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Anketell Road Upgrade Offset Strategy

Environment Protection and Biodiversity Conservation Act 1999

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Document Control

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Executive Summary

Main Roads Western Australia (Main Roads) is proposing to upgrade Anketell Road to an Expressway Standard between Leath Road, Kwinana and Kwinana Freeway, Anketell (the Controlled Action). The Controlled Action also includes the upgrade of a short section of Anketell Road east of the Kwinana Freeway (to Treeby Road) to connect the Controlled Action to the existing Anketell Road.

The purpose of this Offset Strategy is to demonstrate that the significant residual impacts of the Controlled Action on *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species and ecological communities have been adequately compensated for. The Controlled Action (EPBC 2024/09841) is currently being assessed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

The significant residual impacts resulting from the Controlled Action include:

- Up to 14.56 ha Banksia Woodlands of the Swan Coastal Plain (BWSCP) Endangered Threatened Ecological Community (TEC)
- Up to 40.99 ha Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain (TWSCP) Critically Endangered TEC
- Up to 1.94 ha Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion Critically Endangered TEC
- Up to 56.98 ha of Carnaby's Black-Cockatoo foraging habitat
- Up to 38.34 ha of Forest Red-tailed Black-Cockatoo foraging habitat.

Table E1 presents a summary of the proposed offset sites and their contribution to offsetting the residual impacts of the Controlled Action on Environmental Values.

Table E1 Summary of offset package for EPBC 2024/09841

Offset	Offset Type	Distance from Anketell Road Upgrade	Offset Area (ha)	Endangered BWSCP 14.56 ha x Quality 5		Critically Endangered TWSCP 40.99 ha x Quality 3		Critically Endangered Honeymyrtle Shrubland 1.94 ha x Quality 1		CBC Foraging Habitat 56.98 ha x Quality 5		FRTBC Foraging Habitat 38.34 ha x Quality 5	
				ha	%	ha	%	ha	%	ha	%	ha	%
Gabbadah	Restoration	107 km north	96.20	8.10	11.74	5.01	2.20			89.16	20.93		
Lake Clifton	Revegetation	72 km south south-west	18.07			17.50	17.91			18.07	29.70		
Lake Mealup	Restoration	51 km south south-west	69.00	45.00	65.25	40.00	17.54			45.00	10.57	45.00	18.22
	Revegetation					15.85	18.53			16.30	26.79	16.30	46.21
Myalup Beach Road	Revegetation	99 km south south-west	50.00			50.00	43.85						
St Ronans	Revegetation	84 km north-east	12.60							7.36	12.10	12.60	35.72
Tredrea Road	Revegetation	99.5 km south south-west	3.60					3.60	100.06				
Jandakot Regional Park	Restoration	3 km east	16.00	16.00	23.20								
Total				**69.10**	**100.19**	**128.36**	**100.03**	**3.60**	**100.06**	**175.89**	**100.09**	**73.90**	**100.15**

1. Introduction

1.1 Controlled Action Background

Main Roads Western Australia (Main Roads) is proposing to upgrade Anketell Road to an Expressway Standard between Leath Road, Kwinana and the Kwinana Freeway, Anketell within the City of Kwinana (the Controlled Action). This includes the upgrade of a short section of Anketell Road east of the Kwinana Freeway (to Treeby Road) to connect the Controlled Action to the existing Anketell Road (**Figure 1**). The Controlled Action lies approximately 30 km south of the Perth Central Business District.

The Controlled Action includes:

- Approximately 7.5 km of urban expressway standard, dual carriageway
- Grade separated interchanges at Treeby Road, Kwinana Freeway, Mandogalup Road, Abercrombie Road, Armstrong Road and Rockingham Road.
- Grade separations of Rockingham Road and Anketell Road over rail.
- New local roads and existing road modifications, including upgrades at Rockingham Road.
- Drainage basins, drains and other associated infrastructure.
- Principle Shared Path (PSP) for the full length of the Proposal.
- Other road infrastructure and furniture, including but not limited to culverts, lighting, fencing, landscaping, road safety barriers and signs.
- Utility relocations and works to maintain access to properties.

1.2 Environmental Approvals

The Controlled Action was referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 28 March 2024 (Assessment EPBC 2024/09841). DCCEEW invited public comment on the referral in July 2024 and is undergoing assessment as 'Preliminary Documentation'.

This Offset Strategy has been prepared as part of the additional information requested for the Preliminary Documentation.

1.3 Purpose of this Strategy

The purpose of this Offset Strategy is to outline the offsets proposed for the Anketell Road Upgrade (Controlled Action, Assessment EPBC 2024/09841), and demonstrate how they comply with the EPBC Act environmental offsets policy (DSEWPAC 2012), in order to mitigate the significant residual impacts remaining after the application of the mitigation hierarchy.

0 0.5 1 1.5 2 km

GDA 2020 MGA Zone 50

Legend

Anketell Rd Upgrade Development Envelope

Figure 1 - EPBC 2024/09841 Development Envelope

MRWA24012 17 December 2024

2. Significant Residual Impacts

Table 1 provides a summary of the significant residual impacts on Matters of National Environmental Significance (MNES) for the Anketell Road Upgrade that Main Roads is proposing to offset.

Table 1 - Summary of Residual Impacts for EPBC 2024/09841

MNES	Conservation Significance of Environmental Value	Significant Residual Impact	Habitat Quality Score (weighted average/10)	Habitat Quality Score for EPBC Offset Calculator
Banksia Woodland of the Swan Coastal Plain Threatened Ecological Community (TEC)	Endangered	Up to 14.56 ha	4.5	5
Tuart Woodlands and Forests of the Swan Coastal Plan TEC	Critically Endangered	Up to 40.99 ha	2.9	3
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion TEC	Critically Endangered	Up to 1.94 ha	0.8	1
Carnaby's Black-Cockatoo non-breeding foraging habitat	Threatened Species – Endangered	Up to 56.98 ha	4.7	5
Forest Red-tailed Black-Cockatoo non-breeding foraging habitat	Threatened Species – Vulnerable	Up to 38.34 ha	4.6	5

For the purposes of the EPBC offsets calculators, habitat quality scores for MNES impacted by the Controlled Action have been rounded to the nearest whole number.

2.1 Banksia Woodlands of the Swan Coastal Plain TEC

Anketell Road Upgrade will impact up to 14.56 ha of the Banksia Woodland of the Swan Coastal Plain (BWSCP) TEC, listed as Endangered under the EPBC Act (Biota 2025). The BWSCP TEC typically occurs on well drained, low nutrient soils on sandplain landforms, particularly the deep Bassendean and Spearwood sands and occasionally on Quindalup sands (DoEE 2016). The BWSCP TEC is described in the EPBC Act Approved Conservation Advice (DoEE 2016) as:

A Woodland associated with the Swan Coastal Plain of southwest Western Australia. A key diagnostic feature is a prominent tree layer of Banksia, with scattered eucalypts and other tree species often present among or emerging above the Banksia canopy. The understorey is a species rich mix of sclerophyllous shrubs, graminoids and forbs. The ecological community is characterised by a high endemism and considerable localised variation in species composition across its range.

The BWSCP TEC is restricted to the Perth (SWA02) and Dandaragan (SWA01) subregions of the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (DoEE 2016). The range of the BWSCP TEC extends from around Jurien Bay in the north, to Dunsborough in the south, and extending northwest on the Whicher and Darling escarpments (which lie within the JFA01 and JFA02 subregions of the Jarrah Forests IBRA bioregion).

2.2 Tuart Woodlands and Forests of the Swan Coastal Plain TEC

Anketell Road Upgrade will impact up to 40.99 ha of the Tuart Woodlands and Forests of the Swan Coastal Plain (TWSCP) TEC, listed as Critically Endangered under the EPBC Act.

The TWSCP TEC typically occurs as woodland, forest or other structural forms associated with soils of the Swan Coastal Plain with a prominent tree layer of *Eucalyptus gomphocephala* (Tuart) as the defining feature (DoEE 2019). The distribution of the ecological community is limited by the distribution of Tuart, although Tuart trees do also occur as a component of other vegetation communities, including the nationally listed BWSCP TEC.

The TWSCP TEC occurs within the Swan Coastal Plain IBRA region within the Perth subregion, from Jurien, 200 km north of Perth, to Sabina River near Busselton, 225 km south of Perth (DoEE 2019).

2.3 Honeymyrtle Shrubland on limestone ridges

A total of 1.94 ha of Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion TEC (Honeymyrtle shrubland TEC) will be impacted as part of the upgrade (Biota 2025). This TEC is listed as Critically Endangered under the EPBC Act (DCCEEW 2023a).

This ecological community is confined to the slopes and hilltops of limestone ridges of the Swan Coastal Plain (DCCEEW 2023a). It represents an assemblage of plants, animals, and other organisms found in warm temperate shrubland or heath habitats, predominantly dominated by *Melaleuca huegelii, Melaleuca systena*, and/or *Banksia sessilis* commonly over by *Grevillea preissii*, *Spyridium globulosum*, *Acacia lasiocarpa*, and herby understory (DBCA 2023a; DCCEEW 2023a).

2.4 Carnaby's Black-Cockatoo (*Zanda latirostris*) – Endangered

Anketell Road Upgrade will impact up to 56.98 ha of non-breeding foraging habitat for the Carnaby's Black-Cockatoo (CBC) (*Zanda latirostris*). CBC are listed as Endangered under the EPBC Act and are long-lived, slow-breeding birds, endemic to south-western Australia. CBC are post-nuptial nomads as they generally migrate into coastal areas post-breeding season to forage (Johnstone and Kirkby 2011).

During the breeding season, CBC forage in native vegetation that surrounds the woodlands used for breeding. Breeding broadly occurs within Eucalypt woodland in the wheatbelt. Recent breeding activity records indicate the species has expanded its breeding range west and southward into the Jarrah-Marri forests of the Darling Scarp and into the Tuart forests of the Swan Coastal Plain (Johnstone *et al.* 2006), including the Yanchep area and near Bunbury (Johnstone *et al.* 2006; Lee *et al.* 2013).

Common CBC foraging habitat in the Perth Metropolitan Area includes:

- Banksia woodlands or proteaceous understorey of eucalypt woodlands
- Marri and Jarrah woodlands and forest
- Pine plantations
- Planted native and non-native species around the Perth Metropolitan Area.

2.5 Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable

Anketell Road Upgrade will impact up to 38.34 ha of non-breeding foraging habitat for the Forest Red-tailed Black-Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*). FRTBC listed as Vulnerable under the EPBC Act and are endemic to the humid and sub-humid zones of the south-west of Western Australia (Mawson and Johnstone 1997), generally inhabiting the dense Jarrah, Marri and Karri forests receiving more than 600 mm average rainfall annually.

