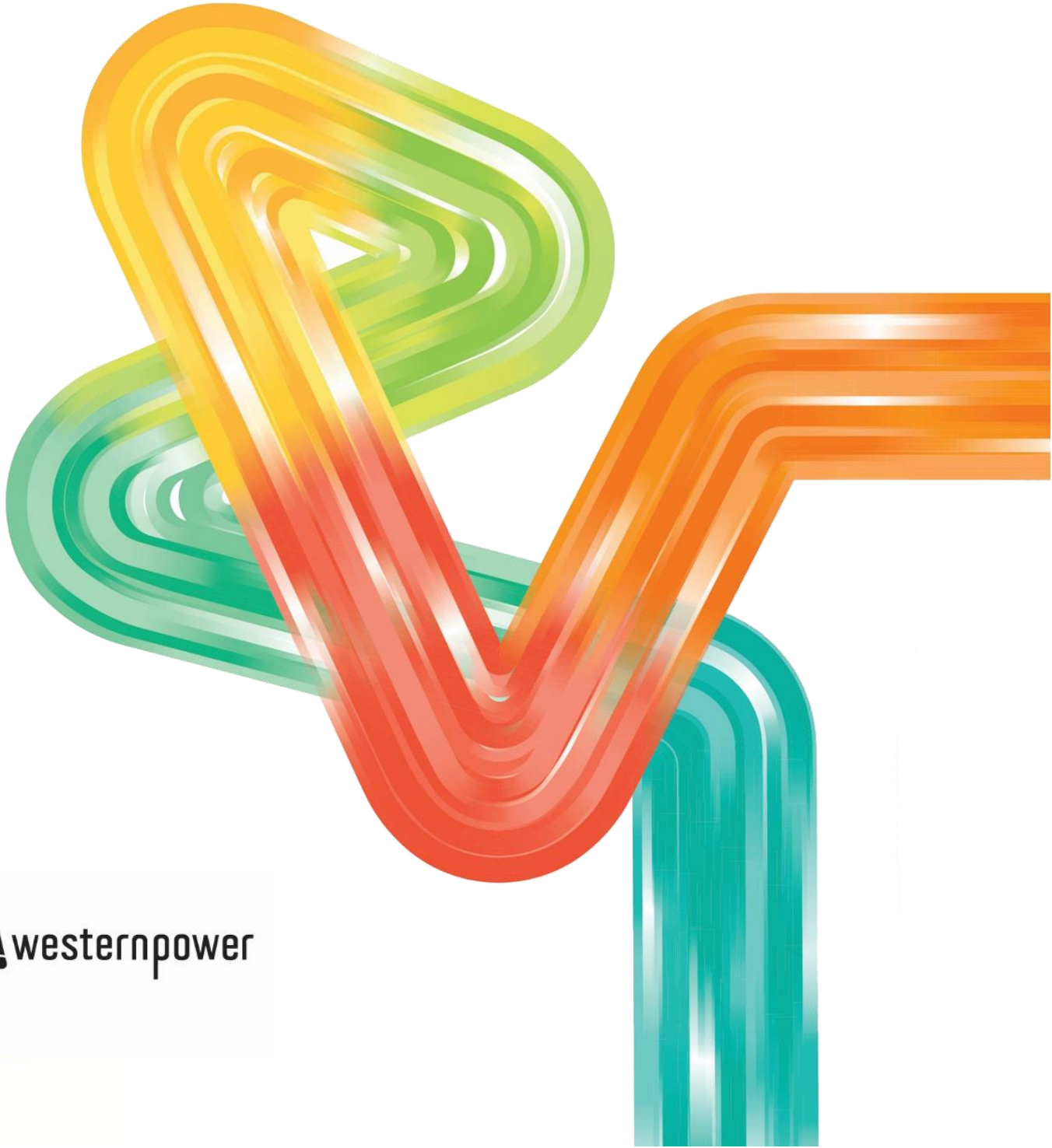
Offset Strategy

Northern Terminal to Neerabup Terminal 330kV Transmission Line

19 January 2026



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Declaration of accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed [redacted]

Full name (please print) [redacted]

Organisation (please print) Western Power

Date 19 / 01 / 2026

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Executive Summary

Table 1 Offset Strategy Summary

Item	Details
Title of Proposal	Northern Terminal to Neerabup Terminal 330kV Transmission Line
Proponent name	Western Power
Purpose of this offset proposal	This Offset Strategy will accompany the Proposal's referral under section 38 of the *Environmental Protection Act 1986* (EP Act) and referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
Permit (under application)	EPA Assessment Number – 2410 EPBC - 2024/09799
Environmental objective	To offset 100% of the Proposal's significant residual impact. The Proposal will have a significant impact on the Banksia Woodland of the Swan Coastal Plain Threatened Ecological Community (Banksia Woodland TEC). Listed as Endangered under the EPBC Act, and as several Priority Ecological Communities (PECs) by the Department of Biodiversity, Conservation and Attractions (DBCA): • Priority 3 *Banksia attenuata-Banksia menziesii* woodlands (floristic community type [FCT] 23b) • Priority 3 Low lying *Banksia attenuata* woodlands or shrublands (FCT 21c) • Priority 3 Banksia Woodlands of the Swan Coastal Plain. The Proposal will also have a significant impact on roosting, foraging and breeding habitat for the three threatened species of black cockatoo, listed below: • Baudin's Black Cockatoo (*Zanda baudinii*) (listed as Endangered under the EPBC Act and the *Biodiversity Conservation Act 2016* [BC Act]). • Carnaby's Black Cockatoo (*Zanda latirostris*) (listed as Endangered under the EPBC Act and the BC Act). • Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*) (listed as Vulnerable under the EPBC Act and the BC Act).
Proposed offset location	Western Power has secured two offset sites, located in Orange Springs, Shire of Gingin, and Hopeland, Shire of Serpentine-Jarrahdale.
Current scheme zoning	The Orange Springs and Hopeland offsets are zoned as General Rural.
Stakeholders	DWER / DCCEEW regarding regulatory requirements DBCA regarding land tenure at Orange Springs Aboriginal Regional Corporation regarding management collaboration opportunities for Hopeland.
Plans and policies	State and Commonwealth offset policy's

Item	Details
Timeline	Both properties are in Western Power ownership and it is proposed to finalise land transfer of Orange Springs to DBCA, where agreed, and complete all covenant execution within 12 months of the Proposal's referral approval. On site rehabilitation actions will occur for a minimum of 10 years and will only cease when monitoring demonstrates the completion criteria are achieved.
Governance arrangement	Western Power intends to transfer ownership of the Orange Springs offset to DBCA, whilst Hopeland will remain under ownership of Western Power. Orange Springs is under active negotiations to be taken into the conservation estate by DBCA for protection into perpetuity. Hopeland and any part of Orange Springs not taken into the conservation estate will be protected by a biodiversity conservation covenant / agreement under either the EP Act, the BC Act or equivalent to ensure security of tenure and protection into perpetuity.
Financial budget	Project budget has been allocated for a minimum of 10 years, with internal processes and approvals available to seek additional funds should rehabilitation completion criteria not be met or remedial actions required to be undertaken.
Proposed Commencement	The offset sites are already acquired and site specific revegetation plans are currently being finalised by a WA based revegetation specialist company. The first on ground rehabilitation actions are planned to commence prior to the clearing of any vegetation.
Revegetation Management Plan	This Offset Strategy outlines and commits Western Power to meeting key criteria, this provides transparency, with confidence in delivery success being supported by Revegetation Management Plans (RMP) for each site (Hopeland and Orange Springs). The RMPs will be finalised in consultation with the EPA and DCCEEW prior to the clearing of any vegetation. These RMPs will align with this Offset Strategy and detail the specific rehabilitation activities to be undertaken. RMPs will include detailed and measurable completion criteria to guide and measure successful site restoration to achieve the objectives of this Offset Strategy. The RMPs will include reporting and monitoring requirements with measurable triggers for review and remedial actions where criteria are not met. Specifically for Orange Springs, the RMP will also include management measures relating to fencing, de-stocking, surveying, weed, feral animal and fire control that will be implemented within the existing high quality remnant vegetation portion of the site. Western Power has embedded key objectives and success criteria into the Offset Strategy in order to enable adaptive management and encourage review, improvement and innovation in the delivery of the RMPs. Objective based target setting ensures that efficiencies and lessons learnt can be applied immediately as the rehabilitation activities progress.

1. Introduction

1.1 Background

Western Power (the Proponent) proposes to construct a new double circuit 330 kilovolt (kV) high voltage powerline between the Northern Terminal (NT) in Malaga and the Neerabup Terminal (NBT) in Pinjar, covering a distance of approximately 29 kilometres (km) (the Proposal) (Figure 1), as part of the Clean Energy Link North program. This Proposal, referred to as the "NT-NBT 330kV Line", falls within the North Region network, the northern area of the Western Power transmission network from Northern Terminal to Geraldton zone substation, consisting of a mix of 330kV and 132kV networks.

On 22 February 2024, Western Power referred the Proposal to the Environmental Protection Authority (EPA) under Part IV, Section 38 (s38) of the *Environmental Protection Act 1986* (EP Act). On 20 March 2024, the EPA set the Level of Assessment as Assessment on Referral Information with additional information, with a 2-week public review period.

Western Power referred the Proposal under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in February 2024. The Commonwealth Minister for Environment and Water determined the Proposal to be a 'Controlled Action' due to likely significant impacts on one or more Matters of National Environmental Significance (MNES). On the referral form to the EPA, Western Power requested that the proposal be assessed under a Bilateral Agreement with the Commonwealth Department of Climate Change, Energy, the Environment, and Water (DCCEEW). Since no Bilateral Agreement is currently in place, the EPA will be assessing the controlled action as an accredited process (EPA Assessment Number – 2410 and EPBC 2024/09799).

Western Power submitted a section 43A request to the EPA, a request to amend a proposal during assessment in August 2025. The EPA accepted the amendment request on 7 August 2025, to be assessed under section 38 of the EP Act. Concurrently, a request to vary a proposal was submitted to DCCEEW under section 156A of the EPBC Act. This request was approved by DCCEEW on 1 September 2025.

1.2 Proposal Information

The Proposal Development Envelope (PDE) consists of the boundaries of all involved land parcels where consent has been granted for development of the Proposal and wherein all infrastructure will be contained. The PDE is 217.24 hectares (ha), and includes the following three overarching construction elements:

- The Transmission Corridor (174.13 ha)
- The Northern Terminal (19.56 ha)
- The Neerabup Terminal (11.71 ha).

The Proposal's Disturbance Footprint (Impact Area) has been reduced after further construction review and now limits the extent of impact within the PDE to (AECOM, 2025):

- 2.23 ha of Banksia Woodland of the Swan Coastal Plain Threatened Ecological Community
- 15.0 ha of Bush Forever vegetation
- 100.5 ha of Carnaby's Cockatoo habitat

- 75.8 ha of Baudin's Cockatoo habitat
- 46.9 ha of Forest Red-tailed Black Cockatoo (FRTBC) habitat.

Noting that the cockatoo habitat numbers are not cumulative due to the overlap in suitable habitat for the three species.

1.3 Objectives

The objective of this Offset Strategy is to demonstrate that the environmental values of the proposed offset sites will counterbalance at least 100% of the Proposal's significant residual impact.

This Offset Strategy follows the 2014 Clearing of Native Vegetation Offsets procedure under the *Environmental Protection Act* (EP Act), as outlined by the Department of Environment Regulation (DER) (now DWER), and the *2012 Environment Protection and Biodiversity Conservation Act* (EPBC Act) *Environmental Offset Policy*, as outlined by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (now DCCEEW).

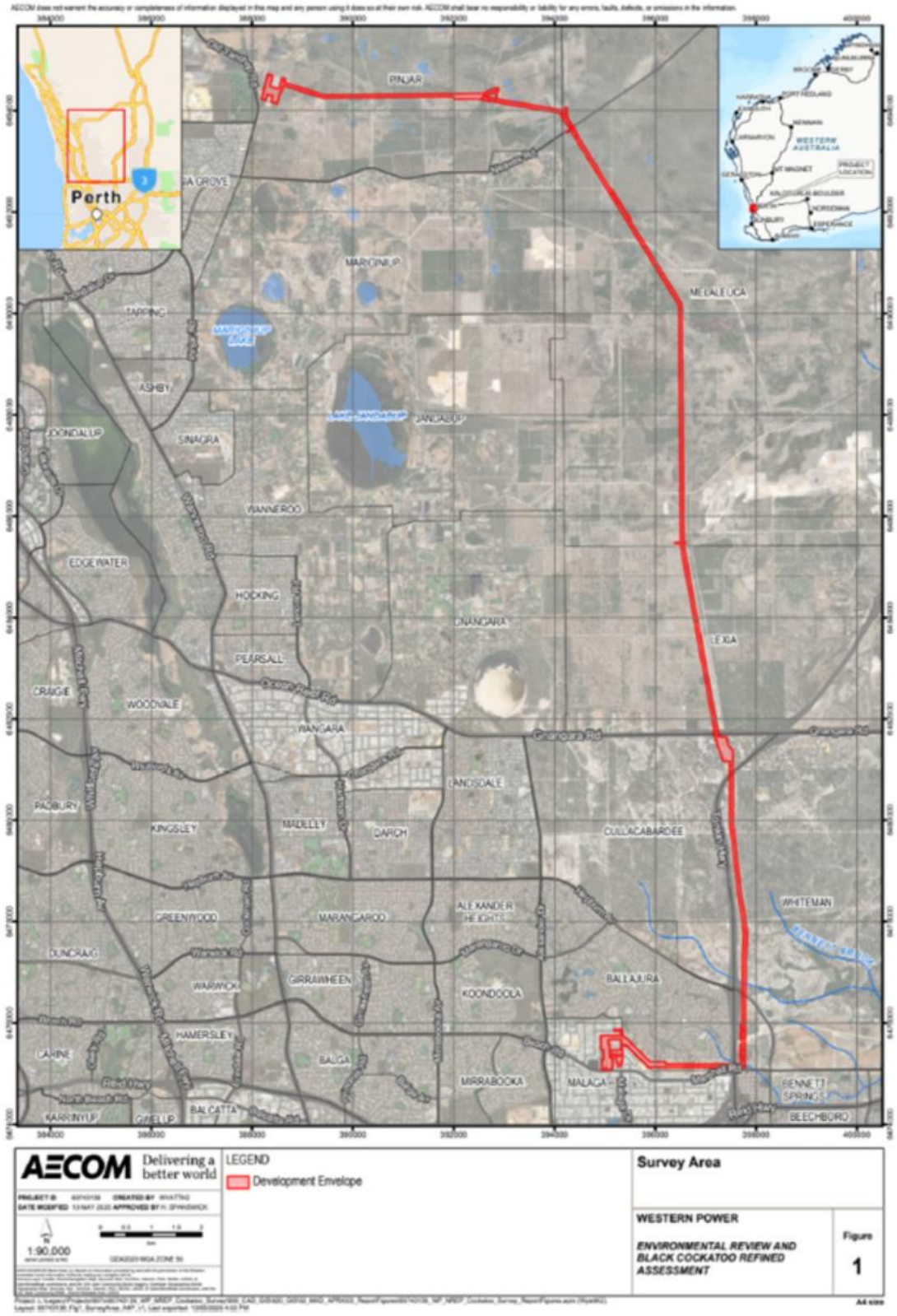


Figure 1 Proposal Development Envelope

2. Offset Requirement

2.1 Proposal Environmental Studies

Western Power has commissioned several biological surveys and environmental studies, and reports for the Proposal, which are detailed in Table 2 below.

Table 2 Environmental Surveys and Studies

Survey	Timing	Survey details
Environmental Review Document (ERD) - Northern Terminal to Neerabup Terminal 330kV Transmission Line (Western Power 2025)	Report: August 2025	Environmental Review Document (ERD) prepared in response to the *Notice requiring information for assessment* (s40(2)(a)) issued by the EPA.
Biological Offset Surveys: Orange Springs (SLR, 2025)	Report: July 2025 Survey: September 2024	SLR (2025) undertook a Detailed flora and vegetation survey and basic fauna survey of the environmental offset property located in Orange Springs. A targeted black cockatoo survey was also completed.
Environmental Review and Black Cockatoo Refined Assessment (AECOM 2025)	Report: June 2025 Survey: February 2025	AECOM (2025) undertook a refined black cockatoo assessment for a 603.2 ha survey area. This comprised the PDE (217.24 ha) and the AECOM (2023) survey area. The report also presents a comprehensive and updated overview of the PDE, integrating both recorded and inferred data. Ground-truthing was conducted to verify inferred mapping, and habitat naming conventions were standardised to ensure consistency and accuracy across all datasets.
Environmental Impact Assessment - Northern Terminal (NT) to Neerabup Terminal (NBT) (AECOM 2024a)	Report: February 2024	AECOM (2024a) prepared an Environmental Impact Assessment (EIA) document using Western Power's template for the Proposal, prior to the changes in PDE. Western Power provided the EIA to the EPA and DCCEEW on 22 February 2024 as part of the referral documentation. The report was published on the 29 February 2024.
North (CEL-N) Swan Coastal Plain Flora, Vegetation and Fauna Assessment. (AECOM 2024b)	Survey: October – November 2023 Report: March 2024	AECOM (2024b) undertook a detailed spring flora and vegetation survey, targeted flora surveys, a basic fauna survey and a targeted black cockatoo assessment for defined linear corridors and terminal sites within the Perth Metropolitan Region. The survey covered five distinct areas, of which two intersect the PDE. These include:

Survey	Timing	Survey details
		– Neerabup Terminal and East Wanneroo survey area (204.98 ha) – Northern Terminal survey area (25.78 ha). The remaining survey areas are not relevant to this Proposal.
NREP 1-NT-NBT 330kV Line Flora, Vegetation and Fauna Assessment (AECOM 2023)	Survey: September – October 2022 Report: May 2023	AECOM (2023) surveyed a 576.37 ha linear corridor between Malaga and Pinjar. The survey included a detailed spring flora and vegetation survey, targeted flora surveys, a basic fauna survey and a targeted black cockatoo assessment.

2.2 Environmental Factors

The Proposal is expected to impact:

- Two Environmental Factors identified by the EPA (Flora and Vegetation and Terrestrial Fauna); and
- One Matter of National Environmental Significance (MNES) listed under the EPBC Act (Threatened Species/Communities).

Assessment of these impacts has determined that, after the application of the mitigation hierarchy, significant residual impacts to identified Environmental Factors and MNES remain (refer to Table 3). This Offset Strategy has been prepared to counterbalance the significant residual impacts of the Proposal. The Environmental Factors and MNES with significant residual impacts are listed below.

- Flora and Vegetation / Threatened Communities
  - Bush Forever Sites - five individual sites, 104, 198, 304, 398 and 399.
  - Banksia Woodland of the Swan Coastal Plain Threatened Ecological Community (Banksia Woodland TEC). Listed as Endangered under the EPBC Act, and as several Priority Ecological Communities (PECs) by the Department of Biodiversity, Conservation and Attractions (DBCA), listed below:
    - Priority 3 *Banksia attenuata-Banksia menziesii* woodlands (floristic community type [FCT] 23b)
    - Priority 3 Low lying *Banksia attenuata* woodlands or shrublands (FCT 21c)
    - Priority 3 Banksia Woodlands of the Swan Coastal Plain.
- Terrestrial Fauna / Threatened Species
  - Baudin's Black Cockatoo (*Zanda baudinii*) (listed as Endangered under the EPBC Act and the Biodiversity Conservation Act 2016 [BC Act]).
  - Carnaby's Black Cockatoo (*Zanda latirostris*) (listed as Endangered under the EPBC Act and the BC Act).
  - Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*) (listed as Vulnerable under the EPBC Act and the BC Act).

2.3 Consultation

The referred Proposal details and supporting information have been published as part of the EPA assessment process and public submission regarding the Offset Strategy were received and are considered in this final version of the Offset Strategy. Identification and development of a suitable offset strategy for the significant residual impacts outlined in Section 2.2 above has been undertaken in consultation with DBCA, EPA and DCCEEW. Key objectives, targets and success criteria have been detailed in this Offset Strategy, with site specific rehabilitation works to be undertaken at Orange Springs and Hopeland to be developed in consultation with DBCA, EPA and DCCEEW.

2.4 Residual Impacts

The Proposal has been identified as having a significant residual impact at both State and Commonwealth levels (refer to Table 3). The ERD for the Proposal considered clearing of Moderate or higher quality black cockatoo foraging habitat as a significant residual impact; however, considering public comment and cumulative impacts across the Swan Coastal Plain, this Offset Strategy now considers the cumulative impacts on all qualities of black cockatoo foraging habitat within the Proposal footprint and the corresponding offset requirements.

Taking into account decision-making processes under the *Planning and Development Act 2005*, the management details and required offset area to offset the impacts to Bush Forever Sites will be addressed through the Development Approval process. Offsets for Bush Forever Sites are discussed in this Offset Strategy to the extent of demonstrating that the required offset land has been secured by Western Power (refer to Section 3.2). It is noted the Bush Forever site areas contain Black Cockatoo habitat values, which will also be accounted for under this Offset Strategy.

The land offset requirements have been calculated using the respective State and Commonwealth calculators (DCCEEW, Offset Assessment Guide, 2023) (DWER, 2021).

Each aspect is discussed in greater detail in Sections and 3.4.

Table 3 Residual Impacts for the Proposal

Aspect		Original Clearing Footprint Impact Area (ha)	Revised Clearing Footprint Impact Area (ha)	Significant residual impact (calculator result) (ha) *
Flora and Vegetation				
Banksia Woodlands TEC/PEC		4.44	2.23	1.78
Bush Forever		16.11	15.0	30 **
Terrestrial Fauna				
Carnaby's Black Cockatoo Foraging Habitat	Negligible quality (1)	18.02	7.4	0.7
	Low quality (2)	98.52	49.6	9.9
	Low to moderate quality (3)	1.22	1.0	0.3
	Moderate quality (4 to 6)	50.46	32.2	19.3
	Moderate to high quality (7)	13.08	7.3	5.1
	High quality (8)	6.84	3.0	2.4
Total Carnaby's Black Cockatoo foraging habitat			100.5	37.7
Baudin's Black Cockatoo Foraging Habitat	Negligible quality (1)	71.15	34.5	3.5
	Low quality (2)	14.22	6.1	1.2
	Moderate quality (4)	57.3	3.0	1.2
	Moderate quality (6)		32.2	19.3
Total Baudin's Black Cockatoo foraging habitat			75.8	25.2
FRTBC Foraging Habitat	Low quality (2)	28.22	11.7	2.3
	Low to moderate quality (3)	6.84	3.0	0.9
	Moderate to high quality (7)	50.46	32.2	22.6
Total FRTBC foraging habitat			46.9	25.8

* Result is from both DCCEEW and DWER offset calculators.
** Value has been derived in accordance with SPP2.8 Appendix 4 – Offset Criteria, where offset requirements must have an outcome of substantial net gain with at least two times the calculated loss in habitat hectares being offset.

3. Offset Strategy Rationale

Western Power proposes the following combination of offsets to counterbalance the significant residual impacts of the Proposal:

- Acquisition, management, and conservation (via transfer to DBCA for inclusion within conservation estate) of freehold land that contains high quality remnant vegetation with like-for-like ecological values to those impacted by the Proposal
- Restoration of cleared/degraded and/or low-quality habitat via rehabilitation with native vegetation, targeting like-for-like ecological values to those impacted by the Proposal
- Implementation of threat abatement activities at offset sites, including TEC condition and extent monitoring, access management, de-stocking, weed and feral animal control programs, fire risk management and dieback management.

Western Power has secured two offset sites, Orange Springs, Shire of Gingin and Hopeland, Shire of Serpentine-Jarrahdale; which are sufficient to counterbalance 100% of the significant residual impacts of the Proposal.

3.1 Policy and Guidelines

To identify a suitable offset site that effectively counterbalances the significant residual impacts of the Proposal resulting from vegetation clearing, Western Power has referred to the following policy and guidelines, and conservation advice. These resources have informed the site selection process to ensure alignment with biodiversity protection objectives:

- Policy and guidance:
  - EP Act – WA Environmental Offsets Guidelines (GoWA, 2014).
  - EP Act – Draft WA Environmental Offsets Policy (GoWA, 2011).
  - EPA (Public Advice) – Considering environmental offsets at a regional scale (EPA, 2024).
- WA Conservation advice:
  - Interim Recovery Plan No. 359 – *Banksia attenuata* woodlands over species rich dense shrublands (2016 2021) (DPaW, 2016).
  - WA Wildlife Management Program No. 52 – Carnaby's Cockatoo *Zanda [Calyptorhynchus] latirostris* Recovery Plan (DPaW, 2016).
  - Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan (DEC, 2008).

The following Commonwealth approved conservation advice were also used to inform the Offset Strategy:

- EPBC Act Approved Conservation Advice for the Banksia Woodlands of the Swan Coastal Plain ecological community (DoEE, 2016).
- EPBC Act Referral guideline for 3 WA threatened black cockatoo species (DAWE, 2022)
- Conservation Advice (*Zanda baudinii*) Baudin's cockatoo (TSSC, 2018).

- Conservation Advice for *Calyptorhynchus banksia naso* (Forest Red-tailed Black Cockatoo) (DCCEEW, 2009).

3.2 Bush Forever

3.2.1 Description

The Proposal intersects five Bush Forever Sites comprised of five vegetation complexes, as outlined in Table 4.

Table 4 Bush Forever Sites impacted by the Proposal

Site Number	Total Size (approx. ha)	Vegetation Complex Present	Extent of complex within Bush Forever within PDE (ha)	Total Extent of Bush Forever Site within PDE (ha)
104	1.54	Bassendean Complex North	0.68	0.81
		Pinjar Complex	0.13	
198	474	Bassendean Complex - Central and South	2.88	9.98
		Southern River Complex	7.09	
304	2,800	Bassendean Complex - Central and South	19.56	19.56
398	1,021	Bassendean Complex North	1.79	3.99
		Bassendean Complex North - Transition	2.20	
399	4,184	Bassendean Complex North	11.63	11.63
Total	**8,480.54**			**45.88**

3.2.2 Proposal Impacts

The Proposal will clear up to a total of 15.0 ha within five Bush Forever Sites (Table 5)

Table 5 Bush Forever Site Impact Areas

Site Number	Total Size (approx. ha)	Impact Area (ha)	Proportion of total extent impacted (%)
104	1.54	0.3	19.5
198	474	4.3	0.9
304	2,800	8.4	0.3

Site Number	Total Size (approx. ha)	Impact Area (ha)	Proportion of total extent impacted (%)
398	1,021	0.4	0.03
399	4,184	1.6	0.03
Total	8480.54	15.0	0.17

3.2.3 Offset Strategy

Conditions of the offset requirements for impacts of the Proposal to Bush Forever Sites will be determined via the Development Application decision-making processes under the *Planning and Development Act 2005.* Consistent with current Government policy on Bush Forever Sites, it is anticipated that the management and required offset area will be at a 2 to 1 ratio. Bush Forever Site offsets are discussed in this Offset Strategy document insofar as to demonstrate Western Power's overarching strategy for Bush Forever offsets and that the land to address the necessary offset requirements has been secured.

The Orange Springs site is mapped as Bassendean Complex – North and Bassendean Complex – North Transition. It is noted that the Orange Springs site does not have the Pinjar complex that is being impacted but it is considered the impacts of 0.03 ha of completely degraded Pinjar Complex are not so significant and that to rehabilitate at such a small scale it would not be considered a viable vegetation patch. The 0.03 ha of Pinjar complex impacts will instead be incorporated into the area for Bassendean Complex North / North Transition.

The Hopeland offset site is mapped as Bassendean Complex – Central and South complex and is within 1km of the mapped edge of the Southern River complex. The Southern River vegetation complex shares some similarities with the Bassendean complex in upland areas and is considered a transitional zone between the Bassendean and Guildford formation. Given this and that both complexes support species such as Jarrah, Sheoak, and various Banksia species it is considered that the rehabilitation of the Hopeland offset site is suitable to address impacts to both complexes.

Western Power will offset impacts to Bush Forever sites through acquisition of land with on-ground management offsets that:

- Contain at least two times the extent of the regionally significant bushland impacted
- Contain the same vegetation communities and/or vegetation complexes as the environmental values being significantly impacted
- Contain, after the implementation of on-ground management, areas with a vegetation condition that is equivalent to or better than the environmental value being impacted.
- Result in no net loss for regionally significant bushland.

3.3 Banksia Woodland TEC/PEC

3.3.1 TEC/PEC Description

The federally listed TEC is found in the southwest of Western Australia and is characterised by a dominant tree layer of *Banksia* spp., often with scattered eucalypts and other tree species. The understorey is rich with wildflowers, sclerophyllous shrubs, sedges and herbs (DoEE, 2016).

The three PECs impacted by the proposal that are analogous to this TEC are each described below.

Banksia attenuata-Banksia menziesii Woodlands (FCT 23b)

This ecological community is found within the Bassendean system, extending from Melaleuca Park to Gingin. It is part of the relatively widespread Banksia woodlands located north of Perth (DBCA, 2023).

AECOM (2023) recorded this PEC at numerous locations within the 576.37 ha survey area, restricted to areas adjacent to and north of Gnangara Road. Of this, 0.36 ha occurs within the Proposal's Impact Area. AECOM (2023) recorded the PEC in seven quadrats in a Good to Excellent condition. The average species diversity was 52.3 species and the similarity index was relatively high, ranging from 46% (likely due to recent vegetation burns) to 64%.

Low Lying Banksia attenuata Woodlands or Shrublands (FCT 21c)

This PEC occurs sporadically between Gingin and Bunbury and is primarily restricted to the Bassendean system. It typically occupies lower-lying, wetter areas and is dominated by *Melaleuca preissiana*, *Banksia attenuata*, *Banksia menziesii*, *Regelia ciliata*, *Eucalyptus marginata*, or *Corymbia calophylla*. This ecological community can appear as a woodland and occasionally as shrubland (DoEE, 2016). A total of 0.59 ha of this PEC was mapped within the Proposal Impact Area.

AECOM (2023) has recorded four quadrats that represent FCT 21c. These quadrats represent three distinct communities; however, all are located in low-lying areas that are potentially wet during winter and may feature an overstorey of *Melaleuca preissiana* or *Eucalyptus marginata*. Species richness is similar across sites, with an average of 39 species. All four quadrats were located in areas of vegetation considered to be in Excellent condition.

Banksia Woodlands of the Swan Coastal Plain

This TEC's canopy is typically dominated or co-dominated by *Banksia attenuata* and/or *Banksia menziesii*. Other species, such as *Banksia prionotes* or *Banksia ilicifolia,* may also become dominant. This community typically occurs on well drained, low nutrient soils associated with sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands. It also commonly occurs on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau, with some presence in other, less typical environments (DoEE, 2016).

Where no other PEC was identified as FCT 21c, FCT 23b or other FCT, AECOM (2023) inferred all patches of Banksia Woodlands TEC as Priority 3 PEC Banksia dominated woodlands and shrublands of the Swan Coastal Plain. A total of 1.08 ha was mapped in Good to Very Good Condition. This PEC corresponds with the Commonwealth listed Banksia Woodlands TEC.

3.3.2 Proposal Impacts

The Proposal will result in clearing of up to 2.23 ha of the Banksia Woodland TEC. The TEC is recognised under multiple ecological community listings in Western Australia, including three Priority 3 PECs that occur within 2.03 ha of this 2.23ha of Banksia TEC:

- 0.36 ha of Priority 3 *Banksia attenuata-Banksia menziesii* woodlands (FCT 23b).
- 0.59 ha of Priority 3 Low lying *Banksia attenuata* woodlands or shrublands (FCT 21c).
- 1.08 ha of Priority 3 Banksia Woodlands of the Swan Coastal Plain.

3.3.3 Offset Strategy

To offset the significant residual impact on the Banksia Woodland TEC, Western Power purchased an offset site containing vegetation with like-for like and ecologically similar FCTs to protect and maintain. Offset sites in proximity to DBCA conservation estate were targeted with the aim of the offset site(s) being transferred to DBCA for inclusion into existing conservation estate where it will be protected into perpetuity. This is consistent with DoEE (2016) advice that, preserving existing high-quality remnants of the Banksia Woodland ecological community is necessary for the long-term recovery of the TEC.

In addition, Western Power proposes to rehabilitate 2 ha of degraded area with native vegetation that is representative of the Low lying *Banksia attenuata* woodlands or shrublands FCT21c PEC.

Locations for offset sites that are to be subject to rehabilitation have been targeted based on their proximity to existing DBCA reserves, either to act as an extension of existing areas, or to form ecological linkages between reserves. The Orange Springs site will provide an extension to Moore River National Park, with the southern boundary of the site shared with the DBCA reserve. The Hopeland site will serve as an ecological linkage between three DBCA reserves, two blocks of R51784 and R37090 (Figure 5Figure 5).

Rehabilitation activities will be detailed in a RMP that will be developed in accordance with the DWER guidance: *A Guide to Preparing Revegetation Plans for Clearing Permits* (2018), and will include rehabilitation targets, completion criteria, ongoing monitoring and maintenance requirements and remedial actions to be implemented when monitoring indicates that the revegetation effort has not met its established completion criteria. The RMPs will be finalised in consultation with the EPA and DCCEEW and be implemented prior to any clearing of vegetation.

Further to the Offset Strategy's key criteria being outlined in Section 7.4, the following rehabilitation objectives are proposed to be embedded in the Orange Springs RMP. Rehabilitation of native vegetation with values that:

- Provide vegetation that is representative of the Low lying *Banksia attenuata* woodlands or shrublands FCT21c PEC
- Provide similar vegetation species richness, diversity, structure and density to the impacted areas, to be baselined and measured against the surveys from the Proposal's referral

Acquisition of land that contains existing higher quality Banksia Woodlands of the Swan Coastal Plain will be subject to threat abatement activities that aim to protect and maintain the current quality of

the TEC. Threat abatement activities will be implemented by Western Power for a period of 10 years or as otherwise specified below. Threat abatement activities include, but are not limited to:

- Protect and manage important and critical habitat
- De-stocking the site of livestock within 12 months of the Proposal's referral approval
- Undertake biennial monitoring and reporting to DBCA, DWER and DCCEEW of the condition, extent and boundaries of the TEC occurrence over a 10 year period
- Demarcation of the offset site with signage
- Annual monitoring for the first five years for signs of weed propagation, spread of dieback and changes in vegetation condition, with a further 5 years of monitoring with the ongoing frequency of monitoring risk assessed and revised if required. Where habitat scoring / condition is declining when compared to the SLR (2025) survey or weed spread is encroaching into intact high quality vegetation patches, then annual infill planting and/or weed control will be implemented until the condition is returned to pre-impacted habitat value and weeds are removed and no sign of encroachment into intact vegetation is achieved for two consecutive years.
- Bi-annual removal and/or treatment of weeds identified during monitoring events
- Within 12 months of the Proposal's approval undertake a baseline dieback survey of the site and development and implementation of a hygiene management plan if dieback is identified as present and determined to be a threat to the existing biodiversity values
- Removal of any rubbish and/or refuse
- Maintenance of existing boundary fencing and site access control to prevent public access. Removal of internal fencing to allow unrestricted movement of fauna.
- For a period of 10 years undertake annual monitoring for signs of feral animals that may be predators or affect the quality of the existing habitat, with feral animal trapping and management triggered where the monitoring identifies feral animals may degrade the existing habitat values. This includes annual monitoring and eradication of feral bees from any suitable hollows present in existing suitable nesting trees.

3.3.4 Offset Calculator Inputs

Table 6 details the calculator inputs to determine the significant residual impact of the Proposal on Banksia Woodland TEC/PEC.

Table 6 Banksia Woodland TEC/PEC – Impact Calculator Values

Attribute	Significant residual impact
Type of environmental value	Ecological Community
Conservation significance of environmental value	TEC/PEC
Conservation significance score	1.2%

Attribute	Significant residual impact
Description	Clearing 2.23 ha of Banksia Woodland TEC/PEC in Good to Excellent condition, comprising: • Priority 3 *Banksia attenuata-Banksia menziesii* woodlands (FCT 23b) in Very Good - Excellent condition. • Priority 3 Low lying *Banksia attenuata* woodlands or shrublands (FCT 21c) in excellent condition. • Priority 3 Banksia Woodlands of the Swan Coastal Plain in Very Good - Excellent condition.
Significant residual impact (adjusted ha)	1.78
Quality (scale)	8/10

3.4 Black Cockatoos

3.4.1 Habitat Description

The Proposal will impact foraging, roosting and breeding habitat for the three threatened black cockatoo species:

- Baudin's Cockatoo (*Zanda baudinii*)
- FRTBC (*Calyptorhynchus banksii naso*)
- Carnaby's Cockatoo (*Zanda latirostris*).

The conservation status under the EP Act and EPBC Act, along with a summary of their foraging, roosting and breeding habitat, as per existing State and Commonwealth Conservation Advice are outlined in Table 7.

Table 7 Black Cockatoo Foraging, Roosting and Breeding Habitat

Species	Foraging habitat	Breeding habitat	Roosting Habitat
Baudin's Cockatoo Endangered under the EPBC Act and BC Act	Species forages in the Jarrah Forest, on the South Coast and eastern side of the Swan Coastal Plain. Primarily foraging in Marri trees (*Corymbia calophylla*) but may also forage in Jarrah trees (*Eucalyptus marginata*) and native proteaceous plants such as *Banksia*, *Dryandra*, and *Hakea* species (TSSC, 2018).	Southern areas of the Swan Coastal Plain, in the Jarrah Forest, woodlands or forests and the western margins of the Wheatbelt. Nesting occurs in suitable hollows of mature or dead *Eucalyptus* trees, including Karri (*E. diversicolor*), Marri, Jarrah, Wandoo, Bullich (*E. megacarpa*) and Tuart (DAWE, 2022; TSSC, 2018).	Generally in or near riparian environments or other permanent water sources. Any tall trees may provide roosting habitat, particularly Jarrah, Flooded Gum, Blackbutt, Tuart and introduced eucalypts.

Species	Foraging habitat	Breeding habitat	Roosting Habitat
Carnaby's Cockatoo Endangered under the EPBC Act and BC Act	South Coast, Swan Coastal Plain and Wheatbelt regions (DAWE, 2022). Kwongan heathlands/woodlands comprise primarily foraging species, including *Banksia* spp., Hakea spp., *Grevillea* spp., *Callistemon* spp. and Marri trees (DAWE, 2022).	The Jarrah Forest, woodlands and forests in the Wheatbelt and South Coast regions and the Swan Coastal Plain, specifically Lake Clifton, provides occasional breeding activity from July to December. Nesting occurs in hollows of mature or dead Eucalyptus trees of primarily Salmon, Gum, Wandoo, Tuart, Jarrah, Flooded Gum (*E. rudis)*, York Gum, Powderbark (*E. accedens*), Karri and Marri species (DAWE, 2022).	Generally in or near riparian environments or natural and artificial permanent water sources, Any tall trees may provide roosting habitat, particularly Flat-topped Yate, Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, introduced eucalypts and introduced pines.
FRTBC Vulnerable under the EPBC Act and BC Act	Swan Coastal Plain, South Coast, and Jarrah Forest regions. Primarily foraging species include Jarrah and Marri woodlands and forests, the edges of Karri (*Eucalyptus diversicolor*) forests, Wandoo (*E. wandoo*) and Blackbutt (*E. patens*) trees (DAWE, 2022).	Swan Coastal Plain, woodland or forest, Perth Metropolitan Area, Jarrah Forest Region, Wheatbelt and the South Coast Region Nesting occurs in suitable hollows of mature or dead *Eucalyptus* trees, Marri, Karri, Wandoo, Bullich, Blackbutt (*E. patens*), Tuart and Jarrah species (DAWE, 2022).	Any tall trees may provide roosting habitat, particularly Jarrah, Marri, Blackbutt, Tuart and introduced eucalypts or large trees on the edges of forests.

3.4.2 Proposal Impacts

The Proposal will have a direct impact on foraging, roosting and breeding habitat for the three threatened species of black cockatoos due to clearing activities associated with the construction of the Proposal. AECOM (2025) assessed the foraging habitat within the PDE using the Bamford Consulting Ecologists (BCE) (2024) scoring tool. This methodology assesses habitat quality based on the presence of preferred foraging species, the site's ecological context (including the likelihood of local breeding) and species stocking rates. Significant residual impacts were considered for all foraging habitat qualities (negligible to very high) (as per the BCE [2024] methodology), as outlined in Table 3.

The total impact area is smaller than the combined individual habitat areas for each species, due to overlap in the foraging habitat types shared among species.

Six fauna habitat types were considered to represent potential roosting habitat for black cockatoos (AECOM, 2025):

- Trees over cleared
- Banksia woodland
- Mature Pine Plantation
- Eucalyptus Woodland
- Urban/Residential
- Burnt pine

Clearing within these areas will result in a total impact of up to 51.1 ha to roosting habitat within the Proposal development envelope.

The Proposal will result in clearing of 54 potential nesting trees, none of which contain hollows or suitable hollows. One of these potential nesting trees (tree ID101) was thought to have a suitable hollow, based on on-ground assessment during the 2022 survey. The refined assessment completed by AECOM in 2025 utilised drones to confirm the suitability of the hollow and determined that the hollow dimensions and characteristics are not suitable to support black cockatoo breeding (Table 8). No evidence of active use by black cockatoos was observed in the hollow at the time of the survey AECOM (2025).

The details of tree ID101are provided in Table 8 below.

Table 8 Suitable Black Cockatoo Breeding Trees

Tree ID	Tree description	Location	Hollow description
101	Coastal Blackbutt *(Eucalyptus todtiana)*, partially dead within Eucalyptus Woodland habitat	115.9173774 -31.8019129	Vertical branch hollow (approximately 20cm x 20cm) approximately 6m above ground, with a south facing entry. No evidence of use observed. Drone imagery demonstrated hollow was a platform only, filled with debris.

3.4.3 Offset Strategy

To offset the significant residual impact on black cockatoo foraging, roosting and breeding habitat, Western Power proposes a combination of land acquisition, protect and manage existing habitat critical for survival and on-ground management offsets including threat abatement activities and rehabilitation activities to achieve a positive environmental benefit to habitat for black cockatoos.

Acquisition of land that contains existing higher quality foraging habitat for black cockatoos will be subject to threat abatement activities that aim to protect and maintain the current quality of the habitat. The threat abatement activities will be implemented by Western Power for a period of 10 years or as otherwise specified. Threat abatement activities are outlined in Section 3.3.3

Locations for offset sites that are to be subject to rehabilitation have been targeted based on their proximity to existing DBCA reserves, either to act as an extension of existing areas, or to form ecological linkages between reserves. The Orange Springs site will provide an extension to Moore River National Park, with the southern boundary of the site shared with the DBCA reserve. The Hopeland site will serve as an ecological linkage between three DBCA reserves, two blocks of R51784 and R37090 (Figure 5).

Rehabilitation activities will be detailed in a RMP that will be developed in accordance with the DWER guidance: *A Guide to Preparing Revegetation Plans for Clearing Permits* (2018), and will include rehabilitation targets, completion criteria, ongoing monitoring and maintenance requirements and remedial actions to be implemented when monitoring indicates that the revegetation effort has not met its established completion criteria. The RMPs will be finalised in consultation with the EPA and DCCEEW and be implemented prior to any clearing of vegetation.

In addition to the Offset Strategy's key criteria being outlined in Section 7.4, the following rehabilitation objectives are proposed to be embedded in the site specific RMP's. Rehabilitation of native vegetation with values that:

- Provides similar habitat opportunities for the three threatened species of black cockatoos that are known to occur in the area
- Provides similar habitat opportunities for other general native fauna
- For Orange Springs, are similar in vegetation species richness, diversity, structure and density to surveyed sites in the contiguous native vegetation on the Orange Springs property, directly to the west of the rehabilitation area
- For Hopeland, provides continued and self-sustaining foraging and roosting habitat for the three threatened species of black cockatoos
- Contain known key flora species that provide suitable foraging and roosting habitat, including Proteaceous Shrubs (Hakea and Banksia), Eucalypts, Marris and other understorey species to ensure adequate vertical stratification of the revegetation

Whilst no suitable breeding trees will be impacted by the Proposal, Western Power has acquired offset sites with areas of remnant vegetation that contain suitable breeding trees for black cockatoos. Biological surveys of the offset sites will map the locations of suitable breeding trees so that they can be subject to pest control and monitoring programs as part of threat abatement management of the offset sites.

3.4.4 Offset Calculator Inputs

Table 9 details the calculator inputs to determine the significant residual impact of the Proposal. The black cockatoo's foraging habitat quality was based on the BCE (2024) method (AECOM, 2025).

Table 9 Black Cockatoos – Impact Calculator Values

Attribute	Significant residual impact					
Carnaby's Cockatoo foraging habitat						
Type of environmental value	Threatened species foraging habitat					
Conservation significance of environmental value	EPBC Act – Endangered BC Act – Endangered					
Conservation significance score	1.2%					
Description	3.0 ha of high-quality (8) foraging habitat	7.3 ha of moderate to high quality (7) foraging habitat	32.2 ha of moderate quality (6) foraging habitat	1.0 ha of low to moderate (3) quality foraging habitat	49.6 ha of low (2) quality foraging habitat	7.4 of negligible (1) quality foraging habitat
Significant residual impact (adjusted ha)	2.4	5.1	19.3	0.3	9.9	0.7
Quality (scale)	8/10	7/10	6/10	3/10	2/10	1/10
Baudin's Cockatoo foraging habitat						
Type of environmental value	Threatened species foraging habitat					

Attribute	Significant residual impact			
Conservation significance of environmental value	EPBC Act – Endangered BC Act – Endangered			
Conservation significance score	1.2%			
Description	32.2 ha of moderate (6) quality foraging habitat	3.0 ha of moderate (4) quality foraging habitat	6.1 ha of low (2) quality foraging habitat	34.5 ha of negligible (1) quality foraging habitat
Significant residual impact (adjusted ha)	19.3	1.2	1.2	3.45
Quality (scale)	6/10	4/10	2/10	1/10
FRTBC Foraging habitat				
Type of environmental value	Area of habitat			
Conservation significance of environmental value	EPBC Act – Vulnerable BC Act – Vulnerable			
Conservation significance score	1.2%			
Description	32.2 ha of moderate to high (7) quality foraging habitat	3.0 ha of low to moderate (3) quality foraging habitat	11.7 ha of low (2) quality foraging habitat	

Attribute	Significant residual impact		
Significant residual impact (adjusted ha)	22.6	0.9	2.3
Quality (scale)	7/10	3/10	2/10

4. Offset Sites

4.1 Orange Springs

Western Power has secured Lot 7 on Plan P013245, located at 299 Orange Springs Road, Orange Springs. The site is 508.3 ha, located approximately 70 km north of the Proposal, adjacent to Moore River National Park, and within the Swan Coastal Plain IBRA region. Western Power engaged SLR Consulting Australia (SLR) (2025) to undertake a biological survey (detailed flora and vegetation, basic fauna and targeted black cockatoo survey) of the whole lot. The location of the offset is shown in Figure 2.

4.1.1 Survey Results

SLR (2025) conducted a comprehensive desktop assessment, which identified the potential for:

- Sixty-nine (69) significant flora species with the potential to occur in the survey area (11 Threatened and 58 Priority species). Of these, 24 species were considered likely to occur.
- Two state-listed Banksia Woodland PECs, Banksia Woodlands of the Swan Coastal Plain ecological community and the Swan Coastal Plain *Banksia attenuata - Banksia menziesii* woodlands (23b), with potential to occur. Both communities form part of the federally listed TEC.
- Twenty-nine (29) significant fauna species with potential to occur, which included 22 birds, six mammals and one reptile.

SLR (2025) did not record any Threatened or Priority flora within the survey area during the field survey. A post-survey likelihood of occurrence assessment found three species of the initial 24 target species were considered likely to occur, *Paracaleana dixonii* (Endangered under the EPBC Act and Vulnerable under the BC Act), *Dillwynia dillwynioides* (P3) and *Regelia megacephala* (P4).

Six vegetation types were recorded within the survey area, including two Banksia Woodland vegetation types (BaBm and BaMpAc), a Eucalypt/Banksia woodland (EtBaBM), Regrowth vegetation (trees over shrubs), Mature trees (MT) and Garden vegetation. A total of 64.5 ha (12.6%) of the survey area was cleared. Vegetation condition ranged from Completely Degraded to Excellent, with the majority (76.3%) in Excellent condition. Evidence of disturbance included past clearing, agricultural activity, and the presence of weeds.

SLR (2025) determined 402.1 ha (79.1%) of the survey area is representative of the federally listed Banksia Woodlands of the SCP TEC. This included three of the vegetation types:

- BaMpAc (26.1 ha)
- BaBm (296.5 ha)
- EtBaBm (79.5 ha).

SLR (2025) conducted FCT analysis for each quadrat within the BaMpAc, BaBm, and EtBaBm vegetation types. Vegetation type BaMpAc, was considered representative of the *Banksia ilicifolia* woodlands, southern SCP (FCT22) Priority 3 PEC and vegetation types BaBm, and EtBaBm were analogous to the SCP *Banksia attenuata - Banksia menziesii* woodlands (FCT 23b).

Seven distinct fauna habitats were identified within the survey area, all of which are common throughout the wider region. Among them, Banksia Woodland and the Ephemeral Banksia Wetland/Woodland stand out as particularly valuable to local fauna, especially as key foraging areas for Carnaby's Cockatoo. The

Wandoo Woodland also plays an important role, offering nesting and roosting sites for the species in proximity to water and foraging resources. No evidence of roosting was recorded during the survey.

No significant fauna species were observed during the survey. However, one significant species, the Carnaby's Cockatoo (*Zanda latirostris*), was assessed as having a high likelihood of occurrence post-survey, based on (SLR, 2025):

- The site being within Carnaby's known distribution range, with a total of 2,027 Carnaby's Cockatoo records identified within a 20km radius of the Orange Springs site. The closest record is located 1.8km northeast of the site
- 29 confirmed Carnaby's Cockatoo breeding sites occur within a 20km radius of Orange Springs, the closest being 9.1km northeast of the site.
- 11 potential breeding sites for Carnaby's Cockatoo occur within a 20km radius of the site
- One known Carnaby's Cockatoo roosting site occurs within a 20km radius, located approximately 4.7km northeast of the site.
- The presence of suitable foraging, roosting and breeding habitat within Orange Springs.

No evidence of black cockatoo foraging or roosting behaviour was recorded during the field survey. The Orange Springs offset site falls outside of the known distribution ranges of both the FRTBC and Baudin's Cockatoo.

The field survey recorded 217 potential breeding trees and 20 suitable breeding trees for Carnaby's Cockatoo (Table 10).

Table 10 Black Cockatoo Nesting Trees Recorded within the Survey Area

Tree Taxa	Known Nesting Tree	Suitable Nesting Tree		Potential Nesting Tree		Total
	Category 1	Category 2	Category 3	Category 4	Category 5	
Marri (*Corymbia calophylla*)	0	0	0	0	10	**10**
Stag	0	0	9	0	8	**17**
Wandoo (*Eucalyptus wandoo)*	0	1	10	3	196	**210**
Total	**0**	**1**	**19**	**3**	**214**	**237**

Carnaby's Black Cockatoo foraging habitat quality was assessed using the DAWE (2022) scoring system, results are provided in Table 11

Table 11 Foraging Habitat Quality Score of Carnaby's Black Cockatoo Habitat using DAWE (2022)

Habitat	Area (ha)	Foraging value
Banksia Woodland	376.4	

Habitat	Area (ha)	Foraging value
Eucalyptus todtiana over Native Regrowth	34.7	High (8)
Ephemeral *Banksia* Wetland / Woodland	25.6	
Wandoo Woodland over Paddock	5.8	
Isolated Eucalyptus over Paddock	0.8	
Garden Planted	0.3	
Cleared / Paddock	64.2	None (0) – No Proteaceae, eucalypts or other potential sources of food.

SLR noted the suitability of Wandoo Woodland over Paddock, *Eucalyptus todtiana* over Native Regrowth and Isolated Eucalyptus over Paddock habitat types as roosting habitats for Black Cockatoos (totalling 41.3 ha) due to the presence of a nearby water source (Moore River, within 900m) and foraging resource availability within a 20km radius (SLR, 2025).

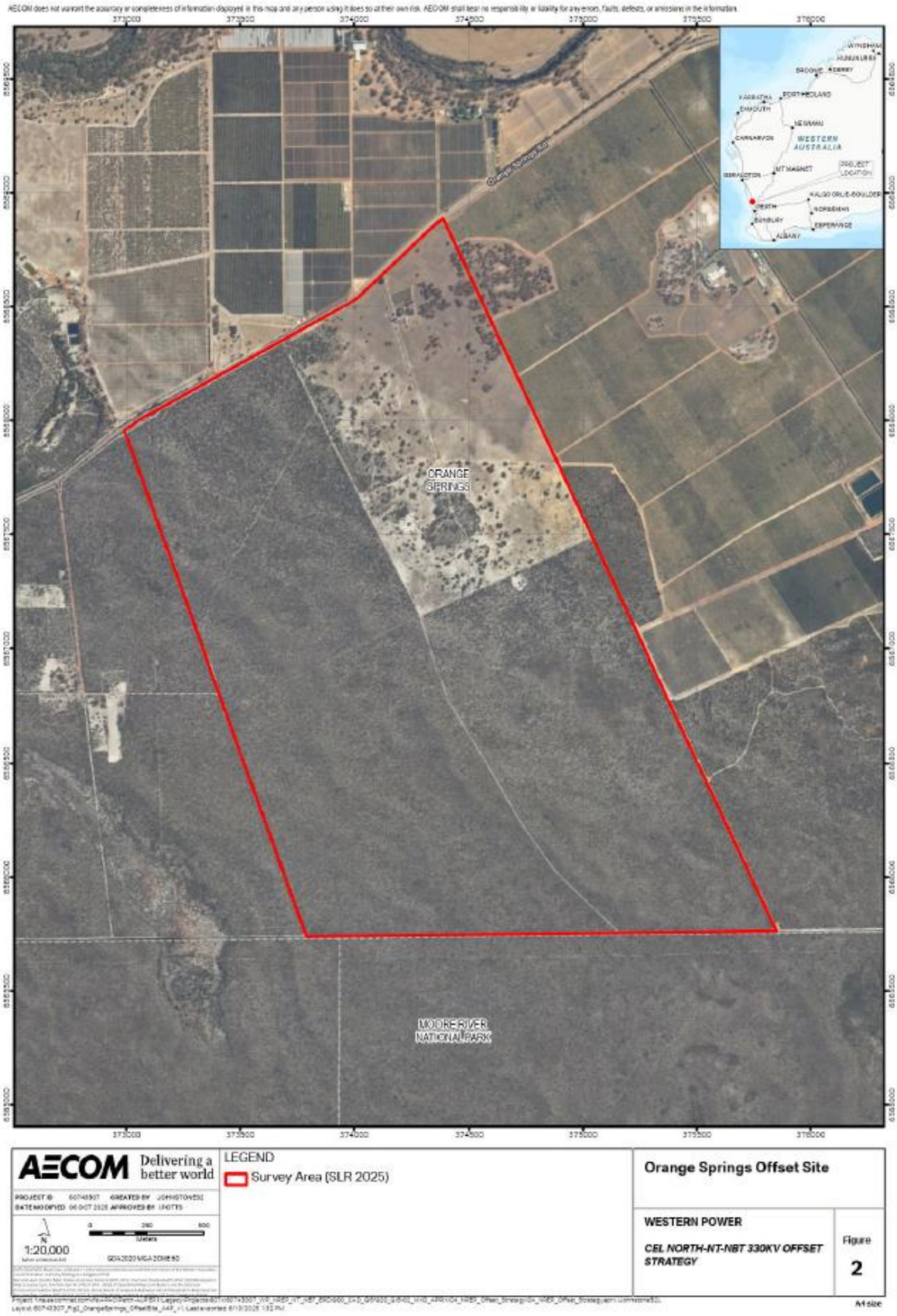


Figure 2 Orange Springs Offset

4.1.2 Suitability as an Offset

The Orange Springs offset site contains 402.1 ha of the Banksia Woodland TEC/PEC, in Very Good to Excellent condition with 376 ha (73.9%) of the TEC representative of the Priority 3 *Banksia attenuata - Banksia menziesii* woodlands (FCT 23b). This is expected to be sufficient to counterbalance 100% of the significant residual impact on FCT 23b and the Banksia Woodland TEC.

It is noted that the Low lying *Banksia attenuata* woodlands or shrublands FCT21c was not identified at the Orange Springs site during the field survey, however the desktop survey completed by SLR noted that FCT21c was one of the nine FCTs identified as statistically similar to the vegetation types within Orange Springs and the soil types, landform positions and records of regional occurrences indicate that it is possible for FCT21c to occur (SLR, 2025) at this site. Therefore, the offset site is deemed capable of supporting a rehabilitated community that is representative of FCT21c and two hectares of rehabilitation is expected to be sufficient to counterbalance 100% of the significant residual impact on FCT 21c.

The offset site includes 442.6 ha (87.1%) of suitable foraging habitat for Carnaby's Cockatoo, with a quality of High (8), as per the DAWE (2022) Foraging Habitat Scoring Tool (SLR, 2025).

It is acknowledged that the offset site is located 70km north of the Proposal impact sites and as such is outside of the local population area that is directly impacted by the Proposal. However, the Proposal's impact site location within the highly developed Perth Metropolitan northern region meant that properties available for purchase, of the required size and that also supported the targeted environmental values for offsets were significantly limited and/or not cost effective.

Noting this and taking into consideration the recommended priorities from the EPA's Public Advice: Considering environmental offsets at a regional scale, offsets have focused on bioregion (Swan Coastal Plain), landscape scale improvements for the species with a focus on creating increased connectivity of the fragments of supporting habitat for Black Cockatoos within their range across the Swan Coastal Plain.

As urban areas continue to develop and expand, there is growing evidence that flocks of Carnaby's Cockatoo can have variability in their home ranges extending from 12-480 km. The Orange Springs site will protect existing critical habitat areas, in accordance with the Carnaby's Cockatoo Recovery Plan (DPAW, 2013), and provides greater value to the species than the impact site due to:

- The presence of a water source
- It's proximity to known roosting, breeding and foraging sites for the species
- It being a known frequented area based on review of DBCA records
- It's location directly adjacent to existing DBCA conservation estate (Moore River National Park), and
- The presence of 20 suitable breeding trees for Carnaby's Cockatoo

The lot contains 64.2 ha of cleared areas which will be subject to rehabilitation, targeting key species providing foraging habitat for Carnaby's Cockatoo. Threat abatement measures will be implemented across the entirety of the site aimed at maintaining and reducing the risk of the quality of the remnant native vegetation declining.

To support future rehabilitation activities, Western Power has engaged Tranen Revegetation Systems (Tranen) to conduct seed collection at Orange Springs. The seed collection program is now in its second year and will ensure local provenance seed is available for revegetation activities.

The Orange Springs site is located outside of the distribution range associated with the FRTBC and Baudin's Black Cockatoo. As such, the Orange Springs site is not being proposed to offset residual impacts to these species.

4.1.3 Offset Calculator

The offset value of Orange Springs was assessed using the DWER and DCCEEW offset calculators for both Carnaby's Black Cockatoo foraging habitat and Banksia Woodland TEC.

The justifications for input values are presented in Appendix A.

Banksia Woodland TEC/PEC

Western Power proposes to offset 100% of the impacts to the Banksia Woodland TEC/PEC through the protection of existing, high quality remnant vegetation with like-for-like values and rehabilitation of degraded areas, targeting a vegetation community composition that is representative of FCT21c.

A subset of the offset calculator inputs for the DCCEEW and DWER calculators for Banksia Woodland TEC are provided in Table 12, as well as the calculated area required to offset the Proposal's significant residual impact to the TEC. Appendix B includes a copy of the full offset calculator inputs for Orange Springs.

Remnant vegetation

Table 12 Orange Springs - Banksia Woodland TEC/PEC Offset Calculator

Offset calculator inputs (Orange Springs)		Area required to offset 100% of residual impacts
Significant Residual Impact Area (adjusted ha)	1.78	**20.97 ha** (DWER 140.9%, DCCEEW 100%)
Current quality of offset site	8/10	
Future quality without offset	8/10	
Future quality with offset	8/10	
Time until ecological benefit (years)	1	
ROL without offset (%)	15	
ROL with offset (%)	0	
Confidence in offset result (%)	90	

Rehabilitation

Western Power proposes to rehabilitate 2 ha of degraded area to vegetation that is representative of the Low lying *Banksia attenuata* woodlands or shrublands FCT21c PEC. This is greater than the 1.09ha required to counterbalance 100% of the offsets due to the known difficulty in rehabilitating Banksia Woodland and to increase the likelihood of success in achieving 100% of the offset requirements at a minimum.

