These remnants are also representative of the Banksia Woodlands Community, although the southern remnant of this community extends to an adjacent area of 1.35 ha (total 4.25 ha). Based on the dieback mapping, while the northern remnant is currently uninfested, it is classed as being unprotectable from future spread of dieback due to the narrow, linear nature of the vegetation adjacent to existing cleared areas and road infrastructure, as well as the Good (Keighery, 1994) condition of the vegetation and evidence of existing disturbance activities in this area (Glevan Consulting, 2020). The southern remnant is classed as protectable from future spread of dieback due to its size (larger than 1 ha), Very Good (Keighery, 1994) condition, and that it is contiguous with a larger area of uninfested vegetation (Glevan Consulting, 2020).

Several declared weeds and woody weeds have been identified in the vicinity of the recorded TECs and PECS, including bridal creeper (**Asparagus asparagoides*), Victorian tea tree (**Lepidospermum laevigatum*), giant reed (**Arundo donax*), castor oil (**Ricinus communis*) and Tagaste (**Cytisus proliferus*) (Biota, 2021; Gambara, 2021). The encroachment of road infrastructure into the retained patches and the reduction of vegetative buffers to road alignments will therefore put all remaining patches of SCP20a, SCP20c, and Banksia Woodlands Community adjacent to the clearing area at risk of weed spread.

To mitigate the risk of weed and dieback spread into adjacent retained native vegetation, MRWA commissioned Gambara (2021) to prepare a topsoil and hygiene management plan (THMP) to be implemented during clearing and construction activities. Weed and dieback controls outlined in the THMP include:

- classification of topsoil according to risk categories based on vegetation condition and *Phytophthora cinnamomi* presence to govern re-use or disposal requirements,
- demarcation of dieback-infested areas in the Site Environment Plans and onsite,
- implementation of Clean on Entry and/or Exit (CoE) procedures onsite, including the inspection and clean down (i.e., brushing, gouging, scraping and/or water blasting to remove soil or plant material) of all machinery, vehicles, tools and footwear prior to entry to the construction site and prior to departure from the construction site,
- record-keeping of entry and exit records at CoE points,
- establishment of CoE points at the boundaries of dieback-uninfested areas and restriction of topsoil movements from infested to uninfested areas,
- staging of clearing activities during the summer-autumn dry period as far as is practicable, to minimise dieback spread,
- installing silt fences and temporary cut off drains within the project area adjacent to down-slope environmentally sensitive areas to prevent potential spread of dieback with sediment and runoff,
- mapping of the extent of weeds, including Declared plants and woody weeds, prior to construction,
- demarcation of weed-infested areas identified from weed mapping and undertaking weed treatment to control populations of significant weeds prior to clearing,
- undertaking clearing of weed infested areas dominated by woody weeds separately,
- monitoring weed coverage throughout construction, with remedial measures to be used to manage any identified weed increases on site, and
- undertaking weed control in work areas every three months (Gambara, 2021).

The proposed management measures are considered adequate to manage the risk of weeds and dieback spreading into adjacent areas of TECs, PECs and other high environmental value areas that are susceptible to weed and dieback spread. To ensure the health of adjacent areas of SCP20a, SCP20c, and the Banksia Woodlands Community does not decline, additional conditions will be enforced on the clearing permit in the vicinity of these communities. These conditions will require mapping of weed-infested areas, three-monthly weed control in cleared areas where construction has not commenced, and the cleaning of all equipment prior to leaving weed-infested areas and prior to entering vegetation adjacent to the dieback-uninfested protectable patch of SCP20a, in addition to standard hygiene procedures.

Hydrology

Advice received from DBCA indicates that the encroachment of road infrastructure to the immediate edges of the Banksia Woodlands Community, SCP20a, and SCP20c occurrences adjacent to the application area also increases the risk of hydrological changes associated with loss of buffer vegetation and altered topography of immediately adjacent land (DBCA, 2022). This may result in a modification to the communities. The impact of construction activities on groundwater levels would also likely impact these communities noting they are groundwater dependant and sensitive to a reduction in groundwater availability (DBCA, 2022).

MRWA have advised that the project has been designed to maintain existing surface and groundwater flows, noting that current surface drainage at the GEHB-Roe Highway interchange is serviced by pits, pipes, culverts and table drains that drain water away from the areas of Banksia Woodlands Community, SCP20a, and SCP20c to the south and east (MRWA, 2022). Existing surface water flows (by way of transfer via culverts) will be reinstated and as such, no alteration in terms of diverting water away from or directly into the adjacent communities is proposed (MRWA, 2022). It is also noted that the terrain falls from a height of 25 m AHD at the southeast extent of the patch of SCP20c to 21 m AHD at the western end, meaning that the interchange infrastructure has limited influence on surface water availability to communities to the south (MRWA, 2022).

Rainfall will either infiltrate at or near source into unsealed verges and landscaping or be directed to roadside infiltration basins where it will percolate through the soil profile to recharge the superficial groundwater aquifer (MRWA, 2022). A hydrogeological assessment determined that the Helena River appears to exert some control over groundwater flow in the local area, with maximum groundwater level contours indicating that the flow direction at the interchange is northwest to north (GCA, 2022b). This suggests that groundwater flow direction is away from the areas of Banksia Woodlands Community, SCP20a, and SCP20c to the south and east of the interchange and that infrastructure will have minimal influence on groundwater availability for these adjacent communities (MRWA, 2022).

This is consistent with advice received from DWER's Water Allocation Planning South branch, which indicated that, while there may be a minor loss of surface water and shallow sub-surface groundwater flow down slope of the project envelope into the communities south of the interchange, this is likely to have a low level of impact on these communities noting the small catchment area being cleared, low topographical gradients, and sandy soils (DWER, 2022c). It was advised that the patches of Banksia Woodlands Community and SCP20a on the eastern side of Roe Highway are highly unlikely to be impacted by hydrological changes caused by the adjacent clearing of vegetation noting the separation from mapped wetlands to the west, the low topographical gradients, and sandy soils (DWER, 2022c).

MRWA (2022) have advised that controls will be in place through the Acid Sulfate Soil and Dewatering Management Plan (GCA, 2023c) and the Environmental Risk Action Plan (ERAP) for water quality, erosion and sedimentation in the Environment Management Plan (GCA, 2023a) to ensure surface and groundwater flows are maintained and to manage the potential impacts of uncontrolled discharges of sediment in surface water run-off. The management commitments in these plans include the following:

- Maintenance of existing natural drainage paths and channels along the road by use of culverts.
- Establishment of silt fences and temporary cut off drains within the project area adjacent to down-slope environmentally sensitive areas to prevent potential spread of dieback with sediment and runoff into the areas.
- Use of booms and silt fences when working over or adjacent to areas of surface water to protect the quality of surface water from construction impacts.
- Undertaking remedial works using manual methods and cleaned equipment to remove sediment from downslope environmentally sensitive areas should silt fences and/or cut off drains be overtopped by storm events during construction.
- Locating stockpiles at sufficient distance from environmentally sensitive areas and applying appropriate dust and sedimentation minimisation measures e.g., water truck, chemical dust suppression and bunding/windrows.

The Delegated Officer considered that the proposed management measures are adequate to manage the low risk of hydrological changes that will indirectly impact adjacent areas of the Banksia Woodlands Community, SCP20a, and SCP20c. Given the assessed low risk of hydrological change, the topographic and groundwater level contours, and the standard management measures outlined in the management plans, the Delegated Officer considered that additional permit conditioning to prevent and monitor run-off into the communities south and east of the application area was not necessary in this instance. However, permit conditioning will ensure existing natural water flows are maintained within the application area for the duration of clearing.

It is acknowledged that dewatering as part of road construction activities also has the potential to alter hydrology and result in adverse impacts to the ecological communities adjacent to the clearing area. It is noted that dewatering and its impact on groundwater levels will be managed under a groundwater license pursuant to the RIWI Act and is outside of the scope of the clearing permit assessment. Further, if construction activities will result in the modification of SCP20a and/or SCP20c, these activities would likely require authorisation under section 45 of the BC Act. The scope of the clearing permit assessment and conditioning has been limited to the potential hydrological impacts associated with clearing activities.

Conclusion

Based on the above assessment, the proposed clearing will result in:

- the loss of 14.94 ha of native vegetation representative of the Banksia Woodlands Community,
- the loss of 5.78 ha of native vegetation representative of SCP20a,
- the loss of 2.53 ha of native vegetation representative of SCP21c, and
- the potential for indirect impacts to remaining patches of the Banksia Woodlands Community, SCP20a, and SCP20c adjacent to the application area through weed and dieback spread or hydrological changes.

For the reasons set out above, it is considered that the potential indirect impacts of the proposed clearing on significant ecological communities adjacent to the application area can be managed to be environmentally acceptable through the applicant's management commitments and permit conditioning.

However, for the reasons set out above, the loss of native vegetation that is representative of the Banksia Woodlands Community, SCP20a, and SCP21c constitutes a significant residual impact. In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), these significant residual impacts have been addressed through the conditioning of environmental offset requirements, as outlined under Section 4.

Conditions

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

- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials, including additional protocols for identified dieback-uninfested protectable areas and weed-infested areas,
- Watercourse and wetland management, which ensures existing surface water flow is maintained by use of culverts,
- Offset – land transfer, which requires the permit holder to provide documentary evidence of the transfer of the Cowalla Offset Site (defined in Section 4) containing native vegetation representative of the Banksia Woodlands Community and SCP21c to DBCA to be managed for conservation in perpetuity,
- Offset – Executed change in purpose, requiring the permit holder to provide documentary evidence of the executed vesting change of the Hartfield Park Offset Site (defined in Section 4) containing native vegetation representative of SCP20a to include Conservation,
- Offset – Executed change in purpose, requiring the permit holder to provide documentary evidence of the executed vesting change of the Mirrabooka Bushland Offset Site (defined in Section 4) containing native vegetation representative of SCP20a include Conservation,
- Offset – Revegetation and rehabilitation requirements, which requires the permit holder to prepare a Revegetation Management Plan for the Mirrabooka Bushland Offset Site (defined in Section 4), including measures to improve the quality of containing native vegetation representative of SCP20a, and
- Offset – Revegetation and rehabilitation requirements, which requires the permit holder to prepare a Revegetation Management Plan for the Hartfield Park Offset Site (defined in Section 4), including measures to improve the quality of native vegetation representative of SCP20a.

3.2.4. 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, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). While the current vegetation extent for the SCP IBRA bioregion is above the 30 per cent threshold, remaining native vegetation within the mapped SCP vegetation complexes (Forrestfield and Southern River complexes) and the local area are below the national objectives (see Appendix C.2).

Noting the vegetation is representative of listed ecological communities, provides significant habitat for conservation significant flora and fauna species, is within Bush Forever Site 481, and is growing in association with significant

wetlands, the application area is considered to be a significant remnant of vegetation. Further, as discussed under Sections 3.2.1 and 3.2.7, the vegetation proposed to be cleared contributes to vegetation connectivity and mapped ecological linkages in the local area. The proposed clearing is therefore 'at variance' with this principle.

However, the Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region to be a constrained area, in which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008). The current vegetation extent for the SCP IBRA Bioregion, the Forrestfield and Southern River Complexes, and the local area are all above this threshold. The application area also represents less than 0.02 per cent of all remaining native vegetation in the local area and mapped within the vegetation complexes on the SCP, meaning the proposed clearing will not cause the extent of native vegetation to fall below the 10 per cent representation threshold. Therefore, when considered in the context of the constrained area, the proposed clearing is consistent with revised thresholds and is not considered to significantly impact vegetation extent in the Perth Metropolitan Region.

Given the high weed load in parts of the application area, it is possible that the proposed clearing will facilitate the spread of weeds and dieback into surrounding significant remnant vegetation in the local area. A hygiene management condition will sufficiently minimise this risk.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to result in significant impacts to vegetation extent within an extensively cleared area or to impact significant ecological linkages but may facilitate the spread of weeds and dieback into nearby vegetation in the local area, including adjacent significant remnant vegetation.

For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable by taking steps to minimise the risk of the introduction and spread of weeds and dieback and does not constitute a significant residual impact.

Conditions

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

- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials.

3.2.5. Land and water resources (wetland, watercourse and water quality) - Clearing Principles (f) and (i)

Assessment

The application area intersects two wetlands mapped in DBCA's Geomorphic Wetlands of the SCP dataset:

- a floodplain of the Helena River (UFI 15540), mapped as a CCW and covering a total area of 51 hectares, of which 2.46 ha intersects the northern portion of the application area, and
- a palusplain, (UFI 15266), mapped as a Multiple Use wetland (MUW) and covering a total area of 210 ha, of which around 0.91 ha intersects the western portion of the application area (see Figure 7 below).

The biological survey identified that vegetation within UFI 15540 comprises the L3, P3, and P6 vegetation types, ranging from Degraded to Excellent (Keighery, 1994) condition (Biota, 2021). These vegetation types include characteristic wetland and riparian species including *Melaleuca rhaphiophylla* (L3) and flooded gum (P3 and P6) (Biota, 2021). Vegetation within UFI 15266 comprises the L2, L5, P1, P2, and P4 vegetation types, ranging from Good to Excellent (Keighery, 1994) condition (Biota, 2021). These areas also include some characteristic wetland species such as *Melaleuca seriata* (L2 and L5), *Pericalymma ellipticum* var. *floridum* (L2), and *Lyginia* spp. (Biota, 2021).

The northern portion of the application area within UFI 15540 also intersects the Helena River itself (see Figure 7 below). The portion of the Helena River within the application area is bordered by flooded gum open forest within the P3 and P6 vegetation types in Degraded to Good (Keighery, 1994) condition (Biota, 2021).

Therefore, the proposed clearing will impact native vegetation growing in association with a watercourse and wetland. Noting the proximity of the application area to these water sources, the proposed clearing also has the potential to cause deterioration in water quality and indirectly impact the hydrological function of the mapped wetlands.

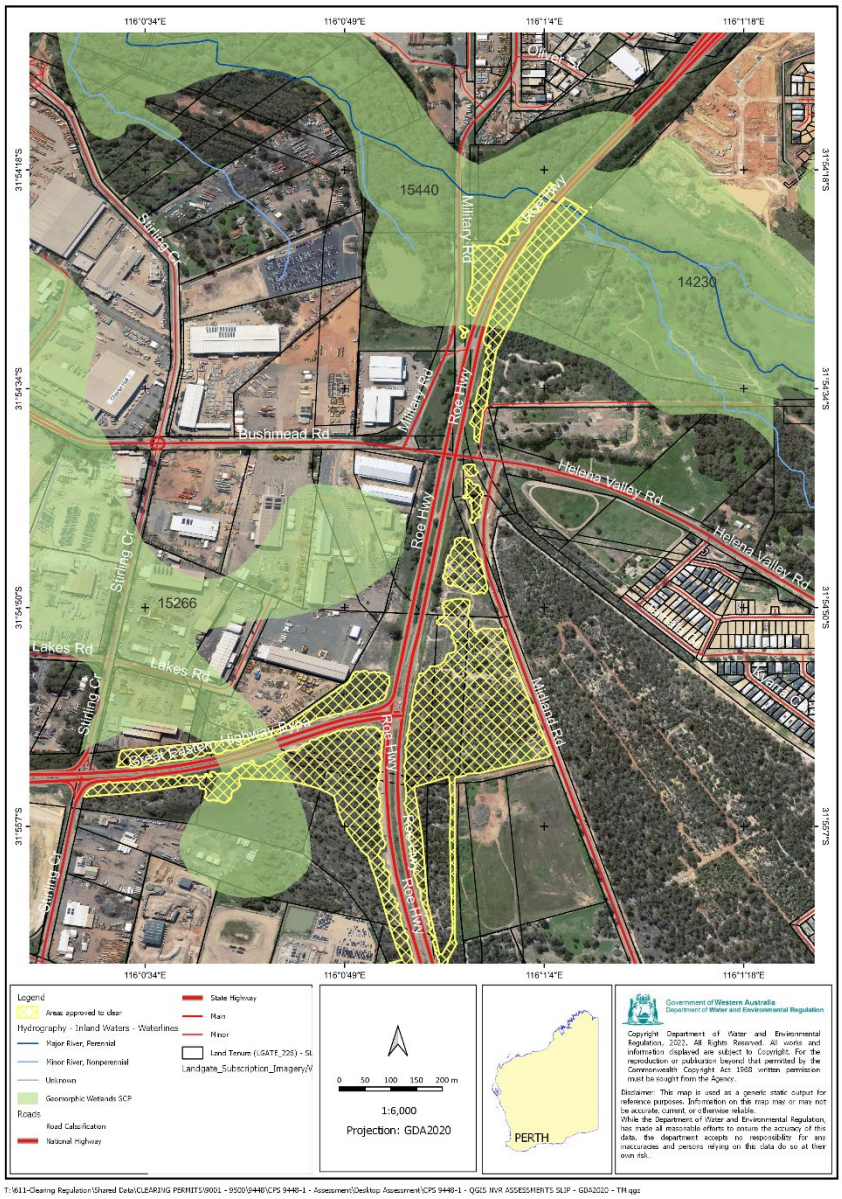


Figure 7. Geomorphic Wetlands UFI 15540 and UFI 15266 (shaded green) in relation to the application area for CPS 9448/1 (cross-hatched yellow).

