



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

ADVICE NOTE

Allocation of offset sites

In relation to conditions 10, 11, 12 and 13 of the permit, the following actions will be attributed to the offset for this project:

- Revegetation and rehabilitation and conservation in perpetuity, as described within the 'CPS 9981/1 Flynn Drive Stage 2 and 3 - 2025 Revegetation and Rehabilitation Plan' (City of Wanneroo, 2025), of:
 - 4.70 hectares of native vegetation within Montrose Park (Crown Reserve 33343), Girrawheen that comprises the "Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)" threatened ecological community (TEC), the "Banksia Woodlands of the Swan Coastal Plain" (Banksia Woodlands) TEC and foraging habitat for Carnaby's cockatoo (*Zanda latirostris*); and
 - 1.78 hectares of native vegetation within Edgar Griffith Park (R 36601), Wanneroo that comprises foraging habitat for Carnaby's cockatoo (*Zanda latirostris*).
- 38.46 hectares of the permit holder's banked offset site at Lot 901 on Deposited Plan 409610, Bindoon, is to be used to offset the impacts of the authorised clearing to Carnaby's cockatoo (*Zanda latirostris*) habitat. The nominated area contains suitable foraging habitat in excellent condition for the Carnaby's cockatoo, among other environmental values.

Purpose Permit number:	CPS 9981/1
Permit Holder:	City of Wanneroo
Duration of Permit:	From 19 June 2025 to 19 June 2037

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 installation of associated infrastructure.

2. Land on which clearing is to be done

Flynn Drive Road Reserve (PIN 11751051), Banksia Grove, Carramar and Neerabup
 Greenwich Parade Road Reserve (PIN 11806345), Neerabup
 Lot 5 on Diagram 91435, Neerabup
 Lot 900 on Deposited Plan 50843, Neerabup
 Lot 901 on Deposited Plan 50843, Neerabup
 Lot 902 on Deposited Plan 50843, Neerabup
 Lot 6001 on Deposited Plan 402319, Banksia Grove

Lot 8002 on Deposited Plan 411322 (Crown Reserve 53763), Neerabup
 Lot 8054 on Deposited Plan 402319 (Crown Reserve 53764), Banksia Grove
 Lot 9943 on Diagram 53573 (Crown Reserve 35951), Neerabup
 Mather Drive Road Reserve (PIN 11751046), Neerabup
 Road (PIN 1177686), Banksia Grove and Pinjar
 Road (PIN 11782987, PIN 12280440), Neerabup
 Tranquil Drive Road Reserve (PIN 11751057), Carramar
 Ziatas Road Reserve (PIN 11751041), Banksia Grove, Neerabup and Pinjar

3. Clearing authorised

The permit holder must not clear more than 7.4 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 19 June 2032.

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; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

7. Wind erosion management

The permit holder must commence road construction activities no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

8. Directional clearing

The permit holder must:

- (a) Conduct all clearing authorised under this permit in a slow, progressive manner, in one direction towards adjacent *native vegetation*; and

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

9. Fauna management – black cockatoo habitat

- (a) Prior to undertaking any clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to inspect the *black cockatoo habitat tree* (ID 4) identified to contain the suitable black cockatoo breeding hollows, for evidence of current or past breeding use by *black cockatoo species*.

Table 1. Habitat tree containing the black cockatoo hollows

ID	Species	Easting	Northing
4	<i>Eucalyptus marginata</i>	386055.96	6493809.85

- (b) Where the *black cockatoo habitat tree* contains no *evidence* of current or past use by *black cockatoo species* is identified in accordance with condition 9(a), that tree must only be cleared immediately after the inspection.
- (c) Where the tree hollows show *evidence* of current or past breeding use by *black cockatoo species* under condition, and clearing of that tree cannot be avoided, that tree must be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.
- (d) If there is *evidence* of current breeding use by *black cockatoo species*, the tree must not be cleared whilst it is in use for that breeding season as determined by the *fauna specialist* under condition 9(c).
- (e) The permit holder must install five (5) artificial black cockatoo nesting hollows as calculated by the WA offset metric calculator to account for the loss of four (4) suitably sized hollows for black cockatoo nesting that cannot be avoided.
- (f) Each artificial black cockatoo nesting hollow required by condition 9(e) must be installed prior to commencement of the next black cockatoo breeding season following clearing of the related *black cockatoo breeding tree*.
- (g) The artificial black cockatoo nest hollows required by condition 9(e) of this permit must:
- be installed within the area cross-hatched blue on Figure 2 of Schedule 2;
 - be designed and placed in accordance with the specifications detailed in Schedule 4; and
 - be monitored and maintained in accordance with the specifications detailed in Schedule 4, for a period of at least ten years.
- (h) Within two months of clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must provide the results of the hollow inspection in a report to the *CEO*.

10. Offset – Crown Reserve 33343

Within 12 months of undertaking clearing authorised under this permit, and no later than 16 June 2026, the permit holder must:

- (a) Provide to the *CEO* a copy of the executed change in purpose of Lot 9276 on Plan 10841 (Montrose Park R 33343), Girrawheen from ‘Public Recreation’ to ‘Conservation’;
- (b) Implement and adhere to the ‘CPS 9981/1 Flynn Drive Stage 2 and 3 2025 Revegetation and Rehabilitation Plan’ (City of Wanneroo, 2025) for the combined

areas hatched red in Figure 3 of Schedule 2, including but not limited to the following actions:

- (i) establish a 10 metre x 10 metre quadrat reference site within Lot 9276 on Plan 10841, Girrawheen (*reference site 1*);
- (ii) deliberately *planting* and/or *direct seeding* at least 4.7 hectares of native vegetation at an *optimal time*, using species representative of the *Banksia attenuata* woodlands over species rich dense shrublands (*floristic community type 20a as originally described in Gibson et al. 1994*) threatened ecological community and providing foraging habitat for Carnaby's cockatoo (*Zanda latirostris*);
- (iii) ensure only *local provenance* propagating material is used to *revegetate* and *rehabilitate*;
- (iv) water planted vegetation at the *optimal time* for the first two years post planting as required;
- (v) establish four 10 metre x 10 metre quadrat monitoring sites within areas of planted vegetation;
- (vi) install signage to educate reserve users of the revegetation activities being undertaken;
- (vii) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the site;
- (viii) undertake *weed control* activities on an 'as needs' basis;
- (ix) achieve the completion criteria specified in Table 4 of Schedule 3 after the three-year monitoring period for areas *revegetated* and *rehabilitated* under condition 10;
- (x) the permit holder may seek approval from the CEO of alternative completion criteria based on *reference site 1* established under condition 10(b)(i) of this Permit;
- (xi) undertake remedial actions for areas revegetated and rehabilitated, where monitoring indicates that *revegetation/rehabilitation* has not met the completion criteria outlined in Table 4 of Schedule 3 or in accordance with condition 10(b)(x) of this permit, including;
 - (A) *revegetate/rehabilitate* the area by deliberately *planting* and/or *direct seeding native vegetation* that will result in the minimum completion criteria being met and ensuring only *local provenance* seeds and propagating material are used;
 - (B) additional *weed control* activities;
 - (C) undertake further watering activities; and
 - (D) annual monitoring of the revegetated and rehabilitated areas by an *environmental specialist*, until the completion criteria are met;
- (c) Where an *environmental specialist* determines that the completion criteria outlined in Table 4 of Schedule 3 or approved under condition 10(b)(x) has been met, a report shall be submitted to the *CEO* within three months of the determination being made; and
- (d) Where the *CEO* does not agree with the determination made under condition 10(c), the *CEO* may require the permit holder to undertake remedial actions in accordance with the requirements under condition 10(b)(xi) and repeat the actions under condition 10(c).

11. Offset – Crown Reserve 33343 – Bush Forever

- (a) Prior to 31 December 2028, the permit holder must provide evidence from the Department of Planning, Lands and Heritage that Lot 9276 on Plan 10841 (Montrose Park R 33343), Girrawheen is identified as ‘Bush Forever’ within the Perth Metropolitan Regional Scheme.

12. Offset – Crown Reserve 36601

Within 12 months of undertaking clearing authorised under this permit, and no later than 16 June 2026, the permit holder must:

- (a) provide to the *CEO* a copy of the executed change in purpose for the portion of Lot 10857 on Plan 15402 (Edgar Griffith Park R 36601), Wanneroo cross-hatched orange in Figure 4 of Schedule 2 from ‘Public Open Space’ to ‘Conservation’;
- (b) implement and adhere to the ‘CPS 9981/1 Flynn Drive Stage 2 and 3 2025 Revegetation and Rehabilitation Plan’ (City of Wanneroo, 2025) for the combined areas hatched orange in Figure 4 of Schedule 2, including but not limited to the following actions:
 - (i) retain the vegetative material and topsoil removed by clearing authorised under this permit and stockpile the vegetative material and topsoil in an area that has already been cleared;
 - (ii) commence *revegetating* and *rehabilitating* the areas cross-hatched orange on Figure 4 of Schedule 2, by way of:
 - (A) laying the vegetative material and topsoil retained under condition 11(b);
 - (B) deliberately *planting* tube stock and salvaged *native vegetation* at an *optimal time* that will result in similar species composition, structure and density of *native vegetation* to *reference site 2*; and
 - (C) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the area.
 - (iii) establish four 10 metre x 10 metre quadrat monitoring sites as specified in Table 5 of Schedule 3;
 - (iv) water planted vegetation at the *optimal time* for the first two years post planting as required;
 - (v) install signage to educate reserve users of the *revegetation* activities being undertaken;
 - (vi) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the site;
 - (vii) undertake *weed* control activities on an ‘as needs’ basis;
 - (viii) achieve the completion criteria specified in Table 5 of Schedule 3 after the three-year monitoring period for areas *revegetated* and *rehabilitated* under condition 12;
 - (ix) undertake remedial actions for area *revegetated* and *rehabilitated* where monitoring indicates that *revegetation* has not met the completion criteria, outlined in 12(b)(viii), including:
 - (A) *revegetate* the area by deliberately planting *native vegetation* that will result in the minimum completion criteria detailed in Table 5 of Schedule 3, ensuring only *local provenance* seeds and propagating material are used;
 - (B) undertake further *weed* control activities;
 - (C) undertake further watering activities; and
 - (D) monitoring of the *revegetated* and *rehabilitated* site by an *environmental specialist*, until the completion criteria are met.

- (c) Where an *environmental specialist* determines that the completion criteria outlined in Table 5 of Schedule 3 has been met, a report shall be submitted to the *CEO* within three months of the determination being made.
- (d) Where the *CEO* does not agree with the determination made by an environmental specialist, the *CEO* may require the permit holder to undertake remedial actions in accordance with the requirements under condition 12(b)(viii) and repeat the actions under condition 12(c).

13. Offset - Lot 901

- (a) Prior to commencement of clearing authorised under this permit, the permit holder must fund the purchase of the area cross hatched blue in Figure 2 of Schedule 2 to be ceded to the Department of Biodiversity Conservation and Attractions for the purpose of conservation.

PART III - RECORD KEEPING AND REPORTING

14. 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 2.

Table 2: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (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 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; and (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 6; (g) actions taken in accordance with condition 7 (h) actions taken in accordance with condition 8,
2.	In relation to black cockatoo fauna management pursuant to condition 9	<ul style="list-style-type: none"> (a) the time(s) and date(s) of inspection(s) of the suitable <i>black cockatoo habitat tree</i> by the <i>fauna specialist</i>; (b) a description of the inspection methodology employed by the <i>fauna specialist</i>; (c) the species name of any fauna determined by the <i>fauna specialist</i> to be occupying the suitable <i>black cockatoo habitat tree</i>; (d) where the suitable <i>black cockatoo habitat tree</i> is determined by the <i>fauna specialist</i> to be occupied by <i>black cockatoo species</i>: <ul style="list-style-type: none"> (i) the time and date that it was determined to be

No.	Relevant matter	Specifications
		<p>no longer occupied; and</p> <p>(ii) a description of the evidence by which it was determined to be no longer occupied;</p> <p>(e) the time and date that the suitable black cockatoo habitat tree was cleared.</p> <p>(f) a copy of the fauna specialist report;</p> <p>(g) the location where artificial black cockatoo hollows were installed, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings;</p> <p>(h) the date when each artificial nesting hollow was monitored and maintained; and</p> <p>(i) a description of the monitoring and maintenance activities undertaken.</p>
3.	In relation to offset condition 10 and 11	<p>(a) actions taken to change the purpose of Crown Reserve 33343 from 'Public recreation' to 'Conservation';</p> <p>(b) actions taken to include Crown Reserve 33343 as a Bush Forever under the Perth Metropolitan Regional Scheme;</p> <p>(c) a description of the revegetation and rehabilitation activities undertaken;</p> <p>(d) the size of the area revegetated and rehabilitated;</p> <p>(e) the date/s on which the revegetation and rehabilitation was undertaken;</p> <p>(f) the boundaries of the area revegetated and rehabilitated (recorded digitally as a shapefile using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings);</p> <p>(g) determinations made by an environmental specialist; and</p> <p>(h) other actions taken in accordance with condition 10 and 11.</p>
4.	In relation to offset condition 11 and 13	<p>(a) actions taken to change the purpose of the identified portion of Crown Reserve 36601 from 'Public Open Space' to 'Conservation';</p> <p>(b) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken;</p> <p>(c) the size of the area <i>revegetated</i> and <i>rehabilitated</i>;</p> <p>(d) the date/s on which the <i>revegetation</i> and <i>rehabilitation</i> was undertaken;</p> <p>(e) the boundaries of the area <i>revegetated</i> and <i>rehabilitated</i> (recorded digitally as a shapefile using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings);</p>

No.	Relevant matter	Specifications
		(f) determinations made by an <i>environmental specialist</i> ; and (g) other actions taken in accordance with condition 12 and 13.

15. 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 14; 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 calendar days prior to the expiry date of the permit, a written report of records required under condition 14, where these records have not already been provided under condition 15(a).

DEFINITIONS

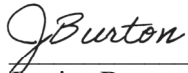
In this permit, the terms in Table 3 have the meanings defined.

Table 3: Definitions

Term	Definition
<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)	means the State listed threatened ecological community including the following dominant species - <i>Banksia attenuata</i> (occasionally with <i>Eucalyptus marginata</i>) with <i>Bossiaea eriocarpa</i> , <i>Conostephium pendulum</i> , <i>Hibbertia huegelii</i> , <i>H. hypericoides</i> , <i>Petrophile linearis</i> , <i>Scaevola repens</i> , <i>Stirlingia latifolia</i> , <i>Mesomelaena pseudostygia</i> and <i>Alexgeorgea nitens</i> .
black cockatoo habitat trees	means trees that have a diameter, measured at 130 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for <i>Eucalyptus salmonophloia</i> or <i>Eucalyptus wandoo</i>) that contain hollows suitable for breeding by black cockatoo species.
black cockatoo species	means one or more of the following species: (a) <i>Zanda latirostris</i> (Carnaby's cockatoo); (b) <i>Zanda baudinii</i> (Baudin's cockatoo); and/or (c) <i>Calyptrorhynchus banksii naso</i> (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
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.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
direct seeding	means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the

Term	Definition
	desired plant species.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (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	<i>Environmental Protection Act 1986</i> (WA)
evidence	means showing chew marks or scratchings on the habitat tree representative of the species being surveyed, the presence of the species entering or leaving the habitat tree, and/or the presence of chicks/young.
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 a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from April to June.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
reference site 1	a quadrat established within Lot within Lot 9276 on Plan 10841, Girrawheen that is representative of the “ <i>Banksia attenuata</i> woodlands over species rich dense shrublands (Swan Coastal Plain Community type 20a – Gibson et al. 1994)” threatened ecological community in very good to excellent (Keighery, 1994) condition.
reference site 2	quadrat number EG04 from Edgar Griffiths Detailed Flora Survey (Natural Area Holdings, 2024) with the following coordinates: Latitude: -31.737723471 Longitude: 115.823360073
rehabilitate/ed/ing/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate/ed/ing/ion	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in

Term	Definition
	that area.
weeds	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; 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.

END OF CONDITIONS


Jessica Burton
A/MANAGER
NATIVE VEGETATION REGULATION

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

26 May 2025

Schedule 1

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

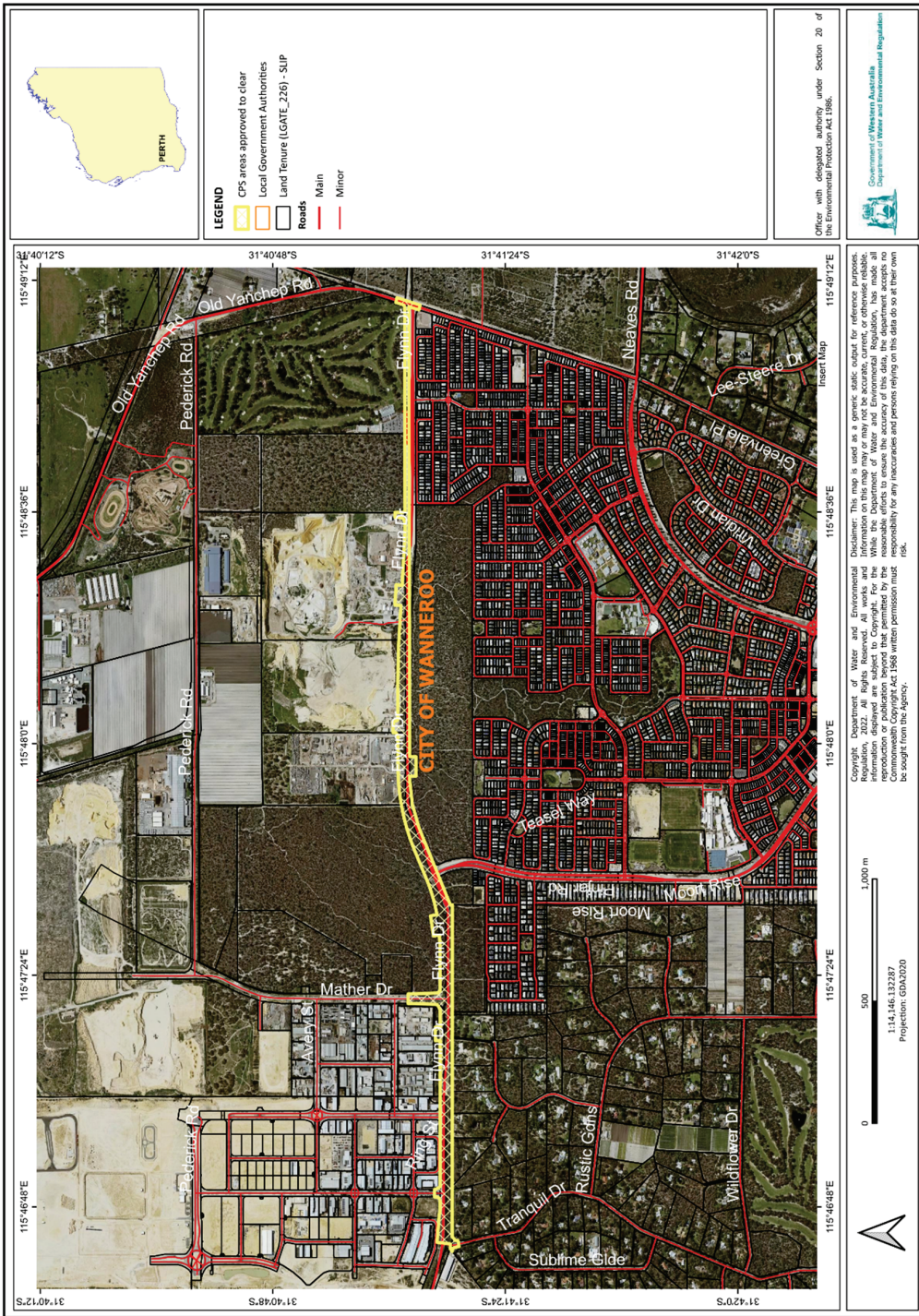


Figure 1: Map of the boundary of the area within which clearing may occur

Schedule 2

The boundary of the areas within which conditions apply are shown in the maps below (Figure 2 Figure 3 and Figure 4)



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Figure 2: Map of the boundary of the area within which Condition 9 and Condition 13 applies.



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Figure 3: Map of the boundary of the area within which Condition 10 and 11 applies.



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Figure 4: Map of the boundary of the area within which Condition 12 applies.

Schedule 3

Table 4. *Revegetation and rehabilitation* criteria for Condition 10 (revegetation and rehabilitation of Montrose Park, Reserve 33343).

Criterion	Reference area data	Completion Targets	Completion Criteria	Monitoring
Quadrat species richness	Quadrat species richness from <i>reference site 1</i>	Minimum of 60% of Quadrat native species recorded in <i>reference site 1</i>	Minimum of 60% of Quadrat native species recorded in <i>reference site 1</i>	Years 3, 4 & 5
Quadrat Species Density	Species density from <i>reference site 1</i>	Minimum of 80% of stems/ha density recorded in <i>reference site 1</i>	Minimum of 80% of stems/ha density recorded in <i>reference site 1</i>	Years 3, 4 & 5.
Weed Cover	Weed cover from <i>reference site 1</i>	Weed cover across site to be no greater than <i>reference site 1</i>	Weed cover across site to be no greater than <i>reference site 1</i>	Years 3, 4 & 5.
Declared weeds	N/A	No declared weeds to be present within the revegetation areas.	0% declared weed cover.	Years 3, 4 & 5.
Survival rate	N/A	A survival rate of at least 70% of new plantings	A survival rate of at least 70% of new plantings	Years 3, 4 & 5.
Bare ground	Bare ground from <i>reference site 1</i>	Bare ground in quadrats to be no greater than in <i>reference site 1</i> .	Bare ground in quadrats to be no greater than in <i>reference site 1</i> .	Years 3, 4 & 5

Table 5. *Revegetation and rehabilitation* criteria for condition 12 (revegetation and rehabilitation of Edgar Griffith Park, Reserve 36601).

Criterion	Reference area data	Completion Targets	Completion Criteria	Monitoring
Site Species Richness	33 (native sp. only) based on results of Edgar Griffiths Detailed Flora Survey (Natural Area Holdings, 2024)	Minimum of 50% of native species returned in the revegetation areas.	Minimum of 17 native species to be present in the revegetation areas	Years 3, 4 & 5.
Quadrat species richness	Quadrat species richness is 31 (native sp. only) based on <i>reference site 2</i>	Minimum of 50% of the number of native species present in <i>reference site 2</i> , which must include a minimum of two tree species which provide suitable foraging habitat for black cockatoo species, in each monitoring quadrat	Minimum of 16 native species, which must include a minimum of two tree species which provide suitable foraging habitat for black cockatoo species, in each monitoring quadrat	Years 3, 4 & 5.
Weed Cover	Average weed cover of quadrats recorded in Edgar Griffiths Detailed Flora Survey (Natural Area Holdings, 2024) is 30%.	Weed cover in the revegetation areas to be no greater than reference data	Weed cover in the revegetation areas to be no greater than 30%	Years 3, 4 & 5.
Declared weeds	N/A	No Declared weeds to be present within the revegetation areas	0% declared weed cover	Years 3, 4 & 5.
Survival rate	N/A	A survival rate of at least 50%	A survival rate of at least 50%	Years 3, 4 & 5
Bare ground	N/A	No more than $\geq 15\%$ bare ground.	No more than $\geq 15\%$ bare ground.	Years 3, 4 & 5.

Schedule 4

How to monitor and maintain artificial hollows for Carnaby's cockatoo

Artificial Hollows for Black Cockatoos

There are three species of threatened black cockatoos in the southwest of Western Australia (WA): Baudin's cockatoo *Zanda baudinii* (previously *Calyptorhynchus baudinii*), Carnaby's cockatoo *Zanda latirostris* (previously *Calyptorhynchus latirostris*) and forest red-tailed black cockatoo *Calyptorhynchus banksii naso*. Some of the main threats to the three species include nest hollow shortages due to ongoing and extensive habitat loss and degradation, lack of recruitment of new hollow bearing trees, and competition with galahs, corellas, and feral European honey bees.

Artificial hollows can be used to help conserve these threatened black cockatoos by enabling them to breed in areas where natural hollows are limited. This Fauna Note provides advice on how to select an appropriate site, guidelines on how to design and place artificial hollows, and advice on how to maintain and monitor artificial hollows. The information presented here is based on experience with Carnaby's cockatoo which have many examples of successful use of artificial hollows and forest red-tailed black cockatoo which have a few known examples of use. However, to date there are no records of Baudin's cockatoo using artificial nest hollows.

Sometimes a site may not be suitable for artificial hollows. This Fauna Note includes options for alternative conservation actions that are important to the conservation of black cockatoos and can also be used to complement the placement of artificial hollows.

It is important to remember that the retention of both old and dead trees (stags) that have suitable hollows for black cockatoos is crucial for breeding, and natural replacement of hollow bearing trees for future breeding is vital for the long-term survival of the species. The installation of artificial hollows should not be used to justify the removal of natural hollow-bearing trees.

It is important to remember that the retention of both old and dead trees (stags) that have suitable hollows for black cockatoos is crucial for breeding, and natural replacement of hollow bearing trees for future breeding is vital for the long-term survival of the species. The installation of artificial hollows should not be used to justify the removal of natural hollow-bearing trees.

When to Use Artificial Hollows

Artificial hollows may be useful at sites where natural hollows are a limiting resource. However, cockatoos may not always use artificial hollows, for example if provided in non-traditional nesting areas. Artificial hollows that are installed within 2 km of current breeding sites are regularly taken up. There are ways to select sites for artificial hollows that will increase the chance that they will be used and that birds will be able to successfully raise chicks.

Where do black cockatoos nest?

Black cockatoos nest in the hollows of mature trees in uncleared or remnant Eucalypt woodland or forest, as well as in remnant paddock trees. Trees may take more than 120 years to develop hollows that are a suitable size, and cockatoos use hollows in both living and dead trees. Refer to the maps at the end of this document for the known breeding range of the three species of black cockatoo.