Table 13 Orange Springs - Banksia Woodland FCT21c PEC Offset Calculator

Offset calculator inputs (Orange Springs)		Area required to offset 100% of residual impacts
Significant Residual Impact Area (adjusted ha)	0.47	**2.0 ha** (DWER 209.3%, DCCEEW 183.48%)
Current quality of offset site	0/10	
Future quality without offset	0/10	
Future quality with offset	6/10	

Offset calculator inputs (Orange Springs)		Area required to offset 100% of residual impacts
Time until ecological benefit (years)	10	
ROL without offset (%)	15	
ROL with offset (%)	0	
Confidence in offset result (%)	80	

Final Offset

Western Power will allocate 20.97 ha of the total available 402.1 ha of Banksia Woodland TEC at Orange Springs and will rehabilitate 2ha of cleared land, targeting a vegetation community composition that is representative of FCT21c to offset 100% of the Proposal's impacts on the TEC. Additionally, a further 101.81 ha of Banksia Woodland TEC area will also be protected through offsets for Carnaby's Cockatoos (see following sections) and subject to on ground management measures that will ensure the ongoing maintenance and protection of the condition of the TEC within the Orange Springs site. This means that Wester Power will go significantly beyond the TEC offset requirements.

Carnaby's Black Cockatoo

Western Power proposes to use a combined approach of protection and management of existing, critical remnant vegetation with like-for-like values, and rehabilitation of areas of degraded suitable habitat to offset the significant residual impacts to Carnaby's Black Cockatoo.

A subset of the offset calculator inputs for the DCCEEW and DWER calculators for Carnaby's Cockatoo foraging and breeding habitat are provided in Table 15, as well as the calculated areas required to offset the Proposal's significant residual impact to the species habitat. Appendix B includes a copy of the full offset calculator inputs.

Rehabilitation

The offset requirements for impacts to Carnaby's habitat in Low to Moderate, Low and Negligible qualities and 84.18% of the Moderate will be addressed through the rehabilitation of the 64.2 ha cleared area at Orange Springs (Table 14), targeting an increase from the current quality (0) (SLR, 2025) to a foraging habitat quality score of 6.

Table 14 Orange Springs – Carnaby's Cockatoo Offset Calculator for Rehabilitation Offsets

Offset calculator inputs (Orange Springs)		Area of rehabilitation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
Moderate (4-6) quality foraging habitat			
Significant Residual Impact (adjusted ha)	19.3	**38.46 ha of rehabilitation of land from quality 0 to quality 6** (DWER 84.81%, DCCEEW 84.81%)	**16.38**
Current quality of offset site	0		
Future quality without offset	0		
Future quality with offset	6		
Time until ecological benefit (years)	10		

Offset calculator inputs (Orange Springs)		Area of rehabilitation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
ROL without offset (%)	0		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Low to Moderate (3) quality foraging habitat			
Significant Residual Impact (adjusted ha)	0.3	**0.71 ha of rehabilitation of land from quality 0 to quality 6** (DWER 100.8%, DCCEEW 100.8%)	**0.3**
Current quality of offset site	0		
Future quality without offset	0		
Future quality with offset	6		
Time until ecological benefit (years)	10		
ROL without offset (%)	0		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Low (2) quality foraging habitat			
Significant Residual Impact (adjusted ha)	9.9	**23.29 ha of rehabilitation of land from quality 0 to quality 6** (DWER 100%, DCCEEW 100.02%)	**9.9**
Current quality of offset site	0		
Future quality without offset	0		
Future quality with offset	6		
Time until ecological benefit (years)	10		
ROL without offset (%)	0		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Negligible (1) quality foraging habitat			
Significant Residual Impact (adjusted ha)	0.7	**1.74 ha of rehabilitation of land from quality 0 to quality 6** (DWER 100.2%, DCCEEW 100.17%)	**0.7**
Current quality of offset site	0		
Future quality without offset	0		
Future quality with offset	6		
Time until ecological benefit (years)	10		
ROL without offset (%)	0		
ROL with offset (%)	0		
Confidence in offset result (%)	80		

Remnant Vegetation

The Orange Springs offset site includes 436.7 ha of High (8) quality Carnaby's Cockatoo foraging habitat (Table 11). 122.78ha of this habitat is sufficient to offset the remaining residual impacts of the Proposal to:

- High (8) quality foraging habitat, which requires 28.21 ha to offset 100% of impacts
- Moderate to High (7) quality foraging habitat, which requires 60.07 ha of area to offset 100% of impacts
- Moderate (4-6) quality foraging habitat, which requires 34.5 ha of offset area to offset 15.19% of impacts (Table 15).

Protection of existing remnant vegetation will only be used to address 15.19% if the offsets required for impacts to Moderate (4-6) quality foraging habitat. The outstanding 84.18% will be addressed through rehabilitation of the degraded portion of the Orange Springs site (see Table 14).

Table 15 Orange Springs – Carnaby's Cockatoo Offset Calculator for Remnant Vegetation Offsets

Offset calculator inputs (Orange Springs)		Area of remnant vegetation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
High (8) quality foraging habitat			
Significant Residual Impact (adjusted ha)	2.4	**28.21 ha** (DWER 139.4%, DCCEEW 100%)	**2.4**
Current quality of offset site	8		
Future quality without offset	8		
Future quality with offset	8		
Time until ecological benefit (years)	1		
ROL without offset (%)	15		
ROL with offset (%)	0		
Confidence in offset result (%)	90		
Moderate to High (7) quality foraging habitat			
Significant Residual Impact (adjusted ha)	5.1	**60.07 ha** (DWER 139.4%, DCCEEW 100%)	**5.1**
Current quality of offset site	8		
Future quality without offset	8		
Future quality with offset	8		
Time until ecological benefit (years)	1		
ROL without offset (%)	15		
ROL with offset (%)	0		
Confidence in offset result (%)	90		
Moderate (4-6) quality foraging habitat			
Significant Residual Impact (adjusted ha)	19.32	**34.5 ha** (DWER 23.6%, DCCEEW 15.19%)	**2.94**
Current quality of offset site	8		

Offset calculator inputs (Orange Springs)		Area of remnant vegetation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
Future quality without offset	8	*Note: 100% of residual impacts not offset – refer to Table 14*	*Note: Gap of 16.38 adjusted ha – refer to Table 14*
Future quality with offset	8		
Time until ecological benefit (years)	1		
ROL without offset (%)	15		
ROL with offset (%)	0		
Confidence in offset result (%)	90		

Final Offset

The 122.78 ha of existing native vegetation identified as suitable foraging habitat for Carnaby's Cockatoos and rehabilitation of 64.2ha of cleared/degraded land to foraging habitat at the Orange Springs offset site will be used to address 100% of the Proposal's significant residual impacts to Carnaby's Cockatoo foraging habitat. The area offset to address impacts to foraging habitat is also considered suitable to address the Proposal's impact to 55.1 ha of suitable roosting habitat.

No suitable nesting trees will be cleared as a result of Proposal activities, however, the Orange Springs site includes 20 suitable nesting trees for Black Cockatoos that will be protected and subject to threat abatement programs (feral bee control) as part of the Offset Strategy.

4.2 Hopeland

4.2.1 Site Description

The Hopeland offset site is a 56.7 ha property located at Lot 806 on Plan 202726, 458 Jarrah Road, Hopeland, within the Shire of Serpentine-Jarrahdale (Figure 3). This site is currently owned by Western Power and zoned for rural use. Western Power intends to remain responsible for the management of the offset site, however, is also exploring opportunities to collaborate with local Aboriginal Regional Corporations to support rehabilitation activities and ongoing land management.

A desktop assessment of the offset site was completed by Western Power in November 2025 to identify the environmental values of the site and the potential for future rehabilitation to support the targeted environmental values for offsets, in this case foraging habitat for all three threatened species of Black Cockatoo.

Key environmental values identified during the desktop assessment include:

- Approximately 25% of the site is vegetated, with an estimated 5-8% comprising remnant native vegetation.
- Remnant native vegetation within the site is mapped as the Bassendean 1000 system association – Woodland/Low woodland/Low forest or woodland.
- The site intersects two unnamed DBCA Conservation Category Wetlands (CCWs), UFIs 14679 and 14682 and Multiple Use Wetlands (MUWs).
- Potential presence of Banksia Woodlands of the Swan Coastal Plain TEC.
- The site lies within the known distribution of all three threatened black cockatoo species (Figure 4).
- 41 known roost sites for Black Cockatoos occur within a 15km radius of the site

- Known breeding sites for Baudin's Cockatoo and Carnaby's Cockatoo occur within a 15km radius of the site.

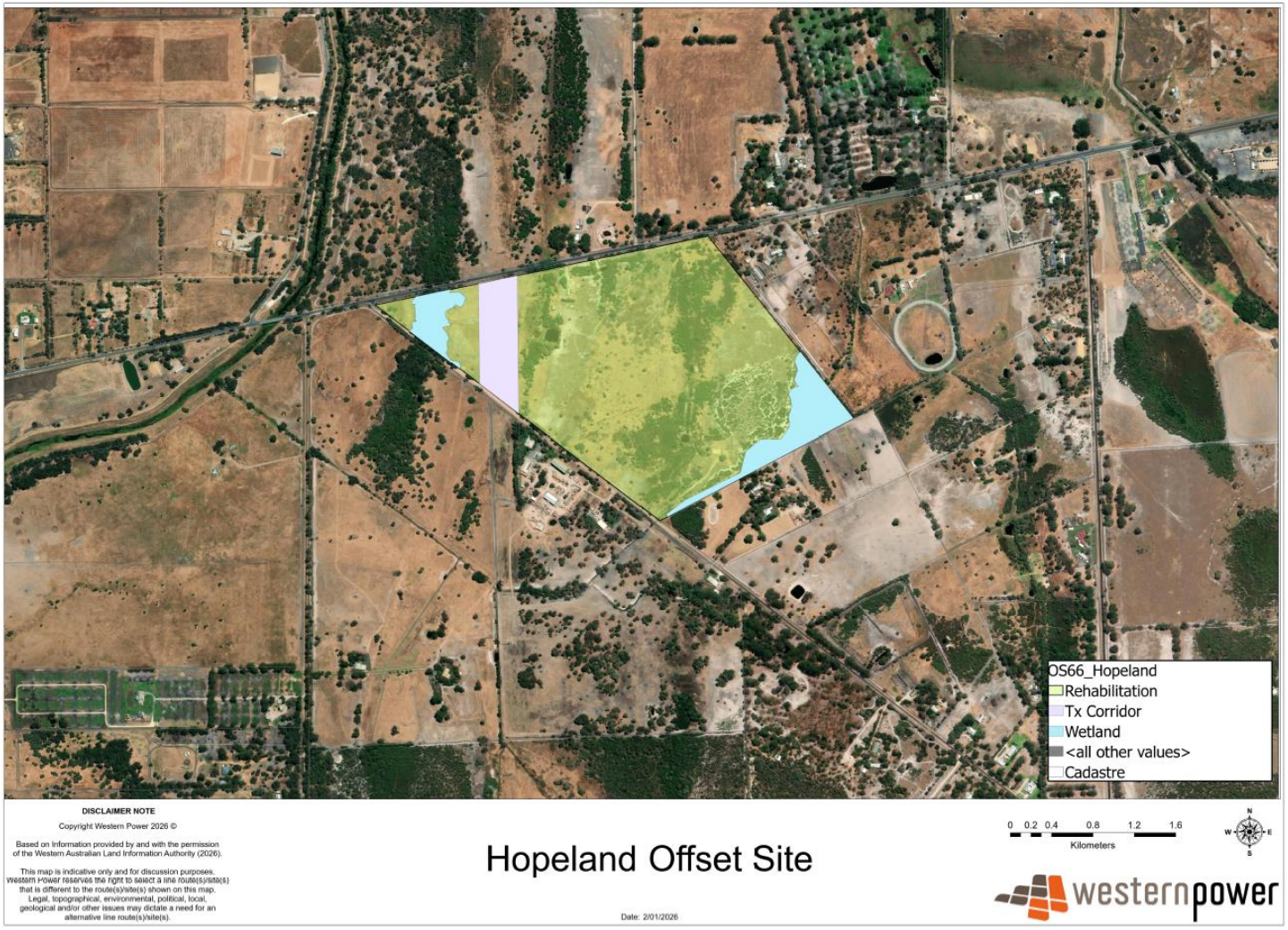


Figure 3 Hopeland offset site

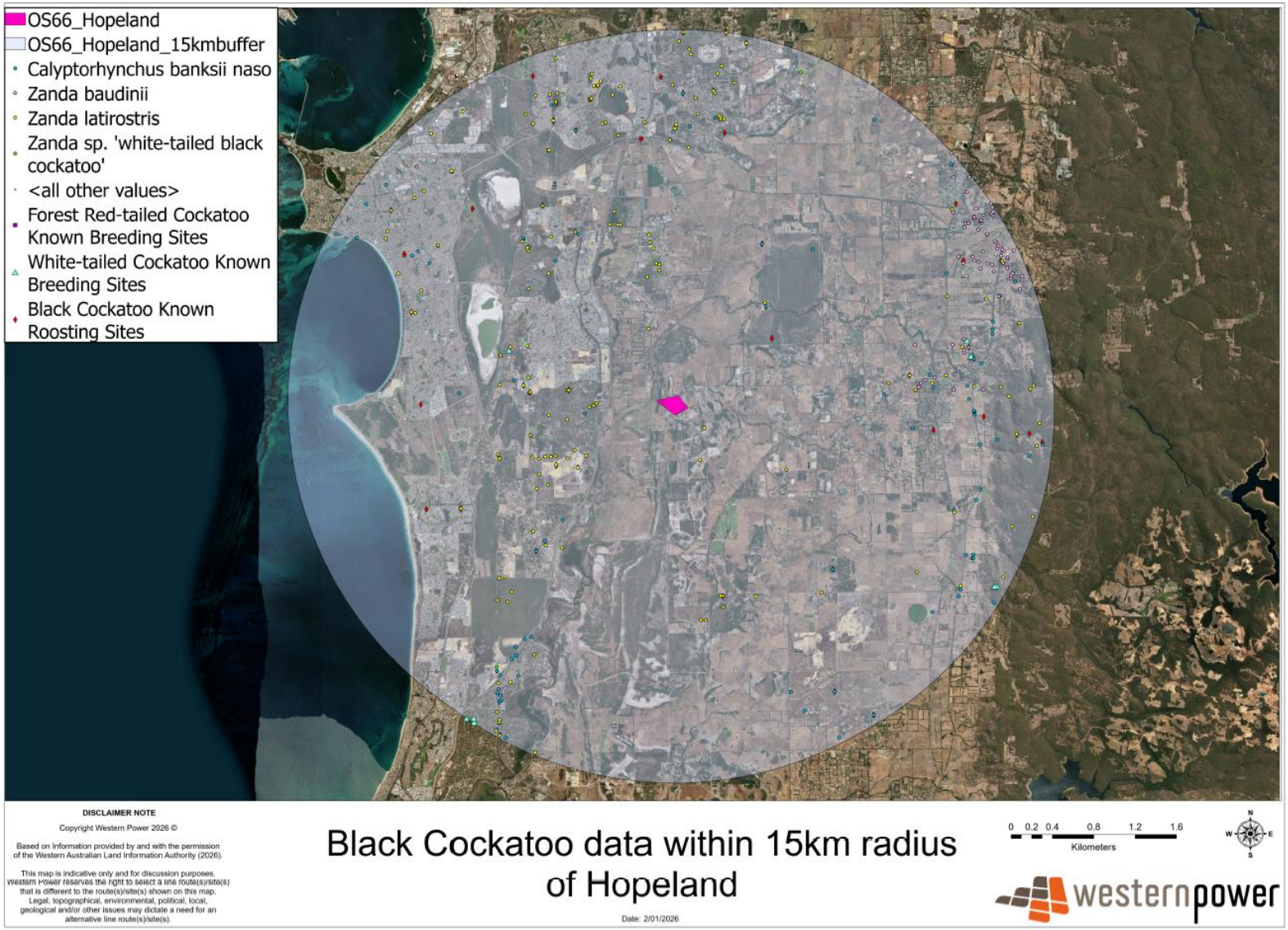


Figure 4 Black Cockatoo records within 15km radius of Hopeland Site

A site visit was undertaken during December 2025 by environmental specialists from the Western Power Environmental Performance team to complete a preliminary assessment on the vegetation present using the Bamford (2020) foraging habitat assessment tool. Appendix E includes photos of key environmental values identified during the site visit.

The areas of remnant vegetation were determined to be representative of wetland communities, dominated by *Melaleuca preissiana* and *Eucalyptus rudis* or ?*Kunzea* sp. (Plate F1 and F2, Appendix E). This aligns with the spatial mapping for the site that indicated the presence of Conservation Category and Multiple Use Wetlands.

Remnant vegetation recorded on the western side of the site (Plate F1 and F7, Appendix E) comprised an overstorey of *Melaleuca preissiana* and *Eucalyptus rudis*. Vegetation condition was considered to be Degraded (EPA, 2016) due to the understorey consisting almost exclusively of aggressive weeds such as**Zantedeschia aethiopica* (Declared Pest) and **Watsonia meriana,* and evidence of historic anthropogenic disturbance.

Investigation of the area on the south-eastern side of the site (Plates F2, F9 and F10, Appendix E), mapped in the DBCA desktop data as potential Banksia Woodland TEC, revealed that the site was not representative of this TEC due to an absence of *Banksia* species in the overstorey. Instead, the area was found to be representative of a wetland community, dominated by an overstorey of *Melaleuca preissiana or* ?*Kunzea* sp. with emergent *Eucalyptus rudis and Corymbia calophylla*. Vegetation condition ranged from Degraded to Excellent (EPA, 2016) in this area.

The remainder of the site consisted of scattered trees over introduced paddock grasses, weeds and sporadic sedges in wetter areas; with a mix of *Eucalyptus marginata*, *Corymbia calophylla, Melaleuca preissiana* and *Nuytsia floribunda* species present (Plate F3-6, Appendix E). Introduced species such as **Ficus* sp. and **Melaleuca viminalis* were observed to have been planted around the residence on the property. Vegetation condition was considered to be Completely Degraded to Degraded (EPA, 2016) in these areas due to historical clearing, presence of weeds and evidence of disturbance by feral pests, such as rabbits.

4.2.2 Foraging Habitat Assessment

The Bamford Consulting Ecologist 2020 Foraging Habitat Assessment Tool was used to support a preliminary, high-level estimation of the foraging habitat quality at the Hopeland Offset Site. This estimation is being used to inform the offset calculations for this strategy.

Site Condition

The more intact wetland areas at the site (Figure 3), comprising approximately 5.52 ha, were given a site condition score of zero for all three species due to the lack of any species that represent potential food sources.

A starting site condition score of one was estimated for the remainder of the site for all three species due to the scattered presence of key foraging species, such as *Corymbia calophylla* and *Eucalyptus marginata*. Sporadic introduced species which represent an alternative food source for black cockatoos were also present at the site, such as **Pelargonium capitatum*, **Ficus* sp., **Acacia ?longifolia* and **Melaleuca viminalis*.

Site Context

A site context score of zero was allocated for all three species due to the percentage of existing native vegetation within 15km that the offset site represents being <1% for FRTBC and <0.1% for both Carnaby's and Baudin's Cockatoo.

Species Density

A species density score of zero was allocated for all three species. Given the limited actual suitable habitat on site and subsequent absence of foraging evidence, all three species of black cockatoo were considered not to be abundant on the site.

Foraging Habitat Score

The foraging habitat scores estimated for the site for all three species of Black Cockatoo are detailed in Table 16.

Table 16 Black cockatoo foraging habitat

Species	None (0)	Negligible (1)
Baudin's Cockatoo	5.52 ha	50.48 ha
Carnaby's Cockatoo	5.52 ha	50.48 ha
FRTBC	5.52 ha	50.48 ha

4.2.3 Suitability as an Offset

The Hopeland site contains a total of 46.82 ha that has been estimated as being of Negligible (1) quality foraging habitat for all three species of Black Cockatoo and suitable for rehabilitation efforts. Rehabilitation of this area will target a foraging habitat quality of Moderate to High (7) for all three species.

The site visit identified areas of the Hopeland offset site that are unsuitable for rehabilitation, these are (Figure 3):

- Transmission line corridor easement (must remain cleared to meet electrical safety requirements).
- Wetland communities (unlikely to successfully support foraging species if subject to revegetation efforts).

This excludes 9.18ha of the total 56 ha lot from rehabilitation for offsets.

The 46.82 ha sufficient to offset 100% of the Proposal's significant residual impact to foraging, roosting and breeding habitat for Baudin's Cockatoo and FRTBC (Table 17 and Table 18, respectively). Given the site is also within the distribution range of Carnaby's Cockatoo, any foraging and breeding habitat established at the site through rehabilitation efforts will also have an additional offset value for this species.

Database searches indicate that the Hopeland site is located within 15km of known roosting and breeding sites for Carnaby's and Baudin's Cockatoo, and within 15km of known roosting sites for FRTBC. There are over 800 records of Black Cockatoos within a 15km radius of the site, the closest being within 1km (Carnaby's Cockatoo).

Additionally, the offset site is located within the centre of three DBCA reserves (Figure 5):

- R51784 located 1.4km north of the site

- R51784 located 3.8km northeast of the site
- R37090 located 4km southwest of the site

Rehabilitation of the site serves to create a new habitat linkage for the three species of Black Cockatoo within the local landscape, especially given the presence of standing water sources at the offset site. No active roosts were identified during the site visit, however several suitable roosting trees were observed and rehabilitation is likely to increase the availability of suitable roosting habitat over time.

A formal breeding tree assessment was not included in the site visit, but several trees observed on site are likely to meet criteria for potential breeding habitat (suitable tree species with a DBH over 500 mm) (Plate F10 and F11, Appendix E). Rehabilitation activities will increase availability of suitable breeding habitat in the long-term.



Figure 5 Hopeland Offset site location in relation to DBCA reserves

4.2.4 Offset Calculator

The offset value of Hopeland was assessed using the DWER and DCCEEW offset calculators for Baudin's Cockatoo and FRTBC foraging habitat.

The offset approach for Hopeland is to rehabilitate the estimated Negligible (1) foraging habitat quality to a quality score of Moderate to High (7).

A high risk of loss without offset value (75%) has been inputted for Hopeland due to the property being acquired by Western Power for a future terminal site as part of strategic planning for load growth in the southeast region.

Baudin's Cockatoo

Western Power proposes to offset the significant residual impacts of the Proposal to Baudin's Cockatoo through rehabilitation of degraded foraging habitat at the Hopeland site, improving the current foraging habitat quality score of Negligible (1) to Moderate to High (7).

Details of the offset calculator inputs are provided in Table 17.

Table 17 Hopeland – Baudin's Cockatoo Offset Calculator for Rehabilitation Offsets

Offset calculator inputs (Orange Springs)		Area of rehabilitation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
Moderate (6) foraging habitat quality			
Significant residual impact (adjusted ha)	19.3	**37.15 ha of rehabilitation of land from quality 1 to 7** (DWER 121.4%, DCCEEW 100%)	**19.3**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Moderate (4) foraging habitat quality			
Significant residual impact (adjusted ha)	1.2	**2.31 ha of rehabilitation of land from quality 1 to 7** (DWER 121.6%, DCCEEW 100.11%)	**1.2**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		

Offset calculator inputs (Orange Springs)		Area of rehabilitation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
Confidence in offset result (%)	80		
Low (2) quality foraging habitat quality			
Significant residual impact (adjusted ha)	1.2	**2.35 ha of rehabilitation of land from quality 1 to 7** (DWER 121.6%, DCCEEW 100%)	**1.2**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Negligible (1) foraging habitat quality			
Significant residual impact (adjusted ha)	3.5	**6.64 ha of rehabilitation of land from quality 1 to 7** (DWER 121.5%, DCCEEW 100.1%)	**3.5**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		
Confidence in offset result (%)	80		

Final Offset

46.82 ha at Hopeland will be subject to restoration activities to improve the foraging habitat quality score from 1 to 7 in order to offset 100% of the significant residual impacts to Baudin's Cockatoo foraging habitat from the implementation of the Proposal. The area offset to address impacts to foraging habitat will also similarly offset the Proposal's impacts to roosting habitat by inclusion of suitable roosting tree species selection.

Forest Red-tailed Black Cockatoo

Western Power proposes to offset the significant residual impacts of the Proposal to FRTBC Cockatoo through rehabilitation of degraded foraging habitat at the Hopeland site, improving the current foraging habitat quality score of Negligible (1) to Moderate to High (7).

Details of the offset calculator inputs are provided in Table 18.

Table 18 Hopeland – FRTBC Offset Calculator for Rehabilitation Offsets

Offset calculator inputs (Orange Springs)		Area of rehabilitation required to offset 100% of residual impacts	Net Present Value (adjusted ha)
Moderate to High (7) quality foraging habitat			
Total Quantum Impact (adjusted ha)	22.6	**36.34 ha of rehabilitation of land from quality 1 to 7** (DWER 103.4%, DCCEEW 100.02%)	**22.6**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Low to Moderate (3) quality foraging habitat			
Total Quantum Impact (adjusted ha)	0.9	**1.45 ha of rehabilitation of land from quality 1 to 7** (DWER 103.4%, DCCEEW 100.22%)	**0.9**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		
Confidence in offset result (%)	80		
Low (2) quality foraging habitat			
Total Quantum Impact (adjusted ha)	2.3	**3.77 ha of rehabilitation of land from quality 1 to 7** (DWER 103.4%, DCCEEW 100.22%)	**2.3**
Current quality of offset site	1		
Future quality without offset	1		
Future quality with offset	7		
Time until ecological benefit (years)	10		
ROL without offset (%)	75		
ROL with offset (%)	0		
Confidence in offset result (%)	80		

Final Offset

46.82 ha at Hopeland will be subject to restoration activities to improve the foraging habitat quality score from 1 to 7 in order to offset 100% of the significant residual impacts to FRTBC Cockatoo foraging habitat from the implementation of the Proposal. The area offset to address impacts to foraging habitat will also similarly offset the Proposal's impacts to roosting habitat by inclusion of suitable roosting tree species selection.

5. Offset Summary

Western Power has secured two offset sites, which provides offset values for the Proposal's residual impacts on the Banksia Woodland TEC and all three threatened black cockatoo species, summarised in Table 19.

Table 19 Residual Impacts for the Proposal

Aspect		Significant residual impact (adjusted ha) *	Nature of Offset	100% of Offset Secured (Y/N)
Flora and Vegetation				
Banksia Woodlands TEC/PEC		1.78	20.97 ha of remnant vegetation at Orange Springs	Y
Banksia Woodlands FCT21c PEC		0.47	2 ha of rehabilitation at Orange Springs	Y
Terrestrial Fauna				
Carnaby's Black Cockatoo Foraging Habitat	Negligible quality (1)	0.7	1.74 ha of rehabilitation at Orange Springs	Y
	Low quality (2)	9.9	23.29 ha of rehabilitation at Orange Springs	Y
	Low to moderate quality (3)	0.3	0.71 ha of rehabilitation at Orange Springs	Y
	Moderate quality (4 to 6)	19.3	34.5 ha of remnant vegetation at Orange Springs 38.46 of rehabilitation at Orange Springs	Y
	Moderate to high quality (7)	5.1	60.07 ha of remnant vegetation at Orange Springs	Y
	High quality (8)	2.4	28.21 ha of remnant vegetation at Orange Springs	Y
Baudin's Black Cockatoo Foraging Habitat	Negligible quality (1)	3.5	6.64 ha of rehabilitation at Hopeland	Y
	Low quality (2)	1.2	2.35 ha of rehabilitation at Hopeland	Y
	Moderate quality (4)	1.2	2.31 ha of rehabilitation at Hopeland	Y
	Moderate quality (6)	19.3	37.15 ha of rehabilitation at Hopeland	Y
FRTBC Foraging Habitat	Low quality (2)	2.3	3.77 ha of rehabilitation at Hopeland	Y
	Low to moderate quality (3)	1.45	1.45 ha of rehabilitation at Hopeland	Y
	Moderate to high quality (7)	36.34	36.34 ha of rehabilitation at Hopeland	Y

* Result is from both DCCEEW and DWER offset calculators.

6. Application of the Environmental Offset Policy Principles

The WA Environmental Offsets Policy (GoWA, 2011) states that environmental offsets are to be used as a last resort, and details six principles to be applied in the assessment and decision-making process with respect to offsets.

The *2012 Environment Protection and Biodiversity Conservation Act* (EPBC Act) *Environmental Offset Policy*, as outlined by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (now DCCEEW) outlines how the Australian Government considers offsets under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). It explains what offsets are and when offsets can and should be used. It also sets out ten policy principles. Principles one to eight explain what an offset must do to be considered suitable. Principles nine and ten provide guidance on how the minister will make decisions when assessing offset proposals.

The State and Commonwealth Policy principles have been considered in preparing the Offsets Strategy. The application and assessment of the environmental offset policy principles are outlined below. It is noted there is overlap of principles at State and Commonwealth levels.

6.1 State Policy Principles

6.1.1 Principle 1: Environmental offsets will only be considered after avoidance and mitigation options have been pursued.

The mitigation hierarchy for environmental factors has been applied in this Proposal design in accordance with the *Statement of environmental principles, factors, objectives and aims of EIA* (EPA, 2023) to manage the risk of the Proposal leading to a significant impact on environmental factors. The mitigation measures that have been applied are:

- Avoid:
  - Alignment of powerline within existing easements to avoid additional clearing of Banksia Woodlands TEC/PEC, Bush Forever sites and valuable fauna habitat, where practicable.
  - Avoidance of 10.8 ha of Banksia Woodlands TEC/PEC through strategic placement of tower locations, spanning over vegetation where possible.
  - Following engagement with the DBCA, the Proposal alignment has been relocated to avoid the Dick Perry Reserve.
  - Use of existing public roads and powerline tracks within the Proposal corridor to avoid additional, unnecessary clearing.
  - A flexible design and construction approach has been adopted, allowing contractors to nominate alternative foundation methods and piling depths.
  - Review and realignment of clearing envelope to refine and reduce total clearing.
  - Assessment of alternative line routes to determine the optimum route on balance when considering environmental, social, safety, cost and constructability factors.
- Minimise:
  - Vegetation clearing will not exceed 111 ha. The majority of the 111 ha of native and non-native vegetation to be cleared is in Completely Degraded or worse condition. Only 45.46 ha of clearing is proposed for vegetation in Degraded or better condition.
  - A Proposal specific Flora and Vegetation Environmental Management Plan has been developed with outcome and objective based targets aimed at minimising impacts to flora and vegetation.

- A Proposal specific Terrestrial Fauna Environmental Management Plan (TFEMP) has been developed with outcome and objective based targets aimed at minimising impacts to flora and vegetation.
- An internal Construction Environmental Management Plan (CEMP) will be prepared by the Principal Contractor and approved by Western Power prior to ground disturbance activities.

6.1.2 Principle 2: Environmental offsets are not appropriate for all projects.

Environmental offsets are considered an appropriate form of mitigation for the significant residual environmental impacts of the Proposal.

The Proposal also supports Western Australia's decarbonisation objectives and the planned retirement of coal-fired power generation by enhancing transmission capacity between Perth and the Mid-West region. This increased capacity will help facilitate the integration of additional wind and solar energy into the grid.

6.1.3 Principle 3: Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted.

Western Power considers environmental offsets to be a cost-effective solution that is relevant and proportionate to the environmental value being impacted by the Proposal. Due diligence has been completed through the commissioning of baseline surveys and site assessments of the offset sites to ensure they are capable of supporting the targeted environmental values to be offset.

Western Power has utilised both the DWER and DCCEEW Offset Calculator Guides to confirm that the area acquired for on-ground management offsets is proportionate to the significant residual impact of the environmental values being impacted by the Proposal.

Offset activities have considered how to generate a net positive benefit through the implementation of threat abatement activities and rehabilitation activities.

6.1.4 Principle 4: Environmental offsets will be based on sound environmental information and knowledge.

The offset site selection has been informed by extensive preliminary database searches, with consideration of proximity of selected sites to DBCA reserves, ecological linkages and capacity of the site to support the targeted environmental values being offset.

Purchased sites have then been subject to biological surveys and/or site assessments to confirm the current environmental values at the site. Technical experts have also been engaged to develop revegetation management plans to support rehabilitation activities and set clear outcome-based objectives for the rehabilitation efforts.

The proposed offsets are aligned with the relevant MNES Recovery Plans and State and Commonwealth offset policy, assessment and guidance documents.

6.1.5 Principle 5: Environmental offsets will be applied within a framework of adaptive management.

The Offset Strategy has overarching objectives and completion criteria as well as key RMP objectives and targets. The RMP's developed for Orange Springs and Hopeland will be based on an adaptive management framework, with outcome-based objectives and targets. The RMP's will be developed with consideration of current EPA guidance: *Instructions How to Prepare Environmental Protection Act 1986 Part IV environmental management plans* (2024) and DWER guidance: *A Guide to Preparing Revegetation Plans for Clearing Permits* (2018).

6.1.6 Principle 6: Environmental offsets will be focused on longer-term strategic outcomes.

Creation of new revegetated suitable habitat is aligned with improved longer term survival of the species and protection of existing critical core habitat into perpetuity via the transfer into the Conservation Estate or under a conservation covenant/agreement will ensure long term outcomes are delivered over time.

Western Power has been in consultation with DBCA and Aboriginal Regional Corporations during the offset site selection process with the intent of transferring ongoing future management of sites where possible. Establishment or use of existing Ranger programs to assist in the implementation of management activities outlined in the RMP's is also being investigated and aligns with Co-benefits for social surroundings as outlined in the EPA's Public Advice Considering Environmental Offsets at a Regional Scale.

6.2 Commonwealth Offset Principals

6.2.1 Principle 1: Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action.

The Offset Strategy provides for the protection and rehabilitation of significant residual impacts to the Banksia Woodland TEC, Carnaby's, Baudin's and FRTBC foraging, roosting and nesting habitats ensuring the same attribute of the environment being impacted, not just the same species or place.

6.2.2 Principle 2: Suitable offsets must be built around direct offsets but may include other compensatory measures.

100% of the offsets are direct offsets. Direct offsets include securing and restoring land and threat abatement activities.

6.2.3 Principle 3: Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.

The level of statutory protection was considered when assessing the significance of the residual impacts. The scale of the proposed offsets was determined using the relevant protected matters current level of conservation status and is documented in the relevant offset calculations.

6.2.4 Principle 4: Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.

The proposed offsets are significant in size and scale and will deliver an overall conservation outcome relative to the scale and condition of the impacts. It is noted the total size of the offset was reduced by selecting sites where significant improvements are to be made to the habitat. All offset calculations were don't consistent with the DCCEEW Offset assessment guide.

6.2.5 Principle 5: Suitable offsets must effectively account for and manage the risks of the offset not succeeding.

The overall risk of the proposed offsets not succeeding is low. Proposed offsets include the protection and maintenance of existing native vegetation, rehabilitation threat abatement activities. Western Power has engaged an experienced and respected professional rehabilitation company to deliver the on ground offset activities. This company has a proven track record of rehabilitation in Southwest WA and rehabilitation budgets have been forecast and approved. Further these are two risks called out with risk controls and remediation triggers embedded in the Offset Strategy to provide confidence success can be achieved.

6.2.6 Principle 6: Suitable offsets must be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action).

The proposed offsets are in addition to that which is already required, determined by law or planning regulations, or agreed to under other schemes or programs. The offset sites are not protected as conservation estate or covenant by any current legislation.

6.2.7 Principle 7: Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable.

The Offset Strategy is effective, scientifically robust and reasonable. Offset sites have had site assessments and are already in Western Power tenure and on ground activities will commence prior to any vegetation clearing.

6.2.8 Principle 8: Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

The Offset Strategy has clear offset activities defined, with measurable completion criteria set to provide transparent and achievable outcomes. Key monitoring, auditing and reporting requirements are set and incident and non-conformance management is outlined.

7. Management framework

Western Power intends for the primary management for the offset sites to be detailed in corresponding RMPs. The RMPs will be developed using an adaptive management framework with outcome-based objectives. For Orange Springs, where a portion of the offsets consist of protection of existing high-quality areas of native vegetation, threat abatement activities will be implemented to ensure the maintenance (at a minimum) of the current quality of the vegetation and to reduce the risk of future decline in condition quality. The intent is for these threat abatement activities to be included in the RMP for the site, as they will be conducted in coordination with activities being implemented to support the rehabilitation works.

Western Power is negotiating to transfer ownership of the Orange Springs offset to DBCA, whilst Hopeland will remain under ownership of Western Power. Orange Springs is under active negotiations to be taken into the conservation estate by DBCA and the final legal arrangement will be determined prior to clearing any vegetation. Where agreement is reached, the agreement that will operate between the parties will be provided to EPA and DCCEEW prior to clearing. Hopeland and any part of Orange Springs not taken into the conservation estate will be protected by a biodiversity conservation covenant / agreement under either the EP Act, the BC Act or equivalent.

Western Power intends to manage the rehabilitation of the Hopeland site in coordination with local revegetation experts and where possible Aboriginal Regional Corporations. The potential for Ranger programs to be expanded, developed and implemented at the site are being discussed with the relevant groups and will be incorporated into the implementation of the RMPs.

7.1 Roles and Responsibilities

Western Power will be wholly responsible for the delivery of the Offset Strategy and implementation of the RMPs (including threat abatement actions) at Orange Spring and Hopland sites. All costs including remedial actions associated with implementation will be Western Powers responsibility.

As part of the offset, Western Power is investigating the use of a ranger program (planned to be in collaboration with the Traditional Owners) which will be afforded responsibilities relating to delivery of on ground activities but achieving the completion criteria remains a Western Power responsibility.

7.2 Monitoring, Auditing and Reporting

The monitoring proposed will focus on three key goals:

1. Provide evidence of progress toward and eventual attainment of completion criteria to enable demonstration of Offset Strategy success
2. Providing feedback on RMP performance as soon as possible to enable early evaluation of the outcomes of implementing the RMP's
3. Provide information from which decisions can be made about the need for remedial actions to ensure the targeted outcomes are achieved

Monitoring and reporting will occur over the 10 year rehabilitation period and be done at a minimum annually for the first 5 years. Monitoring will then move to a risk and outcome-based timeframe and be in accordance with the Revegetation Management Plans developed for each offset site and / or any conditions specified in the Proposal approval documents issued under the EP Act and EPBC Act. Notionally this would move from annually to being at regular intervals, such as years 7, 9 and 10.

Internal auditing of the Offset Strategy will occur at least once every three years or as per any conditions specified in the Proposal approval documents issued under the EP Act and EPBC Act. Internal auditing of the RMP implementation will occur biennially or as per any conditions specified in the Proposal approval documents issued under the EP Act and EPBC Act.

All internal audits will be summarised into an audit report with an executive summary, clear audit scope of work and methodology, the key findings and corrective actions and follow-ups. This summary can be provided on request to the relevant regulator and published on our website as per any conditions specified in the Proposal approval documents issued under the EP Act and EPBC Act.

An Offset Strategy Close Out Report will be prepared that demonstrates how all completion criteria have been met, with associated documented evidence. This report will be sent to DWER, EPA and DCCEEW once all completion criteria have been met.

Western Power will make all reports submitted to the regulator(s) publicly available via the Western Power website within 3 months of report submission.

All incidents of non-conformance will be reported internally as per Western Power's Incident Management Procedure, where the non-conformance is also a condition breach an incident investigation will be conducted, and the relevant regulator will be notified within 4 weeks of the incident investigation being completed. The incident report will include at a minimum the incident overview, incident cause and corrective and preventative actions implemented or to be implemented to prevent future incident recurrence.

7.3 Risk Management

Wester Power is responsible for the management of each risk and implementation of all contingency actions as identified in Table 20. All risks will be internally reviewed annually.

Table 20 Offset Strategy risk assessment and management

Risk description	MNES / Environmental Factor	Risk assessment level	Risk controls / mitigations	Remediation trigger and action
External event causing catastrophic rehabilitation failure (fire, flood weather event etc)	Banksia TEC Black Cockatoo foraging habitat	Low	Internal process available to seek additional funds to enable response to catastrophic rehabilitation failure. Western Power maintains regular maintenance of firebreaks in accordance with local government firebreak notices on land owned.	Trigger: External event causing catastrophic rehabilitation failure Remedial Action: Seek additional funds to implement remediation actions

Limited seed availability for key black cockatoo foraging species or Banksia TEC FCT 21c are not available when required	Banksia TEC Black Cockatoo foraging habitat	Low	Multi year seed collection program implemented at Orange Springs. Currently in its second year.	Trigger: Revegetation specialist advised seed available impact RMP implementation Remedial Action: Increase scale of seed collection program. Supplementing supply with locally sourced commercial seed Adjust revegetation timeframes
Revegetation failure to meet completion targets for species, densities and other RMP criteria	Banksia TEC Black Cockatoo foraging habitat	Moderate Low	Engagement of highly respected and experienced professional revegetation specialist company to deliver RMPs and on ground implementation 10 year rehabilitation budget forecast approved. Internal process available to seek additional funds.	Trigger: RMP monitoring identifies progressive completion targets are not met Remedial Action: Undertake remediation actions as per RMP
Difficulty securing land tenure protection within conservation estate	NA	Low	Commenced initial discussion with DBCA, who have indicated openness to take on Orange Springs site. Internal legal team support and resourcing to implement a conservation covenant agreement	Trigger: Discussions with DBCA fail to arrange Orange Springs transfer into Conservation Estate. Remedial Action: Prepare covenant agreement for part or all Orange Springs
Offset Strategy budget insufficient to successfully achieve all completion criteria.	Banksia TEC Black Cockatoo foraging habitat	Low	10 year rehabilitation budget forecast approved. Internal process available to seek additional funds.	Trigger: Annual finance reconciliation identifies budget is fully committed and criteria have not been met Remedial Actions: Seek internal approval to increase budget

7.4 Completion Criteria

An overview of the completion criteria for the overarching Offset Strategy is provided in Table 21. The Offset Strategy completion criteria are consistent with and linked to the offset calculations proposed future habitat quality ratings.

Table 21 Offset Strategy Completion Criteria

Objective	Offset Activity	Completion Criteria
Banksia Woodlands		
To counterbalance the significant residual impacts to the Banksia Woodlands TEC/PEC	Protect and maintain 20.97 ha of excellent condition Banksia Woodland TEC within the Orange Springs Offset Site	Land tenure is transferred to DBCA for inclusion into conservation estate and/or land is protected by a biodiversity conservation covenant/agreement under either the EP Act, BC Act or equivalent.
		Successful implementation of the Orange Springs RMP, including threat abatement activities
	Rehabilitate 2 ha of degraded land to establish a vegetation community that is representative of the Low lying *Banksia attenuata* woodlands or shrublands FCT21c PEC in good condition.	2 ha of Good condition vegetation that is representative of FCT21c is established via rehabilitation and is self-sustaining.
Carnaby's Cockatoo		
To counterbalance the significant residual impacts to Carnaby's Cockatoo foraging and roosting habitat	Protect and maintain 122.78 ha of high (8) quality foraging habitat and roosting habitat within the Orange Springs Offset site.	Land tenure is transferred to DBCA for inclusion into conservation estate and/or land is protected by a biodiversity conservation covenant/agreement under either the EP Act, BC Act or equivalent.
		Successful implementation of the Orange Springs RMP, including threat abatement actions
		Biennial monitoring and reporting on activity at suitable breeding tree hollows for a period of 20 years.
	Rehabilitate 64.2 ha of cleared area (quality 0) to a foraging habitat quality of 6 within the Orange Springs Offset site.	64.2 ha of Carnaby's Cockatoo foraging habitat with an average quality score of at least 6/10 is rehabilitated and self-sustaining
Baudin's Cockatoo		
To counterbalance the significant residual impacts to Baudin's Cockatoo foraging and roosting habitat	Rehabilitate 46.82 ha of negligible quality (1) foraging habitat to quality 7 at the Hopeland Offset site	46.82 ha of Baudin's Cockatoo foraging habitat with an average quality score of at least 7/10 is rehabilitated and self-sustaining

Objective	Offset Activity	Completion Criteria
		Successful implementation of the Hopeland RMP
FRTBC		
To counterbalance the significant residual impacts to FRTBC foraging and roosting habitat	Rehabilitate 46.82 ha of negligible quality (1) foraging habitat to quality 7 at the Hopeland Offset site	46.82 ha of FRTBC foraging habitat with an average quality score of at least 7/10 is rehabilitated and self-sustaining
		Successful implementation of the Hopeland RMP

The Offset Strategy objectives will also be incorporated into the RMPs being prepared for each offset site. The RMP will detail the proposed revegetation methodology for the site including weed management, surface preparation and vegetation establishment methodology. The RMP will discuss the outcomes from the desktop and site assessments and provide mapping of patch connectivity, vegetation type and vegetation condition. The RMP will detail the expected restoration outcomes in line with current industry standards and the techniques utilised to achieve them and align the ecological and habitat improvements with the required environmental offset. In addition to the Offset Strategy's outcome-based completion criteria (refer Table 21), the RMPs will have site specific completion criteria outlined and key criteria selected will include:

- Minimum vegetation community area, species diversity (stems/ha), percentage vegetation cover, percentage weed cover, vegetation condition and vertical stratification, demonstrated through on ground monitoring and surveying.
- Minimum species diversity, reflecting the minimum required number of suitable foraging species.
- Biological surveying and habitat assessment confirming that the site provides functional black cockatoo foraging value, this assessment will be completed periodically over the rehabilitation period, as rehabilitation activities are completed and vegetation reaches the final habitat score quality target for foraging habitat.
- Biological surveying and TEC extent and condition assessment confirming that the Banksia Woodland TEC rehabilitation area contains a vegetation community composition that is at least 60% representative of FCT21c.
- Self-sustaining criteria include monitoring evidence, after year 5, of
    - annual flowering and seed production, and/or the presence of juvenile plants indicating natural recruitment.
    - presence of mature individuals producing cones, nuts or other foraging resources.

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Appendix A

Justification of calculator inputs

Input Criteria	Orange Springs		Hopeland	
	Value Used	Justification	Value used	Justification
Rehabilitation				
Current quality of offset site	0	As described by SLR in Biological Offsets Survey (2025)	1	As estimated from the site assessment completed by Western Power (2025).
Future quality without offset	0	It is possible for the site to regrow naturally to some extent, however it would be unlikely to provide any significant foraging value for many decades. Location within an area broadly used for agriculture and previous land use for grazing/farming makes it likely that the seed bank within the cleared area is non-existent and that species will not regrow without external intervention.	1	It is possible for the site to regrow naturally to some extent, however it would be unlikely to provide any significant foraging value for many decades. Location within an area broadly used for agriculture and previous land use for grazing/farming makes it likely that the seed bank within the cleared area is non-existent and that species will not regrow without external intervention.
Future quality with offset	6	A revegetation strategy is being developed to support restoration activities on site to meet the targeted completion criteria. Based on consultation with revegetation consultants, achieving a foraging habitat quality of 6 over a 10 year period is not considered unreasonable.	7	A revegetation strategy is being developed to support restoration activities on site to meet the targeted completion criteria. Based on consultation with revegetation consultants, achieving a foraging habitat quality of 6 over a 10 year period is not considered unreasonable.
Time until ecological benefit (years)	10	Vegetation is expected to represent foraging habitat 10 years after rehabilitation works are completed.	10	Vegetation is expected to represent foraging habitat 10 years after rehabilitation works are completed.
ROL without offset (%)	15	Value derived from a combination of the threatened species recovery guidance for deriving 'Risk of Loss' and review of recent EPBC Act and EPA referrals and acceptable levels approved for ROL.	75	The Hopeland site was secured for use a location for key infrastructure planned as part of future upgrades to the distribution and transmission network. Securing the site as an offset means it will no longer de developed as planned.

Input Criteria	Orange Springs		Hopeland	
	Value Used	Justification	Value used	Justification
Rehabilitation				
ROL with offset (%)	0	The offset site will be protected from development, therefore future loss is avoided.	0	The offset site will be protected from development, therefore future loss is avoided.
Confidence in offset result (%)	80	Western Power has confidence that revegetation actions where the starting quality is 0 or 1 will achieve enhanced quality criterion to at least 6 over a 10-year period. This is based on the delivery of revegation offsets primarily to achieve Black Cockatoo foraging habitat and the success of other revegtation offsets that Wesern Power has implemented for smaller projects.	80	Western Power has confidence that revegetation actions where the starting quality is 0 or 1 will achieve enhanced quality criterion to at least 6 over a 10-year period. This is based on the delivery of revegation offsets primarily to achieve Black Cockatoo foraging habitat and the success of other revegtation offsets that Wesern Power has implemented for smaller projects.
Remnant Vegetation				
Current quality of offset site	8	As described by SLR in Biological Offsets Survey (2025)	NA	Not applicable
Future quality without offset	8	Long standing patch of remnant vegetation that is likely to persist relatively unchanged if left undisturbed (assuming no development of area)	NA	Not applicable
Future quality with offset	8	Active on ground protection of the proposed offset site, as detailed in the Revegetation Management Plan for Orange Springs is expected to maintain the existing vegetation condition, at a minimum	NA	Not applicable
Time until ecological benefit (years)	1	As the vegetation is already of high quality, the ecological benefit will be immediate.	NA	Not applicable

Input Criteria	Orange Springs		Hopeland	
	Value Used	Justification	Value used	Justification
Rehabilitation				
ROL without offset (%)	15	Value derived from a combination of the threatened species recovery guidance for deriving 'Risk of Loss' and review of recent EPBC Act and EPA referrals and acceptable levels approved for ROL.	NA	Not applicable
ROL with offset (%)	0	The offset site will be protected from development, therefore future loss is avoided.	NA	Not applicable
Confidence in offset result (%)	90	Western Power had confidence that the management measures implemented at the site will maintain the existing quality of the vegetation, given that the current quality has been sustained to date without any targeted management measures.	NA	Not applicable

Appendix B

Orange Springs Offset Calculators

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Banksia Woodland
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Banksia Woodland of the Swan Coastal Plain	**Area**	2.23	Hectares	AECOM 2023, Condition dominated by Very Good/Excellent condition
			Quality	**8**	Scale 0-10	
			Total quantum of impact	1.78	Adjusted hectares	
Threatened species habitat						
Area of habitat	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	Yes	1.78	Adjusted hectares	Orange Springs	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	20.97	**Risk of loss (%) without offset**	15%	**Risk of loss (%) with offset**	0%	3.15	90%	2.83	2.23	1.78	100.00%	Yes	
									Future area without offset (adjusted hectares)	17.8	**Future area with offset (adjusted hectares)**	21.0								
					Time until ecological benefit	1	**Start quality (scale of 0-10)**	**8**	**Future quality without offset (scale of 0-10)**	**8**	**Future quality with offset (scale of 0-10)**	**8**	0.00	90%	0.00	0.00				
Threatened species habitat																				
Area of habitat	No				**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	0				$0.00		$0.00
Area of community	1.784	1.78	100.00%	**Yes**	$0.00	N/A	$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Banksia Woodlands of the Swan Coastal Plain
	Type of environmental value	Ecological community
	Conservation significance of environmental value	Priority ecological community
	Conservation significance score	**0.1%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Banksia Woodlands of the Swan Coastal Plain

***Area* (impact site)**

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact	AECOM 2023, Condition dominated by Very Good/Excellent Condition	Significant impact (hectares)	2.23
		Quality (scale)	8.00
		Total quantum of impact	1.78

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description			Time until ecological benefit (years)	
Rehabilitation Credit		Proposed rehabilitation (area in hectares)			
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	1.78
	Rehabilitation credit	0.00
	Significant residual impact	1.78

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Banksia Woodlands of the Swan Coastal Plain	Significant impact (step 2, part A)	4.23
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	3.78

Area **(offset site)**

Offset calculation *Area*							
Offsets calculation	**Description**	**Proposed offset (area in hectares)**	20.97	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**2.51**
	Orange Springs Offset Site	**Current quality of offset site (scale)**	8.00	**Time until offset site secured (years)**	1.00		**140.9%**
		Future quality WITHOUT offset (scale)	8.00	**Risk of future loss WITHOUT offset (%)**	15.0%		
		Future quality WITH offset (scale)	8.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	1.00				
		Confidence in offset result (%)	90.0%			**OFFSET ADEQUATE?**	**YES**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Banksia Woodlands of the Swan Coastal Plain		
Type of environmental value	Ecological community		
Conservation significance of environmental value	Priority ecological community		
Landscape-level value impacted	yes/no		
Significant impact			
Description	AECOM 2023, Condition dominated by Very Good/Excellent Condition		
Significant impact (hectares) / Type of feature	2.23		
Quality (scale) / Number	8.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs Offset Site		
Proposed offset (area in hectares)	20.97		
Current quality of offset site / Start number (of type of feature)	8.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00		
Future quality WITH offset (scale) / Future number WITH offset	8.00		
Time until ecological benefit (years)	1.00		
Confidence in offset result (%)	0.9		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	15.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Black Cockatoo Foraging Habitat High quality	**Area**	3	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**8**	Scale 0-10	
			Total quantum of impact	2.40	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	2.40	Adjusted hectares	Orange Springs	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	28.21	**Risk of loss (%) without offset**	15%	**Risk of loss (%) with offset**	0%	4.23	90%	3.81	3.00	2.40	100.00%	Yes	As per Environmental Review Document and supporting surveys
									Future area without offset (adjusted hectares)	24.0	**Future area with offset (adjusted hectares)**	28.2								
					Time until ecological benefit	1	**Start quality (scale of 0-10)**	**8**	**Future quality without offset (scale of 0-10)**	**8**	**Future quality with offset (scale of 0-10)**	**8**	0.00	90%	0.00	0.00				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	2.4	2.40	100.00%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Black Cockatoo foraging habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:	
	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*			
Significant impact	**Description**	**Quantum of impact**	
	Carnaby's Black Cockatoo Foraging Habitat High quality	**Significant impact (hectares)**	3.00
		Quality (scale)	8.00
		Total quantum of impact	**2.40**

Part B: Rehabilitation credit calculation *Area* (onsite)					
Rehabilitation Credit	**Description**	**Proposed rehabilitation (area in hectares)**		**Time until ecological benefit (years)**	
		Current quality of rehabilitation site (scale)		**Confidence in rehabilitation result (%)**	
		Future quality WITHOUT rehabilitation (scale)		**Rehabilitation credit**	**0.00**
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*		
Significant residual impact	**Total quantum of impact**	**2.40**
	Rehabilitation credit	**0.00**
	Significant residual impact	**2.40**

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat	Significant impact (step 2, part A)	3.00
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	2.40

Area **(offset site)**

Offset calculation *Area*							
Offsets calculation	**Description**	**Proposed offset (area in hectares)**	28.21	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**3.35**
	Orange Springs	**Current quality of offset site (scale)**	8.00	**Time until offset site secured (years)**	1.00		**139.4%**
		Future quality WITHOUT offset (scale)	8.00	**Risk of future loss WITHOUT offset (%)**	15.0%		
		Future quality WITH offset (scale)	8.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	1.00				
		Confidence in offset result (%)	90.0%			**OFFSET ADEQUATE?**	**YES**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Black Cockatoo foraging habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Carnaby's Black Cockatoo Foraging Habitat High quality		
Significant impact (hectares) / Type of feature	3.00		
Quality (scale) / Number	8.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs		
Proposed offset (area in hectares)	28.21		
Current quality of offset site / Start number (of type of feature)	8.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00		
Future quality WITH offset (scale) / Future number WITH offset	8.00		
Time until ecological benefit (years)	1.00		
Confidence in offset result (%)	0.9		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	15.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Black Cockatoo Foraging Habitat Moderate to High quality	**Area**	7.3	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**7**	Scale 0-10	
			Total quantum of impact	5.11	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**										
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0									
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**										
Threatened species habitat																					
Area of habitat	Yes	5.11	Adjusted hectares	Orange Springs	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	60.07	**Risk of loss (%) without offset**	15%	**Risk of loss (%) with offset**	0%	9.01	90%	8.11	6.39	5.11	100.01%	Yes		As per Environmental Review Document and supporting surveys
									Future area without offset (adjusted hectares)	51.1	**Future area with offset (adjusted hectares)**	60.1									
					Time until ecological benefit	1	**Start quality (scale of 0-10)**	**8**	**Future quality without offset (scale of 0-10)**	**8**	**Future quality with offset (scale of 0-10)**	**8**	0.00	90%	0.00	0.00					
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	5.11	5.11	100.01%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Black Cockatoo foraging habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Carnaby's Black Cockatoo Foraging Habitat Moderate to Highquality	Significant impact (hectares)	7.30
		Quality (scale)	7.00
		Total quantum of impact	5.11

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	5.11
	Rehabilitation credit	0.00
	Significant residual impact	5.11

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat	Significant impact (step 2, part A)	7.30
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	5.11

Area **(offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	60.07	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**7.12**
	Orange Springs	**Current quality of offset site (scale)**	8.00	**Time until offset site secured (years)**	1.00		**139.4%**
		Future quality WITHOUT offset (scale)	8.00	**Risk of future loss WITHOUT offset (%)**	15.0%		
		Future quality WITH offset (scale)	8.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	1.00				
		Confidence in offset result (%)	90.0%			**OFFSET ADEQUATE?**	**YES**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Black Cockatoo foraging habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Carnaby's Black Cockatoo Foraging Habitat Moderate to Highquality		
Significant impact (hectares) / Type of feature	7.30		
Quality (scale) / Number	7.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs		
Proposed offset (area in hectares)	60.07		
Current quality of offset site / Start number (of type of feature)	8.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00		
Future quality WITH offset (scale) / Future number WITH offset	8.00		
Time until ecological benefit (years)	1.00		
Confidence in offset result (%)	0.9		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	15.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Black Cockatoo Foraging Habitat Moderate quality	**Area**	32.2	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**6**	Scale 0-10	
			Total quantum of impact	19.32	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	19.32	Adjusted hectares	Orange Springs	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	34.5	**Risk of loss (%) without offset**	15%	**Risk of loss (%) with offset**	0%	5.18	90%	4.66	3.67	2.94	15.19%	No	As per Environmental Review Document and supporting surveys
									Future area without offset (adjusted hectares)	29.3	**Future area with offset (adjusted hectares)**	34.5								
					Time until ecological benefit	1	**Start quality (scale of 0-10)**	**8**	**Future quality without offset (scale of 0-10)**	**8**	**Future quality with offset (scale of 0-10)**	**8**	0.00	90%	0.00	0.00				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	19.32	2.94	15.19%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Black Cockatoo foraging habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Carnaby's Black Cockatoo Foraging Habitat Moderate quality	Significant impact (hectares)	32.20
		Quality (scale)	6.00
		Total quantum of impact	19.32

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description	Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	19.32
	Rehabilitation credit	0.00
	Significant residual impact	19.32

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat	Significant impact (step 2, part A)	32.20
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	19.32

***Area* (offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	38.46	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**4.56**
	Orange Springs	**Current quality of offset site (scale)**	8.00	**Time until offset site secured (years)**	1.00		**23.6%**
		Future quality WITHOUT offset (scale)	8.00	**Risk of future loss WITHOUT offset (%)**	15.0%		
		Future quality WITH offset (scale)	8.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	1.00				
		Confidence in offset result (%)	90.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Black Cockatoo foraging habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Carnaby's Black Cockatoo Foraging Habitat Moderate quality		
Significant impact (hectares) / Type of feature	32.20		
Quality (scale) / Number	6.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs		
Proposed offset (area in hectares)	38.46		
Current quality of offset site / Start number (of type of feature)	8.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00		
Future quality WITH offset (scale) / Future number WITH offset	8.00		
Time until ecological benefit (years)	1.00		
Confidence in offset result (%)	0.9		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	15.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Banksia Woodland
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Low lying Banksia attenuata woodlands or shrublands (FCT21c)	**Area**	0.59	Hectares	AECOM 2023, Condition dominated by Very Good/Excellent condition
			Quality	**8**	Scale 0-10	
			Total quantum of impact	0.47	Adjusted hectares	
Threatened species habitat						
Area of habitat	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	Yes	0.47	Adjusted hectares	Orange Springs	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	2	**Risk of loss (%) without offset**	15%	**Risk of loss (%) with offset**	0%	0.30	100%	0.30	0.24	0.87	183.48%	Yes	
									Future area without offset (adjusted hectares)	1.7	**Future area with offset (adjusted hectares)**	2.0								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**6**	6.00	80%	4.80	4.26				
Threatened species habitat																				
Area of habitat	No				**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	0				$0.00		$0.00
Area of community	0.472	0.87	183.48%	**Yes**	$0.00	N/A	$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Low lying Banksia attenuata woodlands or shrublands (FCT21c)
	Type of environmental value	Ecological community
	Conservation significance of environmental value	Priority ecological community
	Conservation significance score	**0.1%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Low lying Banksia attenuata woodlands or shrublands (FCT21c)