Wetlands (UFI 15540 and UFI 15266)

While UFI 15266 is formally mapped as a MUW, however advice received from DBCA indicates that a portion of the wetland (approximately 6.05 ha) south of GEHB is likely to contain higher wetland values (DBCA, 2022). This portion of UFI 15266 meets several of the preliminary criteria outlined in '*A methodology of the evaluation of wetlands on the Swan Coastal Plain, Western Australia*' (DBCA, 2017), noting that the vegetation is in Good to Excellent (Keighery, 1994) condition and supports a TEC (i.e., the Banksia Woodlands Community and SCP20c) (DBCA, 2022). Therefore, this portion of UFI 15266 is likely to have values commensurate with a CCW, which is further supported by the presence of priority flora (DBCA, 2022).

Based on the available information, the proposed clearing will therefore result in the loss of 3.15 ha of native vegetation growing in association with wetlands that have values commensurate with a CCW (being 2.46 ha of UFI 15540 and 0.68 ha of UFI 15266).

It should be noted that the formal classification of UFI 15266 within DBCA's Geomorphic Wetlands of the SCP dataset cannot be changed without a delineation assessment, followed by an evaluation of the wetland values and determination of the appropriate management category. Therefore, while the portion of UFI 15266 is considered to have values commensurate with a CCW, the wetland has not been formally reclassified at present. The remaining portion of UFI 15266 that intersects the application area north of GEHB is no longer considered to function as a

wetland based on DBCA advice, due to the degree of historical clearing and that majority of the mapped MUW is now industrial area.

CCWs are wetlands which support high levels of ecological attributes and functions through various mechanisms (Water and Rivers Commission, 2001). Management priorities of such wetlands are to preserve wetland attributes and functions through reservation in National Parks, Crown Reserve, State owned land and protection under environmental protection policies (Hill et al., 1996).

Noting the significant ecological functions performed by CCWs and the cumulative loss of wetland vegetation on the SCP, the Delegated Officer considered that the loss of 3.15 ha of native vegetation growing in association with wetlands that have values commensurate with a CCW represents a significant residual impact.

The Delegated Officer considered the applicant's efforts to minimise impacts to the extent possible through alignment and design, including reducing the proposed impact to native vegetation growing in association with wetlands that have values commensurate with a CCW from 4.23 ha to 3.15 ha (see Section 3.1). Noting these efforts to avoid and minimise impacts, the Delegated Officer considered it appropriate to consider offsets to counterbalance the significant residual impact to wetlands that have values commensurate with a CCW.

The applicant has proposed an adequate environmental offset to counterbalance the direct loss of native vegetation growing in association with wetlands that have values commensurate with a CCW. The nature and suitability of this offset is detailed under Section 4.

In addition to the direct loss of vegetation, DBCA advised that the proposed clearing may indirectly impact UFI 15540 and UFI 15266 through changes to hydrological regimes post development, as a result of altered geomorphology and drainage (DBCA, 2022). DBCA noted that pre-development hydrological regimes should be maintained to ensure there are no indirect impacts to surrounding vegetation (DBCA, 2022). DBCA also recommended that, if water is being directed into the wetlands from the road, monitoring should occur to ensure water quality in the wetlands are not impacted by the development (DBCA, 2022).

As discussed under Section 3.2.3, controls will be in place through the Acid Sulfate Soil and Dewatering Management Plan (GCA, 2023c), the Helena River Bridge 1899 – Erosion and Sediment Control Plan (GCA, 2022a), and the Environment Management Plan (GCA, 2023a) to ensure surface and groundwater flows are maintained and to manage the potential impacts of uncontrolled discharges of sediment in surface water run-off.

In relation to UFI 15266, the Delegated Officer considered there to be a low risk of significant hydrological change resulting from the proposed clearing, given the current drainage and surface water flows around GEHB will be maintained and that topographic and groundwater level contours indicate natural water flow is northwards, away from the wetland (GCA, 2022b; MRWA, 2022). This is consistent with advice received from DWER's Water Allocation Planning South branch, which indicated that, while there may be a minor loss of surface water and shallow sub-surface groundwater flow down slope of the project envelope into UFI 15266 south of GEHBI, this is likely to have a low level of impact on the wetland noting the small catchment area being cleared, low topographical gradients, and sandy soils (DWER, 2022c).

The Helena River floodplain UFI 15440 may have a slightly higher risk of hydrological change, noting natural surface and groundwater flows are north to north-westerly through the area. However, given the scale of and linear nature of clearing, sandy soils, low topographical gradients, and existing fragmentation of UFI 15440 by Roe Highway, it is unlikely that the proposed clearing will significantly impact hydrological regimes of the wetland.

The Delegated Officer determined that permit conditioning requiring the maintenance of existing water flows within the application area is adequate to manage the low risk of hydrological changes. The Delegated Officer also considered that permit conditioning relating to CFM habitat including the installation of erosion and sediment control structures on the eastern side of Roe Highway within UFI 15440, will further reduce the risk of hydrological change.

It is acknowledged that dewatering as part of road construction activities also has the potential to alter hydrology and result in adverse impacts to the wetlands that have values commensurate with a CCW adjacent to the clearing area. It is noted that dewatering and its impact on groundwater levels will be managed under a groundwater license pursuant to the RIWI Act and is outside of the scope of the clearing permit assessment. The scope of the clearing

permit assessment and conditioning has been limited to the potential hydrological impacts associated with clearing activities.

The proposed clearing may increase the risk of weed spread into areas of UFI 15440 and UFI 15266 adjacent to the clearing area. UFI 15440 has been mapped in predominantly Degraded to Good (Keighery, 1994) condition and has a high weed load at present (Biota, 2021). Therefore, standard weed management protocols are likely to be sufficient to manage risk of weed spread in this area. UFI 15266 is predominantly in Very Good to Excellent (Keighery, 1994) condition and the spread of weeds into the wetland may cause degradation (Biota, 2021). As outlined in Section 3.2.3, the area adjacent to UFI 15266 will be subject to additional weed management conditions including mapping of weed-infested areas, three-monthly weed control in cleared areas where construction has not commenced, and the cleaning of all equipment prior to leaving weed-infested areas, in addition to standard hygiene procedures. The Delegated Officer considered these measures adequate to minimise the risk of weed spread into UFI 15266.

Both wetland areas and their surrounding vegetation have been mapped as dieback infested (Gambara, 2021; Glevan Consulting, 2020). Therefore, the risk of dieback spread can be appropriately managed by standard hygiene protocols as conditioned on the permit.

Watercourse (Helena River)
The proposed clearing will remove riparian vegetation on the banks of the Helena River on either side of the existing Roe Highway alignment. Advice from DWER's RSS indicates that the removal of riparian and floodplain vegetation will result in localised loss of bank stability, soil erosion, loss of riparian habitats, and increased vulnerability of the remaining riparian corridor to degradation through edge effects (DWER, 2022b). While many of these impacts have already occurred as the result of the existing Roe Highway alignment, the additional clearing and expansion of the road bridge over Helena River may exacerbate these impacts (DWER, 2022b).

MRWA have advised that the potential for reduced bank stability, erosion, and sedimentation will be managed in accordance with the Acid Sulfate Soil and Dewatering Management Plan (GCA, 2023c), the Helena River Bridge 1899 – Erosion and Sediment Control Plan (GCA, 2022a), and the Environment Management Plan (GCA, 2023a). Specific measures outlined in these plans include:

- stabilisation of disturbed areas as soon as possible after construction activities are completed,
- erosion and sediment transport control measures, such as booms and sediment fences, particularly when working over or adjacent to areas of surface water, and
- sediment controls, including sediment basins and hardstand washdown areas for vehicles, which will be maintained and have a minimum of 70% sediment storage capacity.

Stabilisation of the disturbed areas will be in accordance with a landscaping design that will include soft and hard landscaping treatments (GCA, 2023b). Soft landscaping (revegetation) will be undertaken on the embankments using native riparian species, and all temporarily disturbed areas either side of the Helena River and will include measures to reduce surface water velocities (e.g., such as scalloping of embankments and increased planting densities), and thus potential for discharge of sediment into the river (GCA, 2022a). Other temporary measures including installation of temporary silt fences along the edge of the river will be implemented and monitored during and following construction until revegetation is established (GCA, 2022a).

The Delegated Officer determined that permit conditioning will be sufficient to manage the risks associated with the removal of riparian vegetation along the Helena River. The conditions include provisions for the maintenance of existing water flows within the application area, the installation of erosion and sediment control structures on the eastern side of Roe Highway, and the maintenance of ecological linkage values which will include revegetation along the riverbanks underneath the Helena River bridge.

The Helena River has been mapped in predominantly Degraded to Good (Keighery, 1994) condition and has a high weed load at present (Biota, 2021). The area and surrounding riparian vegetation is also known to be dieback infested (Gambara, 2021). The Delegated Officer determined that standard weed and dieback management protocols are likely to be sufficient to manage risk of spread into adjacent riparian areas.

The Helena River channel is also part of the Swan and Canning Rivers Development Control Area (DCA) and as such, cannot be disturbed without prior approval from Western Australian Planning Commission (WAPC) under the *Swan and Canning Rivers Management Act 2006*. The proposed bridge and associated works have been designed to avoid the DCA, which will prevent any direct construction activities from occurring within the Helena River channel.

Water Quality
Given that the application area intersects the Helena River and its floodplain (UFI 15440), as well as a Palusplain wetland (UFI 15266), the proposed clearing may impact on surface water quality through sedimentation and turbidity without appropriate management.

As outlined above, the Helena River and its floodplain (UFI 15440) are likely to be at the highest risk of water quality impacts given the assessed hydrological flows and the presence of a permanent water source within the Helena River. Permit conditioning requiring the maintenance of existing water flows and the installation of erosion and sediment control structures on the eastern side of Roe Highway will reduce the movement of sediment into the Helena River and floodplain from surface water run-off. Water quality monitoring of Wetland West and Wetland East within UFI 15440 associated with CFM monitoring (see Section 3.2.1) will provide measures of sedimentation and turbidity that will also be used as an indicator for adverse water quality impacts within UFI 15440 and the Helena River. If water quality monitoring identifies adverse impacts, the permit holder will be required to implement remedial actions to reduce or counterbalance the adverse impacts, in consultation with DWER and DBCA.

Given the management measures in place, the risk of significant water quality impacts resulting from the proposed clearing activities is considered to be low.

As discussed above, road construction activities are likely to include dewatering with construction water sourced from groundwater abstraction bores. Dewatering and its potential impacts on water quality will be managed under a groundwater license pursuant to the RIWI Act and is outside of the scope of the clearing permit assessment.

Conclusion
Based on the above assessment, the proposed clearing will result in:
- the loss of 3.15 ha of native vegetation growing in association with wetlands (UFI 15440 and UFI 15266) that have values commensurate with a CCW,
- the loss of vegetation growing in association with a watercourse (Helena River), and
- the potential for indirect impacts to remaining wetland areas and riparian vegetation adjacent to the application area through weed spread, hydrological changes, and deterioration of water quality.

For the reasons set out above, it is considered that the loss of riparian vegetation growing in association with the Helena River and the potential indirect impacts of the proposed clearing on wetlands and watercourses adjacent to the application area can be managed to be environmentally acceptable through the applicant's management commitments and permit conditioning.

However, for the reasons set out above, the loss of native vegetation growing in association with wetlands that have values commensurate with a CCW constitutes a significant residual impact. In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), these significant residual impacts have been addressed through the conditioning of environmental offset requirements, as outlined under Section 4.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:
- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials, including additional protocols for identified weed-infested areas,
- Ecological linkage management, which requires the permit holder to take specific measures to maintain habitat connectivity along the Helena River, including revegetation which will assist in bank stabilisation
- Watercourse and wetland management, which ensures existing surface water flow is maintained by use of culverts and requires the permit holder to implement clearing controls, management measures and monitoring to reduce indirect impacts to watercourses and wetlands, as well as to undertake remedial actions where monitoring indicates adverse impacts are possible,
- Offset – land transfer, which requires the permit holder to provide documentary evidence of the transfer of the Cowalla Offset Site (defined in Section 4) containing native vegetation growing in association with wetlands that have values commensurate with a CCW to DBCA to be managed for conservation in perpetuity, and
- Offset – revegetation and rehabilitation, which requires the permit holder to prepare a Revegetation Management Plan for the Neaves Road Offset Site (defined in Section 4), including measures to improve the quality of native vegetation growing in association with a wetland that has values commensurate with a CCW.

3.2.6. Land and water resources (land degradation) - Clearing Principle (g)

Assessment

The mapped soil systems are highly susceptible to wind erosion, subsurface acidification, and phosphorus export (DPIRD, 2025). Portions of the mapped soils surrounding the Helena River are also moderately to highly susceptible to water erosion, waterlogging, and flooding (DPIRD, 2025). Without appropriate management, the proposed clearing has the potential to cause land degradation where there is significant disturbance of topsoil, run-off of surface water across cleared areas, or if bare ground is left exposed to weathering for an extended period between clearing and development.

As outlined in Sections 3.2.3 and 3.2.5 above, sufficient management measures will be in place to prevent surface water run-off across cleared areas and minimise the risk of erosion and sedimentation, particularly around watercourses and wetlands. The Delegated Officer considered that conditions on the permit associated with the maintenance of existing water flows and the installation of erosion and sediment control structures will ensure the risk of water erosion, waterlogging, flooding, and nutrient export remain low.

To ensure the risk of wind erosion is minimised, the Delegated Officer determined that permit conditioning specifying that road construction activities must commence within three months of clearing being undertaken was necessary.

It is also acknowledged that the end land-use has the potential to cause water erosion by disturbing the banks of an existing watercourse. However, these impacts will be considered through the assessment of a surface water Permit under section 17 of the RIWI Act and are outside the scope of the clearing permit (see Section 3.3).

Conclusion

Based on the above assessment, the proposed clearing will result in land degradation where ere is significant disturbance of topsoil, run-off of surface water across cleared areas, and if bare ground is left exposed to weathering for an extended period between the clearing of surface vegetation and road construction activities.

For the reasons set out above, it is considered that the risk of land degradation can be appropriately mitigated through permit conditioning, and the proposed clearing is unlikely to result in appreciable land degradation.

Conditions

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

- Erosion management, requiring the permit holder to commence road construction and upgrades within three months after clearing to reduce the potential for wind erosion, and
- Watercourse and wetland management, which ensures existing surface water flow is maintained and requires the permit holder to implement sedimentation and erosion control measures in the vicinity of watercourses and wetlands.