Carnaby's cockatoos generally breed in Wandoo and Salmon Gum in the Wheatbelt, Marri in forested areas, and Tuart along the Swan Coastal Plain. They are also known to nest in Jarrah, Flooded Gum, York Gum, Gimlet, Powderbark Wandoo, and Karri.

Baudin's cockatoos generally nest in Jarrah, Marri, and Karri in densely forested areas. They are also known to nest in hollows in Wandoo and Tuart.



Carnaby's cockatoo nestlings in an artificial hollow. Note this chewing post will require replacement following breeding.

Photo: Rick Dawson

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The breeding habitat for forest red-tailed black cockatoos is in uncleared forest or remnant patches of old Marri. They are also known to nest in Karri, Wandoo, Bullich, Blackbutt, Tuart, and Jarrah.

Is my site suitable for artificial hollows?

It is recommended that artificial hollows be used in known nesting areas where there has been a decrease in the availability of natural nesting hollows. Trials have shown that Carnaby's cockatoo and forest red-tailed black cockatoos will nest in artificial hollows if installed in suitable areas and are of a satisfactory design. However, putting up artificial hollows may not be the best way to help black cockatoos in your area.

Indeed, attracting birds to attempt to breed in unsuitable areas may result in increased risk of harm to adult birds or their chicks. The installation of artificial hollows in built up and urbanized areas of the metropolitan Perth and Peel regions, and other urban centres in the southwest is not recommended and should not be undertaken. This is due to the increased risk in this area, including car strike to young inexperienced birds, attack by predators such as Australian ravens and pets, and in highly urbanised and cleared areas there may not be sufficient food resource for the adults to successfully raise chicks).

To decide if your site is suitable for artificial hollows you need to consider five essential criteria (Table 1). If your site does not match all criteria, you may wish to consider alternative conservation actions including:

- protecting habitat by fencing and/or rabbit and stock control to encourage regeneration of native vegetation;
- controlling competitive species such as galahs, corellas and feral bees that may occupy hollows;
- repairing old and damaged natural nesting hollows;
- providing access to fresh water;
- revegetating with preferred food species and nesting trees; and/or
- creating linkages of vegetation between nesting and feeding areas.



Installing artificial hollows in built up areas to the west of the red line above, increases the risk of harm to birds. No artificial hollows should be installed west of this line. (green = remnant vegetation; grey = extent of existing and future urban and industrial development)

Table 1: Essential criteria for a site to be considered suitable for installation of artificial hollows, with alternative conservation actions suggested for each criterion that is not met.

1.	The site is Eucalypt woodland or forest within the known breeding range of the species	
	<i>Important consideration</i>	Carnaby's cockatoos tend to nest in Wandoo and Salmon Gum in the Wheatbelt, Marri in forested area and Tuart along the Swan Coastal Plain. Baudin's cockatoos generally nest in Jarrah, Marri, and Karri and forest red-tailed black cockatoos usually nest in Marri.
	<i>Alternative conservation actions</i>	If the site is not within the known current breeding range of black cockatoos, then it is unlikely that the installation of artificial hollows will attract the birds to the site. However, black cockatoos are highly mobile species that also require habitat for feeding and roosting which means that it is important to protect and manage habitat visited by the cockatoos by fencing, and carrying out other management, such as rabbit and stock control, to retain existing habitat, and to encourage regeneration of native vegetation. It is also important to revegetate areas within the breeding and non-breeding areas with preferred food species, and to create linkages of vegetation to assist the movement of the birds through the landscape.
2.	Breeding by Black cockatoos is known or suspected at the site. There must also be evidence that a lack of suitable available tree hollows is preventing breeding that would otherwise occur in the area.	

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	<i>Important consideration</i>	If the lack of available hollows is due to nest competitors such as galahs, western long-billed corellas or feral bees then any attempt to install artificial hollows must be accompanied by efforts to deter or control these competitors. Alternatively, successful control of competitors may mean that artificial hollows are not needed.
	<i>Alternative conservation actions</i>	<p>If sufficient suitable natural hollows are available in an area, then there is no need to install artificial hollows. This overcomes the need for ongoing maintenance of unnecessary artificial hollows.</p> <p>If breeding is already occurring at the site and there are plenty of available hollows, efforts can be redirected towards caring for existing or future nesting hollows. This may involve repairing old or damaged nesting hollows by covering cracks, removing debris blocking access to hollows or replacing rotted wood in the hollow so that the depth of the nest floor is manageable for the birds. Future hollows can be protected by preventing compaction of ground around trees, fencing and/or rabbit and stock control to encourage regeneration to produce future nesting trees, fire management, and the strategic pruning of limbs to prevent limbs breaking and tearing open hollows. Efforts can also be aimed at enhancing the success of existing breeding by revegetating with preferred food and nesting species, as well as creating linkages of suitable vegetation and fresh water between nesting and feeding areas.</p> <p>If breeding is not occurring at the site despite hollows being available, then there may be a range of factors making the site unsuitable for breeding. These factors must be identified and addressed before breeding can resume in the area (if at all possible). Lack of sufficient food could be the cause, and this can be addressed by revegetating with preferred food species and increasing connectivity in the landscape.</p> <p>To compile a list of plant species suitable for revegetation at your site, refer to the document Plants Used by Carnaby's Black Cockatoo available on the Department of Biodiversity, Conservation and Attractions (DBCA) black cockatoo webpage.</p>
3.	The artificial hollows can be located in close proximity to adequate feeding areas – within a 12 km radius.	
	<i>Important consideration</i>	Feeding areas commonly contain proteaceous species such as banksias (including dryandras) and hakeas. A list of food plants can be obtained by use of the document Plants Used by Carnaby's Black Cockatoo .
	<i>Alternative conservation actions</i>	If the site is not close to adequate food, then the black cockatoos will not be able to successfully raise young. Cockatoos require sufficient food close to nesting areas in order to be able to forage during the day and return to feed nestlings. Existing feeding habitat close (within 12km) to breeding areas can be protected by fencing and/or undertaking rabbit and stock control to encourage regeneration of native vegetation. The amount of feeding habitat in an area can be increased by planting or revegetating with preferred food species.
4.	The hollows are placed in secure locations and the owner/manager of these areas is supportive and willing to provide the necessary long-term security and annual maintenance for the entire time that the artificial hollow will be in place.	
	<i>Important consideration</i>	For advice on the monitoring and maintenance requirements, please refer to the section on how to monitor and maintain artificial hollows.
	<i>Alternative conservation actions</i>	Artificial hollows can be subject to nest robbing and vandalism. It is highly recommended that artificial hollows are not put in exposed or easily accessible areas such as road verges unless they are above 8m and placed on the side of trees away from roads. If the site is considered at high risk of nest robbing or vandalism then alternative actions to assist the conservation of the species are recommended including: revegetation, fencing, repairing old or damaged natural nesting hollows and planting vegetation linkages to connect nesting and feeding areas.
5.	A suitable artificial hollow design is used.	
	<i>Important consideration</i>	For greatest chance of success, please refer to the sections below on how to design and place artificial hollows.
	<i>Alternative conservation actions</i>	If an alternative design is proposed, it is recommended that Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or WA Museum are contacted to discuss and approve design.

How to Design and Place Artificial Hollows

A wide variety of artificial hollow designs have been previously used with mixed success. Evidence suggests that, while artificial hollows must meet some basic requirements, other factors such as proximity to existing breeding areas may be more important in determining the success of artificial hollows.

Successful artificial hollows have been constructed from sections of salvaged natural hollows, or black and white industrial pipe. Research results show that the most effective artificial hollows are made of plastic culvert pipe which is readily available, durable, light, cheap, and easy to install and maintain (see right picture below). When using non-natural materials care must be taken to ensure there are no toxic residues, and that the materials are safe to ingest.

Below are three examples of successful artificial hollows that have been used by black cockatoos for nesting:

- natural log with cut side entrance (left);
- white industrial pipe with top entrance (centre); and
- DBCA recommended polypropylene pipe design (right)



Photo: Christine Groom (left), Rick Dawson (centre and right)

The notes below provides general guidance on design and construction of artificial hollows for black cockatoos. Additional specifications are provided at the end of this Fauna Note which outline current best practice and may be considered recommendations for minimum requirements.

Walls, size, base, and entrance design

The walls of the artificial hollow need to be constructed from a material that is:

- durable enough to withstand exposure to elements for at least 20 years; and
- able to simulate the thermal properties of a natural tree hollow.

Artificial hollows should be:

- not less than 375 mm in internal diameter; and
- preferably 1200 mm deep overall with 200 mm of substrate/nesting material covering the base.

The base of the artificial hollow must be:

- securely fixed to the walls and able to support the weight of an adult and nestling(s);
- durable enough to last the life of the nest, and survive chewing by cockatoos;
- free draining;

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- at least 375 mm in diameter; and
- covered with 200 mm of sterile, dry, free draining substrate/nesting material such as charcoal, hardwood woodchips or wood debris. Do not use saw dust or fibre products that will retain moisture.

Example materials that could be used for artificial hollow bases include heavy duty stainless steel, galvanised or treated metal (e.g. Zincalume®), thick hard plastic, thick hardwood timber slab or marine ply (not chipboard or MDF). The base material must be cut to fit internally with sharp or rough edges ground away or curled inwards, be fixed securely to the walls and have small drainage holes.

The entrance of the artificial hollow:

- must have a diameter of at least 375 mm; and
- preferably be top entry which will minimise use by non-target species.

Top entry hollows are less attractive to nest competitors such as feral bees, galahs and corellas. Side entry hollows have been successful in areas where feral bees, galahs and corellas are not competitors.

Adding ladders and sacrificial chewing posts

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide a ladder to enable the birds access to the hollow, and sacrificial chewing posts so that birds can chew material, and so that non-target species can exit the hollow. The post can also assist in providing further material to the substrate, however research has shown that not all posts are heavily chewed.

The ladder must be:

- securely mounted to the inside of the hollow;
- made from an open heavy wire mesh with a mesh size of 30 - 50 mm (such as WeldMesh™); or heavy chain; and
- reach to, or below the level of substrate/nesting material.

If using mesh for the ladder, the width will depend on the curvature of the nest walls. A minimum width of about 60 - 100 mm is recommended.

Do not use material for ladders that the birds can chew, including galvanised metal because the birds may grip or chew the ladder, and ingest harmful compounds.

The sacrificial chewing posts must be:

- made of untreated hardwood such as Jarrah, Marri or Wandoo;
- thick enough to satisfy the birds' needs between maintenance visits;
- extended beyond the top of the hollow as an aid to see whether the nest is being used and reach to the floor of the hollow;
- placed on the inside of the hollow; and
- attached in such a way that they are easy to replace (e.g. a hook over the top of hollow or can slide in/out of a pair of U-bolts fitted to the side of the hollow).

It is recommended that at least one chewing post is provided. Posts 70 x 50 mm have been used but require monitoring at least every second breeding season when the nest is active and replacing when found to be no longer reaching the nesting material or otherwise significantly chewed. Birds do vary in their chewing habits, and therefore the frequency at which the chewing posts require replacement will also vary.

Mounting and placement

It is important that artificial hollows are placed where they will be accessible for future monitoring and maintenance, but preferably not conspicuous to the general public.

The height at which artificial hollows should be placed is variable, between 4 - 8m for Carnaby's cockatoo, and the average height of natural hollows in dominant tree species in the area is a good guide. If located in an area that the general public cannot access, such as a private property, the hollows can be placed as low as 4 m from the ground so that they are easily accessible by ladder. If located in an area where the general public are allowed access, hollows should be placed at least 8 m high (i.e. higher than most ladders) and on the side of the tree away from public view to reduce the chance of interference or poaching.

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Black cockatoos show no preference for aspect of natural hollows. However, it may still be beneficial to place artificial hollows facing away from prevailing weather and where they receive the most shade and protection.

Artificial hollows to be placed in trees require:

- accessibility of the tree for a vehicle, elevated work platform or cherry picker;
- a section of trunk 2 - 3 m long suitable for attaching the hollow; and
- fitted on the side where the most shade can be obtained.

Artificial hollows must be mounted such that:

- the fixings used will last the duration of the nest e.g. galvanized bracket or chain and fixed with galvanized coach screws;
- it is secured by more than one anchor for security and stability;
- it is positioned vertically or near vertically; and
- where possible living trees are to be used to provide shade.

Artificial hollows should not be placed in the open on poles, as this may result in excessive exposure to sun during very hot weather.

Safety

Care needs to be taken when placing artificial hollows to ensure human safety is paramount.

Monitoring and Maintaining Artificial Hollows

It is important to monitor and maintain artificial hollows after they have been erected to ensure their effectiveness and so that problems with pest species or maintenance requirements can be identified and resolved. This will ensure the artificial hollow continues to provide opportunities to be used and that birds will be able to successfully raise chicks

Without regular maintenance, artificial hollows are likely to fail to achieve their objective to provide safe nesting opportunities for threatened black cockatoos. Therefore, it is important to continue a regime of regular maintenance for however long the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available. Artificial hollows erected as a condition of development to offset the loss of natural hollows may be required to be available and maintained for the life of the development approval.

How do I monitor artificial hollows?

Before undertaking monitoring of artificial hollows for black cockatoos, it is recommended that you seek advice from the Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or the WA Museum. It is also important to contact the Department's Wildlife Licensing Section, to determine if a lawful authority required (<https://www.dbca.wa.gov.au/licences-permits>).

Monitoring artificial hollows requires keen observation, and naturalist skills. It is often not possible to observe direct evidence of breeding (i.e. nestlings or eggs) and therefore inferences must be made based on other observations. It is also important to limit disturbance to breeding birds. There are many techniques available to monitor artificial hollows, and a combination of several is likely to achieve the best results (**Table 2**).

Monitoring of artificial hollows should consider and record:

- the condition of the tree, hollow fixings and general hollow condition;
- condition and connection of sacrificial chewing posts, ladder and substrate/nesting material inside hollow;
- any use by black cockatoos and nature of activity (adult birds, chewing, eggs, chicks etc.)
- details of use by non-target species (native or pest);
- identify any problems with pest species or maintenance requirements; and
- maintenance actions undertaken to resolve any problems.

The information collected from monitoring should be written down and reported. There are standard fauna report forms available on the Department's website (<https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals>) that can be used to record the details of your sighting. Alternatively, if you are

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frequently monitoring a larger number of artificial hollows, you can put the details into a spreadsheet or use the black cockatoo monitoring forms available on the [DBCA website](https://www.dbca.wa.gov.au). Records should be submitted to the Department by emailing fauna.data@dbca.wa.gov.au. The Department will put the records into the Threatened and Priority Fauna Database, and it will be used to inform conservation and management decisions. Any other opportunistic sightings of Threatened and Priority species can also be reported via the same email.

Table 2: Techniques for monitoring artificial hollows

Technique	Description of Technique								
Looking for signs of use	Cobwebs covering the entrance to the hollow will indicate that the hollow has not been used recently. This would also apply to other light debris that may have fallen to cover the opening partially. Signs of recent use or interest in the hollow include evidence of chewing.								
Observing parent behaviour around a hollow	<table><tr><th>Parent Behaviour</th><th>Approximate Stage and Age of Young</th></tr><tr><td>Prospecting for hollow</td><td>Unborn</td></tr><tr><td>Male only seen out of hollow</td><td>Egg or very young nestling (< 3 - 4 weeks)</td></tr><tr><td>Both parents seen entering/exiting the hollow</td><td>Nestling(s) has hatched (> 3 - 4 weeks)</td></tr></table>	Parent Behaviour	Approximate Stage and Age of Young	Prospecting for hollow	Unborn	Male only seen out of hollow	Egg or very young nestling (< 3 - 4 weeks)	Both parents seen entering/exiting the hollow	Nestling(s) has hatched (> 3 - 4 weeks)
Parent Behaviour	Approximate Stage and Age of Young								
Prospecting for hollow	Unborn								
Male only seen out of hollow	Egg or very young nestling (< 3 - 4 weeks)								
Both parents seen entering/exiting the hollow	Nestling(s) has hatched (> 3 - 4 weeks)								
Observing feeding flocks	Flocks of all male birds can indicate that females are incubating eggs. When flocks are mixed it suggests the birds have either not laid yet or that the nestlings have hatched and no longer require brooding (approximately 3 - 4 weeks old).								
Tapping to flush female	<p>When females are sitting on eggs they will usually respond to tapping or scraping at the base of their tree by appearing at the entrance or flying from the hollow opening. This is not a guarantee of breeding activity, but an indication that breeding is possibly occurring in the hollow.</p> <p>Tapping or scraping is best undertaken between 10 am - 3 pm when females will most likely to be sitting.</p>								
Observing insect activity around a nest	Faecal matter produced by nestlings attracts insects, especially flies and ants. The type and number of these insects will help to indicate how old any nestlings present may be. Factors such as temperature and humidity will also affect insect activity and so observations of insect activity should only be used as supporting evidence for other indications of age/use. Blowflies around the entrance of a nest usually indicate that a death has occurred.								
Listening for nestling	With experience it is possible to determine if nestlings are present, and a broad estimate of age based on the type and volume of noises they make.								
Looking inside a nest	This can be achieved either with the aid of a telescopic pole and camera or mirror, or with the use of a ladder or other climbing equipment. This method can obtain the most detailed monitoring information for artificial hollows. However, it is also the most time consuming and difficult to organize. Also keep in mind that it is important to limit disturbance to breeding birds. Special equipment is likely to be needed depending on the height and positioning of artificial hollows. There are also safety issues associated with ladder or rope climbing to reach nests to undertake observations.								

When do I monitor artificial hollows?

The minimum frequency of monitoring, and the techniques used will be determined by the aims of the monitoring, and the resources available. It is important to limit disturbance to breeding birds, and this should be considered when determining the techniques, frequency, and timing of monitoring (Table 3).

Breeding by the three southwest black cockatoos varies, and the timing of monitoring of artificial hollows should accommodate the breeding of the likely target species. The Commonwealth Department of Climate Change, Energy,

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the Environment and Water (DCCEEW) Species Profile and Threats Database (SPRAT) database records the breeding periods of each of the species as:

- Carnaby's cockatoo - July to November (with peak between August to September)
- Baudin's cockatoo - October to January
- Forest red-tailed black cockatoo - every month, with peaks in April to June and August to October

The age of Carnaby's cockatoo nestlings can be determined by using the following publication:

Saunders, D. A., Dawson, R. and Nicholls, A. O. (2015). Aging nestling Carnaby's cockatoo, *Calyptorhynchus latirostris*, and estimating the timing and length of the breeding season. *Nature Conservation* **12**: 27-42
<http://dx.doi.org/10.3897/natureconservation.12.4863>

This document provides a series of photographs to illustrate changes in size and plumage of nestlings over the 10–11 weeks of the nestling period which can be used to estimate the approximate age of Carnaby's cockatoo nestlings, up to about nine weeks, by comparing appearance with the nestlings illustrated in the photographs.

Any monitoring that involving disturbance or handling of black cockatoos, requires lawful authority (<https://www.dbca.wa.gov.au/licences-permits>). Such activity requires specialist skills and authorisation under the *Biodiversity Conservation Act 2016*.

Table 3: Recommended frequency for monitoring artificial hollows, as determined by the aim of the monitoring

Monitoring Aim	Frequency of Visits	Monitoring Techniques
To determine possible use by black cockatoos	At least once during peak breeding season.	<ul style="list-style-type: none"> • Looking for signs of use (evidence of chewing) • Observing behaviour of adults around a hollow • Tapping or scraping to flush female • Listening for nestlings • Looking inside nest
To confirm use by black cockatoos	At least two visits during peak breeding season.	<ul style="list-style-type: none"> • Looking for signs of use (evidence of chewing) • Observing behaviour of adults around a hollow • Tapping or scraping to flush female • Listening for nestlings • Looking inside a nest <p>Observing breeding evidence from at least two of the techniques confirms use by black cockatoos.</p>
To determine nesting success by black cockatoos	Preferably fortnightly visits between July and December. As a minimum, at least 3 visits spread throughout breeding season.	<ul style="list-style-type: none"> • Observing insect activity around a nest • Listening for nestlings • Looking inside a nest <p>The presence of eggs or nestlings inside a nest will help to determine nesting success.</p>
To determine use by any species	As often as possible.	<p>As a minimum, inspection from the ground:</p> <ul style="list-style-type: none"> • Looking for signs of use <p>To confirm:</p> <ul style="list-style-type: none"> • Looking inside a nest
To determine maintenance requirements	At least every two years and preferably annually.	A basic maintenance check can be undertaken from the ground. Looking inside the nest using a telescopic pole with camera or mirror enables inspection of the sacrificial chewing posts and level of substrate/nesting material. A ladder or elevated work platform will be required for a comprehensive check, and to replace sacrificial chewing posts and carry out other maintenance.

How do I maintain artificial hollows?

Natural hollows used by black cockatoos are typically present for many decades and if artificial hollows are expected to provide a similar role, then they will require maintenance to ensure they continue to function as potential nesting locations for black cockatoos for the long term.

In many cases artificial hollows are required as a condition of development to offset loss of natural hollows, in which case State and Commonwealth offset policy expects that the artificial hollows continue to provide that function for the duration of the impact (or alternatively the expected period of time the natural hollow would have persisted, or the life of the environmental approval). As part of establishing artificial hollows the responsibility and regime for long term monitoring and maintenance should also be established.

Periodic maintenance checks should be undertaken at least every two years, preferably annually, for as long as the artificial hollow is required. Maintenance actions should be completed prior to the breeding season.

Any problems identified during monitoring or maintenance checks should be addressed as soon as possible and will require similar specialist skills and equipment as used in installation. If breeding is currently occurring, maintenance may need to be delayed if it is likely to disturb the parents or nestling. Maintenance concerns regarding the security of attachment points or the stability of the tree or pole should be addressed as a priority for safety reasons. Likely maintenance includes:

- replacement of sacrificial chewing posts (frequently);
- top-up or replacement of nesting substrate to ensure it reaches the ladder and chewing posts (occasionally);
- replacement of nest bases (occasionally);
- repair or replacement of attachment points (infrequently); and/or
- repair of any cracks to wooden hollows (infrequently).

For artificial hollows known to be used, spare chewing posts should be taken into the field when undertaking maintenance checks as these are likely to need replacement.

Artificial hollows are likely to need to be completely replaced after many years, and other circumstances may require the relocation of artificial hollows (e.g. if the tree they are in becomes damaged).



Applying this guidance to forest red-tailed black cockatoo and Baudin's cockatoo

The information presented here is based on experience with Carnaby's cockatoo, for which many examples of successful use of artificial hollows exist, and forest red-tailed black cockatoo for which a few known examples of use exist. However, to date there are no records of Baudin's cockatoo using artificial nest hollows.

A definite reason for this lack of use is not yet known but may relate to the location of artificial hollows installed to date (few or none placed in Baudin's cockatoo breeding sites where breeding is occurring and natural hollows are limiting) or design or installation issues, such as hollows not being installed high enough in tall forest canopy.

Before deciding to install artificial hollows for forest red-tailed black cockatoo or Baudin's cockatoo, it is recommended that you discuss your proposal with, and/or seek advice from, the Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or the WA Museum.

Maps of Black Cockatoo Breeding Range

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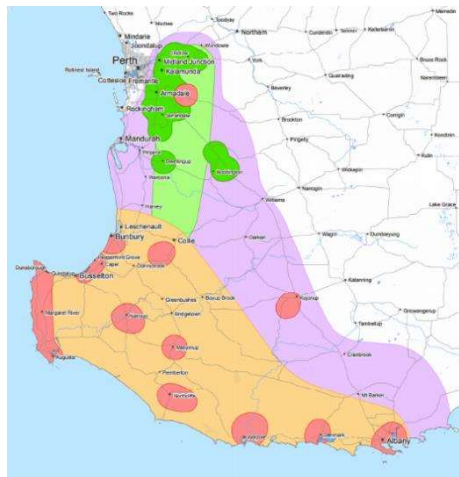


Image: [Commonwealth of Australia, 2011](#)

The maps show the modelled distributions of Carnaby's cockatoo (left), Baudin's cockatoo (centre) and forest red-tailed black cockatoo (right). For Baudin's cockatoo, the breeding range is indicated by the red (known breeding areas) and yellow (predicted breeding range), and for Carnaby's cockatoo, the breeding range is indicated by the orange.

Artificial Hollows – best current design and installation specifications

The specifications below outline the most recent detailed specifications for artificial hollow construction installation and maintenance. These would provide for a well-constructed and installed artificial hollow that is most likely to have an adequate lifespan (minimum 50-years). To ensure longevity, regular maintenance will be required on the nesting material, sacrificial post, and removal of debris from the hollow.

It is highly recommended that any artificial hollows installed as a condition of environmental approval (for example where the artificial hollow is expected to provide benefit for a long period), or installed on DBCA managed lands would meet these specifications as a minimum.

Artificial Hollow Construction Specifications

- Dimensions: internal diameter 375mm (430 mm external), 1200 mm in height, and installed a minimum of 4 m above ground on private property and 8 m on public land.
- Pipe material: Fifty-year UV rated culvert pipe (polypropylene material used with corrugated outer wall and thin inner sleeve. Recommended brand or similar: The 'Vinidex StormPRO' pipes are twin wall, corrugated, polypropylene pipes for non-pressure stormwater and drainage applications, which meet all the requirements for artificial hollows.
- Chain: 6 mm galvanised (not zinc plated). The hollows will be attached to the tree by chain and fixed by 4 points.
- Fixings: Galvanised M10 coach screws four x 75 mm. Two on the weight bearing chain at the top and one each side of the hollow.
- Ladder: 50 x 50 mm square galvanised weldmesh 4mm thick.
- Chewing posts: Untreated Jarrah, Marri or Wandoo that meet requirements in "Adding ladders and sacrificial chewing posts" above.



Artificial hollow design, the fixing method, and the sacrificial chewing post extending above the hollow rim. Left image shows the side chains that are to be at a 30-degree upwards angle to allow the hollow to move up the tree as the tree grows. Right image shows the top weight bearing fixing which is to be 100 mm above the hollow to allow upwards movement.