FRTBC distribution is from north of Perth to Augusta and Albany and to Mount Helena, Christmas Tree Well, North Bannister, Mt Saddleback, Rocky Gully and the upper King River in the east. Family groups and small flocks are now also observed on the Swan Coastal Plain throughout the year (Garnett *et al.* 2011).

Approximately 90% of the FRTBC diet is made up of Marri seeds and Jarrah fruit, but they will also feed on other species on the Swan Coastal Plain including the following:

- Blackbutt (*Eucalyptus patens*)
- Karri (*Eucalyptus diversicolor*)
- Sheoak (*Allocasuarina fraseriana*)
- Snottygobble (*Persoonia longifolia*)
- Tuart (*Eucalyptus gomphocephala*)
- Hakea species
- Spotted Gum (*Eucalyptus maculata*)
- Cape Lilac (*Melia azedarach*).

3. Offset Rationale

Main Roads has developed this offset package to counterbalance the significant residual impacts of the proposed Anketell Road Upgrade. This section provides some rationale for the selection and evaluation of the offsets proposed in this document, noting the challenges often faced by proponents to identify offset sites in close proximity to their proposals in a highly developed area within the Swan Coastal Plain (SCP).

Where a significant residual impact under the *Environmental Protection Act 1986* (EP Act) is also a MNES under the EPBC Act, Main Roads intends to apply the same offset under both acts.

Below is a brief description of how input scores used in the offset calculator for both impact sites and offset sites have been developed. Offsets will be assessed using the EPBC Act Offsets Guide (DCCEEW 2023b).

3.1 Habitat Quality Score (TEC)

Habitat quality scoring for the Honeymyrtle Shrubland TEC is linked to the Keighery (1994) vegetation condition scale. Application of the Keighery (1994) vegetation condition scale is a commonly used and well understood methodology for assessing habitat quality for almost all flora and vegetation surveys in the south-west of Western Australia. Each Keighery (1994) condition class is assigned a value (**Table 2**) out of ten for input into the offset calculator.

For BWSCP TEC, the habitat quality scoring has been determined using the DCCEEW 'Banksia woodland TEC habitat quality scoring framework'. The Keighery (1994) vegetation condition is assigned a score out of 100 (10 times the score in **Table 2**) as an input into the habitat quality scoring framework.

Habitat quality scoring for TWSCP TEC is linked to the vegetation ratings of the Approved Conservation Advice (TSSC 2019). Each TSSC condition class is assigned a value (**Table 3**) out of ten for input into the offset calculator.

In order to obtain a single quality value per site, the habitat quality value was averaged using a weighted average. Under this approach, the area present of each habitat quality class is multiplied by the habitat quality score, and these are then summed and divided by the total area of the offset site to obtain the weighted average. This approach was applied for calculating habitat quality values at both the impact site and offset sites.

Table 2 - Quality Score using Keighery Vegetation Condition Scale

Keighery (1994) Scale Vegetation Condition Category	Impact/Offset Quality Score
Pristine	10
Excellent-Pristine	9
Excellent	8
Very Good-Excellent	7
Very Good	6
Good-Very Good	5
Good	4
Degraded-Good	3
Degraded	2
Completely Degraded-Degraded	1
Completely Degraded	0

Table 3 - Tuart Woodlands Quality Score using Approved Conservation Advice Condition Scale (TSSC 2019)

Approved Conservation Advice Condition Category	Impact/Offset Quality Score
Very high (≥80% of all understorey cover is native)	10
High-Very high	8
High (≥60% of all understorey cover is native)	6
High-Moderate	5
Moderate (≥50% of all understorey cover is native)	4
Poor-Moderate	3
Poor (<50% of all understorey cover is native)	2
Completely degraded	0

3.2 Black Cockatoo Habitat Quality

Black-Cockatoo habitat at the impact and offset sites was assessed using the Bamford Consulting Ecologists (2020) methodology. The Bamford methodology assigns a habitat quality score out of ten for each parcel of habitat. In order to obtain a single quality value for the impact or offset site, a weighted average was calculated for the Bamford habitat quality score using the methodology described in **Section 3.1**.

4. Summary of Offset Package

Seven offset sites are proposed for the Anketell Road Upgrade offset package, and these are summarised below in **Table 4**.

This Offset Strategy has determined the starting and predicted future quality score for each of these offsets for each environmental value, referencing surveys to quantify the residual impacts and predicted offset gains, and ongoing measurable management.

The location of each offset site in relation to the Controlled Action is shown in **Figure 2**.

Within each offset site, only a proportion has been proposed to counter-balance significant residual impacts to each MNES. Where feasible, a larger area has been incorporated into each offset, making the area larger than the actual area required as an offset specified in **Table 4**. This adjustment accounts for access tracks, potential challenges in successful restoration of revegetation, and other unforeseen factors that could lead to non-compliance. Each site is described in more detail in the sections that follow.

Table 4 - Summary of Offset Package Anketell Road Upgrade

Offset	Offset Type	Distance from Anketell Road Upgrade	Offset Area (ha)	Endangered BWSCP 14.56 ha x Quality 5		Critically Endangered TWSCP 40.99 ha x Quality 3		Critically Endangered Honeymyrtle Shrubland 1.94 ha x Quality 1		CBC Foraging Habitat 56.98 ha x Quality 5		FRTBC Foraging Habitat 38.34 ha x Quality 5	
				ha	%	ha	%	ha	%	ha	%	ha	%
Gabbadah	Restoration	107 km north	96.20	8.10	11.74	5.01	2.20			89.16	20.93		
Lake Clifton	Revegetation	72 km south south-west	18.07			17.50	17.91			18.07	29.70		
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	Revegetation					15.85	18.53			16.30	26.79	16.30	46.21
Myalup Beach Road	Revegetation	99 km south south-west	50.00			50.00	43.85						
St Ronans	Revegetation	84 km north-east	12.60							7.36	12.10	12.60	35.72
Tredrea Road	Revegetation	99.5 km south south-west	3.60					3.60	100.06				
Jandakot Regional Park	Restoration	3 km east	16.00	16.00	23.20								
Total				**69.10**	**100.19**	**128.36**	**100.03**	**3.60**	**100.06**	**175.89**	**100.09**	**73.90**	**100.15**

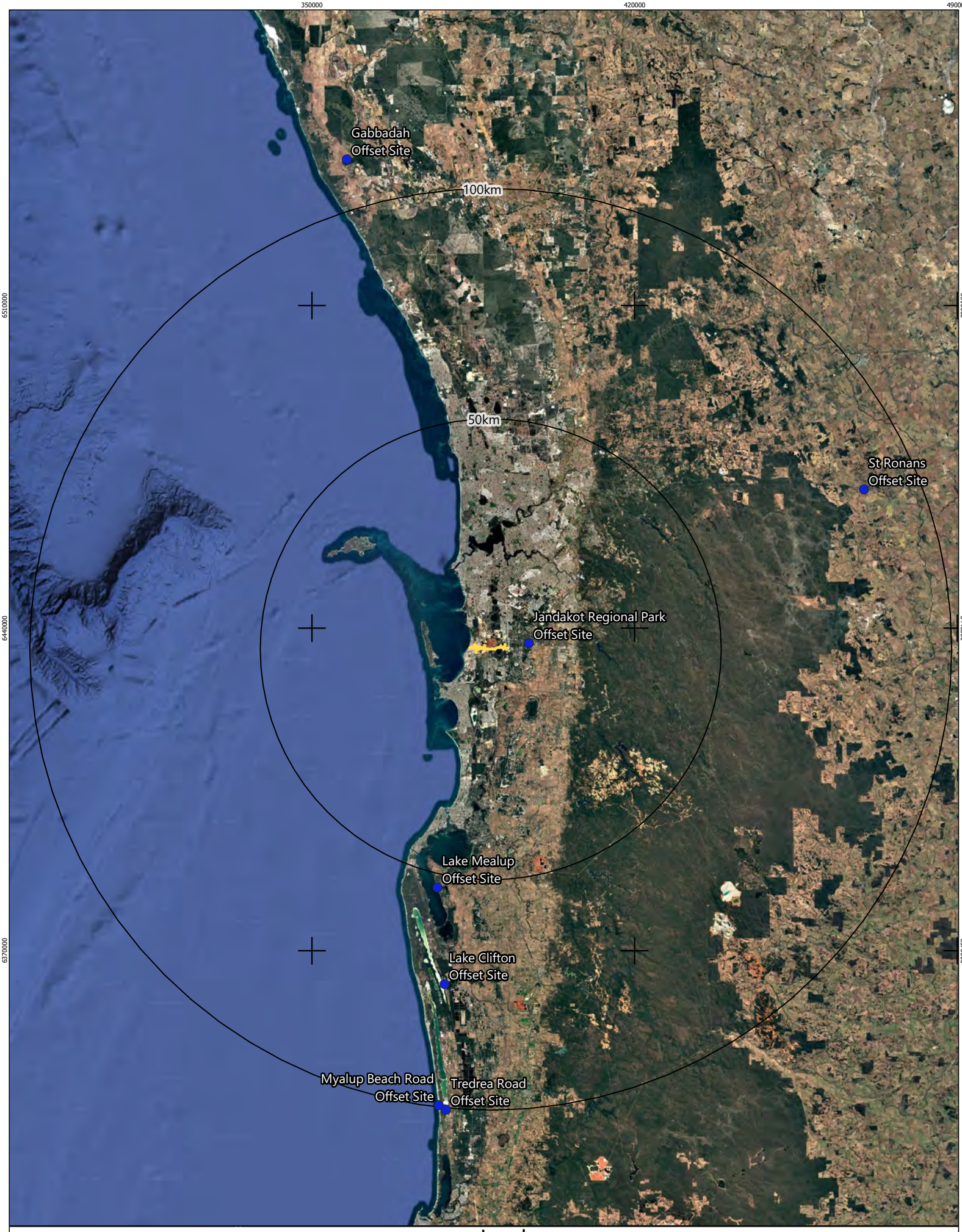

Figure 2 - Location of Offset Properties in Relation to the Controlled Action

FOCUSED VISION consulting

5. Gabbadah Offset Site

5.1 Site Description

Lot 1 Tamarisk Drive, Gabbadah, encompasses a total area of 404.44 ha and is located approximately 5 km east of Seabird, within the Shire of Gingin (**Figure 3**). A 96.2 ha portion of the property will be restored as an environmental offset for BWSCP TEC and the TWSCP TEC. The offset site lies approximately 107 km north of the Controlled Action and occurs within the same Interim Biogeographical Regionalisation for Australia (IBRA) Region, i.e. Swan Coastal Plain, within the known distribution for BWSCP TEC (DoE 2016).