3.2.7. Conservation areas (Bush Forever Site 481 and CCW) - Clearing Principle (h)

Assessment

The central portion of the application area (11.07 ha) is located within Bush Forever Site 481 (see Figure 8 below) and has been identified as regionally significant bushland subject to the policy measures of SPP 2.8 (see Section 3.3). The vegetation proposed to be cleared within Bush Forever Sites 481 is predominantly in Good to Excellent (Keighery, 1994) condition (Biota, 2021). As outlined in the sections above, the native vegetation within Bush Forever Site 481 contains significant environmental values, including conservation significant ecological communities, significant flora and fauna habitats, and vegetation growing in association with a significant wetland. Therefore, the proposed clearing will result in the loss of 11.07 ha of native vegetation within a conservation area and will impact on the environmental values of Bush Forever Site 481.

Figure 8. Bush Forever Site 481 (dashed black) in relation to the application area for CPS 9448/1 (cross-hatched yellow).

The Department of Planning, Lands and Heritage (DPLH) (2021) expressed concerns with the clearing of an area with such high conservation value and at the fragmentation of the remaining Bush Forever Site 481. The current area of Bush Forever Site 481 is approximately 26.6 ha, split into two fragments immediately east (12.65 ha) and west (13.95 ha) of the existing Roe Highway alignment. The proposed clearing will result in the loss of approximately 42 per cent of remaining native vegetation within the site, reducing the western remnant to 8.45 ha and separating the eastern remnant into two areas of 5.15 ha and 1.9 ha, respectively. Therefore, the proposed clearing will significantly isolate and fragment the remaining portion of Bush Forever Site 481.

However, DPLH (2021) advised that the proposal is consistent with the overall intent of the Metropolitan Regional Scheme (MRS) reservation and can be justified under SPP 2.8, given:

- the land is zoned as Primary regional roads, Urban, and Rural under the MRS,
- the site implementation category of Bush Forever Site 481 is classified as 'Government lands or Public infrastructure',
- the supporting information (GCA, 2022c) has demonstrated that the proposal can be reasonably justified with regard to wider environmental, social and economic considerations (see Section 3.3),
- the supporting information (GCA, 2022c) indicates that the avoidance of impacts entirely is limited due to surrounding land tenure constraints (see Section 3.1), and
- the applicant has taken reasonable steps to minimise the impacts on native vegetation within Bush Forever Site 481, including reducing the extent of clearing from 15.95 ha to 11.07 ha (see Sections 3.1 and 3.3).

DPLH (2021) recommended that the following measures be implemented for consistency with SPP 2.8 and to ensure the integrity of Bush Forever Site 481 is not compromised:

- other than the 23.31 ha of native vegetation proposed to be cleared, no additional disturbance or clearing of native vegetation within Bush Forever Site 481 is to result from the construction, access, drainage, battering or ongoing maintenance of the proposal, and
- an offset package is prepared and approved in accordance with the *WA Environmental Offsets Policy* (2011) and with guidance from Appendix 4 of SPP 2.8, prior to the clearing of any native vegetation.

The Delegated Officer determined that an offset consistent with Appendix 4 of SPP 2.8 is required to counterbalance the loss of vegetation within Bush Forever Site 481 and ensure there will be an environmental gain for the proposed clearing within regionally significant bushland. The applicant has proposed to undertake rehabilitation and management actions to improve the quality of at least 22.14 hectares of native vegetation within Bush Forever Site 385, which is sufficient to counterbalance the impacts to regionally significant bushland and align with SPP 2.8.

As outlined in Section 3.2.1, the application area intersects two mapped PREL linkages (ID 33 and 134) which represent broad links between remnant vegetation in local Bush Forever areas (Sites 213, 216 and 481) and along the Helena River (Del Marco, et al., 2004). While the application area is likely to contribute to ecological linkages between local conservation areas, both mapped PREL linkages have already been severed by existing road alignments, and the proposed clearing will result in a minor increase in the degree of separation between remnant vegetation. Further, ecological linkage values along the Helena River will be maintained through management measures conditioned on the permit, including landscaping (see Section 3.2.1). Therefore, the proposed clearing is not likely to significantly impact ecological linkages between local conservation areas.

The proposed clearing also has the potential to result in indirect impacts to habitat values in Bush Forever Site 481 and other nearby Bush Forever areas through the spread of weeds and other pathogens. The areas of Bush Forever Site 481 adjacent to the proposed clearing area are in Good to Excellent (Keighery, 1994) condition and may be degraded by weed spread facilitated by the proposed clearing. Further, while the area of Bush Forever Site 481 west of Roe Highway is dieback-infested, a portion of the eastern area is uninfested and classed as protectable from future spread (Glevan Consulting, 2020). To ensure the environmental values of adjacent areas of Bush Forever Site 481 are not indirectly impacted or degraded, additional conditions will be enforced on the clearing permit in the vicinity of Bush Forever Site 481. These conditions will require mapping of weed-infested areas, three-monthly weed control in cleared areas where construction has not commenced, and the cleaning of all equipment prior to leaving weed-infested areas and prior to entering vegetation adjacent to the dieback-uninfested protectable patch, in addition to standard hygiene procedures.

It is acknowledged that significant wetlands and watercourses can also be considered conservation areas in line with *A guide to the assessment of applications to clear native vegetation* (DER, 2013). Therefore, the areas of native vegetation associated with UFI 15540 (mapped as CCW) and UFI 15266 (considered to have values commensurate with a CCW), may also be considered as conservation areas. However, the Delegated Officer considered that the significance of impacts to these wetlands and appropriate measures to mitigate, manage, and counterbalance these impacts has been assessed in relation to clearing principle (f) and does not require further consideration under clearing principle (h).

<u>Conclusion</u>
Based on the above assessment, the proposed clearing will impact the environmental values of regionally significant bushland within Bush Forever Site 481. There is potential for the clearing activities to result in the introduction or spread of weeds into adjacent vegetation in this conservation area. It is considered that impacts to adjacent vegetation can be appropriately mitigated and managed through hygiene protocols.

For the reasons set out above, it is considered that the impacts of the proposed clearing on significant bushland within Bush Forever Site 481 constitutes a significant residual impact. In accordance with SPP 2.8, this significant residual impact has been addressed through the conditioning of environmental offset requirements, as outlined under Section 4.

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

- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials, including additional protocols for identified dieback-uninfested protectable areas and weed-infested areas,
- Offset – Executed change in purpose, requiring the permit holder to provide documentary evidence of the executed vesting change of the Mirrabooka Bushland Offset Site (defined in Section 4) within Bush Forever Site 385 to include Conservation, and
- Offset – Revegetation and rehabilitation requirements, which requires the permit holder to prepare a Revegetation Management Plan for the Mirrabooka Bushland Offset Site (defined in Section 4), including measures to improve the quality of native vegetation within Bush Forever Site 385.

3.2.8. Cumulative impacts

Assessment
The Delegated Officer considered the existing and reasonably foreseeable cumulative impacts to TECs, PECs, black cockatoo foraging habitat, significant wetland vegetation, and *Conospermum undulatum* occurring in the vicinity of the proposal and as a result of other developments in the local area. The Delegated Officer considered the cumulative effects of a range of threats and pressures in the area of the application and whether the environment affected by the proposed clearing has significant value due to other successive, incremental, and interactive cumulative impacts in the area.

The cumulative loss of native vegetation in the local area largely relates to urban and industrial development. From a local perspective, there are several developments within 10 km with approvals issued since 2020 under Part IV and Part V of the EP Act that impact on black cockatoo foraging habitat, *C. undulatum*, SCP20a, SCP21c, significant wetland vegetation, and/or the Banksia Woodlands community. DWER is aware that these proposals have the potential to impact up to 13.79 ha of the Banksia Woodlands Community, 1.05 ha of SCP20a, 0.92 ha of SCP21c, 16.57 ha of wetland vegetation commensurate with a CCW, 33 *C. undulatum* individuals and 105.33 ha of black cockatoo foraging habitat.

The Delegated Officer acknowledges that the proposed clearing will have the effect of reducing the known local and regional extent of black cockatoo foraging habitat, SCP20a, SCP21c, Banksia Woodlands Community, significant wetland vegetation, and the number of known individuals of *C.undulatum*. However, the known cumulative impacts to the regional extent of these environmental values is small relative to the extent of their mapped occurrence. Further, it is understood that impacts to these environmental values have been appropriately addressed via mitigation measures and offsets where necessary, in accordance with the measures WA *Environmental Offsets Policy* (2011), and *WA Environmental Offsets Guidelines* (2014).

Conclusion
Based on the above assessment, the proposed clearing will result in a relatively small incremental loss of native vegetation representative of these environmental values. The Delegated Officer therefore considered that, subject to appropriate environmental offsets (see Section 4), the environmental outcome is likely to be acceptable in this instance.

3.3 Relevant planning instruments and other matters

In accordance with section 51O(4) of the EP Act, in considering a clearing matter, the Delegated Officer shall have regard to any development approval, planning instrument, or other matter, that they consider relevant. The planning instruments and other matters considered relevant by the Delegated Officer in determining to grant Clearing Permit CPS 9448/1, are outlined below.

Necessity of the clearing
DWER's '*A guide to the assessment of applications to clear native vegetation'* (DER, 2013) indicates that the necessity of the clearing is an 'other relevant matter' to be considered when making decisions as to whether a clearing permit should be granted. The assessment guideline prioritises clearing for public use over private benefit or commercial gain (DER, 2013).

In considering the clearing permit application, the Delegated Officer had regard to the fact that the proposed clearing is necessary to facilitate the GEHBI project which will deliver community benefits for traffic safety and flows, linking key industrial areas, and generating construction jobs and support for local development (see Section 1.2 for details).

Consultation
The clearing permit application was advertised on DWER's website on 21 October 2021, inviting submissions from the public within a 21-day period. Six public submissions were received at this time.

Due to the time elapsed since the initial advertising, the application was re-advertised on DWER's website for 21 days on 11 April 2024. No submissions were received at this time.

The application was again re-advertised on 26 August 2025 for a period of seven days, given the small increase in the application area by 0.02 ha. No public submissions were received on the re-advertised application.

As directly interested parties, the City of Kalamunda, City of Swan, and Shire of Mundaring were invited to provide comment on the application and consistency with Local Planning Schemes (LPS) and Policy (LPP).

The City of Kalamunda advised that, although limited clearing is proposed within the City, works should be undertaken in accordance with a Construction Environmental Management Plan to ensure significant environmental values (e.g., SCP20a, Banksia Woodlands Community, *Conospermum undulatum*, and Bush Forever Site 122) are protected to the extent possible (City of Kalamunda, 2021). The City of Kalamunda also recommended that firebreaks and fire access tracks be constructed of compacted limestone, that any onsite rehabilitation be undertaken with species consistent with local communities, and that offsets should provide a local environmental benefit (City of Kalamunda, 2021). The Delegated Officer considered that these matters have been considered and appropriately assessed under Sections 3 and 4.

The City of Swan indicated that a portion of the clearing area is identified for retention in the approved Hazelmere Enterprise Area Precinct 9A Local Structure Plan (SWAN-SP/2017/3) due to the potential presence of vegetation representative of a TEC (City of Swan, 2021b). The City of Swan recommended that the presence of TECs be confirmed within this area and appropriate management practices such as buffers and offsets be implemented in accordance with the Local Structure Plan (City of Swan, 2021a; 2021b). The Delegated Officer notes that the Local Structure Plan does not preclude the clearing of these areas but notes that consideration must be given to its significance through clearing permit requirements or subsequent development approval. The Delegated Officer considered that the clearing permit assessment has appropriately assessed the risks to the TECs identified onsite and considered the applicant's implementation of the mitigation hierarchy (see Sections 3.2.3 and 4 for more detail).

The City of Swan also noted that there are wild goats in the vicinity of the clearing area that may need to be relocated (City of Swan, 2021a). The Delegated Officer considers that, while permit conditioning is intended for the management of native fauna, requirements to undertake slow, one-directional clearing will allow any other fauna present within the clearing area to move into adjacent vegetation ahead of the clearing activities and that a fauna spotter will be present onsite to assist with the movement of fauna. The Delegated Officer also notes that the management of introduced species is a matter for the relevant landowners in conjunction with the City.

To date, no comments have been received from the Shire of Mundaring.

EPBC Act Approval
On 7 September 2020, MRWA referred the project to the former Commonwealth Department of Agriculture, Water and the Environment (DAWE), now the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (reference EPBC 2020/8784). On 12 October 2020, DAWE determined that the proposed action is a controlled action and required assessment and approval in relation to impacts to listed threatened species and communities (section 18 and 18A) under the EPBC Act before it can proceed.

DAWE subsequently issued the EPBC Act approval on 4 June 2024, subject to conditions. It is noted the EPBC Act approval authorised the clearing of up to 36.54 ha of black cockatoo foraging habitat, 2.62 ha of *Conospermum undulatum* habitat and up to 162 potential black cockatoo breeding trees (with a DBH of more than 500 millimetres), which differs from the impacts proposed under this clearing permit application. This is in part due to MRWA proceeding with a reduced footprint for the current clearing permit application, relative to that approved under the EPBC Act, which has been undertaken to reduce the extent of environmental impact. It should also be noted that the EPBC Act approval included areas of planted vegetation that provide foraging habitat for black cockatoo species, which is not subject to the clearing provisions of the EP Act. Due to the difference in extent of clearing and that the EPBC approval relates only to significant residual impacts to matters of national environmental significance, the extent and nature of the offset requirements conditioned under the EPBC approval differ from those conditioned under the clearing permit (see Section 4).

Other relevant authorisations and planning matters

Other relevant authorisations required for the proposed clearing and construction activities include:

- Development Approval (DA) from Western Australian Planning Commission (WAPC) under the *Swan and Canning Rivers Management Act 2006*,
- Groundwater license from DWER under section 5C of the RIWI Act, and
- Surface water Permit from DWER under section 17 of the RIWI Act.

Development Approval

The Helena River channel, which occurs within a portion of the application area is part of the Swan and Canning Rivers DCA and as such, cannot be disturbed without prior approval from WAPC under the *Swan and Canning Rivers Management Act 2006*.

The applicant is proposing to construct a bridge in this area for the Roe Highway duplication over the Helena River. A DA from WAPC was issued on 8 September 2022 for the works proposed in the vicinity of Helena River. The DA was subject to several conditions including requirements to prepare an Environmental Management Plan to ensure the protection and management of the site's environmental assets to the specifications of DBCA, prepare and implement an acid-sulphate soils management plan to the satisfaction of DWER, and implement an appropriate offset relative to impacts to Bush Forever Site 481.

The Delegated Officer notes that the relevant management plans have been drafted (see Section 3.1) and an appropriate offset for Bush Forever will be implemented as per the conditions of the clearing permit (see Sections 3.2.7 and 4).

Project delays have resulted in the development not substantially commencing within two years of the original approval, and therefore the DA has lapsed and is of no further effect. MRWA has advised that it intends to apply to renew the DA and is of the understanding that works on the proposed Helena River Bridge cannot commence until a DA has been obtained (MRWA, 2025d).

The Delegated Officer considered that, given the prior approval indicates a reasonable level of certainty that the DA will be re-issued and the DA relates to a small portion of the application area, it was appropriate to grant a clearing permit in lieu of the renewed DA in this instance to enable critical road upgrades to commence in other portions of the application area.

RIWI Act Approvals

The application falls within the Perth Groundwater Area proclaimed under the RIWI Act, within which the take of groundwater is subject to DWER approval. The applicant (via its contractors) received a Licence to Take Water (GWL208042) issued under Section 5C of the RIWI Act from DWER, for the purposes of dewatering for construction with an annual water entitlement of up to 90,000 KL. It is understood that GWL208042 expired on 30 June 2024 and is no longer active.

The application area also falls within the Swan River System Surface Water Area proclaimed under the RIWI Act. The interference or obstruction of a watercourse for works relating to the taking of water in a proclaimed area requires a surface water Permit approved under section 17 of the RIWI Act. MRWA may be required to obtain a permit to interfere with the bed and banks of the Helena River under the RIWI Act for works related to bridge construction.