Left image shows the internal view, including substrate material placed on the floor to line the hollow, and the internal weld mesh ladder. Substrate material must be coarse, hard, wood chips at least 200 mm deep.

Centre image shows one hard wood sacrificial post which is to fit and connect to the rim of the hollow by a hook screwed to the post to ensure it does not come loose, block the hollow or injure the occupants.

Right image shows the hard plastic floor which is to be securely fixed with a minimum of 12 small drainage holes. Larger holes may result in the occupants chewing the base.

Monitoring and Maintaining Artificial Hollows

It is important to continue a regime of regular maintenance for however long the artificial hollow is required. Artificial hollows erected as a condition of development to offset the loss of natural hollows may be required to be available and maintained for the life of the development approval. As part of establishing artificial hollows the responsibility and regime for long term monitoring and maintenance should also be established.

Periodic maintenance checks should be undertaken at least every two years, preferably annually, for as long as the artificial hollow is required. Maintenance actions should be completed prior to the breeding season.

Further Reading

DBCA webpage and fauna profiles: [Black cockatoos](#)

Department information sheets: [Fauna Note – Corellas and other flocking cockatoos](#)

BirdLife Australia webpage and brochure: [Identify your Black cockatoo](#)

Western Australian Museum webpage and fact sheets: [Cockatoo Care](#)

Saunders DA et al. (2022) Artificial nesting hollows for the conservation of Carnaby's cockatoo *Calyptorhynchus latirostris*: definitely not a case of erect and forget. Pacific Conservation Biology [doi:10.1071/PC21061](https://doi.org/10.1071/PC21061)

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Last updated: 08 Feb 2023



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9981/1
Permit type:	Purpose permit
Applicant name:	City of Wanneroo
Application received:	24 November 2022
Application area:	7.4 hectares of native vegetation
Purpose of clearing:	Road construction
Method of clearing:	Mechanical
Property:	<p>Flynn Drive Road Reserve (PIN 11751051)</p> <p>Greenwich Parade Road Reserve (PIN 1180634)</p> <p>Lot 5 on Diagram 91435</p> <p>Lot 900 on Deposited Plan 50843</p> <p>Lot 901 on Deposited Plan 50843</p> <p>Lot 902 on Deposited Plan 50843</p> <p>Lot 6001 on Deposited Plan 402319</p> <p>Lot 8002 on Deposited Plan 411322 (Crown Reserve 53763)</p> <p>Lot 8054 on Deposited Plan 402319 (Crown Reserve 53764)</p> <p>Lot 9943 on Diagram 53573 (Crown Reserve 35951)</p> <p>Mather Drive Road Reserve (PIN 11751046)</p> <p>Road (PIN 1177686)</p> <p>Road (PIN 11782987, PIN 12280440)</p> <p>Tranquil Drive Road Reserve (PIN 11751057)</p> <p>Ziata Road Reserve (PIN 11751041)</p>
Location (LGA area/s):	City of Wanneroo
Localities (suburb/s):	Banksia Grove, Carramar, Neerabup, Pinjar

1.2. Description of clearing activities

The City of Wanneroo proposes to upgrade Flynn Drive in three (3) stages. The project comprises of the construction of double carriage ways and associated infrastructures which include adjoining intersections, shared use pathways and connections, drainage and kerbing, street lighting, asset protection, signage and integrated landscaping. Funded by the State and Federal Governments, the road upgrades have been planned for several years for the public benefits in response to the increased traffic volumes and growing needs of residential and commercial road uses.

The application is to clear up to 7.4 ha of native vegetation within a clearing footprint (development envelope) of 20.22 ha for the Flynn Street Stages 2 and 3 Road Upgrade Project, which includes the construction of the double carriage ways and associated infrastructures from Tranquil Drive to Pinjar Road. The vegetation to be cleared is

distributed on both sides of an approximately 3.9 km stretch of road on Flynn Drive and approximately 150 m stretch into Mather Drive.

During assessment, the application area was increased from 6.0 ha of native vegetation within a clearing footprint of 12.16 ha due to the inclusion of the Stage 3 area into the development envelope which was previously applied for as a separate permit and subsequently withdrawn (CPS 10521/1).

1.3. Decision on application

Decision:	Granted
Decision date:	26 May 2025
Decision area:	7.4 hectares 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 original application for 21 days and two (2) submissions were received. During assessment, the application was readvertised for a further seven (7) days with one of the original submitters providing additional comments. Consideration of matters raised in the public submissions is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix H.1), the findings of flora and vegetation surveys and fauna surveys (see Appendix G), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), and relevant planning instruments and any other matters considered relevant to the assessment (see Section 3.3), including that the proposed road upgrades are to account for increased traffic in the region due to residential and commercial developments such as the Neerabup Industrial Estate. The public benefit of the proposal includes (City of Wanneroo, 2022b):

- improving road infrastructure and providing an arterial link from Wanneroo Road to Old Yanchep Road and the adjoining Neerabup Industrial Area
- a strategic transport link between the Mitchell Freeway and the Neerabup Industrial Area
- an important East / West link to the future proposed realigned Neaves Road and Whiteman Park to Yanchep Highway
- accommodate extra traffic capacity generated by the industrial development of Lot 9100, Mather Drive and subsequent development of additional land in the Neerabup Industrial Estate
- encourage investment and development, catering for the pace of development in this corridor
- reduce traffic congestion and frustration, and serve the community in Banksia Grove and Carramar residential areas and
- provide cycle lanes and shared paths and additional road connectivity for surrounding residents.

The assessment identified that the proposed clearing will result in:

- the loss of 5.7 hectare of high-quality foraging habitat for the Carnaby's cockatoo (*Zanda latirostris*),
- the loss of one (1) potential breeding tree containing four (4) hollows for the Carnaby's cockatoo,
- the loss of up to 0.81 ha of the State listed *Banksia attenuata* woodland over species rich dense shrublands threatened ecological community (SCP20a),
- the loss of up to 1.06 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain ecological community,
- the loss of 1.91 ha of vegetation growing in association with a Bush Forever Site,
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values, and
- potential land degradation in the form of wind erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing will result in the following significant residual impacts:

- the loss of up to 5.70 ha of high-quality foraging habitat for Carnaby's cockatoo
- the loss of four (4) hollows suitable for breeding by black cockatoos
- the loss of up to 0.81 ha of the State listed *Banksia attenuata* woodland over species rich dense shrublands TEC (SCP20a),
- the loss of up to 1.06 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain ecological community, and
- the loss of up to 1.91 ha of native vegetation growing in a Bush Forever Site.

In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), the Delegated Officer determined that an offset is required to counterbalance the above significant residual impacts. Further information on the suitability of the offset provided is summarised in Section 4.

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

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- commence road upgrades within three (3) months of clearing to minimise the risk of wind erosion,
- undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity
- the installation of five (5) artificial black cockatoo hollows within Lot 901 on Deposited Plan 409610, Bindoon
- the conservation and rehabilitation of 4.7 hectares of native vegetation within Montrose Park (R 33343), Girrawheen representative of the *Banksia attenuata* woodland over species rich dense shrublands TEC, Banksia Woodlands of the Swan Coastal Plain TEC and provides high quality foraging habitat for Carnaby's cockatoo,
- the conservation, revegetation and rehabilitation of 1.78 ha of native vegetation within Edgar Griffith Park (R 36601), Wanneroo composed of high-quality foraging habitat for Carnaby's cockatoo, and
- the conservation of 38.46 ha of high-quality foraging habitat for Carnaby's cockatoo within Lot 901 on Deposited Plan 409610, Bindoon

1.5. Site map

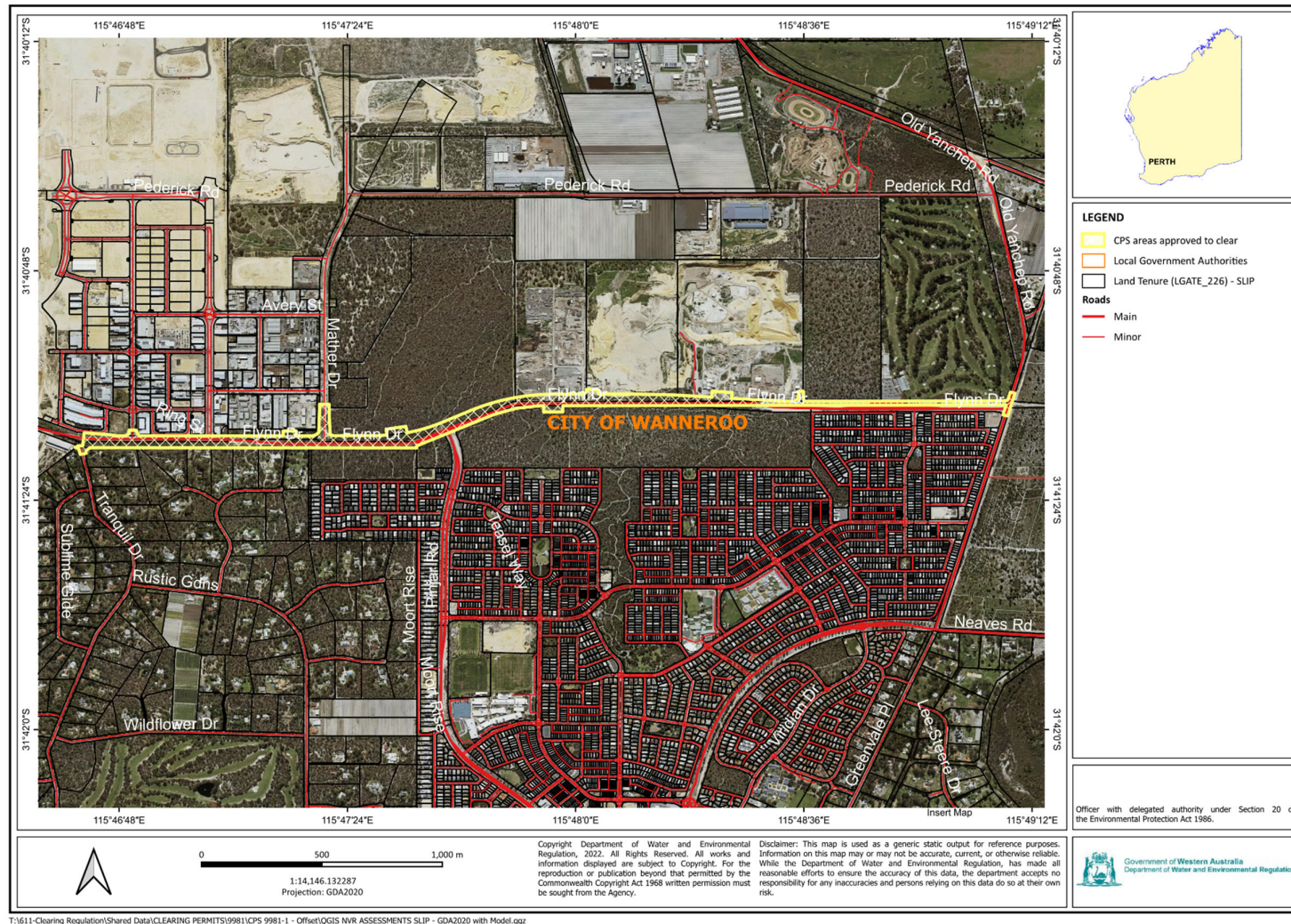


Figure 1. Map of the application area

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

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

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)
- *State Planning Policy 2.8 - Bushland policy for the Perth Metropolitan Region* (2021) (SPP 2.8)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Avoidance

The applicant advised that they were restricted in considering alternative locations to construct the proposed road. The City initially considered the existing cleared areas within the road reserve, however, this was not a feasible option due to the presence of underground pipelines which require cleared areas maintained for access (City of Wanneroo, 2023). The City also considered moving the road further south of the existing pavement, however, this would have required a larger amount of clearing, of which most is within Bush Forever Areas (City of Wanneroo, 2023).

Avoidance measures proposed by the applicant include (City of Wanneroo, 2023):

- reduced speed limit to 70 km/h instead of the typical 80 km/h for the type of road proposed, this allows for improved road geometrics and allows for greater retention of trees and vegetation where possible,
- the project will utilise roadside swales instead of large drainage sumps which would have required a larger clearing footprint,
- prior to commencing clearing, the City will require the civil contractor to conduct an inspection and determine if further tree retention is possible.

Mitigation

Mitigation measures proposed by the applicant include (City of Wanneroo, 2022b):

- surveying and clearly delineating the proposed clearing areas within the larger clearing footprint (with bunting/flagging) to ensure that no unauthorised clearing occurs outside of this footprint,
- adhering to the following environmental management plans:
 - flora and vegetation management plan,
 - fauna management plan, and
 - construction environmental management plan.
- seeking to avoid and mitigate further impacts from the proposed clearing by conducting an inspection prior to the commencement of clearing activities to determine if there are further opportunities to retain or minimise impacts to native vegetation.

Following concerns raised through public submission, the City undertook preliminary investigations into whether a fauna underpass could be utilised between the remaining native vegetation reserves. The applicant advised that this was not a preferable option as it would require a substantial amount of additional clearing into Mather and Wallangarra Reserves to achieve the vertical height to install the underpass (City of Wanneroo, 2023).

After consideration of avoidance and mitigation measures, it was determined that offsets to counterbalance the significant residual impacts to environmental values were necessary.

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 has had regard for the site characteristics (see Appendix C) 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, adjacent flora and vegetation), conservation areas, and land 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 (flora) – Clearing Principle (a)

Assessment

Two flora and vegetation surveys identified the following vegetation types within the proposed clearing area (Ecoscape, 2021a & 2022a):

- BAF - *Banksia* spp. and *Allocasuarina fraseriana* low open woodland.
- EmBaAf - *Eucalyptus marginata*, *Banksia attenuata* and *Allocasuarina fraseriana* mid woodland
- EgBsJs - *Eucalyptus gomphocephala* mid open woodland over *Banksia sessilis* and *Jacksonia sternbergiana* shrubs.

According to available databases, approximately 30 species of conservation significant flora have been recorded within the local area. One of the flora and vegetation surveys identified two species of Priority flora within the proposed clearing area, *Jacksonia sericea* (P4) and *Conostylis bracteata* (P3) (Ecoscape, 2021a). No threatened flora species were recorded within the application area.

Jacksonia sericea

One of the flora and vegetation surveys identified three populations of *Jacksonia sericea* (waldjumi) within the proposed clearing area totalling to approximately 105 individuals (Ecoscape, 2021a). According to available databases, waldjumi has been recorded in the local area 18 times, the nearest being 1.22 km from the proposed clearing.

Waldjumi is a low spreading shrub that produces orange flowers found in banksia or eucalyptus woodland and is often associated with disturbed areas such as roadsides (Florabase, 1998-). According to the WA Herbarium (Florabase, 1998-) the application is near the northern extent of the known distribution of waldjumi, however, it is noted that there are extensive records of waldjumi across the Perth Region, extending to Mandurah in the south. The flora survey also identified waldjumi in vegetation adjacent to the application (Ecoscape, 2021a), with suitable habitat still available in adjacent remnant vegetation. Given this, the proposed clearing is not likely to significantly impact on waldjumi on a local or regional scale.

Conostylis bracteata

One of the flora and vegetation surveys conducted identified one individual of *Conostylis bracteata* within the proposed clearing area (Ecoscape, 2021a). According to available databases, three populations of *C. bracteata* have been recorded in the local area, the nearest being 4.79 km from the proposed clearing.

C. bracteata is a perennial herb that produces yellow flowers generally found in banksia or jarrah woodland in consolidated sand dunes (Florabase, 1998-). According to the WA Herbarium, *C. bracteata* is associated with the northern Swan Coastal Plain, ranging from Perth's northern suburb to Ledge Point (Florabase, 1998-). The proposed clearing is in the middle of the species known distribution and the recorded individual was in vegetation adjacent to a reserve which contains similar habitat to the vegetation within the application area. It is considered that habitat for this species occurs within the adjacent reserve. Given the large range and local records of *C. bracteata*, the proposed clearing is not likely to significantly impact on the local or regional occurrence of this species.

The proposed clearing may result in the introduction and spread of weeds and dieback into adjacent vegetation that contain suitable habitat for and/or individuals of conservation significant flora, impacting on its habitat quality.

Conclusion

For the reasons set out above, it is considered that the proposed clearing is not likely to significantly impact on priority flora. Indirect impacts from the proposed clearing can be managed through taking actions to mitigate the spread of weeds and dieback into adjacent vegetation.

Conditions

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

- hygiene management to reduce the risk of introducing and spreading weeds and dieback into adjacent vegetation.

3.2.2. Biological values (Fauna) – Clearing Principles (a) and (b)

Assessment

The assessment identified 1173 records across 29 species of conservation significant fauna in the local area composed of 19 bird, six invertebrate, 10 mammal and two reptile species.

Two fauna surveys conducted (one for stage 2 and one for stage 3 of the project) identified the following habitat types within the proposed clearing area (Ecoscape, 2021b & 2022b):

- Banksia woodland - *Banksia attenuata*, *B. menziesii* over shrubs on grey sandy soils
- Tuart woodland - *Eucalyptus gomphocephala* (tuart) woodland over mixed shrubs
- Shrubland - Shrubland of revegetation or landscape plantings

The fauna surveys identified three conservation significant fauna species within the proposed clearing area (Ecoscape, 2021b & 2022b):

- Carnaby's cockatoo (*Zanda latirostris*) (EN),
- Quenda (*Isodon fusciventer*) (P4), and
- Rainbow bee-eater (*Merops ornatus*) (MA)

In addition to the above, based on the surveyed habitat types, the following species are considered to have suitable habitat within the proposed clearing area:

- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) (VU), and
- Graceful sunmoth (*Synemon gratiosa*) (P4)

Black cockatoos

According to available mapping, the proposed clearing is located within the known distribution of Carnaby's cockatoo (*Zanda latirostris*) and is partially mapped within the known vagrant distribution for the forest red-tailed black cockatoo (FRTBC) (*Calyptorhynchus banksii naso*). While habitat requirements for these species of black cockatoos differ, the requirements in general can be categorised as breeding habitat, foraging habitat and night roosting habitat. In the context of the application, the fauna surveys recorded the Carnaby's cockatoo within the proposed clearing area (Ecoscape, 2021b & 2022b).

Breeding habitat

Suitable breeding habitat for black cockatoos includes trees which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow (DAWE, 2022). Both of these species prefer to breed in woodland or forest but have been known to breed in partially cleared areas including isolated trees (DAWE, 2022). According to available databases, there are 17 recorded black cockatoo breeding sites in the local area.

Habitat trees considered potentially suitable for black cockatoo breeding generally have a DBH greater than 500 millimetres. The proposed clearing will include the removal of 16 trees with a suitable DBH (eight tuart and eight jarrah), 12 of which do not contain hollows, three contain unsuitable hollows and one which contains suitable hollows (tree 4) (Ecoscape, 2021b & 2022b, Natural Area Holdings, 2023a & 2023b). Tree 4 contains four (4) hollows that are of a suitable size for breeding but did not show evidence of use by black cockatoos (chew marks, feathers etc.) (Natural Area Holdings, 2023b), however, this does not mean they will not be used in the future.

Foraging

Black cockatoo species are noted to forage on a range of plant species, with the primary foraging resources varying between species (DAWE, 2022). Food resources within the range of roosting and breeding sites are important to sustain populations of black cockatoos, and foraging resources should therefore be viewed in the context of the

proximity to the known night roosting and breeding sites to the application area. Black cockatoos will generally forage up to 12 km from an active breeding site. Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DAWE, 2022).

Available databases indicate that there are 17 known breeding sites and 35 known roosting sites in the local area and therefore, the vegetation within the application area is likely to support foraging by both roosting and breeding populations. The fauna surveys observed foraging by Carnaby's cockatoo and secondary evidence of Carnaby's foraging in the form of chewed fruit (Ecoscape, 2021b & 2022b).

A key focus for the Swan Coastal Plain is the ongoing viability of foraging resources for black cockatoos, particularly Carnaby's cockatoo (DAWE, 2022). In considering the definitions of critical habitat for the species, the proximity of the application area to roosting and breeding sites, past evidence of foraging, and the cumulative loss of foraging habitat on the Swan Coastal Plain, the proposed clearing of 5.7 hectares of foraging habitat for Carnaby's cockatoo is considered to represent a significant residual impact.

The surveys noted that while some suitable foraging habitat for the FRTBC is present, it was low in density with limited suitable species (Ecoscape, 2021b & 2022b). Additionally, no evidence of foraging by FRTBC was observed in either fauna survey (Ecoscape, 2021b & 2022b). Given the proposed clearing is located on the edge of the mapped FRTBC vagrant distribution, it is considered that the species may be an occasional visitor to the site, but the proposed clearing area is not likely to consist of significant foraging habitat.

Roosting

Black cockatoo night roosts are usually located in the tallest trees of an area, and near both a food supply and surface water (DAWE, 2022). Available databases indicate that there are 35 black cockatoo roosts in the local area, two of which are recorded within one kilometre of the proposed clearing.

Black cockatoos rely upon the availability of night roosting habitat in proximity to foraging resources and rely on access to watering points in selecting night roost sites, with roost sites usually within two kilometres of a watering point. The fauna surveys did not identify any evidence of roosting within the proposed clearing area, however, one of the surveys did note suitable roosting habitat (Ecoscape, 2021b & 2022b). Noting the number of recorded roost sites in the local area, the proposed clearing is not likely to significantly impact on the availability of black cockatoo roosting habitat.

Quenda

Quenda (*Isodon fusciventer*) are a small ground dwelling marsupial endemic to the South West of Western Australia and are listed as Priority 4 species by DBCA. Quenda require a dense understorey for cover and are often found digging in leaf litter for invertebrates, earthworms, beetles and plant material, generally inhabiting dense understorey vegetation of forests, woodlands, shrubland and heathland (DBCA, 2017).

The Stage 2 fauna survey (Ecoscape, 2021b) recorded secondary evidence of quenda in the form of diggings and observed one deceased individual and a live individual within the proposed clearing area. Additionally, the assessment identified 147 records of quenda in the local area. The proposed clearing will result in the loss of suitable habitat for quenda; however, it is not likely to be significant given the presence of suitable habitat within remnant vegetation adjacent to the proposed clearing. Despite this, the proposed clearing may result in the direct harm or mortality of individuals that may be present within the vegetation.

Rainbow bee-eater

The rainbow bee-eater is a medium sized bird and is widely distributed throughout Australia and is listed as a Marine species under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). It occurs mainly in open forests and woodlands, shrublands and in cleared or semi-cleared habitats often near permanent water (DCCEEW, 2025). This species creates burrowed nests within the ground (nesting tunnels). The Stage 2 fauna survey observed this species within the proposed clearing area (Ecoscape, 2021b).

The fauna survey did not identify any evidence of breeding habitat within the proposed clearing area and noted that much of the proposed clearing area is not likely to be suitable for breeding given that much of the earth has been compacted from previous developments. Given that this species is migratory and can be found in many different habitats, the proposed clearing is not likely to impact on significant habitat for the species.

Graceful sun moth

The graceful sun moth is found only in south-west Western Australia, along a narrow strip of approximately 630 km in length of coastal habitat, from Kalbarri south to Binningup and are most common in open areas of herbland,

heathland and shrubland on secondary Quindalup dunes containing *Lomandra maritima* and banksia woodland with *L. hermaphrodita* (Bishop et. al, 2010). The fauna surveys did not record this species, however, according to available databases, the graceful sun moth has been recorded 71 times in the local area, the nearest being 0.04 km from the proposed clearing. The graceful sun moth is listed as Priority 4 by DBCA.

While the graceful sun moth has been recorded in different vegetation types, it is restricted to areas that contain *Lomandra maritima* or *L. hermaphrodita* which the species uses for breeding on as its caterpillars are adapted to only eating these plants (Bishop et. al., 2010). Both flora and vegetation surveys identified *L. hermaphrodita* within the proposed clearing area in very low density (Ecoscape, 2021a & 2022a). The low number of host plants suggests that the presence of the moth within the site is unlikely. Taking into consideration the known distribution of the species, its mobility and the extent of vegetation, which is present in the surrounding area, the application area is unlikely to provide significant habitat for graceful sunmoth.

Ecological linkage

Sections of the application area are within a linkage (11 - Links Bush Forever Sites 295 and 384) mapped in the Perth Regional Ecological Linkages (WALGA, 2004). This ecological linkage dataset represents the first step in the process of identifying patches of native vegetation that can act as stepping stones to form Regional Ecological Linkages. This linkage corresponds with conceptual linkage identified by the Ecological linkages proposed for the Gnarang Groundwater System (Brown et al, 2009). Conceptual linkages are described by Brown et. al. (2009) as “proposed ecological linkages based on past studies and new linkages across the landscapes with <60% native vegetation retained or on core landscapes that are predominantly over private property”.

While it is acknowledged that the application area is within the above mapped linkage and the clearing will remove a portion of this linkage, it is noted that the proposed clearing is associated with an existing road that crossed through the linkages previously and therefore, is not likely to significantly impact on the function of the linkage. Nevertheless, the proposed clearing will impact on vegetation that is a part of a linkage. The location of the clearing has the potential to increase the impact of edge effects and increase the spread of weeds throughout the remnant.

Conclusion

For the reasons set out above it is considered that impacts to the Carnaby's cockatoo constitutes a significant residual impact. Impacts to quenda can be managed through the implementation of slow, directional clearing, to allow individuals to move into adjacent remnant vegetation ahead of clearing activities.

In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), 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:

- hygiene management to reduce the risk of introducing and spreading weeds and dieback into adjacent vegetation.
- slow directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity
- fauna management (install black cockatoo nesting hollow), which requires the installation of five (5) artificial black cockatoo nesting hollows within Lot 901 on Deposited Plan 409610, Bindoon, and
- the provision of an offset to counterbalance the loss of 5.7 ha of high-quality foraging habitat for the Carnaby's cockatoo

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

Assessment

The preliminary assessment identified that the proposed clearing is mapped within two priority and threatened ecological communities (PEC/TEC), namely:

- Banksia Woodlands of the Swan Coastal Plain ecological community (Banksia woodlands), and
- *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) (SCP20a).