The Swan Coastal Plain IBRA region is described as a low-lying coastal plain, mainly covered with Banksia and Tuart woodlands on sandy soils. Swampy areas are dominated by paperbark, and outwash plains by *Casuarina obesa*. *Melaleuca* shrublands and *C. obesa*-Marri woodlands are located extensively in the south, while Jarrah woodland dominates duri-crusted Mesozoic sediments to the east (Mitchell *et al.* 2002).

One pre-European Beard (1990) vegetation association is mapped within the Gabbadah offset site. Vegetation Association 949 has 56.42% of its pre-European extent remaining (GoWA 2019a) and is described as a Low woodland or Open low woodland of *Acacia* spp., *Banksia* spp., *Casuarina* spp., *Agonis flexuosa*, *Callitris* spp., *Allocasuarina* spp. and *Eucalyptus loxophleba*.

One Heddle *et al.* (1980) vegetation complex is mapped as occurring within the offset site, the Cottesloe Complex - North. This complex is described as predominantly low open forest and low woodland of *Banksia attenuata* (Slender Banksia) - *Banksia menziesii* (Firewood Banksia) - *Eucalyptus todtiana* (Pricklybark); closed heath on the Limestone outcrops. A total of 37.81% of the pre-European extent of the Cottesloe Complex - North remains on the Swan Coastal Plain, which is not considered poorly represented (GoWA 2019b).

The Gnangara – Moore River State Forest (a Class A Reserve) abuts the eastern boundary of Lot 1 Tamarisk Drive.

A vegetation assessment conducted in September 2024 identified the presence of BWSCP TEC and TWSCP TEC (PGV Environmental 2024). Overall, the vegetation within the offset site is in 'Very Good' condition, with poorer quality vegetation occurring adjacent to areas subject to previous disturbance (PGV Environmental 2024).

The offset site is located within the known range of Carnaby's Black-Cockatoo (*Zanda latirostris*), which extends as far north as Kalbarri (DAWE 2022). Over 100 confirmed Department of Biodiversity, Conservation and Attractions (DBCA) records of the species occur within 10 km of the offset site. No confirmed breeding or roosting sites occur within the offset site. The buffer of one confirmed breeding site occurs approximately 5.5 km south-east of the offset, with numerous roosting sites also occurring within 10 km of the site. Vegetation representative of the BWSCP TEC provides suitable foraging habitat for CBC.

The Gabbadah offset site is zoned 'Rural uncoded' in the Shire of Gingin – Local Planning Strategy (Shire of Gingin 2012) and 'General Rural' in the Shire of Gingin Local Planning Scheme No. 9 (DPLH 2024).

The existing threats to MNES within the offset site include weeds, kangaroo grazing and edge effects from adjacent land uses and potential future development. Without active management, the quality

of BWSCP and Carnaby's Black-Cockatoo foraging habitat within the offset site would be expected to decline over time.

5.2 Suitability of Site as an Offset Site

Lot 1 Tamarisk Drive has been acquired by Main Roads and a portion subject to this offset has been transferred to DBCA. The portion transferred will be restored and managed as part of the conservation estate. Main Roads funded the acquisition and will fund 20 years of ongoing management by DBCA as an environmental offset. The property has been incorporated into the conservation estate and protected in perpetuity.

To formalise the land management arrangements, Main Roads and DBCA will develop a Memorandum of Understanding (MoU) outlining the funding commitments and responsibilities of both parties. This MoU will be developed and finalised by the end of 2026.

Due to the limited availability of suitable vegetation and habitat closer to the Controlled Action area, this site was selected for its high ecological value. The offset site is located directly adjacent to the Gnangara–Moore River State Forest, forming part of a broader ecological corridor exceeding 10,000 ha. The offset site supports BWSCP TEC, TWSCP TEC, Honeymyrtle shrubland TEC and Carnaby's Black-Cockatoo foraging habitat.

5.3 MNES Values

The Gabbadah offset site contains the following MNES values pertaining to this Offset Strategy:

- 8.10 ha of BWSCP TEC with habitat quality of '6'
- 5.01 ha of TWSCP TEC with habitat quality of '6'
- 89.16 ha of vegetation suitable for restoration as CBC foraging habitat with habitat quality of '6'.

The Gabbadah offset site is located outside the distribution range for FRTBC.

5.4 Net Gain

The net gain from the implementation of this offset will be:

- Preventing decline of vegetation condition across the site from quality score '6' to '5'
- Enhancing vegetation condition of BWSCP TEC across the site from quality score '6' to '7'
- Enhancing vegetation condition of TWSCP TEC across the site from quality score '6' to '8'
- Restoration of 89.16 ha of CBC foraging habitat from quality score '6' to '7'.

5.5 Management Actions

Main Roads proposes to undertake the following activities in conjunction with DBCA within the offset site.

5.5.1 Restoration Management Plan

- Main Roads, in consultation with DBCA, will develop a Restoration Management Plan for the offset site that incorporates the actions and activities listed below
- Main Roads will fund the implementation of the Restoration Management Plan within the offset site.

5.5.2 Fencing

- Install fencing to restrict and control unauthorised access, and protect existing native vegetation, e.g. from illegal dumping to reduce the potential spread of weeds

- Specification of fences will be determined prior to installation and will depend on the size, location and topography of the offset site, and threatening processes present.

5.5.3 Pest Animal Control

- Carry out pest animal control within the offset site
- Pest management will be carried out using best practices in accordance with Department of Primary Industry and Resource Development (DPIRD) advice and governed by the *Biosecurity and Agricultural Management Act 2007* (BAM Act).

5.5.4 Weed Control

- Develop and implement a weed control program, including monitoring
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery.

5.5.5 Fire Management

- Develop a fire management plan as part of the offset site management plan and implement within the offset site for the duration of this Strategy.

5.5.6 Phytophthora Dieback Management

- Develop a dieback management plan and implement this plan within the offset site for the duration of this Strategy
- The dieback management plan may include measures such as frequency of dieback monitoring, requirement for hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

5.5.7 Surveys and Monitoring

- Conduct biological surveys for flora and fauna to establish current baseline vegetation condition and confirm any unconfirmed vegetation values present
- Conduct vegetation monitoring at regular intervals throughout the offset duration to gauge progress towards achievement of offset targets.

5.6 Targets

Monitoring, management activities and targets for the offset site are outlined in **Table 5**.

Table 5 - Schedule of Monitoring and Management Activities and Targets for Gabbadah Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Offset Security	Offset site will be owned and managed by DBCA MoU between Main Roads and DBCA	MoU complete by end of 2026	MoU complete by end of 2026
Develop and implement offset Restoration Management Plan	In consultation with DBCA, develop a Restoration Management Plan to protect and enhance the site offset values	Complete by end of 2026	Complete by end of 2026
Management of: BWSCP TEC TWSCP TEC Carnaby's Black-Cockatoo Foraging Habitat	Implement Restoration Management Plan Undertake monitoring of vegetation condition	Implement Restoration Management Plan for 20 years from approval of this Strategy	Improve to achieve, then maintain, vegetation condition score of '7' or better for BWSCP and '8' for TWSCP Improve Carnaby's Black-Cockatoo foraging habitat from quality score '6' to '7'

5.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counter-balance significant residual impacts are summarised in **Tables 6**, **7** and **8**.

Table 6 – BWSCP TEC Justification of Offset Calculator Values – Gabbadah Offset Site

Attribute	Value	Justification
Start Quality	**6**	A total of 89.3 ha of vegetation considered representative of BWSCP TEC of 'Very Good' condition (PGV Environmental 2024) was recorded within the property.
Future quality without offset	**5**	Considering the existing threatening processes (weeds. kangaroo grazing and edge effects) and lack of active management, the vegetation quality within the offset site is expected to decline over time without suitable management.
Future quality with offset	**7**	Management actions, addressing potential threats such as kangaroo grazing, weed and dieback infestation will improve the quality of the vegetation over time.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years of management to achieve the improvement in habitat quality.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

Table 7 – TWSCP TEC Justification of Offset Calculator Values – Gabbadah Offset Site

Attribute	Value	Justification
Start Quality	**6**	A total of 5.01 ha of vegetation considered representative of TWSCP TEC of 'Very Good' condition (PGV Environmental 2024) was recorded within the property and will be allocated as part of the package.
Future quality without offset	**5**	Considering the existing threatening processes (weeds and kangaroo grazing and edge effects) and lack of active management, the vegetation quality within the offset site is expected to decline over time without suitable management.
Future quality with offset	**8**	Management actions, addressing potential threats such as kangaroo grazing, weed and dieback infestation will improve the quality of the vegetation over time.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years of management to achieve the improvement in habitat quality.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

Table 8 – CBC Foraging Habitat Justification of Offset Calculator Values – Gabbadah Offset Site

Attribute	Value	Justification
Start Quality	**6**	The offset site contains vegetation dominated by suitable foraging species for Carnaby's Black-Cockatoo and was determined to have a score of 6 made up of 4 for habitat quality, 1 for site context and 1 for presence/stocking rate. The site is within the known distribution range for Carnaby's Black-Cockatoo and it is considered likely that they regularly utilise the offset site for foraging.
Future quality without offset	**6**	Without the threat of further clearing, the foraging habitat is unlikely to become further degraded over time and therefore, the future quality without offset score for CBC is considered unlikely to change.
Future quality with offset	**7**	With restoration and active management as part of the conservation estate, the foraging quality can be improved on this site. Securing the offset will also maintain an ecological linkage with Gnangara-Moore River State Forest to the east.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that restoration actions will achieve results within the predicted timeframe.

5.8 Offset Calculator Values

Offset calculators for the Gabbadah offset site are provided in **Appendix A** and the values summarised in **Table 9**.

Table 9 - Offset Calculator Values, Gabbadah Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
BWSCP TEC	8.10	6	5	7	11.74
TWSCP TEC	5.01	6	5	8	2.20
Carnaby's Black-Cockatoo foraging habitat	89.16	6	6	7	20.93

Figure 3 - Gabbadah Offset Site

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6. Lake Clifton Offset Site

6.1 Site Description

The Lake Clifton offset site is located at Lot 2 Old Coast Road, Lake Clifton and encompasses an area of 18.07 ha within the 74.17 ha property (**Figure 4**). A portion of the lot will be revegetated as an offset for TWSCP TEC and CBC foraging habitat. The property is adjacent to the Myalup State Forest, a Class A Reserve. The offset site lies within the Swan Coastal Plain IBRA Region and is approximately 71.5 km south-west of the Anketell Road Upgrade.