MRWA advised that it intends to submit applications for the relevant RIWI Act approvals and is of the understanding that any dewatering and works on the proposed Helena River Bridge may not commence until all relevant approvals been obtained (MRWA, 2025d).

The Delegated Officer considered that, given the prior approval indicates a reasonable level of certainty that sufficient water allocation is available for the groundwater license and the interference with the bed and banks of the Helena River relates to a small portion of the application area, the outstanding RIWI Act approvals were not a significant barrier to the approval of the clearing permit application, in this instance.

Consistency with SPP 2.8

As discussed under section 3.2.7, a portion of the application area to the west and east of Roe Highway surrounding the existing GEHB road is a designated Bush Forever area. Therefore, the Delegated Officer considers that SPP 2.8 is a relevant matter for this application.

SPP 2.8 sets out that:

'Proposals or decision-making' in respect of Bush Forever areas 'should:

(i) support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision – a. is consistent with the overall

purpose and intent of an existing Crown reserve or can be reasonably justified with regard to wider environmental, social, economic or recreational needs, and all reasonable alternatives have been considered in order to avoid or minimise any direct loss of regionally significant bushland, and reasonable offset strategies are secured to offset any loss of regionally significant bushland, where appropriate and practical (clause 5.1.2.1(i)(e)).'

In considering SPP 2.8 and advice received from DPLH (see Section 3.2.7), the Delegated Officer considered it appropriate to grant the clearing permit in relation to Bush Forever Site 481 given the proposed road upgrades are consistent with the purpose and intent of the land parcels, is justified based on the necessity of the upgrades (see Section 1.2), impacts have been avoided and minimised to the extent possible (see Section 3.1), and a suitable environmental offset is implemented to counterbalance the loss of vegetation (see Section 4). Therefore, the Delegated Officer determined that the proposed clearing is consistent with the provisions of SPP 2.8.

Other relevant matters

EPA Guidance Statement No. 33

The Delegated Officer noted that the EPA's Guidance Statement No. 33, '*Environmental Guidance for Planning and Developmen*t' (EPA, 2008) discusses the need for protection of CCWs. As outlined in Section 3.2 of this decision report, the proposed clearing will impact 3.15 hectares of vegetation that has been determined to have values that are commensurate with a CCW. Given this, the Delegated Officer considered Guidance Statement No. 33 to be a relevant 'other matter' for this application.

In having regard to Guidance Statement No. 33, the Delegated Officer noted that the statement considers CCWs to be wetlands of high conservation significance and of high priority for protection, and that the statement does not consider clearing within CCWs to be appropriate. Also, in accordance with section 51O(4) of the EP Act, the Delegated Officer had regard to the planning context for the proposal and, as a relevant 'other matter', the necessity of the clearing and associated public benefit.

As outlined above, the Delegated Officer noted that the proposal had previously been granted DA by the WAPC for the CCW area relating to the Helena River floodplain (UFI 15540), the surrounding existing land uses, the MRS land zoning within the mapped CCWs as a primary regional road, and that the proposal is expected to provide direct public benefit.

The Delegated Officer also noted that the proposal would not entail clearing of the entire mapped wetlands. Rather, the proposal would result in the clearing of a 0.68 ha portion (11% reduction) of the area commensurate with a CCW at UFI 15266 and a 2.46 ha portion (5% reduction) of UFI 15540, which has already been fragmented by the existing Roe Highway alignment (see Section 3.2.5).

Therefore, in relation to the wetlands, having had regard to the environmental impacts to the wetland values in question, the content and status of Guidance Statement No. 33, the planning context for the proposal and the public benefit associated with the proposed clearing, the Delegated Officer considered that, on balance, the environmental impacts associated with the proposed clearing of the wetlands were not so significant that they outweighed the necessity of the clearing. The Delegated Officer therefore determined that it was appropriate to grant the clearing permit in relation to the wetlands, on the basis that an environmental offset was implemented to counterbalance the impacts (see Section 4).

Aboriginal Heritage Sites

MRWA has advised that an Archaeological and Ethnographic Aboriginal Heritage Survey of the project area was undertaken in 2020 alongside Whadjuk Noongar representatives (GCA, 2022c). During consultations, the Whadjuk Noongar representatives advised that the plans to duplicate the Roe Highway bridge over Helena River would directly and negatively impact the heritage values of the site (GCA, 2022c). In particular, there were concerns regarding the bridge design with pylons in the river channel and floodplain potentially blocking the flows of the Helena River and abutment designs restricting natural flooding events (GCA, 2022c). MRWA advised that, while some adjustments to the shape of the pylon structures were possible, the bridge designed was constrained by the existing structure and the piers could not be moved completely (GCA, 2022c).

On balance, the Whadjuk Noongar representatives advised that the works were supported, as long as all heritage sites were appropriately managed (GCA, 2022c). MRWA has indicated that it will continue to consult with and work with the Whadjuk Noongar People on the matter (GCA, 2022c).

The application area intersects nine registered Aboriginal Heritage Sites (see Table 6 below). MRWA advised that consent under section 18 of the *Aboriginal Heritage Act 1972* was received for potential impacts to several sites in May 2021. It is the permit holder's responsibility to ensure this consent is current and comply with the *Aboriginal*

Heritage Act 1972 to ensure that no unauthorised Aboriginal Sites of Significance are damaged through the clearing process.

Table 6. Aboriginal Sites and Heritage Places mapped within the application area.

Name	Type
Dinner Camp	Historical, Mythological, Camp, Meeting Place, Natural Feature, Water Source
Abattoirs Camp	Camp
Lakes Rd South: Track D+E	Artefacts / Scatter
Great Eastern Highway Isolated Artefact	Artefacts / Scatter, Other: Isolated Artefact
Helena River A-C	Artefacts / Scatter, Historical, Arch Deposit, BP Dating: 29000BP to 2120BP, Camp, Water Source, Other: worked glass
Helena River	Ceremonial, Mythological, Repository / Cache
Lakes Rd: Powerline A, B & C	Artefacts / Scatter
Great Eastern Highway/Stirling Crescent Scatter	Artefacts / Scatter
Midland/Helena Valley Roads	Artefacts / Scatter

4 Suitability of offsets

4.1. Significant residual impacts

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that several significant residual impacts remain after the application of the avoidance, minimisation and mitigation measures (see Section 3.1), being the loss of:

- 20.83 ha of significant foraging habitat for Carnaby's cockatoo,
- 20.38 ha of significant foraging habitat for forest red-tailed black cockatoo and Baudin's cockatoo,
- 5.78 ha of native vegetation that is representative of the SCP20a TEC,
- 1.91 ha of native vegetation representative of the Banksia Woodlands Community,
- 2.53 ha of native vegetation representative of the SCP21c PEC,
- 3.15 ha of significant wetland vegetation that has values commensurate with a CCW,
- 1.43 ha that comprises significant habitat for threatened flora species *Conospermum undulatum* (including 5 individuals), and
- 11.07 ha of native vegetation within Bush Forever Site 481.

The applicant has proposed an environmental offset to address the above impacts, as detailed in Section 4.2 below. The Delegated Officer determined in this instance that it was appropriate to consider an environmental offset to counterbalance the significant residual impacts. This is with consideration for the extent of impacts, the necessity and public benefit associated with the clearing, and the applicant's demonstrated efforts to avoid, minimise and mitigate the environmental impacts of the proposed clearing, in accordance with the mitigation hierarchy under the *WA Environmental Offsets Guidelines* (2014).

4.2. Proposed offset sites

To address the significant residual impacts detailed in Section 4.1 above, MRWA has proposed an environmental offset strategy consisting of offset actions at five sites (MRWA, 2025b). The proposed offset actions at each site are summarised in detail below.

Cowalla Offset Site

In order to counterbalance a portion of the significant residual impacts of the proposed clearing, MRWA proposed an offset involving the acquisition of a total of 137.55 ha of native vegetation within Lot 87 on Deposited Plan 422467 and Lot 88 on Deposited Plan 422467, Cowalla, in the Shire of Gingin (the Cowalla Offset Site) to be ceded to DBCA for conservation in perpetuity (see Figure 9 below). The Cowalla Offsite Site is zoned General Rural under the Shire of Gingin LPS and there is potential for utilisation of the site for agricultural activities without protection through the proposed offset. MRWA will fund offset implementation and routine management actions at the Cowalla Offsite Site for a 20-year period, including fencing, weed and dieback control measures, bush fire management, and feral animal control to maintain current quality (MRWA, 2025b).

The proposed offset of 137.55 ha within the Cowalla Offset Site comprises four separate areas of 114.67 ha, 16.85 ha, 3.99 ha, and 2.04 ha (see Figure 9 below). A review of DBCA spatial databases and biological survey of the Cowalla Offset Site identified that the proposed offset areas are in predominantly Excellent (Keighery, 1994) condition, with some areas of Very Good (Keighery, 1994) condition, and contain the following environmental values:

- 131.04 ha of native vegetation that is representative of the Banksia Woodlands Community within the recorded BaBmEt (Banksia Woodlands – upper slopes) and BaBmMp (Banksia Woodlands – lower slopes) vegetation types,
- 131.04 ha of very high quality foraging habitat for Carnaby's cockatoo within the recorded Banksia Woodland habitat type,
- 18.89 ha of native vegetation that is representative of SCP21c within the recorded BaBmMp vegetation type,
- 11.7 ha of native vegetation growing in association with a CCW (mapped UFI 9446, UFI 9450, UFI 9237, UFI 9238, and UFI 9239) within the recorded MpBaBm (Melaleuca and Banksia Shrubland – floodplain) and BaBmMp vegetation types,
- habitat for Priority 4 flora species *Dodonaea hackettiana*, including 21 individuals, and
- 21 potential breeding trees of suitable DBH for nesting by Carnaby's cockatoo, including one hollow of suitable size for breeding with no evidence of use (FVC, 2025a; FVC, 2023).

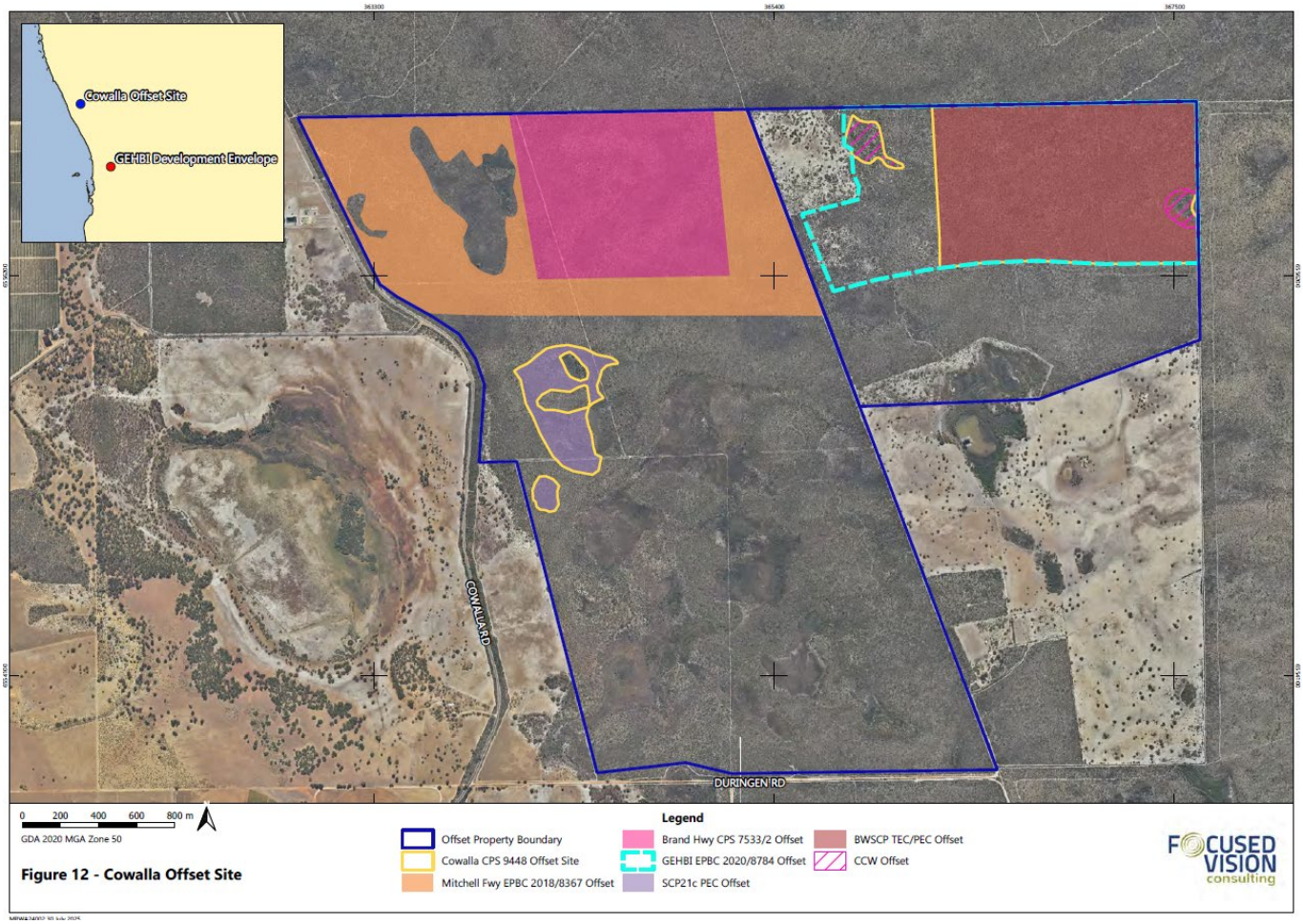


Figure 9. Cowalla Offset Site (outlined yellow) and associated environmental values (MRWA, 2025b).

In considering the site characteristics (FVC, 2025a; FVC, 2023), spatial databases, and that the proposed offset area is part of a larger remnant of native vegetation that provides a strategic outcome for conservation in the region, the Delegated Officer was satisfied that the Cowalla Offset Site is suitable for the purpose of offseting the Banksia Woodlands Community, SCP21c, Carnaby's cockatoo foraging habitat, and native vegetation growing in association with a wetland commensurate with a CCW. The adequacy of the offset extent in counterbalancing these significant residual impacts is described in Section 4.3 below.

Crossman Offset Site

In order to counterbalance a portion of the significant residual impacts of the proposed clearing, MRWA proposed an offset involving the acquisition of a total of 86.6 ha of native vegetation within Lot 331 on Deposited Plan 424430 (Crown Reserve 54323), Crossman, in the Shire of Boddington (the Crossman Offset Site) to be ceded to DBCA for conservation in perpetuity (see Figure 10 below). The Crossman Offsite Site is zoned Rural under the Shire of Boddington LPS is surrounded by intensive agriculture (cropping and stock grazing), with a risk of ongoing degradation or utilisation for agricultural activities without protection through the proposed offset. MRWA will fund offset implementation and routine management actions at the Crossman Offset Site for a 20-year period, including fencing of the site, weed and dieback control measures, bush fire management, and feral animal control to prevent future degradation (MRWA, 2025b).

A black cockatoo habitat assessment confirmed that the Crossman Offset Site provides significant foraging habitat for all three species of black cockatoo in the form of jarrah, marri, wandoo, blackbutt (*Eucalyptus patens*), and *Allocasuarina huegeliana* (AECOM, 2024). The proposed offset area of 86.6 ha includes a mix of closed *Allocasuarina huegeliana* forest with wandoo (55%), wandoo open woodland (37%), and jarrah and marri open woodland (8%) in Excellent (58%) to Good (42%) (Keighery, 1994) condition (AECOM, 2024). Foraging species for Carnaby's cockatoo were recorded at an average of 42% foliage cover across the Crossman Offset Site (AECOM, 2024). Average foliage cover was 28% for Baudin's cockatoo and 30% for forest red-tailed black cockatoo (AECOM, 2024). Foraging evidence also confirmed the presence of all three black cockatoo species at the site (AECOM, 2024).