The Banksia Woodlands PEC/TEC is characterised by a prominent layer of Banksia species with other trees such as eucalypts either amongst or emerging above the Banksia canopy and a rich understorey (DoEE, 2016). This community is considered significant due to its capacity to support a diverse range of fauna and flora species (DoEE, 2016).

The SCP20a TEC is included within the EPBC Act listed Banksia Woodlands community, however, is distinguished by its restricted locations within sandy areas and has the densest species richness out of all identified banksia woodland community types, and as such is also listed as critically endangered under the *Biodiversity Conservation Act 2016* (BC Act) (DPaW, 2016).

The flora and vegetation surveys identified three vegetation types across the proposed clearing area (Ecoscape, 2021a & 2022a):

- BAF - *Banksia* spp. and *Allocasuarina fraseriana* low open woodland,
- EmBaAf: *Eucalyptus marginata*, *Banksia* spp and *Allocasuarina fraseriana* mid woodland, and
- EgBsJs: *Eucalyptus gomphocephala* mid open woodland over *Banksia sessilis* and *Jacksonia sternbergiana*

Based on the results of the survey, both the BAF and EmBaAf vegetation types were considered representative of SCP20a, whereas EgBsJs was identified as the Banksia woodlands PEC/TEC. The proposed clearing will result in the loss of 0.81 ha of SCP20a TEC and 1.06 ha of the Banksia woodlands PEC/TEC based on the project designs.

According to the Interim Recovery Plan for SCP20a (DPaW, 2016), the extent of the community is approximately 585 hectares, 290.5 ha of which is contained within conservation reserve. The proposed clearing would represent the loss of 0.14 per cent of the remaining extent of the community. Furthermore, the proposed clearing and final land use may result in increased edge effects, weed invasion, and introduce dieback into the remnant TEC which may result in further cumulative impacts to the maintenance of the community in the local area. The proposed clearing of 0.81 ha of SCP20a is considered a significant residual impact given the highly restricted nature of the community and its location within areas that are subject to significant development pressures.

While the Banksia Woodlands PEC/TEC is more common and is found throughout the Swan Coastal Plain, local cumulative impacts can be significant. The proposed clearing is located within an area subject to ongoing developments such as the Neerabup Industrial Area and therefore, and the proposed clearing will contribute to further fragmentation of the ecological community and is considered a significant impact.

Other Communities

The Stage 2 flora and vegetation survey (Ecoscape, 2021a) also identified that the proposed clearing could be representative of two other communities based on the presence of key species:

- Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community, and
- Northern Spearwood shrublands and woodlands ('floristic community type 24')

The "Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community" (Tuart Woodlands TEC/PEC) is listed as Priority 3 in Western Australia and Critically Endangered under the EPBC Act. This community is recorded twice within the local area, the nearest being approximately 3.89 km from the proposed clearing.

The Conservation Advice for the Tuart Woodlands TEC/PEC notes that structure of the community can vary greatly depending on factors such as rainfall, soil nutrients, landscape position, historical land use etc., but is generally characterised by an upper canopy of tuart, most commonly in woodlands or forests, but can occur in mallee formations (DoEE, 2019). The Stage 2 flora survey determined that the vegetation within the proposed clearing was not representative of this community (Ecoscape, 2021a). While the EgBsJs vegetation type is dominated by tuart trees, the survey determined that it did not meet the condition and patch size thresholds to be considered part of the EPBC Act community (Ecoscape, 2021a) and therefore, it is not considered for the proposed clearing to impact on the Tuart Woodlands PEC/TEC.

The "Northern Spearwood shrublands and woodlands ('floristic community type 24')" (SCP24) ecological community is listed as Priority 3 in Western Australia and Endangered under the EPBC Act (Part of the Banksia Woodlands TEC). This community is recorded nine times in the local area, the nearest being approximately 1.3 km from the proposed clearing.

This community is described as Heaths with scattered *Eucalyptus gomphocephala* occurring on deeper soils north from Woodman Point. Most sites occur on the Cottesloe unit of the Spearwood system. The heathlands in this group typically include *Dryandra sessilis* (now *Banksia sessilis*), *Calothamnus quadrifidus*, and *Schoenus grandiflorus* (DBCA, 2023). While the proposed clearing area contains some of the key species, it does not have the heath structure required to be considered part of this community (Ecoscape, 2021a) and therefore, it is not considered for the proposed clearing to result in the loss of SCP24.

Conclusion

For the reasons set out above, the loss of 0.81 ha of SCP20a and 1.06 ha of the Banksia Woodlands PEC/TEC constitutes a significant residual impact.

In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), 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:

- the provision of an offset to counterbalance the loss of 0.81 ha of the *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) ecological community,
- the provision of an offset to counterbalance the loss of 1.06 ha of the Banksia Woodlands of the Swan Coastal Plain ecological community; and
- hygiene management to reduce the risk of introducing and spreading weeds and dieback into adjacent vegetation.

3.2.4. Land and water resources (wind erosion) - Clearing Principles (g)

Assessment

The proposed clearing is mapped across two soil types, the Bassendean, Jandakot Phase (212Bs-Ja) and the Karrakatta Sand Yellow Phase (211Sp-Ky) which are characterised as yellow deep sands and pale deep sands (DPIRD, 2019). According to available risk mapping the proposed clearing area is susceptible to land degradation from wind erosion. Noting that the proposed clearing will remove a large area of native vegetation, and that limited native vegetation exists in the vicinity of the application area to act as a buffer, the proposed clearing has the potential to result in appreciable land degradation where there is significant disturbance to top soil and if bare ground is left exposed to weathering for an extended period between the clearing of surface vegetation and commencing road upgrades.

The proposed clearing is also adjacent to Bush Forever Areas and any land degradation from wind erosion could have indirect impacts on these areas through the mobilisation of topsoil.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on land degradation from wind erosion can be managed by minimising the time between clearing and the commencement of road construction.

Conditions

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

- commence road construction activities within three (3) months of undertaking the clearing authorised under this permit to reduce the potential for wind erosion

3.2.5. Significant remnant vegetation and conservation areas (Bush Forever) – Principle (h)

Assessment

Approximately 1.91 ha of the proposed clearing area is mapped within Bush Forever Site 295. The Department of Planning, Lands and Heritage (DPLH) advised that in accordance with State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region (SPP 2.8), conservation of the bushland is a priority except in circumstances where environmental, social or economic benefits, alternatives to clearing have been considered, clearing is minimised as much as possible and reasonable offset strategies are implemented (DPLH, 2023).

SPP 2.8 also sets out that unavoidable adverse impacts on regionally significant bushland within a Bush Forever areas should be offset at a ratio of at least 1:1 in habitat hectares, and at a ratio 2:1 when the conservation significance is deemed the highest (SPP 2.8 - Appendix 4). DPLH also further requested that they be consulted on regarding the offset given the significance of the values being impacted (DPLH, 2023). In this instance, the 2:1 ratio has been applied.

The City has proposed to conserve and rehabilitate Montrose Park in Girrawheen as an offset, which includes Montrose park's inclusion as a Bush Forever Area. The City is currently working to include the Park in the upcoming North Metropolitan Omnibus Amendment for the Perth Metropolitan Regional Scheme with support from DPLH (City of Wanneroo, 2025). More information about the proposed offset is available in Section 4 of the decision report.

There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into adjacent vegetation within Bush Forever Areas, which could impact on its habitat quality and connectivity.

Conclusion

Based on the above, it is likely that a significant residual impact would remain to areas of Bush Forever. It is determined that impacts to Bush Forever 295 can be addressed through adding areas of remnant vegetation into Bush Forever at a ratio of 2:1. Indirect impacts on remnant Bush Forever Areas can be managed through taking actions to mitigate the spread of weeds and dieback into adjacent vegetation.

Conditions

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

- hygiene management to reduce the risk of introducing and spreading weeds and dieback into adjacent vegetation, and
- the provision of an offset to place 3.82 ha of native vegetation under Bush Forever to counterbalance the loss of 1.91 ha of native vegetation growing in association with Bush Forever Area 295.

3.3. Relevant planning instruments and other matters

Cumulative impacts

The department notes that the upgrades to Flynn Drive are occurring over multiple stages, with a previous clearing permit (3731/1, which has been amended and is now CPS 3731/8). The City of Wanneroo subsequently applied for CPS 9981/1 (this application) and then CPS 10521/1. After discussions with the applicant, they agreed to withdraw the application for CPS 10521/1 and combine the area into CPS 9981/1 to allow for cumulative impacts to be assessed.

It is acknowledged that the proposed clearing is also located in proximity to the Neerabup Industrial Area which is subject to ongoing development. The cumulative impacts of the clearing occurring for the Neerabup Industrial Area development has been considered during the assessment of CPS 9981/1 and was a consideration in requiring offsets for this application.

Planning Framework

The proposed clearing and road upgrades is consistent with the Perth Metropolitan Regional Scheme which has identified the dual carriage way footprint for Flynn Drive for several years (City of Wanneroo, 2022b). The proposed clearing and road upgrades are also consistent with Neerabup Industrial Area – Agreed Structure Plan No. 17 which identifies the need to duplicate Flynn Drive as part of ongoing development (City of Wanneroo, 2020).

Necessity of the clearing

The '*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 road upgrades are to account for increased traffic in the region due to residential and commercial developments such as the Neerabup Industrial Estate, which is expected to have a public benefit, including (City of Wanneroo, 2022b):

- improving road infrastructure and providing an arterial link from Wanneroo Road to Old Yanchep Road and the adjoining Neerabup Industrial Area
- a strategic transport link between the Mitchell Freeway and the Neerabup Industrial Area
- an important East / West link to the future proposed realigned Neaves Road and Whiteman Park to Yanchep Highway
- accommodate extra traffic capacity generated by the industrial development of Lot 9100, Mather Drive and subsequent development of additional land in the Neerabup Industrial Estate
- encourage investment and development, catering for the pace of development in this corridor
- reduce traffic congestion and frustration, and serve the community in Banksia Grove and Carramar residential areas and
- provide cycle lanes and shared paths and additional road connectivity for surrounding residents.

EPBC Act referral

On 16 July 2024, the proposal was referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act (Reference: EPBC 2024/09948). On 16 October 2024, DCCEEW determined that the proposed action is a controlled action under the EPBC Act. That is, an action that will have or likely have a significant impact on one or more protected matters and therefore requires assessment and approval under the EPBC Act. As of the date of this report, a decision under the EPBC Act is yet to be made.

Aboriginal heritage

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

4 Suitability of offsets

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

- the loss of up to 5.70 ha of high-quality foraging habitat for Carnaby's cockatoo.
- the loss of four (4) hollows suitable for breeding by black cockatoos
- the loss of up to 0.81 ha of the State listed *Banksia attenuata* woodland over species rich dense shrublands TEC (SCP20a TEC),
- the loss of up to 1.06 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain ecological community (Banksia Woodlands PEC/TEC), and
- the loss of up to 1.91 ha of native vegetation growing in a Bush Forever Area

In determining the appropriateness of an offset, the Delegated Officer took into consideration the applicant's implementation of the mitigation hierarchy and the public benefit of the proposed clearing (see Section 3.1). In considering these matters, the Delegated Officer determined that it was appropriate to grant the clearing permit in relation to the significant residual impacts, on the basis that a suitable environmental offset was implemented to counterbalance the impacts.

The applicant proposed an environmental offset consisting of four components:

- the conservation and rehabilitation of 4.7 ha of the Banksia Woodland PEC/TEC, SCP20a TEC and high quality Carnaby's cockatoo foraging habitat and designation as a Bush Forever Area (5.7 ha) within Montrose Park, Girrawheen (Crown Reserve 33343)
- the conservation and revegetation of 1.78 ha of high quality Carnaby's cockatoo foraging habitat within Edgar Griffith Park, Wanneroo (R 36601)
- the conservation of 38.46 ha of high-quality foraging habitat for Carnaby's cockatoo within the applicant's banked offset at Lot 901 on Deposited Plan 409610, Bindoon, and
- the installation of five (5) artificial hollows within the applicant's banked offset at Lot 901 on Deposited Plan 409610, Bindoon.

Montrose Park

To counterbalance impacts to high-quality foraging habitat for Carnaby's cockatoo, the Banksia Woodlands PEC/TEC, SCP20a TEC and Bush Forever, the applicant has committed to the rehabilitation of 4.7 hectares of native vegetation within Montrose Park, Girrawheen (Crown Reserve 33343) and to conserve the vegetation by changing the vested purpose of the reserve from 'Public Recreation' to 'Conservation' in addition to the inclusion of the Reserve as a new Bush Forever Area (City of Wanneroo, 2025).

Clearing has historically occurred within the Reserve for developments such as a drainage sump, tennis courts, playground and car park (City of Wanneroo, 2025). The park is also a known occurrence of the SCP20a TEC as documented in the community's Recovery Plan (DPaW, 2016), with updated flora and vegetation surveys to be conducted in the Spring of 2025 to assist in planned rehabilitation actions (City of Wanneroo, 2025).

To offset clearing of 1.91 hectares of vegetation secured under Bush Forever, approximately 1:2 or two times the area of native vegetation to be cleared is needed to counterbalance the residual impact. Based on this, 3.82 hectares of vegetation is required to be added into Bush Forever. This is consistent with guidance under the SPP 2.8 for clearing within a Bush Forever site (detailed in Section 3.2.6) and WA Environmental Offsets Policy 2011. The City proposes to convert Montrose Park (5.7 ha) into a Bush Forever Area as part of their offset proposal. This is considered more than adequate to achieve a net gain to Bush Forever. The Department of Planning, Lands and Heritage have indicated their support for Montrose Park's inclusion as a Bush Forever Area and are working with the City for its inclusion in the upcoming Perth Metropolitan Scheme Omnibus Amendment (City of Wanneroo, 2025).

Edgar Griffith Park

To counterbalance impacts to high-quality foraging habitat for Carnaby's cockatoo, the applicant has committed to the revegetation and rehabilitation of 1.78 hectares of native vegetation within Edgar Griffith Park, Wanneroo (R 36601), and to change its vested purpose from 'Public Open Space' to 'Conservation' (City of Wanneroo, 2025).

A flora and vegetation survey of Edgar Griffith Park in Spring of 2024 mapped the proposed revegetation area as being 'completely degraded', consisting of mainly parkland cleared vegetation (Natural Area Holdings, 2024). The

proposed revegetation area is located adjacent to an existing remnant of vegetation that is part of Bush Forever Area 470, composed of both the Banksia Woodlands PEC/TEC and Tuart Woodlands PEC/TEC (Natural Area Holdings, 2024). The City is proposing to revegetate a portion of the parkland cleared area surrounding Edgar Griffith Park by re-spreading soil and seed bank from the proposed clearing area, in addition to infill planting, with species suitable for Carnaby's cockatoo foraging (City of Wanneroo, 2025).

In addition to providing suitable foraging habitat for Carnaby's cockatoo, the revegetation may also act as a buffer to the Bush Forever Area, reducing the impacts of edge effects to the remnant vegetation.

Lot 901, Bindoon

To offset the significant residual impact to the black cockatoo foraging and breeding habitat, the City intends to use a portion of their banked offset site (land acquisition offset) located within Lot 901 on Deposited Plan 409610, Bindoon (City of Wanneroo, 2025). In 2016, Lot 901 was purchased by the City as an offset against a previous clearing permit CPS 6359/2. In 2020, 36.75 hectares within Lot 901 was used as an offset for CPS 7982/2 and CPS 7982/3. In 2024, 5.92 hectares within Lot 901 was used as an offset for CPS 9515/1. The City banked the remainder of the land for future projects. Lot 901 is currently managed by DBCA.

The City has proposed an area of 38.46 hectares within Lot 901 to offset the loss of high-quality Carnaby's cockatoo foraging habitat and has committed to the installation of five (5) artificial hollows within this area to counterbalance the loss of four (4) suitable black cockatoo breeding hollows (City of Wanneroo, 2025). A biological survey of the Lot 901 identified that the proposed offset area contains high-quality foraging habitat for Carnaby's cockatoo and numerous trees suitable for the installation of artificial hollows (Ecoscape, 2020).

Conclusion

The offset proposal has been assessed against the *WA Environmental Offsets Policy* (2011) and *WA Environmental Offsets Guidelines* (August 2014) and informed by guidance such as *Quantifying Environmental Offsets in Western Australia* (DWER, 2021), and the Draft Procedure for Environmental Offset Metric Inputs and associated DWER WA environmental offsets calculator (DWER, 2022). Based on the calculations, the proposed offset counterbalances:

- 100.1 per cent of impacts to high-quality foraging habitat for Carnaby's cockatoo.
- 100 per cent of the impacts to suitable for breeding habitat for black cockatoos
- 115.8 per cent of impacts to the State listed *Banksia attenuata* woodland over species rich dense shrublands TEC,
- 128.8 per cent of impacts to the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain ecological community (Banksia Woodlands PEC/TEC), and
- 123 per cent of impacts to native vegetation growing in a Bush Forever Area.

The Delegated Officer considers that this adequately counterbalances the significant residual impacts listed above. The justification for the values used in the offset calculation is provided in Appendix F.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Response to request for further information, including (City of Wanneroo, 2023): <ul style="list-style-type: none"> • Additional avoidance and mitigation measures • Justification for the necessity of clearing, and • Black cockatoo hollow assessment (Ecoedge, 2023a & 2023b) 	See Section 3.1 Avoidance and mitigation measures and Section 3.3 Relevant planning instruments and other matters.
Final offset proposal (City of Wanneroo, 2025)	See Section 4 Suitability of offsets and Appendix F for offset calculations.

Appendix B. Details of public submissions

Summary of comments	Consideration of comment
Black cockatoos	See Section 3.2.2 for consideration of impacts to black cockatoos and Section 4 for the details of offsets.

Summary of comments	Consideration of comment
<ul style="list-style-type: none"> all remaining foraging habitat in this area is significant, given the clearing of the Gnangara Pine Plantation, the 2019-20 Yanchep fires, and potentially the January 2021 fires the vegetation is significant as foraging habitat due to proximity to several known roosting sites in the area the proposed clearing will result in the loss of local black cockatoo populations the proposed clearing is in proximity to one of the last Carnaby's cockatoo breeding sites in Perth 	
Cumulative impacts <ul style="list-style-type: none"> Need to consider the cumulative impacts of the proposal including loss from bushfires and predicted future loss from bush fires Consideration of cumulative impacts to black cockatoo habitat Consideration of smaller and unregulated habitat losses to black cockatoos occurring on the Swan Coastal Plain Loss of black cockatoo habitat can only be mitigated effectively by providing replacement habitat in the foraging range of affected flocks. Upgrade of Flynn Drive is being undertaken in three stages and its impacts considered under three separate clearing permit assessments. This does not provide for adequate consideration of the impacts along the full length of the road reserve. increased fauna in the semi-rural Carramar areas due to ongoing development in Neerabup and surrounds, concern about the ecological and environmental costs to the community from ongoing developments. 	<p>DWER's assessment of the cumulative impacts of native vegetation clearing was considered in accordance with 'A guide to the assessment of applications to clear native vegetation' (DER, 2013).</p> <p>Regarding black cockatoos, see Section 3.2.2. of the decision report for an assessment of cumulative impacts.</p> <p>Regarding multiple permits, the applicant combined the final stage of the permit into this application to allow for the cumulative impacts to be assessed. See section 3.3 for more information regarding cumulative impacts.</p>
Avoidance and mitigation <ul style="list-style-type: none"> The applicant should locate drainage swales in existing cleared areas to reduce clearing and minimise risk of spreading weeds into adjacent remnant vegetation. The applicant should incorporate fauna underpasses between the areas of remnant vegetation either side of the road Conservation fencing should be installed along the road to minimise risk of fauna strikes. 	See section 3.1 for consideration of avoidance and mitigation measures.
Ecological linkage <ul style="list-style-type: none"> The proposed clearing area will impact on vegetation that an ecological linkage under the City of Wanneroo's biodiversity strategy and Bush Forever Areas long-term effects of habitat fragmentation, isolation and increased risk of fauna being hit by cars are not being addressed in the road upgrade proposal. No alternative solutions to address these matters are provided 	See section 3.2.2 for consideration of impacts to ecological linkage values.

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of a roadside remnant native vegetation in the intensive land use zone of Western Australia. It is surrounded by urban development and large patches of remnant vegetations within the Bush Forever lands.

Characteristic	Details
	Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 34.18 per cent of the original native vegetation cover.
Ecological linkage	Parts of the vegetation proposed to be removed comprise the Perth Regional Ecological Linkages and the Gnangara Ecological Linkages.
Conservation areas	The proposed clearing area partially overlaps Bush Forever Area 295. The Gnangara-Moore River State Forest, vested within the Conservation Commission of WA is located immediately east of the application area.
Vegetation description	<p>Surveys conducted over the application area identified three types of vegetation, as follows (Ecoscape, 2020a & 2021a):</p> <ul style="list-style-type: none"> • BAF - <i>Banksia</i> spp. and <i>Allocasuarina fraseriana</i> low open woodland, • EmBaAf: <i>Eucalyptus marginata</i>, <i>Banksia</i> spp and <i>Allocasuarina fraseriana</i> mid woodland, and • EgBsJs – <i>Eucalyptus gomphocephala</i> mid open woodland over <i>Banksia sessilis</i> and <i>Jacksonia sternbergiana</i> <p>Representative photos and the surveys excerpts and maps are available in Appendix G.</p> <p>This is consistent with the following mapped vegetation types (Government of Western Australia, 2019):</p> <ul style="list-style-type: none"> • Karrakatta Complex – Central and South (49) described as: Predominantly open forest of Tuart-Jarrah-Marri and woodland of Jarrah-Banksia species. <i>Agonis flexuosa</i> is co-dominant south of the Capel River • Pinjar Complex (54) which is described as Vegetation ranges from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Banksia</i> species to a fringing woodland of <i>Eucalyptus rudis</i> (Flooded Gum) - <i>Melaleuca preissiana</i> (Moonah) and sedgelands. <p>The mapped vegetation types retain approximately 23.49 and 35.47 per cent respectively of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>The flora and vegetation surveys (Ecoscape, 2020 & 2021) indicate the vegetation within the proposed clearing area ranges from completely degraded to excellent (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E.</p> <p>The full survey descriptions and mapping are available in Appendix G.</p>
Climate and landform	<p>The climate of the application area and surrounds is characterised by a Mediterranean climate, with average summer maximum temperature exceed 22 degrees Celsius and mean annual rainfall of 794.9 mm.</p> <p>Landform of the proposed clearing area is described as low dunes Slopes <10% and generally more than 5m relief or Low hilly to gently undulating terrain.</p>
Soil description	<p>The soil is mapped as:</p> <ul style="list-style-type: none"> • Bassendean, Jandakot Phase (212Bs-Ja), described as Jandakot low dunes. Slopes <10% and generally more than 5m relief. Grey sand over pale yellow sands generally underlain by humic and iron podsols; <i>Banksia</i> spp. low open woodland with a dense shrub layer; • Karrakatta Sand Yellow Phase (211Sp-Ky). Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. <i>Banksia</i> spp. woodland with scattered emergent <i>E. gomphocephala</i> and <i>E. marginata</i> and a dense shrub layer. <p>Soils surveyed from the area is described as S7 soils, comprising of pale and olive yellow sand, medium to coarse grained sub-angular quartz, moderately sorted, of residual origin, modified by marine inundation.</p>
Land degradation risk	Both soil types are mapped as high risk for wind erosion and the Bassendean Jandakot Phase is mapped as high risk for Phosphorous export. The mapped soils were mapped as low risk for water erosion, sub-surface acidification and were not mapped as being at risk for acid sulphate soils.