The offset site lies within an Environmentally Sensitive Area (ESA), associated with the Peel-Yalgorup Ramsar Wetland and the Yalgorup National Park.

One Beard (1990) vegetation association 998 (Medium woodland; Tuart) is supported by the offset site. Vegetation Association 998 has 36.25% of its pre-European extent remaining (GoWA 2019a).

Two Heddle *et al.* (1980) vegetation complexes occur within the offset site, the Cottesloe Complex – Central and South and the Yoongarlillup Complex. The Cottesloe Complex – Central and South, supports a mosaic of woodland of Tuart and open forest of Tuart - Jarrah - Marri and closed heath on the Limestone outcrops. The Cottesloe Complex – Central and South has 32.16% of its pre-European extent remaining (GoWA 2019b). The Yoongarlillup Complex is described as Woodland to Tall Woodland of Tuart with *Agonis flexuosa* in the second storey. Less consistently an open forest of Tuart - Jarrah - Marri (Heddle *et al.* 1980).

The offset site is located within the range of Carnaby's and Forest Red-tailed Black-Cockatoos (DAWE 2022). Numerous occurrences of Carnaby's Black-Cockatoos occur within close proximity of the offset site. Two known breeding sites occur at the southern end of the offset site.

6.2 Suitability of Site as an Offset Site

The proposed offset site for the Old Coast Road project is located adjacent to the Myalup State Forest (LR3160/63 and LR3160/66). The site has been acquired by Main Roads and transferred to DBCA for incorporation into the State's conservation estate, where it is protected in perpetuity.

Main Roads has funded the acquisition and will fund 20 years of ongoing management of the site by DBCA, as part of its environmental offset obligations under the EPBC Act.

To formalise the land management arrangements, Main Roads and DBCA will develop a MoU outlining the funding commitments and responsibilities of both parties. This MoU will be developed and finalised by the end of 2026.

Due to limited availability of suitable land closer to the Controlled Action area, this site was selected as it contains habitat that can be restored to TWSCP TEC. It is directly adjacent to the Myalup State Forest, a Class A reserve covering approximately 8,638 hectares. According to DBCA's TWSCP dataset (DBCA-048), the site contains TWSCP TEC and significant vegetation and habitat values, including foraging habitat for Black-Cockatoos.

The property has been acquired and will be revegetated and managed as part of DBCA's conservation estate, contributing to long-term biodiversity protection and offsetting the environmental impacts of the project.

6.3 MNES Values

The Lake Clifton offset site currently contains the following MNES values pertaining to this Offset Strategy:

- 17.50 ha of TWSCP TEC with habitat quality of '1'
- 18.07 ha of land suitable for revegetation as CBC habitat.

6.4 Net Gain

The net gain from the implementation of this offset will be:

- Revegetation of 17.5 ha of TWSCP TEC from quality score '1' to '8'
- Revegetation of 18.07 ha of CBC habitat from quality score '1' to '8' (overlapping with the TWSCP TEC revegetation area).

6.5 Management Actions

Main Roads proposes to undertake the following activities in conjunction with DBCA within the offset site.

6.5.1 Revegetation Management Plan

- Main Roads, in consultation with DBCA, will develop a Revegetation Management Plan for the offset site that incorporates the actions and activities listed below
- Main Roads will fund the implementation of the Revegetation Management Plan within the offset site.

6.5.2 Revegetation

- Revegetation works will consist of site preparation (fencing, weed control, ripping / furrow-lining (if required) and pest control), seeding / planting and ongoing management
- Revegetation will be undertaken with a suite of species developed in consultation with DBCA to replicate TWSCP TEC, as well as incorporating proteaceous and other Black-Cockatoo foraging species.

6.5.3 Fencing

- Install fencing to restrict and control unauthorised access, and protect existing native vegetation, e.g. from illegal dumping to reduce the potential spread of weeds
- Specification of fences will be determined prior to installation and will depend on the size, location and topography of the offset site, and threatening processes present.

6.5.4 Pest Animal Control

- Carry out pest animal control within the offset site
- Pest management will be carried out using best practices in accordance with DPIRD advice and governed by the BAM Act.

6.5.5 Weed Control

- Develop and implement a weed control program, including monitoring
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery.

6.5.6 Fire Management

- Develop a fire management plan as part of the offset site management plan and implement within the offset site for the duration of this Strategy.

6.5.7 Phytophthora Dieback Management

- Develop a dieback management plan and implement this plan within the offset site for the duration of this Strategy
- The dieback management plan may include measures such as: frequency of dieback monitoring, requirement for hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

6.5.8 Survey and Monitoring

- Conduct biological surveys for flora and fauna to establish current baseline vegetation condition and confirm any unconfirmed vegetation values present
- Conduct vegetation monitoring of revegetation area at regular intervals throughout the offset duration to gauge progress towards achievement of offset targets.

6.6 Targets

Main Roads will develop a set of monitoring and management activities and targets for the offset site and these are outlined in **Table 10**.

Table 10 - Schedule of Monitoring and Management Activities and Targets for Lake Clifton Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Offset Security	MoU between Main Roads and DBCA	Complete by end of 2026	Complete by end of 2026
Develop and implement site Revegetation Management Plan	In consultation with DBCA, develop a Revegetation Management Plan to protect and enhance the site	Complete by end of 2026 Planting to commence in 2027	Complete by end of 2026 Planting to commence in 2027
Management of TWSCP TEC	Implement Revegetation Management Plan Undertake monitoring of vegetation condition	Implement Revegetation Management Plan for 20 years from approval of this strategy	Improve and maintain overall quality of '8' or better
Black-Cockatoo foraging habitat condition	Implement Revegetation Management Plan Undertake Black-Cockatoo foraging habitat assessment	Implement Revegetation Management Plan for 20 years from approval of this strategy	Improve and maintain overall quality of '8'

6.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counter-balance significant residual impacts are summarised in **Table 11** and **12**.

Table 11 – TWSCP TEC Justification of Offset Calculator Values – Lake Clifton

Attribute	Value	Justification
Start Quality	**1**	Lot 2 Old Coast Road, contains TWSCP of variable condition with some areas recorded as 'Good' or 'Good-Degraded' (DBCA 2023b). The offset site occurs directly adjacent to the Myalup State Forest (LR160/63, LR3160/66), a Class A reserve, encompassing an area of 8,638 hectares. The proposed offset site is a degraded area (17.5 ha), with TWSCP widely distributed within the region (DBCA-048) and it is within the geographical boundary of the TWSCP TEC. Due to the degraded nature, it is not considered that the average species richness would be comparable to intact TWSCP TEC.
Future quality without offset	**1**	The site is unlikely to improve in condition without active management.
Future quality with offset	**8**	Revegetation activities will improve the overall vegetation condition of TWSCP and actively manage the prevention of dieback. Implementation of revegetation and associated management action will significantly improve the quality of vegetation within the site. Revegetation will increase the species richness and density within the site.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years of management to achieve the improvement in habitat quality.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

Table 12 – CBC Foraging Habitat Justification of Offset Calculator Values – Lake Clifton

Attribute	Value	Justification
Start Quality	**1**	The site is within the known distribution range for CBC but it is degraded and is unlikely to contain foraging habitat. The area proposed as the offset is mostly degraded with an abundance of weeds, few mature trees with habitat values and would require revegetation and significant weed control (DBCA 2024). There are known or potential breeding sites for Black-Cockatoos within 6 km of this area. Numerous known Black-Cockatoo roosting sites occur within 10 km of the of the offset area.
Future quality without offset	**1**	The foraging habitat is unlikely to become further degraded over time and therefore the HQS for CBC are unlikely to change for future quality without offset.
Future quality with offset	**8**	With revegetation and active management as part of the conservation estate, the foraging quality can be improved on this site. Revegetation with suitable foraging species for CBC will provide a projected foliage cover of >60%. Securing the offset will also maintain an ecological linkage with Myalup State Forest.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that revegetation actions will achieve results within the predicted timeframe.

6.8 Offset Calculator Values

Offset calculators for the Lake Clifton offset site are provided in **Appendix B** and the values summarised in **Table 13**.

Table 13 - Offset Calculator Values Lake Clifton Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
TWSCP TEC	17.50	1	1	8	17.91
Carnaby's Black-Cockatoo foraging habitat	18.07	1	1	8	29.70

Figure 4 - Lake Clifton Offset Site

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7. Lake Mealup Offset Site

7.1 Site Description

The 'Lake Mealup' offset site encompasses revegetation and restoration within Lot 277 Lake Mealup Road North, Birchmont, Shire of Murray (**Figure 5**). It occurs on the eastern shore of the Peel Inlet, which is part of the Peel-Yalgorup Ramsar System, and is adjacent to the McLarty Nature Reserve (R24739) and Mealup Point Nature Reserve (R2738), both Class A Reserves for the conservation of flora and fauna. The offset site encompasses 69 ha within a 75 ha property acquired by Main Roads and is located approximately 50 km south of the Controlled Action and occurs within the same IBRA Region, i.e. Swan Coastal Plain. The Lake Mealup offset site is zoned part (48.1%) 'Rural' and part (51.9%) 'Regional Open Space' under the Peel Regional Scheme.

Main Roads is proposing to restore 45 ha of the site as an offset for BWSCP TEC, CBC foraging habitat and FRTBC foraging habitat and 40 ha for TWSCP TEC. Restoration is the process of returning degraded ecosystems to an improved condition and will occur in areas that contain existing vegetation. The existing threats within the offset site include weeds, kangaroo (herbivore) grazing and lack of management for conservation. Without active management, the vegetation quality within the offset site is expected to decline over time.

In addition to the above, an area of 16.3 ha will be revegetated for CBC and FRTBC foraging habitat incorporating 15.85 ha of TWSCP TEC revegetation.

Three Beard (1990) pre-European vegetation associations (126, 968 and 998) are mapped as occurring within the offset site:

- vegetation association 126 - Bare areas; freshwater lakes
- vegetation association 968 - Medium woodlands; Jarrah, Marri and Wandoo
- vegetation association 998 - Medium woodlands; Tuart.

All three vegetation associations have more than 30% of their pre-European extent remaining (GoWA 2019a).

One Heddle *et al.* (1980) vegetation complex is mapped as occurring within the offset site, the Cottesloe Complex – Central and South. The Cottesloe Complex – Central and South, supports a mosaic of woodland of Tuart and open forest of Tuart - Jarrah - Marri and closed heath on the Limestone outcrops. The Cottesloe Complex – Central and South has 32.16% of its pre-European extent remaining (GoWA 2019b).