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	AECOM 2023, Condition dominated by Very Good/Excellent Condition	Significant impact (hectares)	0.59
		Quality (scale)	8.00
		Total quantum of impact	0.47

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	0.47
	Rehabilitation credit	0.00
	Significant residual impact	0.47

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Low lying Banksia attenuata woodlands or shrublands (FCT21c)	Significant impact (step 2, part A)	2.59
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	2.47

***Area* (offset site)**

Offset calculation
Area

Offsets calculation	**Description**	**Proposed offset (area in hectares)**	2.00	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**0.99**
	Orange Springs Offset Site	**Current quality of offset site (scale)**	0.00	**Time until offset site secured (years)**	1.00		**209.3%**
		Future quality WITHOUT offset (scale)	0.00	**Risk of future loss WITHOUT offset (%)**	15.0%		
		Future quality WITH offset (scale)	6.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**YES**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Low lying Banksia attenuata woodlands or shrublands (FCT21c)		
Type of environmental value	Ecological community		
Conservation significance of environmental value	Priority ecological community		
Landscape-level value impacted	yes/no		
Significant impact			
Description	AECOM 2023, Condition dominated by Very Good/Excellent Condition		
Significant impact (hectares) / Type of feature	0.59		
Quality (scale) / Number	8.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs Offset Site		
Proposed offset (area in hectares)	2.00		
Current quality of offset site / Start number (of type of feature)	0.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		
Future quality WITH offset (scale) / Future number WITH offset	6.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	15.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Cockatoo foraging habitat Low quality	**Area**	49.6	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**2**	Scale 0-10	
			Total quantum of impact	9.92	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	9.92	Adjusted hectares	Orange Springs - rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	23.29	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	9.92	100.02%	Yes	
									Future area without offset (adjusted hectares)	23.3	**Future area with offset (adjusted hectares)**	23.3								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**6**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	9.92	9.92	100.02%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Cockatoo Foraging Habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Carnaby's Cockatoo Foraging Habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Foraging Habitat	Significant impact (hectares)	49.60
		Quality (scale)	2.00
		Total quantum of impact	9.92

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	9.92
	Rehabilitation credit	0.00
	Significant residual impact	9.92

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Cockatoo Foraging Habitat	Significant impact (step 2, part A)	49.60
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	9.92

Area **(offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	23.29	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**9.92**
	Orange Springs - Rehabilitation	**Current quality of offset site (scale)**	0.00	**Time until offset site secured (years)**	1.00		**100.0%**
		Future quality WITHOUT offset (scale)	0.00	**Risk of future loss WITHOUT offset (%)**	0.0%		
		Future quality WITH offset (scale)	6.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Cockatoo Foraging Habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Foraging Habitat		
Significant impact (hectares) / Type of feature	49.60		
Quality (scale) / Number	2.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs - Rehabilitation		
Proposed offset (area in hectares)	23.29		
Current quality of offset site / Start number (of type of feature)	0.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		
Future quality WITH offset (scale) / Future number WITH offset	6.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	0.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Black Cockatoo Foraging Habitat Lwo to Moderate quality	**Area**	1	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**3**	Scale 0-10	
			Total quantum of impact	0.30	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	0.30	Adjusted hectares	Orange Springs	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	0.71	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	0.7	**Future area with offset (adjusted hectares)**	0.7	0.00	100%	0.00	0.00	0.30	100.83%	Yes	As per Environmental Review Document and supporting surveys
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**6**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	0.3	0.30	100.83%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Black Cockatoo foraging habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact	Carnaby's Black Cockatoo Foraging Habitat Low to Moderate quality	Significant impact (hectares)	1.00
		Quality (scale)	3.00
		Total quantum of impact	0.30

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description				
Rehabilitation Credit		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	0.30
	Rehabilitation credit	0.00
	Significant residual impact	0.30

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat	Significant impact (step 2, part A)	1.00
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	0.30

Area **(offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	0.71	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**0.30**
	Orange Springs	**Current quality of offset site (scale)**	0.00	**Time until offset site secured (years)**	1.00		**100.8%**
		Future quality WITHOUT offset (scale)	0.00	**Risk of future loss WITHOUT offset (%)**	0.0%		
		Future quality WITH offset (scale)	6.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Black Cockatoo foraging habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Carnaby's Black Cockatoo Foraging Habitat Low to Moderate quality		
Significant impact (hectares) / Type of feature	1.00		
Quality (scale) / Number	3.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs		
Proposed offset (area in hectares)	0.71		
Current quality of offset site / Start number (of type of feature)	0.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		
Future quality WITH offset (scale) / Future number WITH offset	6.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	0.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Black Cockatoo Foraging Habitat Lwo to Moderate quality	**Area**	7.4	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**1**	Scale 0-10	
			Total quantum of impact	0.74	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	0.74	Adjusted hectares	Orange Springs	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	1.74	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	1.7	**Future area with offset (adjusted hectares)**	1.7	0.00	90%	0.00	0.00	0.74	100.17%	Yes	As per Environmental Review Document and supporting surveys
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**6**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	0.74	0.74	100.17%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Black Cockatoo foraging habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Carnaby's Black Cockatoo Foraging Habitat Low to Moderate quality	Significant impact (hectares)	7.40
		Quality (scale)	1.00
		Total quantum of impact	0.74

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	0.74
	Rehabilitation credit	0.00
	Significant residual impact	0.74

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat	Significant impact (step 2, part A)	7.40
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	0.74

***Area* (offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	1.74	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**0.74**
	Orange Springs	**Current quality of offset site (scale)**	0.00	**Time until offset site secured (years)**	1.00		**100.2%**
		Future quality WITHOUT offset (scale)	0.00	**Risk of future loss WITHOUT offset (%)**	0.0%		
		Future quality WITH offset (scale)	6.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Black Cockatoo foraging habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Carnaby's Black Cockatoo Foraging Habitat Low to Moderate quality		
Significant impact (hectares) / Type of feature	7.40		
Quality (scale) / Number	1.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs		
Proposed offset (area in hectares)	1.74		
Current quality of offset site / Start number (of type of feature)	0.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		
Future quality WITH offset (scale) / Future number WITH offset	6.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	0.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Carnaby's Black Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Carnaby's Black Cockatoo Foraging Habitat Lwo to Moderate quality	**Area**	32.2	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**6**	Scale 0-10	
			Total quantum of impact	19.32	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	19.32	Adjusted hectares	Orange Springs	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	38.46	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	16.38	84.81%	No	As per Environmental Review Document and supporting surveys
									Future area without offset (adjusted hectares)	38.5	**Future area with offset (adjusted hectares)**	38.5								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**6**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	19.32	16.38	84.81%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Carnaby's Black Cockatoo foraging habitat
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Carnaby's Black Cockatoo Foraging Habitat Low to Moderate quality	Significant impact (hectares)	32.20
		Quality (scale)	6.00
		Total quantum of impact	19.32

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	19.32
	Rehabilitation credit	0.00
	Significant residual impact	19.32

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Carnaby's Black Cockatoo foraging habitat	Significant impact (step 2, part A)	32.20
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	19.32

***Area* (offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	38.46	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**16.38**
	Orange Springs	**Current quality of offset site (scale)**	0.00	**Time until offset site secured (years)**	1.00		**84.8%**
		Future quality WITHOUT offset (scale)	0.00	**Risk of future loss WITHOUT offset (%)**	0.0%		
		Future quality WITH offset (scale)	6.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Carnaby's Black Cockatoo foraging habitat		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Carnaby's Black Cockatoo Foraging Habitat Low to Moderate quality		
Significant impact (hectares) / Type of feature	32.20		
Quality (scale) / Number	6.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Orange Springs		
Proposed offset (area in hectares)	38.46		
Current quality of offset site / Start number (of type of feature)	0.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		
Future quality WITH offset (scale) / Future number WITH offset	6.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	0.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Appendix C

Hopeland Offset Calculators

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Baudin's Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Baudin's Foraging habitat Low quality	**Area**	6.1	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**2**	Scale 0-10	
			Total quantum of impact	1.22	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	1.22	Adjusted hectares	Jarrah Road, Hopeland Rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	2.35	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	0.6	**Future area with offset (adjusted hectares)**	2.4	1.76	100%	1.76	1.39	1.22	100.18%	Yes	
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	1.22	1.22	100.18%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Baudin's Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Baudin's Cockatoo Foraging habitat Low quality	Significant impact (hectares)	6.10
		Quality (scale)	2.00
		Total quantum of impact	1.22

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description			Time until ecological benefit (years)	
		Proposed rehabilitation (area in hectares)		Confidence in rehabilitation result (%)	
		Current quality of rehabilitation site (scale)		Rehabilitation credit	0.00
		Future quality WITHOUT rehabilitation (scale)			
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	1.22
	Rehabilitation credit	0.00
	Significant residual impact	1.22

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:	
	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo	Significant impact (step 2, part A)	6.10
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	1.22

Area **(offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	2.35	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**1.48**
	Jarrah Road, Hopeland	**Current quality of offset site (scale)**	1.00	**Time until offset site secured (years)**	0.00		**121.6%**
		Future quality WITHOUT offset (scale)	1.00	**Risk of future loss WITHOUT offset (%)**	75.0%		
		Future quality WITH offset (scale)	7.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Baudin's Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Baudin's Cockatoo Foraging habitat Low quality		
Significant impact (hectares) / Type of feature	6.10		
Quality (scale) / Number	2.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland		
Proposed offset (area in hectares)	2.35		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	0.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Baudin's Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Baudin's Cockatoo Foraging Habitat Moderate quality	**Area**	3	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**4**	Scale 0-10	
			Total quantum of impact	1.20	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	1.20	Adjusted hectares	Jarrah Road, Hopeland Rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	2.31	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	0.6	**Future area with offset (adjusted hectares)**	2.3	1.73	100%	1.73	1.36	1.20	100.11%	Yes	
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	1.2	1.20	100.11%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Baudin's Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact	Baudin's Cockatoo Foraging habitat Moderate quality	Significant impact (hectares)	3.00
		Quality (scale)	4.00
		Total quantum of impact	1.20

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description				
Rehabilitation Credit		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	1.20
	Rehabilitation credit	0.00
	Significant residual impact	1.20

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo	Significant impact (step 2, part A)	3.00
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	1.20

Area **(offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	2.31	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**1.46**
	Jarrah Road, Hopeland	**Current quality of offset site (scale)**	1.00	**Time until offset site secured (years)**	0.00		**121.6%**
		Future quality WITHOUT offset (scale)	1.00	**Risk of future loss WITHOUT offset (%)**	75.0%		
		Future quality WITH offset (scale)	7.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Baudin's Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Baudin's Cockatoo Foraging habitat Moderate quality		
Significant impact (hectares) / Type of feature	3.00		
Quality (scale) / Number	4.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland		
Proposed offset (area in hectares)	2.31		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	0.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Baudin's Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Baudin's Cockatoo Foraging Habitat Moderate quality	**Area**	32.2	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**6**	Scale 0-10	
			Total quantum of impact	19.32	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**										
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0									
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**										
Threatened species habitat																					
Area of habitat	Yes	19.32	Adjusted hectares	Jarrah Road, Hopeland Rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	37.15	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%	27.86	100%	27.86	21.95	19.32	100.00%	Yes		
									Future area without offset (adjusted hectares)	9.3	**Future area with offset (adjusted hectares)**	37.2									
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.26					
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	19.32	19.32	100.00%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Baudin's Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Baudin's Cockatoo Foraging habitat Moderate quality	Significant impact (hectares)	32.20
		Quality (scale)	6.00
		Total quantum of impact	19.32

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description	Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	19.32
	Rehabilitation credit	0.00
	Significant residual impact	19.32

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo	Significant impact (step 2, part A)	32.20
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	19.32

Area **(offset site)**

Offset calculation
Area

Offsets calculation							
	Description	**Proposed offset (area in hectares)**	37.15	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**23.46**
	Jarrah Road, Hopeland	**Current quality of offset site (scale)**	1.00	**Time until offset site secured (years)**	0.00		**121.4%**
		Future quality WITHOUT offset (scale)	1.00	**Risk of future loss WITHOUT offset (%)**	75.0%		
		Future quality WITH offset (scale)	7.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Baudin's Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Baudin's Cockatoo Foraging habitat Moderate quality		
Significant impact (hectares) / Type of feature	32.20		
Quality (scale) / Number	6.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland		
Proposed offset (area in hectares)	37.15		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	0.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Baudin's Cockatoo
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	Baudin's Foraging Habitat Negligible Quality	**Area**	34.5	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**1**	Scale 0-10	
			Total quantum of impact	3.45	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	3.45	Adjusted hectares	Jarrah Road, Hopeland Rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	6.64	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%	4.98	100%	4.98	3.92	3.45	100.10%	Yes	
									Future area without offset (adjusted hectares)	1.7	**Future area with offset (adjusted hectares)**	6.6								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.26				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	3.45	3.45	100.10%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Baudin's Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened species - endangered
	Conservation significance score	**1.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	Baudin's Cockatoo Foraging habitat Negligible quality	Significant impact (hectares)	34.50
		Quality (scale)	1.00
		Total quantum of impact	3.45

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description	Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	3.45
	Rehabilitation credit	0.00
	Significant residual impact	3.45

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Baudin's Cockatoo	Significant impact (step 2, part A)	34.50
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	3.45

Area **(offset site)**

Offset calculation *Area*							
Offsets calculation	Description	Proposed offset (area in hectares)	6.64	Duration of offset implementation (maximum 20 years)	20.00	Offset value	4.19
	Jarrah Road, Hopeland	Current quality of offset site (scale)	1.00	Time until offset site secured (years)	0.00		121.5%
		Future quality WITHOUT offset (scale)	1.00	Risk of future loss WITHOUT offset (%)	75.0%		
		Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Baudin's Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		
Landscape-level value impacted	yes/no		
Significant impact			
Description	Baudin's Cockatoo Foraging habitat Negligible quality		
Significant impact (hectares) / Type of feature	34.50		
Quality (scale) / Number	1.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland		
Proposed offset (area in hectares)	6.64		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	0.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Forest Red-tailed Black Cockatoo
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	FRTBC Foraging Low quality	**Area**	11.7	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**2**	Scale 0-10	
			Total quantum of impact	2.34	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**										
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0									
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**										
Threatened species habitat																					
Area of habitat	Yes	2.34	Adjusted hectares	Jarrah Road, Hopeland - rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	3.77	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%	2.83	100%	2.83	2.72	2.35	100.22%	Yes		
									Future area without offset (adjusted hectares)	0.9	**Future area with offset (adjusted hectares)**	3.8									
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.71					
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	2.34	2.35	100.22%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Forest Rwed-tailed Black Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened Species - vulnerable
	Conservation significance score	**0.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Forest Rwed-tailed Black Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	FRTBC Foraging habitat Low quality	Significant impact (hectares)	11.70
		Quality (scale)	2.00
		Total quantum of impact	2.34

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	2.34
	Rehabilitation credit	0.00
	Significant residual impact	2.34

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Forest Rwed-tailed Black Cockatoo	Significant impact (step 2, part A)	11.70
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	2.34

Area **(offset site)**

Offset calculation
Area

Offsets calculation	**Description**	**Proposed offset (area in hectares)**	3.77	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**2.42**
	Jarrah Road, Hopeland Rehabilitation	**Current quality of offset site (scale)**	1.00	**Time until offset site secured (years)**	1.00		**103.4%**
		Future quality WITHOUT offset (scale)	1.00	**Risk of future loss WITHOUT offset (%)**	75.0%		
		Future quality WITH offset (scale)	7.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Forest Rwed-tailed Black Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened Species - vulnerable		
Landscape-level value impacted	yes/no		
Significant impact			
Description	FRTBC Foraging habitat Low quality		
Significant impact (hectares) / Type of feature	11.70		
Quality (scale) / Number	2.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland Rehabilitation		
Proposed offset (area in hectares)	3.77		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Forest Red-tailed Black Cockatoo
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	FRTBC Foraging Low to Moderate quality	**Area**	3	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**3**	Scale 0-10	
			Total quantum of impact	0.90	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	0.90	Adjusted hectares	Jarrah Road, Hopeland - rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	1.45	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	0.4	**Future area with offset (adjusted hectares)**	1.5	1.09	100%	1.09	1.04	0.90	100.22%	Yes	
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.71				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	0.9	0.90	100.22%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Forest Rwed-tailed Black Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened Species - vulnerable
	Conservation significance score	**0.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Forest Rwed-tailed Black Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact	FRTBC Foraging habitat Low to Moderate quality	Significant impact (hectares)	3.00
		Quality (scale)	3.00
		Total quantum of impact	0.90

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description			Time until ecological benefit (years)	
Rehabilitation Credit		Proposed rehabilitation (area in hectares)			
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	0.90
	Rehabilitation credit	0.00
	Significant residual impact	0.90

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:	
	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Forest Rwed-tailed Black Cockatoo	Significant impact (step 2, part A)	3.00
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	0.90

Area **(offset site)**

Offset calculation *Area*							
Offsets calculation	Description	Proposed offset (area in hectares)	1.45	Duration of offset implementation (maximum 20 years)	20.00	Offset value	0.93
	Jarrah Road, Hopeland Rehabilitation	Current quality of offset site (scale)	1.00	Time until offset site secured (years)	1.00		103.4%
		Future quality WITHOUT offset (scale)	1.00	Risk of future loss WITHOUT offset (%)	75.0%		
		Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Forest Rwed-tailed Black Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened Species - vulnerable		
Landscape-level value impacted	yes/no		
Significant impact			
Description	FRTBC Foraging habitat Low to Moderate quality		
Significant impact (hectares) / Type of feature	3.00		
Quality (scale) / Number	3.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland Rehabilitation		
Proposed offset (area in hectares)	1.45		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Forest Red-tailed Black Cockatoo
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	FRTBC Foraging Moderate to High quality	**Area**	32.2	Hectares	Environmental Review and Black Cockatoo Refined Assessment (AECOM, 2025)
			Quality	**7**	Scale 0-10	
			Total quantum of impact	22.54	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**										
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0									
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**										
Threatened species habitat																					
Area of habitat	Yes	22.54	Adjusted hectares	Jarrah Road, Hopeland - rehabilitation	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	36.24	**Risk of loss (%) without offset**	75%	**Risk of loss (%) with offset**	0%									
									Future area without offset (adjusted hectares)	9.1	**Future area with offset (adjusted hectares)**	36.2	27.18	100%	27.18	26.12	22.54	100.02%	Yes		
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**7**	6.00	80%	4.80	4.71					
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	22.54	22.54	100.02%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

WA Environmental Offsets calculator

PLEASE ENABLE MACROS FOR THIS SPREADSHEET

Produced by:

The Department of Water and Environmental Regulation (DWER) in consultation with stakeholder working groups

Purpose:

Use the WA Envirionmental Offsets calculator in conjunction with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* guideline. Together, they form a supplement to section 4 of the *WA Environmental Offsets Guidelines* and provide information to help decision-makers, government officers, industry and the community to quantify environmental offsets.

Data currency:

The correct application of the WA Environmental Offsets Calculator relies on access to current datasets (such as vegetation extent and land tenure).

Process for using the WA Environmental Offsets Calculator		
Step	**Worksheet**	**Component**
Step 1: Determining conservation significance	**Step1_ConservationSignificance**	**Conservation significance determination**
		Combined *area* /*feature*
Step 2: Calculating significant residual impact	**Step2_SignificantResidualImpact**	**Part A: Significant impact calculation**
		Separate *area* or *feature* calculations
		Part B: Rehabilitation credit calculation
		Separate *area* or *feature* calculations
		Part C: Significant residual impact calculation
		Separate *area* or *feature* calculations
Step 3: Calculating offsets	**Step3_Offsets**	**Offsets calculation**
		Separate *area* or *feature* calculations
Rationale for scores used in the Offsets Calculator	**Rationale**	**All**

Step 1: Determining conservation significance

Key:

	Data to be entered
	Drop-down selection
	Automatically-generated scores

(Or, if appropriate, manual data entry permitted)

***Area / feature* (Impact site)**

Conservation significance determination for the environmental value impacted		
Conservation significance	**Description**	Forest Rwed-tailed Black Cockatoo
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Rare/threatened Species - vulnerable
	Conservation significance score	**0.2%**

Please select *area* or *feature* for the calculations	**Area**

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Forest Rwed-tailed Black Cockatoo

***Area* (impact site)**

Part A: Significant impact calculation *Area*

Significant impact	Description	Quantum of impact	
	FRTBC Foraging habitat Moderate to High quality	Significant impact (hectares)	32.20
		Quality (scale)	7.00
		Total quantum of impact	22.54

Part B: Rehabilitation credit calculation *Area* (onsite)

Rehabilitation Credit	Description				
		Proposed rehabilitation (area in hectares)		Time until ecological benefit (years)	
		Current quality of rehabilitation site (scale)		Confidence in rehabilitation result (%)	
		Future quality WITHOUT rehabilitation (scale)		Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)			

Part C: Significant residual impact calculation *Area*

Significant residual impact		
	Total quantum of impact	22.54
	Rehabilitation credit	0.00
	Significant residual impact	22.54

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:	
	Data to be entered
	Drop-down selection
	Automatically-generated scores

Environmental value (step 1)	Forest Rwed-tailed Black Cockatoo	Significant impact (step 2, part A)	32.20
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	22.54

Area **(offset site)**

Offset calculation *Area*							
Offsets calculation	**Description**	**Proposed offset (area in hectares)**	36.34	**Duration of offset implementation (maximum 20 years)**	20.00	**Offset value**	**23.31**
	Jarrah Road, Hopeland Rehabilitation	**Current quality of offset site (scale)**	1.00	**Time until offset site secured (years)**	1.00		**103.4%**
		Future quality WITHOUT offset (scale)	1.00	**Risk of future loss WITHOUT offset (%)**	75.0%		
		Future quality WITH offset (scale)	7.00	**Risk of future loss WITH offset (%)**	0.0%		
		Time until ecological benefit (years)	10.00				
		Confidence in offset result (%)	80.0%			**OFFSET ADEQUATE?**	**NO**

WA Environmental Offsets Calculator

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	Forest Rwed-tailed Black Cockatoo		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened Species - vulnerable		
Landscape-level value impacted	yes/no		
Significant impact			
Description	FRTBC Foraging habitat Moderate to High quality		
Significant impact (hectares) / Type of feature	32.20		
Quality (scale) / Number	7.00		
Rehabilitation credit			
Description	0		
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Jarrah Road, Hopeland Rehabilitation		
Proposed offset (area in hectares)	36.34		
Current quality of offset site / Start number (of type of feature)	1.00		
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00		
Future quality WITH offset (scale) / Future number WITH offset	7.00		
Time until ecological benefit (years)	10.00		
Confidence in offset result (%)	0.8		
Duration of offset implementation (maximum 20 years)	20.00		
Time until offset site secured (years)	1.00		
Risk of future loss WITHOUT offset (%)	75.0%		
Risk of future loss WITH offset (%)	0.0%		
Offset ratio (Conservation area only)	N/A		

Appendix D

Hopeland Site Visit Photos



Plate F1 – Vegetation representative of wetland community



Plate F2 - Vegetation representative of wetland community

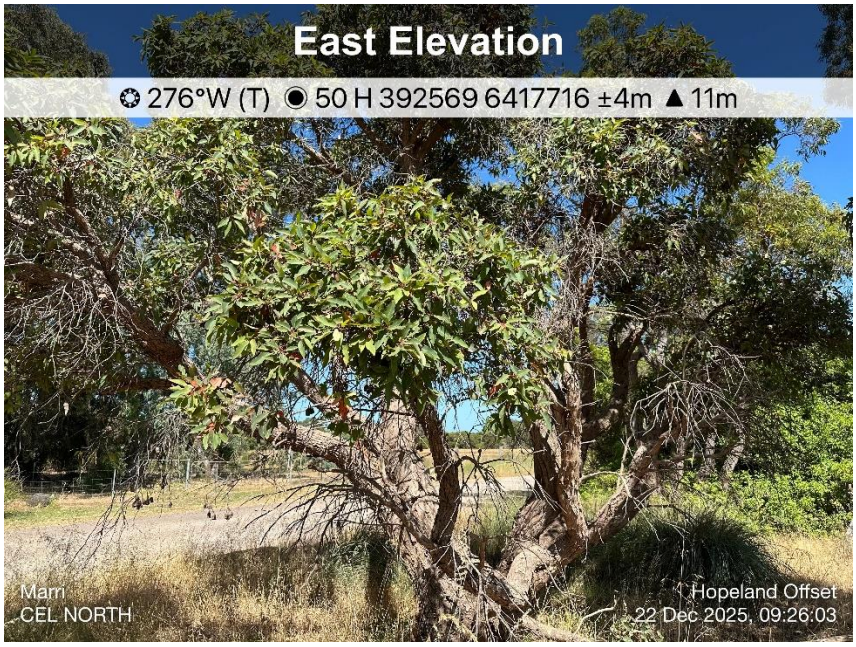


Plate F3 – Marri sp. Suitable foraging habitat

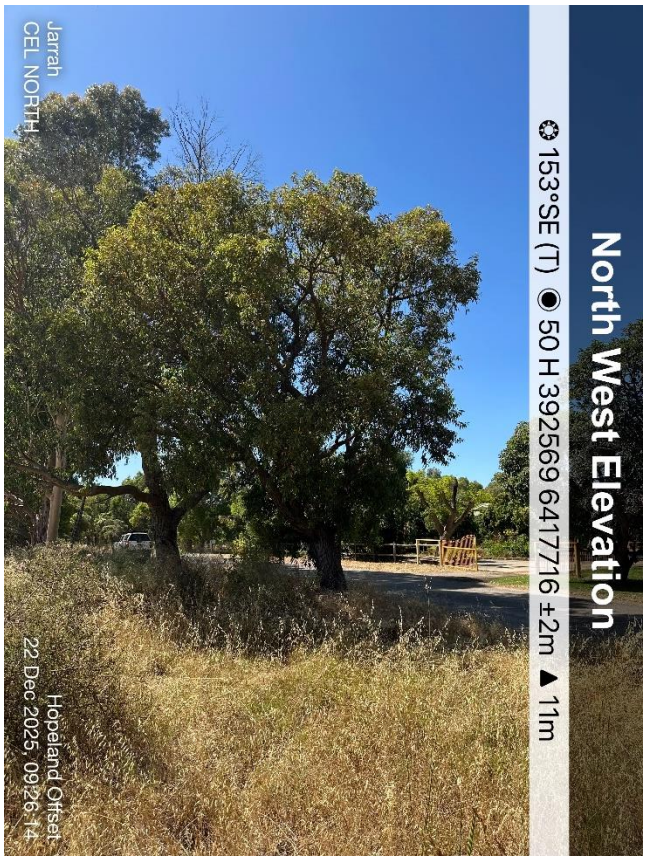


Plate F4 – Jarrah sp. Suitable foraging habitat



Plate F5 – Hopeland site, scattered trees over cleared paddocks



Plate F6 - Hopeland site, scattered trees over cleared paddocks



Plate F7 – **Watsonia meriana* within wetland area

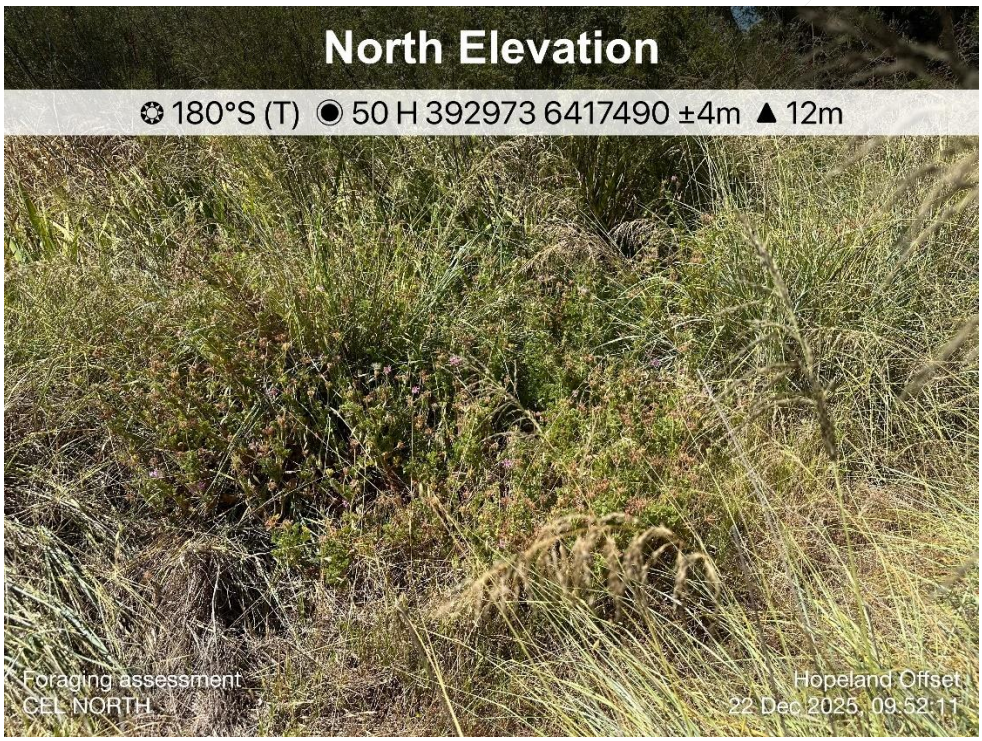


Plate F8 – *Pelargonium capitatum*

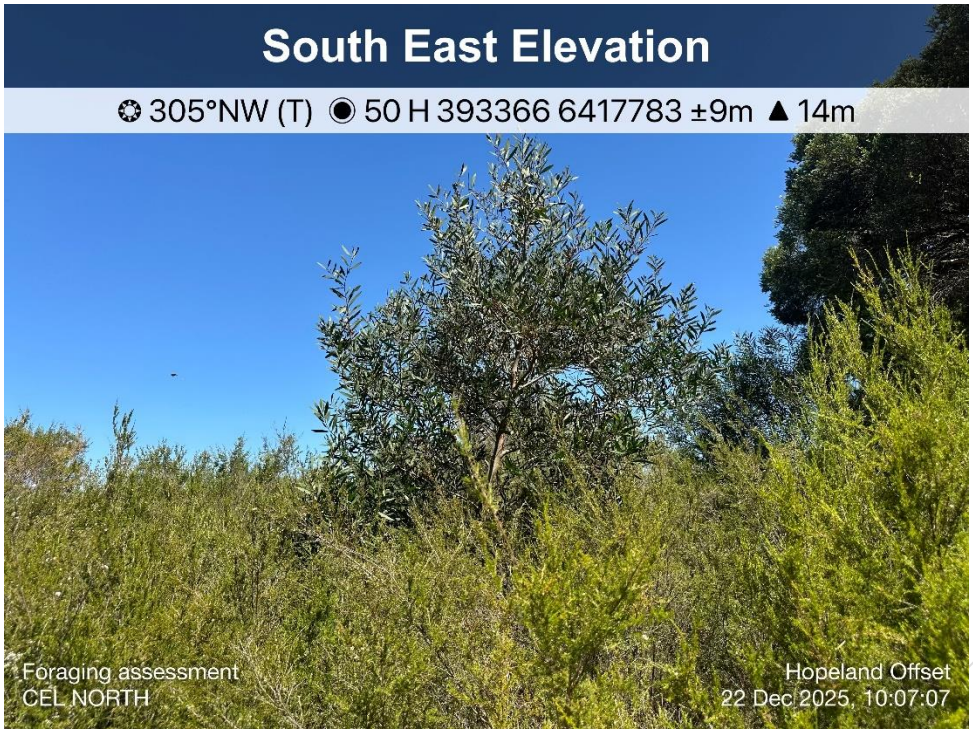


Plate F9 – *Acacia ?longifolia* species



Plate F10 – Potential breeding tree (stag)

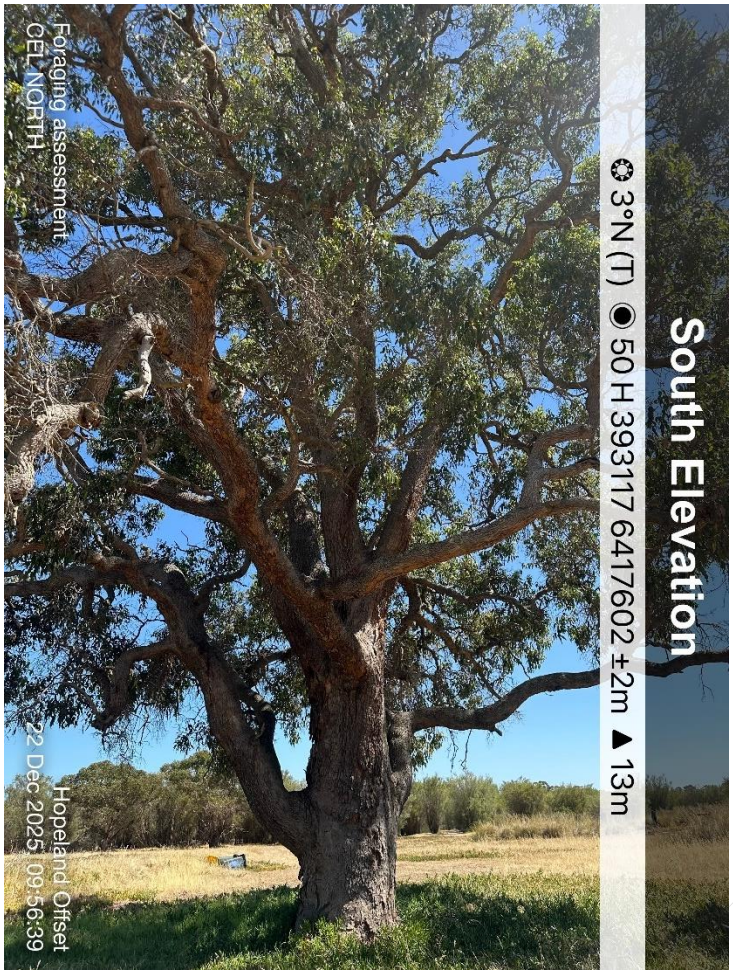


Plate F11 – Potential breeding tree

Appendix E

Biological Offset Surveys – Orange Springs (SLR, 2025)

Biological Offset Surveys

Orange Springs

Western Power

363 Wellington Street, Perth 6000

Prepared by:

SLR Consulting Australia

SLR Project No. 675.072817.00001

10 July 2025

Revision: 3.0

Making Sustainability Happen

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
2.0	8 May 2025	L. Geidans, M. Young	N. Whittington,	N. Whittington,
01	14 March 2025	P. Dean, M. Young	L. Geidans, N. Whittington, E. Webb	N. Whittington,

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Western Power (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Western Power commissioned SLR Consulting Australia to undertake a biological (flora, vegetation, and fauna) assessment of the potential environmental offset property located in Orange Springs, adjacent to the Moore River National Park. The survey was undertaken within a defined area (the Survey Area) that covers approximately 508.3 hectares and is located 100 km northeast of Perth, Western Australia in the Swan Coastal Plain IBRA region.

The objective of the survey was to identify key flora, vegetation, and fauna values within the Survey Area as part of the environmental impact assessment process. This report presents the findings of the survey.

Flora and Vegetation

The detailed flora and vegetation survey recorded the floristic composition and vegetation types from 22 quadrats, 5 relevés, 40 mapping notes, and opportunistic observations. A total of 201 taxa were recorded from 126 genera across 51 families.

No Threatened flora taxa pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey. No Priority taxa as listed by DBCA were recorded during the survey.

No significant flora taxa have been recorded within the Survey Area during previous surveys, and 24 significant flora taxa were assessed as having a high likelihood, 23 significant flora taxa were assessed as having a medium likelihood, and 22 significant flora taxa were assessed as having a low likelihood of occurring within the Survey Area presurvey.

Post survey, three significant flora taxa were assessed as having a high likelihood, three taxa are considered to have a medium likelihood and 63 were considered to have a low likelihood of occurring within the Survey Area.

A total of 32 specimens could not be identified to species level as they were sterile at the time of survey. 19 introduced (weed) taxa were recorded during the survey, none of which are listed as Declared Pests under the BAM Act or listed as a WoNS by the Department of Primary Industry.

A total of five vegetation types were described and mapped across four broad landforms (undulating plains, slopes, crests and depressions/basins), of which four were considered analogous to Threatened or Priority Ecological Communities. Vegetation condition within the Survey Area ranged from Completely Degraded to Excellent with the majority considered to be in Excellent condition. Evidence of disturbance included historical clearing, agricultural activities, and weeds.

Vertebrate Fauna

Fauna habitat mapping was based on a combination of field observations, vegetation mapping, fauna habitat assessment data, and aerial imagery. Seven fauna habitats were mapped within the Survey Area. All habitats recorded within the Survey Area are common throughout the broader region. The Banksia Woodland and the Ephemeral Banksia Wetland / Woodland provide the most value to the broader fauna assemblage, as well as being a key foraging resource for the Carnaby's Cockatoo. The Wandoo Woodland also provides a valuable nesting and roosting opportunities for the Carnaby's Cockatoo.

A total of 37 fauna taxa from 27 families were recorded, comprising 33 birds, three mammals, and one reptile. No significant taxa were recorded during the fauna survey.

One significant fauna taxa was assessed as having a high likelihood of occurrence, the Carnaby's Cockatoo (*Zanda latirostris*) and one significant fauna taxa was assessed as having a medium likelihood of occurrence, the Black-striped Snake (*Neelaps calonotos*).

Two introduced taxa were recorded during the survey, European Cattle (**Bos primigenius taurus*) and Dog (**Canis familiaris*).

The field survey recorded 217 potential nesting trees (i.e. trees that do not contain suitable hollows but may in the future) and 20 suitable nesting trees (i.e. trees that appear to contain suitable hollows when observed from the ground). Some of these trees contained more than one hollow. Carnaby's Cockatoo foraging habitat quality was assessed as following (based on DCCEEW (2023)):

- 402 ha of very high foraging habitat.
- 34.7 ha of high foraging habitat.
- 5.8 moderate foraging habitat.
- 0.8 low to moderate foraging habitat.
- 0.3 negligible to low foraging habitat.
- 64.2 of area containing no foraging habitat.

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Appendix L Significant Fauna Likelihood of Occurrence
Appendix M Black Cockatoo Nesting Trees

Acronyms and Abbreviations

°C	Degree Celsius
ALA	Atlas of Living Australia
BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CISS	Centre for Invasive Species Solutions
CR	Critically Endangered
DAWE	Department of Agriculture Water and Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEE	Department of the Environment and Energy
DEWHA	Department of the Environment, Water, Heritage and the Arts
Desktop Study Area	The area that was studied during the desktop assessment encompassing the Survey Area and surrounds
DMIRS	Department of Mines, Industry Regulation and Safety
DoE	Department of the Environment
DP	Declared Pest
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
ESA	Environmentally Sensitive Area
FCT	Floristic Community Type
GIS	Geographic Information System
GPS	Global Positioning System
GDE	Groundwater Dependent Ecosystem
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments

ILUA	Indigenous land Use Agreement
km	Kilometres
Lat	Latitude
Long	Longitude
m	Metres
MA	Marine
MI	Migratory
mm	Millimetres
mths	Months
NNTT	National Native Title Tribunal
MNES	Matters of National Environmental Significance
NVCP	Native Vegetation Clearing Permit
NVIS	National Vegetation Information System
OS	Other Specially Protected Fauna
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
Western Power	Western Power
Sp.	Species
Spp.	More than one species
SLR	SLR Consulting Australia
SRE	Short Range Endemic
Survey Area	The area that was surveyed
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
TPFRF	Threatened and Priority Flora Report Form
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance

1.0 Introduction

1.1 The Project

Western Power commissioned SLR Consulting Australia to undertake a biological (flora, vegetation, and fauna) assessment of a potential environmental offset property located in Orange Springs, adjacent to the Moore River National Park. The survey was undertaken within a defined area (the Survey Area) that covers approximately 508.3 hectares and is located 100 km northeast of Perth, Western Australia in the Swan Coastal Plain IBRA region (**Map 1**). All maps are provided in **Appendix A**.

1.2 Objective and Scope

The objective of the survey was to identify key flora, vegetation, and fauna values within the Survey Area as part of the environmental impact assessment process for the Project.

The following scope of work was completed:

- Carry out an initial desktop assessment to determine environmental values and significant flora, fauna, habitat, vegetation, or other environmental features relating to the Survey Area (such as riparian areas, and wetlands).
- Carry out a field survey of the Survey Area to assess flora, vegetation and fauna values.
- Prepare a combined technical flora, vegetation, and fauna report.
- Provide a post-survey debrief identifying key environmental values recorded during the field survey.
- Provide all spatial/mapping data collected during the survey.

2.0 Background

2.1 Statutory and Regulatory Framework

Western Australian flora, vegetation, and fauna is governed by the following legislative measures:

- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act). (Commonwealth of Australia, 1999).
- *Biodiversity Conservation Act 2016* (WA) (BC Act) (Government of Western Australia, 2016).
- *Environmental Protection Act 1986* (WA) (EP Act) (Government of Western Australia, 1986).
- *Biosecurity and Agriculture Management Act 2007* (WA) (BAM Act) (Government of Western Australia, 2007).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities.
- Weeds of National Significance (WoNS).
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Western Australia

- *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA, 2016a).
- *Environmental Factor Guideline - Flora and Vegetation* (EPA, 2016b).
- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016c).

Commonwealth

- *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DoE, 2013).
- *EPBC Referral Guidance – Banksia Woodlands of the Swan Coastal Plain ecological community* (DEE, 2019).
- *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022).
- *Survey guidelines for Australia's threatened bats* (DEWHA, 2010a).
- *Survey guidelines for Australia’s threatened birds* (DEWHA, 2010b).

- *Survey guidelines for Australia's threatened frogs* (DEWHA, 2010c).
- *Survey guidelines for Australia's threatened mammals* (DSEWPaC, 2011a).
- *Survey guidelines for Australia's threatened reptiles* (DSEWPaC, 2011b).

2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset for temperature is Gingin Aero WA Weather Station (Station 009178) located approximately 56 km south of the Survey Area, and rainfall is Baramba Weather Station (009144) located 16.2 km west of the Survey Area.

Climate statistics were calculated using data from the most current climate normal, which is defined as a 30-year interval where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (BoM, 2007).

The long-term (1996 to 2024) mean minimum temperature for Gingin Aero Weather Station ranges from 6.6˚C (July and August) to 17.1˚C (February) and the long-term mean maximum temperature ranges from 18.4 (July) to 33.3˚C (January and February) (**Figure 1**) (BoM, 2024).

The Baramba Weather Station recorded 567.9 mm of rainfall in the 12 months prior to the survey (September 2023 to August 2024), which is 63.7 mm below the long-term (1970 to 2024) average of 631.6 mm (BoM, 2024). In the three months prior to the survey (Month June to August 2024), 408 mm of rainfall was recorded, which is 60.6 mm above the long-term average of 347.4 mm for the same period (BoM, 2024).

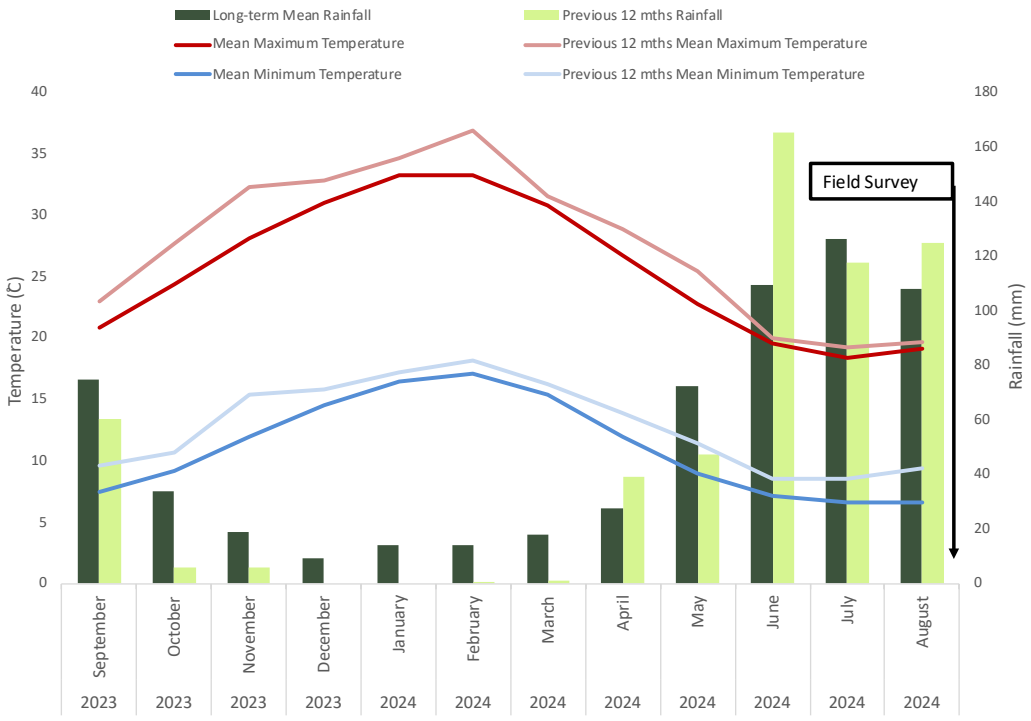


Figure 1: Climate summary of Gingin Aero and Baramba Weather Stations

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DEE, 2016). The Survey Area occurs within the Swan Coastal Plain 2 bioregion and the Swan Coastal Plain (SWA02) subregion.

The Swan Coastal Plain subregion is described as a low lying coastal plain, with annual rainfall between 600 and 1000 mm. The subregion is composed of colluvial and aeolian sands, alluvial river flats, and coastal limestone. A series of seasonal wetlands runs along the inner-coast of the subregion from north-to-south. Vegetation is composed of Heathland/Tuart (*Eucalyptus gomphocephala*) woodlands on limestone, *Banksia spp*. and Banksia-Jarrah (*Eucalyptus marginata*) on Quaternary marine dunes, and Marri (*Corymbia calophylla*) on colluvial and alluvial sands (Mitchell et al., 2002).

2.2.3 Soil Landscape Mapping

Soil landscape mapping of Western Australia consists of a compilation of various surveys at different scales varying between 1:20,000 and 1:3,000,000 (DPIRD, 2022). The mapping comprises a nested hierarchy of levels, with each level a subdivision of the preceding level. Soil landscape mapping provides an indication of potential vegetation types and fauna habitats within the Survey Area and has been described below to the highest level of detail available for the Survey Area.

The Survey Area occurs across two soil landscape systems (**Table 1**;**Map 2**).

Table 1: Soil landscape systems within the Survey Area

System/ subsystem/phase		Description	Area (ha) and percentage within Survey Area
Name	Code		
Bassendean	212Bs	Swan Coastal Plain from Busselton to Jurien. Sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heaths.	469.5 (92%)
Moore River System	212Mo	Alluvial flats; Swan Coastal Plain west of Gingin; wet soil, semi-wet soil, pale, and yellow deep sands; Woodlands and heaths	38.8 (8%)

2.2.4 Pre-European Vegetation

The major source of data for pre-European vegetation mapping in Western Australia is the published and unpublished mapping of J. S. Beard at 1:250,000 scale. These vegetation types were later refined by Shepherd, Beeston, and Hopkins (2002), resulting in 819 Vegetation Association-level units, and a subsequent reclassification resulted in the creation of over 2,175 finer-scale System Associations (Beard et al., 2013). One System Association is mapped within the Survey Area:

- **Bassendean 949**: Low woodland or open low woodland comprised of acacia (Acacia spp), banksia (Banksia spp.), peppermint (*Agonis flexuosa*), cypress pine (Callitris spp.), casuarina (Allocasuarina spp.), York gum (*Eucalyptus loxophleba*).

Representation of Vegetation Associations at a state, regional, and local level is shown in **Table 2** (Government of Western Australia, 2019).

Table 2: Representation of Vegetation Associations within the Survey Area at a state, regional, and local level

Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA lands (%)*
Representation across Western Australia				
949	218,193.94	123,104.02	56.42	55.86
Representation across the Swan Coastal Plain Bioregion				
949	209,983.26	120,287.93	57.28	56.40
Representation across the Perth (SWA02) Subregion				
949	184,475.82	104,128.96	56.45	58.99
Representation across the Shire of Gingin				
949	138,102.77	81,731.46	59.18	61.66

*as a portion of the current extent

2.2.5 Swan Coastal Plain Vegetation Complexes

Vegetation complexes have been mapped Heddle et al. (1980) and Mattiske and Havel (1998) at scales of 1:250,000 and 1:50,000 respectively. These vegetation complexes were consolidated and extended to the boundaries of the Swan Coastal Plain, Dandaragan Plateau, Whicher Scarp, and Darling Plateau landforms in 2016 (Webb et al., 2016). The Survey Area occurs within two vegetation complexes (**Map 3**):

- **Bassendean complex – North Transition**: Vegetation ranges from a low open forest and low open woodland of Banksia species - *Eucalyptus todtiana* (Pricklybark) to low woodland of *Melaleuca* species and sedgelands which occupy the moister sites.
- **Bassendean Complex – North**: A transition complex of low open forest and low woodland of Banksia species - *Eucalyptus todtiana* (Pricklybark) on a series of high sand dunes. The understorey species reflect similarities with both the Bassendean-North and Karrakatta-North vegetation complexes.

Representation of vegetation complexes within the Survey Area at a state level is shown in **Table 3**.

Table 3: Representation of vegetation complexes within the Survey Area at a State level

Vegetation complex	Pre-European area (ha)	Current extent (ha)	Remaining (%)
Bassendean Complex-North	79,057.35	56,659.67	71.67
Bassendean Complex-North Transition	20,856.54	18,552.77	88.95

2.2.6 Hydrography

No mapped hydrological features occur within the Survey Area (DWER, 2018). The nearest mapped hydrological feature is Moore River located 0.6 kms north of the Survey Area. Based on aerial imagery an earth dam was identified within the north east portion of the Survey Area. A suite of wetlands occurs within the vicinity of the Survey Area, of which five areas mapped as Conservation Category Geomorphic Wetlands intersect the Survey Area (**Map 4)**

2.2.7 Conservation Areas

Conservation areas consist of areas protected for the purpose of conservation, including but not limited to National Parks, Nature Reserves, Conservation Parks, and Regional Parks. The Survey Area is located within a suite of Geomorphic Wetlands, of which five occur within the Survey Area boundaries (DBCA, 2023). The wetlands are listed as Conservation management category in the Geomorphic Wetlands dataset. The dataset is identified and utilised by the EPA, Department of Water and Environmental Regulation (DWER) and Department of Lands and Heritage (DPLH) as a basis for planning and decision making (DBCA, 2023). The wetlands intersecting the Survey Area are described in **Table 4** and shown in **Map 4.**

An additional conservation area is located adjacent to the eastern boundary of the Survey Area, Moore River National Park, vested under the Conservation Commission of Western Australia.

Table 4: CCW and Geomorphic wetlands occurring within the Survey Area

UFI	Wetland Type	Management Category
9769	Dampland	Conservation
9773		
9768		
9619		
9767		

2.2.8 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs), or significant wetlands. The Survey Area has five mapped ESAs, which, correlate with the five geomorphic wetlands and their associated 50 m buffers (Department of Water and Environmental Regulation, 2021). The ESAs intersecting the Survey Area are shown in **Map 4**.

2.2.9 Land Use

The upper north eastern portion of the Survey Area has historically been operated as a mixed stock and crop farm.

3.0 Methods

The surveys documented in this report were undertaken in accordance with relevant EPA and DAWE guidelines (see **Section 2.1**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds (the Desktop Study Area) was compiled prior to the field survey. The literature review considered a selection of relevant reports detailing assessments undertaken in the region that were either publicly available from sources such as the Index of Biodiversity Surveys for Assessments (IBSA) website, the EPA Consultation Hub, or internet searches, or provided by the client. These reports are listed below in order of distance from the current Survey Area, summarised in **Appendix B**.

- *Orange Springs Road Fauna Assessment Report* (Ecoedge, 2019), adjacent to the northern boundary of the Survey Area.
- *Brand Highway, Regans Ford Biological Survey* (Astron Environmental Services, 2016), located 3.5 km east of Survey Area.
- *2800 Cowalla Road, Cowalla Vegetation Assessment* (PVG, 2021), located 11 km northeast of Survey Area.
- *Proposed Gravel Extraction 308 Scenic Drive, Yathroo* (Bayley Environmental Services, 2021), located 19 km northeast of Survey Area.
- *Yandin Wind Farm Flora, Vegetation and Aviefauna Assessment* (ecolgica Environmental Services, 2017), located 20 km northwest of Survey Area.
- *Mogumber Poultry Farm Development* (360 Environmental, 2018), located 26 km east of Survey Area.
- *Lot 510 Ledge Point Road Lancelin Flora and Vegetation Survey* (Plantecology Consulting, 2021), located 30 km west of Survey Area.
- *Guilderton Sovereign Hill Pipeline Spring Flora, Vegetation, Fauna and Black Cockatoo Survey* (Ecological, 2021), located 32 km southwest of Survey Area.
- *Great Northern Highway: Bindoon Bypass* (Bamford Consulting Ecologists, 2018), located 39 km southeast of the Survey Area.
- *Waddi Wind Farm Project – Cataby Supplementary Flora, Vegetation and Fauna Survey* (ecologia Environment, 2016), located 46 km north of Survey Area.
- *Deep Space Facility Flora and Fauna Survey* (Ecoscape, 2020), located 47 km East of Survey Area.
- *CBH Moora expansion: Flora, Vegetation and Fauna Survey* (Eco Logical, 2020), located 48 km northeast of Survey Area.
- *Midland Brick Muchea Flora and Fauna survey* (Mattiske Consulting Pty Ltd, 2022), located 66 km south of Survey Area.

3.1.2 Database Searches

Database searches were undertaken to compile a list of flora and fauna known to occur in the Desktop Study Area and identify significant flora, fauna, and ecological communities with potential to occur within the Survey Area (**Table 5**).

Table 5: Database search details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Ecological Communities database search (DBCA, 2024b)	19 September 2024	TECs and PECs	10 km
Threatened and Priority Flora (TPFL) database search (DBCA, 2024d)	19 September 2024	Threatened and Priority flora	10 km
Western Australian Herbarium Flora database search (DBCA, 2024e)	19 September 2024	Threatened and Priority flora	10 km
Threatened and Priority Fauna including black cockatoo-specific database search (DBCA, 2024c)	19 September 2024	Threatened and Priority fauna	20 km
Protected Matters Search Tool (PMST) (DCCEEW, 2024)	20 September 2024	Threatened flora, fauna, and ecological communities	20 km
NatureMap (DBCA, 2024a)	26 September 2024	Flora and fauna	20 km

3.1.3 Likelihood of Occurrence

Significant flora and fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria is presented in **Table 6**.

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon's known distribution) were excluded from consideration. Only taxa that have been recorded within the Survey Area or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 6: Likelihood of occurrence criteria

Rank	Criteria
Recorded	The taxon was recorded within the Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Survey Area according to database searches or existing literature.
High (Likely to occur)	Suitable habitat is present within the Survey Area, and, for flora, the taxon has been recorded within 5 km of the Survey Area or, for fauna, the taxon has been recorded within the Desktop Study Area more than once in the last 15 years.

Rank	Criteria
Medium (May occur)	There are existing records of the taxon within the Desktop Study Area, however suitable habitat within the Survey Area is marginal or limited in extent or, for fauna, the taxon has not been recorded within the Desktop Study Area in the last 15 years.
Low (Unlikely to occur)	Suitable habitat is not present within the Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.

3.1.3.1 Black Cockatoo Desktop Assessment

In addition to the general desktop assessment outlined above, a black cockatoo-specific desktop assessment was undertaken prior to the field survey. Modelled distributions and previous records, including known or potential breeding and roosting sites, of the three threatened black cockatoo taxa were reviewed (DAWE, 2022; DBCA, 2024c).

3.2 Field Survey

3.2.1 Survey Timing

The field surveys were undertaken across one field trip as shown in **Table 7**.

Table 7: Survey timing

Survey trip	Tasks completed	Dates	Person field days
1	Basic fauna and black cockatoo survey.	25 – 27 September 2024	6
2	Flora and vegetation survey.	25 – 27 September 2024	6

3.2.2 Field Personnel and Licences

Details of field personnel, including their level of experience, role for each field trip, and flora collection licence numbers are detailed in **Table 8**.

Table 8: Field personnel

Personnel	Experience	Licence	Role	Trips
Narelle Whittington	25 years	FB62000177-2 TFL: 2223-0068	Principal Botanist	1
Megan Young	3 years	FB62000388-02	Senior Botanist	1
Grant Buller	4.5 years	FB62000321-2	Senior Ecologist	1
Jack Hardie	3 years	FB62000389-02	Senior Botanist	1
Lukas Geidans	5 Years	FB62000303	Associate Ecologist	1
Phillippa Dean	2 Years	-	Zoologist	1

3.2.3 Weather Conditions

Weather conditions during the fauna survey are presented in **Table 9**. Daily temperature and rainfall data is from the Gingin Weather Station (Station 009178) (BoM, 2024). Weather conditions can impact potential detection of fauna taxa during a survey.

Table 9: Field survey weather conditions

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
25/09/2024	9.2	24.3	0
26/09/2024	11.9	30.4	0
27/09/2024	9.2	16.8	10.6

3.3 Flora and Vegetation

3.3.1 Establishment of Flora Sites

Indicative site selection was undertaken prior to the survey based on aerial photography and available literature. The number and locations of flora sites were then adjusted on site to achieve sites most representative of the vegetation present. Where possible, at least three flora sites were established in each vegetation type within the Survey Area. In instances where vegetation types were not large enough to accommodate three flora sites, one or two sites were established.

Flora sites consisted of either quadrats or relevés. Quadrats were 10 x 10 m with corners aligned to northwest, northeast, southeast and southwest, and were measured out using measuring tapes. As a minimum, the northwest corner of each quadrat was demarcated with an aluminium fence dropper and where possible a fence dropper was also installed in the southeast corner. Relevés comprised unbounded sites of approximately 10 x 10 m where possible, or alternate configurations approximating 100 m^2 (as required in linear areas such as drainage lines, gullies, and narrow ridge lines). A comprehensive list of the flora present at the time of sampling was recorded for both quadrat and relevé sites.

Flora site locations were recorded using a GPS-enabled handheld device, with points recorded at north west corner of quadrats and relevés. The following information was recorded at each flora site:

- Site code.
- Date and personnel.
- Landform and soil description.
- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover, and fire history.
- Inventory of vascular flora including the approximate average height and percentage foliar cover for each taxon.
- Vegetation description in accordance with the National Vegetation Information System (NVIS) Level 5 ‘association’ whereby the dominant growth form, height, cover, and species (three species) for the three traditional strata (upper, mid, and ground) are described.

- Vegetation condition in accordance with the South-West Botanical Province vegetation condition scale.
- Evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion, and evidence of feral animals and dieback) where present.
- Photograph of the vegetation occurring within the site.

A total of 27 flora sites (comprising 22 quadrats and five relevés) were established within the Survey Area. An additional 40 mapping notes were completed to aid vegetation mapping. Flora site locations are shown on **Map 5**.

3.3.2 Opportunistic Flora

Flora taxa observed outside flora sites were recorded opportunistically. When significant flora, Declared Pests (DPs), or WoNS were encountered opportunistically, a GPS location and count of the individuals present was recorded.