Characteristic	Details
Waterbodies	The application area does not intersect any waterbodies. The nearest water bodies to the application area include the Little Coogee Flat approximately 600 m to the east and Lake Pinjar at 1.2 km to the north.
Hydrogeography	The majority of the application area is within the Wanneroo Coastal Lakes, with the most eastern part lies within the Swan Avon (Lower Swan) Catchment, and. It is within the Wanneroo Groundwater Area proclaimed under the RIWI Act.
Flora	<p>According to available databases there are 97 records across 30 species of conservation significant flora in the local area (10-kilometre radius), none of which were located within the proposed clearing. The nearest record is approximately 0.68 km from the proposed clearing area.</p> <p>One of the flora and vegetation surveys identified two species of conservation significance within the proposed clearing area, namely (Ecoscope, 2020):</p> <ul style="list-style-type: none"> • <i>Conostylis bracteata</i> (P3), and • <i>Jacksonia sericea</i> (P4).
Ecological communities	<p>The proposed clearing is mapped within two significant ecological communities, namely:</p> <ul style="list-style-type: none"> • <i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) (CR, BC Act and EN, EPBC Act), and • Banksia Woodlands of the Swan Coastal Plain ecological community (P3, DBCA and EN, EPBC Act) <p>The flora and vegetation surveys (Ecoscope, 2020 & 2021) indicate that the proposed clearing area does contain vegetation representative of these communities.</p>
Fauna	<p>According to available databases, there are 1173 records across 29 species of conservation significant fauna in the local area (10-kilometre radius). Two species have previously been recorded within the proposed clearing area, namely:</p> <ul style="list-style-type: none"> • Carnaby's cockatoo (<i>Zanda latirostris</i>) (EN), and • Quenda (<i>Isodon fusciventer</i>) (P4). <p>Additionally, another four species have previously been recorded within one kilometre of the proposal, namely:</p> <ul style="list-style-type: none"> • Graceful sunmoth (<i>Synemon gratiosa</i>) (P4) - 0.04 km, • Peregrine falcon (<i>Falco peregrinus</i>) (OS) - 0.84 km, • Western brush wallaby (<i>Notamacropus irma</i>) (P4) - 0.79 km, and • Woollybush bee (<i>Hylaeus globuliferus</i>) (P3) – 0.04 km <p>According to available databases, there are 17 recorded black cockatoo breeding sites and 35 recorded black cockatoo roosting sites in the local area.</p> <p>Three fauna species of conservation significance were recorded during the fauna surveys (REF):</p> <ul style="list-style-type: none"> • Carnaby's cockatoo, • Quenda, and • Rainbow bee-eater (<i>Merops ornatus</i>) (MA)

C.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix H.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	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 (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Conostylis bracteata</i>	P3	Y	Y	Y	4.79	8	Y
<i>Jacksonia sericea</i>	P4	Y	Y	Y	4.84	60	Y

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

C.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	Y	1.51	9	Y
<i>Isodon fusciventer</i> (quenda, southwestern brown bandicoot)	P4	Y	Y	0.00	147	Y
<i>Synemon gratio</i> (graceful sunmoth)	P4	Y	Y	0.04	71	Y
<i>Zanda latirostris</i> (Carnaby's cockatoo)	EN	Y	Y	0.00	664	Y
Zanda sp. 'white-tailed black cockatoo' (white-tailed black cockatoo)	EN	Y	Y	2.40	27	Y

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

C.4. Ecological community analysis table

Community name	Conservation status	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 (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)	CR (BC Act), EN (EPBC Act)	Y	Y	Y	0	1	Y
Banksia Woodlands of the Swan Coastal Plain ecological community	P3 (DBCA) EN (EPBC Act)	Y	Y	Y	0	6	Y

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

C.5. Land degradation risk table

Risk categories	Bassendean, Jandakot Phase	Karrakatta Sand Yellow Phase
Wind erosion	H2: >70% of map unit has a high to extreme wind erosion risk	H1: 50-70% of map unit has a high to extreme wind erosion risk

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains regionally significant flora, fauna, habitats and assemblages of plants, including vegetation that is representative of the "Banksia Woodlands of the Swan Coastal Plain Ecological Community" and the "<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)" ecological community, foraging and suitable breeding habitat for the Carnaby's cockatoo and individuals of Priority 4 flora species <i>Jacksonia sericea</i> and Priority 3 <i>Conostylis bracteata</i>.</p>	At variance	<p>Yes</p> <p>Refer to Section 3.2.1, 3.2.2 and 3.2.3 above.</p>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (b):</u> <i>"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."</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains significant foraging habitat for Carnaby's cockatoo and suitable foraging habitat for the forest red-tailed black cockatoo, as well as suitable habitat for several conservation significant fauna species. The proposed clearing is also part of a mapped ecological linkage.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</i></p> <p><u>Assessment:</u></p> <p>The flora and vegetation surveys did not identify any threatened flora within the proposed clearing area (Ecoscape, 2021a & 2022a). the application area is unlikely to contain habitat suitable for flora species listed under the BC Act.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>"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."</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing area contains vegetation representative of two threatened ecological communities (TEC), the "Banksia Woodlands of the Swan Coastal Plain Ecological Community" (Banksia Woodlands) and the "<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)" (SCP20a) ecological community.</p> <p>The Banksia Woodlands TEC is listed as Endangered under the EPBC Act and the SCP20a TEC is listed as Critically Endangered under the BC Act and is considered part of the Banksia Woodlands TEC under the EPBC Act.</p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."</i></p> <p><u>Assessment:</u></p> <p>The local area has a remnant vegetation cover of more than 30 per cent, which is consistent with the national objectives and targets for biodiversity conservation in Australia. The Karrakatta Complex only retains approximately 23 percent of its original extent. Noting that the application area lies within a constrained area of the Perth Metropolitan Regional Scheme, within which a minimum 10 per cent representative threshold is recommended (EPA, 2008), the vegetation extent is above this threshold.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>"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."</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing will result in the loss of approximately 1.91 ha of native vegetation growing in association with Bush Forever Area 295.</p>	At variance	Yes <i>Refer to Section 3.2.5, above.</i>
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (f):</u> <i>"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."</i></p> <p><u>Assessment:</u></p> <p>No water courses or wetlands are recorded within 600 m of application area, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality.</p>	Not at variance	No
<p><u>Principle (g):</u> <i>"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."</i></p> <p><u>Assessment:</u></p> <p>The surveyed soils are highly susceptible to wind. The proposed clearing has the potential to cause land degradation where there is significant disturbance of topsoil and if bare ground is left exposed to weathering for an extended period between clearing and development.</p>	May be at variance	Yes <i>Refer to Section 3.2.4, above.</i>
<p><u>Principle (i):</u> <i>"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."</i></p> <p><u>Assessment:</u></p> <p>Given no water courses or wetlands are recorded within 0.5 kilometres of the application area, the proposed clearing is unlikely to impact surface or ground water quality. The mapped soils are not at high risk of water erosion or waterlogging.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."</i></p> <p><u>Assessment:</u></p> <p>The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</p> <p>Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to contribute to waterlogging.</p>	Not likely to be at variance	No

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.

Condition	Description
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. Offset calculator value justification

F.1. Banksia Woodlands of the Swan Coastal Plain offset calculations

WA environmental offset calculator - Rationale for scores used in the offset calculator – Rehabilitation and conservation

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Banksia Woodlands PEC/TEC	The flora and vegetation surveys (Ecoscape, 2020a & 2021a) identified that a portion of the proposed clearing area is representative of the Banksia Woodlands of the Swan Coastal Plain Ecological Community (Banksia Woodlands PEC/TEC).
Type of environmental value	Ecological community	Banksia Woodlands of the Swan Coastal Plain Ecological Community
Conservation significance of environmental value	Threatened ecological community - endangered	The Banksia Woodlands PEC/TEC is managed as a Priority 3 Community by DBCA and is listed as Endangered under the EPBC Act. The highest listing is used for this calculation
Landscape-level value impacted	yes/no	No, the TEC is still present adjacent to the proposal contained within conservation tenure.
Significant impact		
Description	Banksia woodlands PEC/TEC	Native vegetation representative of the Banksia Woodlands PEC/TEC is proposed to be cleared for the purpose of road upgrades.
Significant impact (hectares)	1.06	Based on the results of the flora surveys (Ecoscape, 2020a & 2021a), approximately 1.06 ha of the Banksia Woodlands PEC/TEC is recorded within the proposed clearing area.
Quality (scale)	7.00	The flora and vegetation surveys (Ecoscape 2020a & 2021a) noted that the area mapped as the Banksia Woodlands PEC/TEC was generally in very good to excellent (Keighery, 1994) condition, despite its proximity to the existing road.
Rehabilitation credit		
Description	N/A	No onsite revegetation and rehabilitation proposed.
Offset		
Description	rehabilitation and conservation	Rehabilitation and conservation in perpetuity of Montrose Park, Girrawheen through the changing of zoned purpose from 'public recreation' to 'conservation', in addition to designating the Park as a Bush Forever Area.
Proposed offset (area in hectares)	4.70	Area proposed by the applicant to undergo rehabilitation within Montrose Park which contains the Banksia Woodlands PEC/TEC.

Current quality of offset site	5.00	Most of the vegetation within the park is in good (Keighery, 1994) condition due to its location within an urbanised area and public access to the park allowing rubbish, weeds and degradation of the vegetation in varying severity.
Future quality WITHOUT offset (scale)	5.00	The quality of the vegetation would likely remain the same without ongoing management.
Future quality WITH offset (scale)	7.00	Rehabilitation is expected to improve the quality of the vegetation from good to very good (Keighery, 1994) condition.
Time until ecological benefit (years)	11.00	It is assumed that the rehabilitated areas will take ten years to improve the vegetation quality of the site and 1 year for rehabilitation activities to commence.
Confidence in offset result (%)	90.0	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.00	The offset will be conserved in perpetuity through the changed vesting and Bush Forever designation, so the maximum time is applied.
Time until offset site secured (years)	1.00	Montrose Park is already managed by the City of Wanneroo, however, changing the zoned purpose to 'conservation' and designating the site for Bush Forever is expected to take approximately 12 months.
Risk of future loss WITHOUT offset (%)	15.0	There is a medium chance of loss as the park is zoned for 'public recreation' and has previously seen development such as the tennis courts and sump.
Risk of future loss WITH offset (%)	5.0	There is a low risk of loss as land will be conserved in perpetuity through changing the zoned purpose of the land to 'conservation' and designating the site as a Bush Forever Area.

F.2. *Banksia attenuata* woodlands over species rich dense shrublands (SCP20a)

WA environmental offset calculator - Rationale for scores used in the offset calculator – Rehabilitation and conservation

Calculation	Score (Area)	Rationale
Conservation significance		
Description	<i>Banksia attenuata</i> woodland over species rich dense shrublands TEC (SCP20a)	The flora and vegetation survey (Ecoscape, 2020a & 2021a) identified that a portion of the proposed clearing area is representative of the <i>Banksia attenuata</i> woodland over species rich dense shrublands (SCP20a) threatened ecological community (TEC).
Type of environmental value	Ecological community	<i>Banksia attenuata</i> woodland over species rich dense shrublands (SCP20a).
Conservation significance of environmental value	Threatened ecological community - critically endangered	SCP20a is listed as critically endangered under the BC Act and endangered under EPBC Act (as part of the Banksia Woodlands of the Swan Coastal Plain TEC).
Landscape-level value impacted	yes/no	No, the TEC is still present within vegetation under conservation tenure adjacent to the proposal.
Significant impact		
Description	<i>Banksia attenuata</i> woodland over species rich dense shrublands TEC (SCP20a)	The proposed clearing area contains native vegetation representative of the SCP20a TEC is proposed to be cleared for the purpose of road upgrades.
Significant impact (hectares)	0.81	Based on the results of the flora survey (Ecoscape, 2020a & 2021a), approximately 0.81 ha of SCP20a is recorded within the proposed clearing area.

Quality (scale)	7.00	The flora and vegetation survey (Ecoscape, 2020a & 2021a) noted that the area mapped as SCP20a was in very good to excellent (Keighery, 1994) condition, despite its proximity to the existing road.
Rehabilitation credit		
Description	N/A	No onsite revegetation and rehabilitation proposed.
Offset		
Description	Rehabilitation and conservation in perpetuity	Rehabilitation and conservation in perpetuity of Montrose Park, Girrawheen through the changing of zoned purpose from 'public recreation' to 'conservation', in addition to designating the Park as a Bush Forever Area.
Proposed offset (area in hectares)	4.70	Area proposed by the applicant to undergo rehabilitation within Montrose Park which contains SCP20a. Montrose Park is a documented occurrence of SCP20a according to the community's interim recovery plan (DPAW, 2016) and confirmed to be present in correspondence from DBCA (2025).
Current quality of offset site	5.00	Most of the vegetation within the Park is in good (Keighery, 1994) condition due to its location within an urbanised area and public access to the Park allowing rubbish, weeds and degradation of the vegetation in varying severity.
Future quality WITHOUT offset (scale)	5.00	The quality of the vegetation would likely remain the same without ongoing management.
Future quality WITH offset (scale)	7.00	Rehabilitation is expected to improve the quality of the vegetation from good to very good (Keighery, 1994) condition.
Time until ecological benefit (years)	11.00	It is assumed that the rehabilitated areas will take ten years to improve the vegetation quality of the site and 1 year for rehabilitation activities to commence.
Confidence in offset result (%)	90.0	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.00	The offset will be conserved in perpetuity through the changed vesting and Bush Forever designation, so the maximum time is applied.
Time until offset site secured (years)	1.00	Montrose Park is already managed by the City of Wanneroo, however, changing the zoned purpose to 'conservation' and designating the site for Bush Forever is expected to take approximately 12 months.
Risk of future loss WITHOUT offset (%)	15.0	There is a medium chance of loss as the park is zoned for 'public recreation' and has previously seen development such as the tennis courts and sump.
Risk of future loss WITH offset (%)	5.0	There is a low risk of loss as land will be conserved in perpetuity through changing the zoned purpose of the land to 'conservation' and designating the site as a Bush Forever Area.

F.3. Carnaby's cockatoo (foraging habitat)

WA environmental offset calculator - Rationale for scores used in the offset calculator – Rehabilitation and conservation

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Carnaby's cockatoo foraging habitat	The fauna surveys (Ecoscape, 2020b & 2021b) identified suitable foraging habitat for Carnaby's cockatoo within the proposed clearing area.

Type of environmental value	Species (flora/fauna)	Carnaby's cockatoo (<i>Zanda latirostris</i>)
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's cockatoo are listed as endangered under both the BC Act and EPBC Act.
Landscape-level value impacted	yes/no	No, suitable foraging habitat is still available in adjacent vegetation under conservation tenure.
Significant impact		
Description	Carnaby's cockatoo foraging habitat	The proposed clearing area containing high-quality foraging habitat for Carnaby's cockatoo is proposed to be cleared for the purpose of road upgrades.
Significant impact (hectares)	5.70	Based on the results of the fauna surveys (Ecoscape 2020b & 2021b), approximately 5.7 ha of the proposed clearing area is composed of high-quality foraging habitat for Carnaby's cockatoos.
Quality (scale)	8.00	The fauna surveys (Ecoscape, 2020b & 2021b) identified high-quality foraging habitat for Carnaby's cockatoos within the proposed clearing area including evidence of foraging. The application is located on the Swan Coastal Plain which is primarily used for foraging by Carnaby's cockatoo.
Rehabilitation credit		
Description	N/A	No onsite revegetation and rehabilitation proposed.
Offset		
Description	rehabilitation and conservation in perpetuity	Rehabilitation and conservation in perpetuity of Montrose Park, Girrawheen through the changing of zoned purpose from 'public recreation' to 'conservation', in addition to designating the Park as a Bush Forever Area.
Proposed offset (area in hectares)	4.70	Area proposed by the applicant to undergo rehabilitation within Montrose Park. This accounts for approximately 21.2 per cent of significant residual impacts to Carnaby's cockatoo.
Current quality of offset site	6.00	The vegetation within the reserve is Banksia Woodland which is a key foraging resource for Carnaby's cockatoo, however, ongoing and historical disturbance has impacted its habitat quality.
Future quality WITHOUT offset (scale)	6.00	The quality of the habitat would likely remain the same without ongoing management.
Future quality WITH offset (scale)	8.00	It is expected that infill planting and ongoing management within the park will improve the habitat quality by increasing the availability of foraging resources.
Time until ecological benefit (years)	16.00	It is assumed that it will take 15 years for the rehabilitated areas to provide sufficient foraging habitat for Carnaby's cockatoos and 1 year for rehabilitation activities to commence.
Confidence in offset result (%)	90.00	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.0	The offset will be conserved in perpetuity through the changed vesting and Bush Forever designation, so the maximum time is applied.
Time until offset site secured (years)	1.00	Montrose Park is already managed by the City of Wanneroo, however, changing the zoned purpose to 'conservation' and designating the site for Bush Forever is expected to take approximately 12 months.
Risk of future loss WITHOUT offset (%)	15.0	There is a medium chance of loss as the park is zoned for 'public recreation' and has previously seen development such as the tennis courts and sump.

Risk of future loss WITH offset (%)	5.0	There is a low risk of loss as land will be conserved in perpetuity through changing the zoned purpose of the land to 'conservation' and designating the site as a Bush Forever Area.
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**WA environmental offset calculator - Rationale for scores used in the offset calculator –
Revegetation and conservation**

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Carnaby's cockatoo foraging habitat	The fauna surveys (Ecoscape, 2020b & 2021b) identified suitable foraging habitat for Carnaby's cockatoo within the proposed clearing area
Type of environmental value	Species (flora/fauna)	Carnaby's cockatoo (<i>Zanda latirostris</i>)
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's cockatoo are listed as endangered under both the BC Act and EPBC Act
Landscape-level value impacted	yes/no	No, suitable foraging habitat is still available in adjacent vegetation under conservation tenure
Significant impact		
Description	Carnaby's cockatoo foraging habitat	The proposed clearing area containing high-quality foraging habitat for Carnaby's cockatoo is proposed to be cleared for the purpose of road upgrades
Significant impact (hectares)	5.70	Based on the results of the fauna surveys (Ecoscape 2020b & 2021b), approximately 5.7 ha of the proposed clearing area is composed of high-quality foraging habitat for Carnaby's cockatoos
Quality (scale)	8.00	The fauna surveys (Ecoscape, 2020b & 2021b) identified high-quality foraging habitat for Carnaby's cockatoos within the proposed clearing area including evidence of foraging. The application is located on the Swan Coastal Plain which is primarily used for foraging by Carnaby's cockatoo.
Rehabilitation credit		
Description	N/A	No onsite revegetation and rehabilitation proposed.
Offset		
Description	rehabilitation and conservation in perpetuity	Revegetation/rehabilitation and conservation in perpetuity within Edgar Griffiths Park, Wanneroo through the changing of zoned purpose from 'public open space' to 'conservation'.
Proposed offset (area in hectares)	1.78	Area proposed by the applicant, surrounding existing bushland. This accounts for 12.2 per cent of significant residual impacts to Carnaby's cockatoo.
Current quality of offset site	1.00	The proposed revegetation areas are in completely degraded (Keighery, 1994) condition/parkland cleared with scattered trees.
Future quality WITHOUT offset (scale)	1.00	The quality of the vegetation would likely remain the same without ongoing management.
Future quality WITH offset (scale)	5.00	The applicant has proposed to undergo revegetation and rehabilitation within the Park with species found within banksia woodlands which is expected to provide moderate quality foraging habitat.
Time until ecological benefit (years)	16.00	It is assumed that it will take 15 years for the rehabilitated areas to provide sufficient foraging habitat for Carnaby's cockatoos and 1 year for the commencement of revegetation activities

Confidence in offset result (%)	90.0	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site
Duration of offset implementation (maximum 20 years)	20.00	The offset will be conserved in perpetuity, so the maximum time is applied
Time until offset site secured (years)	1.00	Edgar Griffiths Park is already managed by the City of Wanneroo, however, changing the zoned purpose to 'conservation' is expected to take approximately 12 months
Risk of future loss WITHOUT offset (%)	20.0%	The site is currently zoned as 'public open space' under the Local Planning Scheme and is mapped for retention under the East Wanneroo Structure plan, however, is zoned as 'urban deferred' under the Metropolitan Regional Scheme, meaning there is a moderate to high chance that the site could be developed further in the future.
Risk of future loss WITH offset (%)	5.0%	The land will be conserved in perpetuity through changing the zoned purpose of the land to 'conservation'.

WA environmental offset calculator -Rationale for scores used in the offset calculator – Conservation

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Carnaby's cockatoo foraging habitat	The fauna surveys (Ecoscape, 2020b & 2021b) identified suitable foraging habitat for Carnaby's cockatoo within the proposed clearing area
Type of environmental value	Species (flora/fauna)	Carnaby's cockatoo (<i>Zanda latirostris</i>)
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's cockatoo are listed as endangered under both the BC Act and EPBC Act
Landscape-level value impacted	yes/no	No, suitable foraging habitat is still available in adjacent vegetation under conservation tenure
Significant impact		
Description	Carnaby's cockatoo foraging habitat	The proposed clearing area containing high-quality foraging habitat for Carnaby's cockatoo is proposed to be cleared for the purpose of road upgrades
Significant impact (hectares)	5.70	Based on the results of the fauna surveys (Ecoscape 2020b & 2021b), approximately 5.7 ha of the proposed clearing area is composed of high-quality foraging habitat for Carnaby's cockatoos
Quality (scale)	8.00	The fauna surveys (Ecoscape, 2020b & 2021b) identified high-quality foraging habitat for Carnaby's cockatoos within the proposed clearing area including evidence of foraging. The application is located on the Swan Coastal Plain which is primarily used for foraging by Carnaby's cockatoo.
Rehabilitation credit		
Description	N/A	No onsite revegetation and rehabilitation proposed.
Offset		
Description	Conservation in perpetuity	The City will allocate a portion of their banked offset at Lot 901 on Deposited Plan 409610, Bindoon which is managed by DBCA for conservation in perpetuity.
Proposed offset (area in hectares)	38.46	Area proposed by the applicant. This accounts for 66.7 per cent of significant residual impacts to Carnaby's cockatoo.

Current quality of offset site	8.00	A black cockatoo habitat survey (Ecoscape, 2020c) identified that Lot 901 contains high-quality foraging habitat for Carnaby's cockatoo including observations of secondary foraging. The offset site is also in proximity to several breeding and roosting sites in the local area.
Future quality WITHOUT offset (scale)	8.00	The quality of the vegetation would likely remain the same without ongoing management.
Future quality WITH offset (scale)	8.00	It is assumed that the habitat will maintain its current quality without additional management.
Time until ecological benefit (years)	1.00	The offset is banked and is already under conservation tenure, so the minimum value is applied
Confidence in offset result (%)	90.0	The site has been ceded to DBCA for conservation in perpetuity so there is a very high confidence in the offset result.
Duration of offset implementation (maximum 20 years)	20.00	The offset will be conserved in perpetuity, so the maximum time is applied
Time until offset site secured (years)	1.00	Lot 901 is a banked offset that is already secure, therefore the minimum value is applied.
Risk of future loss WITHOUT offset (%)	15.0%	the offset area is located within a rural zoning and so there is a moderate risk of future loss. The City is not penalised for planning ahead and banking areas for future offsets.
Risk of future loss WITH offset (%)	5.0%	it is considered that the land ceded to DBCA will substantially reduce the risk of loss of the site

F.4. Carnaby's cockatoo (breeding habitat)

WA environmental offset calculator - Rationale for scores used in the offset calculator – Artificial hollows

Calculation	Score (Feature)	Rationale
Conservation significance		
Description	Black cockatoo breeding habitat	A tree assessment (Natural Area Holdings, 2023a) identified that one tree contains hollows suitable for black cockatoo breeding
Type of environmental value	Species (flora/fauna)	Carnaby's cockatoo (<i>Zanda latirostris</i>)
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's cockatoo are listed as endangered under both the BC Act and EPBC Act
Landscape-level value impacted	yes/no	Yes. It is considered that any loss of suitable black cockatoo breeding habitat is significant on a landscape level.
Significant impact		
Description	Black cockatoo breeding hollows	One tree containing suitably sized hollows to provide significant breeding habitat for Carnaby's cockatoo are proposed to be cleared for the purpose of road upgrades.
Type of feature	Suitable breeding hollows	The loss of suitably sized hollows for breeding by Carnaby's cockatoos as identified in the tree habitat assessment (Natural Area Holdings 2023b)
Number	4.00	The results of the tree assessment noted four hollows of a suitable size to provide breeding for black cockatoos (Natural Area Holdings, 2023b)
Rehabilitation credit		
Description	N/A	Not applicable for artificial hollows
Offset		

Description	Artificial hollow installation	The applicant has committed to installing five artificial nest hollows for Carnaby's cockatoos within their banked offset site in Bindoon.
Start number (of type of feature)	0.00	The area proposed for inclusion under the banked offset does not currently contain trees with suitable hollows for black cockatoos, only 2 trees were identified as containing hollows, they were not suitable for black cockatoos (Ecoedge, 2021)
Future number WITHOUT offset	0.00	Given that no suitable habitat trees were identified within the proposed offset area, it is not likely hollows will develop in the foreseeable future
Future number WITH offset	5.00	The applicant has committed to installing five artificial nest hollows for Carnaby's cockatoos within their Bindoon banked offset site. This accounts for 100 per cent of significant residual impacts to suitable breeding habitat for Carnaby's cockatoo
Time until ecological benefit (years)	1.00	The installation of the hollows will be done prior to the next breeding season.
Confidence in offset result (%)	90.0	The offset is contained within a banked offset site under conservation tenure and is located within the mapped breeding distribution of Carnaby's cockatoo

Appendix G. Biological survey information excerpts

Flynn Drive flora and vegetation survey 2020 (Ecoscape, 2021a)



Landform	Mapping unit	Vegetation type	Floristic quadrats	Representative photograph	Other characteristic species	Area (ha) and extent (%)
Undulating Plain	EmBaAf	<i>Eucalyptus marginata</i> , <i>Banksia attenuata</i> and <i>Allocasuarina fraseriana</i> mid woodland over <i>Xanthorrhoea preissii</i> mid open shrubland over <i>Hibbertia hypericoides</i> and <i>Mesomelaena pseudostygia</i> low sparse shrubland and sedges.	FD01 FD02 FD03		<i>Alexgeorgea nitens</i> , <i>Adenanthos cygnorum</i> , <i>Allocasuarina fraseriana</i> , <i>Banksia attenuata</i> , <i>Banksia menziesii</i> , <i>Burchardia congesta</i> , <i>Caladenia flava</i> subsp. <i>flava</i> , <i>Conostephium pendulum</i> , <i>Daviesia triflora</i> , <i>Desmocladius flexuosus</i> , <i>Drosera erythrorhiza</i> , <i>Drosera macrantha</i> , <i>Eucalyptus marginata</i> , <i>Hibbertia hypericoides</i> , <i>Lepidobolus preissianus</i> , <i>Lomandra preissii</i> , <i>Mesomelaena pseudostygia</i> , <i>Petrophile linearis</i> , <i>Pimelea sulphurea</i> , <i>Rytidosperma occidentale</i> , <i>Stirlingia latifolia</i> , <i>Stylidium androsaceum</i> , <i>Stylidium piliferum</i> , <i>Thysanotus</i> sp. Coastal plain (N.H. Brittan 66/63), <i>Xanthorrhoea preissii</i> .	3.41 ha 16.61%
Undulating Plain	EgBsJs	<i>Eucalyptus gomphocephala</i> mid open woodland over <i>Banksia sessilis</i> , <i>Jacksonia sternbergiana</i> and <i>Xanthorrhoea preissii</i> tall open shrubland over exotic grassland.	FD04 FD05 FD06		<i>Acacia saligna</i> , <i>Acanthocarpus preissii</i> , <i>Banksia sessilis</i> , <i>Caladenia latifolia</i> , <i>Conostylis</i> ? <i>pauciflora</i> subsp. <i>pauciflora</i> , <i>Corynotheca micrantha</i> , <i>Dianella revoluta</i> , <i>Eucalyptus gomphocephala</i> , <i>Hardenbergia comptoniana</i> , <i>Jacksonia sternbergiana</i> , <i>Phyllanthus calycinus</i> , <i>Styphelia propinqua</i> , <i>Tricoryne elatior</i> , <i>Xanthorrhoea preissii</i> .	6.59 ha 32.10%
Cleared / Not Vegetated						9.64 ha 46.95%
Revegetation / Landscape Planting						0.89 ha 4.34%
TOTAL EXTENT						20.54 ha 100%

Figure 2. Descriptions of vegetation types recorded within western section of the proposed clearing area.