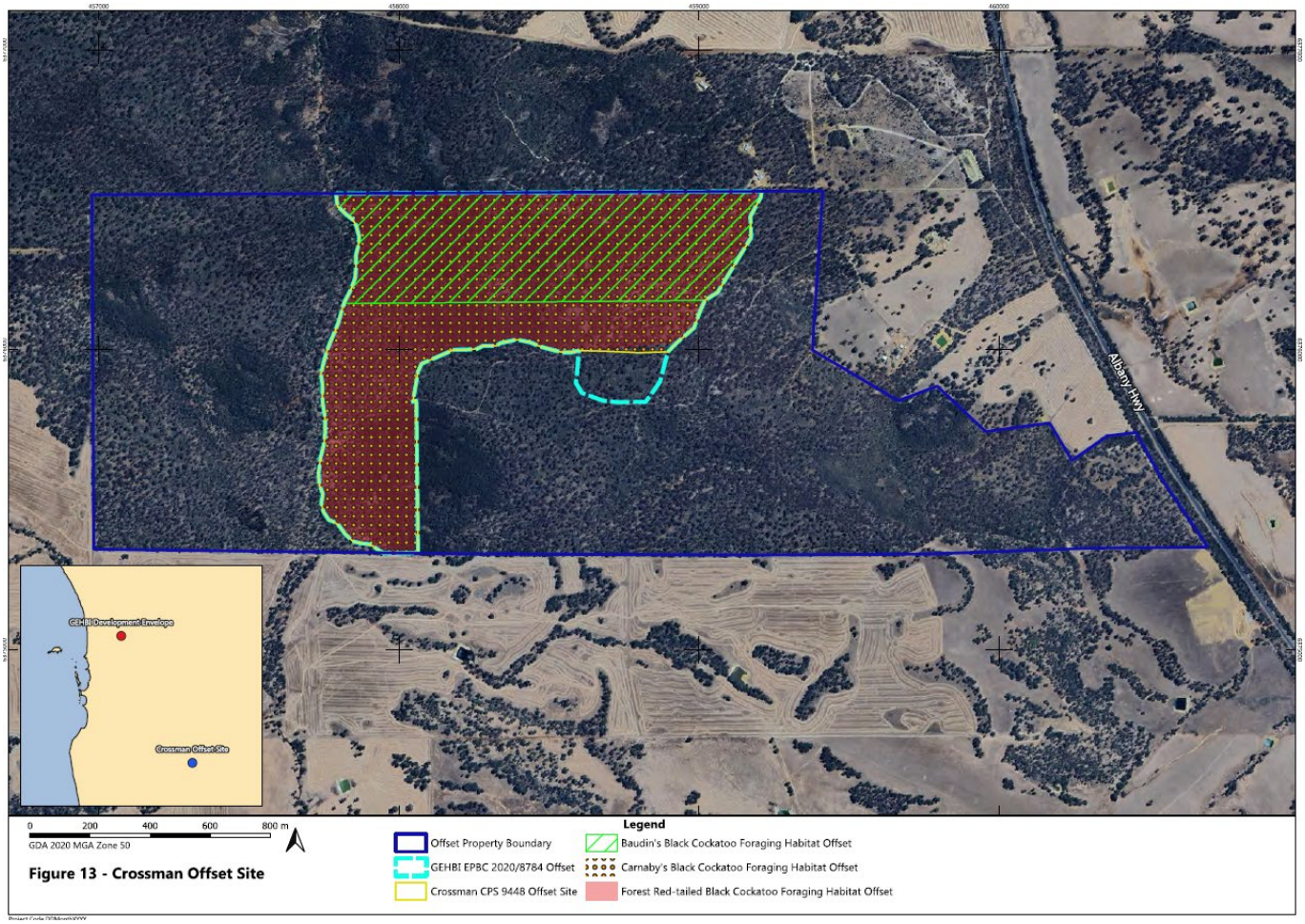


Figure 10. Crossman Offset Site (outlined yellow) and associated environmental values (MRWA, 2025b).

In considering the site characteristics (AECOM, 2024) and that the proposed offset area is part of a larger remnant of native vegetation that provides a strategic outcome for conservation in the region, the Delegated Officer was satisfied that the Crossman Offset Site is suitable for the purpose of offseting Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo foraging habitat. The adequacy of the offset extent in counterbalancing the significant residual impacts to these species is described in Section 4.3 below.

Hartfield Park Offset Site

In order to counterbalance a portion of the significant residual impacts of the proposed clearing, MRWA proposed an offset involving the rehabilitation and conservation in perpetuity of a total of 5.28 ha of native vegetation within Lot 3003 on Deposited Plan 70568 (Crown Reserve 17098), Forrestfield, in the City of Kalamunda (the Hartfield Park Offset Site) (see Figure 11 below). The Hartfield Park Offset Site is zoned Parks and Recreation under the MRS and Crown Reserve 17098 is currently vested for the purpose of Recreation. The Hartfield Park Offset Site forms part of Bush Forever Site 320, which is afforded a level of protection under SPP 2.8. No routine environmental management actions are currently being undertaken within Hartfield Park and the site is at risk of future degradation in the absence of the proposed offset from adjacent recreational land uses, lack of fencing resulting in unauthorised access, and adjacent tracks and firebreaks along the boundaries facilitating weed invasion (MRWA, 2025b). To ensure conservation of the Hartfield Park Offset Site in perpetuity, the vesting of the offset areas within Crown Reserve 17098 will be changed from Recreation to Conservation.

The proposed offset of 5.28 ha within the Hartfield Park Offset Site comprises two separate patches of vegetation (northern and southern) of 2.36 ha and 2.92 ha, respectively (see Figure 11 below). Biological surveys and a DWER site inspection of the Hartfield Park Offset Site identified that the proposed offset areas are in Very Good (Keighery, 1994) condition and contain the following environmental values:

- 5.28 ha of significant habitat for *Conospermum undulatum*, including 2.36 ha (the southern patch) of suitable habitat within the recorded VT3 vegetation type (Low marri woodland over *Acacia pulchella* shrubland) that contains 46 recorded individuals and 2.92 ha (the northern patch) that provides suitable habitat within the recorded VT1 (Low jarrah, *Banksia menziesii* and sheoak woodland) vegetation type and is contiguous with known records, and
- 2.92 ha of native vegetation representative of SCP20a within the recorded VT1 vegetation type (Umwelt, 2025a; Umwelt, 2025b; Woodman Environmental, 2021).

As part of the offset, MRWA proposes to develop and fund a management plan for the Hartfield Park Offset Site in collaboration with the City of Kalamunda, including commitments over a period of 20 years for:

- the installation and/or replacement of boundary fencing, adjacent to the golf course and hockey field to deter unauthorised access,
- pest and/or feral animal control,
- selective weed control to improve vegetation condition,
- bush fire management,
- dieback management to minimise the spread of dieback from infested areas south-east of the hockey field to uninfested areas south-west of the hockey field,
- rubbish removal, and
- infill planting of a minimum of 0.85 ha with species commensurate with SCP20a in a degraded area within the eastermost ‘arm’ of the northern patch to improve vegetation quality to a Very Good to Excellent (Keighery, 1994) condition (MRWA, 2025b).

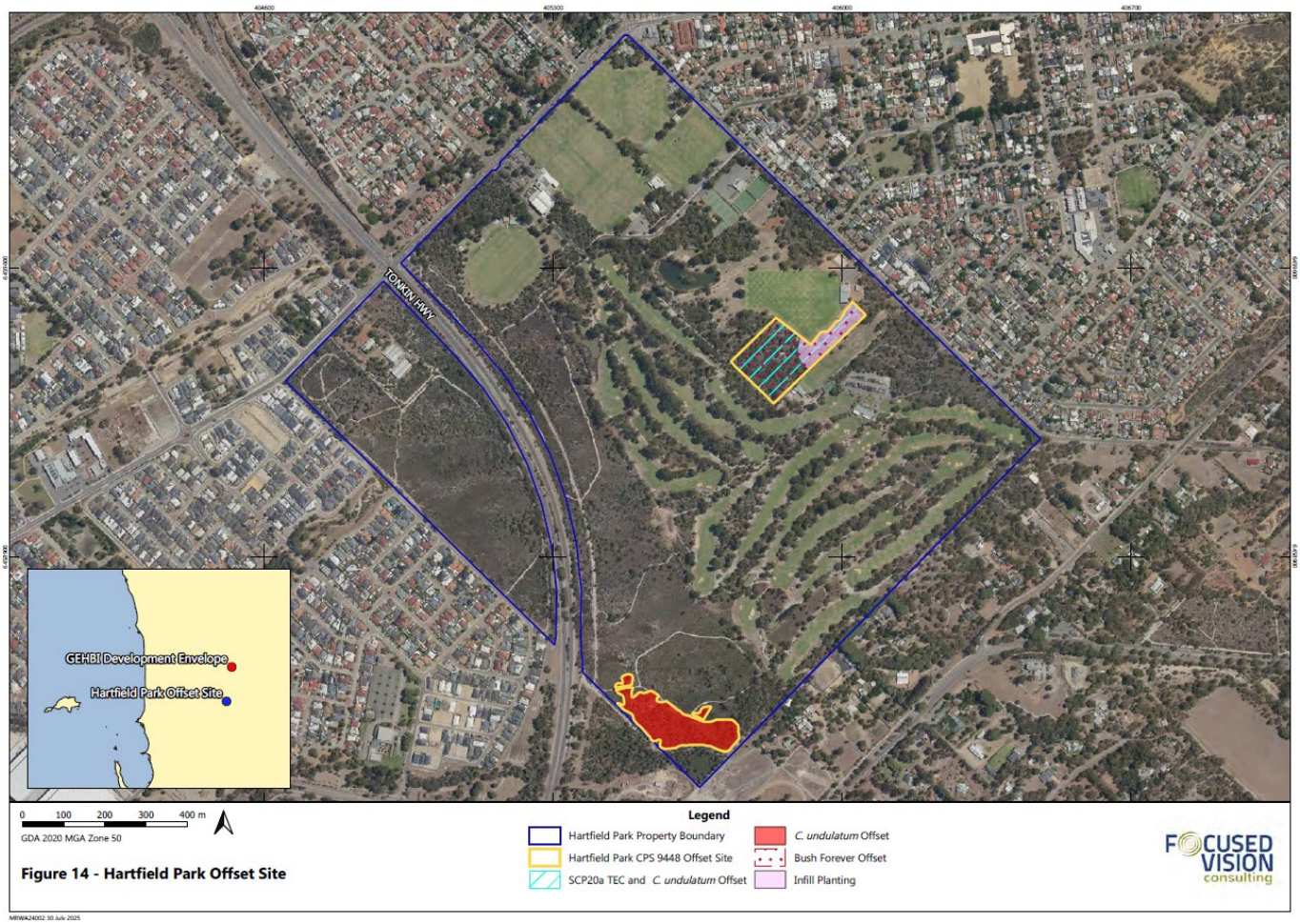


Figure 11. Hartfield Park Offset Site (outlined yellow) and associated environmental values (MRWA, 2025b).

In considering the site characteristics (Umwelt, 2025a; Umwelt, 2025b; Woodman Environmental, 2021) and DBCA advice that increasing security of tenure and management actions (i.e., prevention of weed invasion and dieback spread) should be considered as offset measures for SCP20a where additional site acquisition is not possible (DBCA, 2024), the Delegated Officer was satisfied that the Hartfield Park Offset Site is suitable for the purpose of offseting SCP20a and significant habitat for *Conospermum undulatum*. The adequacy of the offset extent in counterbalancing these significant residual impacts is described in Section 4.3 below.

Mirrabooka Bushland Offset Site

In order to counterbalance a portion of the significant residual impacts of the proposed clearing, MRWA proposed an offset involving the rehabilitation and conservation in perpetuity of a total of 42.8 ha of native vegetation within various properties within Bush Forever Site 385 in the locality of Mirrabooka, in the City of Stirling (the Mirrabooka Bushland Offset Site) (see Figure 12 below). The Mirrabooka Bushland Offset Site currently consists of road reserves and various freehold land parcels owned by WAPC and is zoned Regional Open Space under the MRS. The Mirrabooka Bushland Offset Site forms part of Bush Forever Site 385, which is afforded a level of protection under SPP 2.8. To ensure conservation of the Mirrabooka Bushland Offset Site in perpetuity, it is understood that WAPC intends to amalgamate the freehold properties and road reserves across the site into a single Crown Reserve, which will be managed by the State and vested in Conservation and Passive Recreation (MRWA, 2025b).

The proposed offset of 42.8 ha within the Mirrabooka Bushland Offset Site comprises two components; the Mirrabooka Boundary offset area (a 9.5 ha linear area of native vegetation along the boundary of the site that has been strategically selected for rehabilitation actions adjacent to existing firebreaks) and the Mirrabooka Internal offset area (a 33.3 ha internal patch of native vegetation) (see Figure 12 below). A DWER site inspection, DBCA spatial databases, information provided by MRWA (2025a), and a historical flora and vegetation survey (Madden, 2002) of the Mirrabooka Bushland Offset Site identified that the proposed offset area is in Very Good to Excellent (Keighery, 1994) condition and comprises 42.8 ha of native vgetation representative of SCP20a. It is also noted that the Mirrabooka Boundary offset area was observed to contain a higher weed load than the Mirrabooka Internal offset area (DPAW, 2013b).

As part of the offset, MRWA proposes to develop and fund a management plan for the Mirrabooka Bushland Offset Site in collaboration with the City of Stirling, including commitments over a period of 20 years for:

- maintaining and upgrading boundary fencing,
- the rationalisation of tracks, with closed tracks to be revegetated or allowed to regenerate naturally,
- weed control to improve vegetation condition, including hand weeding, spraying of herbicide and cutting of woody weeds,
- bush fire management,
- dieback management, and
- revegetation and rehabilitation to improve the overall quality of the Mirrabooka Boundary offset area to a Very Good to Excellent (Keighery, 1994) condition and the Mirrabooka Internal offset area to an Excellent (Keighery, 1994) condition (MRWA, 2025b).