3.3.3 Targeted Searching

Prior to the survey a list of significant flora taxa with the potential to occur within the Survey Area was compiled (see **Section 3.1.3**). Field personnel familiarised themselves with photographs, reference samples, and descriptions of these taxa before conducting the survey.

Personnel actively searched for conservation significant flora species while traversing on foot within the Survey Areas and in known locations or preferred habitat encountered in the Survey Areas.

When Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby and delineate population boundaries where relevant and possible. Specimens of potential significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.3.4 Vegetation Type and Condition Mapping

Vegetation type and condition mapping was initially conducted in the field with boundaries delineated over aerial photography at a scale of 1:1,000. Vegetation types were refined based on taxonomic identification of flora collections and mapping notes taken during the field survey. Further validation of vegetation types was undertaken using multivariate analysis of data collected from the quadrats and relevés. Vegetation condition mapping was refined based on site data and mapping notes. Polygons were digitised using GIS software.

3.3.5 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using WAH resources. Identification of flora collections was completed by Senior Botanist Lousia Cockram and Principal Botanist Dr Sacha Ruoss.

FloraBase (DBCA, 2024) was used to determine the conservation status and known distribution of each taxon. The control status of introduced flora was sourced from the WoNS list and declared plants list (CISS, 2024; DPIRD, 2024).

Any significant flora taxa, including potential Threatened and Priority taxa, range extensions, and potential new taxa, were submitted to the WAH for verification and lodgement. Where relevant, Threatened and Priority Flora Report Forms (TPFRFs) were submitted to DBCA.



3.3.6 Statistical Analyses

3.3.6.1 Floristic Community Type Analysis

Multivariate analysis for Floristic Community Type (FCT) analysis was undertaken using PRIMER version 7. A comparison of the similarity of floristic composition between quadrat data from the field survey and quadrat data compiled between 1990 and 1996 (Keighery et al., 2012) based on species presence or absence was undertaken using the Bray-Curtis similarity index. The Keighery et al. (2012) dataset combines a total of 1098 sites across the Swan Coastal Plain (SCP) and is a publicly available standardised regional vegetation dataset. Where possible, vegetation types within the Survey were matched with analogous FCTs as presented in the Keighery et al. (2012) dataset to aid in determining the significance of the vegetation. Further validation of the FCT analysis was undertaken using key information such as the presence of indicator species, soil types, landform position, and knowledge of regional occurrences.

3.3.6.2 Species Accumulation Curve

A species accumulation curve was plotted using Primer v6 to determine the adequacy of the survey. The treatments comprised Sobs (Mao Tao), which effectively smooths the curve of observed species by simulating an infinite number of randomisations of the sample order, and richness estimators Chao 1, Chao 2, Jacknife 1, Bootstrap, and Michaelis-Menton to predict the theoretical maximum number of species that could potentially be recorded. The species accumulation curve was calculated using systematic sampling data from flora sites and does not include opportunistic flora records. All identified flora taxa, including annual and perennial, within each flora site was used to generate the species accumulation curve. Unknown flora taxa that could not be identified to a species level was excluded.

3.3.7 Banksia Woodlands TEC Diagnostic Criteria

The Commonwealth ‘Banksia Woodlands of the Swan Coastal Plain ecological community’ was listed as an Endangered TEC under the EPBC Act in 2016. The DCCEEW provides guidance through the Approved Conservation Advice for the Banksia Woodlands of the Swan Coastal Plain ecological community document (DEE, 2019) for determining whether a Banksia woodland protected under the EPBC Act is present within the Survey Area.

Areas of mapped vegetation within the Survey Area that were considered to potentially align with the TEC were assessed in the field against the key diagnostic characteristics and condition thresholds presented in **Table 10** below.

A summary of this assessment is provided in **Appendix C.**

Table 10: Assessment against the key diagnostic criteria for the Banksia Woodlands of the Swan Coastal Plain TEC

Key Diagnostics	Criteria
Location and Physical Environment	Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions.
Soils and Landform	Well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean, and Spearwood sands and occasionally on Quindalup sands Sandy colluviums and aeolian sands of the Ridge Hill Shelf, Whicher Scarp, and Dandaragan Plateau Transitional substrates and sandflats.

Key Diagnostics	Criteria
Structure	Low woodland to forest with: A distinctive upper sclerophyllous layer of low trees (occasionally large shrubs more than 2 m tall), typically dominated or co-dominated by one or more of the banksia species identified below: Emergent trees of medium or tall (>10 m) height. Eucalyptus or Allocasuarina species may sometimes be present above the banksia canopy. An often highly species-rich understorey.
Composition	The canopy is most commonly dominated or co-dominated by *Banksia attenuata* and/or *B. menziesii*. Other Banksia species that dominate in some examples of the ecological community are *B. prionotes* (acorn banksia) or *B. ilicifolia.* Contains at least one of the following species: *Banksia attenuata* *Banksia menziesii* *Banksia prionotes* *Banksia ilicifolia.*
Condition and patch size	Pristine – no minimum patch size Excellent – at least 0.5 ha Very Good – at least 1 ha Good – at least 2 ha. A patch is a discrete and mostly continuous area of the ecological community. A patch may include small-scale (<30 m) variations, gaps, and disturbances, such as tracks, paths, or breaks (Department of the Environment and Energy, 2019).
Presence of contra indicators	Patches clearly dominated by *Banksia littoralis* are not part of the Banksia Woodlands ecological community but indicates a different dampland community is present. Patches clearly dominated by *Bankia burdettii* are not part of the Banksia Woodlands ecological community but indicates a tall shrubland and not the Banksia Woodlands ecological community.

3.4 Fauna

3.4.1 Habitat Assessment and Mapping

Habitat assessments were undertaken in representative areas of fauna habitat within the Survey Area to record habitat values. Where possible, at least one habitat assessment was recorded within each habitat type. Habitat assessment locations are shown in **Map 5**.

The following information was collected at each habitat assessment location using a GPS-enabled handheld device:

- Site photo.
- Landform.
- Soil type and colour.

- Rock types, surface stone cover, and size classes.
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, and water sources.
- Habitat quality, fire history, and evidence of disturbance.
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, habitat assessment data, aerial imagery, and vegetation type mapping. Polygons were digitised using GIS software.

3.4.2 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area, including primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings, remains).

3.4.3 Black Cockatoo Habitat Assessment

A black cockatoo habitat assessment was undertaken to assess breeding, night roosting, and foraging habitat values for three threatened black cockatoo taxa, the Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*), and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*).

3.4.3.1 Breeding Habitat

Breeding habitat was assessed based on the number and location of trees that meet the following criteria:

- Tree taxa is known to form suitable hollows, including trees endemic to southwest Western Australia such as Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Tuart (*E. gomphocephala*), Karri (*E. diversicolor*), Wandoo (*E. wandoo*), and Salmon Gum (*E. salmonophloia*), and non-endemic Eucalyptus and Corymbia trees.
- Tree is of a suitable diameter at breast height (DBH) to develop a nest hollow, which is greater than 500 mm for most tree species, regardless of the presence or absence of hollows. DBH was measured approximately 1.3 m above the ground, except in instances where trees had swelling or forking at breast height, in which case the diameter measurement was taken just above the swelling or forking. In instances where trees had multiple stems at breast height, the stem with the largest diameter was recorded.
- Tree contains hollows (observed from the ground) with an estimated opening diameter of greater than 100 mm (Saunders et al., 2014).

If observed, trees that met the above criteria were recorded using a GPS-enabled handheld device and photographed. Recorded trees were categorised as potential, suitable, or known nesting trees as adapted from the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022) and given a ranking of 1 – 5 based on the black cockatoo nesting and potential nesting tree ranking system developed by Bamford Consulting Ecologists (Bamford Consulting Ecologists, 2020):

- Known nesting tree:
    1) Active nest observed. Adult or immature bird seen entering or emerging from hollow.

- Suitable nesting tree:
    2) Hollow of suitable size and angle (i.e. near-vertical) visible with chew marks around entrance.
    3) Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of greater than 10 m).
- Potential nesting tree:
    4) Tree with large hollows or broken branches that might contain large hollows, but hollows or potential hollows are not vertical or near vertical; thus, a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by black cockatoos.
    5) Tree lacking large hollows or broken branches that might have large hollows, a tree with intact branches and a spreading crown.

Where possible, photographs of hollows were taken.

3.4.3.2 Night Roosting Habitat

Potential black cockatoo roosting habitat consists of tall trees, particularly when they occur near water sources (for Carnaby's Cockatoo and Baudin's Cockatoo) or on the edges of large forests (for Forest Red-tailed Black Cockatoo) (DAWE, 2022). Areas containing tall trees suitable for black cockatoo roosting were identified and recorded. If observed, evidence of black cockatoo roosting, which typically consists of large amounts of scat with occasional feathers at the base of trees, was recorded. Dawn and dusk surveys were not undertaken as part of this scope of works.

3.4.3.3 Foraging Habitat

Foraging habitat was assessed based on the presence and coverage of known foraging plants for black cockatoos as outlined in the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022) or other available literature. Foraging habitat was mapped and classified using the Foraging Habitat Scoring Tool (DAWE, 2022). The quality of foraging habitat was further refined using the DCCEEW, (2023) habitat scoring system, which takes into consideration vegetation condition, structure, proximity to other habitat, and species stocking rate.

If observed, evidence of black cockatoo foraging, including direct observations of foraging and chewed foraging material (e.g. nuts or cones) was recorded.

3.4.3.4 Hollow Inspection

Hollows were initially assessed from the ground to determine the hollows that are obviously unsuitable (wrong orientation or too small). Hollows that were unsuitable due to incorrect orientation, depth, or diameter and that were visible from the ground were photographed from the ground for record-keeping purposes. Potentially suitable hollows that displayed correct orientation, depth, and diameter from the ground should be treated as suitable hollows unless confirmed otherwise. This may be done via further inspections utilising drone or pole-top camera. Hollow inspections using drone or pole-top camera were not part of the scope of the survey



3.4.4 Identification and Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field and released on site.

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the Checklist of the Terrestrial Vertebrate Fauna of Western Australia (WAM, 2024) where relevant.

3.5 Limitations

Limitations and constraints of the flora, vegetation, and fauna survey are detailed below in **Table 11**.

Table 11: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	None	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	None	The survey was undertaken by a team with extensive experience undertaking similar scopes within the bioregion.
The proportion of flora and fauna identified, recorded, or collected	None	Of the 201 flora taxa recorded, 32 specimens (15.9%), could not be identified to species level because they were sterile at the time of the survey. The unidentified flora specimens were not analogous to significant flora taxa. Of the 37 fauna taxa recorded, all were identified to species level in the field.
Scope of the survey	None	The scope of the survey was limited to vascular plants and terrestrial vertebrate fauna. No further exclusions were made within these groups.
Adequacy of the survey intensity and proportion of survey achieved	None	A minimum of three quadrats were installed within each vegetation type. Additional survey effort may yield additional flora and fauna taxa; however, sufficient time and effort was allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity. The Survey Area was adequately surveyed for a basic fauna survey, and all present habitats were identified. The Survey Area was adequately surveyed for a black cockatoo habitat assessment and was not deemed a limitation.
Access problems	None	The entirety of the Survey Area was accessible by vehicle and on foot.
Timing, weather, and season	None	The recommended primary survey period for flora and vegetation within the Southwest Botanical Province occurs Spring (September – November). The flora and vegetation survey (25 – 27 September) was undertaken within the recommended primary survey period. In the three months before the survey, the average rainfall was above the expected rainfall for the same period, therefore, weather was not deemed a limitation.

Variable	Degree of limitation	Potential constraints on survey outcomes
		The recommended primary fauna survey periods for the Southwest broad climatic regions are: • Amphibians – May-August and November-December • Birds – September-December and November-March • Mammals – September-December • Reptiles – October-December and February-March The fauna survey (25 - 27 September) was undertaken within the recommended primary survey period and were not considered a limitation for a basic fauna survey and black cockatoo assessment.
Disturbance that may have affected the results of survey	None	Areas of disturbance associated with agricultural activities were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	None	Species accumulation curves provide an indication of survey adequacy at each sampling location but do not necessarily reflect survey adequacy across the entire Survey Area, however, this is not considered a limitation on the survey outcomes. Survey effort for significant flora and fauna taxa was concentrated in preferred habitats. This may introduce a bias where the use of non-preferred habitat is underrepresented, however, this is not considered a limitation on the survey outcomes.

4.0 Results

4.1 Flora and Vegetation

4.1.1 Desktop Assessment

The database searches and literature review identified 69 significant flora taxa occurring within the Desktop Study Area, comprising:

- 11 Threatened taxa
- Three Priority 1 taxa
- 12 Priority 2 taxa
- 27 Priority 3 taxa
- 16 Priority 4 taxa

Key findings of the literature review are summarised in **Appendix B,** and database search results are summarised in **Appendix D** and presented in Map 6.

A total of two significant ecological communities were identified within the Survey Area (**Table 12**). Significant ecological communities identified by database searches are presented in **Map 6**.

Table 12: Significant Ecological Communities in the vicinity of the Survey Area

Significant Ecological Community	State Listing	Federal Listing	Distance from the Survey Area
Banksia Woodlands of the Swan Coastal Plain ecological community	Priority 3	Endangered	Overlaps the Survey Area
Swan Coastal Plain *Banksia attenuata - Banksia menziesii* woodlands (23b)	Priority 3	Endangered (Part)	3.1 km east of the Survey Area

4.1.1.1 Likelihood of Occurrence

The pre-survey likelihood of occurrence identified that of the 69 significant flora taxa identified by the desktop assessment:

- No taxa had previously been recorded within the Survey Area
- 24 taxa were considered to have a high likelihood of occurrence
- 23 taxa were considered to have a medium likelihood of occurrence
- 22 taxa were considered to have a low likelihood of occurrence.

Following the survey, the likelihood of occurrence assessment identified that:

- No taxa were recorded within the Survey Area
- Three taxa were considered to have a high likelihood of occurrence
- Three taxa considered to have a medium likelihood of occurrence
- 63 were considered to have a low likelihood of occurrence.

The likelihood of occurrence assessment is provided in **Appendix F**.

4.1.2 Floristic Composition

The field survey recorded a total of 201 taxa from 126 genera across 51 families (**Appendix E**). The most abundant genus was *Stylidium* (9 taxa). The most diverse families were Myrtaceae (28 taxa), Proteaceae (17 taxa), and Fabaceae (16 taxa).

4.1.3 Significant Flora

No Threatened flora taxa or Priority flora taxa were recorded during the field survey

4.1.4 Other Significant Flora Recorded Within the Survey Area

No flora taxa recorded during the field survey were considered to be significant for reasons other than Threatened or Priority status.

4.1.5 Introduced Flora

A total of 19 introduced taxa were recorded within the Survey Area, representing 9.5% of the total taxa recorded (**Table 13**). No taxa are listed as Declared Pests under the BAM Act or listed as a WoNS by the Department of Primary Industry.

Table 13: Introduced flora taxa recorded within the Survey Area

Taxon	Common name	Status under BAM Act	WoNS
**Arctotheca calendula*	Cape Weed	Permitted - s11	No
**Avena barbata*	Bearded Oat	Permitted - s11	No
**Briza maxima*	Blowfly Grass	Permitted - s11	No
**Bromus diandrus*	Great Brome	Permitted - s11	No
**Disa bracteata*	South African Orchid	-	No
**Dischisma capitatum*	Woolly-headed Dischisma	Permitted - s11	No
**Ehrharta calycina*	Perennial Veldt Grass	Permitted - s11	No
**Gladiolus caryophyllaceus*	Wild Gladiolus	Permitted - s11	No
**Hypochaeris glabra*	Smooth Cats-ear	Permitted - s11	No
**Lolium rigidum*	Wimmera Ryegrass	-	No
**Lupinus angustifolius*	Narrowleaf Lupin	Permitted - s11	No
**Lysimachia arvensis*	Pimpernel	Permitted - s11	No
**Medicago polymorpha*	Burr Medic	Permitted - s11	No
**Orobanche minor*	Lesser Broomrape	Permitted - s11	No
**Pelargonium capitatum*	Rose Pelargonium	Permitted - s11	No
**Raphanus raphanistrum*	Wild Radish	Permitted - s11	No
**Rumex hypogaeus*	Doublegee	-	No
**Solanum nigrum*	Black Berry Nightshade	Permitted - s11	No
**Wahlenbergia capensis*	Cape Bluebell	Permitted - s11	No

4.1.6 Unconfirmed Flora

32 specimens (15.9% of the taxa recorded) could not be identified to species level because the taxa were sterile at the time of the survey (**Appendix E**). Of these specimens, two were identified to family level, 16 were identified to genus level, and 14 were tentatively identified to species level. Eight unconfirmed flora taxa may represent duplicates of taxa that were confirmed within the Survey Area.

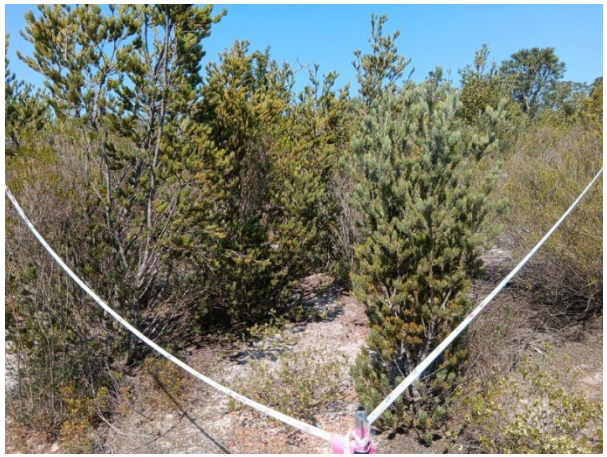
No unconfirmed flora taxa were analogous to significant flora taxa identified by the desktop assessment.

4.1.7 Vegetation Types

Five vegetation types were described and mapped across four broad landforms (undulating plains, slopes, crests and depressions/basins) within the Survey Area (**Table 14**; **Map 7**). A total of 65.1 ha (12.8%) was mapped as Cleared and comprised of tracks, gardens, paddocks and infrastructure.

Detailed site sheets for each quadrat are provided in **Appendix G**.

Table 14: Vegetation types recorded within the Survey Area

Vegetation type and description*	Local landform	Sites	Vegetation condition	Representative photograph	Total area, percentage of Survey
BaMpAc *Banksia attenuata, (B, ilicifolia)* and (*Melaleuca preissiana)* low open woodland over *(Adenanthos cygnorum* subsp. *cygnorum), B. laricina, Hypocalymma angustifolium* mid open shrubland over *Styphelia xerophylla, Hibbertia subvaginata* and *Melaleuca ?leuropoma* low sparse shrubland	Basin/depression and mid slopes with grey white sands	OSQ01 OSQ11, OSQ17, OSQ19, OSQ20, OSQ21,	Excellent		26.1 ha 5.1%
BaBm *Banksia attenuata* and *B. menziesii* low woodland over *Eremaea pauciflora* and *Beaufortia elegans* mid open shrubland over *Patersonia occidentalis*, *Phlebocarya ciliata* and *Schoenus caespititius* low sparse sedgeland	Undulating plains, mid slopes, and basins/depressions with grey white sands	OSQ02, OSQ03, OSQ04, OSQ05, OSQ06, OSQ07, OSQ08, OSQ10, OSQ12, OSQ13, OSQ22,	Excellent		296.5 ha 58.32%

Vegetation type and description*	Local landform	Sites	Vegetation condition	Representative photograph	Total area, percentage of Survey
EtBaBm *Eucalyptus todtiana*, *Banksia menziesii* and (*Banksia attenuata*) low open woodland over *Jacksonia floribunda, Eremaea pauciflora* and *Verticordia* ?*nitens* mid open shrubland over *Hibbertia* spp., *Melaleuca* spp. and *Petrophile* spp. low sparse shrubland	Undulating plains, mid slopes, crests and basins/depressions with grey white sands	OSQ09, OSQ14, OSQ15,OSQ18, OSR02, OSR03, OSR04, OSR05	Very Good to Excellent		79.5 ha 15.6%

Vegetation type and description*	Local landform	Sites	Vegetation condition	Representative photograph	Total area, percentage of Survey
MT Mature trees of *Corymbia calophylla*, *Eucalyptus todtiana*, *Eucalyptus wandoo* and non-endemic Eucalypt species over mixed weed species	Undulating plains with grey white sands	Map Note	Completely Degraded		6.5 ha 1.3%
Regrowth Isolated trees of *Eucalyptus todtiana* over *Verticordia nitens* and *Adenanthos cygnorum* subsp. *cygnorum* mid shrubland over *Jacksonia nutans* low open shrubland over *Podotheca gnaphalioides* and **Ursinia anthemoides* low isolated clumps of forbs	Undulating plains with grey white sands	OSR01	Good		34.7 ha 6.8%

*Brackets indicate species that may or may not be present, but were observed as dominant at some of the sites that make up the vegetation type

4.1.8 Vegetation Condition

Vegetation condition within the Survey Area ranged from Excellent to Completely Degraded, with the majority (76.3%) being in Excellent condition (**Table 15**; **Map 8**). A total of 65.1 ha (12.8%) was mapped as Cleared and was not assessed for vegetation condition due to the absence of native vegetation.

Evidence of disturbance was primarily associated with historical clearing, agricultural activities, and weeds.

Table 15: Summary of vegetation condition within the Survey Area

Vegetation condition	Area (ha)	Percentage of Survey Area
Excellent	387.9	76.3
Very Good	14.1	2.8
Good	34.7	6.8
Completely Degraded	6.5	1.3

4.1.9 Floristic Community Type Analysis

The FCT analysis identified nine Keighery et al. (2012) FCTs as statistically similar to vegetation types within the Survey Area:

- FCT 21c – Low lying *Banksia attenuata* woodlands or shrublands
- FCT 22 – *Banksia ilicifolia* woodlands
- FCT 23a – Central *Banksia attenuata* - *Banksia menziesii* woodlands
- FCT 23b – Northern *Banksia attenuata* - *Banksia menziesii* woodlands
- FCT 23c – North-eastern *Banksia attenuata* - *Banksia menziesii* woodlands
- FCT S04 – *Regelia ciliata* Dandaragan Plateau wetlands
- FCT S09 – *Banksia attenuata* woodlands over dense low shrublands
- FCT S16 – Mixed dense shrublands on yellow brown sands.

Following further validation of the FCTs included using key information like the presence of indicator species, soil types and landform positions as well as knowledge of regional occurrences, the following two FCTs were assessed as present within the Survey Area:

- FCT 22 – *Banksia ilicifolia* woodlands
- FCT 23b – Northern *Banksia attenuata* - *Banksia menziesii* woodlands

4.1.10 Significant Vegetation

4.1.10.1 Threatened and Priority Ecological Communities

Both FCTs identified as occurring within the Survey Area from the analysis have the potential to be conservation significant.

Vegetation type BaMpAc is considered to be analogous to the ‘‘*Banksia ilicifolia* woodlands, southern Swan Coastal Plain (‘floristic community type 22’)” which is listed as a Priority 3 ecological community at a state level and can also be a component of the EPBC Act Banksia Woodlands of the Swan Coastal Plain TEC. BaMpAc occurred in six instances across the Survey Area and covers 26.1 ha (5.1% of the Survey Area). The ‘*Banksia ilicifolia* woodlands” ecological community occurs in low lying sites and generally consists of *Banksia ilicifolia* – *B. attenuata* woodlands, however, *Melaleuca preissiana* woodlands and scrubs have also been recorded. The vegetation community occurs on Bassendean and Spearwood systems from south end of the Dandaragan Plateau between Ledge Point and Wannamal in the north, to Pinjarra in the south. The community typically, has a very open understorey and are likely to be seasonally waterlogged.

Vegetation types BaBm and EtBaBm are analogous to the ‘Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands (‘floristic community type 23b’)’ and is listed as a Priority 3 ecological community at a State level and can also be a component of the EPBC Act Banksia Woodlands of the Swan Coastal Plain TEC. BaBm was the dominant vegetation type within the Survey Area, covering 296.5 ha (58.3% of the Survey Area). EtBaBm occurred in three areas across the Survey Area and covers 79.5 ha (15.6% of the Survey Area). The ‘Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands is defined as woodlands occurring in the Bassendean system, north of Perth between Regans Ford and Wanneroo.

4.1.10.2 Banksia Woodlands Commonwealth TEC Patch Assessment

The Banksia Woodlands of the Swan Coastal Plain TEC (Banksia WL SCP) was expected to occur within the Survey Area, as previously identified by the DBCA (See **Section 4.1.1**) and Astron (Astron Environmental Services, 2016).

The vegetation types BaMpAc, BaBm, and EtBaBm were considered to be analogous to the Banksia WL SCP (See **Table 10** and **Appendix C** for patch assessment). One continuous patch was identified within the Survey Area, and as a result of the assessment is considered to be representative of the Banksia WL SCP (Map 9). The patch extends beyond the boundary of the Survey Area into properties including Moore River National Park. For the purposes of the Banksia woodland analysis, a 1 km buffer of adjoining Banksia woodland was included. The extrapolated patch of Banksia woodland is 1,169 ha, of which 402 ha (34.4%) is located within the Survey Area.

4.1.10.3 Other Significant Vegetation

The BaMpAc vegetation type is considered representative of wetland vegetation and closely aligns with the boundaries of Conservation Category wetlands mapped in the Geomorphic Wetland dataset.

4.1.11 Species Accumulation Curve

Analysis of systematic flora data for the Survey Area produced a Sobs curve that is approaching an asymptotic plateau (**Figure 2**). All richness estimators were greater than the Sobs curve, indicating that the observed species richness was slightly lower than predicted by the analysis. The observed species richness for the Survey Area was 128 taxa, whereas estimated species richness ranged from 139.2 (Bootstrap) to 150.1 (Jacknife 1), which suggests that approximately 85% to 92% of the theoretical maximum number of flora species was recorded during the field survey (**Table 16**).



The data used to produce the species accumulation curve was conservative because opportunistic species (which are not associated with a site), and unconfirmed flora were not included. With opportunistic and unconfirmed flora included the number of flora taxa recorded during the survey was 201, which is 134% of the highest expected species richness, and 144.4% of the lowest expected species richness.

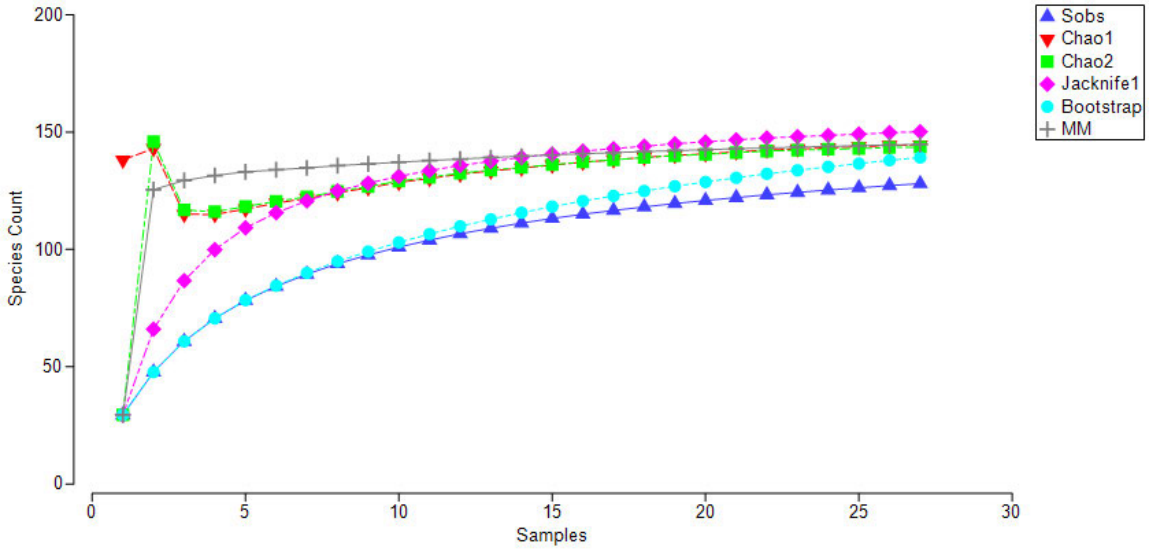


Figure 2: Flora species accumulation curve

Table 16: Flora species richness estimators

Treatment	Estimated species richness	Observed species richness as a proportion of estimated species richness
Chao 1	144.5	89%
Chao 2	143.6	89%
Jacknife 1	150.1	85%
Bootstrap	139.2	92%
Michaelis-Menton	144.8	88%

4.2 Fauna

4.2.1 Desktop Assessment

The database searches and literature review identified 222 terrestrial vertebrate fauna taxa occurring within the Desktop Study Area, comprising:

- Eight amphibians, of which none are significant.
- 161 birds, of which 22 are significant.
- 21 mammals, of which six are significant.
- 27 reptiles, of which one is significant.

Key findings of the literature review are summarised in **Appendix B**, a complete list of fauna taxa recorded within the Desktop Study Area is presented in **Appendix I**, and database search results are displayed in **Map 10**.

4.2.1.1 Black Cockatoo Desktop Assessment

The Survey Area occurs within the modelled distribution of Carnaby's Cockatoo. (DAWE, 2022). The DBCA database search results are presented in **Map 11** and summarised below:

- A total of 2,122 black cockatoo records were identified, comprising of 2,027 Carnaby's Cockatoo records, and 95 White-tailed Black Cockatoo records. The White-tailed Black Cockatoo records are considered to be Carnaby's Cockatoo due to the Survey Areas lying outside of the modelled distribution of Baudin's Cockatoo. There were no records of Baudin's Cockatoo or Forest Red-tailed Black Cockatoo.
- Carnaby's Cockatoo has been recorded within 3 km northeast of the Survey Area, with the closest record being 1.8 km northeast of the Survey Area in 2000. The most recent record was 7.7 km northeast of the Survey Area in 2022. White-tailed Black Cockatoo (i.e Carnaby's Cockatoo) has been recorded 4.5 km northeast of the Survey Area in 2018.
- 29 confirmed White-tailed Black Cockatoo (i.e. Carnaby's Cockatoo) breeding sites occur within 20km of the Desktop Study Area, the closest of which is 9.1 km northeast of the Survey Area. All confirmed breeding sites occurred in natural hollows.
- Eleven potential White-tailed Black Cockatoo (i.e. Carnaby's Cockatoo) breeding sites occur within the Desktop Study Area, the closest of which is 4.5 km northwest of the Survey Area. All occur in natural hollows.
- No confirmed Forest Red-tailed Black Cockatoo breeding sites occur within the Desktop Study Area.
- No potential Forest Red-tailed Black Cockatoo breeding sites occur within the Desktop Study Area.
- One Carnaby's Cockatoo black cockatoo roost site occurs within the Desktop Study Area approximately 4.7 km northeast of the Survey Area, with activity last recorded in 2011.

Key findings of the literature review are summarised in **Appendix B**.

4.2.2 Fauna Habitats

Seven fauna habitats were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 12**, described below in **Table 17**, and site sheets for each habitat assessment are provided in **Appendix J**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.

Table 17: Fauna habitats recorded within the Survey Area

Fauna habitat	Code	Total area, percentage of Survey Area	Habitat description	Representative photograph
Banksia Woodland	BW	376.4 ha, 74%	Undulating plains with grey, white sands. Vegetation consists of low *Banksia attenuata* and *Banksia menziesii* woodland over *Eremaea pauciflora* and *Beaufortia elegans* mid open shrubland over *Patersonia occidentalis*, *Phlebocarya ciliata* and *Schoenus aespititius* low sparse sedgeland. This habitat contained microhabitats of woody debris and dense shrub vegetation. Overall habitat condition is very high, providing foraging habitat for the Carnaby's Cockatoo whilst the sandy substrate is preferred habitat by the Black-striped Snake. The dense understorey present is suitable for use by the broader fauna assemblage given its good connectivity to surrounding native vegetation.	

Fauna habitat	Code	Total area, percentage of Survey Area	Habitat description	Representative photograph
Eucalyptus todtiana over Native Regrowth	ETONR	34.7 ha, 6.8%	Undulating plains with grey, white sands. Vegetations consists of isolated *Eucalyptus todtiana* over mid *Verticordia nitens* and *Adenanthos cygnorum* subsp. *Cygnorum* shrubland over low *Jacksonia nutans* open shrubland over *Podotheca gnaphalioides* and **Ursinia anthemoides* low isolated clumps of forbs. This habitat contained microhabitats of woody debris. Habitat was of moderate condition due to the presence of weeds and vehicle tracks. This habitat may be used by the Carnaby's Cockatoo due to the presence of foraging species. Pockets of denser vegetation may also be used by small reptiles or mammals for shelter.	
Ephemeral *Banksia* Wetland / Woodland		25.6 ha, 5%	*Banksia attenuata*, *Banksia ilicifolia*, and *Melaleuca preissiana* low open woodland over *Adenanthos cygnorum* and *Hypocalymma angustifolium* shrubland. Basin/depression and mid slopes with grey, white sands. Habitat was of very high condition, with foraging species preferred by the Carnaby's Cockatoo. The dense understorey present is suitable for use by the broader fauna assemblage given its good connectivity to surrounding native vegetation. This habitat is likely to hold water during wetter months and therefore may provide a valuable resource to the broader fauna assemblage.	

Fauna habitat	Code	Total area, percentage of Survey Area	Habitat description	Representative photograph
Wandoo Woodland over Paddock	WWOP	5.8 ha, 1.1%	Undulating plains with grey, white sands. *Eucalyptus wandoo* over mixed weed species. Overall habitat condition is low, due to the disturbances from a weedy understorey, litter, vehicle tracks, agriculture, and infrastructure. The *Eucalyptus wandoo* are suitable for use by the Carnaby's Cockatoo for nesting and roosting. Hollows were observed within this habitat which have the potential for use by black cockatoos as well as other avian species.	

Fauna habitat	Code	Total area, percentage of Survey Area	Habitat description	Representative photograph
Isolated Eucalypts over Paddock	IEOP	0.8ha, 0.2%	Plains with sandy loam soils. Vegetation consists of isolated mature trees of *Corymbia calophylla*, *Eucalyptus todtiana*, *Eucalyptus wandoo* and non-endemic Eucalypt species over mixed weed species. This habitat contained woody debris microhabitats. Overall condition of this habitat is low, with disturbances from weeds and vehicle tracks. Avian species may utilise the trees for nesting or roosting, while small mammals or reptiles may shelter in denser patches of understorey.	

Fauna habitat	Code	Total area, percentage of Survey Area	Habitat description	Representative photograph
Paddock Cleared	PC	0.3 ha, 0.06%	Grass plains with sandy clay substrate. Vegetation consists of introduced grasses with microhabitats of leaf litter. Overall habitat condition is low caused by the presence of weeds, clearing, vehicle tracks, litter and infrastructure. Pooling water was present in depressions within this habitat and may provide value to the broader fauna assemblage.	
Garden Planted	GP	0.3 ha, 0.1%	Planted introduced species included gardens and orchards.	No photo available.
Total		**508 ha, 100%**		

4.2.3 Fauna Records

The fauna survey recorded a total of 37 fauna taxa from 27 families, a full inventory of fauna taxa recorded during the field survey is provided in **Appendix K**.

Birds

A total of 33 native bird taxa from 22 families were recorded within the Survey Area. The most abundant taxa were the Brown Honeyeater (*Lichmera indistincta*), and Western Gerygone (*Gerygone fusca*). The most diverse bird families were Meliphagidae (six taxa) and Artamidae (three taxa).

No significant birds were recorded within the Survey Area.

Mammals

One native mammal taxa from Macropodidae family was recorded within the Survey Area, the Western Grey Kangaroo (*Macropus fuliginosus melanops*). The introduced European Cattle (**Bos primigenius taurus*) and Dog (**Canis familiaris*) were also recorded within the Survey Area.

No significant mammal species were recorded within the Survey Area.

Reptiles

One native Agamid was recorded within the Survey Area, the Western heath dragon (*Ctenophorus adelaidensis*).

No significant reptiles or introduced reptiles were recorded within the Survey Area.

4.2.4 Significant Fauna

4.2.4.1 Recorded Within the Survey Area

No significant fauna taxa were recorded within the Survey Area during the field survey.

4.2.4.2 Potentially Occurring Within the Survey Area

Carnaby's Cockatoo (*Zanda latirostris*) was the only significant fauna taxa assessed as having a high likelihood of occurring within the Survey Area. Carnaby's Cockatoo are listed Endangered under State and Commonwealth legislation.

Black-striped Snake (*Neelaps calonotos*) was the only significant fauna taxa assessed as having a medium likelihood of occurring within the Survey Area. Black-striped Snake are listed as a Priority 3 species (DBCA).

The remaining 28 significant fauna taxa were assessed as having a low likelihood of occurring within the Survey Area.

The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Appendix M**.

4.2.5 Black Cockatoo Habitat Assessment

4.2.5.1 Black Cockatoo Observations

No evidence of black cockatoos was recorded within the Survey Area during the field survey.



4.2.5.2 Night Roosting Habitat

No black cockatoo roosting sites were recorded within the Survey Area.

4.2.5.3 Black Cockatoo Breeding Habitat

The Wandoo Woodland over Paddock and Isolated Eucalypts over Paddock habitats were identified as the most suitable breeding habitat for black cockatoos. A total of 217 potential nesting trees and a further 20 suitable nesting trees were recorded within the Survey Area, including one suitable hollow exhibiting signs of chew marks, as outlined below in **Table 18**. The locations of inventory of these trees are provided in **Appendix N** and displayed in **Map 13**.

Table 18: Black cockatoo nesting trees recorded within the Survey Area

Tree Taxa	Known Nesting Tree	Suitable Nesting Tree		Potential Nesting Tree		Total
	Category 1	Category 2	Category 3	Category 4	Category 5	
Marri (*Corymbia calophylla*)	-	-	-	-	10	**10**
Stag	-	-	9	-	8	**17**
Wandoo (*Eucalyptus wandoo*)	-	1	10	3	196	**210**
Total	**-**	**1**	**19**	**3**	**214**	**237**

4.2.5.4 Foraging Habitat

No evidence of black cockatoo foraging was recorded during the field survey.

According to the DAWE (2022) Foraging Habitat Scoring Tool, the Survey Area contains 508 ha of high quality foraging habitat for Carnaby's Cockatoo (**Table 19**).

According to the DCCEEW (DCCEEW, 2023) scoring system for the assessment of foraging value of vegetation, the Survey Area contains 402 ha of very high value, 34.7 ha of high value, 5.8 ha of moderate value, 0.8 ha of low to moderate value, 0.3 ha of negligible to low value foraging habitat, and 64.2 ha of no suitable foraging habitat for Carnaby's Cockatoo (**Table 20**).

Foraging habitat is presented in **Map 14**.

Table 19: DAWE foraging habitat scoring tool results

Taxa	Area (ha)	Starting habitat score	Foraging potential	Connectivity	Proximity to breeding	Proximity to roosting	Impact from disease	Total score	Quality
Carnaby's Cockatoo	508	10	-2	0	0	0	0	8	High

Table 20: DCCEEW scoring system results for Carnaby's Cockatoo

Habitat	Area (ha)	Foraging value
Banksia Woodland	376.4	Very High (7) – Native kwongan heath and shrubland (>30% projected foliage cover), banksia and eucalypt woodlands with >50% projected foliage cover.
Eucalyptus todtiana over Native Regrowth	34.7	High (6) – Native kwongan heath and shrubland (>25% projected foliage cover), banksia and eucalypt woodlands with >40% projected foliage cover.
Ephemeral *Banksia* Wetland / Woodland	25.6	Very High (7) – Native kwongan heath and shrubland (>30% projected foliage cover), banksia and eucalypt woodlands with >50% projected foliage cover.
Wandoo Woodland over Paddock	5.8	Moderate (4) - Eucalypt woodlands with 20-30% projected foliage cover.
Isolated Eucalypts over Paddock	0.8	Low to Moderate (3) - Native kwongan heath and shrubland, banksia or eucalypt woodlands with 10-20% projected foliage cover.
Garden Planted	0.3	Negligible to Low (1) - Urban areas with scattered foraging trees.
Cleared / Paddock	64.2	None (0) – No Proteaceae, eucalypts or other potential sources of food.
Site context score	**Proximity of the site in relation to other habitat**	
3	Site is within 9.1 km of known breeding site.	
3	Foraging resources occur within the Survey Areas and throughout the surrounding landscape.	

6.0 Discussion

6.1 Flora and Vegetation

6.1.1 Floristic Composition

The suite of flora taxa recorded during the survey is considered typical for the Bassendean subregion and aligns with the database search results obtained. Despite the slightly below-average rainfall recorded for the 12 months prior to commencing the survey, the floristic diversity was considered within the expected range for the bioregions for the timing of the survey undertaken. Undertaking a secondary survey after a significant rainfall event would, however, likely result in additional annual and ephemeral species being recorded.

6.1.2 Significant Flora

The database searches identified 69 extant Threatened and Priority Flora species as having the potential to occur within the Survey Areas. Prior to the survey, 24 species were considered to have a high likelihood of occurring within the Survey Area, 23 were considered to have a medium likelihood and the remaining 22 were given a low likelihood of occurrence.

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened Flora pursuant to the BC Act 2016 or Priority species listed by DBCA were recorded within the Survey Area.

Following a post survey likelihood of occurrence assessment:

- Three species are considered to have a high likelihood of occurrence:
  - *Paracaleana dixonii* (T)
  - *Haemodorum loratum* (P3)
  - *Rumex drummondii* (P4)
- Three species are considered to have a medium likelihood of occurrence:
  - *Drakaea elastica* (T)
  - *Ptychosema pusillum* (T)
  - *Stylidium aceratum* (P3)

The likelihood of these species remaining as a medium or high likelihood following the survey is attributed to these species being annual species and although they were searched for in their preferred habitats, they are cryptic species that may not emerge every year, even with suitable environmental conditions, which could explain their apparent absence during the survey period.

The remaining 63 potential species were given a low likelihood of occurrence due to either the absence of suitable habitat within the Survey Areas or are species that are easily recognisable so would have been recorded if they had been present during the survey.

6.1.3 Introduced Flora

A total of 19 weed species were recorded in the Survey Area, none of which are listed as Declared Pests under the BAM Act or listed as a WoNS by the Department of Primary Industry. The areas mapped as Cleared and MT were primarily comprised of paddocks with weed species.

6.1.4 Vegetation Types and Condition

Mapping reliability is considered to be high across the Survey Area. The Swan Coastal Plain vegetation complexes within the area have been identified as low open forests and woodlands dominated by *Eucalyptus todtiana* and mixed Banksia species, transitioning to low woodlands of Melaleuca species and sedgelands in moister areas, which is consistent with the vegetation recorded within the Survey Area.

Vegetation condition across the Survey Area was predominantly Excellent, with disturbances largely confined to the north eastern section, which had been used for farming and contained the residence. The majority of this area was paddocks with mixed mature tree species over weed species, and buildings.

Historical imagery indicates that a significant portion of the Survey Area was heavily affected by fire between 2010 and 2012. The fire scar aligns with the boundary of the EtBaBm and BaBm vegetation types, suggesting that EtBaBm originally spanned the entire Survey Area however, *Eucalyptus todtiana* does not appear to have regenerated after the fire.

Aerial imagery also shows that the Regrowth vegetation type was cleared between 2000 and 2003. Since then, it has naturally regenerated and is considered to be in Good condition. However, the structure of the vegetation has yet to recover, as Banksia species are still absent, despite being dominant in the surrounding areas. While the upper and middle layers of vegetation are naturally regenerating, the area would benefit from weed control due to the high presence of weeds in the lower strata.

A small pocket of *Banksia prionotes* was recorded from one location within the vegetation type EtBaBm, an additional vegetation type containing the *Banksia prionotes* was not created and was included in the EtBaBm vegetation type as the dominant species still remained the same. The EtBaBm patch that occurs within the north-eastern portion of Survey Area occurs within an area that has previously been used for grazing. This has resulted in a loss of condition compared with other areas of this vegetation type. Given the dominating presence of weeds in the adjacent cleared areas, this area would benefit from targeted weed control efforts.

Vegetation BaBm was the most dominant vegetation type, covering 58.3% (296.5 ha) of the Survey Area and was in Excellent condition. It was characterised by *Banksia attenuata* and *B. menziesii* dominated woodlands over mixed Myrtaceae shrublands. While the understorey species varied across different sites within the BaBm vegetation type, the dominant tree species in the overstorey layer remained consistently the same throughout. To avoid the complexity of micromapping individual sites based on the varied understorey composition, it was decided to group the sites based on the dominant upper layer. This decision allowed for a more efficient classification of the vegetation, as the consistency of the overstorey species provided a clear and reliable basis for grouping. By focusing on the dominant tree species, the survey could encompass the broader characteristics of the vegetation type while accounting for minor variations in the understorey across different areas of the Survey Area.

The vegetation type BaMpAc represented wetland vegetation occurring in basins and depressions, covering 5.1% (26.1 ha). The BaMpAc vegetation type occurred through the middle of the Survey Area was characterised by *Banksia attenuata*, *B. ilicifolia* and *Melaleuca preissiana* woodlands over mixed shrublands and was in Excellent condition. The wetlands form part a suite of damplands wetlands that extend southeast from the Moore River to Sand Spring Well Nature Reserve. As damplands are only seasonally inundated and the soils are primarily sandy, water would only be retained in the wetlands for short periods which has resulted in both wetland and upland species being present in BaMpAc vegetation type.



6.1.5 Significant Vegetation

6.1.5.1 Banksia Woodlands Commonwealth TEC Patch Assessment

Vegetation type BaMpAc is analogous to the ‘‘*Banksia ilicifolia* woodlands, southern Swan Coastal Plain (‘floristic community type 22’)’ and Vegetation types BaBm and EtBaBm are analogous to the ‘Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands (‘floristic community type 23b’)’. Both of which are listed priority 3 ecological communities at a state level and can be components of the EPBC Act Banksia Woodlands of the Swan Coastal Plain TEC.

For vegetation to be considered as the Endangered TEC under the EPBC Act and warrant full national protection, the community has to meet key diagnostic characteristics. Regarding the presence of the TEC, the approved conservation advice for the thresholds state that for vegetation in Excellent condition the minimum patch size should be 0.5 ha, while vegetation in Very Good condition should be a minimum of one hectare, and vegetation in Good condition should be a minimum of two hectares. If a vegetation patch is considered Degraded or worse, it is not considered favourable for national protection. The TEC generally has a dominant Banksia component, which includes at least one of four key species, *Banksia attenuata*, *B. menziesii*, *B. prionotes* and/or *B. ilicifolia* (see **Section 3.3.7**).

Based on this information, and the survey results, the vegetation types BaMcAc, BaBm, and EtBaBm are representative of the Commonwealth *Banksia Woodlands of the Swan Coastal Plain* TEC and therefore are likely to be considered suitable for national protection. This is based on the presence of *Banksia* tree species, as well as the patch size and condition of the vegetation.

A patch is a discrete and mostly continuous area of the ecological community, which may include small-scale (<30 m) variations, gaps and disturbances, such as tracks, paths or localised variations in vegetation that do not significantly alter the overall functionality of the ecological community (DEE, 2019). One continuous patch was identified and considered to be representative of the Banksia WL SCP TEC, totalling 402 ha (79.1%) of the Survey Area.

6.1.6 Survey Adequacy

The flora and vegetation survey effort was in accordance with the scope of works, and appropriate for a detailed flora and vegetation survey in the Swan Coastal Plain and to determine the Banksia FCTs present within the Survey Area. At least three flora sites were sampled within each vegetation type within the Survey Area. The inventory of vascular flora, and records of conservation significant flora and weed species was compiled using site data and opportunistic observations made while traversing between sites and during systematic targeted searching within the Survey Area.

6.1.7 Regional Representation

According to the EPA (2000), the threshold level below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being 30% of the pre-clearing extent of the vegetation type. Proposals that would affect a vegetation association with 30% or less of its pre-clearing extent remaining are likely to be formally assessed by the EPA (2006). The Bassendean 949 vegetation association has 56.45% remaining on the Swan Coastal Plain based on its pre-European extent, which is greater than the threshold level of 30% of the pre-clearing extent set by the EPA for protecting biological diversity.

6.2 Fauna

6.2.1 Fauna Habitats

The seven fauna habitats identified within the Survey Area are typical of the Swan Coastal Plain bioregion and consistent with habitats identified by previous studies in the region (**Appendix A**). All habitats identified within the Survey Area extend outside the Survey Area with Moore River National Park to the south and the Namming Nature reserve to the north. The Survey Area is not critical for habitat connectivity and fauna dispersal.

The *Banksia* Woodland and Ephemeral *Banksia* Wetland / Woodland habitats are widespread within the surrounding region, occurring to the north, west, and south of the Survey Area. This habitat contains proteaceous species that provide foraging resources for the significant Carnaby's Cockatoo as well as a dense understorey and mid storey vegetation that is likely to provide sheltering and foraging opportunities to the broader fauna assemblage. The Ephemeral *Banksia* Wetland / Woodland habitat may hold water during the wetter months of the year due to the clay substrate and therefore may constitute an important water source for all fauna taxa.

The *Eucalyptus todtiana* over Native Regrowth habitat appears to occur elsewhere within the broader landscape, typically as a transition zone between remnant bushlands and agricultural fields. This habitat may provide roosting opportunities for the Carnaby's Cockatoo and other birds. Ground dwelling mammals and reptiles may use the patchy understorey which occurs within this habitat. Fauna species may also use this habitat for dispersal between patches of remnant *Banksia* Woodland.

The Wandoo Woodland over Paddock and Isolated Eucalypts over Paddock habitats contained both suitable and potential nesting trees for the Carnaby's Cockatoo. Native Eucalypt species within these habitats were found to contain hollows, however none were observed to be in use for nesting by birds during the field survey. The presence of a weedy understorey from agriculture in both habitats is unlikely to be critical habitat for ground dwelling mammals and reptiles, however they may be transient through this habitat whilst accessing habitats of greater value.

The Garden Planted habitat is limited in extent within the Survey Area and is associated with the infrastructure located in the northeastern quarter of the Survey Area. The presence of some introduced fruiting species may provide limited foraging for Carnaby's Cockatoos as well as a wide range of fauna however, overall, this habitat is of low quality and low value to fauna taxa.

The Paddock Cleared habitat is of generally low quality due to the weedy understorey and a lack of overstorey, however, low lying depressions are likely to contain water during the wetter months.

6.2.2 Significant Fauna

6.2.2.1 Recorded within the Survey Area

No significant fauna taxa were recorded within the Survey Area during the field survey.

6.2.2.2 High Likelihood of Occurrence within the Survey Area

Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)

Carnaby's Cockatoo is endemic to southwest Australia, the limits of its range include Cape Arid to the east, Lake Cronin, Hatters Hill and Lake Moore inland, and Kalbarri to the north (DAWE, 2022). Breeding generally occurs in mature Wandoo (*Eucalyptus wandoo*) and



Salmon Gum (*E. salmonophloia*) woodlands and takes place from July to December in areas receiving 350-700 mm rainfall a year, from the Stirling Range to Three Springs as well as around Bunbury (DAWE, 2022; ALA, 2025). Carnaby's Cockatoos feed on seeds, nuts, and flowers of a variety of native and exotic plants, (Shah, 2006). The taxon is sedentary in wetter parts of its range and migratory in drier areas, where birds form flocks and move south and west towards the coast in summer (ALA, 2025).

Carnaby's Cockatoo has been recorded frequently within the Desktop Study Area and is likely to occur within the Survey Area. The Wandoo Woodland over Paddock constitutes core habitat for the Carnaby's Cockatoo because of its potential value for foraging, breeding, and roosting. The *Banksia* Woodland, Ephemeral *Banksia* Wetland / Woodland and Garden Planted also provide foraging habitat for this species.

6.2.2.3 Medium Likelihood of Occurrence within the Survey Area

Black-striped Snake (*Neelaps calonotos*) – P3 (DBCA)

The Black-striped Snake is a small-bodied burrowing snake that is endemic to the Perth region. The species is restricted to the sandy coastal strip from Mandurah to Cataby, where it inhabits dunes and sandplains vegetated with heaths and eucalypt/*Banksia* woodland (Wilson and Swan, 2017). Given its small extent of less than 20,000 km2, it is facing pressures from urban expansion and clearing works (Wilson and Swan, 2017).

Black-striped Snake has been recorded approximately 1 km outside of the Desktop Study Area. However, given the presence of suitable and connected habitat from this record to the Survey Area, and the lack of surveys in the regions, it is likely that this species may occur. The *Banksia* Woodland and Ephemeral *Banksia* Wetland / Woodland habitats constitute core habitat for this taxon.

6.2.3 Black Cockatoo Habitat Assessment

No black cockatoos or signs of their presence were recorded during the field survey. Although the Survey Area falls within the breeding distribution of Carnaby's Cockatoo (DAWE, 2022), no evidence of breeding activity was observed. However, the survey identified potentially suitable breeding habitat, with 233 potential nesting trees (i.e. trees that do not contain suitable but may in the future) and 20 suitable nesting trees (i.e. trees that appear to contain suitable hollows when observed from the ground), with suitable hollows primarily located within the Wandoo Woodland habitat. One Wandoo was recorded to have a hollow with some chew marks along the bottom. This hollow appeared to be recently chewed and displayed evidence more similar to that expected by Galah's. However, the use of this hollow by Carnaby's Cockatoo cannot be ruled out.

The Wandoo Woodland Lacking Understorey and Isolated Eucalypt habitats within the Survey Area were assessed as potentially suitable for night roosting. Black cockatoos typically prefer roosting sites near water sources, with foraging resources available within 20 km (DAWE, 2022). The presence of a nearby water source (Moore River) approximately 900 m to the north of the Survey Area suggests that the Wandoo Woodland over Paddock and Isolated Eucalypt over Paddock habitats within the Survey Area are suitable for night roosting.

No evidence of black cockatoo foraging was recorded during the field survey, however suitable foraging habitat is abundant through the *Banksia* Woodland, *Eucalyptus todtiana* over Native Regrowth, and Ephemeral *Banksia* Wetland / Woodland habitats.

7.0 Conclusion

7.1 Flora and Vegetation

- No Threatened flora taxa pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey
- No Priority taxa as listed by DBCA were recorded during the survey.
- A total of 19 introduced taxa were recorded, none of which are listed as Declared Pests under the BAM Act or listed as a WoNS by the Department of Primary Industry.
- Vegetation condition ranged from Excellent to Completely Degraded with the majority being in Excellent condition. Disturbances were mainly restricted to the north eastern portion of the Survey Area and associated with its previous use as a crop and cattle farm.
- Vegetation types BaMpAc was determined to be analogous with '*Banksia ilicifolia* woodlands, southern Swan Coastal Plain ('floristic community type 22')' which is listed as Priority 3 by the State and is listed as a sub-community of the Commonwealth 'Banksia Woodlands of the Swan Coastal Plain ecological community' which is listed as an Endangered TEC under the EPBC Act.
- Vegetation types BaBm and EtBaBm are analogous 'Swan Coastal Plain Banksia attenuata - Banksia menziesii woodlands ('floristic community type 23b')' which is listed as Priority 3 by the State and is listed as a sub-community of the Commonwealth 'Banksia Woodlands of the Swan Coastal Plain ecological community' which is listed as an Endangered TEC under the EPBC Act.
- One patch of vegetation comprising of vegetation types BaMpAc, BaBm and EtBaBm is considered to be representative of the Banksia Woodlands of the Swan Coastal Plain TEC.

7.2 Fauna

- Seven fauna habitats were mapped within the Survey Area. Of these habitats, *Banksia* Woodland and Ephemeral *Banksia* Wetland / Woodland are widespread and abundant at a regional scale and provide dispersal and connectivity at a landscape scale.
- A total of 37 fauna taxa from 27 families were recorded, comprising 33 birds, three mammals, and one reptile. No significant taxa were recorded during the fauna survey.
- Carnaby's Cockatoo (*Zanda latirostris*) was the only significant fauna taxa assessed as having a high likelihood of occurring within the Survey Area. Carnaby's Cockatoo is listed Endangered under State and Commonwealth legislation.
- Black-striped Snake (*Neelaps calonotos*) was the only significant fauna taxa assessed as having a medium likelihood of occurring within the Survey Area. Black-striped Snake is listed as a Priority 3 Species.
- Wandoo Woodland over Paddock habitat constitutes potential breeding and roosting habitat for Carnaby's Cockatoo.



- *Banksia* Woodland, Ephemeral *Banksia* Wetland / Woodland, *Eucalyptus todtiana* over Native Regrowth, Isolated Eucalypts over Paddocks and Garden Planted habitats constitute potential foraging habitat for Carnaby's Cockatoo.
- Two introduced taxa were recorded during the survey, European Cattle (*Bos primigenius taurus*) and Dog (*Canis familiaris*).
- The field survey recorded 217 potential nesting trees and 20 suitable nesting trees.
- Carnaby's Cockatoo foraging habitat quality was assessed as following:
    - 402 ha of very high foraging habitat.
    - 34.7 ha of high foraging habitat.
    - 5.8 moderate foraging habitat.
    - 0.8 low to moderate foraging habitat.
    - 0.3 negligible to low foraging habitat.
    - 64.2 of area containing no foraging habitat.