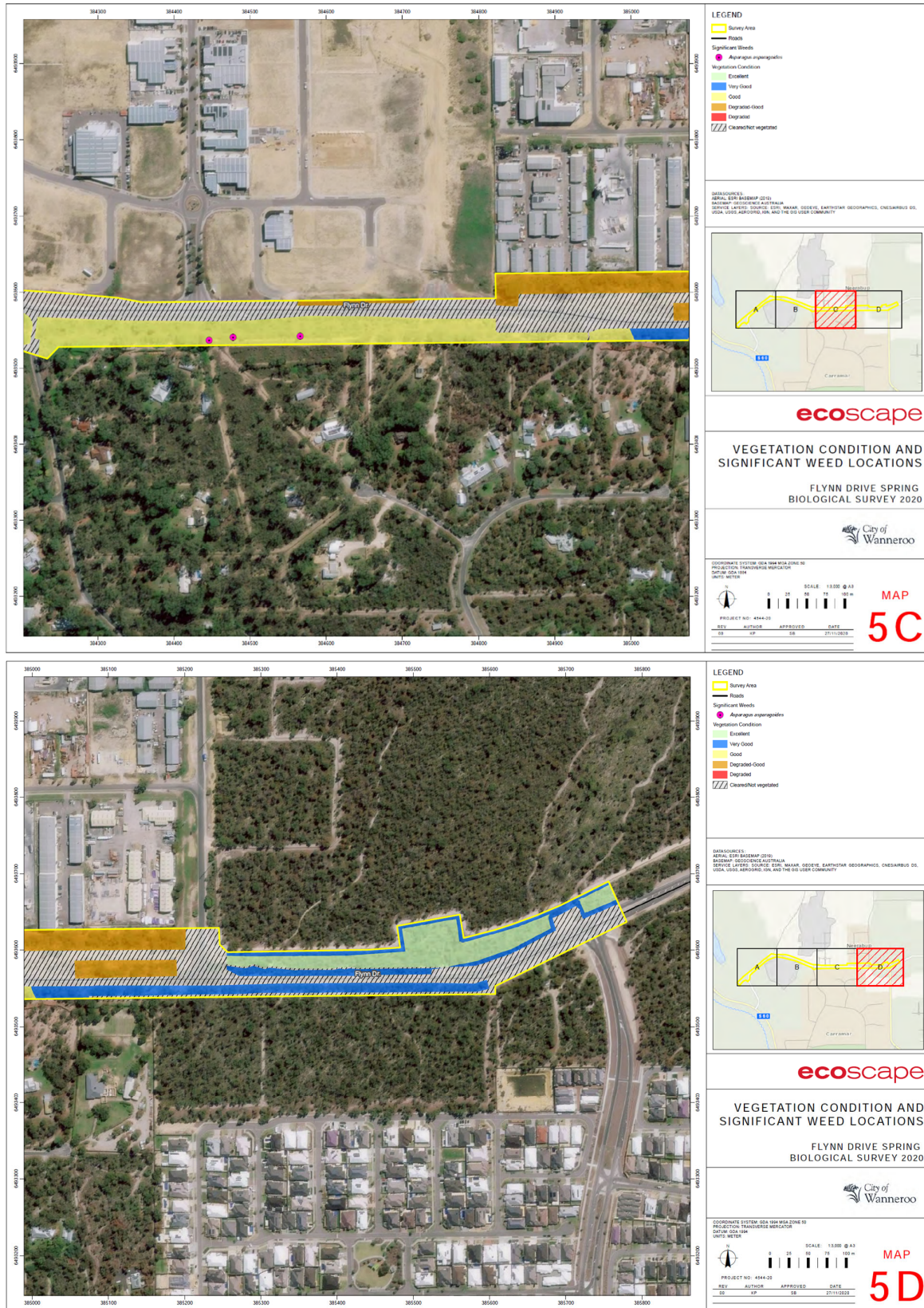


Figure 4. Vegetation condition and significant weed locations within the western section of the proposed clearing area.

Flynn Drive (stage 2) flora and vegetation survey 2021 (Ecoscape, 2022a)




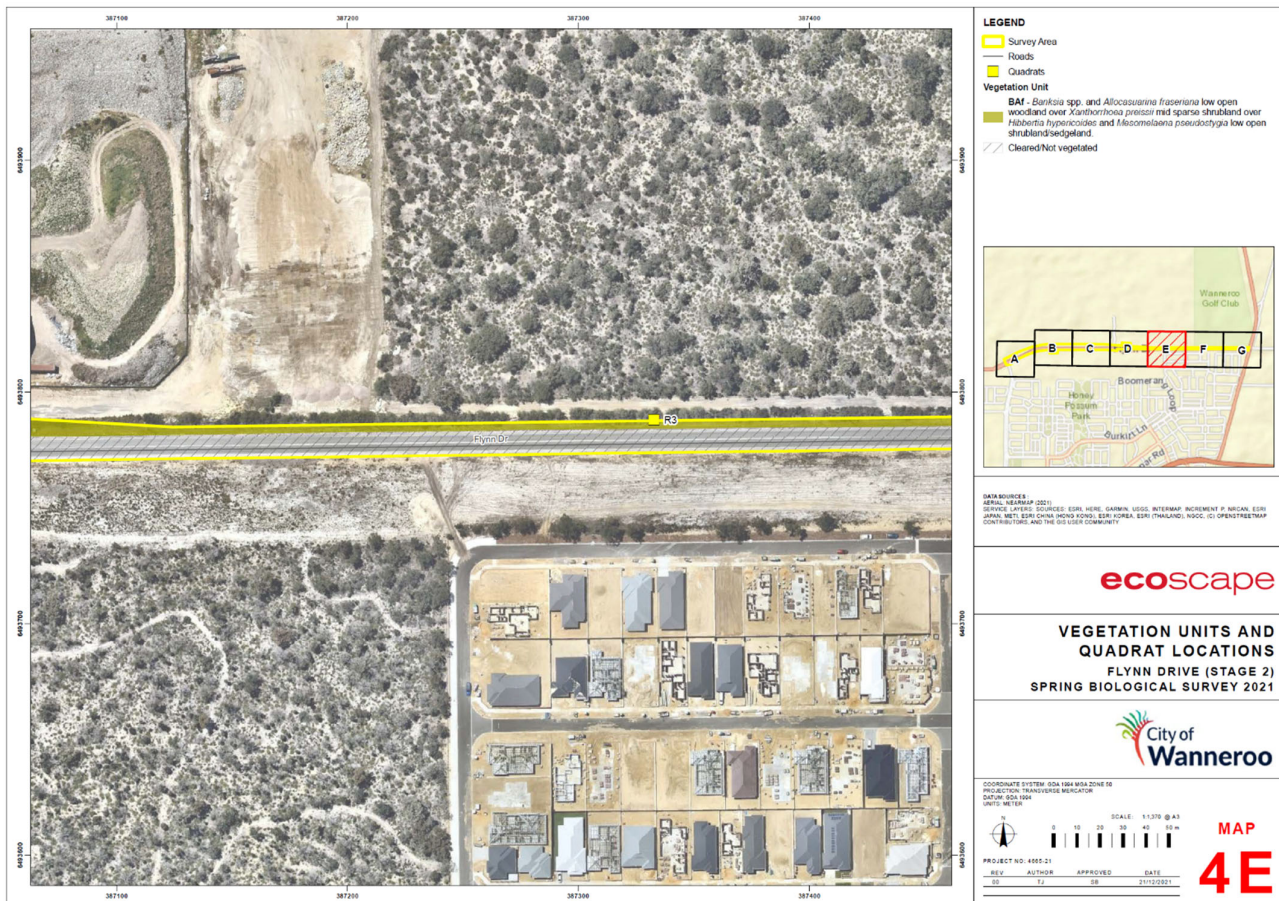
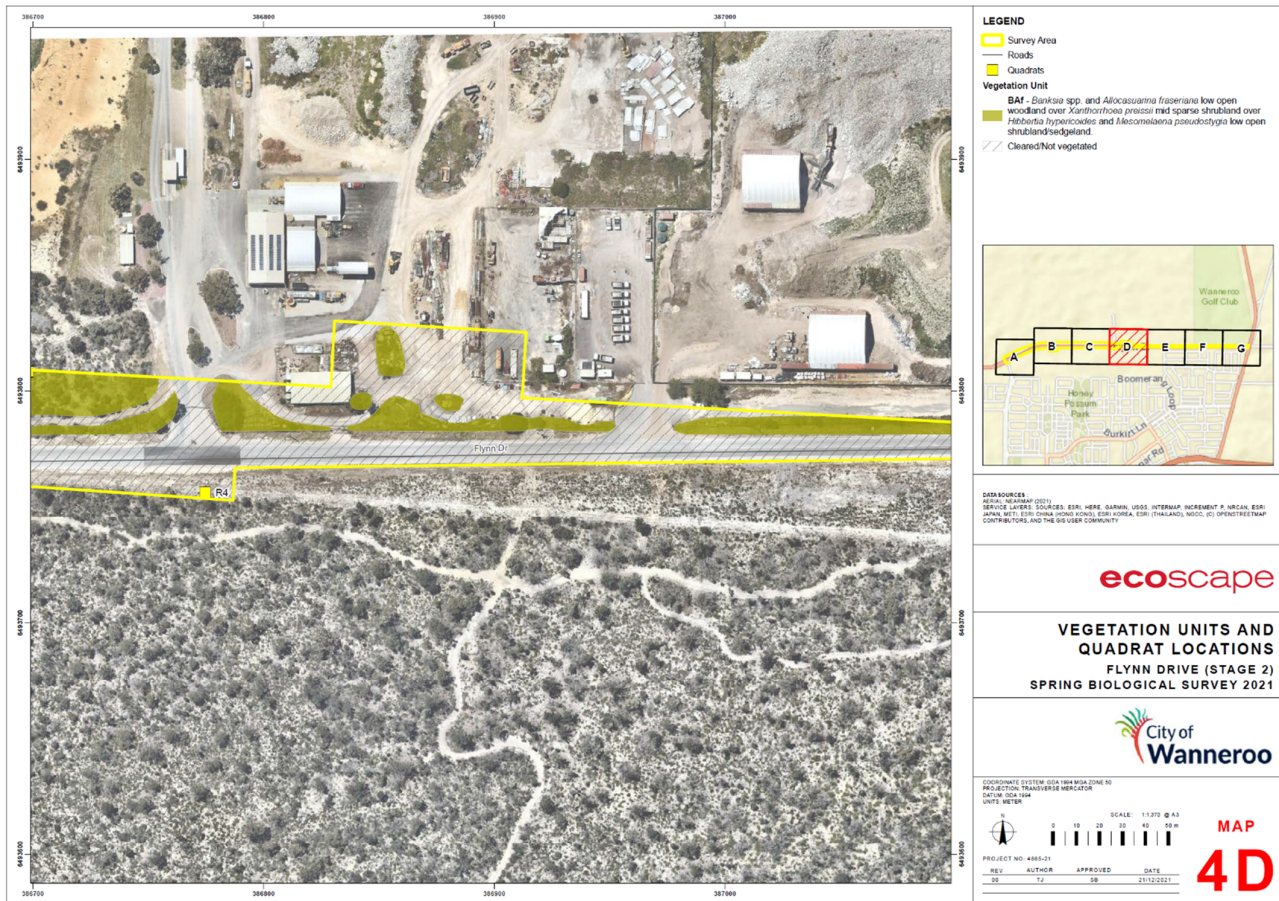
Landform	Mapping unit	Floristic quadrats / relevés	Vegetation type	Characteristic species	Representative photograph	Area (ha) and extent (%)
Undulating Plain	BAf	Q01 Q02 Q03	<i>Banksia</i> spp. and <i>Allocasuarina fraseriana</i> low open woodland, over <i>Xanthorrhoea preissii</i> mid sparse shrubland, over <i>Hibbertia hypericoides</i> and <i>Mesomelaena pseudostygia</i> low open shrubland/sedgeland.	<i>Adenanthos cygnorum</i> , <i>Alexgeorgea nitens</i> , <i>Allocasuarina fraseriana</i> , <i>Anigozanthos manglesii</i> , <i>Banksia attenuata</i> , <i>Banksia menziesii</i> , <i>Bossiaea eriocarpa</i> , <i>Burchardia congesta</i> , <i>Caladenia flava</i> , <i>Conostylis aculeata</i> subsp. <i>cygnorum</i> , <i>Conostylis setigera</i> subsp. <i>setigera</i> , <i>Crassula colorata</i> , <i>Dampiera linearis</i> , <i>Daviesia nudiflora</i> , <i>Daviesia triflora</i> , <i>Desmocladius fasciculatus</i> , <i>Desmocladius flexuosus</i> , <i>Drosera erythrorhiza</i> , <i>Haemodorum laxum</i> , <i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i> , <i>Hyalosperma cotula</i> , <i>Mesomelaena pseudostygia</i> , <i>Philothea spicata</i> , <i>Stirlingia latifolia</i> , <i>Stylidium androsaceum</i> , <i>Stylidium neurophyllum</i> , <i>Trachymene pilosa</i> , <i>Xanthorrhoea preissii</i> .		2.54 ha 28.74%
Undulating Plain	n/a	Q04	Revegetation			0.26 ha 2.99%
Undulating Plain	n/a	R01 R02 R03 R04	Cleared / Not Vegetated			6.03 ha 68.27%
TOTAL EXTENT						8.83 ha 100%

Figure 5. Descriptions of vegetation types recorded within the eastern section of the proposed clearing area.





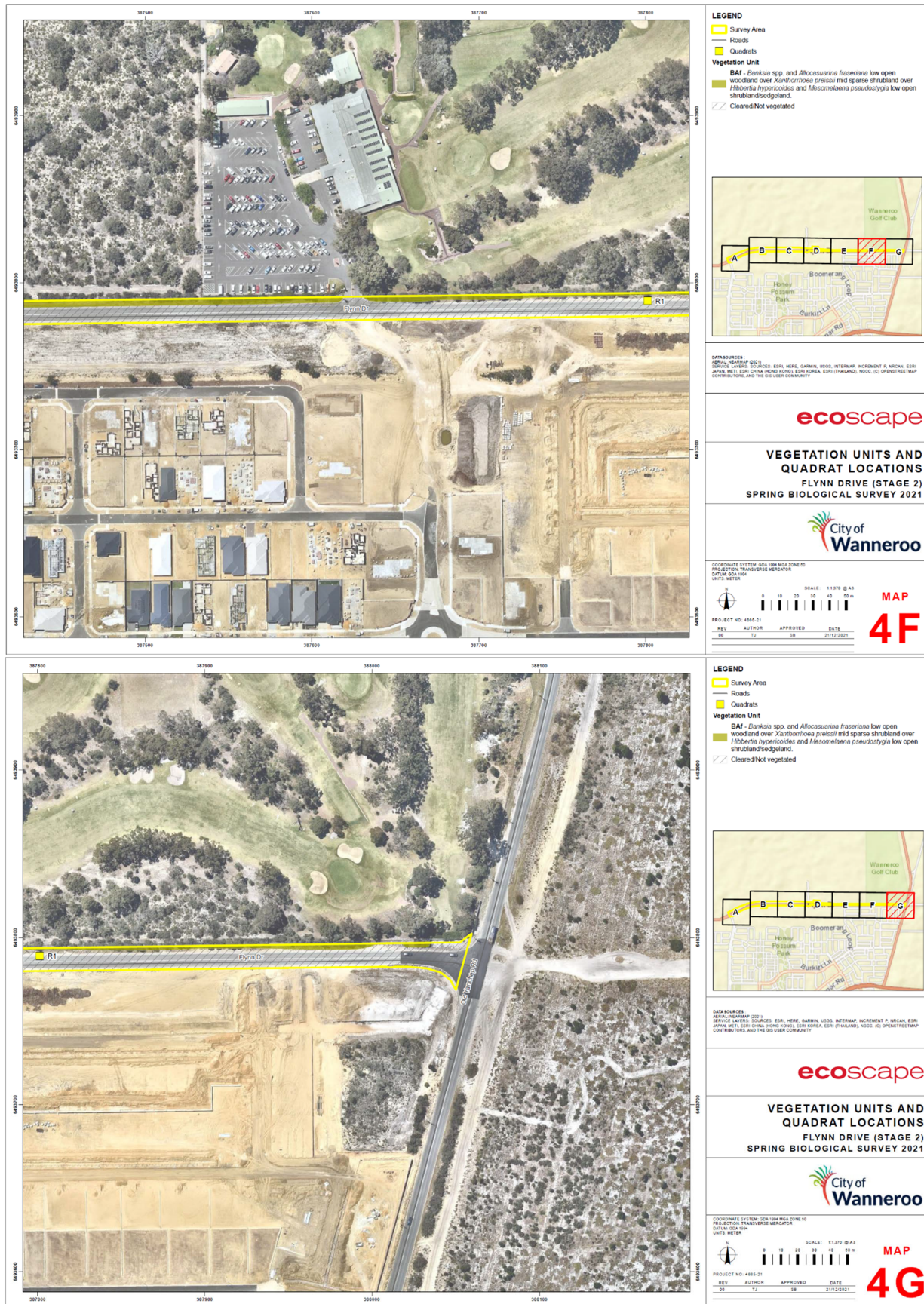
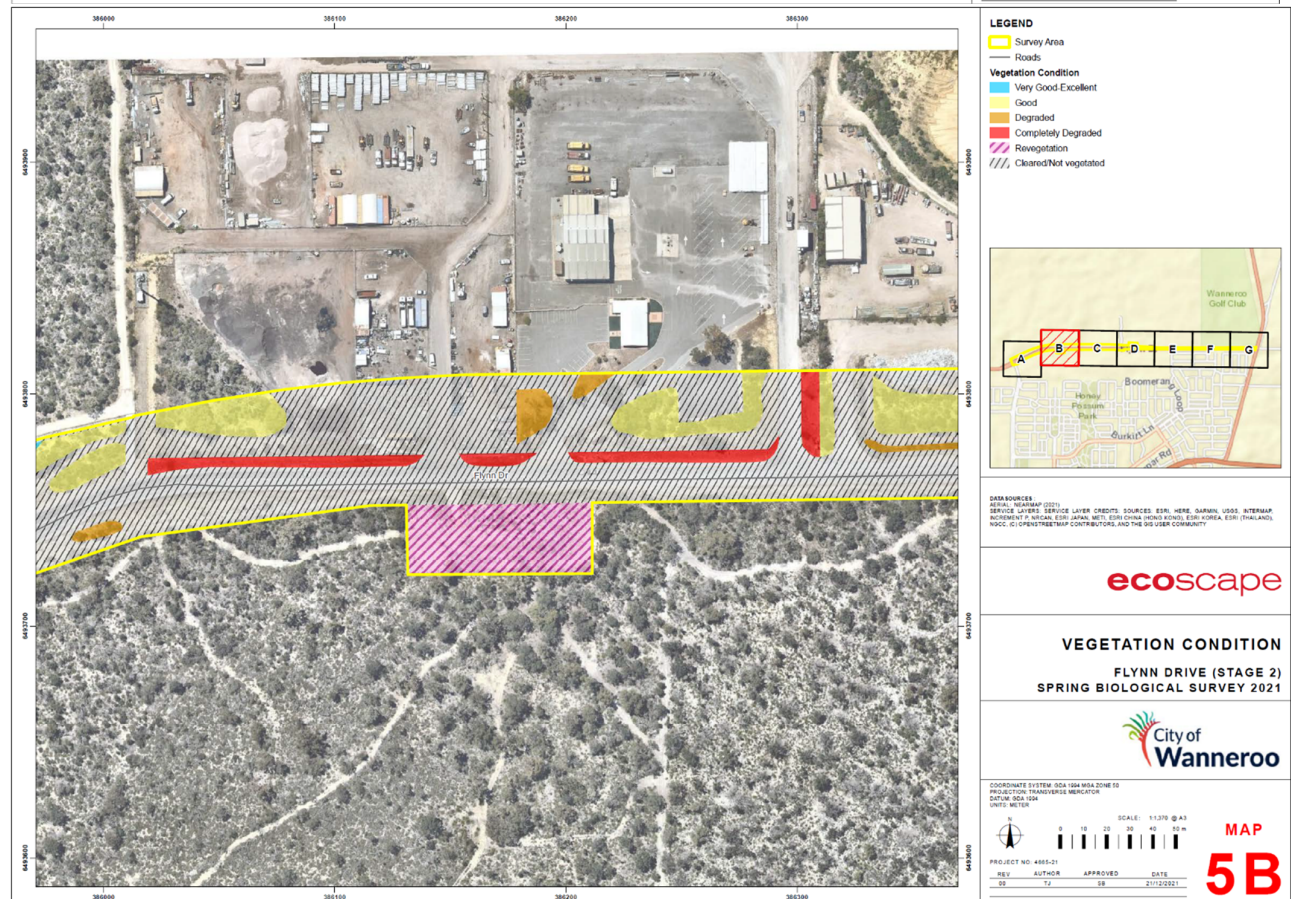
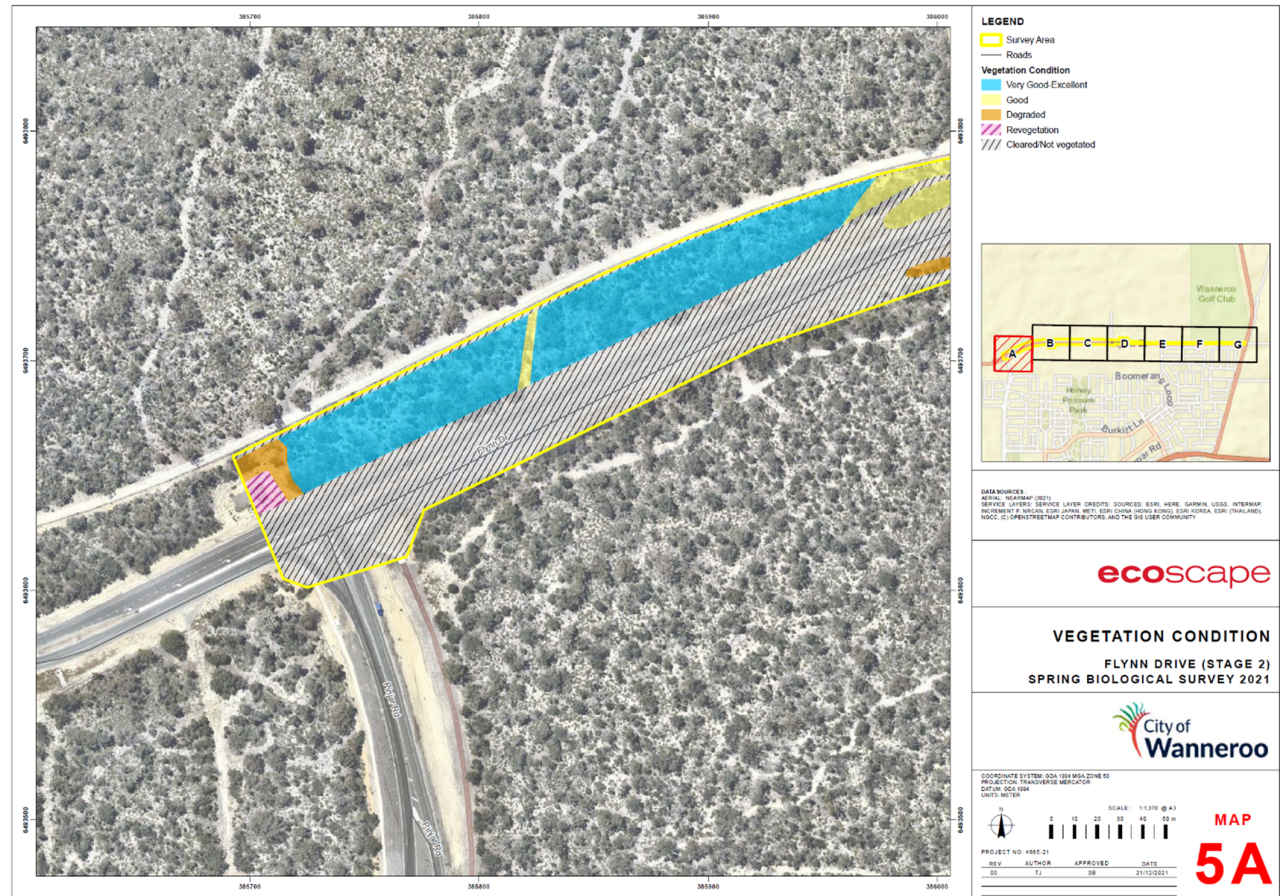
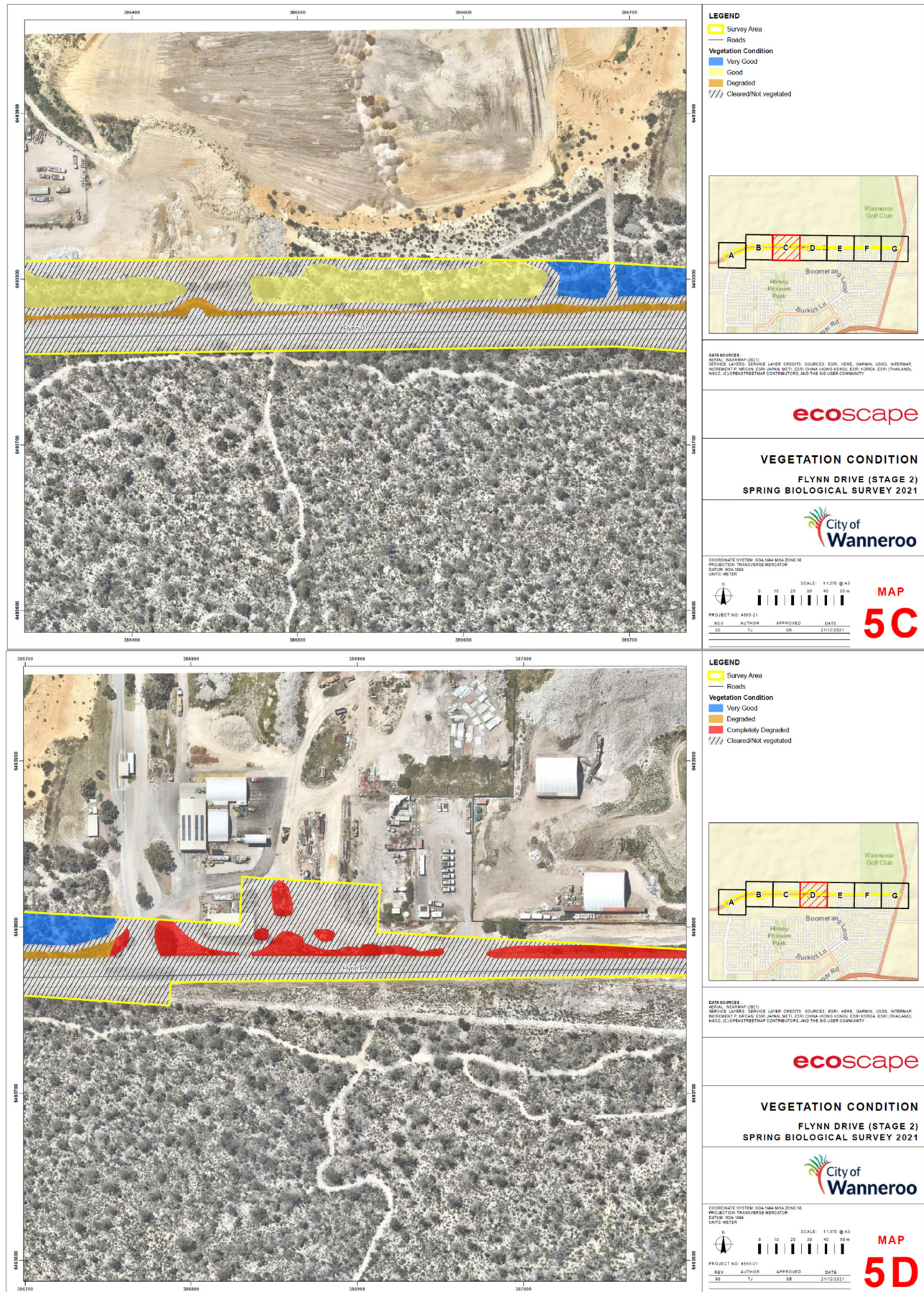
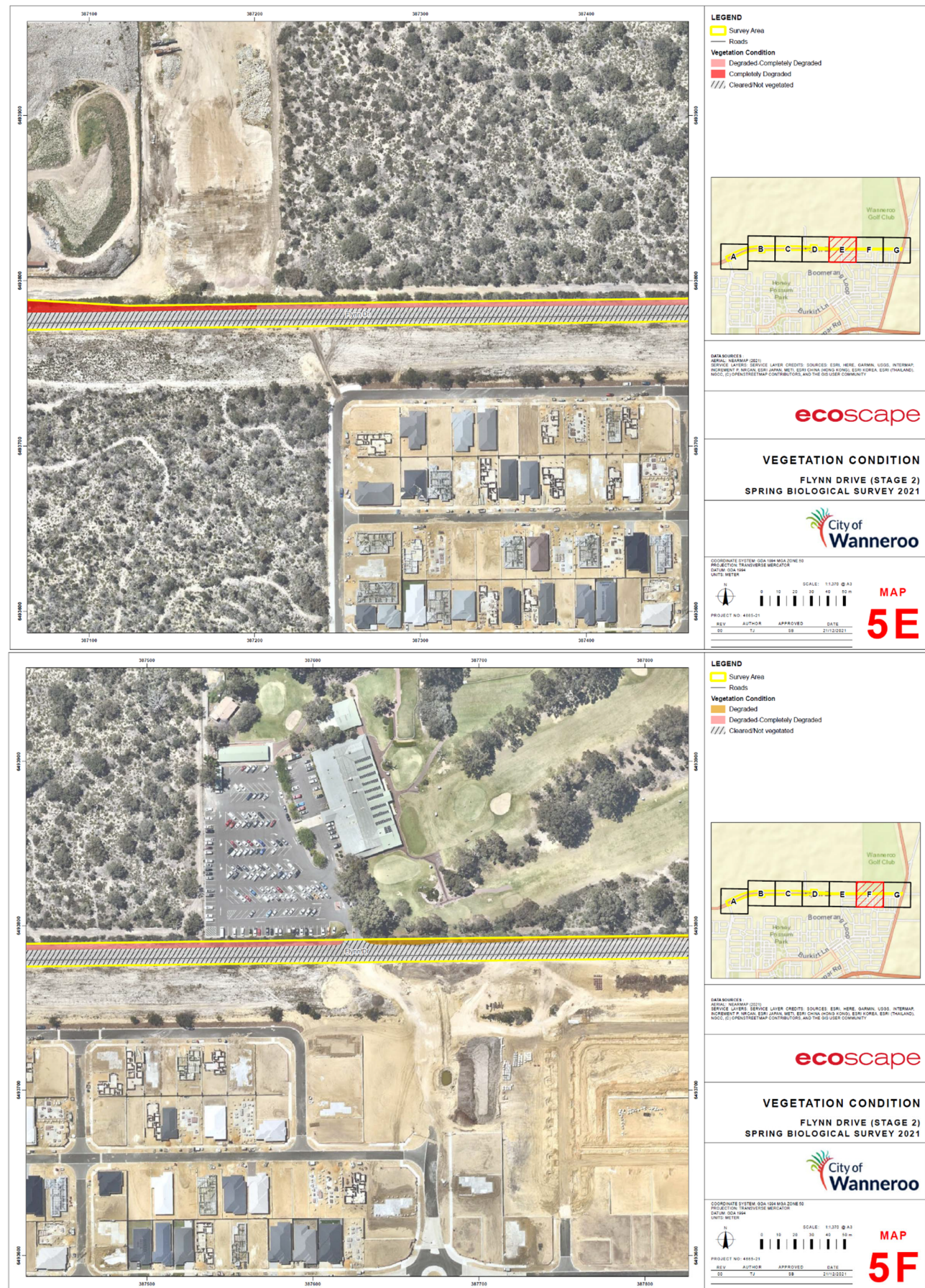