DBCA's Threatened and Priority Ecological Community database identifies the occurrence or predicted occurrence of two Commonwealth listed TECs, or their buffers, within the Lake Mealup offset site. They are as follows:

- Coastal Saltmarsh – Subtropical and Temperate Coastal Saltmarsh TEC (Vulnerable)
- TWSCP TEC.

The offset site is within the known range for both Carnaby's and Forest Red-tailed Black-Cockatoos (DAWE 2022). No known Black-Cockatoo breeding or roosting sites or their buffers occur within the offset site. Numerous confirmed roost sites occur on the western side of the Peel inlet, 4 km west of the offset site. One confirmed breeding site occurs 7.6 km south-west of the offset site. Both species of Black-Cockatoo have been recorded regularly within close proximity to the offset site.

7.2 Suitability of Site as an Offset Site

The Lake Mealup offset site has been acquired by Main Roads and transferred to DBCA for incorporation into the State's conservation estate, where it is protected in perpetuity.

Main Roads has funded the acquisition, and will fund revegetation and 20 years of management as an EPBC Act environmental offset.

To formalise the land management arrangements, Main Roads and DBCA will develop a MoU outlining the funding commitments and responsibilities of both parties. This MoU will be developed and finalised by the end of 2026.

The site will serve as a restoration and revegetation offset for BWSCP TEC, TWSCP TEC, and foraging habitat for CBC and FRTBC. It is located within the known ranges of both CBC and FRTBC.

Restoration and revegetation will result in a net benefit to MNES impacted by the Controlled Action.

7.3 MNES Values

The Lake Mealup offset site currently contains the following MNES values pertaining to this Offset Strategy:

- 45 ha of BWSCP TEC with habitat quality of '5'
- 40 ha of TWSCP TEC with habitat quality of '6' (overlapping with the BWSCP TEC area)
- 45 ha of vegetation suitable for restoration as CBC and FRTBC foraging habitat (offset start score of '6') (overlapping with the TEC areas).

A biological survey will be conducted in spring 2025 to confirm the environmental values present onsite.

7.4 Net Gain

The net gain from the implementation of this offset will be:

- Restoration of 45 ha of BWSCP TEC from quality score '5' to '6'
- Restoration of 40 ha of TWSCP TEC from quality score '6' to '8'
- Restoration of 45 ha of CBC and FRTBC foraging habitat from habitat score '6' to '7'
- Revegetation of 15.85 ha of TWSCP TEC from quality score '0' to '8'
- Revegetation of 16.3 ha of CBC and FRTBC foraging habitat from habitat score '1' to '8'.

7.5 Management Actions

Main Roads proposes to undertake the following activities in conjunction with DBCA within the offset site.

7.5.1 Revegetation and Restoration Management Plan

- Main Roads, in consultation with DBCA, will develop and implement the Lake Mealup Restoration and Revegetation Management Plan (LMRRMP) that incorporates the actions and activities listed below
- Main Roads will fund the implementation of the LMRRMP within the offset site.

7.5.2 Revegetation

- Revegetation works will consist of site preparation (fencing, weed control, ripping / furrow-lining (if required) and pest control), seeding / planting and ongoing management
- Revegetation will be undertaken with a suite of species developed in consultation with DBCA to represent BWSCP TEC and TWSCP TEC, and to provide suitable foraging species for CBC and FRTBC.

7.5.3 Fencing

- Install fencing to restrict and control unauthorised access, and protect existing native vegetation
- Specification of fences will be determined prior to installation and will depend on the size, location and topography of the offset site, and threatening processes present. Pest Animal Control
- Carry out pest animal control (including kangaroo control) as required where impacts to the recovery of existing vegetation or establishment of revegetation are observed or considered likely to occur
- Pest management will be carried out using best practices in accordance with DPIRD advice and governed by the BAM Act.

7.5.4 Weed Control

- Develop and implement a weed control program, including monitoring
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery and revegetation establishment.

7.5.5 Fire Management

- Develop and implement a fire management plan as part of the LMRRMP and implement within the offset site for the duration of this Strategy.

7.5.6 Phytophthora Dieback Management

- Develop a dieback management plan and implement this plan within the offset site for the duration of this Strategy.
- The dieback management plan may include measures such as: frequency of dieback monitoring, requirement for hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

7.5.7 Surveys and Monitoring

- Undertake baseline flora and vegetation surveys to confirm condition and extent of TECs
- Conduct revegetation monitoring at regular intervals throughout the offset duration to gauge progress towards achievement of 'High-Very High' (8) condition TWSCP TEC vegetation
- Conduct ongoing monitoring within existing vegetation and revegetation areas to assess vegetation and habitat condition.

7.6 Targets

Monitoring, management activities and targets for the offset site are outlined in **Table 14**.

Table 14 - Schedule of Monitoring and Management Activities and Targets for Lake Mealup Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Offset Security	Offset site will be owned and managed by DBCA MoU between Main Roads and DBCA	MoU complete by end of 2026	MoU complete by end of 2026
Develop and implement LMRRMP	In consultation with DBCA, develop LMRRMP to improve existing vegetation values and undertake revegetation within the offset site	Develop LMRRMP by end of 2026 Planting to commence in 2027	LMRRMP developed by the end 2026 Planting to commence in 2027
BWSCP TEC TWSCP TEC	Implement LMRRMP Undertake monitoring of vegetation condition	Implement LMRRMP for 20 years from approval of this strategy	Improve to achieve, then maintain overall vegetation condition of 'Very Good' (6) and 'High-Very High' (8) or better for BWSCP and TWSCP, respectively within restoration area Improve to achieve, then maintain overall vegetation condition of 'High-Very High' (8) or better for TWSCP within revegetation area
Black-Cockatoo foraging habitat condition	Implement LMRRMP Undertake Black-Cockatoo foraging habitat assessment	Implement LMRRMP for 20 years from approval of this strategy	Black-Cockatoo habitat quality score of '7' within restoration area and '8' within revegetation area or better

7.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counter-balance significant residual impacts are summarised in **Tables 15-21**.

7.7.1 Restoration

Table 15 – BWSCP TEC Justification of Offset Calculator Values – Lake Mealup Restoration

Attribute	Value	Justification
Start Quality	**5**	The BWSCP TEC within the restoration portion of the Lake Mealup offset site is in 'Good-Very Good' condition and has been assigned a start score of '5'.
Future quality without offset	**4**	Considering the existing threatening processes (weeds, kangaroo grazing and dieback) and lack of active management, the vegetation quality within the offset site is expected to decline over time without suitable management.
Future quality with offset	**6**	Management actions, addressing potential threats include weed management and installation of fencing along the boundary of the site, to prevent kangaroo grazing, weed and dieback infestation will improve the condition of the vegetation.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years to achieve the desired species diversity, vegetation cover/structure and weed density
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

Table 16 – TWSCP TEC Justification of Offset Calculator Values – Lake Mealup Restoration

Attribute	Value	Justification
Start Quality	**6**	The TWSCP TEC within the restoration portion of the Lake Mealup offset site is in 'High' condition and has been assigned a start score of '6'.
Future quality without offset	**5**	Considering the existing threatening processes (weeds, kangaroo grazing and dieback) and lack of active management, the vegetation quality within the offset site is expected to decline over time without suitable management.
Future quality with offset	**8**	Management actions, addressing potential threats include weed management and installation of fencing along the boundary of the site, to prevent kangaroo grazing, weed, dieback infestation and restoration/revegetation will improve the condition of the in-situ TWSCP TEC vegetation.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years to achieve the desired species diversity, vegetation cover/structure and weed density.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

Table 17 – CBC Foraging Habitat Justification of Offset Calculator Values – Lake Mealup Restoration

Attribute	Value	Justification
Start Quality	**6**	The restoration portion of the Lake Mealup offset site contains vegetation dominated by suitable foraging species for CBC and was determined to have a score of '6' (Moderate foraging value) made up of: 4 for habitat quality, 1 for site context and 1 for presence. There are known or potential roosting sites for Black-Cockatoos within 6 km of this area, the closest being 4 km west.
Future quality without offset	**6**	Without the threat of further clearing, the foraging habitat is unlikely to become further degraded over time and therefore the future quality without offset score for CBC is considered unlikely to change.
Future quality with offset	**7**	With restoration and active management as part of the conservation estate, the foraging quality can be improved on this site. Securing the offset will also provide an ecological linkage between Mealup Point Nature Reserve, McLarty Nature Reserve and Lake Mealup Nature Reserve.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that restoration actions will achieve results within the predicted timeframe.

Table 18 – FRTBC Foraging Habitat Justification of Offset Calculator Values – Lake Mealup Restoration

Attribute	Value	Justification
Start Quality	**6**	The restoration portion of the Lake Mealup offset site contains vegetation dominated by suitable foraging species for FRTBC and was determined to have a score of 6 made up of: 4 for habitat quality, 1 for site context and 1 for presence/stocking rate. (Moderate foraging value). There are known or potential roosting sites for Black-Cockatoos within 6 km of this area, the closest being 4 km west. One known Black-Cockatoo breeding roosting sites area located approximately 7.6 km south-west of the offset area.
Future quality without offset	**6**	Without the threat of further clearing, the foraging habitat is unlikely to become further degraded over time and therefore, the future quality without offset score for FRTBC is considered unlikely to change.
Future quality with offset	**7**	With restoration and active management as part of the conservation estate, the foraging quality can be improved on this site. Securing the offset will also provide an ecological linkage between Mealup Point Nature Reserve, McLarty Nature Reserve and Lake Mealup Nature Reserve.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that restoration actions will achieve results within the predicted timeframe.

7.7.2 Revegetation

Table 19 – TWSCP TEC Justification of Offset Calculator Values – Lake Mealup Revegetation

Attribute	Value	Justification
Start Quality	**0**	The revegetation portion of the Lake Mealup offset site contains no TWSCP TEC, but is directly adjacent to TWSCP vegetation within the property. The proposed revegetation offset area is largely devoid of intact remnant vegetation and would once have contained TWSCP, that will be revegetated to the TEC.
Future quality without offset	**0**	Without active revegetation of the site, the vegetation condition is unlikely to improve.
Future quality with offset	**8**	Revegetation activities will reinstate the TWSCP TEC, improve the overall vegetation condition and actively manage the prevention of dieback. Implementation of revegetation and associated management actions will significantly improve the quality of vegetation within the site.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years to achieve the desired species diversity, vegetation cover/structure and weed density.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

Table 20 – CBC Foraging Habitat Justification of Offset Calculator Values – Lake Mealup Revegetation

Attribute	Value	Justification
Start Quality	**1**	The site is within the known distribution range for CBC and the species is considered likely to be a regular visitor to adjacent habitat. The offset site proposed to be revegetated contains limited foraging habitat for CBC.
Future quality without offset	**1**	The foraging habitat is unlikely to become further degraded over time and therefore the HQS for CBC are unlikely to change for future quality without offset. Without active revegetation of the site, the habitat condition will not improve.
Future quality with offset	**8**	With revegetation and active management as part of the conservation estate, the foraging quality can be improved on this site. Revegetation with suitable foraging species for CBC will provide a projected foliage cover of >60%.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for the long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years for revegetation to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that revegetation actions will achieve results within the predicted timeframe.