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Appendix A Maps

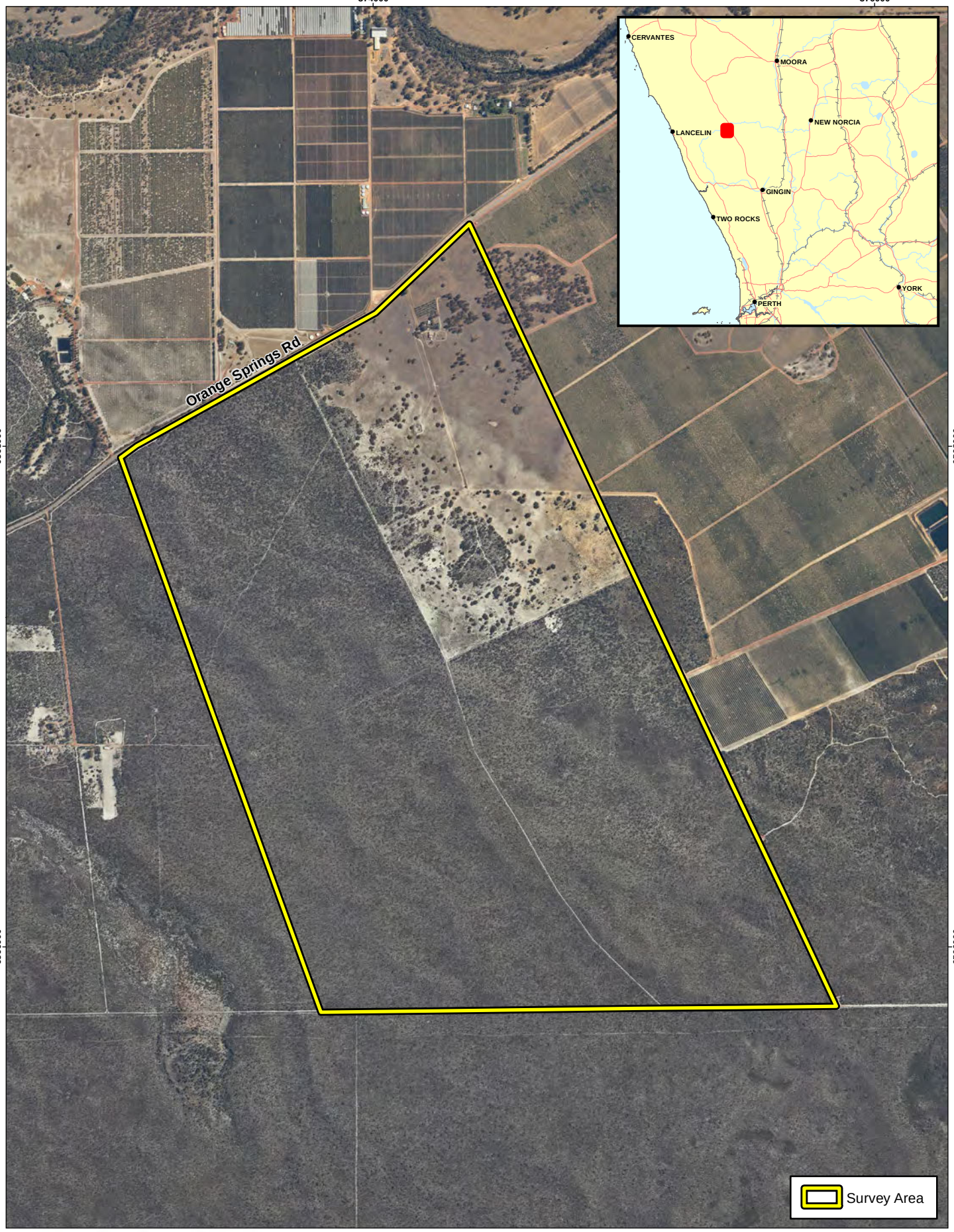
Biological Offset Surveys

Orange Springs

Western Power

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10 July 2025



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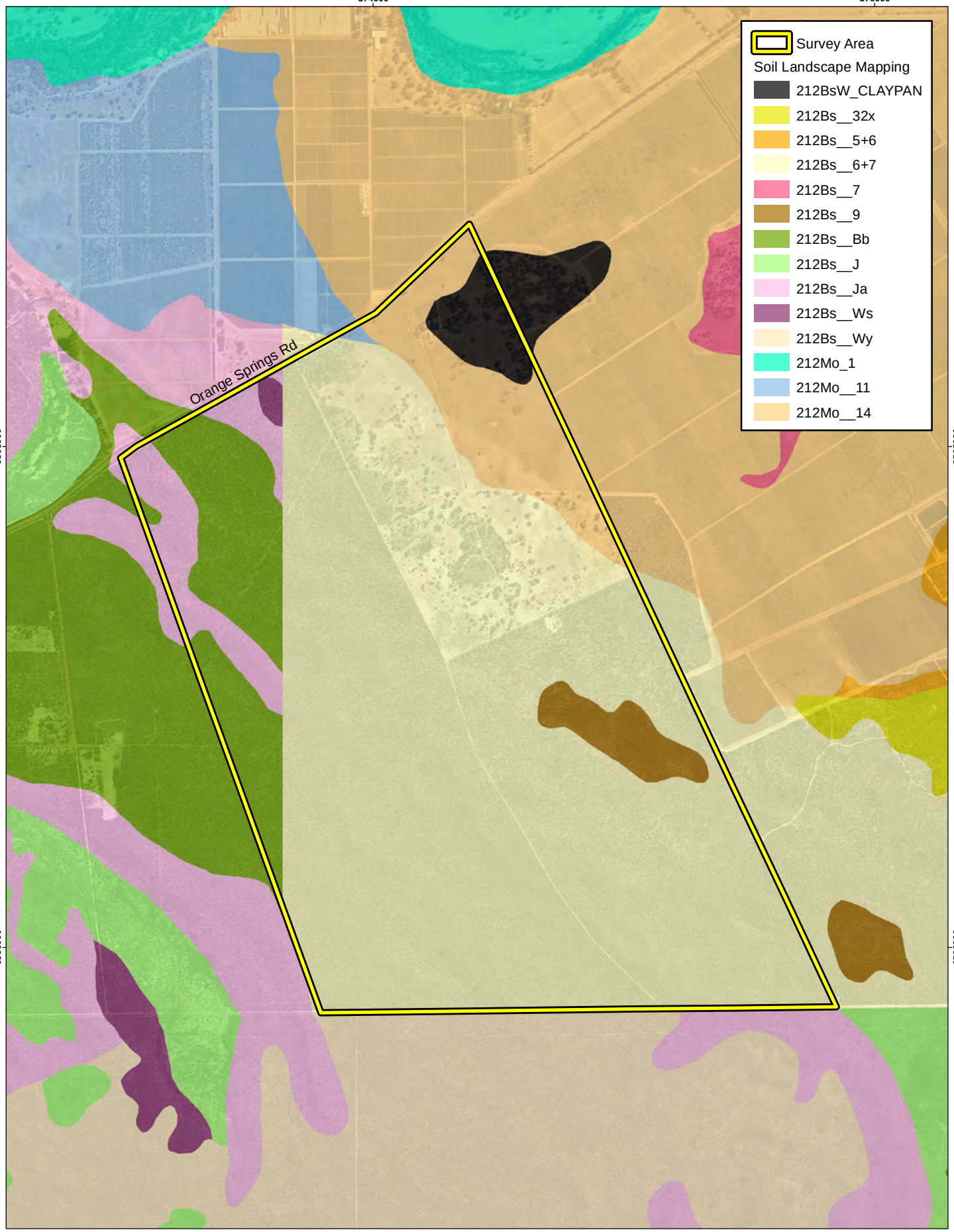
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Date Drawn	: 7/03/2025
Drawn By	: Environmaps
Reviewed By	: LG

Western Power
Orange Springs
Biological Offset Surveys

Survey Area
MAP 1

C:\GIS\Jobs\360\675.072817.00001 - Orange Springs Biological Offset Surveys, Western Pwr\Figures\675-072817-00001_M01 Survey Area_250307.mxd



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Service Layer Credits: Landgate / SLIP
Soil Landscape Mapping - DPIRD 027

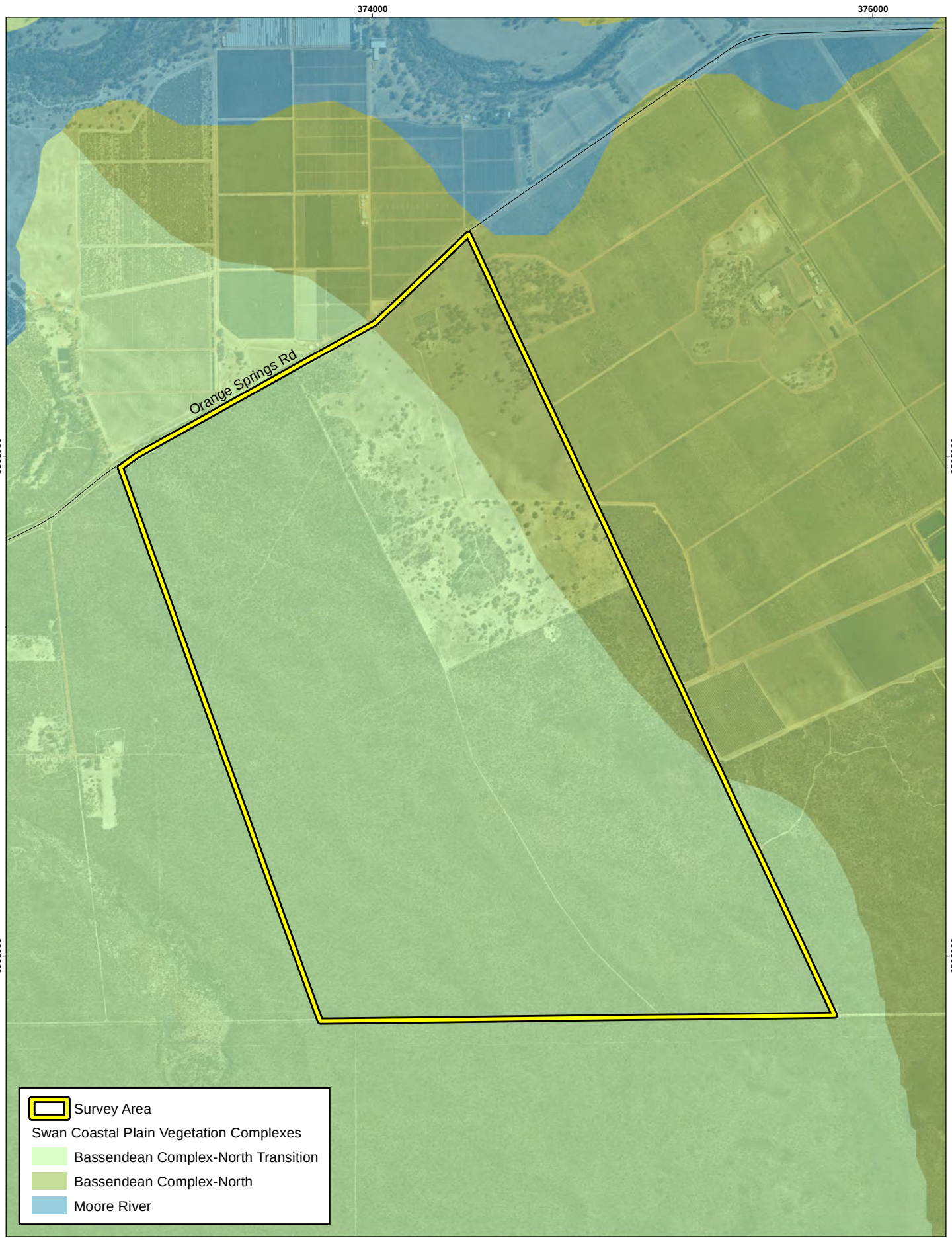
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Project Number	: 675.072817.00001
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Reviewed By	: LG

Western Power
Orange Springs
Biological Offset Surveys

Soil Landscape Mapping
MAP 2

C:\GIS\Jobs\360\675.072817.00001 - Orange Springs Biological Offset Surveys, Western Pwr\Figures\675-072817-00001_M02 Soil Landscape Mapping_250307.mxd



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Vegetation Complexes - DBCA 046

Coordinate System: GDA2020 MGA Zone 50

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Project Number	: 675.072817.00001
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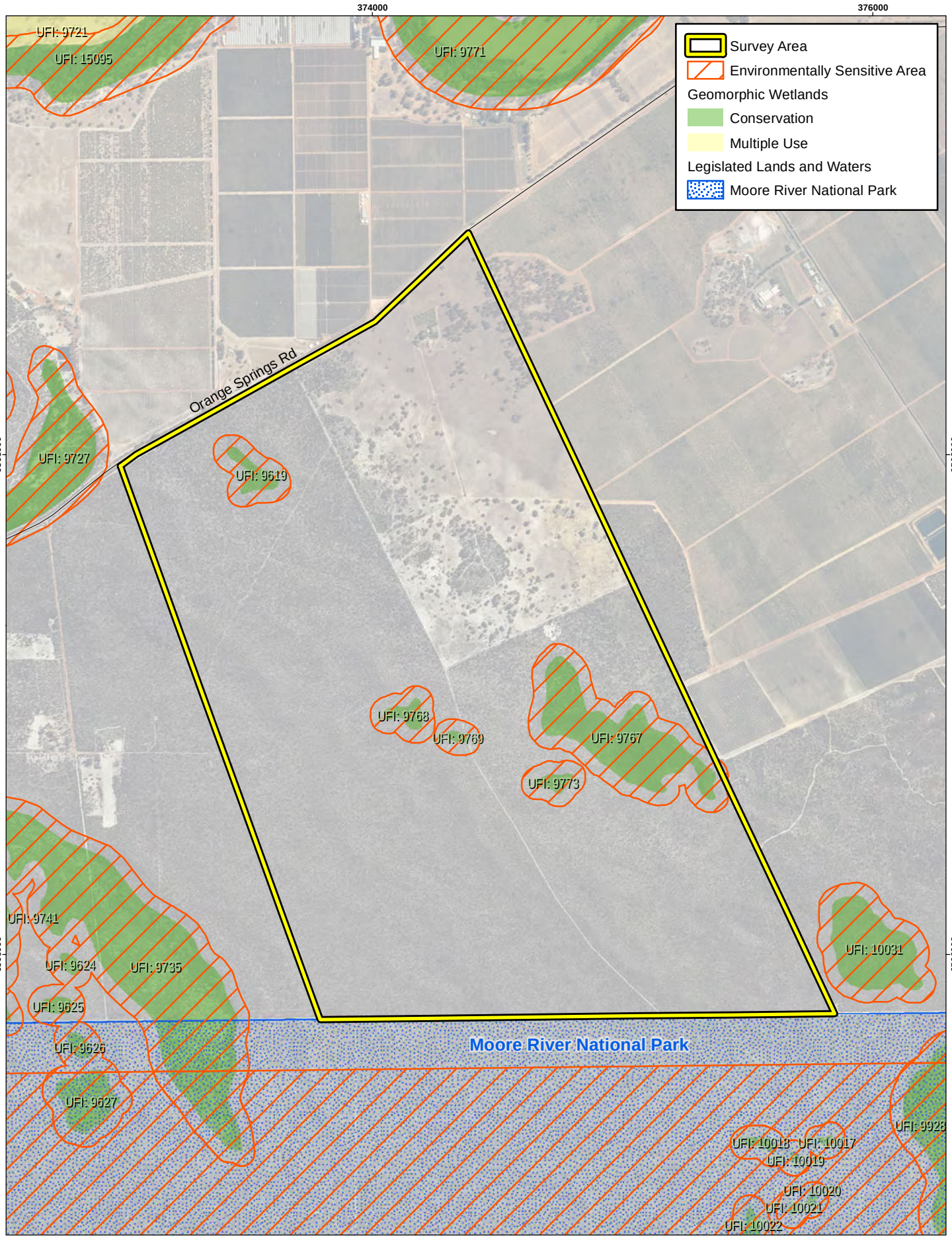
Western Power
Orange Springs
Biological Offset Surveys

Swan Coastal Plain Vegetation Complexes
MAP 3

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Service Layer Credits: Landgate / SLIP
Wetlands / Legis Lands - DBCA 046 | ESA - DWER

Coordinate System: GDA2020 MGA Zone 50

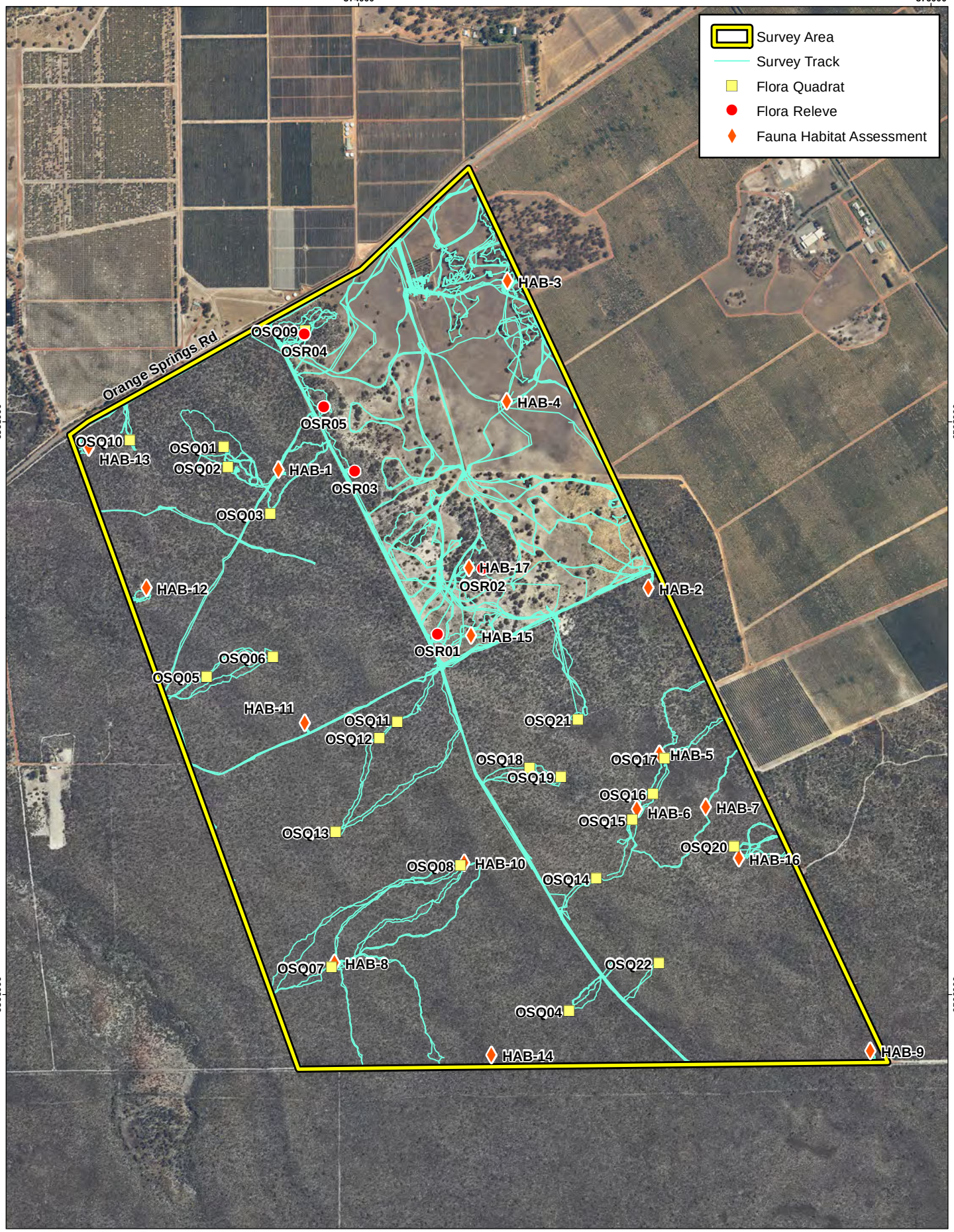
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Project Number	: 675.072817.00001
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Western Power
Orange Springs
Biological Offset Surveys

Conservation Areas and Geomorphic Wetlands
MAP 4

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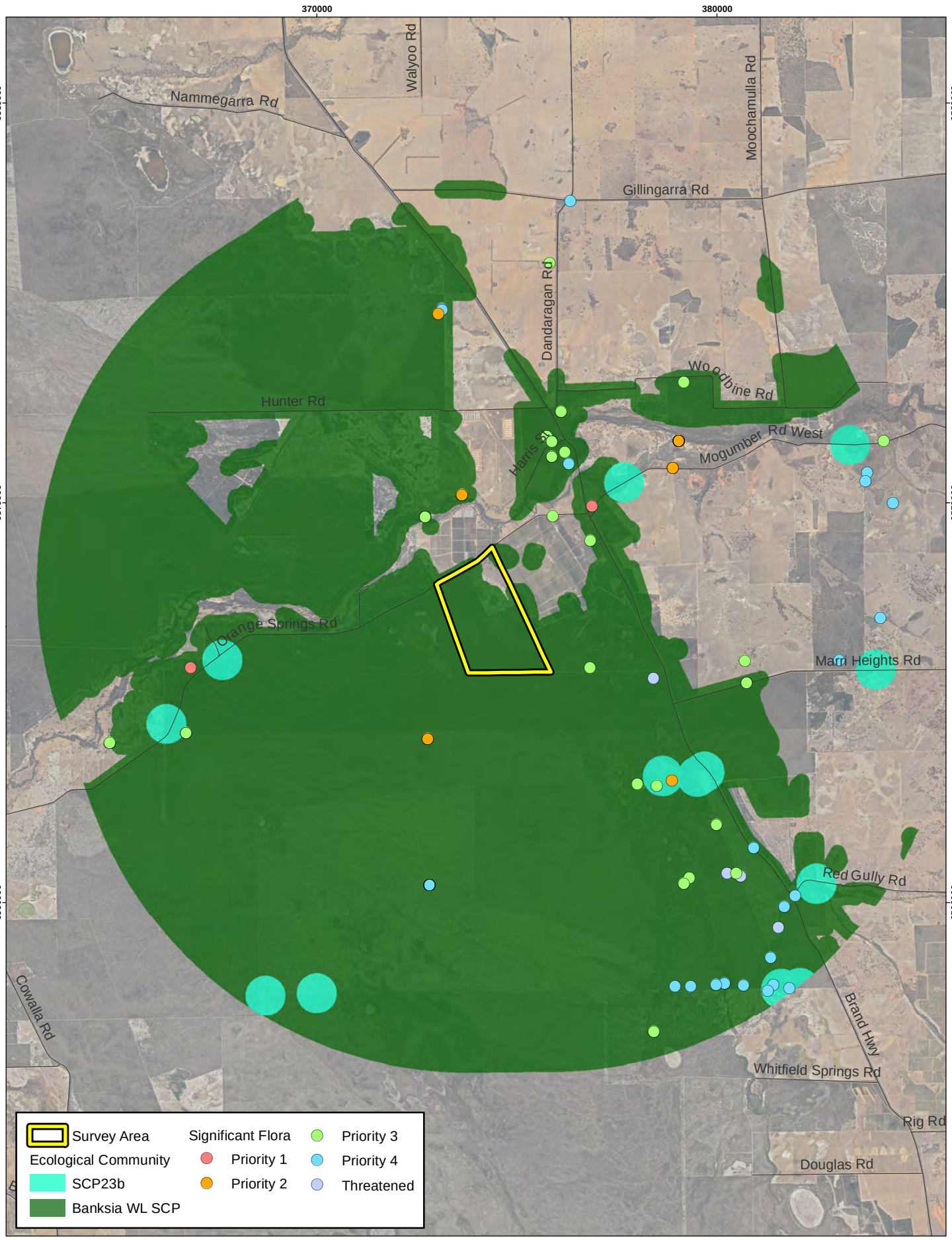
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Scale	: 1:17,500 @ A4
Project Number	: 675.072817.00001
Date Drawn	: 7/03/2025
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Western Power
Orange Springs
Biological Offset Surveys

Survey Effort
MAP 5

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N 0 1 2 4 km

Service Layer Credits: Landgate / SLIP
Significant Flora / Ecological Comms - DBCA

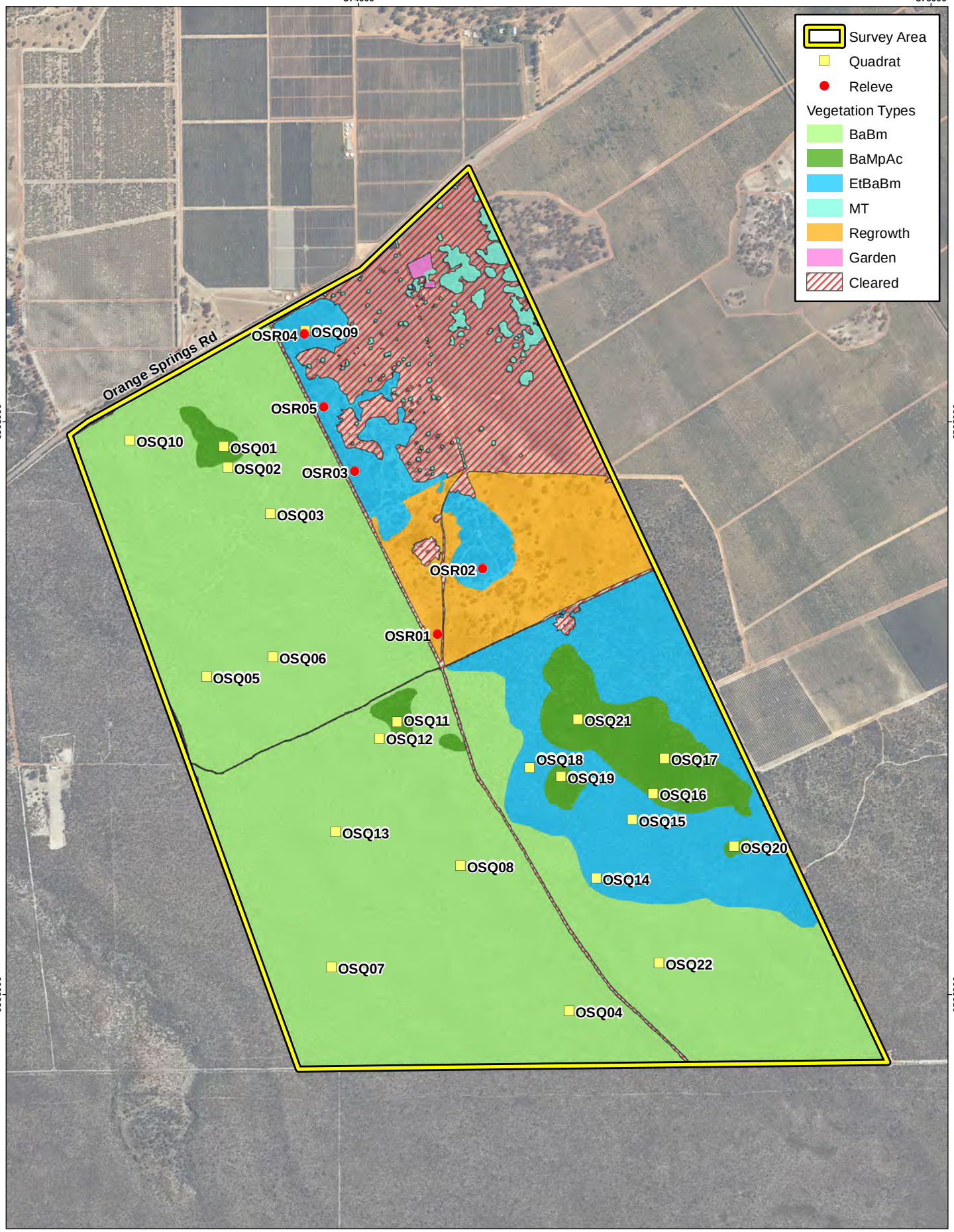
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Project Number	: 675.072817.00001
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Western Power
Orange Springs
Biological Offset Surveys

Significant Flora and Ecological Community Database Search Results MAP 6

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0 200 400 800 m

Service Layer Credits: Landgate / SLIP

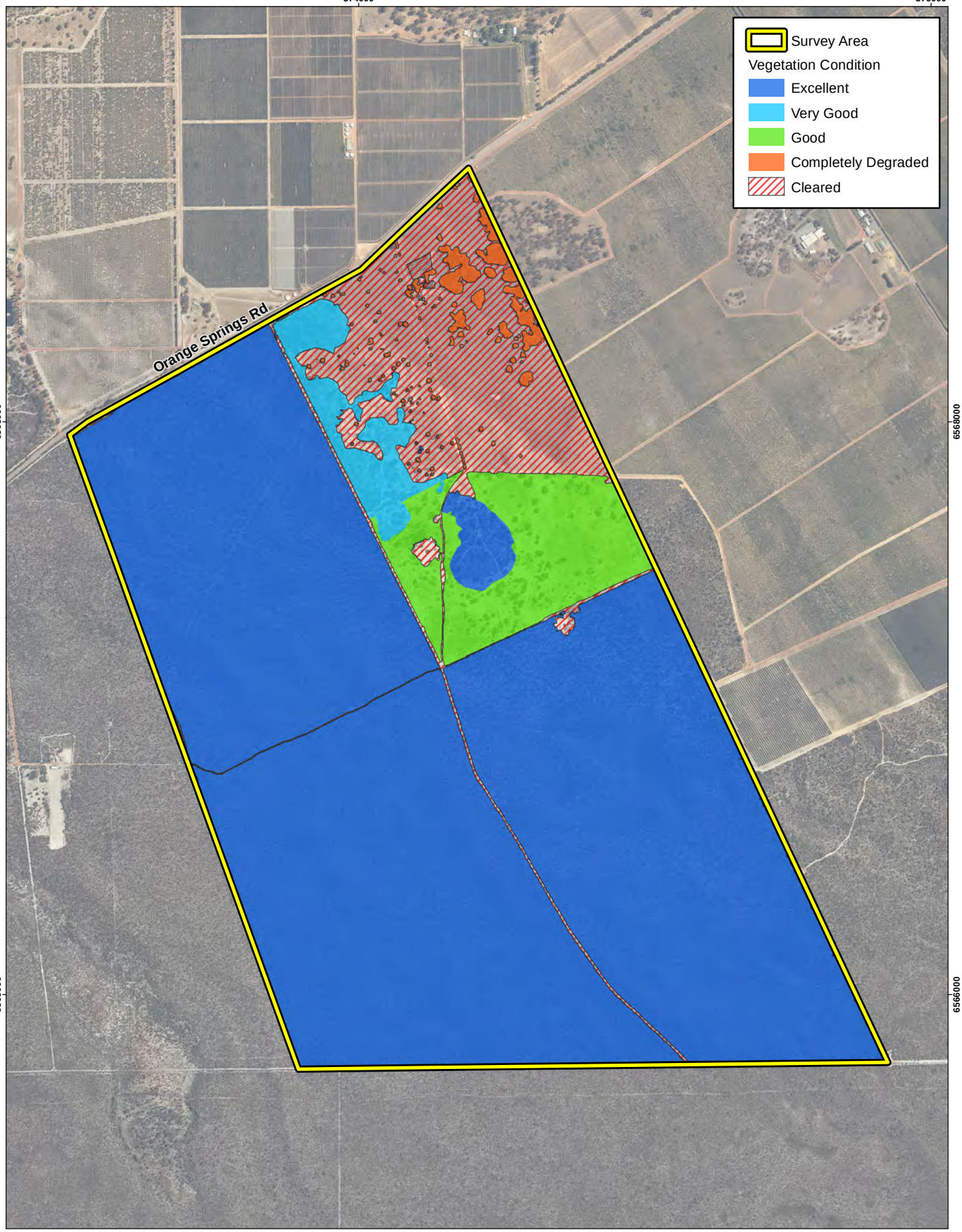
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Scale	: 1:17,500 @ A4
Project Number	: 675.072817.00001
Date Drawn	: 13/03/2025
Drawn By	: Environmaps
Reviewed By	: LG

Western Power
Orange Springs
Biological Offset Surveys

Vegetation Types
MAP 7

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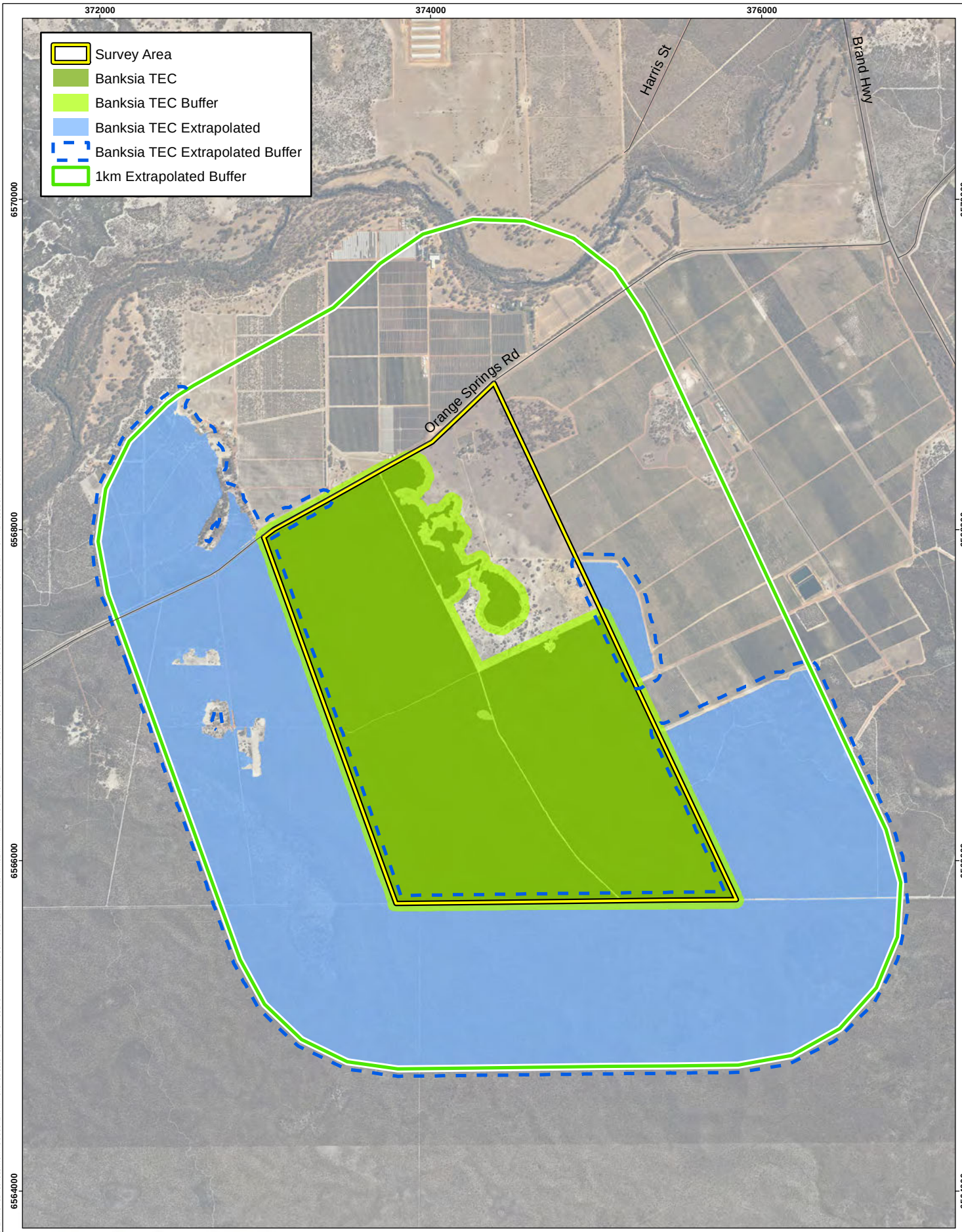
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Scale	: 1:17,500 @ A4
Project Number	: 675.072817.00001
Date Drawn	: 28/05/2025
Drawn By	: Environmaps
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Western Power
Orange Springs
Biological Offset Surveys

Vegetation Condition
MAP 8

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N 0 0.375 0.75 1.5 km

Service Layer Credits: Landgate / SLIP
Soil Landscape Mapping - DPIRD 027

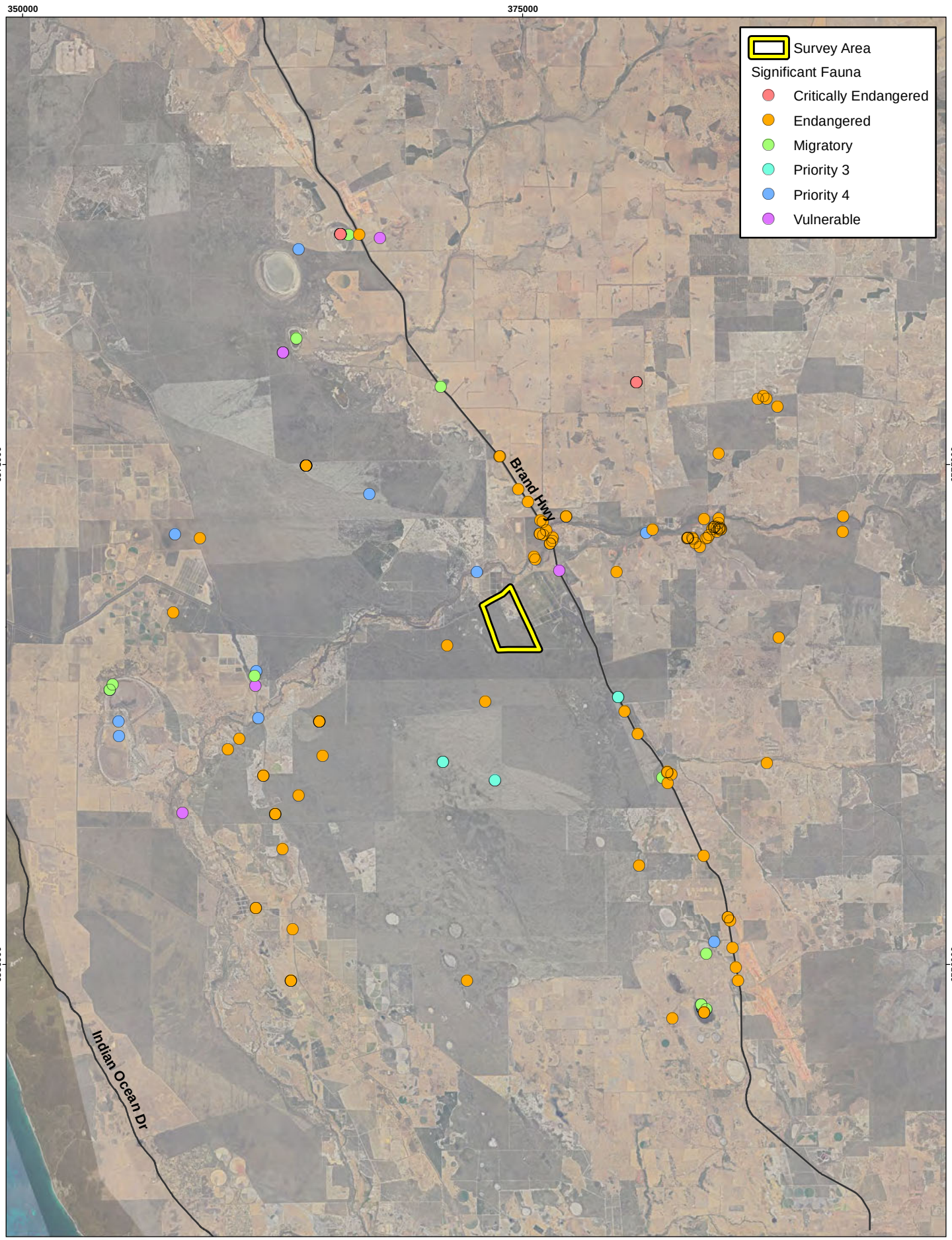
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Project Number	: 675.072817.00001
Date Drawn	: 7/03/2025
Drawn By	: Environmaps
Reviewed By	: LG

Western Power
Orange Springs
Biological Offset Surveys

Banksia Woodlands of the Swan Coastal Plain TEC
MAP 9

C:\GIS\Jobs\260\675.072817.00001 - Orange Springs Biological Offset Surveys - Western Pwr\Figures\675.072817.00001_M09 Banksia Woodlands of the Swan Coastal Plain TEC_350207.mxd



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N

0 2.5 5 10 km

Service Layer Credits: Landgate / SLIP
Significant Fauna - DBCA

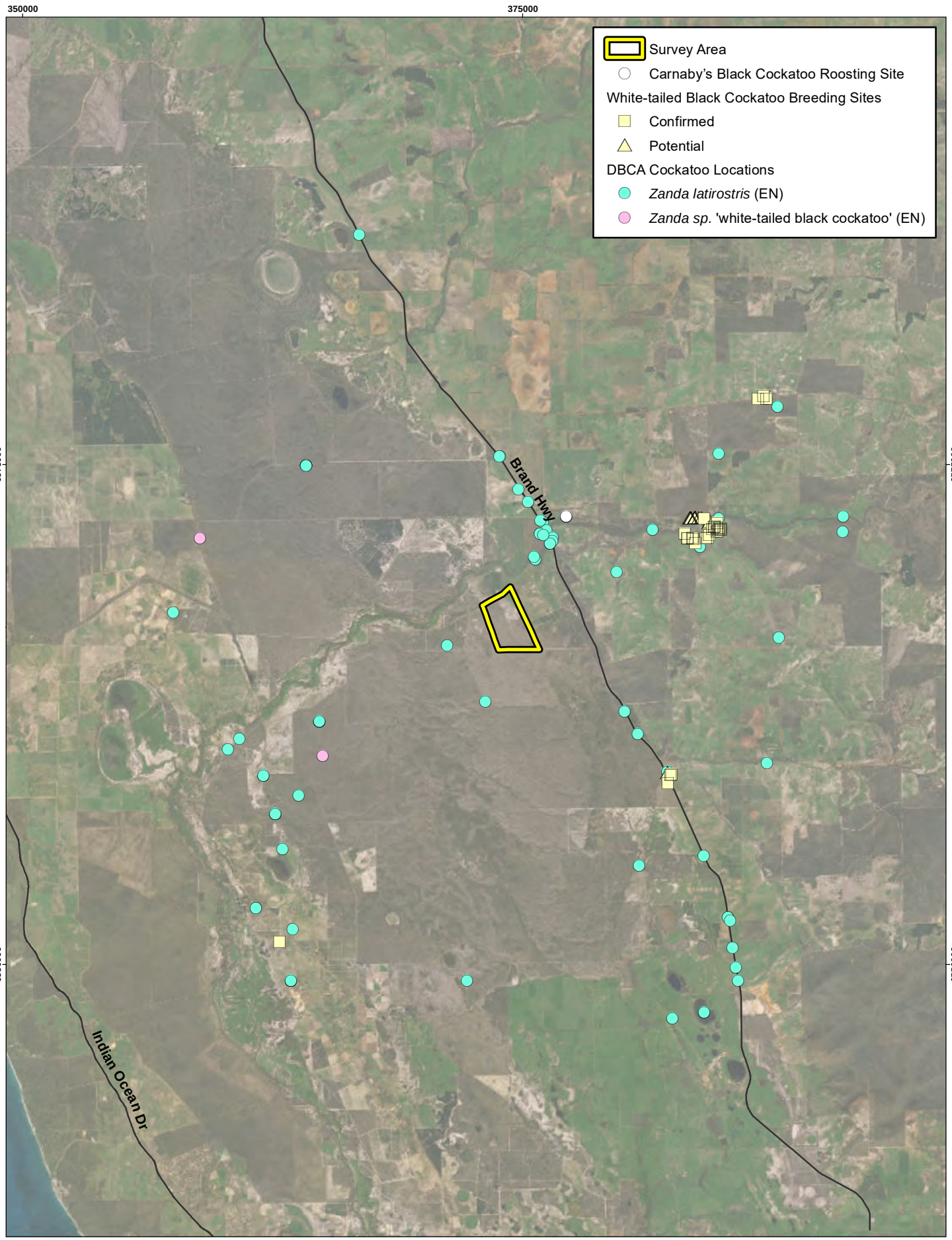
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Project Number	: 675.072817.00001
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Drawn By	: Environmaps
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Western Power
Orange Springs
Biological Offset Surveys

Significant Fauna Database Search Results MAP 10

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N 0 2.5 5 10 km

Service Layer Credits: Landgate / SLIP
Significant Fauna - DBCA

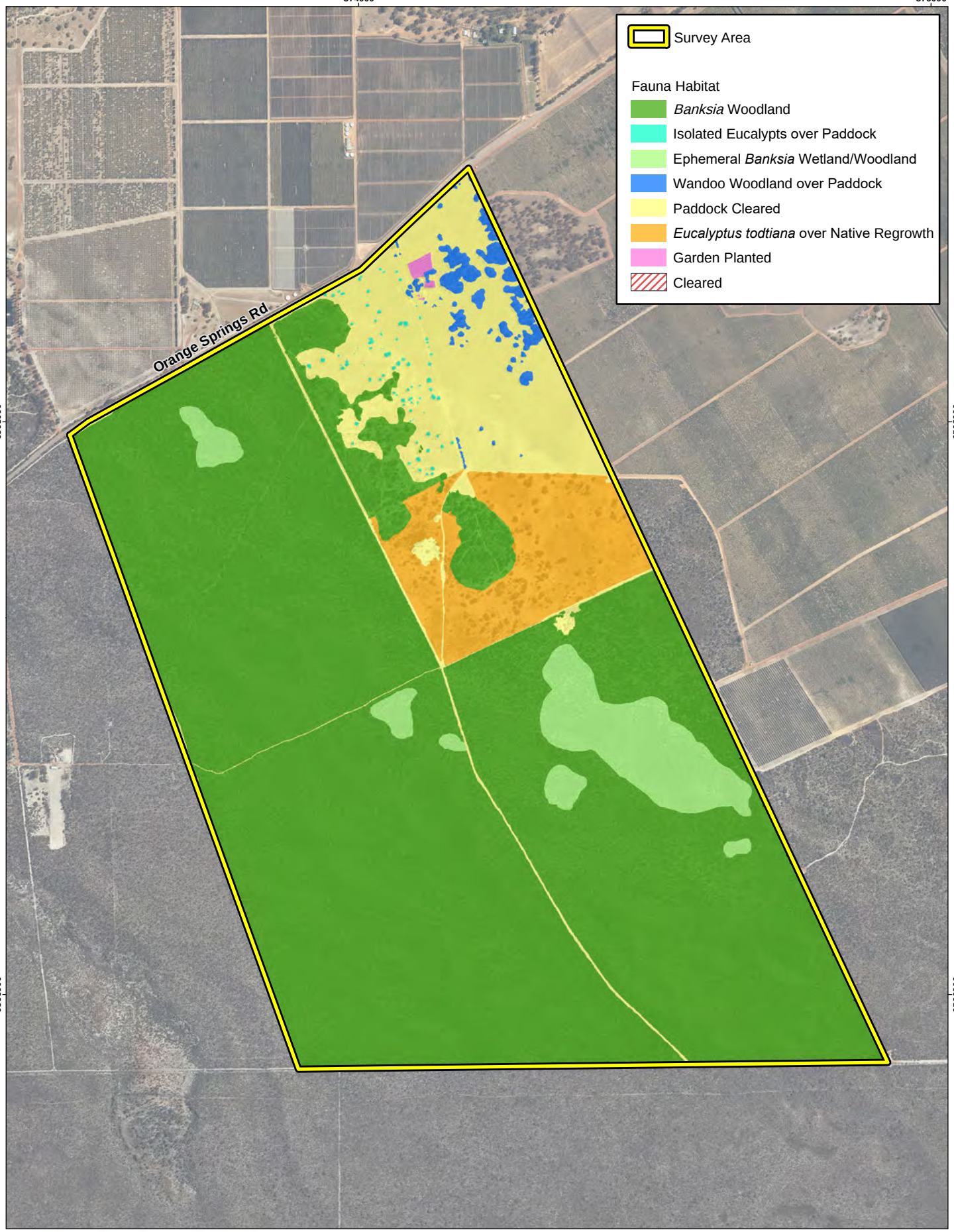
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Project Number	: 675.072817.00001
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Western Power
Orange Springs
Biological Offset Surveys

Black Cockatoo
Database Search Results
MAP 11

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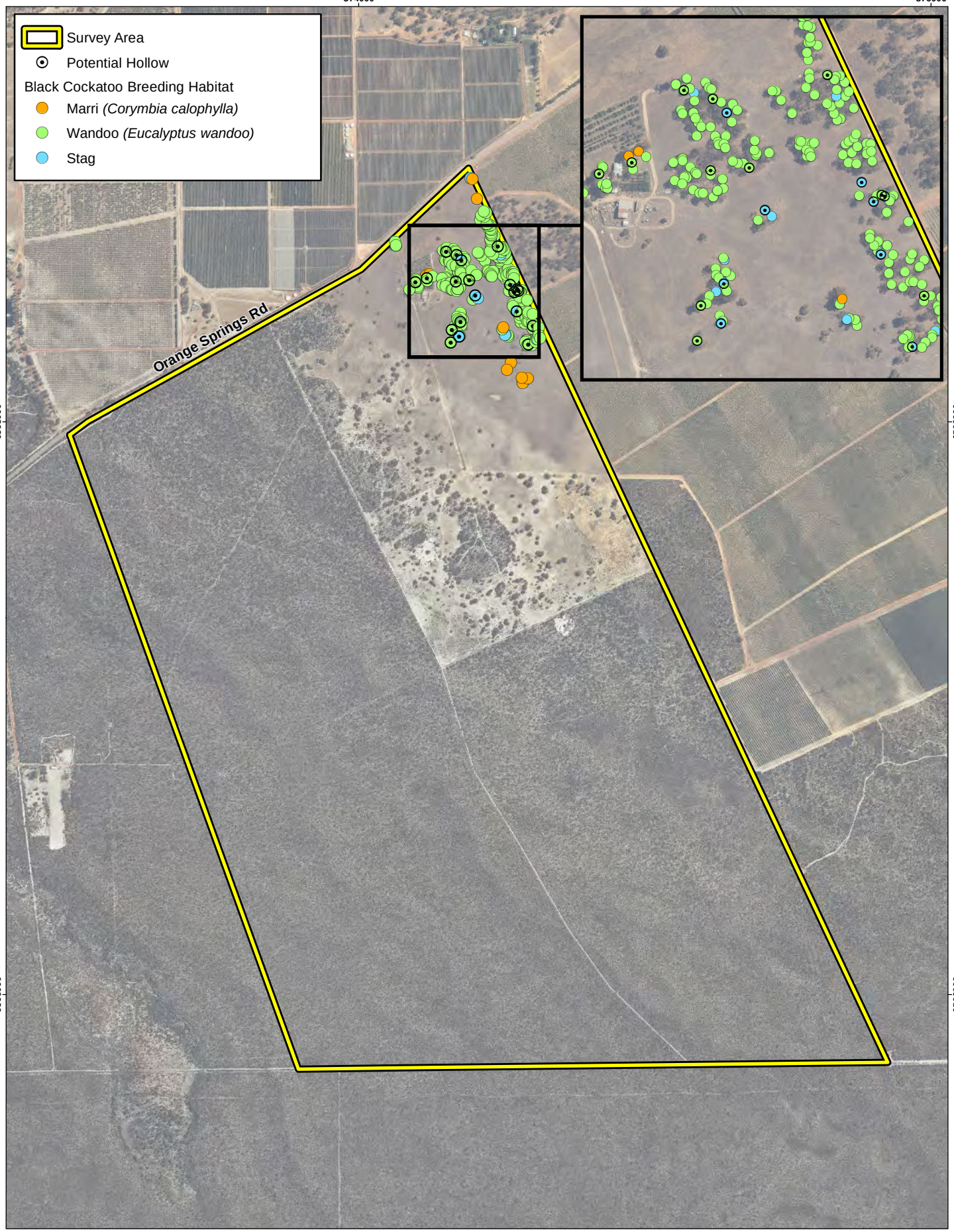
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Western Power
Orange Springs
Biological Offset Surveys

Fauna Habitat and Significant Fauna Records MAP 12

C:\GIS\Jobs\360\675.072817.00001 - Orange Springs Biological Offset Surveys, Western Pwr\Figures\675-072817-00001_M12 Fauna Habitat and Significant Fauna Records_250313.mxd



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Coordinate System: GDA2020 MGA Zone 50

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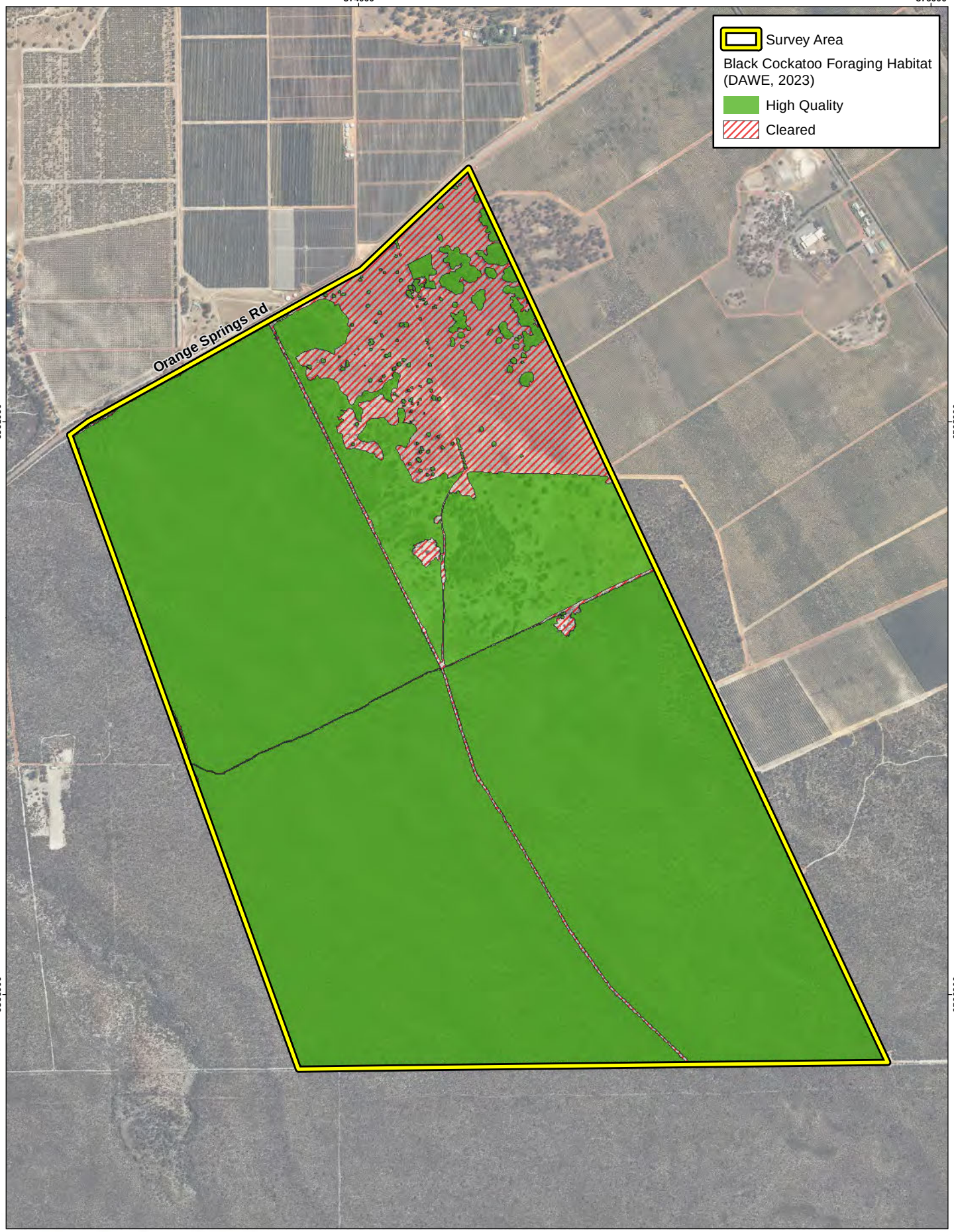
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Western Power
Orange Springs
Biological Offset Surveys

Black Cockatoo Breeding Habitat
MAP 13

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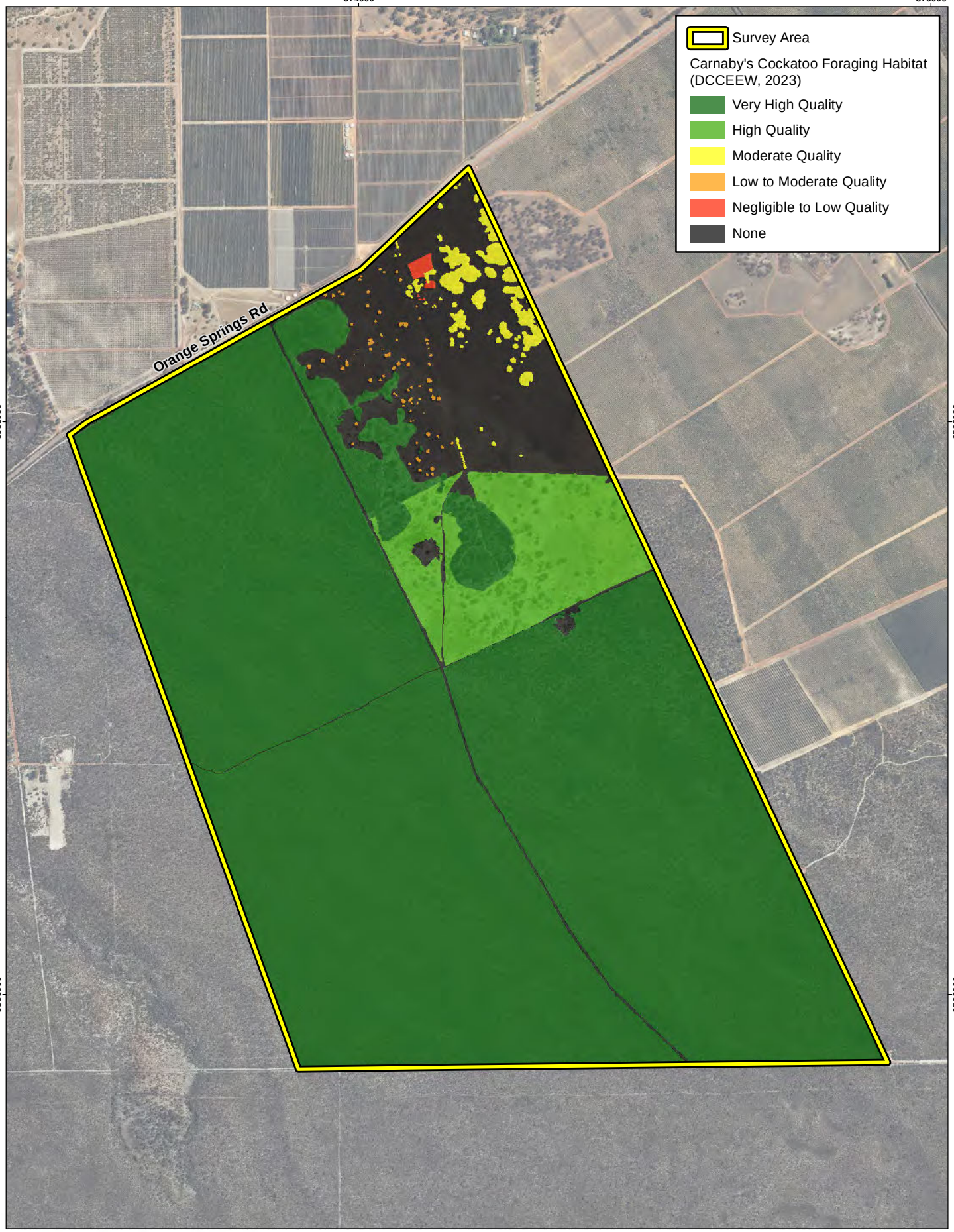
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Project Number	: 675.072817.00001
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Western Power
Orange Springs
Biological Offset Surveys

Black Cockatoo Foraging Habitat (DAWE)
MAP 14a

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Western Power
Orange Springs
Biological Offset Surveys

Carnaby's Cockatoo Foraging Habitat (DCCEEW)
MAP 14b

C:\GIS\Jobs\360\675.072817.00001 - Orange Springs Biological Offset Surveys, Western Pwr\Figures\675-072817-00001_M14b Carnaby's Cockatoo Foraging Habitat (DCCEEW)_250310.mxd

Appendix B Literature Review Summary

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Orange Springs Road Fauna Assessment Report (Ecoedge, 2019)	Adjacent to the northern boundary of the Survey Area.	September 2018	Basic Fauna Assessment Report & Black Cockatoo	• Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)	• Coastal Blackbutt - *Banksia* • Woodland • *Banksia* Woodland • Flooded Gum – Paperbark Woodland
Brand Highway, Regans Ford Biological Survey (Astron, 2016)	Located 3.5 km east of Survey Area.	September 2016	Biological Survey Report (fauna & vegetation) A targeted Carnaby's black-cockatoo assessment	• None recorded.	• *Banksia* Woodland • Eucalypt Woodland • Ephemeral Wetland • Cleared areas
Yandin Wind Farm Flora, Vegetation and Avifauna Assessment (Ecologia, 2017)	Located 20 km northwest of Survey Area.	September 2017	A reconnaissance flora and vegetation survey, Threatened Ecological Community assessment, and avifauna survey	• None identified	• Parkland /Cleared • Marri Woodland • *Proteraceous Heath* • Dryandra Allocasuarina Shrubland • *Eucalyptus Todtiana* Woodland • *Banksia* Woodland • Creek line
Mogumber Poultry Farm II Development, Flora, Vegetation and Black Cockatoo Assessment (360 Environmental, 2018)	Located 26 km east of Survey Area.	March 2018	Basic Fauna Assessment Report & Black Cockatoo	• None recorded	• Heath • Paddock
Guilderton Sovereign Hill Pipeline Spring Flora, Vegetation, Fauna and Black	Located 32 km southwest of Survey Area.	September 2021	Basic fauna survey and Targeted black cockatoo survey	• None recorded.	• *Banksia* Woodland • Planted and cleared areas

Cockatoo Survey (Ecological, 2021)					
Great Northern Highway: Bindoon Bypass Fauna Assessment (Bamford Consulting Ecologists, 2018)	Located 39 km southeast of the Survey Area.	October 2016 & December 2016		• Forest Red-tailed Black cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act; EPBC Act) • Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act) • Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act) • Scarlet Robin (*Petroica multicolor*) – VU (BC Act; EPBC Act)	• *Banksia* woodland • *Banksia* woodland with scattered Marri and/or Jarrah • Marri-Jarrah woodland • Marri-Jarrah woodland with little to no remnant understorey • Wandoo woodland (with or without understorey) • Heath • Waterways or wetlands/damplands • Paddocks with large remnant trees • Paddocks
Waddi Wind Farm Project – Cataby Supplemenary Flora, vegetation and fauna survey (Ecologia, 2016)	Located 46 km north of Survey Area.	October 2016	Basic fauna & flora	• Carnaby's Black-Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)	• *Banksia* Woodland • Mining Rehabilitation • Cleared/Disturbed • Cleared Farmland with Paddock Trees • Cleared Farmland • Drainage Line
Deep Space Facility Flora and Fauna Survey (Ecoscape, 2020)	Located 47 km East of Survey Area.	May 2020	Basic fauna and BC	• None	• Open Woodland • Paddock • Infrastructure
CBH Moora Expenstion Flora, vegetation and fauna survey Ecological, 2020)	Located 48 km northeast of Survey Area.	September 2020	Basic fauna/flora & BC	• Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)	• Open Salmon Gum, Wandoo, York Gum woodland over open shrubland and grassland on clay loam • Cleared areas

Report	Survey location	Survey timing	Survey type	Significant ecological communities	Significant flora	Introduced flora
Brand Highway, Regans Ford Biological Survey (Astron Environmental Services, 2016)	3.5 km east of Survey Area	September 2016	Detailed Flora and Vegetation survey	Swan Costal Plain *Banksia attenuata – Banksia menziesii* woodlands – State listed P3 PEC and part of the federally listed Endangered TEC – Banksia Woodland of Swan Coastal Plain	• *Haemodorum loratum* - P3	45 introduced species, none of which are listed as WoNS or DP
Waddi Wind Farm Project – Cataby Supplementary Flora, Vegetation and Fauna Survey (ecologia Environment, 2016)	46 km north of Survey Area	October 2016	Detailed Flora and Vegetation survey	Banksia woodlands of the Swan Coastal Plain federally listed TEC (P3 at the state-level)	• *Conostephium magnum* - P4	15 introduced species, none of which are listed as WoNS or DP
Lot 510 Ledge Point Road Lancelin Flora and Vegetation Survey (Plantecology Consulting, 2021)	30 km west of Survey Area	October 2020	Detailed Flora and Vegetation survey	FCT29a Coastal shrublands on shallow sands (P3) FCT29b Acacia shrublands on taller dunes (P3)	• *Stylidium maritimum* (P3) • *Conostylis ?pauciflora* var. *euryhipis* (P4)	Eight introduced species, none of which are listed as WoNS or DP
2800 Cowalla Road, Cowalla Vegetation Assessment (PGV, 2021)	11 km northeast of Survey Area	February 2021	Reconnaissance Flora and Vegetation Survey	None recorded	None recorded	20 introduced species, none of which are listed as WoNS or DP
Proposed Gravel Extraction 308 Scenic Drive, Yathroo (Bayley Environmental Services, 2021)	19 km northeast of Survey Area	December 2020	Reconnaissance Flora and Vegetation Survey	None recorded	None recorded	No introduced species recorded are listed as WoNS or DP
Mogumber Poultry Farm Development (360 Environmental, 2018)	26 km east of Survey Area	March 2018	Detailed Flora and Vegetation Survey	Banksia woodlands of the Swan Coastal Plain federally listed TEC (P3 at the state-level)	• *Banksia mimica* (T) • *Synaphea ?sparsiflora* (P2) • *Banksia dallanneyi* subsp. *pollosta* (P3) • *Banksia pteridifolia* subsp. *vernalis* (P3) • *Isopogon drummondii* (P3) • *Stylidium nonscandens* (P3) • *Banksia chamaephyton* (P4)	Three introduced species, none of which are listed as WoNS or DP
CBH Moora expansion: Flora, Vegetation and Fauna Survey (Eco Logical, 2020)	48 km northeast of Survey Area	June 2020 September 2020	Detailed Flora, Vegetation and Targeted Survey	Eucalypt Woodlands of the Western Australian Wheatbelt federally TEC (P3 at the state-level)	• *Eremophila glabra* subsp. *chlorella* (T)	26 introduced species, none of which are listed as WoNS or DP
Guilderton Sovereign Hill Pipeline Spring Flora, Vegetation, Fauna and Black Cockatoo Survey (Ecological, 2021)	32 km southwest of Survey Area	September 2021	Detailed Flora, Vegetation and Targeted Survey	Banksia woodlands of the Swan Coastal Plain federally listed TEC (P3 at the state-level)	None recorded	No WoNS or DP
Yandin Wind Farm Flora, Vegetation and Aviefauna Assessment (ecologia Environment, 2017)	20 km northwest of Survey Area	September 2017	Reconnaissance Flora and Vegetation Survey, TEC Assessment	Banksia woodlands of the Swan Coastal Plain federally listed TEC (P3 at the state-level)	• *Hypocalymma tetrapterum* (P3)	Not discussed in the report

Report	Survey location	Survey timing	Survey type	Significant ecological communities	Significant flora	Introduced flora
Midland Brick Muchea Flora and Fauna survey (Mattiske, 2022)	66 km south of Survey Area	November 2021	Reconnaissance Flora and Vegetation Survey	None recorded	None recorded	Nine introduced species, one of which is listed as a Declared Pest; • **Echium plantagineum*
Deep Space Facility Flora and Fauna Survey (Ecoscape, 2020)	47 km East of Survey Area	May 2020	Detailed Flora, Vegetation and Targeted Survey	None recorded	None recorded	Six introduced species, none of which are listed as WoNS or DP

Appendix C Banksia Woodlands Patch Assessment

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

TEC PATCH ASSESSMENT		Vegetation Type			
Key Diagnostics	**Criteria**	BaBi	BaBm	EtBaBm	Wetland
	# Patch assessements	1			
	Tec Patch No.	1			
Location and Physical Environment	Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions.	Yes - Swan Coastal Plain	Yes - Swan Coastal Plain	Yes - Swan Coastal Plain	Yes - Swan Coastal Plain
Soils and Landform	•Well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean, and Spearwood sands and occasionally on Quindalup sands •Sandy colluviums and aeolian sands of the Ridge Hill Shelf, Whicher Scarp, and Dandaragan Plateau •Transitional substrates and sandflats.	Yes - Bassendean system	Yes - Bassendean system	Yes - Bassendean system	Yes - Bassendean system
Structure	Low woodland to forest with: 1. A distinctive upper sclerophyllous layer of low trees (occasionally large shrubs more than 2 m tall), typically dominated or co-dominated by one or more of the *banksia* species identified below; and	Yes	Yes	Yes	Yes
	2. Emergent trees of medium or tall (>10 m) height. Eucalyptus or Allocasuarina species may sometimes be present above the banksia canopy.	Yes	Yes	Yes	Yes
	3. An often highly species-rich understorey.	Yes	Yes	Yes	Yes
Composition	*Contains at least one of the following species:* •*Banksia attenuata*	Yes	Yes	Yes	Yes
	•*Banksia menziesii*	Yes	Yes	Yes	Yes
	•*Banksia prionotes*				
	•*Banksia ilicifolia.*	Yes			
Presence of contra indicators	•Patches clearly dominated by *Banksia littoralis* are NOT part of the *Banksia* Woodlands ecological community but indicates a different, dampland community is present.	No contra indicators present	No contra indicators present	No contra indicators present	No contra indicators present
	•Patches clearly dominated by *Bankia burdettii* are NOT part of the *Banksia* Woodlands ecological community but indicates a tall shrubland and not the *Banksia* Woodlands ecological community.	No contra indicators present	No contra indicators present	No contra indicators present	No contra indicators present
	•FCT 20c – Eastern shrublands and woodlands, corresponds with a separate EPBC ecological community listing, Shrublands and Woodlands of the eastern Swan Coastal Plain. Occurrences of this FCT should be considered under that separate listing.	No contra indicators present	No contra indicators present	No contra indicators present	No contra indicators present
Condition Threshold	To be considered as part of the EPBC Act ecological community a patch should meet at least the 'Good' Condition category	Yes	Yes	Yes	Yes
Minimum patch size	Pristine – no minimum patch size				
	Excellent – at least 0.5 ha	Yes, condition is Excellent and patch size is 14.3 ha within the Survey Area, continuous patch outside of the Survey Area within the 1 km buffer is 1169 ha	Yes, ondition is Excellent and patch size 292.6 ha within the Survey Area, continuous patch outside of the Survey Area within the 1 km buffer is 1169 ha	Condition ranges from Excellent - Very Good with the majority in Excellent Condition, and patch size is 74.2 ha within the Survey Area, continuous patch outside of the Survey Area within the 1 km buffer is 1169 ha	Yes, condition is Excellent and patch size is 74.2 ha within the Survey Area, ontinuous patch outside of the Survey Area within the 1 km buffer is 1169 ha
	Very Good – at least 1 ha				
	Good – at least 2 ha.				
Assessment Result	**Does patch meet criteria for TEC status?**	**Yes**	**Yes**	**Yes**	**Yes**

Appendix D Flora Desktop Assessment Results

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Flora Database Search Results

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. VU - Vulnerable, P - Listed as Priority by DBCA.