Figure 6. Vegetation mapping of the eastern section of the proposed clearing area.







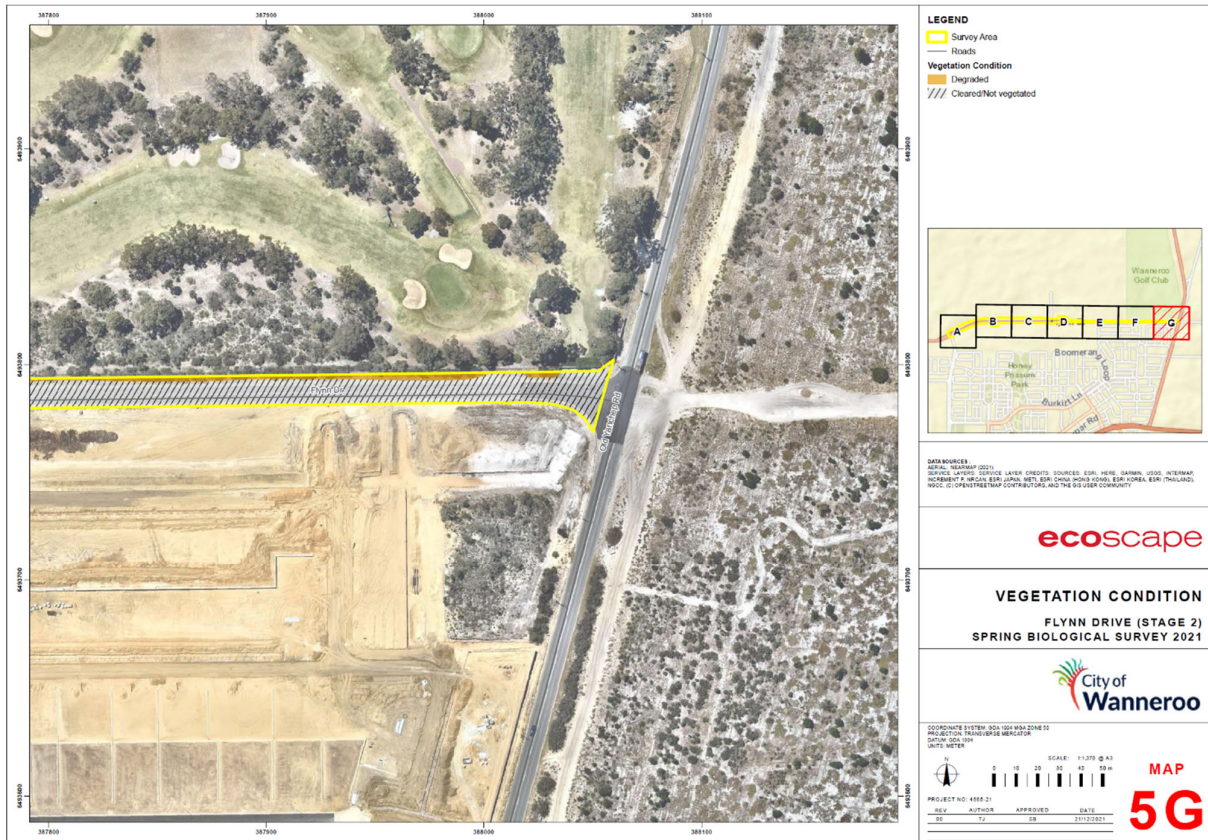


Figure 7. Vegetation condition mapping within the eastern section of the proposed clearing.

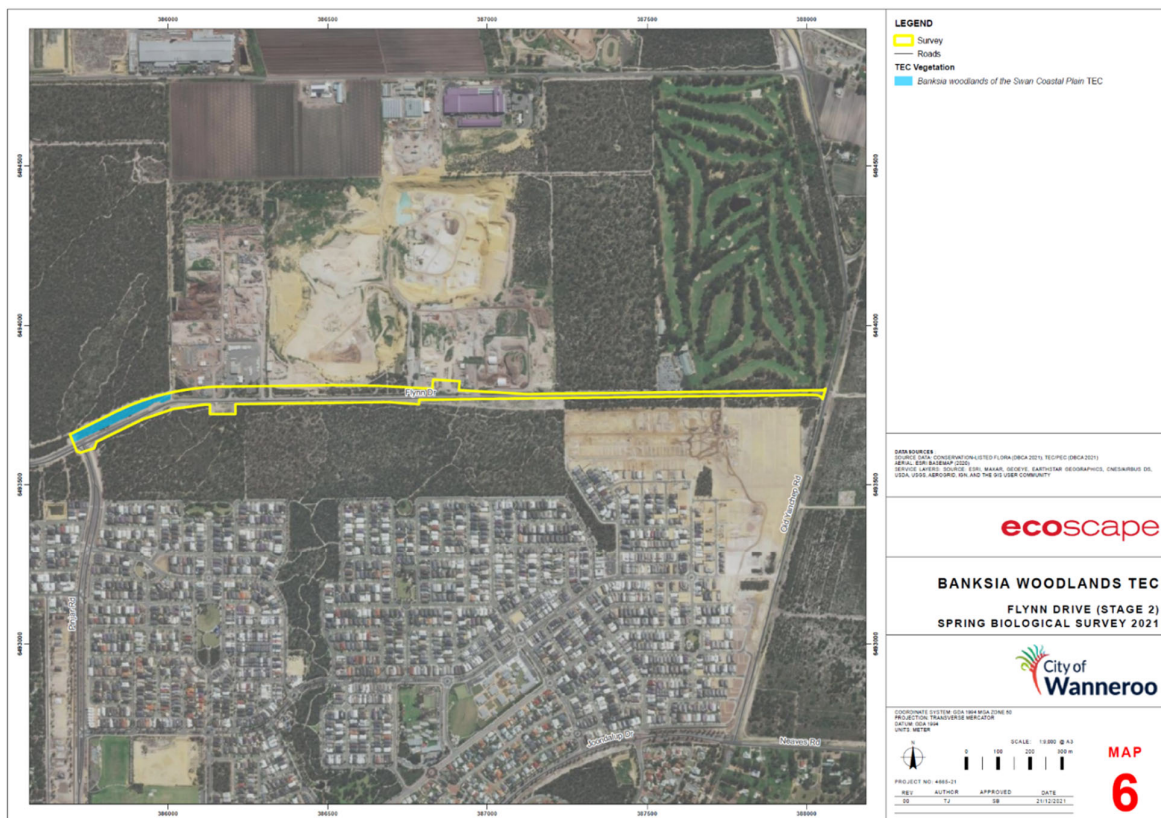


Figure 8. Map of the location of vegetation representative of the Banksia Woodlands of the Swan Coastal Plain PEC/TEC.

Flynn Drive basic fauna survey 2020 (Ecoscape, 2021b)





Habitat type	Description	Photograph
Woodland Sub-unit: <i>Eucalyptus gomphocephala</i> (Tuart) woodland	<i>Eucalyptus gomphocephala</i> woodland over mixed shrubs This habitat provides food and shelter resources for both the bird and ground-dwelling vertebrate species present. Extent: 5.05 ha; 24.60%	
Woodland Sub-unit: <i>Banksia attenuata</i> woodland	<i>Banksia attenuata</i> woodland over mixed proteaceous shrubs This habitat provides food and shelter resources for both the bird and ground-dwelling vertebrate species present. Extent: 3.41 ha; 16.6%	
Shrubland	Shrubland of revegetation or landscape plantings This habitat contains plantings of shrubs and ground covers some of which may provide food and shelter resources for both the bird and ground-dwelling vertebrate species present. Extent: 2.22 ha; 10.83%	
Not Habitat/Cleared	Not habitat (cleared, non-native vegetation) This area provides little or no suitable habitat for fauna species. No species are expected. Extent: 9.85 ha; 47.96%	

Figure 9. Fauna habitat types mapped within the western section of the proposed clearing.



Figure 10. Secondary evidence of foraging by Carnaby's cockatoo observed within the proposed clearing area.

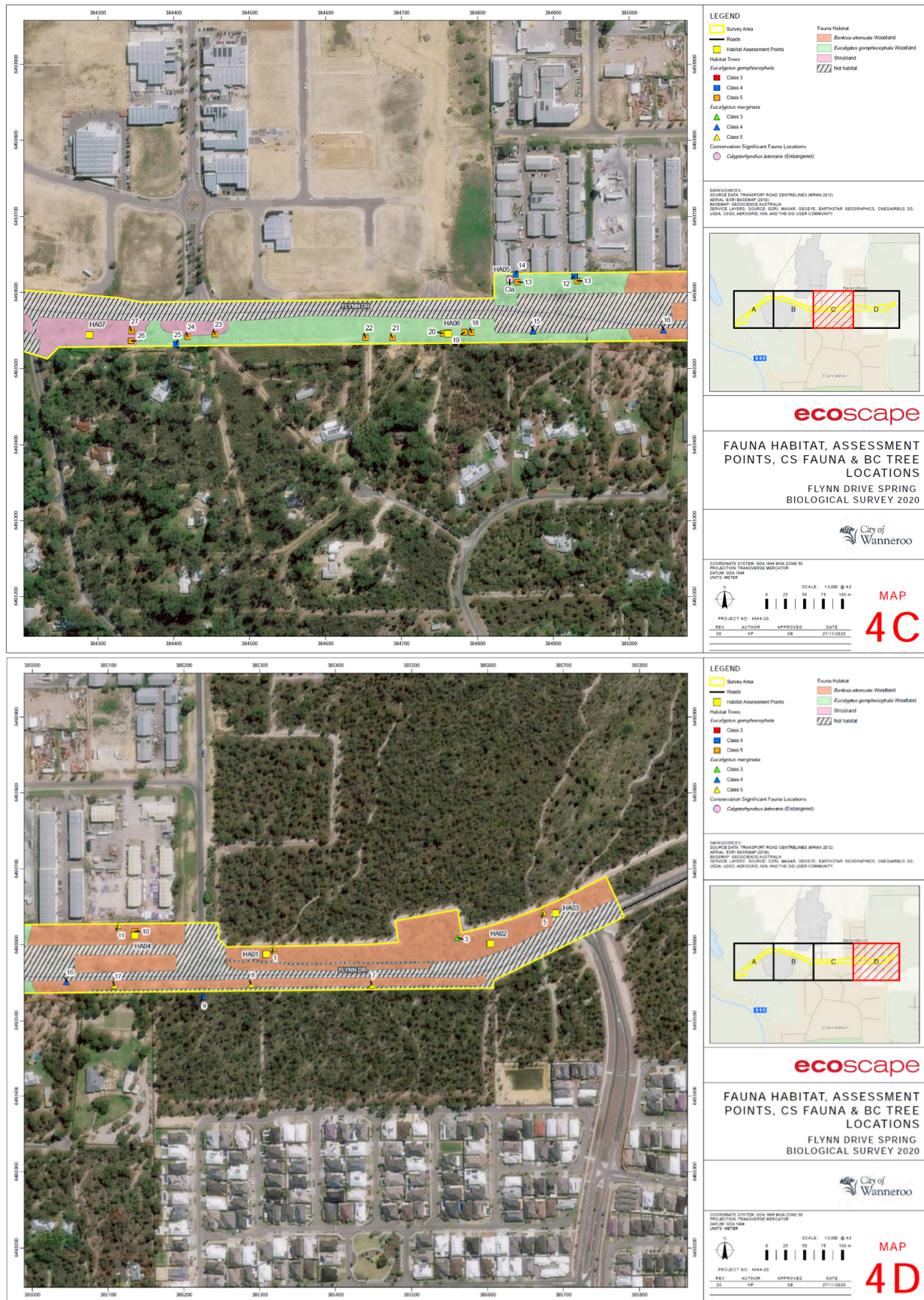


Figure 11. Fauna habitat mapping within the western section of the proposed clearing area, including fauna observations.

Flynn Drive (stage 2) basic fauna survey 2021 (Ecoscape, 2022b)




Habitat type	Description	Photograph
Banksia Woodland	<p><i>Banksia attenuata</i>, <i>B. menziesii</i> over shrubs on grey sandy soils</p> <p>The habitat is significant foraging habitat for the Black Cockatoo species and provide foraging and shelter for small mammals, reptiles and woodland bird species.</p> <p>Extent: 2.54 ha; 28.7%</p>	
Cleared / Not Vegetated	<p>NOT HABITAT</p> <p>Cleared areas, no native vegetation present.</p> <p>Extent: 6.03 ha; 68.27%</p>	
Revegetation	<p>NOT HABITAT</p> <p>Land under rehabilitation or revegetation with inadequate cover.</p> <p>Extent: 0.26 ha; 2.99%</p>	

Figure 12. Descriptions of the fauna habitat observed within the eastern section of the proposed clearing area.



LEGEND

- Survey Area
- Roads
- Habitat Assessment Point

Conservation Significant Fauna

- Calyptrorhynchus latirostris* (Endangered)
- Isodon fusciventer* (Priority 4)
- Aleropus ornatus* (Migratory Species)

Habitat Unit

- Bankia Woodland
- Cleared/Not vegetated
- Revegetation

Map Details:

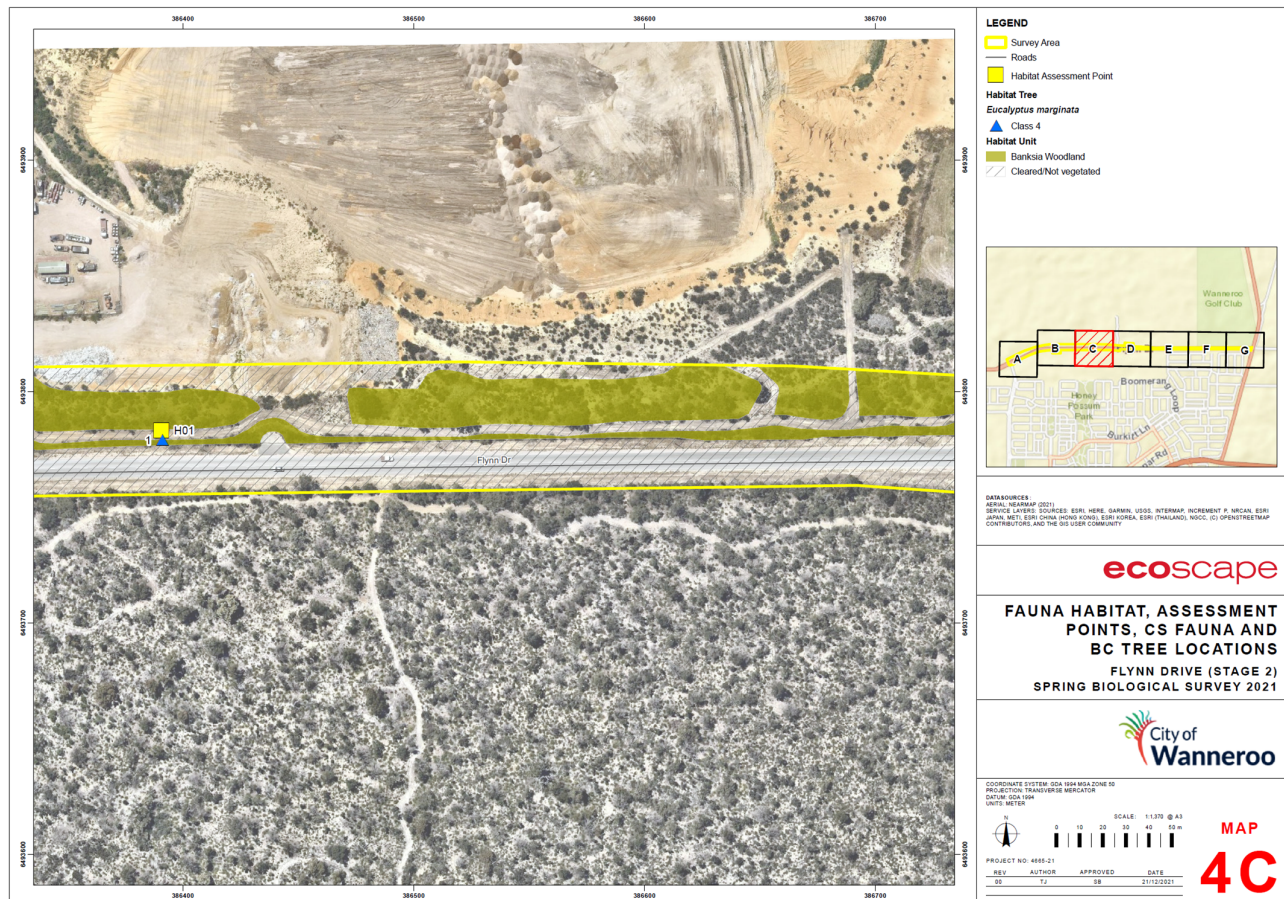
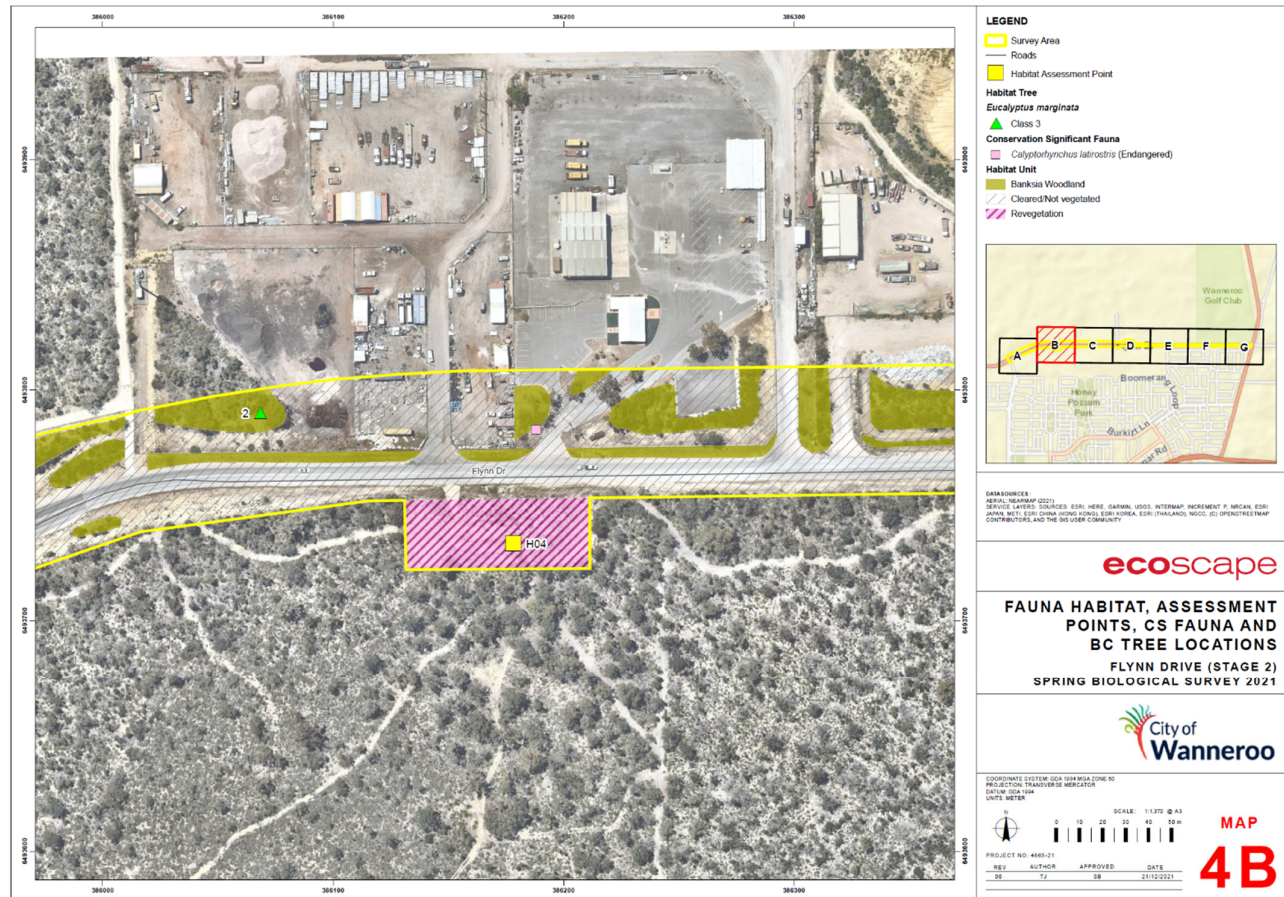
- Scale: 1:1,370 @ A3
- Coordinate System: GDA 1984 MGA Zone 50
- Projection: Transverse Mercator
- Datum: GDA 1984
- Units: Metres