Table 21 – FRTBC Foraging Habitat Justification of Offset Calculator Values – Lake Mealup Revegetation

Attribute	Value	Justification
Start Quality	**1**	The site is within the known distribution range for FRTBC. FRTBC individuals were observed foraging in Marri trees onsite during initial site assessments prior to acquisition negotiations commencing, and the species is considered likely to be a regular visitor to adjacent habitat. The offset site proposed to be revegetated contains limited foraging habitat for FRTBC.
Future quality without offset	**1**	The foraging habitat is unlikely to become further degraded over time and therefore the HQS for FRTBC are unlikely to change for future quality without offset. Without active revegetation of the site, the habitat condition will not improve.
Future quality with offset	**8**	With revegetation and active management as part of the conservation estate, the foraging quality can be improved on this site. Revegetation with suitable foraging species for FRTBC will provide a projected foliage cover of >60%.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years for revegetation to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that revegetation actions will achieve results within the predicted timeframe.

7.8 Offset Calculator Values

Offset calculators for the Lake Mealup offset site are provided in **Appendix C** and the values are summarised in **Table 22**.

Table 22 - Offset Calculator Values for Lake Mealup Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
Restoration					
BWSCP TEC	45.00	5	4	6	65.25
TWSCP TEC	40.00	6	5	8	17.54
Carnaby's Black-Cockatoo foraging habitat	45.00	6	6	7	10.57
Forest Red-tailed Black-Cockatoo foraging habitat	45.00	6	6	7	18.22
Revegetation					
TWSCP TEC	15.85	0	0	8	18.53
Carnaby's Black-Cockatoo foraging habitat	16.30	1	1	8	26.79
Forest Red-tailed Black-Cockatoo foraging habitat	16.30	1	1	8	46.21

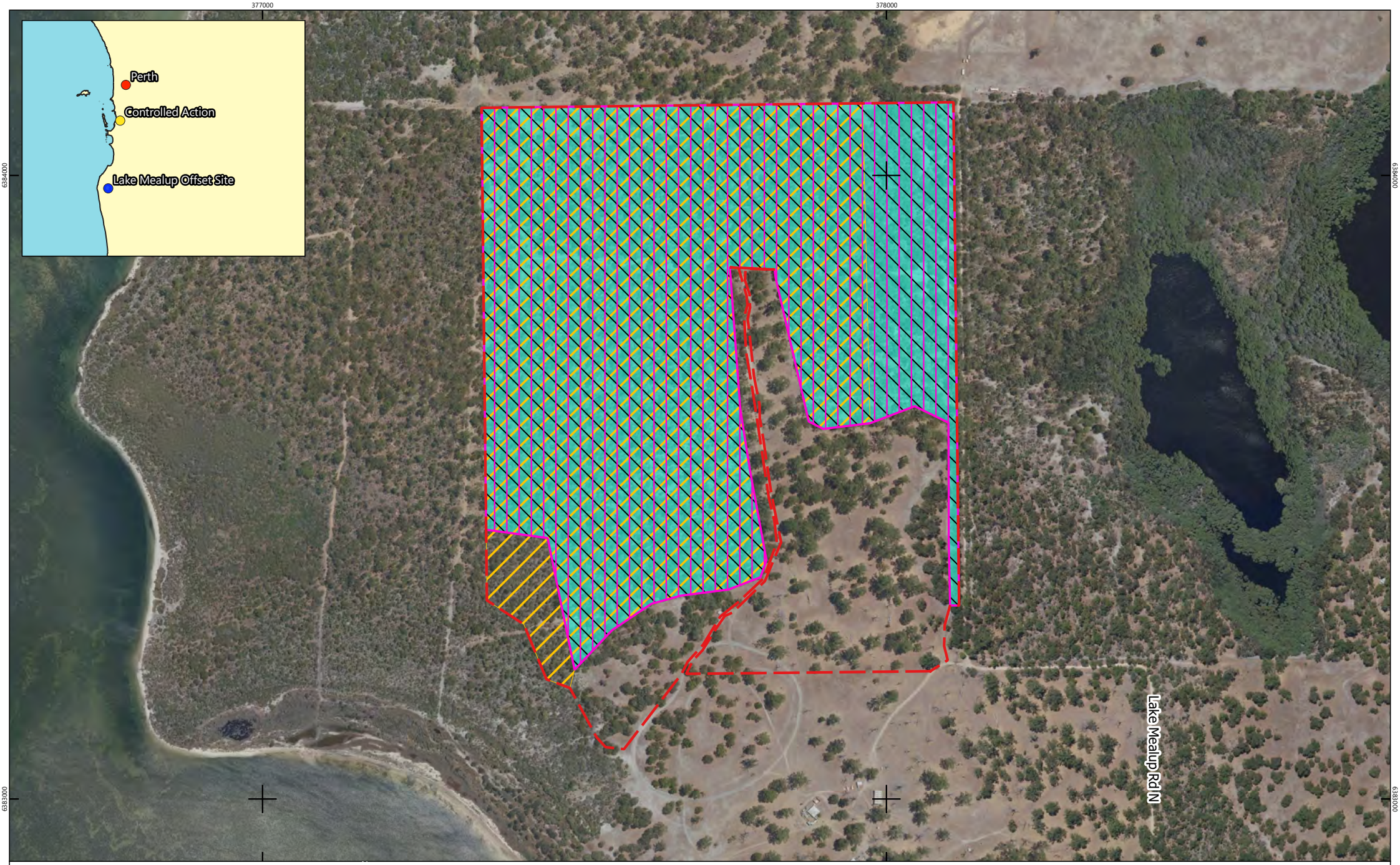

Figure 5a - Lake Mealup Offset Site (Restoration)

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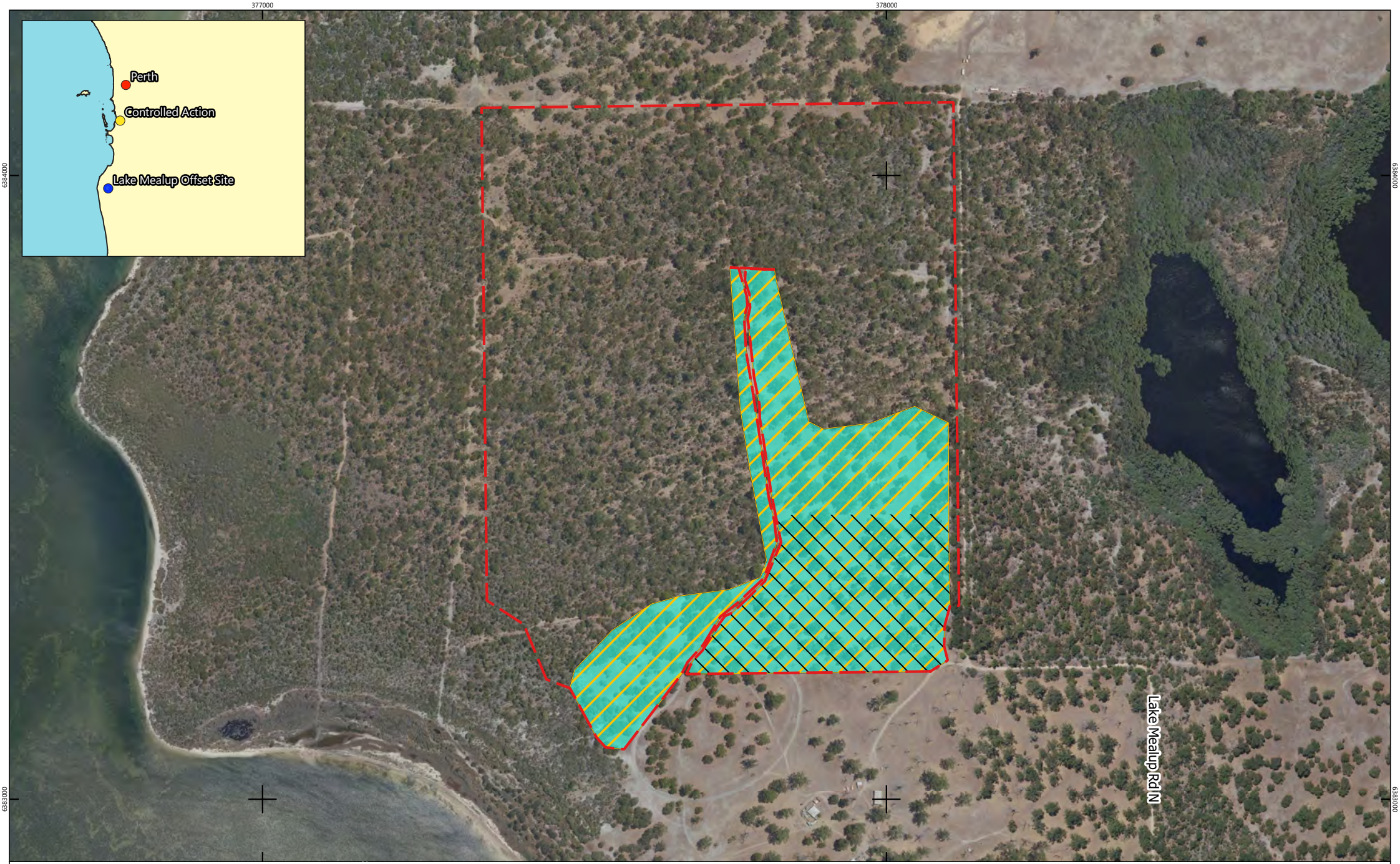

Figure 5b - Lake Mealup Offset Site (Revegetation)

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8. Myalup Beach Road Offset Site

8.1 Site Description

Lot 200 Myalup Beach Road, Myalup (73.4 ha) is located approximately 500 m south of Myalup townsite, within the Shire of Harvey (**Figure 6**). It lies on the Swan Coastal Plain, approximately 98 km south of the Anketell Road Upgrade. An ESA covers the eastern portion of the lot.