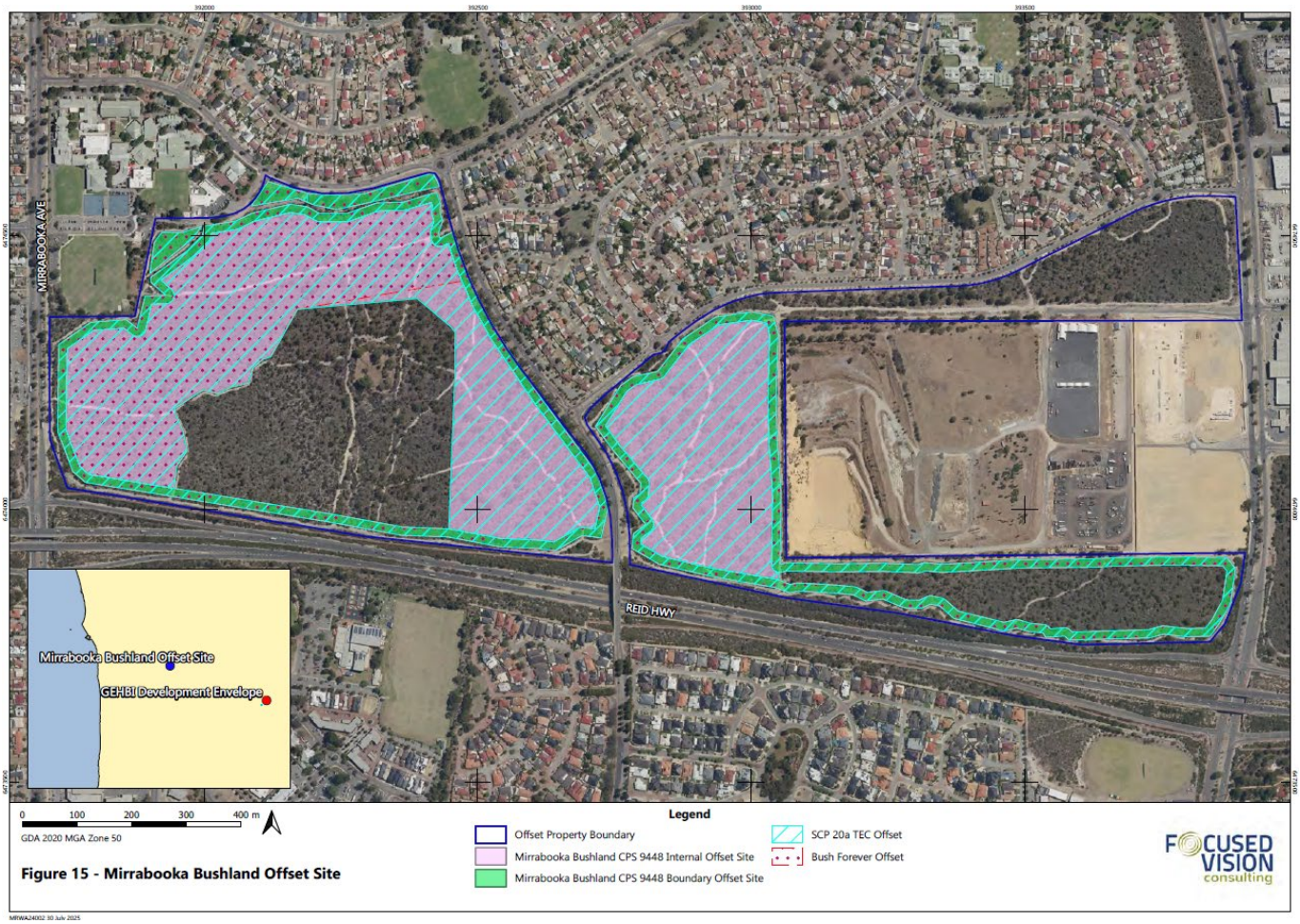


Figure 12. Mirrabooka Bushland Offset Site (outlined yellow) and associated environmental values (MRWA, 2025b).

In considering the site characteristics, that the proposed offset area is part of a larger remnant of native vegetation that provides a strategic outcome for conservation in the region, and DBCA advice that increasing security of tenure and management actions (i.e., prevention of weed invasion and dieback spread) should be considered as offset measures for SCP20a where additional site acquisition is not possible (DBCA, 2024), the Delegated Officer was satisfied that the Mirrabooka Bushland Offset Site is suitable for the purpose of offseting SCP20a and the loss of regionally significant vegetation within a Bush Forever area. The adequacy of the offset extent in counterbalancing these significant residual impacts is described in Section 4.3 below.

Neaves Road Offset Site

In order to counterbalance a portion of the significant residual impacts of the proposed clearing, MRWA proposed an offset involving the intensive rehabilitation of a total of 5.7 ha of native vegetation within various properties within Lot 156 on Deposited Plan 56488, Bullsbrook, in the City of Swan (the Neaves Road Offset Site) (see Figure 13 below). The Neaves Road Offset Site is a State-owned freehold land parcel managed by MRWA and is zoned Rural under the MRS.

The proposed offset of 5.7 ha within the Neaves Road Offset Site comprises two separate areas of 4.05 ha and 1.65 ha (see Figure 13 below). A review of DBCA spatial databases and a biological survey of the Neaves Road Offset Site identified that the proposed offset areas comprise:

- 4.05 ha of native vegetation growing in association with a CCW (3.49 ha within the mapped UFI 8773, UFI 8909 and UFI 1462, and 0.56 ha of surrounding supporting vegetation) within the recorded C1 (*Eucalyptus rudis* and *Melaleuca preissiana* forest), C2 (*Eucalyptus rudis* forest), P1 (marri woodland), and MPT (mixed planted tree species) vegetation types in Very Good to Completely Degraded (Keighery, 1994) condition, and
- 1.65 ha of mixed planted tree species in Degraded (Keighery, 1994) condition that provides foraging habitat for Carnaby's cockatoo and forest red-tailed black cockatoo in the form of marri and prickley bark (*Eucalyptus todtiana*). Average foliage cover of suitable foraging species across the site is low, at approximately 8% for Carnaby's cockatoo and 5% for forest red-tailed black cockatoo. However, foraging evidence from both species was recorded onsite (Astron, 2025).

As part of the offset, MRWA proposes to develop and fund a Revegetation Management Plan, including commitments over a period of 20 years for:

- installation of boundary fencing,
- selective weed control as required to improve vegetation condition,
- bush fire management,
- dieback management,
- rubbish removal,
- revegetation of a minimum of 1.65 ha with preferred foraging habitat for Carnaby's cockatoo and forest red-tailed black cockatoo to improve the overall quality to a Good (Keighery, 1994) condition, and
- revegetation of a minimum of 4.02 ha of native wetland vegetation to improve the overall quality of native vegetation growing in association with a CCW to a Good (Keighery, 1994) condition (MRWA, 2025b).

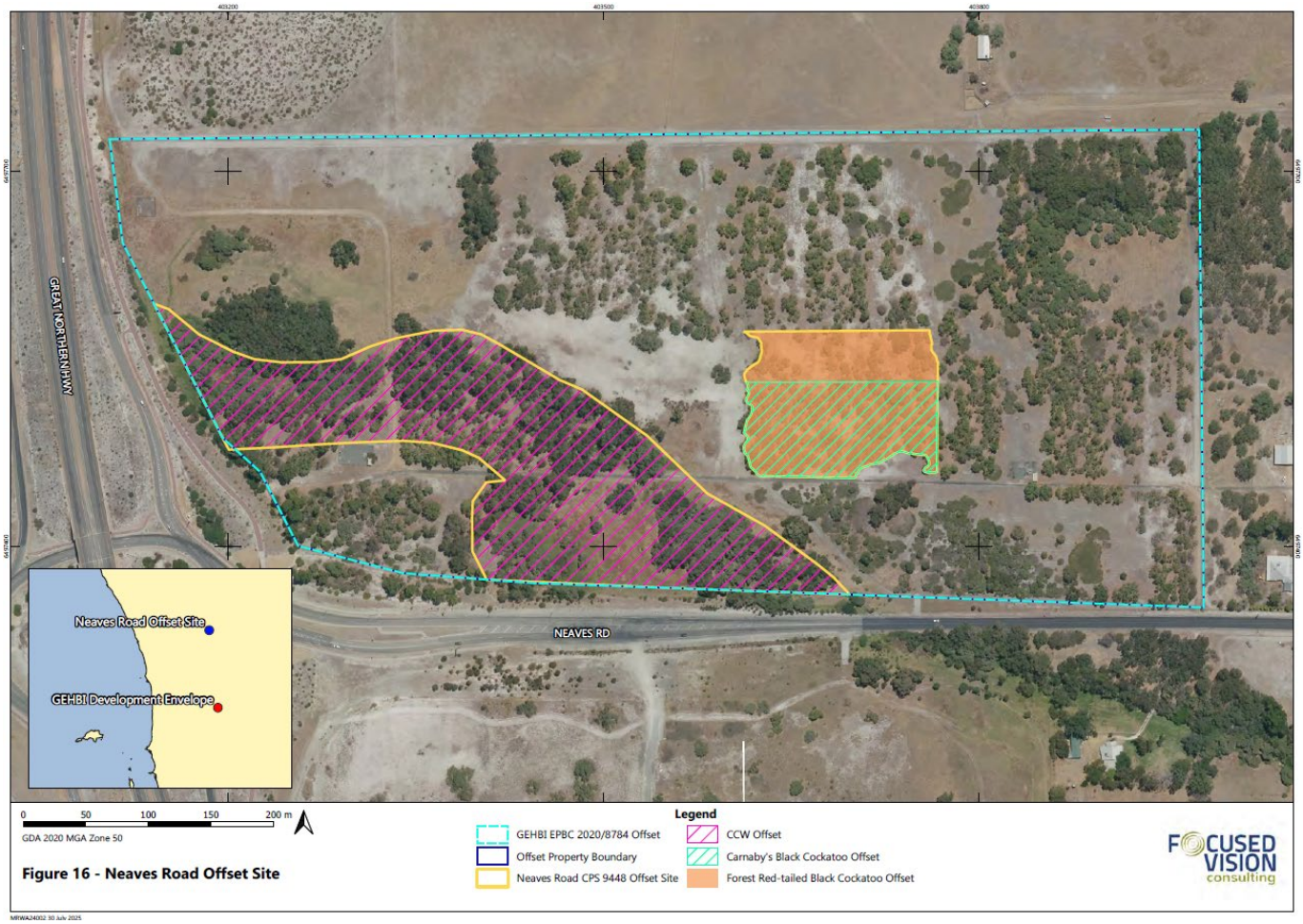


Figure 13. Neaves Road Offset Site (outlined yellow) and associated environmental values (MRWA, 2025b).

In considering the site characteristics and the need for local revegetation actions to enhance black cockatoo foraging habitat on the SCP and address direct impacts to local flocks utilising the application area, the Delegated Officer was satisfied that the Neaves Road Offset Site is suitable for the purpose of offseting Carnaby's cockatoo and forest red-tailed black cockatoo foraging habitat, as well as native vegetation growing in association with a wetland commensurate with a CCW. While no formal mechanism of protection is proposed as part of the offset, the Delegated Officer considered the Neaves Road Offset Site to have a low risk of future loss, given the site is intended to be managed and protected by MRWA as a revegetation area within MRWA's 'Internal Property Management Information System' and allocated to its Director Environment and Heritage, for a minimum of 20 years (MRWA, 2025b). The Delegated Officer also noted that, as a condition of the clearing permit represents a binding undertaking to establish and maintain vegetation, the revegation would likely meet the definition of native vegetation pursuant to the Clearing Regulations, and be afforded a level of protection through the requirements of the EP Act. Therefore, the Neaves Road Offset Site was considered to be an appropriate offset site in this instance. The adequacy of the offset extent in counterbalancing the significant residual impacts is described in Section 4.3 below.

4.3. Offset adequacy

In assessing whether the proposed offsets are adequately proportionate to the significance of the environmental values being impacted, DWER has considered the site information outlined in Section 4.2 above and undertaken calculations using the WA Environmental Offsets Metric Calculator. In relation to Bush Forever Site 481, the Delegated Officer has also considered Appendix 4 of SPP 2.8, which specifies that clearing of high-value vegetation within Bush Forever Sites should be offset with a net outcome of at least two times the calculated habitat loss in hectares, to ensure there will be an environmental gain. Based on these calculations, the extent (offset area) attributed for each significant residual impact at each of the proposed offset sites is presented in Table 7 below. The justifications for the values used in the offset calculations are available on DWER's website: http://ftp.dwer.wa.gov.au/permit/9448/.

In determining the adequacy of the proposed offsets, the Delegated Officer also considered:

- the approved conservation advice for the Banksia Woodlands Community, which notes that a perpetual change in land tenure for conservation with ongoing threat abatement and monitoring can provide a substantial net conservation benefit for the community (DotEE, 2016),
- the draft recovery plan for SCP20a which notes the objective to increase the number of occurrences of this community managed for conservation and/or with conservation included in the purpose, as well as to improve and/or maintain the condition of existing occurrences (DPAW, 2016),
- the recovery plans for Carnaby's cockatoo, Baudin's cockatoo, and forest red-tailed black cockatoo, which identify the protection and management of important habitat for these species as a key recovery action (DPAW, 2013a; DEC, 2008). For Carnaby's cockatoo, a key recovery action includes improving security of tenure and management of foraging habitat within the species non-breeding range, through purchase, transfer of vesting, or conservation covenant (DPAW, 2013a), and
- the recovery plan for *Conospermum undulatum*, which specifies that increasing the total number of mature plants and/or area of occupancy of the species under secure conservation tenure is a key recovery action, as well as to undertake management actions (i.e., fencing, weed control, etc.) at existing populations (DEC, 2009).

The environmental outcome of the proposed offsets is considered consistent with the above approved conservation advice and recovery plans.

In accordance with the WA Environmental Offsets Metric, WA *Environmental Offsets Policy* (2011), and *WA Environmental Offsets Guidelines* (2014), the Delegated Officer considers that the proposed conservation, rehabilitation and revegetation offsets, when combined, are adequate to counterbalance the significant residual impacts of the proposed clearing.

The Delegated Officer therefore determined that the following offset measures will be required as conditions on the clearing permit:

- Offset – Land transfer, requiring the permit holder to provide documentary evidence of the transfer of the Cowalla and Crossman Offset Sites to DBCA to be managed for conservation in perpetuity and ensure the construction of appropriate boundary fencing,
- Offset – Executed change in purpose, requiring the permit holder to provide documentary evidence of the executed vesting change of the Hartfield Park and Mirrabooka Bushland Offset Sites to include Conservation, and
- Offset – Revegetation and rehabilitation requirements, requiring the permit holder to prepare individual Revegetation Management Plans for each of the Hartfield Park, Mirrabooka Bushland, and Neaves Road Offset Sites, which must include weed control, direct seeding or planting, revegetation success completion criteria based on reference sites, remedial actions, and maintenance and monitoring actions.

Table 7. Offset summary table for CPS 9448/1.

Offset Site	**Offset Area (ha)**	**SCP20a**	**FCT21c**	**Banksia Woodland Community**	**Baudin's cockatoo foraging**	**Carnaby's cockatoo foraging**	**FRTBC foraging**	**CCW**	***C. undulatum***	**BF Site**
SRI		**5.78 ha**	**2.53 ha**	**14.94 ha**	**20.38 ha**	**20.83 ha**	**20.38 ha**	**3.15 ha**	**1.43 ha**	**11.07 ha**
Cowalla	137.55*		18.89 (100%)	113.4 (100%)		30.52 (16.5%)		11.7 (51.9%)		
Crossman	86.6				52.1 (100%)	86.6 (81.4%)	82.05 (97.2%)			
Hartfield Park	5.28	2.92 (9.5%)							5.28 (100.6%)	
Mirrabooka Internal	33.3	33.3 (72.2%)								22.14 (no calc)
Mirrabooka Boundary	9.5	9.5 (19.6%)								
Neaves Road	5.7**					1.65 (2.8%)	1.65 (2.8%)	4.05 (48.1%)		
Total (ha)	**276.6 ha**									
% SRI addressed		**101.3**	**99.5**	**100**	**100**	**100**	**100**	**100**	**100.6**	**100**

End

5 Appendices

Appendix A. Additional information provided by applicant

Since the application was accepted for assessment on 21 October 2021, additional information was provided by the applicant as summarised in Table 8 below.

Table 8. Summary of additional information provided by the applicant for CPS 9448/1.

Summary of comments	Consideration of comment
In response to formal requests for further information issued by DWER, the applicant provided additional information on several occasions, including: • Evidence of additional avoidance and mitigation measures to minimise significant environmental impacts resulting from the proposed clearing (MRWA, 2022), including copies of relevant management plans, • Additional hydrological information regarding surface and groundwater flows (GCA, 2022b), • A targeted CFM survey (Biologic, 2022), • Additional information regarding onsite ecological linkages and proposed management measures to maintain linkage values (MRWA, 2024a), • A desktop assessment and gap analysis to identify whether additional environmental values need to be considered, given the length of time elapsed since the original biological surveys were conducted (MRWA, 2024b), • An assessment of CFM impacts and management measures (Biologic, 2025), • A targeted flora survey (FVC, 2025b) and *Conospermum undulatum* population survey (GHD, 2025), and • Identification of satisfactory environmental offsets (MRWA, 2025b).	The additional information was considered as follows: • Implementation of the mitigation hierarchy and summaries of the relevant management plans are considered in *Avoidance, minimisation and mitigation measures* (see Section 3.1), • Hydrological information has been considered in the *Assessment of impacts on environmental values* (see Section 3.2.3 and 3.2.5), • The CFM survey and impacts are considered in the *Assessment of impacts on environmental values* (see Section 3.2.1), • Management of ecological linkage values has been considered in the *Assessment of impacts on environmental values* (see Section 3.2.1 and 3.2.7), • The results of MRWA's gap analysis were considered in the *Assessment of impacts on environmental values* (see Section 3.2.1 and 3.2.2), • The targeted flora surveys are considered in the *Assessment of impacts on environmental values* (see Section 3.2.2), and • The proposed environmental offsets are considered in *Suitability of offsets* (see Section 4).