Scientific Name	Conservation Status		Source		
	State	Federal	Nature Map	PMST	TPFL
Acacia denticulosa	T		x		
Andersonia gracilis	T	EN	x		x
Anigozanthos viridis subsp. *terraspectans*	T		x		
Banksia mimica	T		x		
Calectasia elegans	T		x		
Darwinia acerosa	T	EN	x		x
Darwinia carnea	T	EN	x		x
Drakaea elastica	T	EN	x		x
Macarthuria keigheryi	T	EN	x		x
Paracaleana dixonii	T	EN	x		x
Ptychosema pusillum	T		x		
Babingtonia delicata	P1		*x*		
Gyrostemon sp. Mogumber (T.J. Hawkeswood 250)	P1		x		x
Hypocalymma lateriticola	P1		x		x
Andersonia sp. Mysosma (E.A. Griffin 2213)	P2		x		x
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	P2		x		
Chordifex reseminans	P2		x		x
Desmocladus microcarpus	P2		x		
Goodenia xanthotricha	P2		x		
Hypocalymma serrulatum	P2		x		
Lepyrodia curvescens	P2		x		x
Leucopogon squarrosus subsp. *trigynus*	P2		x		x
Lyginia excelsa	P2		x		
Stylidium milleri	P2		x		
Stylidium sp. Moora (J.A. Wege 713)	P2		x		x
Tetratheca hirsuta subsp. *Boonanarring*	P2		x		
Acacia cummingiana	P3		x		
Acacia drummondii subsp. *affinis*	P3		x		
Allocasuarina grevilleoides	P3		x		x
Babingtonia urbana	P3		x		x
Banksia dallanneyi subsp. *pollosta*	P3		x		x
Banksia kippistiana var. *paenepeccata*	P3		x		x
Banksia pteridifolia subsp. *vernalis*	P3		x		
Beaufortia eriocephala	P3		x		x
Calytrix ecalycata subsp. *brevis*	P3		x		
Comesperma rhadinocarpum	P3		x		
Dampiera tephrea	P3		x		x
Desmocladus biformis	P3		x		x
Desmocladus nodatus	P3		x		

Flora Database Search Results

Scientific Name	Conservation Status		Source		
	State	Federal	Nature Map	PMST	TPFL
Dillwynia dillwynioides	P3		x		x
Haemodorum loratum	P3		x		x
Hensmania stoniella	P3		x		x
Hypocalymma quadrangulare	P3		x		x
Isopogon autumnalis	P3		x		
Isotropis cuneifolia subsp. *glabra*	P3		x		x
Leucopogon sp. Yanchep (M. Hislop 1986)	P3		x		
Persoonia rudis	P3		x		x
Petrophile biternata	P3		x		x
Phlebocarya pilosissima subsp. *pilosissima*	P3		x		x
Platysace ramosissima	P3		x		
Stylidium aceratum	P3		x		
Stylidium nonscandens	P3		x		x
Styphelia allittii	P3		x		
Anigozanthos humilis subsp. *chrysanthus*	P4		x		x
Banksia chamaephyton	P4		x		
Calothamnus pachystachyus	P4		x		x
Conostephium magnum	P4		x		
Dodonaea hackettiana	P4		x		
Eucalyptus macrocarpa subsp. *elachantha*	P4		x		x
Grevillea olivacea	P4		x		
Hypolaena robusta	P4		x		
Lepidobolus densus	P4		x		
Regelia megacephala	P4		x		
Rumex drummondii	P4		x		x
Schoenus griffinianus	P4		x		x
Thelymitra apiculata	P4		x		
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4		x		
Verticordia lindleyi subsp. *lindleyi*	P4		x		x
Verticordia paludosa	P4		x		x

Appendix E Flora Recorded During the Survey

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Family	Taxa
Amaranthaceae	*?Ptilotus manglesii*
	Ptilotus polystachyus
Anarthriaceae	*Lyginia ?imberbis*
	Lyginia imberbis
Apiaceae	*Xanthosia huegelii*
Araliaceae	*Trachymene pilosa*
Asparagaceae	*Lomandra caespitosa*
	Lomandra hermaphrodita
	Thysanotus sp.
Asteraceae	**Arctotheca calendula*
	**Hypochaeris glabra*
	Podotheca angustifolia
	Podotheca gnaphalioides
	Pterochaeta paniculata
	**Ursinia anthemoides*
Brassicaceae	**Raphanus raphanistrum*
Campanulaceae	**Wahlenbergia capensis*
Casuarinaceae	*Allocasuarina humilis*
Celastraceae	*Celastraceae* sp.
	Tripterococcus brunonis
Colchicaceae	*Burchardia congesta*
Crassulaceae	*Crassula colorata*
Cupressaceae	*Callitris pyramidalis*
Cyperaceae	*Chaetospora curvifolia*
	Cyathochaeta avenacea
	Lepidosperma ?scabrum
	Lepidosperma sp.
	Mesomelaena pseudostygia
	Schoenus caespititius
	Schoenus nanus
	Schoenus pedicellatus
	Schoenus pleiostemoneus
	Schoenus sp. A3 Ciliate Sheaths (K.R. Newbey 9402)
Dasypogonaceae	*Calectasia narragara*
Dilleniaceae	*?Hibbertia huegelii*
	Hibbertia huegelii
	Hibbertia hypericoides
	Hibbertia pubens
	Hibbertia sp.
	Hibbertia subvaginata
Droseraceae	*Drosera erythrorhiza*
	Drosera humilis
	Drosera menziesii
	Drosera menziesii
	Drosera sp.
	Drosera sp. climbing
Ericaceae	*Andersonia heterophylla*
	Conostephium minus
	Conostephium pendulum
	Leucopogon sprengelioides
	Lysinema elegans
	Lysinema pentapetalum
	Styphelia ciliosa
	Styphelia conostephioides
	Styphelia sp.
	Styphelia xerophylla
Euphorbiaceae	*Monotaxis grandiflora* var. *grandiflora*
	Ricinocarpos undulatus
Fabaceae	*Acacia barbinervis* subsp. *borealis*
	Acacia stenoptera
	Aotus procumbens
	Bossiaea eriocarpa
	Daviesia decurrens subsp. *decurrens*
	Daviesia divaricata subsp. *divaricata*
	Euchilopsis linearis
	Gastrolobium plicatum
	Gompholobium confertum
	Gompholobium tomentosum
	Isotropis cuneifolia
	Jacksonia floribunda
	Jacksonia nutans
	**Lupinus angustifolius*
	**Medicago polymorpha*
	Mirbelia spinosa

Family	Taxa
Geraniaceae	**Erodium cygnorum*
	**Pelargonium capitatum*
Goodeniaceae	*Dampiera linearis*
	Lechenaultia floribunda
	Lechenaultia linarioides
Gyrostemonaceae	*Gyrostemon ramulosus*
Haemodoraceae	*Anigozanthos humilis* subsp. *humilis*
	Conostylis aculeata
	Conostylis angustifolia
	Conostylis crassinerva
	Conostylis juncea
	Haemodorum sp.
	Phlebocarya ciliata
Haloragaceae	*Gonocarpus pithioides*
Hemerocallidaceae	*Arnocrinum preissii*
	Caesia sp.
	Hensmania turbinata
	Tricoryne humilis
Iridaceae	**Gladiolus caryophyllaceus*
	Patersonia occidentalis
Lamiaceae	*Hemiandra ?pungens*
	Hemiandra pungens
	Hemiphora bartlingii
	Cassytha glabella
Lauraceae	*Cassytha pomiformis*
Loganiaceae	*Orianthera spermacocea*
	Phyllangium paradoxum
Loranthaceae	*Nuytsia floribunda*
Molluginaceae	*Macarthuria australis*
Myrtaceae	*Apectospermum spinescens*
	Beaufortia elegans
	Calothamnus sanguineus
	Calothamnus sp.
	Calytrix sapphirina
	Calytrix sp.
	Corymbia calophylla
	Eremaea asterocarpa subsp. *asterocarpa*
	Eremaea pauciflora
	Eucalyptus todtiana
	Eucalyptus wandoo subsp. *wandoo*
	Hypocalymma angustifolium
	Leptospermopsi s sp.
	Melaleuca ?leuropoma
	Melaleuca ?seriata
	Melaleuca ciliosa
	Melaleuca preissiana
	Melaleuca seriata
	Myrtaceae sp.
	Scholtzia ?involucrata
	Scholtzia laxiflora
	Verticordia ?densiflora
	Verticordia ?huegelii
	Verticordia ?nitens
	Verticordia nitens
	Verticordia nobilis
	Verticordia ovalifolia
	Verticordia sp.
Orchidaceae	*?Leporella fimbriata*
	Caladenia flava subsp. *flava*
	Caladenia sp.
	**Disa bracteata*
	Diuris tinkeri
	Elythranthera brunonis
	Paracaleana nigrita
	Pterostylis dilatata
	Pterostylis sp.
	Pyrorchis nigricans
	Thelymitra campanulata

Family	Taxa
Orobanchaceae	**Orobanche minor*
Phyllanthaceae	*Poranthera microphylla*
Poaceae	*Amphipogon* sp.
	Amphipogon turbinatus
	Austrostipa compressa
	Austrostipa elegantissima
	Austrostipa flavescens
	Austrostipa macalpinei
	**Avena barbata*
	**Briza maxima*
	**Bromus diandrus*
	**Ehrharta calycina*
	**Hordeum leporinum*
	**Lolium rigidum*
	Neurachne alopecuroidea
Polygonaceae	**Rumex hypogaeus*
Portulacaceae	*Calandrinia granulifera*
Primulaceae	**Lysimachia arvensis*
Proteaceae	*Adenanthos cygnorum* subsp. *cygnorum*
	Banksia attenuata
	Banksia ilicifolia
	Banksia laricina
	Banksia menziesii
	Banksia prionotes
	Conospermum stoechadis
	Hakea costata
	Hakea psilorrhyncha
	Persoonia comata
	Petrophile brevifolia
	Petrophile linearis
	Petrophile macrostachya
	Petrophile scabriuscula
	Petrophile seminuda
	Stirlingia latifolia
	Synaphea spinulosa subsp. *spinulosa*
Restionaceae	*Alexgeorgea nitens*
	Chordifex sinuosus
	Leptocarpus coangustatus
Rubiaceae	*Opercularia vaginata*
Rutaceae	*Cyanothamnus ramosus* subsp. *anethifolius*
	Philotheca spicata
Santalaceae	*Leptomeria empetriformis*
Scrophulariaceae	**Dischisma capitatum*
Solanaceae	**Solanum nigrum*
Stylidiaceae	*Levenhookia stipitata*
	Stylidium ?adpressum
	Stylidium ?spiciforme
	Stylidium crossocephalum
	Stylidium miniatum
	Stylidium piliferum
	Stylidium repens
	Stylidium schoenoides
	Stylidium sp.
	Stylidium spiciforme
Thymelaeaceae	*Pimelea* sp.
	Pimelea sulpherea
Xanthorrhoeaceae	*Xanthorrhoea acanthostachya*
	Xanthorrhoea preissii
Zamiaceae	*Macrozamia fraseri*

Appendix F Flora Likelihood of Occurence

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2024 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 10 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 10 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2024). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2024). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Acacia denticulosa	T		x			10.68	Sep - Oct	Sand, loam, clay. Granite outcrops, rarely on sandplains.[2]	Low	No	Low
Andersonia gracilis	T	EN	x		x	6.09	Sep - Nov	Currently known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils.[1]	Medium	No	Low
Anigozanthos viridis subsp. *terraspectans*	T		x			7.28	Aug - Sep	Occurs in winter-wet depressions where it grows on grey sandy clay loam, or grey sand, in low post-fire regenerating heath.[1]	Medium	No	Low
Banksia mimica	T		x			10.65	Dec or Jan - Feb	Grows on flat to gentle slopes, on grey and white sand in open woodlands.[1]	Low	Yes	Low
Calectasia elegans	T		x			10.58	Sep - Nov	Grey sand, pale yellow sand, flat plains or gentle slopes.[2]	Low	Yes	Low
Darwinia acerosa	T	EN	x		x	1.61	Sep - Nov	Sand, loam, often moist soils. Granite outcrops, road verges.[2]	High	No	Low
Darwinia carnea	T	EN	x		x	1.61	Oct - Dec	Situated on the tops of lateric breakaways, growing in gravelly brown loamy soils, in open Eycalyptus wandoo (Wandoo) woodland over heath.[1]	High	No	Low
Drakaea elastica	T	EN	x		x	8.56	Oct - Nov	White, grey sand, low-lying situations adjoining winter-wet swamps.[1]	Medium	Yes	Medium
Macarthuria keigheryi	T	EN	x		x	6.70	Sep - Dec or Feb - Mar	White or grey sand.[2]	Medium	Yes	Low
Paracaleana dixonii	T	EN	x		x	2.57	Oct - Dec or Jan	Typically occurs in deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland.[2]	High	Yes	High
Ptychosema pusillum	T		x			7.35	Aug - Oct	Sand. Rises.[2]	Medium	Yes	Medium
Babingtonia delicata	P1		*x*			7.01	Nov	Grey, yellow, white or brown sand over gravel. Drainages, lakes and low lying areas.[2]	Medium	No	Low
Gyrostemon sp. Mogumber (T.J. Hawkeswood 250)	P1		x		x	6.50	Unknown	Only known from one specimen from Mogumber.[2]	Medium	Unknown	Low
Hypocalymma lateriticola	P1		x		x	2.71	Aug - Sep	Sand. [2]	High	Yes	Low
Andersonia sp. Mysosma (E.A. Griffin 2213)	P2		x		x	4.07	Sep - Nov	Grey sand. Slopes, Lateritic gravel.[2]	High	No	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	P2		x			14.55	Sep - Oct	Grey-white sand, rich brown sandy loam, sandy clay, alluvial soils. Low plains, river-banks, winter-wet swamps.[2]	Low	Yes	Low
Chordifex reseminans	P2		x		x	6.00	Mar - May	Dry sand. Heath.[2]	High	Yes	Low
Desmocladus microcarpus	P2		x			10.65	Aug - Oct	Shallow, white, grey or brown sand or sandy loam over lateritic gravel. Mid and lower slopes.[2]	Low	No	Low
Goodenia xanthotricha	P2		x			12.08	Nov - Dec or Jan - Feb	Sandy soils. Gravelly hills.[2]	Low	No	Low
Hypocalymma serrulatum	P2		x			1.75	Apr - May	Grey or white sand. Along drainage lines.[2]	High	No	Low
Lepyrodia curvescens	P2		x		x	4.97	Sep - Nov	Sand, laterite. Seasonally inundated swampland.[2]	High	No	Low
Leucopogon squarrosus subsp. *trigynus*	P2		x		x	1.94	Feb - Oct	White/grey sand.[2]	High	Yes	Low
Lyginia excelsa	P2		x			6.93	Mar -Nov	Sand. Dry heath & Banksia woodland.[2]	Medium	Yes	Low
Stylidium milleri	P2		x			10.67	Sep - Oct	Grey sand with lateritic gravel in Allocasuarina and Lambertia shrubland with Xanthorrhoea and scattered mallees, Proteaceous and Myrtaceous shrubland with Allocasuarina and scattered Banksia attenuata, or B. carlinoides heath.[2]	Low	No	Low
Stylidium sp. Moora (J.A. Wege 713)	P2		x		x	1.52	Sep - Nov	Grey sand with laterite, sometimes with silt. Mid to upper slopes.[2]	High	No	Low
Tetratheca hirsuta subsp. *Boonanarring*	P2		x			11.83	Sep - Oct	Black brown sand over lateritic gravel. Slope.[2]	Low	No	Low
Acacia cummingiana	P3		x			12.26	May - Jun or Aug	Grey or yellow sand, lateritic gravel. Sandplains, lateritic breakaways.[2]	Low	No	Low
Acacia drummondii subsp. *affinis*	P3		x			7.51	Jul - Aug	Lateritic gravelly soils.[2]	Medium	No	Low
Allocasuarina grevilleoides	P3		x		x	9.08	Sep - Nov	Sand over laterite, gravel.[2]	Medium	No	Low
Babingtonia urbana	P3		x		x	2.72	Jan - Mar	Associated with wetlands on the coastal plain.[2]	High	Yes	Low
Banksia dallanneyi subsp. *pollosta*	P3		x		x	3.90	Aug - Sep	Grey/yellow sand. Flats, lateritic rises.[2]	High	No	Low
Banksia kippistiana var. paenepeccata	P3		x		x	7.25	Oct - Nov	Lateritic gravelly soils.[2]	Medium	No	Low
Banksia pteridifolia subsp. *vernalis*	P3		x			10.68	Sep - Oct	White/grey sand over laterite.[2]	Low	No	Low
Beaufortia eriocephala	P3		x		x	10.07	Sep - Nov	Lateritic sandy soils. Slopes.[2]	Low	No	Low
Calytrix ecalycata subsp. brevis	P3		x			14.52	Aug - Sep	Dry yellow sand. Sandplains, low-rises.[2]	Low	No	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Comesperma rhadinocarpum	P3		x			10.60	Oct - Nov	Sandy soils.[2]	Low	Yes	Low
Dampiera tephrea	P3		x		x	3.09	Jul	Sand, gravelly loam.[2]	High	No	Low
Desmocladus biformis	P3		x		x	4.91	Sep - Oct	Sand, sandy clay, lateritic soils. Dry sites.[2]	High	No	Low
Desmocladus nodatus	P3		x			14.52	Oct	Grey, brown or yellow clay, sand or sandy loam. Rises in winter wet flats.[2]	Low	No	Low
Dillwynia dillwynioides	P3		x		x	3.55	Aug - Dec	Sandy soils. Winter-wet depressions.[2]	High	Yes	Low
Haemodorum loratum	P3		x		x	2.72	Nov	Grey or yellow sand, gravel.[2]	High	Yes	High
Hensmania stoniella	P3		x		x	1.61	Sep - Nov	White, grey or lateritic sand, often winter-wet.[2]	High	Yes	Low
Hypocalymma quadrangulare	P3		x		x	7.20	Jul - Aug	Undulating plains, slopes. Sand.[2]	Medium	Yes	Low
Isopogon autumnalis	P3		x			11.02	Feb - Jun	White, yellow or grey sand. Laterite gravel. Sandplains, gentle slopes.[2]	Low	Yes	Low
Isotropis cuneifolia subsp. glabra	P3		x		x	1.52	Sep	Sand, clay loam. Winter-wet flats.[2]	High	Yes	Low
Leucopogon sp. Yanchep (M. Hislop 1986)	P3		x			10.31	Apr - Jun, Sep	Light grey-yellow sand, brown loam, limestone, laterite, granite. Coastal plain, breakaways, valley slopes, low hills.[2]	Low	Yes	Low
Persoonia rudis	P3		x		x	1.71	Sep - Dec or Jan	White, grey or yellow sand, often over laterite.[2]	High	Yes	Low
Petrophile biternata	P3		x		x	1.52	Aug - Oct	Yellow/grey sand and gravel, laterite, quartzite soils. Lateritic ridges, plains.[2]	High	No	Low
Phlebocarya pilosissima subsp. pilosissima	P3		x		x	0.98	Aug - Oct	White or grey sand, lateritic gravel.[2]	High	No	Low
Platysace ramosissima	P3		x			7.00	Oct - Nov	Sandy soils.[2]	Medium	Yes	Low
Stylidium aceratum	P3		x			6.94	Oct - Nov	Sandy soils. Swamp heathland.[2]	Medium	Yes	Medium
Stylidium nonscandens	P3		x		x	5.64	Sep - Nov	Sand over laterite. Hillslopes and crests. Banksia woodland, heath, mallee shrubland.[2]	Medium	No	Low
Styphelia allittii	P3		x			10.58	May - Oct	Yellow grey clayey sand over laterite.	Low	No	Low
Anigozanthos humilis subsp. chrysanthus	P4		x		x	6.73	Jul - Oct	Grey or yellow sand.[2]	Medium	Yes	Low
Banksia chamaephyton	P4		x			7.01	Oct - Dec	Grey or white sand over laterite.[2]	Medium	No	Low
Calothamnus pachystachyus	P4		x		x	9.08	Aug - Oct	Lateritic soils, often gravelly. Ridges, road verges. Dense shrubland.[2]	Medium	No	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Conostephium magnum	P4		x			16.17	Jul - Sep	White-grey sands sometomes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.[2]	Low	Yes	Low
Dodonaea hackettiana	P4		x			10.35	Jul - Oct	Sand. Outcropping limestone.[2]	Low	No	Low
Eucalyptus macrocarpa subsp. elachantha	P4		x		x	2.84	Aug - Sep or Nov - Dec	White or grey sand over laterite. Hillslopes, ridges, sandplains.[2]	High	No	Low
Grevillea olivacea	P4		x			12.58	Jun - Oct	White or grey sand. Coastal dunes, limestone rocks.[2]	Low	No	Low
Hypolaena robusta	P4		x			11.99	Sep - Oct	White sand. Sandplains.[2]	Low	Yes	Low
Lepidobolus densus	P4		x			11.93	Aug or Sep	Yellow lateritic sand, lateritic gravel. Dry kwongan.[2]	Low	No	Low
Regelia megacephala	P4		x			6.90	Oct - Dec	Red sand. Quartzite hills. In association with open low woodland of Allocasuarina huegeliana.[2]	Medium	No	Low
Rumex drummondii	P4		x		x	3.03	Aug - Nov	Winter-wet disturbed areas.[2]	High	Yes	High
Schoenus griffinianus	P4		x		x	8.29	Sep - Oct	White sand.[2]	Medium	Yes	Low
Thelymitra apiculata	P4		x			1.73	May - Jul	Grey sand, lateritic gravel.[2]	High	No	Low
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4		x			7.28	Feb	Winter wet flats, peaty sand over clay.[2]	Medium	No	Low
Verticordia lindleyi subsp. lindleyi	P4		x		x	5.40	May or Nov - Dec or Jan	Sand, sandy clay. Winter-wet depressions.[2]	Medium	Yes	Low
Verticordia paludosa	P4		x		x	5.40	Jan - May	White/grey sand. Winter-wet flats.[2]	Medium	Yes	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix G Flora Site Sheets

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

FLORA SITE SHEET

Site: **OSQ01**

Project Name Orange Springs Offset Survey
Location -31.01563 **Lat** 115.67507 **Long**
Described by: GB, JH
Date: 25-09-2024

Type: Quadrat 10 x 10
Landform: Basin/depression
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia ilicifolia and B. attenuata low open woodland over B. laricina, Xanthorrhoea preissii and Eremaea pauciflora mid open shrubland over Phlebocarya ciliata and Patersonia occidentalis low sparse sedgeland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	30	0.5	
Alexgeorgea nitens	5	0.1	
Amphipogon sp.	10	0.1	
Banksia attenuata	350	2	
Banksia ilicifolia	350	5	
Banksia laricina	160	11	
Beaufortia elegans	120	1	
Conostephium pendulum	50	0.1	
Dampiera linearis	10	0.1	
Drosera sp. climbing	20	0.1	
Eremaea asterocarpa subsp. asterocarpa	20	0.1	
Eremaea pauciflora	150	1	
Gompholobium confertum	50	2	
Gonocarpus pithyoides	10	0.5	
Hypocalymma angustifolium	170	0.5	
Leptocarpus coangustatus	30	0.1	
Lyginia ?imberbis	20	1	
Melaleuca ?leuropoma	30	1.5	
Paracaleana nigrita	10	0.1	
Patersonia occidentalis	40	2	
Phlebocarya ciliata	30	3.5	
Schoenus caespititius	30	0.5	
Scholtzia ?involucrata	20	0.1	
Stylidium repens	5	0.1	
Verticordia ?nitens	40	0.5	
Xanthorrhoea preissii	140	4	

FLORA SITE SHEET

Site: **OSQ02**

Project Name Orange Springs Offset Survey
Location -31.01627 **Lat** 115.67521 **Long**
Described by: GB, JH
Date: 25-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Eremaea pauciflora and Beaufortia elegans mid open shrubland over Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius low sparse sedgeland*

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	5	0.5	
Andersonia heterophylla	20	0.2	
Banksia attenuata	400	15	
Banksia menziesii	400	20	
Beaufortia elegans	140	2	
Bossiaea eriocarpa	20	0.1	
Burchardia congesta	40	0.1	
Calytrix sp.	20	0.5	
Cassytha glabella	10	0.1	
Conostephium pendulum	50	0.5	
Dampiera linearis	10	0.1	
Drosera menziesii	20	0.1	
Eremaea pauciflora	150	5	
**Gladiolus caryophyllaceus*	10	0.1	
Gonocarpus pithyoides	10	0.2	
Hibbertia subvaginata	30	1	
Lyginia ?imberbis	20	1	
Melaleuca ?leuropoma	50	1	
Myrtaceae sp.	40	1	
Paracaleana nigrita	10	0.1	
Patersonia occidentalis	20	3	
Petrophile linearis	20	0.1	
Phlebocarya ciliata	20	2	
Phyllangium paradoxum	5	0.1	
Schoenus caespititius	30	2	
Scholtzia ?involucrata	30	1	
Styphelia sp.	50	1	
Styphelia xerophylla	50	1	
Xanthosia huegelii	10	0.1	

FLORA SITE SHEET

Site: **OSQ03**

Project Name Orange Springs Offset Survey
Location -31.01776 **Lat** 115.67675 **Long**
Described by: GB, JH
Date: 25-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and B. menziesii low woodland over Leptospermopsis sp., Eremaea pauciflora and Petrophile macrostachya mid sparse shrubland over Mesomelaena pseudostygia, Schoenus pedicellatus and Lyginia imberbis low open sedgeland*

Condition: Very Good **Disturbance Type:**
Fire Age: >10 years Weeds, Rabbit tracks/scats

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	20	0.1	
Alexgeorgea nitens	10	1	
Anigozanthos humilis subsp. humilis	10	0.1	
Arnocrinum preissii	20	0.1	
Austrostipa flavescens	10	0.1	
Banksia attenuata	400	6	
Banksia menziesii	400	5	
Burchardia congesta	40	0.1	
Conospermum stoechadis	50	0.5	
Drosera sp. climbing	20	0.1	
Eremaea pauciflora	130	3	
**Gladiolus caryophyllaceus*	10	0.1	
Hibbertia huegelii	30	0.2	
Hibbertia hypericoides	50	2	
Isotropis cuneifolia subsp. cuneifolia	5	0.1	
Leptospermopsis sp.	140	3	
Lyginia imberbis	30	2.5	
Mesomelaena pseudostygia	40	10	
Petrophile macrostachya	140	1	
Petrophile seminuda	40	1	
Phyllangium paradoxum	5	0.1	
Pimelea sp.	10	0.1	
Poranthera microphylla	5	0.1	
Schoenus pedicellatus	20	2	
Stirlingia latifolia	50	4	
Stylidium sp.	10	0.1	
Synaphea spinulosa subsp. spinulosa	20	0.1	
Tricoryne humilis	10	0.1	
**Ursinia anthemoides*	5	0.1	
Verticordia nitens	60	2	

FLORA SITE SHEET

Site: **OSQ04**

Project Name Orange Springs Offset Survey
Location -31.03353 **Lat** 115.68747 **Long**
Described by: GB, JH
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and B. menziesii low woodland over Jacksonia floribunda, Eremaea pauciflora and Conospermum stoechadis low open shrubland over Schoenus pedicellatus and Patersonia occidentalis low sparse sedgeland*

Condition: Excellent **Disturbance Type:**
Fire Age: >10 years Weeds

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	0.1	
Allocasuarina humilis	40	1	
Amphipogon sp.	10	0.1	
Anigozanthos humilis subsp. humilis	20	0.5	
Apectospermum spinescens	50	0.2	
Banksia attenuata	350	7	
Banksia menziesii	350	3	
Beaufortia elegans	80	0.3	
Bossiaea eriocarpa	20	0.1	
Burchardia congesta	40	0.1	
Cassytha glabella	20	0.5	
Chordifex sinuosus	30	0.1	
Conospermum stoechadis	80	2	
Conostephium pendulum	20	0.2	
Conostylis angustifolia	30	0.2	
Daviesia decurrens subsp. decurrens	20	0.1	
Drosera sp. climbing	10	0.1	
Elythranthera brunonis	10	0.1	
Eremaea pauciflora	60	5	
Gastrolobium plicatum	10	0.1	
Hibbertia huegelii	30	0.5	
Hibbertia pubens	20	1	
Jacksonia floribunda	50	6	
Leptospermopsis sp.	60	0.2	
Lysinema pentapetalum	60	1	
Melaleuca ciliosa	40	0.5	
Mesomelaena pseudostygia	30	1	
Monotaxis grandiflora var. grandiflora	5	0.1	
Patersonia occidentalis	30	1	
Petrophile linearis	30	0.5	
Petrophile macrostachya	60	2	
Petrophile seminuda	30	1	
Phyllangium paradoxum	3	0.1	
Pimelea sulpherea	20	0.1	
Pyrorchis nigricans	2	0.1	
Schoenus pedicellatus	30	4	
Scholtzia ?involucrata	30	0.5	
Stirlingia latifolia	70	1	
Stylidium ?spiciforme	10	0.1	
Stylidium sp.	5	0.2	
Styphelia conostephioides	50	0.5	
Styphelia xerophylla	20	0.1	
Synaphea spinulosa subsp. spinulosa	30	0.5	
Verticordia ?huegelii	20	0.1	
Verticordia nitens	80	0.2	
Xanthosia huegelii	10	1	

FLORA SITE SHEET

Site: **OSQ05**

Project Name Orange Springs Offset Survey
Location -31.02286 **Lat** 115.67434 **Long**
Described by: GB, JH
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and B. menziesii low woodland over Eremaea pauciflora, Beaufortia elegans and Verticodia nitens low open shrubland over Schoenus pedicellatus, Chordifex sinuosus and Lyginia ?imberbis low sparse sedgeland*

Condition: Very Good **Disturbance Type:**
Fire Age: >10 years Weeds

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	20	0.1	
Alexgeorgea nitens	10	0.1	
Anigozanthos humilis subsp. humilis	20	0.1	
Apectospermum spinescens	40	0.2	
Banksia attenuata	400	15	
Banksia menziesii	350	2	
Beaufortia elegans	80	3	
Bossiaea eriocarpa	20	0.2	
Burchardia congesta	30	0.1	
Caladenia flava subsp. flava	10	0.1	
Calytrix sp.	20	0.2	
Cassytha glabella	20	0.1	
Chordifex sinuosus	20	0.5	
Conostephium minus	30	0.1	
Conostephium pendulum	40	1	
Drosera erythrorhiza	2	0.2	
Drosera sp. climbing	10	0.1	
Eremaea asterocarpa subsp. asterocarpa	30	0.5	
Eremaea pauciflora	70	12	
Hibbertia huegelii	30	0.2	
Hibbertia subvaginata	20	0.5	
Jacksonia floribunda	60	0.5	
Leucopogon sprengelioides	50	0.2	
Lyginia ?imberbis	30	1	
Melaleuca seriata	60	1.5	
Patersonia occidentalis	30	1	
Petrophile linearis	40	1	
Petrophile seminuda	10	0.1	
Philotheca spicata	90	0.5	
Phlebocarya ciliata	30	0.2	
Phyllangium paradoxum	3	0.1	
Pimelea sulpherea	20	0.1	
Pterostylis sp.	10	0.1	
Schoenus pedicellatus	30	2	
Scholtzia ?involucrata	30	0.5	
Stylidium schoenoides	20	0.1	
Stylidium sp.	10	0.1	
Styphelia sp.	20	2	
Verticordia nitens	80	3	

FLORA SITE SHEET

Site: **OSQ06**

Project Name Orange Springs Offset Survey
Location -31.02227 **Lat** 115.67678 **Long**
Described by: GB, JH
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and B. menziesii low woodland over Eremaea pauciflora, Jacksonia nutans and Lysinema pentapetalum mid open shrubland over Petrophile seminuda, Leucopogon sprengelioides and Stirlingia latifolia low sparse shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	2	1.5	
Amphipogon sp.	20	0.1	
Anigozanthos humilis subsp. humilis	20	0.2	
Apectospermum spinescens	50	0.2	
Banksia attenuata	450	15	
Banksia menziesii	450	5	
Bossiaea eriocarpa	10	0.5	
Burchardia congesta	30	0.1	
Chaetospora curvifolia	20	0.1	
Chordifex sinuosus	30	0.2	
Conospermum stoechadis	100	3	
Conostephium pendulum	50	0.2	
Dampiera linearis	20	0.2	
Drosera sp. climbing	10	0.1	
Eremaea pauciflora	140	11	
Hibbertia huegelii	30	0.2	
Jacksonia floribunda	60	0.2	
Jacksonia nutans	140	5	
Leucopogon sprengelioides	30	2	
Lysinema pentapetalum	100	4	
Melaleuca seriata	35	0.5	
Mesomelaena pseudostygia	30	1	
Monotaxis grandiflora var. grandiflora	5	0.2	
Neurachne alopecuroidea	20	0.2	
Petrophile linearis	20	1	
Petrophile macrostachya	50	1	
Petrophile seminuda	30	3	
Pimelea sulpherea	25	0.1	
Pterostylis sp.	5	0.1	
Schoenus sp. A3 Ciliate Sheaths (K.R. Newbey 9402)	30	1	
Scholtzia ?involucrata	20	0.1	
Stirlingia latifolia	40	2	
Stylidium sp.	20	0.1	
Styphelia sp.	20	2	
Styphelia xerophylla	40	0.5	
Tricoryne humilis	10	0.1	
Verticordia nitens	140	2	
Xanthosia huegelii	10	0.5	

FLORA SITE SHEET

Site: **OSQ07**

Project Name Orange Springs Offset Survey
Location -31.03206 **Lat** 115.67878 **Long**
Described by: GB, JH
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Adenanthos cygnorum subsp. cygnorum and Verticodia nitens mid open shrubland over Beaufortia elegans, Apectospermum spinescens and Jacksonia floribunda low sparse shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

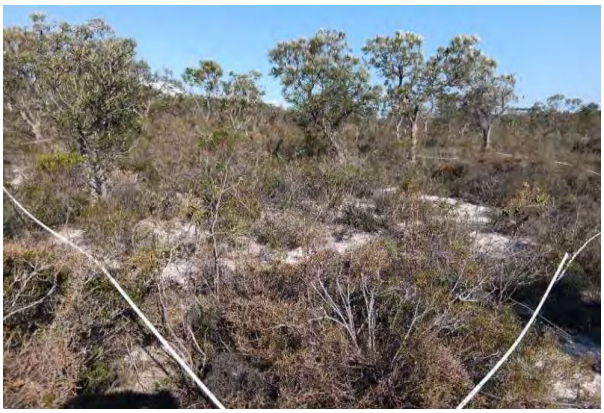
Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	20	0.2	
Adenanthos cygnorum subsp. cygnorum	200	15	
Alexgeorgea nitens	10	0.2	
Anigozanthos humilis subsp. humilis	20	0.2	
Apectospermum spinescens	40	1.5	
Banksia attenuata	350	3	
Banksia menziesii	450	8	
Beaufortia elegans	80	5	
Bossiaea eriocarpa	20	0.2	
Burchardia congesta	50	0.2	
Calothamnus sp.	60	1	
Cassytha glabella	30	0.5	
Chordifex sinuosus	20	0.1	
Conostephium pendulum	30	0.2	
Conostylis crassinerva	5	0.1	
Drosera sp. climbing	10	0.1	
Eremaea pauciflora	40	0.5	
Gompholobium tomentosum	20	0.1	
Hemiandra ?pungens	10	0.1	
Hibbertia huegelii	20	0.1	
Hibbertia pubens	10	1.5	
Isotropis cuneifolia subsp. cuneifolia	10	0.1	
Jacksonia floribunda	80	1	
Leucopogon sprengelioides	30	0.2	
Lyginia imberbis	30	0.2	
Lysinema pentapetalum	30	0.5	
Melaleuca seriata	30	0.5	
Mesomelaena pseudostygia	30	2	
Patersonia occidentalis	30	1	
Petrophile linearis	30	0.2	
Petrophile macrostachya	50	0.5	
Pimelea sulpherea	40	0.2	
Pterostylis sp.	10	0.1	
Schoenus sp. A3 Ciliate Sheaths (K.R. Newbey 9402)	30	3	
Scholtzia ?involucrata	20	0.1	
Stirlingia latifolia	40	1	
Styphelia sp.	10	0.5	
Tricoryne humilis	10	0.1	
Verticordia nitens	160	2	
Xanthosia huegelii	10	0.2	

FLORA SITE SHEET

Site: **OSQ08**

Project Name Orange Springs Offset Survey
Location -31.02890 **Lat** 115.68356 **Long**
Described by: GB, JH
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and B. menziesii low woodland over Jacksonia nutans and Verticordia nitens mid open shrubland over Stirlingia latifolia, Styphelia sp. and Apectospermum spinescens low sparse shrubland*

Condition: Excellent **Disturbance Type:**
Fire Age: >10 years Weeds

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	0.2	
Anigozanthos humilis subsp. humilis	20	0.2	
Apectospermum spinescens	50	1	
Banksia attenuata	350	11	
Banksia menziesii	250	1.5	
Bossiaea eriocarpa	30	0.2	
Burchardia congesta	30	0.1	
Calothamnus sanguineus	30	0.2	
Cassytha glabella	30	0.5	
Chordifex sinuosus	20	1	
Conostephium minus	30	0.2	
Conostephium pendulum	40	0.5	
Cyanothamnus ramosus subsp. anethifolius	30	0.1	
Drosera erythrorhiza	2	0.1	
Drosera sp. climbing	20	0.1	
Eremaea asterocarpa subsp. asterocarpa	30	0.2	
Eremaea pauciflora	60	5	
Hibbertia huegelii	30	1	
Hibbertia hypericoides	30	0.2	
Hibbertia pubens	30	1	
Jacksonia floribunda	150	5	
Leucopogon sprengelioides	30	0.1	
Lyginia ?imberbis	40	0.2	
Lysinema pentapetalum	30	1	
Macrozamia fraseri	60	0.5	
Melaleuca ciliosa	30	1	
Mesomelaena pseudostygia	30	0.2	
Myrtaceae sp.	30	0.1	
Patersonia occidentalis	30	1	
Petrophile linearis	30	0.5	
Petrophile seminuda	50	1	
Philotheca spicata	50	0.2	
Schoenus sp. A3 Ciliate Sheaths (K.R. Newbey 9402)	30	0.2	
Stirlingia latifolia	30	4	
Stylidium repens	10	0.1	
Styphelia sp.	30	2	
Styphelia xerophylla	30	1	
Verticordia nitens	150	5	
Xanthosia huegelii	10	0.5	

FLORA SITE SHEET

Site: **OSQ09**

Project Name Orange Springs Offset Survey
Location -31.01199 **Lat** 115.67810 **Long**
Described by: GB, JH
Date: 27-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Eucalyptus todtiana, Banksia prionotes and B. menziesii low woodland over Hibbertia hypercoides, Synaphea spinulosa subsp. spinulosa and Petrophile macrostachya low open shrubland over *Ursinia anthemoides low sparse forbland*

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	1	
Austrostipa macalpinei	20	0.1	
Banksia menziesii	170	0.5	
Banksia prionotes	500	8	
**Briza maxima*	10	0.2	
Burchardia congesta	50	0.1	
Caladenia flava subsp. flava	10	0.1	
Cassytha glabella	30	0.1	
Drosera erythrorhiza	2	0.1	
Drosera sp. climbing	20	0.1	
**Ehrharta calycina*	30	0.5	
Eremaea pauciflora	20	0.5	
Eucalyptus todtiana	45	12	
**Gladiolus caryophyllaceus*	60	0.2	
Hibbertia hypericoides	80	22	
Jacksonia floribunda	60	0.2	
Jacksonia nutans	40	0.2	
Mesomelaena pseudostygia	50	1	
Neurachne alopecuroidea	10	0.1	
Opercularia vaginata	10	0.1	
Petrophile brevifolia	30	0.2	
Petrophile macrostachya	50	1	
Podotheca gnaphalioides	10	0.1	
Styphelia sp.	20	0.2	
Synaphea spinulosa subsp. spinulosa	50	3	
Trachymene pilosa	5	0.2	
**Ursinia anthemoides*	10	5	
Verticordia sp.	30	0.2	
Xanthorrhoea preissii	60	0.5	

FLORA SITE SHEET

Site: **OSQ10**

Project Name Orange Springs Offset Survey
Location -31.01538 **Lat** 115.67164 **Long**
Described by: GB, JH
Date: 27-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Eremaea pauciflora mid open shrubland over Schoenus pedicellatus, Alexgeorgea nitens and Patersonia occidentalis low sparse sedgeland*

Condition: Very Good **Disturbance Type:**
Fire Age: >10 years Weeds

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	2	
Anigozanthos humilis subsp. humilis	15	0.2	
Banksia attenuata	500	8	
Banksia menziesii	450	25	
Bossiaea eriocarpa	20	1	
Burchardia congesta	30	0.2	
Caladenia flava subsp. flava	20	0.2	
Calytrix sp.	20	0.2	
Cassytha glabella	30	0.2	
Conostephium pendulum	30	2	
Dampiera linearis	20	0.5	
Drosera sp. climbing	20	0.1	
Eremaea pauciflora	160	11	
Hibbertia subvaginata	20	0.2	
Lyginia imberbis	40	1	
Melaleuca seriata	50	1	
Patersonia occidentalis	30	2	
Phlebocarya ciliata	30	1	
Phyllangium paradoxum	2	0.1	
Podotheca gnaphalioides	10	0.1	
Schoenus pedicellatus	30	15	
Scholtzia ?involucrata	20	1	
Stylidium ?spiciforme	20	0.1	
Stylidium miniatum	20	0.2	
Stylidium schoenoides	30	0.1	
Tricoryne humilis	20	0.1	
**Ursinia anthemoides*	10	0.3	
Verticordia sp.	10	0.1	
**Wahlenbergia capensis*	20	0.2	
Xanthosia huegelii	10	0.5	

FLORA SITE SHEET

Site: **OSQ11**

Project Name Orange Springs Offset Survey
Location -31.02436 **Lat** 115.68131 **Long**
Described by: NW, MY
Date: 25-09-2024

Type: Quadrat 10 x 10
Landform: Basin/depression
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia ilicifolia and B. attenuata tall sparse shrubland over Adenanthos cygnorum subsp. cygnorum, Hypocalymma angustifolium and Verticordia ?nitens mid open shrubland over Styphelia xerophylla, Andersonia heterophylla and Petrophile seminuda low open shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Adenanthos cygnorum subsp. cygnorum	200	20	
Alexgeorgea nitens	10	0.1	
Andersonia heterophylla	40	0.5	
Banksia attenuata	110	1	
Banksia ilicifolia	300	2	
Dampiera linearis	20	0.1	
Euchilopsis linearis	35	0.5	
Gompholobium confertum	80	0.1	
Hibbertia subvaginata	25	0.2	
Hypocalymma angustifolium	130	7	
Jacksonia nutans	20	0.5	
Leucopogon sprengelioides	30	0.1	
Lyginia imberbis	80	1.2	
Melaleuca ?leuropoma	30	0.5	
Melaleuca ?seriata	30	0.1	
Patersonia occidentalis	3	0.1	
Petrophile linearis	40	0.3	
Petrophile seminuda	60	0.5	
Schoenus caespititius	60	0.2	
Stirlingia latifolia	50	0.4	
Styphelia conostephioides	30	0.5	
Styphelia xerophylla	40	12	
Verticordia ?nitens	110	10	
Xanthosia huegelii	15	0.1	

FLORA SITE SHEET

Site: **OSQ12**

Project Name Orange Springs Offset Survey
Location -31.02486 **Lat** 115.68064 **Long**
Described by: NW, MY
Date: 25-09-2024

Type: Quadrat 10 x 10
Landform: Mid slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii low open woodland over Adenanthos cygnorum subsp. cygnorum, Jacksonia floribunda and Verticordia ?nitens mid sparse shrubland over Eremaea pauciflora, Melaleuca ?seriata and Styphelia xerophylla low sparse shrubland*

Condition: Excellent **Disturbance Type:**
Fire Age: >10 years Weeds

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	30	0.5	
Adenanthos cygnorum subsp. cygnorum	180	2	
Alexgeorgea nitens	2	0.1	
Amphipogon turbinatus	20	0.2	
Anigozanthos humilis subsp. humilis	20	0.1	
Banksia menziesii	400	15	
Bossiaea eriocarpa	30	0.2	
Burchardia congesta	35	0.1	
Cassytha pomiformis	40	0.2	
Chaetospora curvifolia	30	0.1	
Chordifex sinuosus	40	0.2	
Conospermum stoechadis	120	1.5	
Conostephium pendulum	40	0.3	
Dampiera linearis	30	0.2	
Drosera erythrorhiza	1	0.1	
Drosera menziesii	20	0.1	
Eremaea pauciflora	100	9	
Eucalyptus todtiana	400	15	
Gastrolobium plicatum	40	0.5	
Hemiandra ?pungens	30	0.2	
Hibbertia huegelii	30	0.2	
Jacksonia floribunda	70	1	
Jacksonia nutans	70	2	
Leucopogon sprengelioides	60	0.5	
Lomandra hermaphrodita	20	0.2	
Lyginia imberbis	30	1	
Melaleuca ?seriata	60	2	
Monotaxis grandiflora var. grandiflora	30	0.1	
Patersonia occidentalis	40	1	
Petrophile linearis	40	0.2	
Petrophile seminuda	110	1.5	
Philotheca spicata	90	0.2	
Phyllangium paradoxum	5	0.1	
Pimelea sp.	30	0.1	
Pterostylis dilatata	10	0.1	
Schoenus caespititius	30	0.5	
Schoenus nanus	5	0.1	
Stirlingia latifolia	80	0.1	
Stylidium miniatum	15	0.1	
Styphelia conostephioides	20	0.5	
Styphelia xerophylla	70	1.5	
Thysanotus sp.	15	0.1	
Tricoryne humilis	20	0.1	
Verticordia ?huegelii	60	0.1	
Verticordia ?nitens	120	0.2	
Xanthosia huegelii	10	0.1	

FLORA SITE SHEET

Site: **OSQ13**

Project Name Orange Springs Offset Survey
Location -31.02781 **Lat** 115.67901 **Long**
Described by: NW, MY
Date: 25-09-2024

Type: Quadrat 10 x 10
Landform: Mid slope
Slope: Moderate
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata low open woodland over Eremaea pauciflora, Verticordia ?nitens and Styphelia xerophylla low sparse shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
?Leporella fimbriata	1	0.1	
Alexgeorgea nitens	8	0.5	
Amphipogon turbinatus	30	0.1	
Anigozanthos humilis subsp. humilis	10	0.1	
Banksia attenuata	400	30	
Bossiaea eriocarpa	30	0.3	
Burchardia congesta	30	0.1	
Calytrix sapphirina	80	0.2	
Cassytha pomiformis	30	1	
Chaetospora curvifolia	2	0.1	
Chordifex sinuosus	40	0.5	
Conostephium pendulum	35	1	
Dampiera linearis	20	0.1	
Drosera menziesii	30	0.1	
Drosera sp.	1	0.1	
Eremaea pauciflora	60	45	
Hibbertia subvaginata	30	0.3	
Jacksonia floribunda	60	0.1	
Jacksonia nutans	5	0.1	
Lechenaultia linarioides	35	0.2	
Leucopogon sprengelioides	50	0.1	
Lomandra hermaphrodita	15	0.1	
Lyginia imberbis	50	0.1	
Melaleuca ?seriata	95	5	
Patersonia occidentalis	40	0.1	
Petrophile linearis	20	0.1	
Petrophile seminuda	60	0.5	
Philotheca spicata	120	0.3	
Phyllangium paradoxum	5	0.1	
Podotheca gnaphalioides	30	0.1	
Poranthera microphylla	2	0.1	
Schoenus caespititius	40	0.2	
Stirlingia latifolia	80	1	
Stylidium miniatum	20	0.1	
Styphelia conostephioides	40	2	
Tricoryne humilis	20	0.1	
Verticordia ?huegelii	30	0.1	
Verticordia ?nitens	70	0.1	
Xanthosia huegelii	10	0.1	

FLORA SITE SHEET

Site: **OSQ14**

Project Name Orange Springs Offset Survey
Location -31.02936 **Lat** 115.68852 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Mid slope
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Jacksonia floribunda and Petrophile macrostachya mid open shrubland over Eremaea pauciflora, Melaleuca ?leuropoma and Melaleuca ciliosa low open shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
?Hibbertia huegelii	30	0.1	
Acacia stenoptera	45	0.5	
Alexgeorgea nitens	5	0.1	
Amphipogon turbinatus	20	0.1	
Anigozanthos humilis subsp. humilis	20	0.1	
Apectospermum spinescens	50	0.5	
**Arctotheca calendula*	10	0.1	
Austrostipa compressa	15	0.1	
Banksia attenuata	700	6	
Banksia menziesii	650	5	
Bossiaea eriocarpa	30	0.5	
Burchardia congesta	60	0.1	
Caesia sp.	30	0.1	
Celastraceae sp.	30	0.1	
Chaetospora curvifolia	40	0.5	
Chordifex sinuosus	50	0.2	
Conostephium pendulum	70	2	
Conostylis angustifolia	30	0.1	
Dampiera linearis	30	0.5	
Drosera sp.	1	0.1	
Drosera sp. climbing	30	0.1	
Eremaea asterocarpa subsp. asterocarpa	40	0.2	
Eremaea pauciflora	110	20	
Eucalyptus todtiana	650	6	
Hibbertia huegelii	35	0.2	
Hibbertia pubens	30	0.1	
Hibbertia sp.	30	0.1	
Hibbertia subvaginata	30	0.2	
Jacksonia floribunda	120	1	
Lepidosperma ?scabrum	70	0.1	
Lepidosperma sp.	30	0.1	
Leucopogon sprengelioides	40	0.5	
Lomandra hermaphrodita	30	0.2	
Lyginia imberbis	50	0.2	
Lysinema pentapetalum	50	0.2	
Melaleuca ?leuropoma	60	2	
Melaleuca ?seriata	110	4	
Melaleuca ciliosa	60	1	
Mesomelaena pseudostygia	55	0.3	
Monotaxis grandiflora var. grandiflora	15	0.1	
Paracaleana nigrita	20	0.1	
Patersonia occidentalis	40	1	
Petrophile linearis	30	0.1	
Petrophile macrostachya	60	2	
Petrophile seminuda	60	1	
Phyllangium paradoxum	6	0.1	
Schoenus caespititius	40	2	
Stirlingia latifolia	70	0.1	
Stylidium ?adpressum	60	0.1	
Stylidium miniatum	20	0.1	
Styphelia conostephioides	30	1.5	
Styphelia xerophylla	85	1	
Trachymene pilosa	2	0.1	
Verticordia ?nitens	160	1.5	
Verticordia ovalifolia	60	0.2	
Xanthosia huegelii	10	0.1	

FLORA SITE SHEET

Site: **OSQ15**

Project Name Orange Springs Offset Survey
Location -31.02753 **Lat** 115.68986 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Eremaea pauciflora, Melaleuca ?leuropoma and Stirlingia latifolia low sparse shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	20	0.1	
Alexgeorgea nitens	15	0.1	
Amphipogon turbinatus	30	0.1	
Anigozanthos humilis subsp. humilis	15	0.1	
Austrostipa compressa	15	0.1	
Banksia attenuata	310	5	
Banksia menziesii	410	15	
Bossiaea eriocarpa	30	0.2	
Burchardia congesta	60	0.1	
Caesia sp.	30	0.1	
Caladenia flava subsp. flava	20	0.1	
Callitris pyramidalis	70	0.1	
Cassytha pomiformis	50	0.5	
Celastraceae sp.	20	0.1	
Chaetospora curvifolia	30	0.1	
Chordifex sinuosus	40	0.1	
Conostephium pendulum	25	0.5	
Dampiera linearis	20	0.1	
Drosera menziesii	40	0.1	
Eremaea pauciflora	50	10	
Eucalyptus todtiana	40	0.1	
Gastrolobium plicatum	5	0.3	
Gompholobium confertum	40	0.1	
Hibbertia sp.	30	0.1	
Hibbertia subvaginata	40	1	
Isotropis cuneifolia subsp. cuneifolia	15	0.1	
Jacksonia floribunda	0.1	0.1	
Lepidosperma sp.	50	0.2	
Leucopogon sprengelioides	50	1.5	
Lomandra hermaphrodita	20	0.1	
Lyginia imberbis	60	1	
Melaleuca ?leuropoma	50	4	
Monotaxis grandiflora var. grandiflora	5	0.1	
Patersonia occidentalis	30	0.5	
Persoonia comata	60	2	
Petrophile linearis	25	0.2	
Petrophile seminuda	20	0.1	
Philotheca spicata	70	0.2	
Phyllangium paradoxum	5	0.1	
Podotheca gnaphalioides	20	0.1	
Poranthera microphylla	3	0.1	
Pterostylis dilatata	15	0.1	
Schoenus caespititius	30	0.2	
Scholtzia ?involucrata	30	0.2	
Stirlingia latifolia	45	2	
Stylidium ?adpressum	5	0.1	
Stylidium miniatum	30	0.1	
Stylidium schoenoides	20	0.1	
Stylidium sp.	1	0.1	
Styphelia conostephioides	35	2	
Styphelia xerophylla	50	0.1	
Verticordia ?huegelii	30	0.2	
Verticordia ?nitens	140	0.1	
Xanthosia huegelii	10	0.1	