The TWSCP TEC has been documented to occur within the lot (DBCA-048 dataset). Main Roads is proposing to restore 50 ha of TWSCP TEC at this site as an environmental offset for impacts upon the TWSCP TEC as part of the Anketell Road Upgrade.

Two pre-European Beard (1990) vegetation associations (37 and 48) occur within Lot 200. Vegetation association 37 is described as Shrublands; teatree thicket and has 62.92% of its pre-European extent remaining. Vegetation association 48 is described as; Shrublands; scrub heath and has 39.35% of its pre-European extent remaining (GoWA 2019a) and therefore both meet the West Australian Environmental Protection Authority's (EPA) 30% retention target.

Two Heddle *et al.* (1980) vegetation complexes occur within the lot, the Quindalup Complex and the Vasse Complex. The Quindalup Complex is a coastal dune complex with the low closed forest of *Melaleuca lanceolata* (Rottnest Teatree) - *Callitris preissii* (Rottnest Island Pine), the closed scrub of *Acacia rostellifera* (Summer-scented Wattle) and the low closed *Agonis flexuosa* (Peppermint) forest of Geographe Bay. The Vasse Complex has a mixture of the closed scrub of *Melaleuca* species fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca* species and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri). It also includes areas dominated by *Tecticornia* and *Sarcocornia* species (Samphire) near Mandurah and south of the Capel River (Heddle *et al.* 1980). Both complexes have more than 30% of their original pre-European extent remaining, represented by 60.49% and 31.4%, respectively.

8.2 Suitability of Site as an Offset Site

The Myalup Beach Road offset site will be used as a restoration offset for the TWSCP TEC. The site will be managed by Main Roads under a Management Order with the Department of Planning, Lands and Heritage (DPLH). Main Roads will fund and implement restoration and management for a period of 20 years as part of its environmental offset obligations under the EPBC Act.

Due to the limited availability of suitable land containing the TWSCP TEC closer to the Controlled Action area, this site was selected because it contains the TWSCP TEC.

8.3 MNES Values

The existing environmental value of the Myalup Road offset site pertaining to this Offset Strategy includes:

- 50 ha of 'Degraded' TWSCP TEC with habitat quality '2'.

8.4 Net Gain

The net gain from the implementation of this offset will be:

- Revegetation and restoration of 50 ha of TWSCP TEC from quality score '2' to '8'.

8.5 Management Actions

Main Roads proposes to undertake the following activities in conjunction with DBCA within the offset site.

8.5.1 Revegetation and Restoration Management Plan

- Main Roads, in consultation with DPLH, will develop a Revegetation and Restoration Management Plan for the offset site that incorporates the actions and activities listed below
- Main Roads will fund the implementation of the Revegetation and Restoration Management Plan within the offset site.

8.5.2 Revegetation

- Revegetation and Restoration works will consist of site preparation (fencing, weed control, ripping / furrow-lining (if required) and pest control), seeding / planting and ongoing management
- Revegetation will be undertaken with a suite of species appropriate to represent TWSCP TEC.

8.5.3 Fencing

- Install fencing or alternate measures to control unauthorised access, and protect existing native vegetation, e.g. from illegal dumping to reduce the potential spread of weeds
- Specification of fences and/or barriers will be determined prior to installation and will depend on the size, location and topography of the offset site, and threatening processes present.

8.5.4 Pest Animal Control

- Carry out pest animal control as required where conservation values are being adversely impacted by pest animal activity
- Pest management will be carried out using best practices in accordance with DPIRD advice and governed by the BAM Act.

8.5.5 Weed Control

- Develop and implement a weed control program, including monitoring
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery.

8.5.6 Fire Management

- Develop a fire management plan as part of the Revegetation and Restoration Management Plan and implement within the offset site for the duration of this Strategy.

8.5.7 Phytophthora Dieback Management

- Develop a dieback management plan and implement this plan within the offset site for the duration of this Strategy
- The dieback management plan may include measures such as: frequency of dieback monitoring, requirement for hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

8.5.8 Survey and Monitoring

- Conduct biological surveys for flora and fauna to establish current baseline vegetation condition and confirm any unconfirmed vegetation values present
- Conduct vegetation monitoring within the offset site at regular intervals throughout the offset duration to gauge progress towards achievement of offset targets.

8.6 Targets

Main Roads will develop a set of monitoring and management activities and targets for the offset site as part of the development and implementation of the revegetation plan as outlined in **Table 23**.

Table 23 - Schedule of Monitoring and Management Activities and Targets for Myalup Beach Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Develop and implement site Revegetation and Restoration Management Plan	In consultation with DBCA, develop Revegetation and Restoration Management Plan to enhance and improve vegetation within the site.	Plan developed by end of 2026 Planting to commence in 2027	Plan developed by end of 2026 Planting to commence in 2027
TWSCP TEC	Implement Revegetation and Restoration Management Plan Undertake monitoring of vegetation condition	Implement Revegetation and Restoration Management Plan for 20 years from approval of this strategy	Improve and maintain TWSCP TEC condition of 'High-Very high' (8) or better

8.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counter-balance significant residual impacts are summarised in **Table 24**.

Table 24 – TWSCP TEC Justification of Offset Calculator Values –Myalup Beach Road

Attribute	Value	Justification
Start Quality	**2**	The property has been subject to previous disturbance and contains a degraded occurrence ('Poor' condition) of TWSCP TEC. The DBCA Tuart Woodlands dataset (DBCA-048) indicates the presence of this TEC within and extending south beyond the boundary of the property.
Future quality without offset	**2**	Due to the existing degraded nature of the offset site, it is assumed that the habitat quality will remain unchanged without active management.
Future quality with offset	**8**	Restoration and revegetation activities will improve the overall vegetation condition of TWSCP TEC and actively manage the prevention of dieback. Implementation of restoration, revegetation and associated management actions will significantly improve the quality of vegetation within the site.
Time over which loss is averted (years)	**20**	The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years to achieve the stated target condition score of '8'.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

8.8 Offset Calculator Values

The Offset calculator for the Myalup Beach Road offset site is provided in **Appendix D** and the values are summarised in **Table 25**.

Table 25 - Offset Calculator Values for Myalup Beach Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
TWSCP TEC	50	2	2	8	43.85

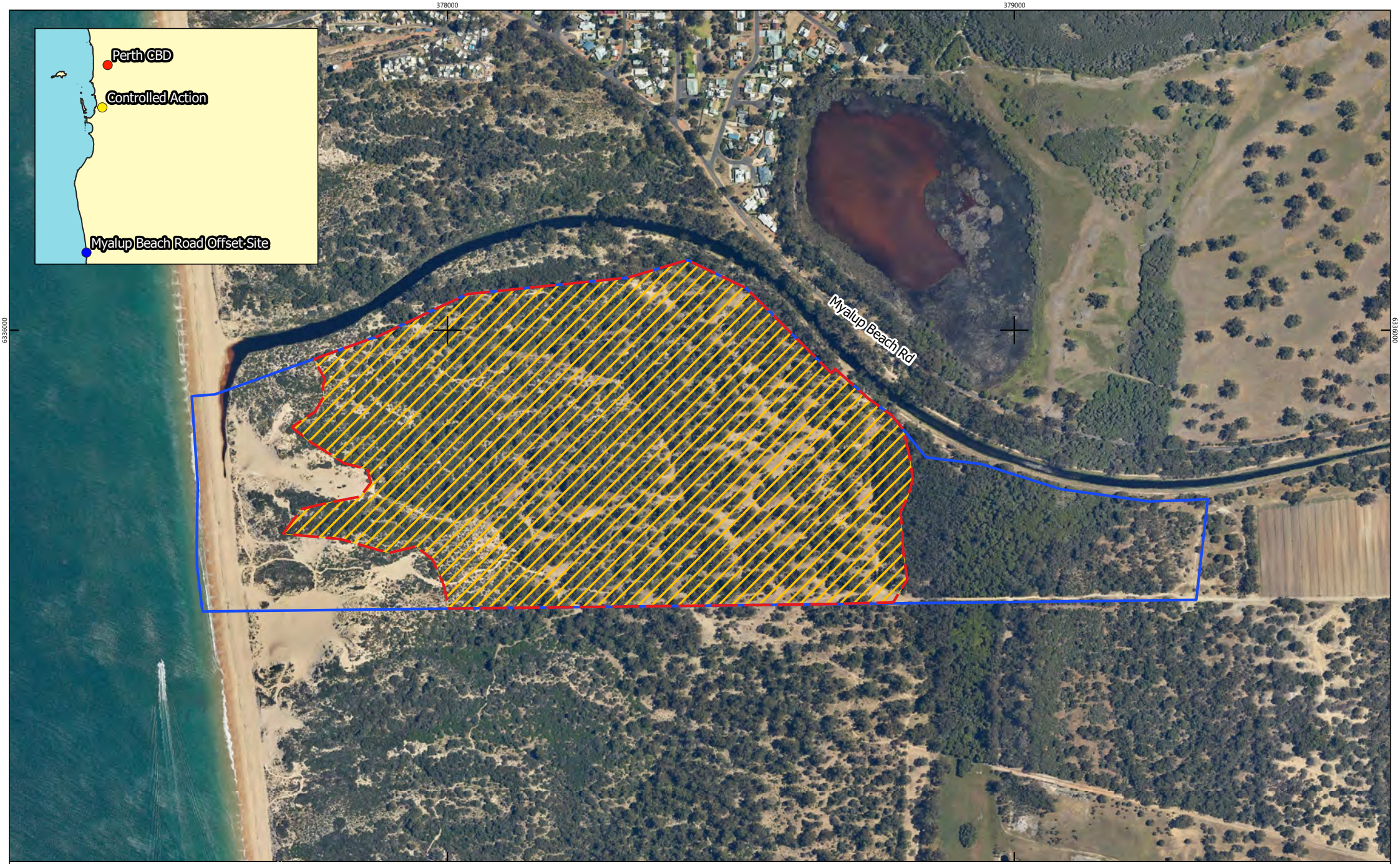

Figure 6 - Myalup Beach Road Offset Site

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9. St Ronans Offset Site

9.1 Site Description

The 'St Ronans' offset site encompasses a 12.6 ha portion of Lots 58, 706 and 1437 Great Southern Highway, St Ronans. These three lots cover an area of 120.75 ha, and are located approximately 8.5 km west of York (**Figure 7**). The offset site occurs within the Avon Wheatbelt and the Jarrah Forest IBRA Regions and is located approximately 84 km east north-east of the Controlled Action.

Main Roads is proposing to revegetate 7.36 ha within Lot 706 as an environmental offset for CBC and 12.6 ha for FRTBC foraging habitat. The property has been cleared for agriculture, and contains approximately 40 ha of existing revegetated CBC and FRTBC foraging habitat.