Appendix B. Details of public submissions

DWER advertised the application for a total of 49 days across three advertising periods between 2021 and 2025. A total of six public submissions were received, all during the first advertising period between 21 October and 10 November 2021. Where submissions raised similar concerns, consideration of the comments provided was combined into one ground of submission to allow a more streamlined response. Table 9 below indicates overlap in grounds between submissions. A summary of the issues raised and DWER's consideration of the grounds are summarised in Table 10.

Table 9. Summary of the grounds of public submissions received for CPS 9448/1 (Submissions, 2021).

Ground of submission	Submitter					
	1	2	3	4	5	6
Lack of details about project design	✓	✓	✓			✓
Lack of alternative design options	✓	✓	✓	✓	✓	✓
Omission of the adjacent development for Lloyd St Bridge from the application		✓	✓			✓
Roe Highway-Helena River Bridge and associated wetland impacts		✓	✓		✓	✓
Significant environmental impacts		✓	✓	✓		✓
Potential indirect impacts to FCT20a				✓		
Use of outdated remnant vegetation data		✓	✓			✓
Lack of ASS assessment		✓	✓			✓
Cumulative impacts		✓	✓			✓
The proposed clearing is at variance with five of the 10 Clearing Principles		✓	✓			✓
Lack of details about offsets	✓			✓	✓	
Aboriginal Sites of Significance and lack of consultation with Traditional Owners		✓	✓	✓	✓	✓
Necessity of clearing				✓		

Table 10. Details of public submissions received for CPS 9448/1 (Submissions, 2021) and DWER's consideration of the matters raised.

Ground of submission and comments	Consideration of comments
Lack of details about project design Several submissions raised that the approach of applying to clear a larger development envelope and then refining the design post-approval is disingenous, provides no incentive to reduce impacts, and does not provide sufficient detail for assessment of impacts.	DWER's assessment of impacts has applied the precautionary principle and assumed the worst case scenario of clearing with respect to the development envelope. It is noted that the development envelope has been further refined during the assessment of the application, as outlined in '*Avoidance, minimisation and mitigation measures'* (see Section 3.1). Whilst it is acknowledged that the final road design is still being refined, the Delegated Officer considered it appropriate to grant a clearing permit for the development envelope, noting: • there is the need for a level of on-ground flexibility during construction to meet road safety and efficacy requirements, and • while a maximum extent of 23.31 ha is authorised to be cleared, the permit holder is required to continue to implement the mitigation hierarchy to the extent possible during authorised clearing activities, as a condition of the permit.
Lack of alternative design options All submissions suggested that alternative options to the design and alighnment of the interchange either had not been considered or were not clear from the supporting documentation. One submission suggested alternative options that would minimise clearing were possble, such as: • shifting the interchange further north to reduce clearing of the large vegetated remnant south of the existing GEHB, and • utilising elevated ramps or a directions T/full Y interchange.	DWER's assessment considered supporting information from MRWA indicating that design reviews were undertaken during the planning phase of the proposal and that the final design was determined to balance the needs of improving safety performance with avoiding significant environmental values. Consideration of alternative design options and implementation of the mitigation hierarchy are outlined in detail in '*Avoidance, minimisation and mitigation measures'* (see Section 3.1).
Omission of the adjacent development for Lloyd Street Bridge from the application Several submissions noted that clearing associated with the Lloyd Street Bridge adjacent to the application area was undertaken under Clearing Permit CPS 818/15. The submissions raised that, due to the proximity of the two bridges and given impacts to similar environmental values, the respective clearing should have been assessed together under CPS 9448/1.	DWER acknowledges that clearing associated with the new Lloyd Street Bridge was undertaken in accordance with the conditions of CPS 818/15, including the requirement to adhere to an Assessment Report (including a Vegetation Management Plan) and implement an offset proposal approved by DWER in June 2021. It is understood that the Lloyd Street Bridge, whilst part of the broader GEHBI project, is a separate component to the grade separated interchange that is the subject of this application (MRWA, 2025c). The Lloyd Street Bridge was co-funded by the City of Swan and therefore, also subject to a different delivery timeframe than the works proposed under CPS 9448/1. The Delegated Officer notes that the cumulative impacts of other proposals in the local area on similar environmental values , including the Lloyd Street Bridge works, have been considered in in the *Assessment of impacts on environmental values* (see Section 3.2.8).
Roe Highway-Helena River Bridge and associated	DWER's assessment of impacts to the Helena River

Ground of submission and comments	Consideration of comments
wetland impacts Several submissions raised concerns regarding the clearing of native vegetation within the Helena River floodplain for the proposed Roe Highway-Helena River Bridge. The submissions stated that remnant vegetation within the floodplain is already distressingly small and being cleared at a concerning rate. The submissions raised that the proposed clearing represents a large reduction at a local scale and will severely impact the function of the area as an ecological corridor. One submission also raised concern at the loss of mature flooded gum trees along the Helena River, noting it will take hundreds of years before other trees meet the same maturity and habitat value.	and associated floodplain wetland is summarised in the *Assessment of impacts on environmental values* (see Section 3.2.5). The Delegated Officer determined to enforce conditions on the clearing permit to minimise, manage, and counterbalance impacts to these environmental values.
Significant environmental impacts Submissions raised that the proposed clearing will impact significant environmental values including TECs, PECs, Bush Forever Sites, critical fauna habitat, and rare flora. In particular, the submissions raised concerns at the extent of impacts to black cockatoo foraging and potential breeding habitat, as well as direct impacts to quenda during clearing. The submissions suggested that the application area is critical to maintaining biodiversity in the local area and should not be cleared.	DWER's assessment of impacts to biodiversity values are detailed in the *Assessment of impacts on environmental values* (see Sections 3.2.1, 3.2.2, 3.2.3, and 3.2.7). The Delegated Officer determined to enforce conditions on the clearing permit to minimise, manage, and counterbalance impacts to these environmental values, including conditions for fauna management to reduce the risk of vehicle strike.
Potential indirect impacts to FCT20a One submission raised that dewatering could have a serious effect on adjacent occurrences of FCT20a.	DWER's assessment of the potential indirect impacts of clearing to FCT20a is outlined in the *Assessment of impacts on environmental values* (see Section 3.2.3). The Delegated Officer noted that modifications to FCT20a resulting from dewatering during construction activities will be managed under a groundwater license pursuant to the RIWI Act and/or an authorisation under section 45 of the BC Act.
Use of outdated remnant vegetation data Several submissions questioned the comparison of remnant native vegetation extent against 2018 figures, stating that more recent data should be used.	DWER's assessment of native vegetation extent with respect to clearing principle (e) is undertaken in line with *A guide to the assessment of applications to clear native vegetation* (DER, 2013) and uses the best information available to DWER at the time of the assessment. Updated vegetation statistics for remnant vegetation across Swan Coastal Plain vegetation complexes and Perth MRS areas were made available in 2025 (Government of Western Australia, 2025) and have been used to inform this assessment, given its location.
Lack of ASS assessment	The risk of land degradation, including subsurface acidification, resulting from the proposed clearing has

Ground of submission and comments	Consideration of comments
Several submissions stated that there has been no field assessment of the potential for ASS within the Helena River floodplain. The submissions stated that sulphides in floodplain vegetation are common where wet conditions promote the accumulation of reactive materials near surface. The submissions suggested that while mapping indicates the floodplain has a moderate risk of ASS, ground-truthing should be undertaken to confirm the level of risk and variance level to Clearing Principle (g).	been considered in the *Assessment of impacts on environmental values* (see Section 3.2.6). ASS risk as a result of construction activities will be managed in accordance with the Acid Sulfate Soil and Dewatering Management Plan (GCA, 2023c), as required under the conditions of the Helena River Bridge DA. It is understood that an ASS investigation was undertaken as part of the development of the management plan and management measures will be in place during the construction and installation of pile caps at piers 1 and 2 of the Helena River Bridge, due to potential ASS (GCA, 2023c).
Cumulative impacts Several submissions raised concerns with the cumulative impact of the proposed clearing on significant environmental values, in particular the Helena River floodplain and black cockatoo foraging habitat.	DWER's consideration of the cumulative impacts of the proposed clearing are available in the *Assessment of impacts on environmental values* (see Section 3.2.8).
The proposed clearing is at variance with five of the 10 Clearing Principles Submissions raised that the proposed clearing is at variance with five of the 10 Clearing Principles, which is unacceptable for approval.	DWER's assessment against the clearing principles is available in Appendix D and supported by the *Detailed assessment of application* (see Section 3).
Lack of details about offsets Several submissions raised that insufficient detail on the proposed environmental offsets to counterbalance the significant residual impacts of the proposed clearing had been provided in the application.	It is noted that a suitable offset proposal was supplied during the assessment of the clearing permit application. The Delegated Officer has determined that the offsets proposed are consistent with the WA *Environmental Offsets Policy* (2011) and *WA Environmental Offsets Guidelines* (2014) and adequately counterbalance the significant residual impacts of clearing (see Section 4).
Aboriginal Sites of Significance and lack of consultation with Traditional Owners Several submissions noted that the application area intersects several Aboriginal Heritage Sites of significance. The Submissions stated that the Traditional Owners, the Whadjuk Noongar People, are opposed to the works, particularly the proposed Roe Highway-Helena River Bridge.	DWER's consideration of impacts to Aboriginal Sites of Significance and related consultation is summarised in *Relevant planning instruments and other matters* (see Section 3.3).
Necessity of clearing One submission questioned the necessity of clearing and whether the objectives of the proposal outweigh the environmental impacts.	DWER's assessment considered the necessity of clearing as a relevant matter, noting the significance of the environmental values being impacted. This consideration is summarised in *Description of the application and necessity of clearing* (see Section 1.2) and *Relevant planning instruments and other matters* (see Section 3.3).

Appendix C. Site characteristics

C.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 D.

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td>Local context</td><td>The application area is part of a series of fragmented patches of native vegetation within the intensive land use zone of Western Australia. It follows the existing Roe Highway and GEHB alignments between Clayton Street in the north and Kalamunda Road in the south and is bordered by the industrial area of Hazelmere to the west and patches of remnant native vegetation to the east.

The application area occurs approximately 14 km east of Perth Central Business District within the SCP IBRA bioregion, and Perth subregion. The application area is also mapped in the Perth Metropolitan Area where the EPA has a modified objective to retain at least 10% of the pre-clearing extent of vegetation complexes for defined constrained areas (EPA, 2008).

Spatial data indicates that the local area (a 10-kilometre radius measured from the boundary of the application area) retains approximately 29.9% (12,464.41 ha) of the original native vegetation cover (see Appendix C.2).</td></tr>
<tr><td>Ecological linkage</td><td>The application area intersects two mapped Perth Regional Ecological Linkages (PREL) identified by Western Australian Local Government Association’s Biodiversity Projects (Del Marco et al., 2004). One mapped PREL linkage (ID 134) runs east-west and is associated with Helena River, connecting remnants along the river. The other PREL linkage (ID 33) runs northwest to southeast and connects remnants of native vegetation within Bush Forever Sites 213, 216 and 481.</td></tr>
<tr><td>Conservation areas</td><td>The application area includes 11.07 ha of Bush Forever Site 481, known as Stirling Crescent Bushland, Hazelmere.

The next closest conservation areas are:
a 213-hectare area protected under a DBCA covenant which overlaps within Bush Forever Site 213. The site abuts the eastern boundary of the application area,
a 24-hectare property secured under the CALM Act adjacent to the north-eastern portion of the application area, and
a 55-hectare, Class A Nature Reserve adjacent to the south-western boundary of the application area vested for the purpose of conservation of flora and fauna. The boundary of this reserve overlaps Bush Forever Site 122.</td></tr>
<tr><td>Vegetation description</td><td>The Biota Biological Survey (Biota, 2021) indicates that the native vegetation within the application area consists of nine vegetation types:
<table>
<tr><th>Veg type</th><th>Description</th><th>Area (ha)</th><th>Area (%)</th></tr>
<tr><td>L3</td><td>Corymbia calophylla open woodland over Melaleuca rhaphiophylla low open forest over *Bromus diandrus, *Briza maxima,*Briza minor, *Ehrharta calycina, *Avena fatua very open tussock grassland over Schoenus clandestinus, Juncus articulates</td><td>0.15</td><td>0.7</td></tr>
<tr><td>L5</td><td>Jacksonia floribunda scattered tall shrubs over Xanthorrhoea preissii, Melaleuca seriata open shrubland over *Ehrharta calycina,*Pentameris pallida scattered grasses over Lyginia barbata, (Lyginia imberbis) open sedgeland over Alexgeorgea nitens,</td><td>0.08</td><td>0.3</td></tr>
<tr><td>P1</td><td>Allocasuarina fraseriana open woodland over Eucalyptus todtiana, Banksia menziesii (Banksia attenuata) low woodland over Jacksonia floribunda scattered tall shrubs over Xanthorrhoea preissii open shrubland over Hibbertia hypericoides subsp. hypericoides,</td><td>15.25</td><td>65.5</td></tr>
<tr><td>P2</td><td>Corymbia calophylla low open woodland over Kingia australis tall open shrubland over Xanthorrhoea preissii open shrubland over</td><td>0.35</td><td>1.5</td></tr>
</table></td></tr>
</table>

Characteristic	Details			
		Verticordia densiflora, Banksia dallanneyi var. *dallanneyi*, *Stirlingia latifolia* low shrubland over *Caustis dioica*, *Mesomelaena*		
	P3	*Eucalyptus rudis* subsp. *rudis* open forest over **Bromus diandrus*, **Avena fatua*, **Ehrharta longiflora* grassland over **Fumaria capreolata* herbland.	2.35	10.1
	P4	*Jacksonia floribunda* scattered tall shrubs over *Eremaea pauciflora* open heath over *Astroloma xerophyllum* low open shrubs over *Lyginia imberbis* very open sedgeland.	0.37	1.5
	P5	*Eucalyptus marginata* subsp. *marginata* open forest over *Adenanthos cygnorum, Xanthorrhoea preissii* tall open shrubland over *Hibbertia hypericoides*, *Gompholobium tomentosum* scattered low shrubs over **Eragrostis curvula* **Briza maxima* very open grassland	1.99	8.5
	P6	*Eucalyptus rudis* subsp. *rudis* open forest over *Melaleuca rhaphiophylla* low open woodland over **Ehrharta longiflora*, **Bromus diandrus* open grassland over **Fumaria capreolata*, *Cycnogeton huegelii* open herbland.	0.12	0.5
	P7	*Eucalyptus marginata* subsp. *marginata*, *Banksia attenuata*, *Allocasuarina fraseriana* and *Banksia menziesii* low open woodland over *Xanthorrhoea preissii*, *Allocasuarina humilis* open shrubland over *Dasypogon bromeliifolius*, *Hibbertia hypericoides*,	2.65	11.4
	Total		23.3	100
	The recorded vegetation types are consistent with the broad scale mapped Swan Coastal Plain vegetation types (Heddle et al., 1980): • **Forrestfield Complex** – described as open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah) to open forest of *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species. Fringing woodland of *Eucalyptus rudis* (Flooded Gum) in the gullies that dissect this landform (12.15 ha of the application area), and • **Southern River Complex** - 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 (11.16 ha of the application area).		
Vegetation condition	The Biota Biological Survey (Biota, 2021) indicates that the vegetation within the application area ranges from Excellent-Very Good to Degraded (Keighery, 1994) condition: • Excellent to Very Good – 5.76 ha (25% of the application area), • Very Good – 4.80 ha (20% of the application area), • Very Good to Good – 2.49 ha (11% of the application area), • Good – 5.45 ha (23% of the application area), and • Degraded – 4.81 ha (21% of the application area). The full Keighery (1994) condition rating scale is provided in Appendix E.			
Climate and landform	The application area is located at the base of the Darling Scarp and has a general northwestern gradient. The application area lies on a relatively flat landform with the elevation of the site ranging from 35 m Australian height datum (mAHD) in the southern portion to 5 mAHD in the northern portion around Helena River. Aside from the valley of the Helena River the topographical change is very gradual. The area experiences a warm Mediterranean climate, characterised by hot, dry summers and cool to mild wet winters. The region has a mean annual maximum temperature of 24.6°C and a mean annual minimum temperature of 12.2°C (BoM, 2025). The mean annual rainfall recorded at the nearest Bureau of Meteorology weather station (Perth Airport) is 752.7 mm (BoM, 2025).			