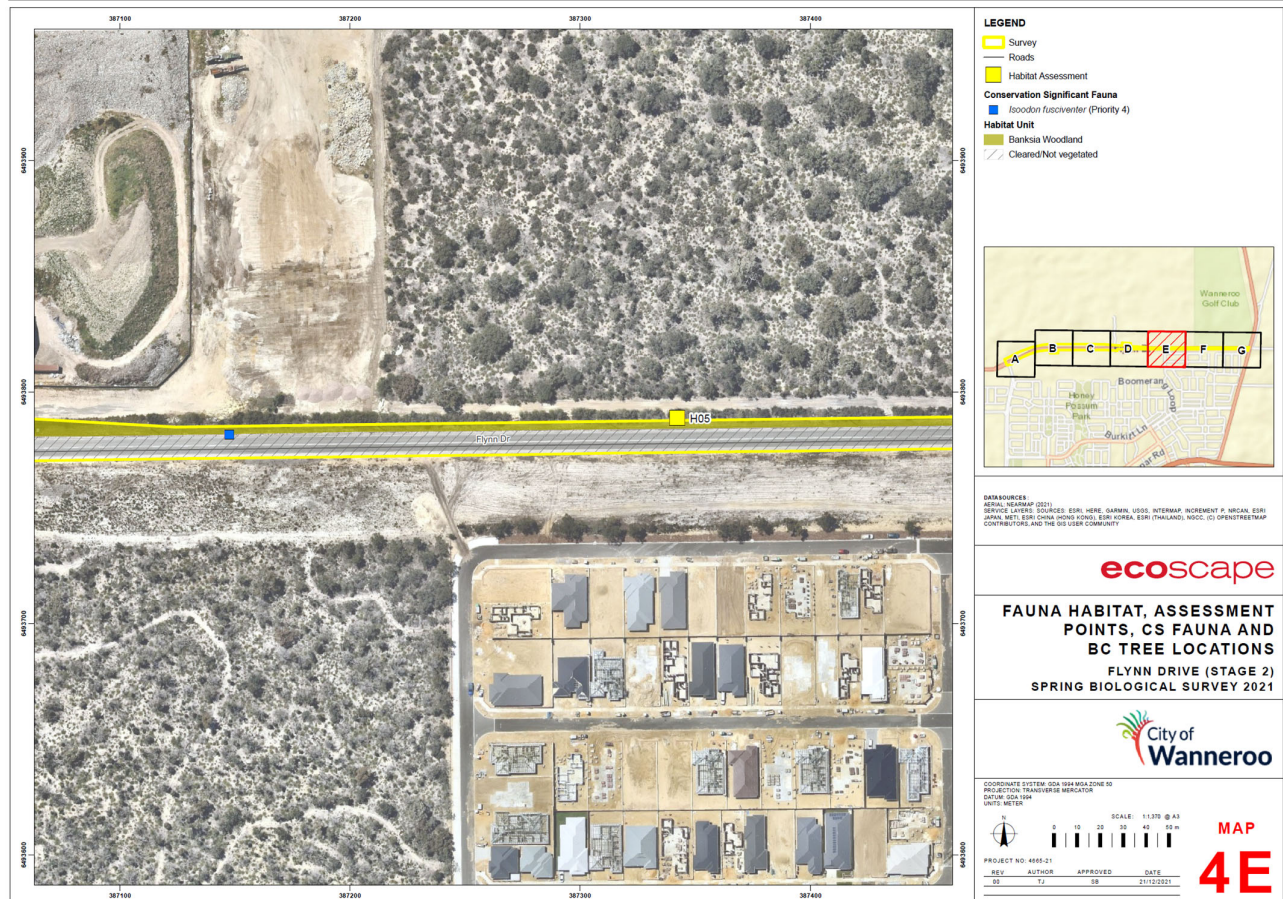
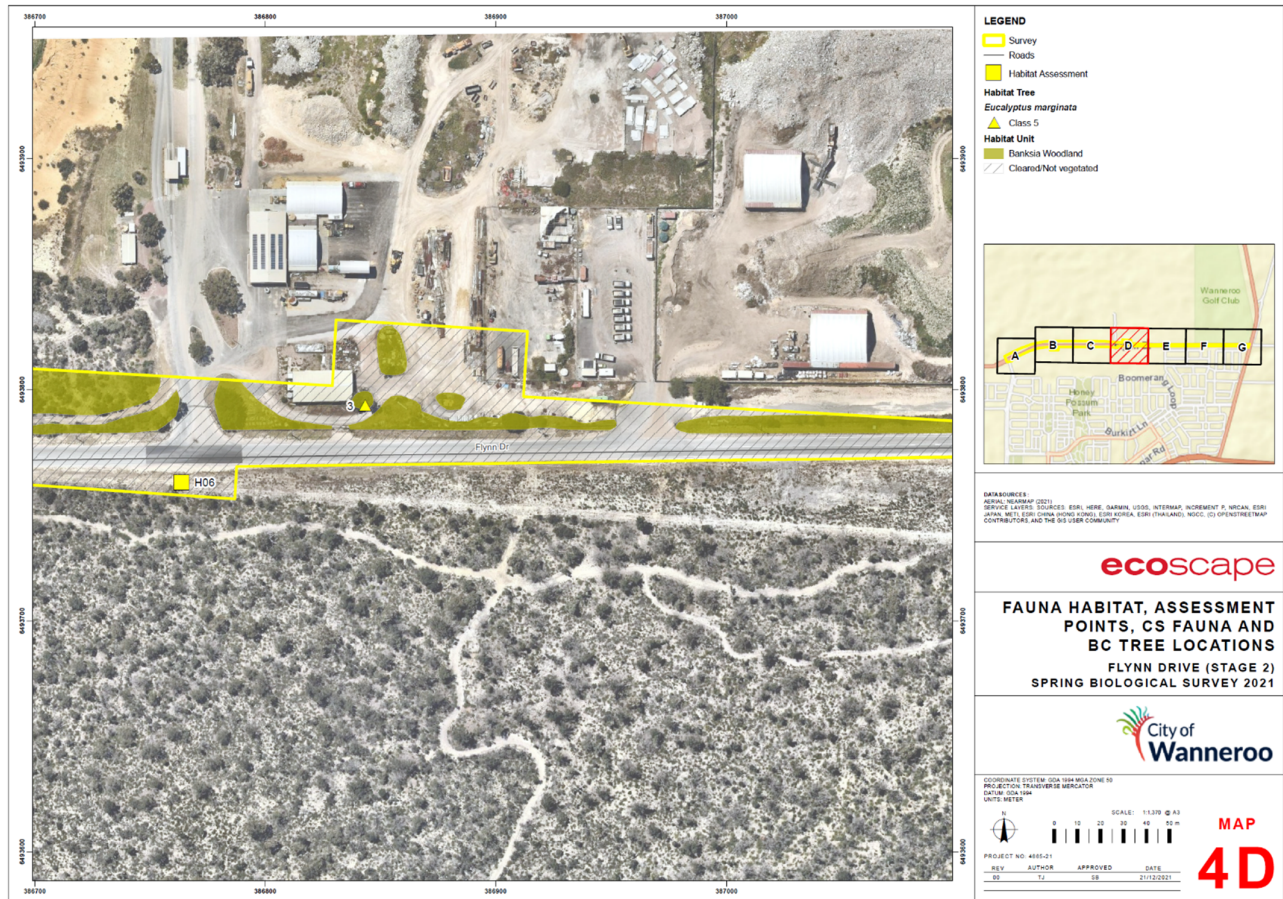
Project Information:

REV	AUTHOR	APPROVED	DATE
01	11	18	21/10/2021

City of Wanneroo

MAP 4A





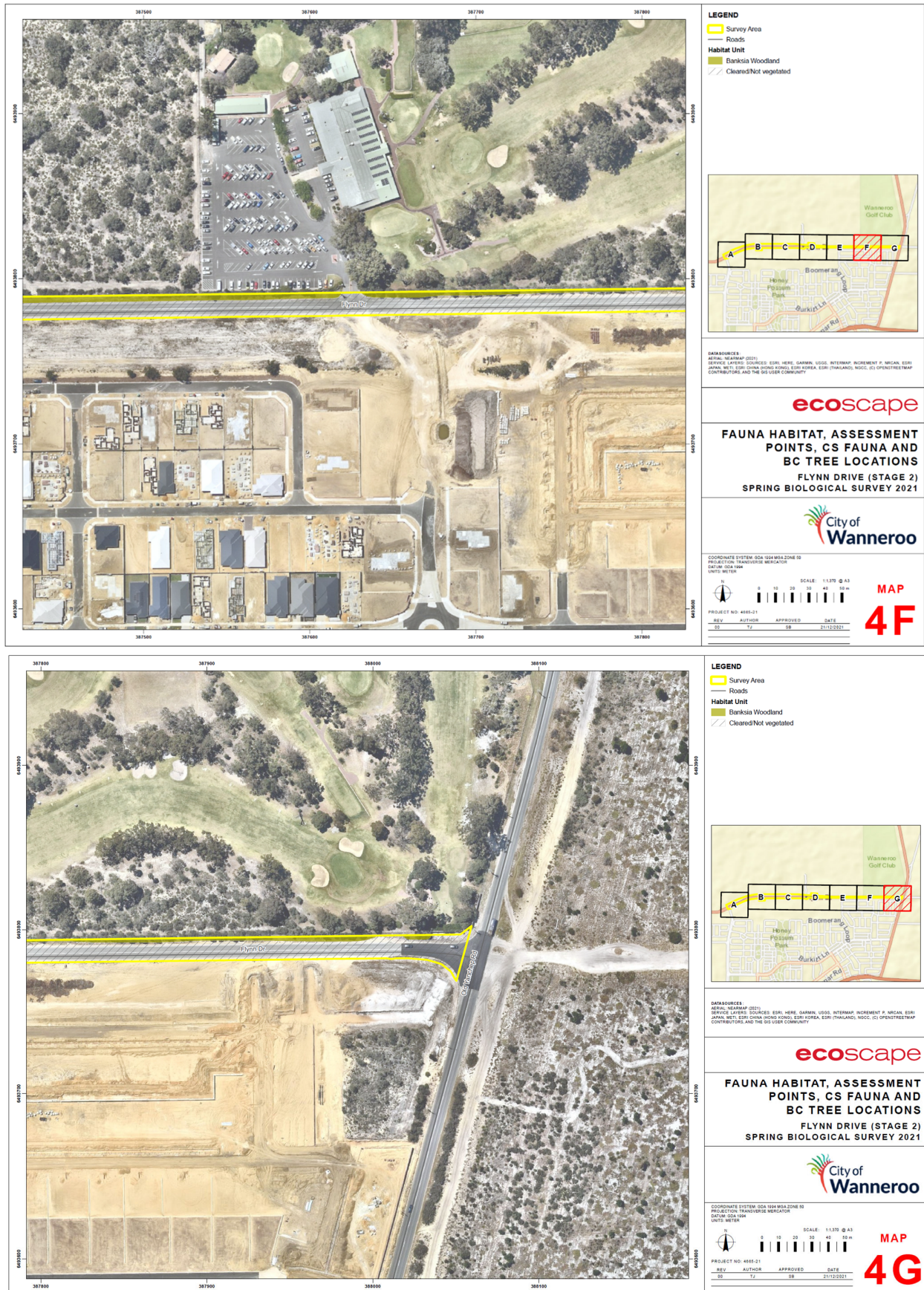


Figure 14. Fauna habitat mapping of the eastern section of the proposed clearing area.

City of Wanneroo black cockatoo habitat tree assessment Flynn Drive, Neerabup (stage 2) tree 3 (Natural Area Holdings, 2023a)



Figure 15. location of tree 3 within the proposed clearing area.



Figure 16. Photographs of tree 3.

Hollow 1:

Unsuitable for cockatoo breeding as a large crack has developed along the length of the hollow, thus compromising structural integrity.

- Diameter of hollow: 50 by 50 mm
 - Angle of hollow entry: Sloping Upright
 - Chewing around hollow entrance: Absent
 - Feeding signs/ feeding debris: No feeding debris was present (No chewed nuts or *Banksia* cones were present)
 - Signs of hollow occupancy: No droppings, chew marks or feathers were present within the hollow.
 - Camera evidence of occupancy: No evidence present.
- No direct observation of Black Cockatoos

**Hollow 2:**

- Diameter of hollow: 50 by 300 mm
- Angle of hollow entry: Side
- Chewing around hollow entrance: Absent
- Feeding signs/ feeding debris: No feeding debris was present (No chewed nuts or *Banksia* cones were present)
- Signs of hollow occupancy: No droppings, chew marks or feathers were present within the hollow.
- Camera evidence of occupancy: No evidence present.
- Unsuitable for Black Cockatoo breeding.

**Hollow 3:**

- Diameter of hollow: small hollow, 50 by 50 mm
- Angle of hollow entry: Sloping
- Chewing around hollow entrance: Absent
- Feeding signs/ feeding debris: No feeding debris was present (No chewed nuts or *Banksia* cones were present)
- Signs of hollow occupancy: No droppings, chew marks or feathers were present within the hollow.
- Camera evidence of occupancy: No evidence present.
- Unsuitable for Black Cockatoo breeding.

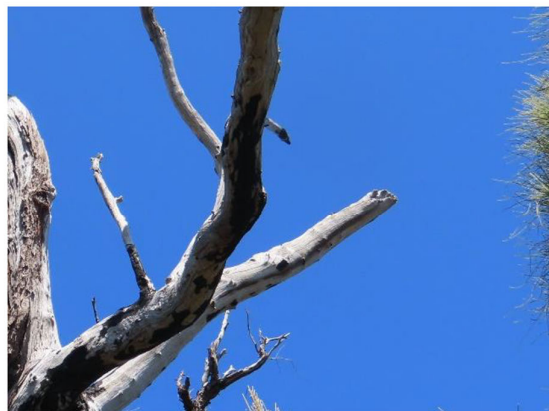


Figure 17. Suitability assessment of the hollows identified within tree 3.

City of Wanneroo black cockatoo habitat tree assessment Flynn Drive, Neerabup (stage 3) tree 4 (Natural Area Holdings, 2023b)



Figure 18. Location of tree 4 within the proposed clearing area.

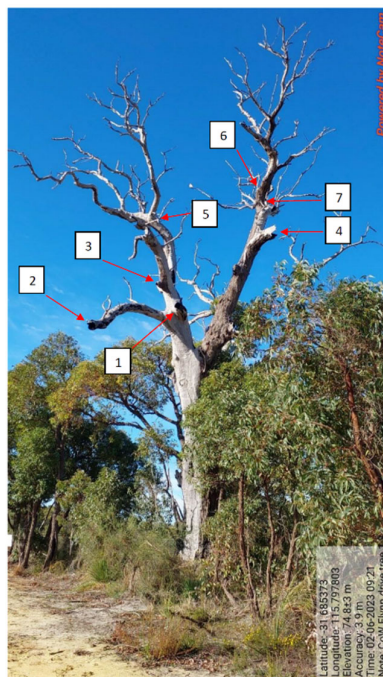


Figure 19. Photograph of tree 4 including the locations of identified hollows.

Hollow 1:

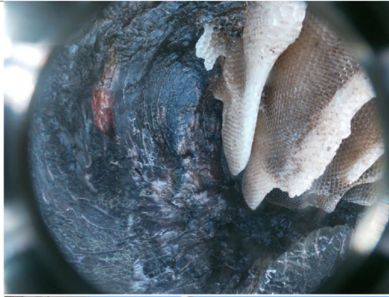
Suitable type (vertical hollow) and entrance size (300 mm diameter) for Black Cockatoos.
8 m above ground.

Occupied by European Honey Bee (*Apis mellifera*). Depth unknown.

Not available for Black Cockatoos due to beehive.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

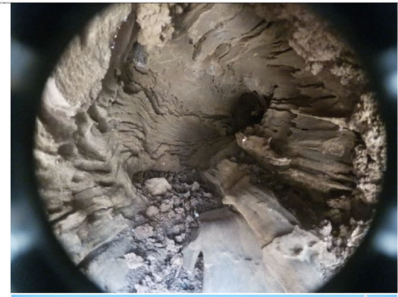
**Hollow 2:**

Side hollow, entrance 100 mm diameter.
7.3 m above ground.
Side orientation unsuitable for Black Cockatoos.

Unoccupied.

No secondary evidence of Black Cockatoo use.

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

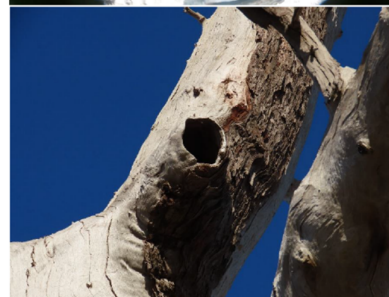
**Hollow 3:**

Side hollow, entrance 100 mm diameter.
8.2 m above ground.
Side orientation unsuitable for Black Cockatoos.

Unoccupied.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

**Hollow 4:**

Suitable type (vertical hollow) and entrance size (150 mm diameter) for Black Cockatoos.
9.2 m above ground.

Occupied by European Honey Bee (*Apis mellifera*) hive. Depth unknown.

Not available for Black Cockatoos due to beehive.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

**Hollow 5:**

Side hollow, entrance 80 mm diameter.
10 m above ground.
Side orientation and size of hollow unsuitable for Black Cockatoos.

Unoccupied.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

**Hollow 6:**

Suitable type (vertical hollow) and entrance size (estimated 150 mm diameter) for Black Cockatoos.
10.5 m above ground.

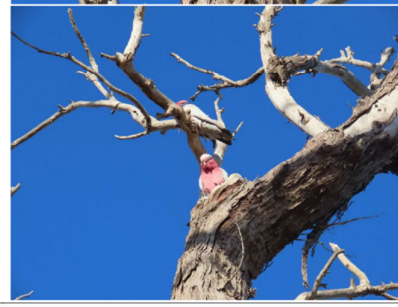
Occupied by Galahs (*Eolophus roseicapilla*).

Unable to measure and view inside of hollow with camera on telescopic pole due to height and inaccessibility. Depth unknown.

Potentially suitable for Black Cockatoos, however currently unavailable due to nesting Galahs.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.



Hollow 7:

Suitable type (vertical hollow) and entrance size (200 mm diameter) for Black Cockatoos. 10 m above ground.

Occupied by European Honey Bee (*Apis mellifera*) hive. Depth unknown.

Not available for Black Cockatoos due to beehive.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.



Figure 20. Suitability assessment of the hollows identified within tree 4.



Australian Ringneck (*Barnardius zonarius*)



Elegant Parrot (*Neophema elegans*)



Nankeen Kestrel (*Falco cenchroides*)



Singing Honeyeater (*Gavicalis virescens* subsp. *virescens*)

Figure 21. Other bird species observed utilising tree 4 during the habitat assessment.

Appendix H. Sources of information

H.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)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

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

H.2. References

Bishop C., M. Williams, D. Mitchell, A. Williams, J. Fissioli & T. Gamblin (2010). *Conservation of the Graceful Sun-moth: Findings from the 2010 Graceful Sun-moth surveys and habitat assessments across the Swan, South West and southern Midwest Regions*. Interim report. Kensington, Western Australia: Department of Environment and Conservation.

Brown, P.H., Davis, R.A., Sonneman, T. & Kinloch, J. (2009). *Ecological Linkages Proposed for The Gnamptoglossa Groundwater System*. Government of Western Australia, Perth.

- City of Wanneroo (2020) *Neerabup Industrial Area – Agreed Structure Plan No. 17*. Available from: <https://www.wanneroo.wa.gov.au/>
- City of Wanneroo (2022a) *Clearing permit application CPS 9981/1*, received 24 November 2022 (DWER Ref: DWERDT691681).
- City of Wanneroo (2022b) *Supporting Documentation for Clearing Permit Application CPS 9981/1*, received 24 November 2022 (DWER Ref: DWERDT691681).
- City of Wanneroo (2023) *Additional supporting documentation for Clearing Permit Application CPS 9981/1 – Response to request for further information*, received 15 July, 2023 (DWER Ref: DWERDT808024).
- City of Wanneroo (2024) *Clearing permit application and supporting documentation for Clearing Permit Application CPS 10521/1*, received 15 February 2024 (DWER Ref: DWERDT905851).
- City of Wanneroo (2025a) *Final offset proposal for CPS 9981/1*, received between 17 March and 14 May 2025 (DWER Ref: DWERDT1118309, DWERDT1118363)
- Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.
- Department of Agriculture, Water and the Environment (DAWE 2022), *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo*, Department of Agriculture, Water and the Environment, Canberra, February. Available from: [Referral guideline for 3 WA threatened black cockatoo species - DCCEEW](#)
- Department of Biodiversity, Conservation and Attractions (DBCA) (2017) *Fauna Notes – Living with quenda*. Available from: [Home | Department of Biodiversity, Conservation and Attractions](#).
- Department of Biodiversity, Conservation and Attractions (DBCA) (2025) *Species and Communities Branch TEC advice for clearing permit application CPS 9981/1 – Montrose Park*, received 17 March 2025. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: DWERDT1118316).
- Department of Biodiversity, Conservation and Attractions (DBCA) (2023) *Priority Ecological Communities for Western Australia Version 35*. Available from: [Threatened ecological communities | Department of Biodiversity, Conservation and Attractions](#)
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2025). *Merops ornatus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>.
- Department of the Environment and Energy (DoEE) (2016). *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf>. In effect under the EPBC Act from 16-Sep-2016.
- Department of the Environment and Energy (DoEE) (2019). *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf>. In effect under the EPBC Act from 04-Jul-2019.
- Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.
- Department of Parks and Wildlife (DPaW) (2016). *Banksia attenuata woodlands over species rich dense shrublands (Swan Coastal Plain community type 20a – Gibson et al. 1994)*. Interim Recovery Plan No. 359. Parks and Wildlife, Kensington, Western Australia

- Department of Planning, Lands and Heritage (DPLH) (2023) *Bush Forever advice for clearing permit application CPS 9981/1*, received 6 April 2023. Department of Planning, Lands and Heritage, Western Australia (DWER Ref: DWERDT762516).
- Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/>.
- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- Ecoscape (2020). Part Lot 901 Brennan Road Bindoon Black Cockatoo Habitat Surveys. A report for City of Wanneroo. North Fremantle, WA. (DWER Ref: DWERDT962178)
- Ecoscape (2021a). Flynn Drive Flora and Vegetation Survey 2020, prepared for City of Wanneroo. North Fremantle, WA. (DWER Ref: DWERDT725523)
- Ecoscape (2021b). Flynn Drive Basic Fauna Survey 2020, prepared for City of Wanneroo. North Fremantle, WA. (DWER Ref: DWERDT725522)
- Ecoscape (2022a). Flynn Drive Flora and Vegetation Survey 2021 Stage 2, prepared for City of Wanneroo. North Fremantle, WA. (DWER Ref: DWERDT725524)
- Ecoscape (2022b). Flynn Drive Basic Fauna Survey 2021 Stage 2, prepared for City of Wanneroo. North Fremantle, WA. (DWER Ref: DWERDT725524)
- Environmental Protection Authority (EPA) (2008). Environmental Guidance for Planning and Development. Guidance Statement No. 33. Environmental Protection Authority, Western Australia.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.
- Government of Western Australia (2019) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Natural Area Holdings (2023a) City of Wanneroo - Black Cockatoo Habitat Tree Assessment – Flynn Drive, Neerabup (Stage 2) – Tree 3. Malaga, WA. (DWER Ref: DWERDT808028)
- Natural Area Holdings (2023b) City of Wanneroo – Black Cockatoo Habitat Assessment – Flynn Drive, Neerabup (Stage 3) – Tree 4. Malaga, WA. (DWER Ref: DWERDT905852)
- Natural Area Holdings (2024) City of Wanneroo – Edgar Griffiths – Detailed Flora Survey. Malaga, WA. (DWER Ref: DWERDT1118309).
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and

- Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shah, B. (2006) *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia*. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Submission (2023) *Public submission in relation to clearing permit application CPS 9981/1*, received between 8 March 2023 and 10 March 2023 (DWER Ref: DWERDT747127, DWERDT750051).
- Submission (2024) *Public submission in relation to clearing permit application CPS 9981/1 – Additional comments based on revised application area*, received 12 April 2024 (DWER Ref: DWERDT933080).
- Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnamptara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation. December 2008.
- Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/>.
- Western Australian Local Government Association (WALGA) (2004). *Perth Regional Ecological Linkages dataset*. Metadata retrieved from <https://catalogue.data.wa.gov.au/dataset/perth-regional-ecological-linkages/resource/d99db838-920d>