FLORA SITE SHEET

Site: **OSQ16**

Project Name Orange Springs Offset Survey
Location -31.02672 **Lat** 115.69063 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata low woodland over Adenanthos cygnorum subsp. cygnorum and Banksia laricina mid sparse shrubland over Petrophile brevifolia and Persoonia comata low shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Adenanthos cygnorum subsp. cygnorum	210	10	
Alexgeorgea nitens	20	0.1	
Amphipogon turbinatus	15	0.1	
**Arctotheca calendula*	5	0.1	
Austrostipa macalpinei	20	0.1	
Banksia attenuata	250	2	
Banksia laricina	160	2	
Beaufortia elegans	70	2	
Bossiaea eriocarpa	15	0.1	
Caladenia flava subsp. flava	20	0.1	
Callitris pyramidalis	80	0.3	
Chaetospora curvifolia	50	0.5	
Chordifex sinuosus	4	0.2	
Crassula colorata	3	0.1	
Dampiera linearis	20	0.1	
Drosera erythrorhiza	1	0.1	
Drosera menziesii	45	0.1	
Eremaea pauciflora	120	8	
Gompholobium tomentosum	10	0.1	
Hibbertia subvaginata	30	0.8	
Jacksonia floribunda	170	0.5	
Lepidosperma sp.	30	0.2	
**Lolium rigidum*	30	0.1	
Lomandra caespitosa	30	0.1	
Lomandra hermaphrodita	30	0.1	
Lyginia imberbis	50	0.2	
Melaleuca ?leuropoma	45	1.5	
Patersonia occidentalis	20	0.1	
Petrophile linearis	45	0.3	
Philotheca spicata	50	0.2	
Phlebocarya ciliata	30	0.5	
Phyllangium paradoxum	1	0.1	
Podotheca angustifolia	5	0.1	
Podotheca gnaphalioides	20	0.1	
Schoenus caespititius	0.2	50	
Schoenus nanus	2	0.1	
Styphelia conostephioides	35	1.5	
Styphelia xerophylla	30	0.5	
Verticordia ?nitens	130	20	
**Wahlenbergia capensis*	30	0.1	
Xanthorrhoea preissii	140	6	

FLORA SITE SHEET

Site: **OSQ17**

Project Name Orange Springs Offset Survey
Location -31.02561 **Lat** 115.69107 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Basin/depression
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and Melaleuca preissiana low open woodland over Hypocalymma angustifolium, Callitris pyramidalis and Verticordia sp. mid open shrubland over Conostephium pendulum, Melaleuca ?leuropoma and Petrophile macrostachya low sparse shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Acacia stenoptera	30	0.3	
Adenanthos cygnorum subsp. cygnorum	180	6	
Amphipogon turbinatus	30	0.1	
Austrostipa macalpinei	15	0.1	
Banksia attenuata	150	1	
Caladenia sp.	2	0.1	
Callitris pyramidalis	200	3	
Cassytha pomiformis	10	0.1	
Cyathochaeta avenacea	50	0.2	
Dampiera linearis	15	0.1	
Drosera erythrorhiza	1	0.1	
Elythranthera brunonis	10	0.1	
Hibbertia subvaginata	20	0.1	
Hypocalymma angustifolium	120	2	
Jacksonia nutans	130	25	
Levenhookia stipitata	3	0.1	
Lyginia imberbis	70	0.2	
Melaleuca ?leuropoma	130	1.5	
Melaleuca preissiana	500	10	
Persoonia comata	55	1	
Petrophile brevifolia	45	2	
Philotheca spicata	120	0.5	
Phyllangium paradoxum	5	0.1	
Poranthera microphylla	3	0.1	
Pterostylis dilatata	20	0.1	
Schoenus nanus	3	0.1	
Scholtzia ?involucrata	30	0.2	
Stirlingia latifolia	30	0.2	
Stylidium ?adpressum	5	0.1	
Trachymene pilosa	3	0.1	
Verticordia sp.	145	20	

FLORA SITE SHEET

Site: **OSQ18**

Project Name Orange Springs Offset Survey
Location -31.02586 **Lat** 115.68613 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Eremaea pauciflora, Melaleuca ?seriata and Styphelia conostephioides low shrubland over Lyginia imberbis and Schoenus caespititius low isolated clumps of sedges*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	0.1	
Amphipogon turbinatus	20	0.2	
Andersonia heterophylla	50	1	
**Arctotheca calendula*	6	0.1	
Austrostipa macalpinei	15	0.1	
Banksia attenuata	400	20	
Banksia menziesii	400	2	
Bossiaea eriocarpa	35	0.1	
Burchardia congesta	60	0.1	
Caesia sp.	20	0.1	
Caladenia flava subsp. flava	15	0.1	
Chaetospora curvifolia	30	0.1	
Conostephium pendulum	40	0.1	
Conostylis juncea	40	0.2	
Crassula colorata	1	0.1	
Cyanothamnus ramosus subsp. anethifolius	20	0.1	
Dampiera linearis	40	0.1	
Drosera erythrorhiza	1	0.1	
Eremaea pauciflora	110	10	
**Gladiolus caryophyllaceus*	20	0.1	
Hibbertia subvaginata	30	0.3	
**Hypochaeris glabra*	1	0.1	
Isotropis cuneifolia subsp. cuneifolia	20	0.1	
Jacksonia nutans	110	3	
Leucopogon sprengelioides	80	0.5	
Lomandra hermaphrodita	15	0.1	
Lyginia imberbis	50	0.2	
Melaleuca ?seriata	70	12	
Patersonia occidentalis	40	0.1	
Petrophile linearis	40	0.2	
Phyllangium paradoxum	5	0.1	
Podotheca gnaphalioides	5	0.1	
Poranthera microphylla	3	0.1	
Schoenus caespititius	60	0.5	
Scholtzia ?involucrata	30	0.4	
Stylidium ?adpressum	5	0.1	
Styphelia conostephioides	80	2	
Thysanotus sp.	10	0.1	
Trachymene pilosa	5	0.1	
**Ursinia anthemoides*	20	0.1	
Verticordia sp.	3	0.1	

FLORA SITE SHEET

Site: **OSQ19**

Project Name Orange Springs Offset Survey
Location -31.02615 **Lat** 115.68727 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Basin/depression
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia ilicifolia, B. attenuata and Melaleuca preissiana low open woodland over Adenanthos cygnorum subsp. cygnorum tall sparse shrubland over Verticordia ?nitens and Eremaea pauciflora*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Adenanthos cygnorum subsp. cygnorum	310	6	
Alexgeorgea nitens	15	0.1	
Andersonia heterophylla	3	0.1	
Austrostipa macalpinei	10	0.1	
Banksia attenuata	230	1	
Banksia ilicifolia	400	1	
Banksia laricina	60	0.2	
Banksia menziesii	310	1.5	
Cassytha pomiformis	30	0.1	
Chaetospora curvifolia	40	0.1	
Conostephium pendulum	30	0.2	
Dampiera linearis	5	0.1	
Eremaea pauciflora	120	8	
Hibbertia subvaginata	20	0.5	
Leptocarpus coangustatus	100	0.2	
Leucopogon sprengelioides	50	0.2	
Lyginia imberbis	20	0.1	
Melaleuca ?leuropoma	60	10	
Melaleuca preissiana	210	1	
Patersonia occidentalis	20	0.1	
Petrophile linearis	40	0.1	
Phlebocarya ciliata	40	0.2	
Phyllangium paradoxum	3	0.1	
Podotheca angustifolia	5	0.1	
Schoenus caespititius	60	0.2	
Scholtzia ?involucrata	20	0.5	
Stylidium ?adpressum	20	0.1	
Stylidium schoenoides	50	0.1	
Styphelia ciliosa	60	0.2	
Styphelia conostephioides	40	5	
Styphelia xerophylla	70	5	
Verticordia ?nitens	120	3	

FLORA SITE SHEET

Site: **OSQ20**

Project Name Orange Springs Offset Survey
Location -31.02840 **Lat** 115.69358 **Long**
Described by: NW, MY
Date: 26-09-2024

Type: Quadrat 10 x 10
Landform: Mid slope
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and Melaleuca preissiana low woodland over Jacksonia floribunda and Verticordia ?nitens mid open shrubland over Eremaea pauciflora and Melaleuca ?seriata low open shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	8	0.3	
Andersonia heterophylla	70	0.5	
Austrostipa macalpinei	20	0.1	
Banksia menziesii	1000	8	
Bossiaea eriocarpa	20	0.1	
Burchardia congesta	60	0.1	
Caladenia flava subsp. flava	15	0.1	
Callitris pyramidalis	50	0.2	
Calytrix sp.	60	0.2	
Cassytha pomiformis	30	0.1	
Conostephium pendulum	40	0.3	
Conostylis juncea	35	0.1	
Drosera menziesii	20	0.1	
Eremaea pauciflora	80	15	
Gompholobium tomentosum	20	0.1	
Hibbertia subvaginata	30	0.5	
Jacksonia floribunda	120	0.5	
Lechenaultia floribunda	30	0.4	
Leptocarpus coangustatus	90	0.1	
Lomandra hermaphrodita	30	0.1	
Lyginia imberbis	60	0.1	
Melaleuca ?seriata	80	6	
Melaleuca preissiana	450	6	
Patersonia occidentalis	45	0.5	
Phlebocarya ciliata	35	0.2	
Phyllangium paradoxum	5	0.1	
Pterostylis dilatata	15	0.1	
Schoenus caespititius	55	0.5	
Schoenus nanus	5	0.1	
Scholtzia ?involucrata	35	1	
Scholtzia laxiflora	25	0.1	
Stylidium ?adpressum	20	0.1	
Styphelia conostephioides	40	1	
Styphelia xerophylla	45	3	
Thysanotus sp.	20	0.1	
Trachymene pilosa	10	0.1	
**Ursinia anthemoides*	20	0.3	
Verticordia ?nitens	130	0.5	

FLORA SITE SHEET

Site: **OSQ21**

Project Name Orange Springs Offset Survey
Location -31.02436 **Lat** 115.68792 **Long**
Described by: NW, MY
Date: 27-09-2024

Type: Quadrat 10 x 10
Landform: Basin/depression
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia ilicifolia and B. attenuata tall open shrubland over Banksia laricina, Hypocalymma angustifolium and Verticorida ?nitens mid open shrubland over Hibbertia subvaginata, Styphelia xerophylla and Andersonia heterophylla low open shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Adenanthos cygnorum subsp. cygnorum	230	10	
Andersonia heterophylla	30	0.2	
Banksia attenuata	800	5	
Banksia ilicifolia	400	1	
Banksia laricina	130	3	
Bossiaea eriocarpa	25	0.5	
Dampiera linearis	40	0.1	
Drosera menziesii	30	0.1	
Euchilopsis linearis	30	0.1	
Gompholobium confertum	80	0.5	
Hibbertia sp.	15	0.3	
Hibbertia subvaginata	30	1	
Hypocalymma angustifolium	120	2	
Leptocarpus coangustatus	30	0.3	
Lyginia imberbis	60	1.5	
Melaleuca ?leuropoma	45	0.5	
Patersonia occidentalis	40	0.1	
Persoonia comata	30	0.1	
Petrophile linearis	30	0.1	
Philotheca spicata	70	0.1	
Phlebocarya ciliata	40	0.5	
Phyllangium paradoxum	3	0.1	
Schoenus caespititius	60	0.3	
Scholtzia ?involucrata	30	0.2	
Stylidium ?adpressum	5	0.1	
Styphelia ciliosa	35	0.4	
Styphelia conostephioides	30	0.3	
Styphelia xerophylla	65	6	
Verticordia ?nitens	130	8	

FLORA SITE SHEET

Site: **OSQ22**

Project Name Orange Springs Offset Survey
Location -31.03206 **Lat** 115.69077 **Long**
Described by: NW, MY
Date: 27-09-2024

Type: Quadrat 10 x 10
Landform: Mid slope
Slope: Moderate
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia menziesii and B. attenuata low woodland over Eremaea pauciflora, Jacksonia floribunda and Leptocarpus coangustatus mid open shrubland over Melaleuca ?leuropoma, Melaleuca ciliosa and Styphelia xerophylla low open shrubland*

Condition: Excellent **Disturbance Type:** Weeds
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
?Hibbertia huegelii	25	0.1	
Acacia stenoptera	50	0.1	
Alexgeorgea nitens	15	0.1	
Anigozanthos humilis subsp. humilis	25	0.1	
Apectospermum spinescens	40	0.1	
Arnocrinum preissii	70	0.1	
Banksia attenuata	450	5	
Banksia menziesii	500	7	
Bossiaea eriocarpa	50	0.1	
Cassytha pomiformis	50	0.1	
Chaetospora curvifolia	2	0.1	
Chordifex sinuosus	40	0.1	
Conospermum stoechadis	80	1	
Conostylis angustifolia	20	0.1	
Daviesia divaricata subsp. divaricata	55	1	
Drosera erythrorhiza	1	0.1	
Drosera humilis	15	0.1	
Drosera menziesii	30	0.1	
Drosera sp.	1	0.1	
Eremaea pauciflora	80	10	
Gastrolobium plicatum	40	0.2	
Hemiandra ?pungens	30	0.1	
Hibbertia hypericoides	45	1.5	
Hibbertia pubens	30	0.1	
Jacksonia floribunda	120	8	
Lepidosperma ?scabrum	60	0.1	
Leptocarpus coangustatus	65	1	
Leptospermopsis sp.	70	0.5	
Leucopogon sprengelioides	50	0.2	
Lomandra hermaphrodita	20	0.1	
Lysinema pentapetalum	50	0.2	
Melaleuca ?leuropoma	60	1.5	
Melaleuca ciliosa	70	1	
Mesomelaena pseudostygia	60	8	
Monotaxis grandiflora var. grandiflora	10	0.1	
Patersonia occidentalis	60	0.1	
Petrophile linearis	60	0.1	
Petrophile macrostachya	110	2.5	
Poranthera microphylla	4	0.1	
Schoenus pleiostemoneus	20	0.1	
Scholtzia ?involucrata	45	0.1	
Stirlingia latifolia	60	1.5	
Stylidium miniatum	30	0.1	
Styphelia conostephioides	50	0.5	
Synaphea spinulosa subsp. spinulosa	30	0.5	
Verticordia sp.	60	0.2	
Xanthosia huegelii	15	0.2	

FLORA SITE SHEET

Site: **OSR01**

Project Name Orange Springs Offset Survey
Location -31.02161 **Lat** 115.68282 **Long**
Described by: GB
Date: 27-09-2024

Type: Releve 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Verticordia nitens and Adenanthos cygnorum subsp. cygnorum mid shrubland over Jacksonia nutans low open shrubland over Podotheca gnaphalioides and *Ursinia anthemoides low isolated clumps of forbs*

Condition: Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Adenanthos cygnorum subsp. cygnorum	100	25	
**Bromus diandrus*	4	2	
Jacksonia nutans	30	25	
Nuytsia floribunda	400	0.1	
Podotheca gnaphalioides	10	1	
**Ursinia anthemoides*	5	1	
Verticordia nitens	140	30	

FLORA SITE SHEET

Site: **OSR02**

Project Name Orange Springs Offset Survey
Location -31.01957 **Lat** 115.68449 **Long**
Described by: GB
Date: 27-09-2024

Type: Releve 10 x 10
Landform: Undulating plain
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata, Eucalyptus todtiana and B. menziesii low woodland over Hibbertia hypericoides, Eremaea pauciflora and Leptospermopsis sp. low shrubland over Patersonia occidentalis and Alexgeorgea nitens sparse forbland*

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	1	
Banksia attenuata	400	10	
Banksia menziesii	500	2	
Banksia prionotes	350	2	
Eremaea pauciflora	50	5	
Eucalyptus todtiana	400	3	
Hibbertia hypericoides	80	5	
Jacksonia floribunda	80	0.5	
Leptospermopsis sp.	80	2	
Patersonia occidentalis	30	1	
Stirlingia latifolia	40	1	

FLORA SITE SHEET

Site: **OSR03**

Project Name Orange Springs Offset Survey
Location -31.01644 **Lat** 115.67986 **Long**
Described by: MY
Date: 25-09-2024

Type: Releve 10 x 10
Landform: Upper slope
Slope: Moderate
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia attenuata and B. menziesii low woodland over Stirlingia latifolia and Petrophile seminuda mid sparse shrubland over Hibbertia hypericoides and Eremaea pauciflora low shrubland*

Condition: Excellent **Disturbance Type:** Weeds,Animal (Other) tracks/scats
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	15	0.2	
Allocasuarina humilis	90	1	
Anigozanthos humilis subsp. humilis	20	0.1	
Austrostipa elegantissima	90	0.1	
Banksia attenuata	300	3	
Banksia menziesii	350	30	
**Briza maxima*	20	0.1	
Burchardia congesta	20	0.1	
Calectasia narragara	30	0.1	
Cassytha pomiformis	50	0.1	
Conostephium pendulum	20	0.2	
Dampiera linearis	20	0.5	
**Ehrharta calycina*	50	1	
Eremaea pauciflora	60	5	
**Gladiolus caryophyllaceus*	70	0.2	
Hibbertia hypericoides	90	30	
**Hypochaeris glabra*	20	0.1	
Isotropis cuneifolia subsp. cuneifolia	3	0.2	
Lyginia imberbis	60	0.1	
Mesomelaena pseudostygia	40	2	
Myrtaceae sp.	48	0.2	
Neurachne alopecuroidea	30	0.1	
Patersonia occidentalis	20	0.1	
Petrophile seminuda	90	5	
Philotheca spicata	120	0.2	
Phyllangium paradoxum	5	0.1	
Podotheca gnaphalioides	30	5	
Schoenus nanus	2	0.1	
Stirlingia latifolia	110	4.5	
Synaphea spinulosa subsp. spinulosa	30	0.1	
Trachymene pilosa	5	0.1	
**Ursinia anthemoides*	20	0.1	
**Wahlenbergia capensis*	30	0.1	

FLORA SITE SHEET

Site: **OSR04**

Project Name Orange Springs Offset Survey
Location -31.01212 **Lat** 115.67807 **Long**
Described by: GB
Date: 25-09-2024

Type: Releve 10 x 10
Landform: Undulating plain
Slope: Gentle
Rock Type: N/A
Soil Type: Sand
Soil Colour: Grey,White



Vegetation: *Banksia prionotes, Eucalyptus todtiana and B. menziesii over Jacksonia floribunda and Petrophile macrostachya mid sparse shrubland over Hibbertia hypericoides and Eremaea pauciflora low shrubland*

Condition: Very Good **Disturbance Type:** Weeds,Cattle tracks/scats,Rabbit tracks/scats
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	10	1.5	
Austrostipa flavescens	30	2	
Banksia menziesii	300	2	
Banksia prionotes	500	25	
Burchardia congesta	60	0.5	
Eremaea pauciflora	60	2	
Eucalyptus todtiana	450	5	
Hibbertia hypericoides	90	20	
Jacksonia floribunda	120	3	
Mesomelaena pseudostygia	60	2	
Petrophile macrostachya	100	1	
**Ursinia anthemoides*	20	2	

FLORA SITE SHEET

Site: **OSR05**

Project Name	Orange Springs Offset Survey			
Location	-31.01440	**Lat**	115.67875	**Long**
Described by:	NW			
Date:	25-09-2024			
Type:	Releve	10 x 10		
Landform:	Crest			
Slope:	Moderate			
Rock Type:	N/A			
Soil Type:	Sand			
Soil Colour:	Grey,White			



Vegetation: *Eucalyptus todtiana and Banksia menziesii low woodland over Jacksonia nutans and J. floribunda mid sparse shrubland over Hibbertia hypericoides, Eremaea pauciflora and Stirlingia latifolia low shrubland*

Condition: Very Good **Disturbance Type:** Weeds,Rabbit tracks/scats

Fire Age: >10 years

SPECIES LIST

Taxon	Height (m)	Cover (%)	Notes
Alexgeorgea nitens	8	0.5	
Anigozanthos humilis subsp. humilis	30	0.3	
Banksia menziesii	650	10	
Bossiaea eriocarpa	40	0.5	
**Briza maxima*	25	2	
Burchardia congesta	45	0.2	
Caladenia flava subsp. flava	15	0.1	
**Ehrharta calycina*	80	2	
Eremaea pauciflora	90	5	
Eucalyptus todtiana	650	15	
**Gladiolus caryophyllaceus*	50	0.2	
Hibbertia hypericoides	80	20	
**Hypochaeris glabra*	15	4	
Jacksonia floribunda	150	1	
Jacksonia nutans	120	3	
Mesomelaena pseudostygia	60	3	
Opercularia vaginata	20	0.2	
Petrophile linearis	35	0.2	
Podotheca gnaphalioides	35	0.3	
Stirlingia latifolia	85	3	
Styphelia xerophylla	60	3	
Trachymene pilosa	10	1	
**Ursinia anthemoides*	35	4	

Appendix H Flora Statistical Analysis

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Flora Site and Vegetation Type	Nearest Neighbout Analysis			FCT Comparison
	Similarity (%)	Site	FCT	
OSQ01	37.93	5D01	23b	22
	37.04	MPK02	22	
	38.30	YAN-17	22	
OSQ02	46.43	ELE28	23b	23b
	46.15	MNP01	23b	
	46.15	MP05	23b	
OSQ03	36.36	BNR20	S09	23b
	37.68	MR09	23b	
	37.14	MR14	S09	
	36.36	SF01	23b	
OSQ04	45.98	BNR31	23b	23b
	50.00	MOOR 09	23b	
	45.57	MP05	23b	
OSQ05	48.00	MP05	23b	23b
	47.06	MP08	23b	
	47.89	MR10	23b	
OSQ06	51.22	BNR31	23b	23b
	53.01	MOOR 09	23b	
	46.38	WN100WNR	23b	
OSQ07	48.78	BNR31	23b	23b
	48.65	MNP01	23b	
	48.00	MR09	23b	
OSQ08	48.00	BNR33	23b	23b
	50.67	MP05	23b	
	52.63	MR09	23b	
OSQ09	36.07	MR05	23b	23b
	35.56	perth04	23a	
	35.79	yuri01	23c	
OSQ10	38.71	5D01	23b	23b
	40.63	MWR10	23b	
	42.11	SF03	21c	
OSQ11	44.00	BNR32	22	22
	45.00	ELE18	22	
	41.94	MNP01	23b	
OSQ12	44.12	ELE17	23b	23b
	46.58	MOOR 07	23b	
	46.67	MR13	23b	
OSQ13	42.42	MNP02	23b	23b
	45.45	MOOR 07	23b	
	50.98	MR11	22	
OSQ14	50.00	MOOR 09	23b	23b
	45.00	MR09	23b	
	42.35	WN084CHE	23b	
OSQ15	53.93	MOOR 09	23b	23b
	47.50	MP05	23b	
	51.85	MR09	23b	
OSQ16	48.00	MNP01	23b	23b
	47.37	MR09	23b	
	47.89	MR10	23b	
OSQ17	48.35	BNR31	23b	23b
	54.35	MOOR 09	23b	
	48.84	SF02	23b	
OSQ18	49.46	MOOR 09	23b	23b
	50.00	MR10	23b	
	48.28	SF02	23b	
OSQ19	48.10	MNP01	23b	23b
	45.00	MNP02	23b	
	44.74	MP04	23b	
OSQ20	32.35	MR09	23b	23b
	33.96	MR11	22	
	30.19	MR12	23b	
OSQ21	47.62	ELE03	23b	23b
	48.19	MELA-2	23b	
	51.11	YULE-1	23a	
OSQ22	47.06	BNR33	23b	23b
	47.06	MNP01	23b	
	47.76	PLINE-1	23b	
OSR01	19.35	ELE21	S09	23b
	17.39	WN098WNR	S04	
	17.39	WN107MNR	S16	
OSR02	36.73	MR10	23b	23b
	41.03	MSF02	S09	
	36.00	MWR08	23b	
	36.00	MWR10	23b	
OSR03	28.57	ELE24	23b	23b
	28.57	MR09	23b	
	30.77	MWR10	23b	
	30.19	SF01	23b	
OSR04	40.96	ELE03	23b	23b
	42.11	ELE24	23b	
	41.03	SF02	23b	
OSR05	43.24	ELE03	23b	23b
	41.67	ELE08	23b	
	45.61	ELE28	23b	

Appendix I Fauna Desktop Assessment Results

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Conservation Status: State - Listed under Biodiversity Conservation Act 2-16 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR/CE - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.
Database: NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, Field - Recorded during the current field survey.
Literature: A - Orange Springs Road Fauna Assessment Report (Ecoedge, 2019)

Literature: B - Brand Highway, Regans Ford Biological Survey (Astron 2016)

Literature: C - Mogumber Poultry Farm 2 Development, Flora, Vegetation and Black Cockatoo Assessment (360 Environmental, 2018)

Literature: D - CBH Moora Expansion Flora, Vegetation and Fauna Survey (Ecological, 2020)

Literature: E - Guilderton Sovereign Hill Pipeline Spring Flora, Vegetation Fauna and Black Cockatoo (Ecological, 2021)

Literature: F - Great Northern Highway: Bindoon Bypass Fauna Assessment (Bamford Consulting Ecologists, 2018)

Literature: G - Yandin Wind Farm Flora, Vegetation and Avifauna Assessment (Ecologia, 2017)

Literature: H - Midland Brick Muchea-6 Survey Area (Mattiske Consulting, 2022)

Literature: I - Deep Space Facility Flora and Fauna Survey (Ecoscape, 2020)

Literature: J - Waddi Wind Farm Project - Cataby Supplementary Flora, Vegetation and Fauna Survey (Ecological, 2020)

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Amphibia																		
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog	-	-	3													
Limnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog	-	-	1					1				1				
Limnodynastidae	*Neobatrachus pelobatoides*	Humming Frog	-	-	8													
Myobatrachidae	*Crinia glauerti*	Clicking Frog	-	-	4									1				
Myobatrachidae	*Crinia insignifera*	Squelching Froglet	-	-	16					1								
Myobatrachidae	*Pseudophryne guentheri*	Crawling Toadlet	-	-	64													
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog	-	-	2									1				
Pelodryadidae	*Litoria moorei*	Motorbike Frog	-	-	5									1				
Aves																		
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill	-	-	18										1			
Acanthizidae	*Acanthiza chrysorrhoa*	Reticulated Velvet Gecko	-	-	37				1		1				1		1	
Acanthizidae	*Acanthiza inornata*	Western Thornbill	-	-	17										1			
Acanthizidae	*Aphelocephala leucopsis*	Southern Whiteface	-	VU		1												
Acanthizidae	*Gerygone fusca*	Western Gerygone	-	-	67				1		1		1		1			
Acanthizidae	*Sericornis maculatus*	Spotted Scrubwren	-	-	2										1			
Acanthizidae	*Smicrornis brevirostris*	Weebill	-	-	15					1		1	1		1		1	
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk	-	-	1													1
Accipitridae	*Accipiter fasciatus*	Brown Goshawk	-	MA	5													
Accipitridae	*Aquila audax*	Wedge-tailed Eagle	-	-	12													
Accipitridae	*Circus approximans*	Swamp Harrier	-	MA	8													
Accipitridae	*Circus assimilis*	Spotted Harrier	-	-	1													
Accipitridae	*Elanus axillaris*	Black-shouldered Kite	-	-	5				1						1			
Accipitridae	*Haliastur sphenurus*	Whistling Kite	-	MA	16							1						
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	-	-	4					1								
Accipitridae	*Lophoictinia isura*	Square-tailed Kite	-	-	2										1			

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler	-	MA	1-													
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra	-	-	32					1	1		1		1		1	
Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	-	MA	22													
Anatidae	*Anas gracilis*	Grey Teal	-	-	41					1								
Anatidae	*Anas platyrhynchos*	Mallard	-	-	1													
Anatidae	*Anas superciliosa*	Pacific Black Duck	-	-	67					1								
Anatidae	*Aythya australis*	Hardhead	-	-	9													
Anatidae	*Biziura lobata*	Musk Duck	-	MA	19													
Anatidae	*Chenonetta jubata*	Australian Wood Duck, Wood Duck, Maned Duck	-	-	31					1				1				
Anatidae	*Cygnus atratus*	Black Swan	-	-	29													
Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck	-	-	6													
Anatidae	*Oxyura australis*	Blue-billed Duck	P4	-	23		2											
Anatidae	*Spatula rhynchotis*	Australasian Shoveler	-	-	14													
Anatidae	*Stictonetta naevosa*	Freckled Duck	-	-	3													
Anatidae	*Tadorna tadornoides*	Australian Shelduck, Mountain Duck	-	-	41									1				
Anhingidae	*Anhinga novaehollandiae*	Australasian Darter	-	-	5													
Apodidae	*Apus pacificus*	Pacific Swift, Fork-tailed Swift	MI	MI, MA		1												
Ardeidae	*Ardea alba*	Great Egret, Eastern Great Egret	-	MA										1				
Ardeidae	*Ardea alba modesta*	Eastern Grey Egret	-		12									1				
Ardeidae	*Ardea cinerea*	Grey Heron	-	-														
Ardeidae	*Ardea pacifica*	White-necked Heron	-	-	9													
Ardeidae	*Egretta novaehollandiae*	White-faced Heron	-	-	38										1			
Ardeidae	*Nycticorax caledonicus*	Nankeen Night Heron, Rufous Night Heron	-	MA	5													
Artamidae	*Artamus cinereus*	Black-faced Woodswallow	-	-	13				1						1			
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow	-	-	2													
Artamidae	*Artamus personatus*	Masked Woodswallow	-	-									1					
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	-	-	3				1	1								
Artamidae	*Cracticus torquatus*	Grey Butcherbird	-	-	31				1						1			
Artamidae	*Gymnorhina tibicen*	Australian Magpie	-	-	58				1	1	1	1	1		1		1	1
Artamidae	*Strepera versicolor*	Grey Currawong	-	-	1													
Cacatuidae	*Cacatua pastinator*	Western Long-billed Corella		-	1-										1			
Cacatuidae	*Cacatua sanguinea*	Little Corella	-	-	4				1	1		1	1					
Cacatuidae	*Calyptorhynchus banksii*	Red-tailed Black Cockatoo	-	-	2													
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU										1				
Cacatuidae	*Eolophus roseicapilla*	Galah	-	-	3-					1	1	1	1		1			
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN	EN										1				
Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN	EN	18-	1	858		1	1		1	1	1	1	1	1	1
Cacatuidae	*Zanda sp. 'white-tailed black cockatoo'*	-	EN	EN	4		22											
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	-	MA	33				1	1	1	1			1			1

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Casuariidae	*Dromaius novaehollandiae*	Emu	-	-	3						1			1	1			
Charadriidae	*Anarhynchus ruficapillus*	Red-capped Plover	-	MA	6													
Charadriidae	*Charadrius melanops*	Black-fronted Dotterel	-	-	18													1
Charadriidae	*Erythrogonys cinctus*	Red-kneed Dotterel	-	-	5													
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	MI	MI, MA	2													
Charadriidae	*Thinornis cucullatus*	Hooded Plover, Hooded Dotterel	-	-	5													
Charadriidae	*Vanellus tricolor*	Banded Lapwing	-	-	2													
Columbidae	*Ocyphaps lophotes*	Crested Pigeon	-	-	1-							1	1					
Columbidae	*Phaps chalcoptera*	Common Bronzewing	-	-	1					1			1	1	1			
Columbidae	*Spilopelia chinensis*	Spotted Turtle Dove	-	-	3													
Columbidae	*Spilopelia senegalensis*	Laughing Turtle Dove	-	-	7								1					
Corvidae	*Corvus bennetti*	Little Crow	-	-	2													
Corvidae	*Corvus coronoides*	Australian Raven	-	-	62				1	1	1	1	1		1			
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	-	MA											1			
Cuculidae	*Chalcites basalis*	Horsfield's Bronze Cuckoo	-	MA									1				1	1
Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo	-	MA	13													
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird	-	-	1													
Falconidae	*Falco berigora*	Brown Falcon	-	-	2													
Falconidae	*Falco cenchroides*	Nankeen Kestral	-	MA	24					1					1			
Falconidae	*Falco longipennis*	Australian Hobby	-	-	3										1			
Hirundinidae	*Cheramoeca leucosterna*	White-backed Swallow	-	-	1													
Hirundinidae	*Hirundo neoxena*	Welcome Swallow	-	MA	35					1			1					
Hirundinidae	*Petrochelidon ariel*	Fairy Martin	-	-	1													
Hirundinidae	*Petrochelidon nigricans*	Tree Martin	-	MA	38				1						1			
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull	-	-	1-													
Laridae	*Hydroprogne caspia*	Caspian Tern	MI	MI, MA	2													
Laridae	*Sternula nereis*	Fairy Tern				1												
Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark	-	-	3													
Locustellidae	*Poodytes gramineus*	Little Grassbird	-	-	4													
Maluridae	*Malurus assimilis*	Purple-backed Fairywren		-	7								1		1			
Maluridae	*Malurus leucopterus*	White-winged Fairywren			4				1		1							
Maluridae	*Malurus splendens*	Splendid Fairywren	-	-	49				1			1			1			
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	4	1												
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill	-	-	22				1									
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	-	-	37							1	1		1			
Meliphagidae	*Anthochaera lunulata*	Western Little Wattlebird, Western Wattlebird	-	-	1-										1			
Meliphagidae	*Epthianura albifrons*	White-fronted Chat	-	-	9													
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	-	-	28					1	1	1	1		1			
Meliphagidae	*Gliciphila melanops*	Tawny-crowned Honeyeater	-	-	6													
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	-	-	75				1	1	1	1	1		1			1
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	-	-	6							1			1			
Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater	-	-	2													

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Meliphagidae	*Phylidonyris niger*	White-cheeked Honeyeater	-	-	14					1	1		1		1			
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	-	-	21				1	1			1		1			
Meliphagidae	*Ptilotula ornata*	Yellow-plumed Honeyeater	-	-	3													
Meropidae	*Merops ornatus*	Rainbow Bee-eater	-	MA	8								1	1				
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	-	MA	3-				1	1	1	1	1		1			
Monarchidae	*Myiagra inquieta*	Restless Flycatcher	-	-	6													
Motacillidae	*Anthus australis*	Australian Pipit	-								1				1			
Motacillidae	*Motacilla cinerea*	Grey Wagtail	MI	MI, MA		1												
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	-	-	6													
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird	-	-	3													
Otididae	*Ardeotis australis*	Australian Bustard	-	-	1													
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush	-	-	9				1						1			
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler	-		1													
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	-	-	52				1				1		1			1
Pandionidae	*Pandion haliaetus*	Osprey	MI	MI, MA		1												
Pandionidae	*Pandion haliaetus cristatus*	Eastern Osprey			1													1
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	-	-	48										1			
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican	-	MA	7													
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin	-	-	1													
Petroicidae	*Microeca fascinans*	Jacky Winter	-	-	1													
Petroicidae	*Petroica boodang*	Scarlet Robin	-	-	14				1					1				
Petroicidae	*Petroica goodenovii*	Red-capped Robin	-	-	3													
Petroicidae	*Quoyornis georgianus*	White-breasted Robin	-	-														
Phalacrocoracidae	*Microcarbo melanoleucos*	mallee black-backed snake	-	-	27												1	
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant	-	-	2													
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	-	-	22													
Phalacrocoracidae	*Phalacrocorax varius*	Pied Cormorant, Australian Pied Cormorant	-	-						1								
Phasianidae	*Coturnix pectoralis*	Stubble Quail	-	MA											1			
Phasianidae	*Synoicus ypsilophorus*	Brown Quail	-	-														
Podicipedidae	*Podiceps cristatus*	Great Crested Grebe	-	-	1													
Podicipedidae	*Poliocephalus poliocephalus*	Hoary-headed Grebe	-	-	18					1								
Podicipedidae	*Tachybaptus novaehollandiae*	Southern Shovel-nose Snake	-	-	24									1				
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-	6-				1	1	1	1	1		1			
Psittaculidae	*Barnardius zonarius zonarius*	Port Lincoln Parrot	-	-	2													
Psittaculidae	*Melopsittacus undulatus*	Budgerigar	-	-									1				1	
Psittaculidae	*Platycercus icterotis*	Western Rosella	-	-	8								1					
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot	-	-	11						1							
Psittaculidae	*Trichoglossus moluccanus*	Rainbow Lorikeet	-	-	5													
Rallidae	*Fulica atra*	Eurasian Coot	-	-	25					1								
Rallidae	*Fulica atra australis*	Australian Coot	-	-	13													
Rallidae	*Gallinula tenebrosa*	Western Three-lined Skink	-	-	6													
Rallidae	*Porphyrio melanotus*	Australasian Swamphen	-	MA	8													
Rallidae	*Tribonyx ventralis*	Black-tailed Native-hen	-	-	3													
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt	-	-	4													

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	-	MA	18													
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet	-	MA	4													
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	-	-	62				1		1				1			
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	-	-	45				1	1	1	1	1		1			
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN	EN, MA		1											1	
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI, MA	2	1											1	
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	MI	VU, MI, MA	4	2												
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR	CE, MI, MA	4	2												
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	MI	MI, MA		1												
Scolopacidae	*Calidris pugnax*	Ruff	MI	MI, MA	2													
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	MI	MI, MA	6													
Scolopacidae	*Numenius madagascariensis*	Far Eastern Curlew, Eastern Curlew	CR	CE, MI, MA		2												
Scolopacidae	*Tringa glareola*	Wood Sandpiper	MI	MI, MA	5													
Scolopacidae	*Tringa nebularia*	Common Greenshank	MI	EN, MI, MA	17	2	2											
Strigidae	*Ninox boobook*	Boobook Owl	-	-	1													
Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill	-	-	22													
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	MI	MI, MA	8													
Threskiornithidae	*Threskiornis molucca*	Australian White Ibis	-	MA	17									1				
Threskiornithidae	*Threskiornis spinicollis*	Straw-necked Ibis	-	MA	24									1	1			
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye	-	MA	32					1					1			
Mammalia																		
Bovidae	*Bos primigenius taurus*	European Cattle	-	-							1						1	
Bovidae	*Ovis aries*	Sheep	-	-													1	
Canidae	*Canis familiaris*	Dingo / Dog	-	-						1								
Canidae	*Vulpes vulpes*	Red Fox	-	-							1						1	
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU	4	1												
Dasyuridae	*Parantechinus apicalis*	Dibbler	EN	EN		1												
Felidae	*Felis catus*	Cat	-	-								1						
Leporidae	*Oryctolagus cuniculus*	Rabbit	-	-						1	1						1	
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo	-	-	1				1	1	1	1					1	
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-	19													
Macropodidae	*Osphranter robustus*	Euro, Biggada	-	-									1					
Megadermatidae	*Macroderma gigas*	Ghost Bat	VU	VU		1												
Muridae	*Hydromys chrysogaster*	Water Rat	P4	-	4													
Muridae	*Mus musculus*	House Mouse	-	-	1						1	1						
Muridae	*Pseudomys albocinereus*	Ash-grey Mouse	-	-	3													
Muridae	*Rattus rattus*	Black Rat	-	-	1													
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna	-	-	1												1	
Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU	2													
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	-	-	9													
Vespertilionidae	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	-	-	4													
Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat	-	-	11													
Reptilia																		

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Agamidae	*Ctenophorus adelaidensis*	Western heath dragon	-	-	1-													
Agamidae	*Ctenophorus maculatus*	Spotted Sand Dragon	-	-							1							
Agamidae	*Pogona minor minor*	Western Bearded Dragon	-	-	3													
Chelidae	*Pseudemydura umbrina*	Western Swamp Tortoise	CR	CE	8	1												
Diplodactylidae	*Hesperoedura reticulata*	-	-	-													1	
Diplodactylidae	*Lucasium alboguttatum*	White-spotted Ground Gecko	-	-	2													
Diplodactylidae	*Strophurus spinigerus*	Soft Spiny-tailed Gecko	-	-	6													
Elapidae	*Brachyurophis fasciolatus*	Narrow-banded Shovel-nosed Snake	-	-	1													
Elapidae	*Brachyurophis semifasciatus*	-	-	-	1													
Elapidae	*Demansia reticulata*	Reticulated Whipsnake	-	-	2													
Elapidae	*Echiopsis curta*	Bardick	-	-	2													
Elapidae	*Suta gouldii*	Gould's Hooded Snake	-	-	1													
Elapidae	*Suta nigriceps*	-	-	-	1													
Pygopodidae	*Aprasia repens*	Sand-plain Worm-lizard	-	-	1													
Pygopodidae	*Lialis burtonis*	Burton's Snake-lizard	-	-	2													
Pygopodidae	*Pygopus lepidopodus*	Common Scaly Foot	-	-	2													
Scincidae	*Acritoscincus trilineatus*	-	-	-	1													
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink	-	-	2									1				
Scincidae	*Ctenotus fallens*	West-coast Laterite Ctenotus	-	-	2													
Scincidae	*Egernia stokesii badia*	Western Spiny-tailed Skink	VU	EN		1												
Scincidae	*Lerista elegans*	Elegant Slider	-	-	1													
Scincidae	*Lerista praepedita*	Blunt-tailed West-coast Slider	-	-	1													
Scincidae	*Menetia greyii*	Common Dwarf Skink	-	-	2													
Scincidae	*Morethia obscura*	Shrubland Morethia Skink	-	-	2													
Scincidae	*Tiliqua rugosa*	Bobtail	-	-								1		1				
Typhlopidae	*Anilios australis*	Southern Blind Snake	-	-	1													
Varanidae	*Varanus gouldii*	Bungarra Or Sand Goanna	-	-	1						1			1				

Appendix J Fauna Site Sheets

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

OS-HAB-01-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0163723	**Longitude**	115.6770581
Date	25-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	Southwest	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Peeling bark,Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Banksia menziesii, Banksia attenuata, Jacksonia floribunda, Eremaea pauciflora and Verticordia nitens*
Ground stratum	Low (>0.5 m)	Rushland and/or sedgeland (50-80%)	*Melaleuca spp., Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	8046c774-3b4e-4171-81a0-1e10a7b22414,ea5401d3-8715-4589-

OS-HAB-02-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0105149	**Longitude**	115.6855227
Date	26-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very low	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Woody debris
Disturbance	Infrastructure,Litter,Vehicle tracks,Weeds		
Introduced fauna	None observed	**Leaf litter cover**	<5%

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Corymbia calophylla and Eucalyptus wandoo*
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Closed forbland (>80%)	*Weed grasses*



Fulcrum photo ID	ed56ecac-a02e-4079-a6ad-68f62f4a82a0,3ac76487-7cfc-47cc-9a10-

OS-HAB-03-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0202521	**Longitude**	115.6905443
Date	25-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	South	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White,Yellow	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Peeling bark,Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Banksia menziesii, Banksia attenuata, Jacksonia floribunda, Eremaea pauciflora and Verticordia nitens*
Ground stratum	Low (>0.5 m)	Closed rushland and/or sedgeland (>80%)	*Hibbertia spp., Melaleuca spp. and Petrophile spp.*



Fulcrum photo ID	34be0170-3c73-4a27-b079-95fab7139230,85417105-41d4-4749-

OS-HAB-04-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.014307	**Longitude**	115.6854333
Date	26-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sandy clay	**Rock/boulder cover**	Absent
Soil colour	Red,White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very low	**Water Source**	Present
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	
Disturbance	Clearing,Infrastructure,Vehicle tracks,Weeds		
Introduced fauna	None observed	**Leaf litter cover**	Absent

Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Closed forbland (>80%)	*Weed grasses*



Fulcrum photo ID	069307fd-e3e5-4631-b418-fd62ed510de9,74b8dfb5-1603-4490-90cb-

OS-HAB-05-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0254722	**Longitude**	115.690874
Date	26-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremaea pauciflora, Beaufortia elegans and Adenanthos cygnorum subsp. cygnorum*
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	2cbf0d73-7396-449f-aca7-154841fdef0c,8daa250e-7071-4ee6-b5d8-

OS-HAB-06-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0271719	**Longitude**	115.6925358
Date	26-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Banksia menziesii, Banksia attenuata, Verticordia nitens and Adenanthos cygnorum subsp. cygnorum*
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	abe9d181-3954-483b-9d90-eef042d04d7d,6173913c-9240-4abd-acf5-

OS-HAB-07-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0272098	**Longitude**	115.6900309
Date	26-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	<5%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Banksia menziesii and Banksia attenuata*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Verticordia nitens, Banksia menziesii and Banksia attenuata*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	1e87ba0a-d983-4b49-ae27-ccfa07d8368b,3a907767-00f9-4104-8c1a-

OS-HAB-08-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0319439	**Longitude**	115.6788937
Date	26-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Banksia attenuata, Adenanthos cygnorum subsp. cygnorum*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Sp*



Fulcrum photo ID	ec153d0d-ea6a-4920-b9bf-b3fc08a00ec2,5ac6f96f-ccee-4bf2-9d70-

OS-HAB-09-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.03491906	**Longitude**	115.6984551
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	South	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	<5%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Banksia menziesii and Banksia attenuata*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Banksia menziesii, Banksia attenuata, Verticordia nitens, Adenanthos cygnorum subsp. Cygnorum*
Ground stratum	Low (>0.5 m)	Rushland and/or sedgeland (50-80%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	e5da815c-1ad3-4708-a0c8-24e1203fc122,b86f4846-4f0d-4fef-87e9-

OS-HAB-10-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0216834	**Longitude**	115.6840294
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Low	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	Infrastructure,Overgrazing,Vehicle tracks		
Introduced fauna	None observed	**Leaf litter cover**	<5%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus todtiana*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Verticordia nitens, Adenanthos cygnorum subsp. cygnorum*
Ground stratum	Low (>0.5 m)	Open forbland (20-50%)	*Podotheca gnaphalioides and *Ursinia anthemoides*



Fulcrum photo ID	4ccb0d0b-5175-4ce4-a372-7f8b54dc758e,78338004-a627-4047-927e-

OS-HAB-11-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.02006339	**Longitude**	115.6721668
Date	25-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	Northeast	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Peeling bark,Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Banksia menziesii and Banksia attenuata*
Ground stratum	Low (>0.5 m)	Rushland and/or sedgeland (50-80%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	d2b299c1-5c4e-4b09-9f11-e390995557ae,2be0435b-045d-440e-8e3a-

OS-HAB-12-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.02883681	**Longitude**	115.6836855
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	West	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	<5%

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Banksia menziesii and Banksia attenuata*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Verticordia nitens, Eremaea pauciflora and Beaufortia elegans*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	b9af97b7-c66a-4e21-8ed5-8a2080475aa8,dfba24e2-1e1b-4348-807a-

OS-HAB-13-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0243697	**Longitude**	115.6779032
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	West	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Banksia menziesii and Banksia attenuata*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	845a06bc-366d-4f0f-af8d-e711f031e61a,c812e5dd-cef0-4471-b4d8-

OS-HAB-14-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0195538	**Longitude**	115.6839813
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	Southwest	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	High	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus todtiana, Banksia menziesii and Banksia attenuata*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Jacksonia floribunda, Eremaea pauciflora and Verticordia nitens*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Hibbertia spp., Melaleuca spp. and Petrophile spp.*



Fulcrum photo ID	7bb1c0bd-6c37-430a-bad6-c2a569c233d4,f64b62bf-3f6d-4031-91a8-

OS-HAB-15-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.0349026	**Longitude**	115.6846003
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	South	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	25 - 50%

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Banksia menziesii and Banksia attenuata*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Verticordia nitens, Adenanthos cygnorum subsp. cygnorum*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	7dafb119-216b-4782-bc27-bf9c44081f3c,85ceeb8b-7846-42da-94ff-

OS-HAB-16-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.015617	**Longitude**	115.6701218
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Aspect	East	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	High	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Banksia menziesii and Banksia attenuata*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Eremaea pauciflora and Beaufortia elegans*
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Patersonia occidentalis, Phlebocarya ciliata and Schoenus caespititius*



Fulcrum photo ID	7199a2c6-47a1-4e0d-826f-16c8e15de5d8,d359ebe5-f109-4fc2-94ea-

OS-HAB-17-LG

Project	Orange Springs Biological Survey			**Latitude**	-31.028798	**Longitude**	115.6937326
Date	27-09-2024	**Sample Type**	Terrestrial vertebrate fauna - HAB			**Weather**	

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	None
Aspect	Negligible	**Pebble/stone cover**	Absent
Soil type	Sand	**Rock/boulder cover**	Absent
Soil colour	White	**Outcropping cover**	
Condition		**Habitat Features**	
Quality	Very high	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Leaf litter cover**	5 - 25%

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus todtiana, Banksia menziesii and Banksia attenuata*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Jacksonia floribunda, Eremaea pauciflora and Verticordia nitens*
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)	*Hibbertia spp., Melaleuca spp. and Petrophile spp.*



Fulcrum photo ID	808ca184-4239-4804-b32b-2b5fc19d163c,08e06f5f-99b9-4e7c-9449-

Appendix K Fauna Recorded During the Survey

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Family	Scientific Name	Common Name	Conservation Status		Abundance
			State	Common wealth	
Birds					
Acanthizidae	*Gerygone fusca*	Western Gerygone	-	-	1
Anatidae	*Chenonetta jubata*	Australian Wood Duck	-	-	2
Ardeidae	*Ardea cinerea*	Grey Heron	-	-	1
Ardeidae	*Egretta novaehollandiae*	White-faced heron	-	-	1
Artamidae	*Artamus cinereus*	Black-faced Woodswallow	-	-	20
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	-	-	2
Artamidae	*Gymnorhina tibicen*	Australian Magpie	-	-	6
Cacatuidae	*Cacatua sanguinea*	Little Corella	-	-	8
Cacatuidae	*Eolophus roseicapilla*	Galah	-	-	15
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	-	MA	1
Casuariidae	*Dromaius novaehollandiae*	Emu	-	-	4
Columbidae	*Ocyphaps lophotes*	Crested Pigeon	-	-	2
Columbidae	*Phaps chalcoptera*	Common Bronzewing	-	-	2
Corvidae	*Corvus coronoides*	Australian Raven	-	-	4
Falconidae	*Falco cenchroides*	Nankeen Kestrel	-	MA	2
Maluridae	*Malurus splendens*	Splendid Fairywren	-	-	1
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill	-	-	1
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	-	-	1
Meliphagidae	*Anthochaera lunulata*	Western Wattlebird	-	-	1
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	-	-	9
Meliphagidae	*Phylidonyris niger*	White-cheeked Honeyeater	-	-	1
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	-	-	1
Meropidae	*Merops ornatus*	Rainbow Bee-eater	-	MA	1
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	-	-	3
Motacillidae	*Anthus australis*	Australian Pipit	-	-	6
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	-	-	4

Family	Scientific Name	Common Name	Conservation Status		Abundance
			State	Common wealth	
Petroicidae	*Quoyornis georgianus*	White-breasted Robin	-	-	1
Phasianidae	*Synoicus ypsilophorus*	Brown Quail	-	-	1
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-	14
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	-	-	9
Strigidae	*Ninox boobook*	Australian Boobook	-	-	1
Zosteropidae	*Zosterops lateralis*	Silvereye	-	MA	5
Mammals					
Bovidae	**Bos primigenius taurus*	European Cattle	-	-	**2**
Canidae	**Canis familiaris*	Dog	-	-	**2**
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo	-	-	**11**
Reptiles					
Agamidae	*Ctenophorus adelaidensis*	Western Heath Dragon	-	-	**1**

*Introduced species

Appendix L Significant Fauna Likelihood of Occurrence

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR/CE - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.
Source: NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, Field - Recorded during the current field survey.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Birds						
Acanthizidae	*Aphelocephala leucopsis* Southern Whiteface	-	VU	Open forest and woodland, inland scrubs such as mallee, mulga, cypress pine; saltbush, dead trees, stumps (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature	**low** No nearby records. No suitable habitat within the Survey Area.
Anatidae	*Oxyura australis* Blue-billed Duck	P4	-	Densely vegetated freshwater lakes, swamps, dams (Morcombe, 2003).	The DBCA database identified thirteen records within 20 km of the Survey Area. The most recent record 19.5 km south of the Survey Area in 2010. The closest record was 11.7 km west of the Survey Area in 2001 (DBCA, 2024).	**Low** Some nearby records were returned. No suitable habitat within the Survey Area.
Apodidae	*Apus pacificus* Pacific Swift, Fork-tailed Swift	MI	MI, MA	Low to very high airspace over varied habitat (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature	**low** No nearby records but may forage in aerial space above Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Cacatuidae	*Zanda latirostris* Carnaby's Cockatoo	EN	EN	Forests, woodlands, heathlands, farms; feeds on Banksias and Hakeas, pine plantations (Morcombe, 2003).	The DBCA database identified 2122 records within 20 km of the Survey Area. The Most recent record included 7.7km east of the Survey Area in 2022. The closest record is 2.3 km west of the Survey Area in 2008 (DBCA, 2024).	**High** Of the 2122 records returned, 856 of these were recent. There is suitable habitat within the survey area including Banksia. The DBCA data also returned records of nesting and roosting sites approximately 9 km east of the Survey Area.
Cacatuidae	*Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo	VU	VU	Tall eucalypt forest, woodland, feeds on seeds of large-fruited eucalypts (Menkhorst et al., 2017).	One record returned in the literature review. The species was recorded within Marri-Jarrah Woodlands in the Survey Area for Bindoon Bypass Project (Great Northern Highway: Bindoon Bypass Fauna Assessment (Focused Vision Consulting, 2017). This survey area is approx. 53km south east of the Survey Area. This is right on the cusp of the modelled distribution.	**Low** The Survey Area is located outside of modelled distribution for Forest Red-tailed Black Cockatoo. Limited suitable habitat was observed within the Survey Area. The record from the literature review was 50 km southeast of Survey Area.
Charadriidae	*Pluvialis fulva* Pacific Golden Plover	MI	MI, MA	Estuaries, mudflats, saltmarshes, mangroves; rocky reefs and stranded seaweed on ocean shores; margins of shallow open inland swamps; sewage ponds, short-grass paddocks, sportsground, airfield, ploughed land (Pizzey and Knight, 2012).	The DBCA database identified one record within 20 km of the Survey Area. The record was 19.5km north of the Survey Area in 1991 (DBCA, 2024).	**Low** Only one historic record returned and limited suitable habitat within Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Laridae	*Hydroprogne caspia* Caspian Tern	MI	MI, MA	Coastal, offshore waters; beaches, mudflats, estuaries, larger rivers, reservoirs, lakes. Sometimes found inland (Pizzey and Knight, 2012).	The DBCA database identified one record within 20 km of the Survey Area. The record was 17.8km south of the Survey Area in 1991 (DBCA, 2024).	**Low** Only one historic record returned and little to no suitable habitat within Survey Area.
Megapodiidae	*Leipoa ocellata* Malleefowl	VU	VU	Mallee, acacia, paperbark, she-oak and other scrubs; eucalypt woodland; coastal heath; mostly on sandy or gravel soils (Pizzey and Knight, 2012).	The DBCA database identified two historic records within 20 km of the Survey Area, both records were 16.1 km north west in1988 and 1993 (DBCA, 2024).	**Low** The records returned are historical. No suitable habitat was identified within the Survey Area.
Motacillidae	*Motacilla cinerea* Grey Wagtail	MI	MI, MA	Running water near disused quarries; sandy, rocky streams in escarpments; sewage ponds, ploughed fields, airfields (Pizzey and Knight 2012).	No nearby records identified from the database searches or literature	**Low** No nearby records. No suitable habitat within the Survey Area.
Pandionidae	*Pandion haliaetus* Osprey	MI	MI, MA	Coasts, estuaries, bays, inlets; islands and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks; larger rivers (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature	**Low** No nearby records and no suitable habitat within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	*Actitis hypoleucos* Common Sandpiper	MI	MI, MA	Shallow, pebbly, muddy or sandy sedges of rivers and streams, coastal to far inland; dams, lakes, sewage ponds; margins of tidal rivers; waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches; causeways, riverside lawns, drains, street gutters (Pizzey and Knight, 2012).	The DBCA database identified one record within 20 km of the Survey Area. The record was 19.5km north of the Survey Area in 1990 (DBCA, 2024).	**Low** Only one historic record returned and limited suitable habitat within Survey Area.
Scolopacidae	*Calidris ferruginea* Curlew Sandpiper	CR	CE, MI, MA	Inter-tidal mudflats of estuaries, lagoons, mangrove channel; saltmarsh, saltfields; fresh, brachish or saline wetlands; flooded saltbush surrounds of inland lakes; dams, floodwaters, sewage ponds (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified three historical records within 20 km of the Survey Area, including 12km north east in 1977 & 1978 and 19.5 km north of the Survey Area in 1991 (DBCA, 2024).	**Low** The three records returned were historic. There is limited suitable habitat within the Survey Area, however following heavy rainfall events there could be some suitability.
Scolopacidae	*Calidris acuminata* Sharp-tailed Sandpiper	MI	VU, MI, MA	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; muddy edges of lagoons, swamps, lakes, floodwaters, dams, irrigated patures and crops; sewage ponds, saltfields (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified two historical records within 20 km of the Survey Area, both records were 19.5 km north of the Survey Area in 1990 & 1991 (DBCA, 2024).	**low** The records returned are historical. The species is closely associated with coastal habitats. There is limited suitable habitat within the Survey Area, however there may be some suitability following heavy rainfall events.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	*Calidris ruficollis* Red-necked Stint	MI	MI, MA	Tidal mudflats, saltmarshes, sandy or shelly beaches; saline and freshwater wetlands, salt fields, sewage ponds (Pizzey and Knight, 2012).	The DBCA database identified four historic records within 20 km of the Survey Area. Two of the records were 19.5 north of the survey area in 1990 & 1991.The other two records were 12 km north-east in 1997 & 1998 (DBCA, 2024).	**low** The four records returned are historical. The species is closely associated with coastal habitats. There is limited suitable habitat within the Survey Area, however there may be some suitability following heavy rainfall events.
Scolopacidae	*Calidris melanotos* Pectoral Sandpiper	MI	MI, MA	Shallow fresh waters, often with low grass or other herbage; swamp margins, flooded pastures, sewage ponds; occasionally tidal areas, saltmarshes (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature	**Low** No nearby records. No suitable habitat within the Survey Area.
Scolopacidae	*Calidris pugnax* Ruff	MI	MI, MA (as P. pugnax)	Fresh, brackish and saline wetlands; tidal mudflats, saltfields, sewage farms (Pizzey and Knight, 2012).	The DBCA database identified one record within 20 km of the Survey Area. The record was 18.9km west of the Survey Area in 2001 (DBCA, 2024).	**Low** Only one historic record returned and little to no suitable habitat within Survey Area.
Scolopacidae	*Tringa glareola* Wood Sandpiper	MI	MI, MA	Muddy margins of wetlands with emergent sedges and taller fringing vegetation; tidal mangroves; margins of tidal mudflats; saltmarshes, sewage pond (Pizzey and Knight, 2012; Menkhorst et al., 2017).	The DBCA database identified three historical records within 20 km of the Survey Area, including two records 19.6km north in 1990 & 1991, and one record 12 km north east in1978 (DBCA, 2024).	**Low** The records returned are historical. The species is considered to be associated with coastal habitats. No suitable habitat within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	*Tringa nebularia* Common Greenshank	MI	EN, MI, MA	Mudflats, estuaries, saltmarshes, swamps, margins of lakes, muddy shallows of lagoons; permanent and temporary wetlands, claypans; commercial saltfield, irrigated crops, sewage ponds (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified nine records within 20 km of the Survey Area. The most recent being two records approximately 19.5 km south east of the Survey Area in 2010 (DBCA, 2024).	**Low** Two of the nine records are recent (2010). The remaining records returned are historical. The species is closely associated with coastal habitats. There is limited suitable habitat within the Survey Area, however there may be some suitability following heavy rainfall events.
Scolopacidae	*Numenius madagascariensis* Far Eastern Curlew, Eastern Curlew	CR	CE, MI, MA	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes; bare grasslands near water (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature	**Low** No nearby records. No suitable habitat within the Survey Area.
Rostratulidae	*Rostratula australis* Australian Painted Snipe	EN	EN, MA	Well-vegetated shallows and margins of wetlands, dams, sewage ponds; wet pastures, marshy areas, irrigation systems, lignum, tea-tree scrub, open timber (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature	**Low** No nearby records. There is limited suitable habitat within the Survey Area, however there may be some suitability following heavy rainfall events.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Threskiornithidae	*Plegadis falcinellus* Glossy Ibis	MI	MI, MA	Well-vegetated wetlands, wet pastures, ricefields, flooded waters, floodplains; brackish or occasionally saline wetlands, mangroves, mudflats, occasionally dry grasslands (Pizzey and Knight, 2012).	The DBCA database identified four' records within 20' km of the Survey Area. The most recent record being 8.8 km south east of the survey Area in 2004. The other three records were within 19km north and west of the survey area in 1990 &1999 (DBCA, 2024).	**low** The four records returned are historical with the most recent being 2004. The species is closely associated with coastal habitats. There is limited suitable habitat within the Survey Area, however there may be some suitability following heavy rainfall events.
Mammals						
Dasyuridae	*Dasyurus geoffroii fortis* Western Quoll, Chuditch	VU	VU	Areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck and Strahan, 2008).	The DBCA database identified two records within 20km of the Survey Area, including 3.2km north east in 2001 and 18.6 km north in 1987 (DBCA, 2024).	**low** Two historic records were returned. There is limited suitability within Survey Area.
Dasyuridae	*Parantechinus apicalis* Dibbler	EN	EN	Dense, long unburnt vegetation with a thick litter layer and sandy soils (DBCA, 2012). Mature mallee-heath on mainland; low heath and scrubland on islands (Van Dyck, Gynther and Baker, 2013).	No nearby records identified from the database searches or literature	**low** No nearby records.
Macropodidae	*Notamacropus irma* Western Brush Wallaby	P4	-	Optimum habitat of open forest or woodland, particularly favouring rather open, seasonally wet flats with low grasses and open, shrubby thickets. It is found in some larger areas of mallee and heathland in the wheatbelt and is uncommon in wet sclerophyll forest (Van Dyck and Strahan, 2008).	The DBCA database identified nine records within 20 km of the Survey Area, including the closest record 3.1 km north of the Survey Area in 1981 (DBCA, 2024).	**low** Records returned are historical. There is limited suitable habitat within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Megadermatidae	*Macroderma gigas* Ghost Bat	VU	VU	Deep caves and mines, and occasionally rock fissures and boulder piles occurring within a widespread but patchy distribution across northern Australia from the arid Pilbara to the lush rainforests of north Queensland (Baker and Gynther, 2023).	No nearby records identified from the database searches or literature	**low** No nearby records.
Muridae	*Hydromys chrysogaster* Water Rat	P4	-	Permanent bodies of fresh or brackish water, from subalpine streams to lakes and farm dams; also mangroves and on sheltered coastal beaches and offshore islands (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified one historical record within 20 km of the Survey Area. The record was 7.3km east of the Survey Area in 1972 (DBCA, 2024).	**Low** One historic record and no suitable habitat within the Survey Area.
Thylacomyidae	*Macrotis lagotis* Bilby, Dalgyte	VU	VU	Mitchell grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, hummock grassland and massive red earths with Acacia shrubland (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified one historical record within 20 km of the Survey Area. The record was 17.7km west of the Survey Area in 1920 (DBCA, 2024).	**Low** One historic record and no suitable habitat within the Survey Area.
Reptiles						
Chelidae	*Pseudemydura umbrina* Western Swamp Tortoise	CR	CE	Restricted to small clay-based swamps at Bullsbrook, WA (Wilson and Swan, 2017).	Species only returned through PMST search (PMST, 2024)	**Low** No suitable habitat is present within the Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Elapidae	*Neelaps calonotos* Black-striped Snake	P3	-	dunes and sandplains vegetated with heaths and eucalypt/banksia woodlands.(Wilson & Swan, 2021)	One record (photographic evidence) 42 km southeast of the Survey Area from 2024 was identified from iNaturalist (iNaturalist, 2025)	**Medium** This record is outside of the Desktop Study Area. However, suitable habitat is present within the Survey Area, and given the cryptic nature of the species and the lack of survey effort in the region, a Medium likelihood is given to the species.
Scincidae	*Egernia stokesii badia* Western Spiny-tailed Skink	VU	EN	Occupies rock crevices and hollow timber in southwest interior of WA and on Dirk Hartog Island, Shark Bay (Wilson and Swan, 2021).	No nearby records identified from the database searches or literature	**low** No nearby records. No suitable habitat within the Survey Area.