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td>Soil description and land degradation risk</td><td>
The following soil types have been mapped within the application area (DPIRD, 2025):
<table>
<tr><th>Soil subsystem</th><th>Soil subsystem description (Schoknecht et al., 2004)</th><th>Area (ha)</th><th>Area (%)</th></tr>
<tr><td>EnvGeol S8 Phase</td><td>Sand - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin.</td><td>7.78</td><td>33.4</td></tr>
<tr><td>EnvGeol S10 Phase</td><td>Sand - as S8 as relatively thin veneer over sandy clay to clayey sand. Of eolian origin.</td><td>9.87</td><td>42.3</td></tr>
<tr><td>Pinjarra, Phase Gf7</td><td>Minor rises with deep rapidly drained brownish, siliceous or bleached sands underlain by mottled yellow clay. Low woodland of B. prionotes and some tall E. calophylla with E. rudis along streamlines.</td><td>2.71</td><td>11.6</td></tr>
<tr><td>Sw3 - Swan, brown alluvial sands and sandy loams</td><td>Low level, occasionally flooded, alluvial terraces with imperfectly drained variable alluvial soils with sand to sandy loam surfaces.</td><td>1.4</td><td>5.7</td></tr>
<tr><td>Pinjarra, Phase Gf9</td><td>Minor sandy rises (aeolian deposits) with moderately deep well drained sands overlying gravelly mottled clay.</td><td>1.07</td><td>4.6</td></tr>
<tr><td>Pinjarra System</td><td>Swan Coastal Plain from Perth to Capel. Poorly drained coastal plain with variable alluvial and aeolian soils. Variable vegetation includes Jarrah, marri, wandoo, paperbark sheoaks and rudis.</td><td>0.43</td><td>1.9</td></tr>
<tr><td>EnvGeol Mgs1 Phase</td><td>Pebbly silt - strong brown silt with common, fine to occasionally coarse-grained, sub-rounded laterite quartz, heavily weathered granite pebble, some fine to medium-grained quartz sand, of alluvial or</td><td>0.07</td><td>0.3</td></tr>
<tr><td>Sw1 - Swan, poorly drained mixed alluvials</td><td>River margins and low flats with poorly drained variable alluvial soils, subject to frequent flooding.</td><td>0.04</td><td>0.2</td></tr>
<tr><td>Forrestfield (D Range) F2 Phase</td><td>Foot and low slopes < 10%.Well drained gravelly yellow or brown duplex soils with sandy topsoil. Woodland of Eucalyptus .marginata, E. calophylla and some Banksia.grandis.</td><td>0.004</td><td>0.02</td></tr>
<tr><td></td><td>Total</td><td>23.31</td><td>100</td></tr>
</table>
The soil types within the application area are mapped as having a low risk of land degradation resulting from salinity, but are susceptible to wind erosion, subsurface acidification, and phosphorus export (DPIRD, 2025). The soil types Sw3 – Swan and Pinjarra System surrounding the Helena River also have a moderate to high risk of water erosion, waterlogging, and flooding (DPIRD, 2025).
</td></tr>
<tr><td>Waterbodies, wetlands and hydrogeography</td><td>
The application area intersects two mapped wetlands within DBCA’s Geomorphic Wetlands of the Swan Coastal Plain dataset:

a floodplain of the Helena River (UFI 15540), mapped as CCW, covers 2.46 ha of the northern portion of the application area, and
a palusplain, (UFI 15266), mapped as Multiple Use (MUW), covers around 2 ha of the western portion of the application area.

While the Palusplain in the western portion of the application area is mapped as an MUW in the abovementioned dataset, advice from DBCA indicates a portion of the MUW overlapping the application area (0.68 ha) is more commensurate with a CCW (see Section 3.2.5).

The northern portion of the application area also intersects the Helena River itself.

The application area falls within the Swan River System Surface Water Area and Perth Groundwater Area proclaimed under the RIWI Act.
</td></tr>
</table>

Characteristic	Details
	Groundwater salinity within the application area is mapped at 500-1000 milligrams per litre total dissolved solids.
Conservation listed flora	The desktop assessment identified that there are 83 conservation significant flora taxa known from the local area, including 19 threatened species (listed under the BC Act) and 64 priority species (as listed by DBCA). Two records of *Conospermum undulatum* (T) occur within the application area. The biological survey (Biota, 2021) identified the following conservation listed flora species in the application area: • *Conospermum undulatum* (Vulnerable), • *Hypolaena robusta* (Priority 4), • *Isopogon autumnalis* (Priority 3), and • *Johnsonia pubescens* subsp. *cygnorum* (Priority 2). A follow up targeted flora survey for *Levenhookia preissii* (Priority 1), *Bolboschoenus fluviatilis* (Priority 1), *Schoenus benthamii* (Priority 3) and *Conospermum undulatum* in suitable habitat of the application area was undertaken between October and December 2024 (FVC, 2025b). This survey was undertaken to provide more current information on the extent of *Conospermum undulatum* within the application area, given the time since the previous survey and that the priority flora species mentioned above were not targeted during the Biota (2021) survey. The FVC (2025b) survey identified five individuals of *Conospermum undulatum* in the application area in a similar location to that identified in the Biota survey. None of the targeted priority flora were identified during the survey (FVC, 2025b). Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area and the findings of the flora surveys, impacts to the four flora species detailed in Appendix C.3 required further consideration. Given the methods and timing of the two flora surveys are consistent with the relevant EPA Technical Guidance (EPA, 2016), DWER deemed these adequate to identify conservation significant flora known from the local area and risks to other species from the proposed clearing are considered unlikely.
Ecological communities	The desktop assessment identified that the application area is mapped within several occurrences of three conservation significant ecological communities. The biological survey (Biota, 2021) confirmed that these threatened and priority ecological communities occur within the application area: • *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994)) (SCP20a) (listed as Critically Endangered under the BC Act). This community is a component of the federally listed Banksia Woodlands Community described below. • Low lying *Banksia attenuata* woodlands or shrublands floristic community type 21c as originally described in Gibson et al. 1994) (SCP21c) (listed as Priority 3 by DBCA). This community is a component of the federally listed Banksia Woodlands Community described below. • Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Banksia Woodlands Community) (listed as Endangered under the EPBC Act and Priority 3 by DBCA). The Shrublands and woodlands of the eastern Swan Coastal Plain (floristic community type 20c as originally described in Gibson et al. 1994) (SCP20c) was also identified within 10 m of a western portion of the application area. However, the application area does not encroach on this TEC. Based on available databases and the findings of the Biota (2021) survey, impacts to these four ecological communities required further consideration (see Appendix C.4). Given the methods of the floristic community analysis are consistent with the relevant EPA Technical Guidance (EPA, 2016), DWER deemed the Biota (2021) survey adequate to identify and map

Characteristic	Details
	conservation significant ecological communities known from the local area and impacts to any other communities from the proposed clearing are considered unlikely.
Conservation listed fauna	The desktop assessment identified that a total of 57 conservation significant fauna species have been recorded in the local area. *Zanda latirostris* (Carnaby's cockatoo), *Dasyurus geoffroii* (chuditch) and quenda (*Isoodon fusciventer*) have previously been recorded within or adjacent to the application area, all from single records. The biological survey (Biota, 2021) identified evidence of three conservation significant fauna species in the application area: • Carnaby's cockatoo (*Zanda latirostris*) (listed as Endangered under the BC Act and EPBC Act), • forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) (listed as Vulnerable under the BC Act and EPBC Act), and • quenda (*Isoodon fusciventer*) (listed as Priority 4 by DBCA). Those fauna species most likely to occur within the application area based on habitat preferences, the site characteristics set out above, and fauna assessments of the application area are listed below under Appendix C.5 and assessed under Section 3.2.1. Given the methods and timing of the fauna survey is consistent with the relevant EPA Technical Guidance (EPA, 2020), DWER deemed these adequate to identify habitat for conservation significant fauna known from the local area and impacts to other species from the proposed clearing are considered unlikely.

C.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	1,501,222	578,913	38.6	222,917	14.9
Vegetation Complex**					
Forrestfield complex	22,812.92	2,803.36	12.03	381.57	1.67
Southern River complex	58,781.48	10,302.86	17.53	940.36	1.60
Local area					
10km radius	41,722.35	12,464.41	29.87	-	-

*Government of Western Australia (2019)
**Government of Western Australia (2025)

C.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the habitat preferences and conservation statuses of flora species known from the local area, the distribution and extent of existing records, and flora and vegetation assessments of the application area (FVC, 2025b; Biota, 2021), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status (WA)	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
Conospermum undulatum	T (VU)	Y	Y	Y	0.0	73	Y
Hypolaena robusta	P4	Y	Y	Y	18.2	0	Y
Isopogon autumnalis	P3	Y	Y	Y	0.0	33	Y
Johnsonia pubescens subsp. *cygnorum*	P2	Y	Y	Y	3.3	1	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

C.4. Ecological community analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the distribution and extent of existing records, and flora and vegetation assessments of the application area (Biota, 2021) impacts to the following conservation significant ecological communities required further consideration.

Community name	Conservation status (WA)	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
Banksia attenuata woodlands over species rich dense shrublands (SCP20a)	T (CR)	Y	Y	Y	0.0	56	Y
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	P3	Y	Y	Y	0.0	>500	Y
Low lying *Banksia attenuata* woodlands or shrublands (SCP21c)	P3	Y	Y	Y	0.0	15	Y
Shrublands and woodlands of the eastern Swan Coastal Plain (SCP20c)	T (CR)	Y	Y	Y	0.01	9	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

C.5 Fauna analysis

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the habitat preferences of the aforementioned species, the distribution and extent of existing records, and fauna assessments of the application area (Biologic, 2022; Biota, 2021), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status (WA)	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus banksii naso (Forest red-tailed black cockatoo)	T (VU)	Y	Y	0.48	274	Y
Dasyurus geoffroii (Chuditch)	T (VU)	Y	Y	0.0	77	Y
Falco peregrinus (Peregrine falcon)	OS	Y	Y	3.37	53	Y
Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)	P3	Y	Y	2.72	10	N
Isoodon fusciventer (Quenda)	P4	Y	Y	0.02	1011	Y
Lerista lineata (Perth slider)	P3	Y	Y	10.5	2	N
Neelaps calonotos (Black-striped burrowing snake)	P3	Y	Y	5.9	27	N
Synemon gratiosa (Graceful sunmoth)	P4	Y	Y	4.2	3	N
Westralunio carteri (Carter's freshwater mussel)	T (VU)	Y	Y	3.3	14	Y
Zanda baudinii (Baudin's cockatoo)	T (EN)	Y	Y	0.47	124	Y

Species name	Conservation status (WA)	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
Zanda latirostris (Carnaby's cockatoo)	T (EN)	Y	Y	0.02	2134	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix D. 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: The application area includes: • Native vegetation representative of SCP20a, SCP21c, and the Banksia Woodlands Community, • significant habitat for *Conospermum undulatum* including five individuals of this species, • habitat for priority flora species, • significant foraging habitat for black cockatoos, and • wetland vegetation commensurate with a CCW. The application area therefore comprises a high level of biodiversity and based on the significance of this biodiversity and extent of impact, the proposed clearing is 'seriously at variance' with this principle.	Seriously at variance	Yes *Refer to Sections 3.2.1, 3.2.2, 3.2.3 and 3.2.5 above.*
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 includes critical foraging habitat for Carnaby's cockatoo and significant habitat for forest red-tailed black cockatoo and Baudin's cockatoo. Based on the extent and significance of the Carnaby's cockatoo critical habitat proposed for clearing, the proposed clearing is 'seriously at variance' with this principle.	Seriously 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: The application area includes significant habitat for *Conospermum undulatum*, including five individuals of this species. The proposed clearing is therefore 'at variance' with this principle.	At variance	Yes *Refer to Section 3.2.2, above.*
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 includes vegetation representative of SCP20a and the Banksia Woodlands Community. Based on the significance of the SCP20a patch proposed for clearing, and extent of impact, the proposed clearing is 'seriously at variance' with this principle.	Seriously at variance	Yes *Refer to Section 3.2.3, above.*
Environmental value: significant remnant vegetation and conservation areas		

Assessment against the clearing principles	Variance level	Is further consideration required?
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. However, the extent is consistent with the 10 per cent threshold for constrained areas. The vegetation proposed to be cleared contributes to vegetation connectivity in the local area. The proposed clearing is therefore 'at variance' with this principle.	At variance	Yes *Refer to Section 3.2.4, 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: The proposed clearing impacts on 11.07 ha of native vegetation within Bush Forever Site 481 and may impact on the environmental values on this area through the direct loss of vegetation and indirect impacts to adjacent remaining vegetation. The proposed clearing is therefore 'at variance' with this principle.	At variance	Yes *Refer to Section 3.2.7, above.*
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 intersects a mapped floodplain (associated with the Helena River), the Helena River itself, and a palusplain wetland, including wetland vegetation commensurate with a CCW. Riparian vegetation commensurate with wetland habitats was identified in the application area. The proposed clearing is therefore 'at variance' with this principle.	At variance	Yes *Refer to Section 3.2.5, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Portions of the mapped soils are moderately to highly susceptible to wind erosion, water erosion and subsurface acidification. Without appropriate management, the proposed clearing has the potential to cause land degradation where there is significant disturbance of topsoil, run-off of surface water across cleared areas, and if bare ground is left exposed to weathering for an extended period between clearing and development. The proposed clearing 'may be at variance' with this principle.	May be at variance	Yes *Refer to Section 3.2.6, above.*
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: Given that the application area intersects the Helena River and its floodplain and a Palusplain wetland, without appropriate management the proposed clearing may impact on surface water quality through sedimentation. The proposed clearing 'may be at variance' with this principle.	May be at variance	Yes *Refer to Section 3.2.5, above.*
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: While much of the application area is mapped as having a low or moderate risk of flooding, 1.37 ha of the application area in the vicinity of the Helena River has a moderate to high risk of flooding. Noting the topographic contours of the site and that the applicant will implement surface water management as part of the GEHBI construction, in accordance with	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
MRWA current practice, it is unlikely that the proposed clearing will cause, or exacerbate, the incidence or intensity of flooding.		

Appendix E. 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 F. Sources of information

F.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)
- Bush Forever Areas 2000 (DPLH-019)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- CAWSA Part 2A Clearing Control Catchments (DWER-004)
- Consanguineous Wetlands Suites (DBCA-020)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- DBCA Statewide Vegetation Statistics
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)

- Flood Risk (DPIRD-007)
- Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments - Catchments (DWER-028)
- Hydrographic Catchments - Divisions (DWER-029)
- Hydrography, Linear (Hierarchy) (DWER-031)
- 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 (DPIRD-006)
- 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 (DPIRD-027)
- Soil Landscape Mapping – Systems (DPIRD-064)
- Vegetation Complexes - Swan Coastal Plain (DBCA-046)

Restricted GIS Databases used:

- Conservation Covenants Western Australia (DPIRD-023)
- Contaminated Sites Database - Restricted (DWER-073)
- 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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