Appendix M Black Cockatoo Nesting Trees

Biological Offset Surveys

Orange Springs

Western Power

SLR Project No. 675.072817.00001

10 July 2025

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0079069	115.6844401	Marri *(Corymbia calophylla)*	530	14		No	Potential nesting tree (Category 5)		afd78f8f-9654-4a1c-87ba-8f7c9696e2f7,7469c803-0a9c-49a8-861a-e3c627ecb740
-31.0103259	115.6825371	Marri *(Corymbia calophylla)*	550	12		No	Potential nesting tree (Category 5)		3ef7e96e-ab75-4fa8-b2f5-6ce22d1ef850,60be888e-fca7-47ea-b207-a0a4242ecf52
-31.0133077	115.6854677	Marri *(Corymbia calophylla)*	590	18		No	Potential nesting tree (Category 5)		4a3054c1-9780-45bc-95ad-77b82f403f84
-31.0072966	115.6842745	Marri *(Corymbia calophylla)*	700	10		No	Potential nesting tree (Category 5)		b29fee2e-b2da-4544-8238-dfeebf294c0c
-31.0119833	115.6853345	Marri *(Corymbia calophylla)*	750	20		No	Potential nesting tree (Category 5)		0302f6bd-d978-447e-ae8c-69079a4d06ce
-31.0135878	115.6862199	Marri *(Corymbia calophylla)*	760	18		No	Potential nesting tree (Category 5)		822d1eb3-a108-43b0-9975-738eaeb5324f
-31.0130854	115.6856065	Marri *(Corymbia calophylla)*	820	18		No	Potential nesting tree (Category 5)		98afcc2b-fa56-41b0-a422-68c4c387cdd7
-31.0102742	115.6826656	Marri *(Corymbia calophylla)*	1010	12		No	Potential nesting tree (Category 5)		19c62d27-cb1c-469b-b993-703ca666ae21,09573fe4-79a6-474c-9705-5e69afb70f39
-31.0137293	115.6860362	Marri *(Corymbia calophylla)*	1050	20		No	Potential nesting tree (Category 5)		b17846dd-44b5-45d3-9449-5bfbfd092e0a
-31.0135721	115.6860022	Marri *(Corymbia calophylla)*	1180	18		No	Potential nesting tree (Category 5)		2c71127f-379e-4f6e-bba9-818c1abbecaf
-31.0125332	115.6862521	Stag	330	7	1	Yes	Suitable nesting tree (Category 3) - entrance visible		534b3a4d-6130-4867-a488-2ad49e401ccf
-31.0117937	115.6837739	Stag	420	16	1	Yes	Suitable nesting tree (Category 3) - entrance not visible		e0822139-bdc2-47c1-b44b-bc764ae11d44
-31.0110423	115.6844202	Stag	500	15		No	Potential nesting tree (Category 5)		0b8da6e9-450a-41f6-a475-5081027ed141
-31.0122154	115.6853975	Stag	500	14		No	Potential nesting tree (Category 5)		678637a8-b022-45ee-8a2c-0aab9ed8bc47
-31.01088	115.6857674	Stag	520	10	2	No	Suitable nesting tree (Category 3) - entrance visible	Hollow facing N and facing SE	3afeb4d5-6072-4de5-a13e-37e1f111dc3f
-31.0106547	115.6856126	Stag	520	10	1	No	Suitable nesting tree (Category 3) - entrance visible	Low hollow facing north ~3.5m from ground	88631daa-c54a-4ef4-a750-e60907229017
-31.009678	115.6852873	Stag	520	17		No	Potential nesting tree (Category 5)		192b27b3-a507-4e76-9afb-a1a18620b50e
-31.0123599	115.6865585	Stag	540	16		No	Potential nesting tree (Category 5)		92e4720e-bda2-4df6-885f-36bace43a9d0
-31.0118846	115.6836694	Stag	550	11		No	Potential nesting tree (Category 5)		79758eeb-2ee6-4b9b-9274-4aaccaa82d2c,64a30405-0033-47bc-b6f0-d3869da61a52
-31.009619	115.6834097	Stag	570	10		No	Potential nesting tree (Category 5)		7202dedb-41fb-4a6b-b3e6-1d05c18f2a80
-31.0098439	115.6838399	Stag	570	14	2	No	Suitable nesting tree (Category 3) - entrance not visible		2f3c5aa9-55e3-4aa1-b27d-48fa2d3f86be
-31.0115263	115.6837824	Stag	580	12		No	Potential nesting tree (Category 5)		3b2ffbce-d726-461c-9bf6-4444349530e7,52812d29-6519-4ab8-b01c-58b94d1b354d
-31.0114845	115.6858524	Stag	600	14	2	No	Suitable nesting tree (Category 3) - entrance not visible		063bcd24-2fa3-4675-87eb-63e206adcbd0
-31.01082135	115.6859108	Stag	740	14	4	Yes	Suitable nesting tree (Category 3) - entrance visible		b755657d-27d5-4d11-8471-f6fc0bf4d0b2
-31.0109637	115.6843301	Stag	810	15	4	No	Suitable nesting tree (Category 3) - entrance not visible		6c5dff37-0c63-4e4b-b307-be073d8bf245

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.00727	115.6842112	Stag	870	12		No	Potential nesting tree (Category 5)		f9c55011-dbed-416f-82ba-7aca17b21a10,d87ad684-6a9e-41ab-ae56-6ca30ae03bee
-31.0122505	115.6837265	Stag	1470	12	5	No	Suitable nesting tree (Category 3) - entrance visible		162bbd07-fb12-41b7-b24f-c6eb380b3af1
-31.010282	115.6842	Wandoo *(Eucalyptus wandoo)*	300	17		No	Potential nesting tree (Category 5)		cc270aa4-dc4e-4d68-913c-98ebf957e60a
-31.0095219	115.6854037	Wandoo *(Eucalyptus wandoo)*	300	12		No	Potential nesting tree (Category 5)		5cbdd1f3-b4e2-4ea8-a45b-f39258911d86
-31.0103254	115.6854869	Wandoo *(Eucalyptus wandoo)*	300	12		No	Potential nesting tree (Category 5)		a2cfca86-8013-4fde-b70b-2539fa9ecc4f
-31.0098447	115.6833908	Wandoo *(Eucalyptus wandoo)*	310	9		No	Potential nesting tree (Category 5)		fa47d995-d869-4f0d-b090-da8b619df06e,ebb405f6-db4c-4518-9352-150aa2c44b1d
-31.0101135	115.6855466	Wandoo *(Eucalyptus wandoo)*	310	10		No	Potential nesting tree (Category 5)		fc493cc3-30fa-46db-a39e-02e46df3df9e
-31.0106587	115.6832422	Wandoo *(Eucalyptus wandoo)*	310	10		No	Potential nesting tree (Category 5)		79ed7768-e3f1-4488-a5de-96596180ef17
-31.0108163	115.6858429	Wandoo *(Eucalyptus wandoo)*	310	16		No	Potential nesting tree (Category 5)		1b689814-1f7c-424c-9c6c-b70e971dd0bf
-31.0108602	115.68599	Wandoo *(Eucalyptus wandoo)*	310	14		No	Potential nesting tree (Category 5)		aec91d18-05e2-41e0-880b-861d796bc7f7
-31.0115836	115.6859569	Wandoo *(Eucalyptus wandoo)*	310	9		No	Potential nesting tree (Category 5)		79b9e097-217f-4b9f-b38e-84adb3964bd5
-31.010104	115.6834381	Wandoo *(Eucalyptus wandoo)*	320	8		No	Potential nesting tree (Category 5)		d035518c-05b5-4d68-bcd1-6c09095d3427,f2d7a07c-8d94-4ae3-9282-8577fd5ac760
-31.0095638	115.6836066	Wandoo *(Eucalyptus wandoo)*	320	4		No	Potential nesting tree (Category 5)		72736ee4-55bf-4dc8-a437-85d6037ba670
-31.0104292	115.6840482	Wandoo *(Eucalyptus wandoo)*	320	9		No	Potential nesting tree (Category 5)		1bba94da-8282-4670-bc35-c86cabbd752c
-31.010339	115.6842219	Wandoo *(Eucalyptus wandoo)*	320	15		No	Potential nesting tree (Category 5)		f97291df-dbc3-4e3e-90ca-25915c3c992d
-31.0103935	115.6832511	Wandoo *(Eucalyptus wandoo)*	320	10		No	Potential nesting tree (Category 5)		e33cfe53-a39f-4917-910a-f788c4906351
-31.0107409	115.6837019	Wandoo *(Eucalyptus wandoo)*	320	8		No	Potential nesting tree (Category 5)		7bd000d0-fa09-4fbd-8d06-cde6a3c107ff
-31.0118051	115.6862814	Wandoo *(Eucalyptus wandoo)*	320	7		No	Potential nesting tree (Category 5)		d97f1fe6-52ad-4f7f-8d93-edf9715f6627
-31.0097564	115.6851646	Wandoo *(Eucalyptus wandoo)*	330	10		No	Potential nesting tree (Category 5)		2b714d92-a009-4dbe-873a-eae6a8aebb37,021ec450-71bd-42cd-af54-056acf123aa1
-31.0102046	115.6849882	Wandoo *(Eucalyptus wandoo)*	330	8		No	Potential nesting tree (Category 5)		85001c0e-ab56-45f4-b823-47b874b4d673
-31.0096142	115.6844965	Wandoo *(Eucalyptus wandoo)*	330	8		No	Potential nesting tree (Category 5)		43f7dbb5-d9aa-47f3-97be-7b8f706edff5
-31.0114921	115.6862683	Wandoo *(Eucalyptus wandoo)*	330	10		No	Potential nesting tree (Category 5)		9188a7ce-05e5-4743-8322-43348bb06772
-31.0118066	115.6862361	Wandoo *(Eucalyptus wandoo)*	330	10		No	Potential nesting tree (Category 5)		39edaf3c-34d2-4391-aa1e-13cab6b6b5de
-31.0101148	115.6836872	Wandoo *(Eucalyptus wandoo)*	335	10		No	Potential nesting tree (Category 5)		901d2223-1a63-40ac-b1fb-c56f761d9bfb,419aa76f-ae1c-4ece-8873-34f76a51d237
-31.0114995	115.6837754	Wandoo *(Eucalyptus wandoo)*	340	5		No	Potential nesting tree (Category 5)		49009bbd-7935-4c20-8902-7aba9b3b8c27,6c9d5640-39b7-443a-8474-74775ec902a3

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0113346	115.6858241	Wandoo *(Eucalyptus wandoo)*	340	12		No	Potential nesting tree (Category 5)		2f421d86-d17b-4ddc-b7db-a452812be49e,657e8035-5281-4482-a918-e5232a303397
-31.0104281	115.6839762	Wandoo *(Eucalyptus wandoo)*	340	15		No	Potential nesting tree (Category 5)		fd78c81a-84ef-484f-80e5-72ff16ee98a6
-31.0094556	115.6852877	Wandoo *(Eucalyptus wandoo)*	340	12		No	Potential nesting tree (Category 5)		da708ac8-18ba-4d40-9f47-e1b7456de896
-31.009661	115.6850036	Wandoo *(Eucalyptus wandoo)*	340	18		No	Potential nesting tree (Category 5)		56e99fce-3e1c-4476-8901-e498d0fcab27
-31.0094162	115.6849339	Wandoo *(Eucalyptus wandoo)*	340	7		No	Potential nesting tree (Category 5)		4b5e0680-8eb3-4825-8062-0f6092ba6a08
-31.0087733	115.6848525	Wandoo *(Eucalyptus wandoo)*	340	8		No	Potential nesting tree (Category 5)		f1374803-3d22-4acf-9eb6-e2d908212e6c
-31.0113844	115.685764	Wandoo *(Eucalyptus wandoo)*	340	12		No	Potential nesting tree (Category 5)		723f83bf-10f9-424d-875c-703b13c3e6bf
-31.0124367	115.6865184	Wandoo *(Eucalyptus wandoo)*	340	6		No	Potential nesting tree (Category 5)		e90d2300-acb7-414b-83ee-a181cecfded3
-31.0103537	115.6848942	Wandoo *(Eucalyptus wandoo)*	350	13		No	Potential nesting tree (Category 5)		cd900234-7674-4036-857f-f44e7b28f73b,2c2ab779-bbba-488f-bc8c-d6626fcd336d
-31.0105414	115.6834321	Wandoo *(Eucalyptus wandoo)*	350	14		No	Potential nesting tree (Category 5)		b100dbd2-8e53-48c0-a0d1-a94874c776a7
-31.0101935	115.6848169	Wandoo *(Eucalyptus wandoo)*	350	15		No	Potential nesting tree (Category 5)		a57f0ef0-cb6f-48c7-b179-de1853d8259d
-31.0103194	115.6849299	Wandoo *(Eucalyptus wandoo)*	350	12		No	Potential nesting tree (Category 5)		feb05db5-6d12-4aa2-8f6d-1387f3c98692
-31.0091822	115.6849095	Wandoo *(Eucalyptus wandoo)*	350	12		No	Potential nesting tree (Category 5)		5ef74cda-10f8-47ab-8206-a348c4610ace
-31.0086989	115.6847812	Wandoo *(Eucalyptus wandoo)*	350	14		No	Potential nesting tree (Category 5)		f34968de-2db3-49cd-b2b0-80cdde153e17
-31.011636	115.6863603	Wandoo *(Eucalyptus wandoo)*	350	14		No	Potential nesting tree (Category 5)		0b382cfa-c778-4fe7-91a1-e1730698a8d1
-31.0103638	115.6832477	Wandoo *(Eucalyptus wandoo)*	360	12		No	Potential nesting tree (Category 5)		ae9b9cd1-09fa-40f5-bfb4-590968a7db50,4d09c179-6600-42a0-99ab-ae9619de75dc
-31.0102145	115.6854068	Wandoo *(Eucalyptus wandoo)*	360	8		No	Potential nesting tree (Category 5)		fcb79c5e-949a-4bfb-bdd6-514034c7a3b1,6dd441b5-b481-45ed-b4f2-ede02c1eb2b1
-31.0124053	115.6861919	Wandoo *(Eucalyptus wandoo)*	360	9		No	Potential nesting tree (Category 5)		fca2d3c6-ddcb-4973-a8a3-8315428af12b,7fd72ed1-2589-4381-a095-7470c70dc907,45294b94-da3c-49d1-ad09-7e6f11283ec0
-31.0099583	115.683464	Wandoo *(Eucalyptus wandoo)*	360	10		No	Potential nesting tree (Category 5)		8dcdadde-9ac6-4a2c-a681-597f0551c93e
-31.0101126	115.6838281	Wandoo *(Eucalyptus wandoo)*	360	16		No	Potential nesting tree (Category 5)		04bf8c62-4408-46e5-b32b-d683991a1ed7
-31.0104055	115.6839136	Wandoo *(Eucalyptus wandoo)*	360	14		No	Potential nesting tree (Category 5)		709cfc61-d950-4b61-8c9f-87416d9493c4
-31.0103617	115.6849428	Wandoo *(Eucalyptus wandoo)*	360	16		No	Potential nesting tree (Category 5)		4a0ca45f-0b10-45e1-824d-f4e52b1d5eba
-31.0096829	115.6854141	Wandoo *(Eucalyptus wandoo)*	360	10		No	Potential nesting tree (Category 5)		2d9720ae-7336-466f-8bf1-0b954c95f8f1
-31.0090112	115.6849501	Wandoo *(Eucalyptus wandoo)*	360	9		No	Potential nesting tree (Category 5)		8b372ce8-6488-4dc1-8274-130ddaceda8b
-31.0108204	115.6860296	Wandoo *(Eucalyptus wandoo)*	360	8		No	Potential nesting tree (Category 5)		931adfd5-5e6e-405d-aef7-86009a6dba69

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0119546	115.6864221	Wandoo *(Eucalyptus wandoo)*	360	18	1	Yes	Suitable nesting tree (Category 3) - entrance not visible		06373089-a83e-422b-9bf4-9506aa388a67
-31.012354	115.6865943	Wandoo *(Eucalyptus wandoo)*	360	12		No	Potential nesting tree (Category 5)		bd5e0c8a-0bb9-4c6c-a650-1bbed529db93
-31.0124897	115.6864269	Wandoo *(Eucalyptus wandoo)*	360	12		No	Potential nesting tree (Category 5)		599e11c1-530c-4f5b-87fa-7a5a9c52e6b7
-31.0099302	115.6853417	Wandoo *(Eucalyptus wandoo)*	365	9		No	Potential nesting tree (Category 5)		d168b79f-ae57-4e0d-a22f-32c11dbe1d2d,6cf218ca-c4b2-4dc8-830f-532fd3a3e5d0
-31.0124983	115.686211	Wandoo *(Eucalyptus wandoo)*	370	11		No	Potential nesting tree (Category 5)		719c869a-4abd-482e-8ec0-0a92fb77a753,c1569dfc-86c0-4f75-8efe-57ecbc750242
-31.0099077	115.6834216	Wandoo *(Eucalyptus wandoo)*	370	15		No	Potential nesting tree (Category 5)		fbe82743-f1ad-4e5d-ad4d-c3e0023ac85d
-31.0103176	115.6842294	Wandoo *(Eucalyptus wandoo)*	370	14		No	Potential nesting tree (Category 5)		966eed1e-d84b-4370-a345-339d778c8dc2
-31.0105299	115.6834155	Wandoo *(Eucalyptus wandoo)*	370	15		No	Potential nesting tree (Category 5)		9b473732-1a83-4e97-80f3-9d08fbb71fd7
-31.0101928	115.6854506	Wandoo *(Eucalyptus wandoo)*	370	10		No	Potential nesting tree (Category 5)		df8d5ff8-2bd3-4d57-b8f1-f61abc7e7b52
-31.0095769	115.6848904	Wandoo *(Eucalyptus wandoo)*	370	16		No	Potential nesting tree (Category 5)		7f11959f-0b41-455f-a500-1f9415ce02a6
-31.0088958	115.684969	Wandoo *(Eucalyptus wandoo)*	370	14		No	Potential nesting tree (Category 5)		00960b1e-854e-41b9-b938-ad355bdf7b63
-31.0110801	115.6842362	Wandoo *(Eucalyptus wandoo)*	370	14		No	Potential nesting tree (Category 5)		edca5263-7dce-4669-88e5-4b8d79b91c8c
-31.0103158	115.6857485	Wandoo *(Eucalyptus wandoo)*	370	14		No	Potential nesting tree (Category 5)		045a47ff-de8b-44aa-8ea1-f2c1a5b465a7
-31.0104267	115.6857541	Wandoo *(Eucalyptus wandoo)*	370	12		No	Potential nesting tree (Category 5)		e0972708-6e49-436d-80c8-1fd75b5b439d
-31.0116952	115.6861712	Wandoo *(Eucalyptus wandoo)*	370	13		No	Potential nesting tree (Category 5)		81dca6db-4c9c-4749-8aac-58e79cb9453b
-31.0120817	115.6865973	Wandoo *(Eucalyptus wandoo)*	370	12		No	Potential nesting tree (Category 5)		0a017489-41c5-499e-bb9c-db5a699ba441
-31.012403	115.6865211	Wandoo *(Eucalyptus wandoo)*	370	8		No	Potential nesting tree (Category 5)		bc25e322-6c11-4d91-b8d3-a96788133f53
-31.012206	115.6854206	Wandoo *(Eucalyptus wandoo)*	370	14		No	Potential nesting tree (Category 5)		11c415e8-c586-408b-b093-9e0e7f0309c8
-31.0098534	115.6832561	Wandoo *(Eucalyptus wandoo)*	380	8		No	Potential nesting tree (Category 5)		b64afa7f-c68a-47a1-8d88-5281c89b6d56,7ecc320b-bcef-4096-900f-8b6bfb310245
-31.0112438	115.685712	Wandoo *(Eucalyptus wandoo)*	380	12		No	Potential nesting tree (Category 5)		b3695bc9-b80e-4fae-9b3a-9c0f604a80fe,314b5e4c-7668-45c4-b1cd-d4c09536ef8a
-31.0106273	115.6831995	Wandoo *(Eucalyptus wandoo)*	380	12		No	Potential nesting tree (Category 5)		720b5034-2008-4d35-8f94-4a8b13ae3889,db60379e-1e91-4e1b-bec8-46a3a4190547
-31.0097909	115.6852218	Wandoo *(Eucalyptus wandoo)*	380	10		No	Potential nesting tree (Category 5)		655607a4-a3fe-4791-abbc-fa6a604e79dd,6937614c-b9bf-4c98-9141-296313ddd3b3
-31.0124099	115.6862156	Wandoo *(Eucalyptus wandoo)*	380	11		No	Potential nesting tree (Category 5)		6895a5f7-faf5-47b4-aa1a-dc4ca4259869,eb15bb9f-41e3-44c6-9698-24633ef998d5
-31.0094528	115.6833188	Wandoo *(Eucalyptus wandoo)*	380	9		No	Potential nesting tree (Category 5)		252e6f78-0e99-4440-b284-3df59f058657
-31.0115599	115.6864227	Wandoo *(Eucalyptus wandoo)*	380	17		No	Potential nesting tree (Category 5)		a6199e0d-45d8-4eac-a881-3fc975513d78

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0118532	115.6861386	Wandoo *(Eucalyptus wandoo)*	390	11		No	Potential nesting tree (Category 5)		d45e2110-47de-4475-af22-eea675230085,8028b708-4afc-478f-9f19-afaeed94b558
-31.0099565	115.6839081	Wandoo *(Eucalyptus wandoo)*	390	16		No	Potential nesting tree (Category 5)		c530b535-9b23-4650-a9da-2e2b339509e9
-31.0106195	115.6831397	Wandoo *(Eucalyptus wandoo)*	390	14		No	Potential nesting tree (Category 5)		78a6dad3-a050-4392-88c9-f75439645fa0
-31.0084847	115.6847096	Wandoo *(Eucalyptus wandoo)*	390	18		No	Potential nesting tree (Category 5)		50c46a02-d626-4c5b-bf62-419db413cfbb
-31.0110164	115.6859396	Wandoo *(Eucalyptus wandoo)*	390	14		No	Potential nesting tree (Category 5)		c13a3ffb-78f4-4d2f-807d-82235a4fbea9
-31.0103428	115.6853701	Wandoo *(Eucalyptus wandoo)*	400	10		No	Potential nesting tree (Category 5)		058eb963-fdf6-4de5-b53c-0c7083a55cc5,a0a3dd15-09e7-4913-93bf-7690c96384ad
-31.0101774	115.6847971	Wandoo *(Eucalyptus wandoo)*	400	12		No	Potential nesting tree (Category 5)		258181a6-be2d-49bf-921e-b2e1d9ac7211
-31.0098175	115.6855176	Wandoo *(Eucalyptus wandoo)*	400	16		No	Potential nesting tree (Category 5)		2ff8df46-4add-4737-b4ae-f057d909f943
-31.0097571	115.6853323	Wandoo *(Eucalyptus wandoo)*	400	16		No	Potential nesting tree (Category 5)		aa5fe4c3-4c45-4e04-bc69-f277b6366785
-31.0090601	115.6849567	Wandoo *(Eucalyptus wandoo)*	400	12		No	Potential nesting tree (Category 5)		d41f243e-c924-425e-b45c-776447f35bd0
-31.0086995	115.684835	Wandoo *(Eucalyptus wandoo)*	400	18		No	Potential nesting tree (Category 5)		90b48c32-264a-4e50-b8e7-3bc28055c7e9
-31.0102257	115.685688	Wandoo *(Eucalyptus wandoo)*	400	9		No	Potential nesting tree (Category 5)		7ad1f446-03da-44a3-936b-1e503a90a723
-31.0114966	115.6860162	Wandoo *(Eucalyptus wandoo)*	400	13		No	Potential nesting tree (Category 5)		7c849635-ce6d-4af3-9dc5-7290d6405913
-31.0125419	115.6862023	Wandoo *(Eucalyptus wandoo)*	400	8		No	Potential nesting tree (Category 5)		f1e694e9-6109-4f2e-953f-352b215a1ba4
-31.012429	115.6862269	Wandoo *(Eucalyptus wandoo)*	410	10		No	Potential nesting tree (Category 5)		62b86208-29c1-4f7d-a7ce-86c794c5bece,cacea4a2-fd35-47b3-8c1b-a5095fac6afe
-31.0107457	115.6837041	Wandoo *(Eucalyptus wandoo)*	410	10		No	Potential nesting tree (Category 5)		8fc49348-d8a8-40d1-9370-0c178ca25dba
-31.01031	115.6856912	Wandoo *(Eucalyptus wandoo)*	410	12		No	Potential nesting tree (Category 5)		519a46a5-5e85-4955-bbf0-50f88b9f44d2
-31.0108837	115.6859816	Wandoo *(Eucalyptus wandoo)*	410	12		No	Potential nesting tree (Category 5)		e0d3fb8f-8d9e-4157-8899-3136befad138,81440623-3047-459f-bded-69048b53b135
-31.0101563	115.68552	Wandoo *(Eucalyptus wandoo)*	420	14		No	Potential nesting tree (Category 5)		6f02753e-753e-42e5-ad46-0218c2590f9d
-31.0117094	115.6836801	Wandoo *(Eucalyptus wandoo)*	420	18		No	Potential nesting tree (Category 5)		50f9ad5d-d251-4a60-a870-239f7cfc4a3d
-31.0113938	115.6859399	Wandoo *(Eucalyptus wandoo)*	420	14		No	Potential nesting tree (Category 5)		9a054e0f-e9a6-4041-b973-18aa60ad5052
-31.011549	115.6862416	Wandoo *(Eucalyptus wandoo)*	420	16		No	Potential nesting tree (Category 5)		e795361a-cbef-472d-812b-b64e0239e9b4
-31.012123	115.6866125	Wandoo *(Eucalyptus wandoo)*	420	18		No	Potential nesting tree (Category 5)		39ec0503-6c14-4a04-9cf8-8b19e5fe9db5
-31.0122308	115.6866505	Wandoo *(Eucalyptus wandoo)*	420	12		No	Potential nesting tree (Category 5)		98a3df08-a8c8-45fa-a9fe-2d073cd32d1b
-31.0095792	115.6836414	Wandoo *(Eucalyptus wandoo)*	430	12		No	Potential nesting tree (Category 5)		fe11e205-285b-4891-af60-727a449d7ad9
-31.0107663	115.6835128	Wandoo *(Eucalyptus wandoo)*	430	14		No	Potential nesting tree (Category 5)		3b383b04-3844-42fe-9105-47694ee3ef65
-31.0104571	115.6855456	Wandoo *(Eucalyptus wandoo)*	430	14		No	Potential nesting tree (Category 5)		fba60116-ad98-44a7-a338-02f4857be2b7

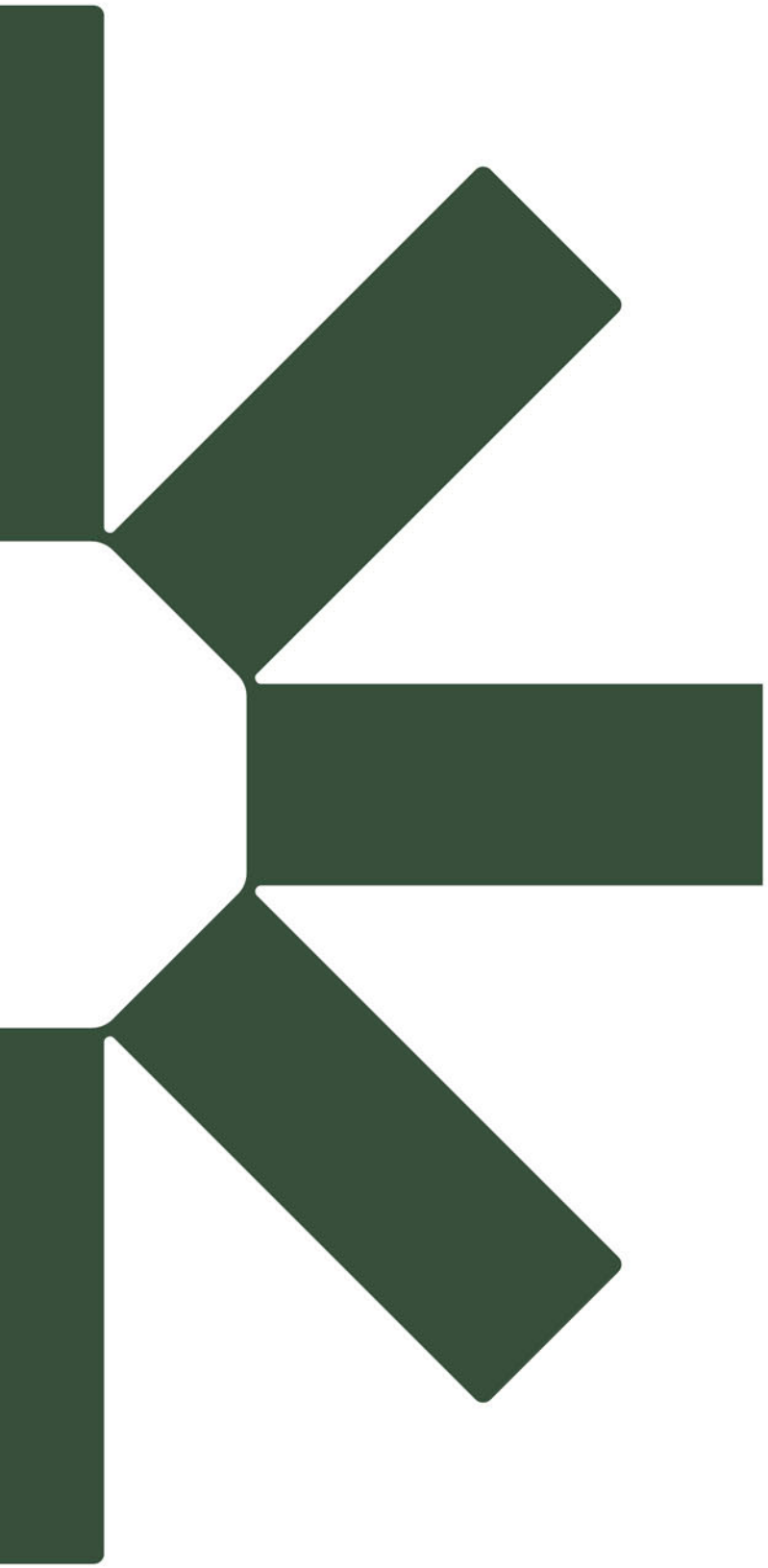
Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0090904	115.6850494	Wandoo *(Eucalyptus wandoo)*	440	10		No	Potential nesting tree (Category 5)		9cc82145-670f-4702-906d-1f71185fb92e,02107f98-1015-4bbb-995b-1293a549f920
-31.0094972	115.6835656	Wandoo *(Eucalyptus wandoo)*	440	12		No	Potential nesting tree (Category 5)		823431f1-3136-45c6-a439-bbd83ee5739f
-31.0122246	115.6855047	Wandoo *(Eucalyptus wandoo)*	440	8		No	Potential nesting tree (Category 5)		2f1410d8-d1a0-44bf-83a8-91824d2c17d0
-31.0085929	115.6845486	Wandoo *(Eucalyptus wandoo)*	450	10		No	Potential nesting tree (Category 5)		7501e7a7-62c6-4aa8-a394-8ac33a212c87,1ccba4c1-505b-4fb5-87a2-b15a5ec758ec
-31.0106012	115.6837744	Wandoo *(Eucalyptus wandoo)*	450	12		No	Potential nesting tree (Category 5)		6d94cb6b-ac59-4366-8b77-a350612db7e5,426e5ee0-40d9-4db1-95cf-7690b5b1d048
-31.0104091	115.6831233	Wandoo *(Eucalyptus wandoo)*	450	15		No	Potential nesting tree (Category 5)		3e3b1624-973e-4ec5-a4ba-f27ed6917b48
-31.0117375	115.6837091	Wandoo *(Eucalyptus wandoo)*	450	18		No	Potential nesting tree (Category 5)		b5f909a3-e9a1-4ca6-b191-2dfc995b1eb0
-31.0105557	115.6836201	Wandoo *(Eucalyptus wandoo)*	460	9		No	Potential nesting tree (Category 5)		1fcf4596-b2d0-43d0-832d-2465a016bad6,011658a7-e8f9-41fa-8b55-40c796f1c0fd
-31.0087086	115.6847436	Wandoo *(Eucalyptus wandoo)*	460	10		No	Potential nesting tree (Category 5)		0b8ac66d-76ab-4dbc-a7b6-cfff6355de04,eb21a8c9-882e-4b72-bd3e-495aa78b901f,9a02fa3d-8fb5-41be-aa6d-43f04587cb19
-31.0100027	115.6835036	Wandoo *(Eucalyptus wandoo)*	460	18		No	Potential nesting tree (Category 5)		52b79f21-b74a-4694-bae7-5f847f74b6e3
-31.0100123	115.6836229	Wandoo *(Eucalyptus wandoo)*	460	16		No	Potential nesting tree (Category 5)		2498c8f4-8582-4971-b1b9-537428e392a7
-31.01083	115.6860006	Wandoo *(Eucalyptus wandoo)*	460	18		No	Potential nesting tree (Category 5)		cc124fb5-0ed1-4ca2-ab85-f3d81485c888
-31.0118428	115.6863922	Wandoo *(Eucalyptus wandoo)*	460	17		No	Potential nesting tree (Category 5)		d812c3e0-7db1-4de9-9684-4c9da92dbc69
-31.0119735	115.6865013	Wandoo *(Eucalyptus wandoo)*	460	13		No	Potential nesting tree (Category 5)		e918c250-52e9-4f04-9960-a4b4e8b431f1
-31.0120177	115.6864106	Wandoo *(Eucalyptus wandoo)*	460	18		No	Potential nesting tree (Category 4)		9aff1bf5-9ef4-44cb-8b5a-fa339b6f026e
-31.009583	115.6832747	Wandoo *(Eucalyptus wandoo)*	470	12	1	No	Suitable nesting tree (Category 2)	Hollow facing NNW, some chewing marks along bottom	023e3240-2c5a-4481-ae6a-1d0030d6b6f2,fcd54013-a4c0-4998-99c1-8fc7cbae9d1d,7cef5426-221d-46f5-88b1-cd7947ecb369,b8e97125-5cf4-4a64-9d45-3d3826540ee8
-31.0101782	115.6837169	Wandoo *(Eucalyptus wandoo)*	470	13		No	Potential nesting tree (Category 5)		d4399974-9080-4308-b6b4-5184fb31afd7,e30d34b9-6dd1-4745-853d-e10c153be514
-31.0096276	115.6854566	Wandoo *(Eucalyptus wandoo)*	470	16		No	Potential nesting tree (Category 5)		e68e0d48-1467-4255-9dff-14a4ec8f7db4
-31.00949	115.6852712	Wandoo *(Eucalyptus wandoo)*	470	18		No	Potential nesting tree (Category 5)		4030710b-5384-437f-844a-3a893e40ddb5
-31.0092632	115.6849236	Wandoo *(Eucalyptus wandoo)*	470	8		No	Potential nesting tree (Category 5)		4a337e9f-531c-42f3-9ded-b06d4623c4f1
-31.0084357	115.6845765	Wandoo *(Eucalyptus wandoo)*	470	18		No	Potential nesting tree (Category 5)		907cb109-f406-4773-b7a5-2de9ac252773
-31.0102333	115.6857338	Wandoo *(Eucalyptus wandoo)*	470	16		No	Potential nesting tree (Category 5)		eb8b24f5-e3d7-4e87-8053-8e91b9cf78ba

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0113018	115.6857079	Wandoo *(Eucalyptus wandoo)*	470	16		No	Potential nesting tree (Category 5)		4fbeb0ad-c07b-41a1-a579-a4b7ec0cb900
-31.0116419	115.6863499	Wandoo *(Eucalyptus wandoo)*	470	15		No	Potential nesting tree (Category 5)		e11b82a8-e28d-4a3e-9947-51c1f6441ea5
-31.0097038	115.683418	Wandoo *(Eucalyptus wandoo)*	480	13		No	Potential nesting tree (Category 5)		76a9be64-9119-4051-a1ce-076587dea19c,08909c6f-c189-415d-b694-2bc7c913a01f
-31.0098077	115.6832363	Wandoo *(Eucalyptus wandoo)*	480	7		No	Potential nesting tree (Category 5)		e959115e-0050-4409-aa3f-bc6b4eb28201,6e4049df-8c2b-47fd-9099-daaa81eb0f20
-31.0103724	115.6832311	Wandoo *(Eucalyptus wandoo)*	480	14		No	Potential nesting tree (Category 5)		84016109-25b0-4e14-9dcf-951f2f933717,ad9e757c-40a9-46ca-8298-584a75543090
-31.0124464	115.686137	Wandoo *(Eucalyptus wandoo)*	480	10		No	Potential nesting tree (Category 5)		0295af60-589e-4756-b2d2-3f46810a3e40,1438ad2a-27a3-4b3e-bc5e-ad2ca5ff1d3c
-31.0104559	115.6821923	Wandoo *(Eucalyptus wandoo)*	480	7		No	Potential nesting tree (Category 5)		b4a5569a-d0c0-443f-a316-7ba755df67cd
-31.0102845	115.6848866	Wandoo *(Eucalyptus wandoo)*	480	18		No	Potential nesting tree (Category 5)		ae019643-c79b-42d4-af0e-1741c784ed7b
-31.0107671	115.6834679	Wandoo *(Eucalyptus wandoo)*	480	18		No	Potential nesting tree (Category 5)		87a09277-b925-4c9d-8db8-2a721459db79
-31.0097551	115.6839228	Wandoo *(Eucalyptus wandoo)*	490	10		No	Potential nesting tree (Category 5)		88743cd7-b8bc-4ea4-823b-0b8b2e3479fa
-31.0102235	115.6849674	Wandoo *(Eucalyptus wandoo)*	490	16		No	Potential nesting tree (Category 5)		5b024298-d71e-4f81-b653-47a976ca1de4
-31.0096059	115.6852988	Wandoo *(Eucalyptus wandoo)*	490	15		No	Potential nesting tree (Category 5)		9928e43e-ad54-4c89-b515-79af07c608d1
-31.010208	115.6837278	Wandoo *(Eucalyptus wandoo)*	500	10		No	Potential nesting tree (Category 5)		45983b22-ead9-42a0-87df-33f088f3d1d3,97782208-a782-4806-88a1-7856e41c7be8
-31.0097256	115.6837701	Wandoo *(Eucalyptus wandoo)*	500	14		No	Potential nesting tree (Category 5)		37c4164e-0977-4489-a380-64f7975e60dc
-31.0123261	115.6866829	Wandoo *(Eucalyptus wandoo)*	500	9		No	Potential nesting tree (Category 5)		beb45ede-3c3a-47ed-8272-471c4cafaf50
-31.0107111	115.6837817	Wandoo *(Eucalyptus wandoo)*	510	14		No	Potential nesting tree (Category 5)		9dd557d6-2943-42ce-ae09-9c62b4ae0107,8d0e0bcd-6e91-40d4-addf-25b41469304a
-31.0106934	115.6822545	Wandoo *(Eucalyptus wandoo)*	510	10		No	Potential nesting tree (Category 4)		531a2bb9-9c19-43fc-ad92-9436a3658687
-31.0102047	115.6837981	Wandoo *(Eucalyptus wandoo)*	510	18		No	Potential nesting tree (Category 5)		c34f789c-db10-4455-a109-cc7508257466
-31.0102471	115.6838183	Wandoo *(Eucalyptus wandoo)*	510	16		No	Potential nesting tree (Category 5)		77a853ec-b631-4c67-b844-0e46c2856afe
-31.0094752	115.6849376	Wandoo *(Eucalyptus wandoo)*	520	16		No	Potential nesting tree (Category 5)		e0bdfa2d-5771-4650-bc66-c517b8fa214b
-31.0117013	115.6836733	Wandoo *(Eucalyptus wandoo)*	520	18		No	Potential nesting tree (Category 5)		9d422b6a-f792-4c8d-909c-a610e4260140
-31.01081876	115.6858065	Wandoo *(Eucalyptus wandoo)*	530	18		No	Potential nesting tree (Category 5)		e8d87c31-c5e7-4804-aa53-e89ce59a9f0c
-31.009819	115.6839822	Wandoo *(Eucalyptus wandoo)*	530	12		No	Potential nesting tree (Category 5)		beba2a29-d950-4ae7-901e-2b6254044c9b
-31.0088763	115.6849227	Wandoo *(Eucalyptus wandoo)*	530	18		No	Potential nesting tree (Category 5)		2b09d06a-129e-4a4a-88b0-318c88a50576
-31.0087566	115.6849182	Wandoo *(Eucalyptus wandoo)*	530	18		No	Potential nesting tree (Category 5)		a1018878-2abb-414a-95c8-63add68a60b7
-31.0117148	115.6838626	Wandoo *(Eucalyptus wandoo)*	530	18		No	Potential nesting tree (Category 5)		fa23f58c-759c-4915-aa25-243127540aaf

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0118844	115.6838109	Wandoo *(Eucalyptus wandoo)*	530	14		No	Potential nesting tree (Category 5)		66ecc7fc-2210-4798-a95e-85cae7b76f5d
-31.0108041	115.6858722	Wandoo *(Eucalyptus wandoo)*	530	10	1	No	Suitable nesting tree (Category 3) - entrance visible		a833224a-80b3-45ff-a36d-b1c5e64cc811
-31.0098435	115.6834029	Wandoo *(Eucalyptus wandoo)*	540	11		No	Potential nesting tree (Category 5)		0dd23ce1-23f2-42a0-a776-978fa6605eb7,e8c32e36-c541-4b05-a342-d2ee7849c012
-31.0105798	115.683305	Wandoo *(Eucalyptus wandoo)*	540	14		No	Potential nesting tree (Category 5)		f9803a8b-fdc2-4339-9c4c-3f86a60c58a3,3c311e55-128a-49f6-8b86-404ecd1bb655
-31.0102062	115.6849054	Wandoo *(Eucalyptus wandoo)*	540	15		No	Potential nesting tree (Category 5)		d22f95d3-0d5f-4c29-85da-650c07b40515,1472e976-7e7a-4c7f-b805-49c40dcdbdcb
-31.0098697	115.6852591	Wandoo *(Eucalyptus wandoo)*	540	8		No	Potential nesting tree (Category 5)		88279f9d-be21-477a-85d5-03188499b64c,7017a660-87ce-420a-8d7d-04eddea6484a
-31.0116197	115.6836728	Wandoo *(Eucalyptus wandoo)*	540	15		No	Potential nesting tree (Category 5)		9a7b2bc2-9830-4efc-9cb6-22c1a17fe0cd,50dd2ab5-4caa-4592-9d42-0dbce8847ac9
-31.0095695	115.6833553	Wandoo *(Eucalyptus wandoo)*	540	14		No	Potential nesting tree (Category 5)		2cde1389-9eed-4f32-915c-c2b066274f86
-31.0096133	115.6844423	Wandoo *(Eucalyptus wandoo)*	540	17		No	Potential nesting tree (Category 5)		91885ee9-f25d-4c02-b720-1e0639f11295
-31.0102577	115.6855605	Wandoo *(Eucalyptus wandoo)*	540	9		No	Potential nesting tree (Category 5)		a2b87885-5dc2-4d60-af2b-90f6530b3b1e
-31.0086294	115.684686	Wandoo *(Eucalyptus wandoo)*	550	10		No	Potential nesting tree (Category 5)		8f0f9514-e06b-49c9-ac35-f568675a836a,e0ba8367-312a-463c-beaf-c91db47b0cd1
-31.0120195	115.6835477	Wandoo *(Eucalyptus wandoo)*	550	15		No	Potential nesting tree (Category 5)		631e2a7e-8759-4189-ac7f-1d6adcf098f6,2367b8fd-20a3-444c-b2bd-2e15b1274b09
-31.0106864	115.6822253	Wandoo *(Eucalyptus wandoo)*	550	16		No	Potential nesting tree (Category 4)		ec694201-324a-4fed-8c68-cc89b03a8f85
-31.0106441	115.6822418	Wandoo *(Eucalyptus wandoo)*	550	14		No	Potential nesting tree (Category 5)		169fd29f-49ea-488a-9527-24d4c17f750e
-31.0105768	115.6832679	Wandoo *(Eucalyptus wandoo)*	550	16		No	Potential nesting tree (Category 5)		71854066-7bfe-4277-9cdc-b391f7224580
-31.0122297	115.6837514	Wandoo *(Eucalyptus wandoo)*	550	9		No	Potential nesting tree (Category 5)		25c4c376-b41d-46b1-a3e4-04252b8a6315,32887602-7fc9-49b8-b8b1-750ef86d19cd
-31.0103439	115.685687	Wandoo *(Eucalyptus wandoo)*	560	16		No	Potential nesting tree (Category 5)		5a068919-ed01-48d6-a1b6-b217337a79d3
-31.0119872	115.6866409	Wandoo *(Eucalyptus wandoo)*	560	18		No	Potential nesting tree (Category 5)		f0d66bd1-fb4e-47ce-9e3a-f5c4f4228bbc
-31.0097088	115.6845592	Wandoo *(Eucalyptus wandoo)*	570	10		No	Potential nesting tree (Category 5)		030619da-ed31-4b90-8835-be22dc2b8bfe,2f54dda9-0837-4caa-9888-03fb7fcae098
-31.0101731	115.6842035	Wandoo *(Eucalyptus wandoo)*	570	19		No	Potential nesting tree (Category 5)		a6361dc4-b81c-4de4-89f7-1e3a6a314693
-31.0104611	115.6833511	Wandoo *(Eucalyptus wandoo)*	580	13		No	Potential nesting tree (Category 5)		b5e4d5e4-19d3-485e-8dc5-6d58751ed6f5,31ad5a6e-84ce-410f-99b0-afe9a26e1a7c
-31.0102295	115.6847957	Wandoo *(Eucalyptus wandoo)*	580	14		No	Potential nesting tree (Category 5)		21727bc1-2e7f-4acb-b236-70be38b5c54f,dad70588-55b3-4beb-bdd0-a9ebbf5f64f2
-31.0083484	115.6847695	Wandoo *(Eucalyptus wandoo)*	580	12		No	Potential nesting tree (Category 5)		e7c382bd-a73d-4556-b21f-eae9771e356d

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0107421	115.6819331	Wandoo *(Eucalyptus wandoo)*	580	9		No	Potential nesting tree (Category 5)		ad3c4547-a1d6-49e8-8401-0f3c5c1fddb2
-31.0106415	115.682181	Wandoo *(Eucalyptus wandoo)*	600	14		No	Potential nesting tree (Category 5)		a4bfbd4a-a110-4cd1-aab8-285c826ff094,aacb54ce-f958-4d02-af72-ce630d0fe8f1
-31.0088588	115.6848631	Wandoo *(Eucalyptus wandoo)*	600	7		No	Potential nesting tree (Category 5)		9c26b2c6-9f0b-4b8c-9ae0-9659bcb54948,d0ea47c2-be2b-47ef-84b4-bdae9f0a53be
-31.0107239	115.6833847	Wandoo *(Eucalyptus wandoo)*	600	16		No	Potential nesting tree (Category 5)		b63a4c0b-5ae6-4881-a1b5-147ee23fd8c7,9331c9a2-01ba-4bde-ac66-ee8e707ece28
-31.0119314	115.6835799	Wandoo *(Eucalyptus wandoo)*	610	14		No	Potential nesting tree (Category 5)		61092be7-70e6-4f4e-9468-6557d7dc768f,48ed67b2-95e0-4aba-a098-cbd57b5b5efa
-31.0083085	115.6846851	Wandoo *(Eucalyptus wandoo)*	620	14		No	Potential nesting tree (Category 5)		4ed25dee-f600-4743-9568-746e572a0c0a
-31.0104333	115.6821818	Wandoo *(Eucalyptus wandoo)*	630	14		No	Potential nesting tree (Category 5)		300f8a3f-9fae-4ce2-9fa8-f4fe9b9a85e0
-31.0104748	115.6841262	Wandoo *(Eucalyptus wandoo)*	630	18	1	Yes	Suitable nesting tree (Category 3) - entrance not visible		87ca595e-519c-43ef-8789-a25b6e2c7c2d
-31.0124391	115.6834096	Wandoo *(Eucalyptus wandoo)*	630	16	1	No	Suitable nesting tree (Category 3) - entrance visible		b885223e-65c5-47d8-81da-485b217896a9
-31.0090665	115.6849307	Wandoo *(Eucalyptus wandoo)*	640	18		No	Potential nesting tree (Category 5)		371c0aac-2e34-4005-8bad-dcad240b0558
-31.010503	115.6836203	Wandoo *(Eucalyptus wandoo)*	650	15	1	Yes	Suitable nesting tree (Category 3) - entrance visible	Hollow facing east, bees nest present	0c28b50f-30e8-448e-8ff4-3d3fc9b928da,97e5e073-87ec-42bb-acec-a91fdc3b2e33
-31.0104349	115.6854407	Wandoo *(Eucalyptus wandoo)*	650	15		No	Potential nesting tree (Category 5)		88a74613-fba0-411a-95ee-4a5cecbd550b,f3a34958-97d2-4e67-8289-7bf7af69a1d8
-31.0108174	115.6855766	Wandoo *(Eucalyptus wandoo)*	650	18		No	Potential nesting tree (Category 5)		41c0a5f1-8ef3-4030-9665-6feb5a876778
-31.0094458	115.6853429	Wandoo *(Eucalyptus wandoo)*	660	16		No	Potential nesting tree (Category 5)		6a767f04-f835-44bd-9bfb-ed8f7a53ca82
-31.0108143	115.6836497	Wandoo *(Eucalyptus wandoo)*	670	18		No	Potential nesting tree (Category 5)		be663f9a-91d0-4e98-8bb5-e2f5be5a447b
-31.0122852	115.6855265	Wandoo *(Eucalyptus wandoo)*	670	18		No	Potential nesting tree (Category 5)		b90b66f1-43fa-4950-afe8-c511b3fd8361
-31.0099443	115.6852945	Wandoo *(Eucalyptus wandoo)*	675	14		No	Potential nesting tree (Category 5)	2 Galahs in tree. No hollows visible	f5f38969-6f00-497a-bcdc-b2d8208f9dca,bfb1dd75-aadf-484d-a66c-5a9f8f3962d7,73be69c8-97b5-4a65-95cb-ac76ea4d29be
-31.0096855	115.6836589	Wandoo *(Eucalyptus wandoo)*	710	8	1	No	Suitable nesting tree (Category 3) - entrance visible		fc78e831-d6eb-4065-95ca-5091ab08eee8
-31.0120359	115.6834663	Wandoo *(Eucalyptus wandoo)*	720	16	1	Yes	Suitable nesting tree (Category 3) - entrance visible	Hollow facing up with bees	574d89dc-3e10-47a5-963b-951eb949b8d1,3c96e60a-d20c-495e-8992-99184b8211c1
-31.0116995	115.6859584	Wandoo *(Eucalyptus wandoo)*	740	17		No	Potential nesting tree (Category 5)		c7cdb0d6-42ec-4594-9ee2-0bed1723197a,b94e5cb1-b695-482f-a004-bf2d76d20185
-31.0121674	115.6837148	Wandoo *(Eucalyptus wandoo)*	740	7		No	Potential nesting tree (Category 5)		95d91c19-40c7-42e4-a195-7cbd08963649
-31.012547	115.6863813	Wandoo *(Eucalyptus wandoo)*	750	15		No	Potential nesting tree (Category 5)		b8d13d71-1cc6-4b07-8af3-d68ceda55779
-31.0116668	115.6838014	Wandoo *(Eucalyptus wandoo)*	810	16		No	Potential nesting tree (Category 5)		aba07e7e-8916-42a7-b604-7baae6ad5dcc

Latitude	Longitude	Taxon	DBH (mm)	Height (m)	No. Hollows	Bees Present?	Tree Category	Comments	Photos
-31.0111233	115.686221	Wandoo *(Eucalyptus wandoo)*	810	18		No	Potential nesting tree (Category 5)		568148a6-a361-4506-8c5e-54a7468db1cc
-31.0118214	115.6859881	Wandoo *(Eucalyptus wandoo)*	820	15		No	Potential nesting tree (Category 5)		3e6a5cbe-1f22-4964-adb9-0c8701afb5c2,503d286c-ee25-4940-a855-e28dfcee7436
-31.0103395	115.6827672	Wandoo *(Eucalyptus wandoo)*	820	11		No	Potential nesting tree (Category 5)		71acc520-6b41-42df-a873-3bf291f56af9
-31.0104852	115.6825897	Wandoo *(Eucalyptus wandoo)*	840	8		No	Potential nesting tree (Category 5)		df05b489-f97e-4b54-a2ae-6955a8dc7d5f
-31.0118536	115.6837963	Wandoo *(Eucalyptus wandoo)*	870	20		No	Potential nesting tree (Category 5)		5bbb97e5-cdde-42e3-8813-c9c8a05df3b2
-31.0092437	115.6814177	Wandoo *(Eucalyptus wandoo)*	920	18		No	Potential nesting tree (Category 5)		5aa97711-a930-4114-8d00-9e97977e2eab
-31.0120413	115.6853044	Wandoo *(Eucalyptus wandoo)*	940	20		No	Potential nesting tree (Category 5)		166b98b2-268e-44e6-81d0-3dc02c453720
-31.0094277	115.6851748	Wandoo *(Eucalyptus wandoo)*	960	5	1	No	Suitable nesting tree (Category 3) - entrance visible		b9e4b7d6-c4d5-43d8-8e91-b92394016c53
-31.0103149	115.6843947	Wandoo *(Eucalyptus wandoo)*	970	2		No	Potential nesting tree (Category 5)		5bdc3668-6f9c-420c-8290-83b937f168e1
-31.0114534	115.6858129	Wandoo *(Eucalyptus wandoo)*	970	15		No	Potential nesting tree (Category 5)		7d667fca-bcbd-4cd4-a324-237c0c3e0aff
-31.0093801	115.681458	Wandoo *(Eucalyptus wandoo)*	990	18		No	Potential nesting tree (Category 5)		1ce0ed3a-6434-4e2a-bfeb-d0ba52b99ca9,76c6bd7d-ab81-40f4-bb1b-59d267e44e20
-31.0103994	115.6825741	Wandoo *(Eucalyptus wandoo)*	1020	8	3	No	Suitable nesting tree (Category 3) - entrance visible		9a1ae41d-8f03-46b3-8813-f2ed8294c6e0
-31.0093307	115.681448	Wandoo *(Eucalyptus wandoo)*	1020	22		No	Potential nesting tree (Category 5)		f71ae0e2-2210-494a-bbe1-3c069fe641b8
-31.0098614	115.6847035	Wandoo *(Eucalyptus wandoo)*	1040	9		No	Potential nesting tree (Category 5)		daf8ee3a-21bf-495a-9d83-22581a133c6f
-31.0095247	115.6831701	Wandoo *(Eucalyptus wandoo)*	1110	24		No	Potential nesting tree (Category 5)		7af2522a-3e1b-4e89-8579-395579a2a198
-31.010525	115.6821423	Wandoo *(Eucalyptus wandoo)*	1180	16	2	No	Suitable nesting tree (Category 3) - entrance not visible	One with bees	a13540e4-b8e2-48d9-b394-9af903ac7208



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