The Jarrah Forest IBRA Region is characterised by Jarrah-Marri forests on lateritic soils in the west of the region and Wandoo-Marri woodlands on clay soils in the east (Williams and Mitchell 2001). The Avon Wheatbelt IBRA Region has been extensively cleared for agriculture, but where native vegetation exists, it consists of Proteaceous scrub-heaths on lateritic uplands and mixed eucalypt, sheoak and Jam-York Gum woodlands on alluvial and eluvial soils (DCCEEW 2025).

Two Beard (1990) pre-European vegetation associations are mapped within the offset site, being Vegetation Association 4, described as; Medium woodland; Marri and Wandoo and has 26.95% of its pre-European extent remaining and Vegetation Association 352, described as Medium woodland; York Gum (GoWA 2019a) with 19.61% of its pre-European extent remaining. Neither of retained extents therefore meet the EPA's 30% retention target.

Two Heddle *et al.* (1980) vegetation complexes are mapped as occurring within the offset site, the Coolakin Complex and the Yalanbee Complex. The Coolakin complex is described as Woodland of *Eucalyptus wandoo* with mixtures of *Eucalyptus patens, Eucalyptus marginata* subsp. *thalassica* and *Corymbia calophylla* on the valley slopes in arid and peri-arid zones. The Yalanbee Complex consists of Woodland of *Eucalyptus wandoo-Eucalyptus accedens*, less consistently open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on lateritic uplands and breakaway landscapes in arid and perarid zones. Both vegetation complexes have more than 30% of their original pre-European extent remaining, being 39.15% and 46.54%, respectively.

The offset site is located within the range of both Carnaby's and Forest Red-tailed Black-Cockatoos (DAWE 2022). Both species have been observed within the offset site (MRWA 2024). No confirmed Black-Cockatoo breeding sites occur close to the offset site, however, one confirmed roost site occurs near York, approximately 8 km east north-east.

The St Ronans offset site is zoned 'Rural' under the Shire of York Local Planning Scheme No.3 (DPLH 2021).

9.2 Suitability of the Site as an Offset Site

The offset site was acquired by Main Roads in 2024. Main Roads will retain ownership of and manage the property as an environmental offset. Main Roads will create a new freehold lot with the designated purpose of "Environmental Offset" registered on the Certificate of Title. The land will be designated as an environmental offset prior to the revegetation reaching completion criteria to protect the site in perpetuity.

The St Ronans offset site currently does not support MNES values due to degradation from past land uses. A total of 12.6 ha of the site will be revegetated, resulting in a net benefit for Black-Cockatoo species. Species planted during revegetation will be suitable for foraging by both species of Black-Cockatoo impacted by the Controlled Action.

9.3 MNES Values

The St Ronans offset site currently contains the following MNES values pertaining to this Offset Strategy:

- 7.36 ha of cleared land suitable for the establishment of foraging habitat for CBC
- 12.6 ha of cleared land suitable for the establishment of foraging habitat for FRTBC.

9.4 Net Gain

The net gain from the implementation of this offset will be:

- Revegetation of 7.36 ha of CBC foraging habitat from habitat quality score '1' to '8'
- Revegetation of 12.6 ha of FRTBC foraging habitat from habitat quality score '1' to '8'.

9.5 Management Actions

Main Roads proposes to develop and implement a revegetation plan that that will include the following activities:

9.5.1 Revegetation Plan

- Main Roads will develop and implement a Revegetation Plan for St Ronans offset site
- Main Roads will fund the implementation of the St Ronans Revegetation Plan within the offset site.

9.5.2 Revegetation

- Revegetation works will consist of site preparation (fencing, weed control, ripping / furrow-lining (if required) and pest control), seeding / planting and ongoing management
- Revegetation will be undertaken with a suite of species that are consistent with the historical vegetation associations and complexes of the site, with a primary focus on Eucalyptus species, Marri, Proteaceous species and other Black-Cockatoo foraging species.

9.5.3 Fencing

- Install fencing if required to restrict stock access from adjoining properties as well as restricting unauthorised access
- Specification of fences will be determined prior to installation and will depend on the size, location and topography of the offset site and threatening processes present.

9.5.4 Pest Animal Control

- Pest management will be carried out using best practices in accordance with DPIRD advice and governed by the BAM Act
- Control measures for rabbits and other pest animals will be implemented if they are observed to be adversely impacting the quality of native vegetation.

9.5.5 Fire Management

- Develop and implement a fire management plan as part of the revegetation plan and implement within the offset site for the duration of this Strategy.

9.5.6 Weed Control

- Develop and implement a weed control program, including monitoring
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery and revegetation establishment.

9.5.7 Phytophthora Dieback Management

- Develop a dieback management plan and implement this plan within the offset site for the duration of this Strategy
- The dieback management plan may include measures such as: frequency of dieback monitoring, requirement for hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

9.5.8 Surveys and Monitoring

- Conduct revegetation monitoring at regular intervals throughout the offset duration to gauge progress towards achievement of habitat quality of a score of '8'.

9.6 Targets

Monitoring and management activities and targets for the St Ronans offset site are outlined in **Table 26**.

Table 26 - Schedule of Monitoring and Management Activities and Targets for St Ronans Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Offset Security	Create new freehold lot with the designated purpose of 'Environmental Offset'	Complete by end of 2036	Complete by end of 2036
Develop and implement a Revegetation Plan	A Revegetation Plan will be developed to ensure achievement of habitat quality of a score of '8'	Plan developed by the end of 2026 Planting to commence in 2027	Plan developed by the end of 2026 Planting to commence in 2027
Black-Cockatoo foraging habitat condition	Implement Revegetation Plan Undertake Black-Cockatoo foraging habitat assessment	Implement Revegetation Plan for 20 years from approval of this strategy	Black-Cockatoo habitat quality '8' or better

9.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counter-balance significant residual impacts are summarised in **Tables 27** and **28**.

Table 27 – CBC Foraging Habitat Justification of Offset Calculator Values – St Ronans Offset Site

Attribute	Value	Justification
Start Quality	**1**	The site is within the known distribution range for CBC and the species has been observed within the offset site (MRWA 2024). No CBC foraging habitat is currently present within the offset site.
Future quality without offset	**1**	The proposed revegetation areas are currently devoid of vegetation and are considered highly unlikely to improve over time without active management.
Future quality with offset	**8**	With revegetation and active management, foraging habitat will be established on this site. Revegetation with suitable foraging species for Carnaby's Black-Cockatoo will provide a projected foliage cover of >60%.
Time over which loss is averted (years)	**20**	The site will be managed by Main Roads. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years for revegetation to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that revegetation actions will achieve results within the predicted timeframe.

Table 28 – FRTBC Foraging Habitat Justification of Offset Calculator Values – St Ronans Offset Site

Attribute	Value	Justification
Start Quality	**1**	The site is within the known distribution range for FRTBC and the species has been observed within the offset site (MRWA 2024). No FRTBC foraging habitat is currently present within the offset site.
Future quality without offset	**1**	The proposed revegetation areas are currently devoid of vegetation and are considered highly unlikely to improve over time without active management.
Future quality with offset	**8**	With revegetation and active management, foraging habitat will be established on this site. Revegetation with suitable foraging species for FRTBC will provide a projected foliage cover of >60%.
Time over which loss is averted (years)	**20**	The site will be managed by Main Roads. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**15**	It is estimated that it will take 15 years for revegetation to achieve the desired ecological benefit.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**80**	High level of confidence that revegetation actions will achieve results within the predicted timeframe.

9.8 Offset Calculator Values

Offset calculators for St Ronans offset site are provided in **Appendix E** and the values are summarised in **Table 29**.

Table 29 - Offset Calculator Values for St Ronans Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
Carnaby's Black-Cockatoo foraging habitat	7.36	1	1	8	12.10
Forest Red-tailed Black-Cockatoo foraging habitat	12.60	1	1	8	35.72

Figure 7 - St Ronans Offset Site

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10. Tredrea Road Offset Site

10.1 Site Description

The 'Tredrea Road' offset site comprises a 3.6 ha portion of Lot 27 Tredrea Place, Myalup, within the Shire of Harvey (**Figure 8**). Lot 27 Tredrea Place encompasses approximately 40 ha and is zoned as 'rural' under the Greater Bunbury Region Scheme (GBRS). This property was originally purchased by Main Roads for the purpose of developing a limestone and sand pit; however, is now utilised for its environmental offset values. It is adjoined to the south and east by mostly cleared farmland, and to the north and west by remnant vegetation. In the west, it is situated on the Quindalup dunes and in the east, on the Spearwood dunes (MRWA 2020). Throughout the lot, the canopy of upland vegetation is dominated by Tuart and Jarrah woodland and in the low-lying areas it is dominated by *Melaleuca rhaphiophylla*, *Melaleuca huegelii* and *Agonis flexuosa* (MRWA 2021).

Three pre-European Beard (1990) vegetation associations (37, 48 and 998) occur within the lot which are described as:

- Vegetation association 37 - Shrublands; teatree thicket
- Vegetation association 48 - Shrublands; scrub heath
- Vegetation association 998 – Medium woodland, Marri.

All three vegetation associations have more than 30% of their pre-European extent remaining (GoWA 2019a) and therefore, all meet the EPA's 30% retention target.

Three Heddle *et al.* (1980) vegetation complexes are mapped as occurring within the lot which are described as:

- Quindalup Complex is a coastal dune complex with the low closed forest of *Melaleuca lanceolata - Callitris preissii*, the closed scrub of *Acacia rostellifera* and the low closed *Agonis flexuosa* (Peppermint) forest of Geographe Bay
- Vasse Complex has a mixture of the closed scrub of *Melaleuca* species fringing woodland of *Eucalyptus rudis - Melaleuca* species and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata - Corymbia calophylla*
- Yoongarillup Complex - Woodland to tall woodland of *Eucalyptus gomphocephala* with *Agonis flexuosa, l*ess consistently an open forest of *Eucalyptus gomphocephala - Eucalyptus marginata - Corymbia calophylla*.

All three vegetation complexes have more than 30% of their pre-European extent remaining (GoWA 2019b) and therefore, all meet the EPA's 30% retention target.

It is estimated that the offset site contains approximately 6.5 ha of Honeymyrtle shrubland TEC in 'Completely Degraded – Degraded' condition (score of '1'). Further survey is required to confirm the extent and condition of the TEC occurrence.

10.2 Suitability of the Site as an Offset Site

Lot 27 Tredrea Place is owned by the Commissioner of Main Roads. Main Roads will request WAPC to rezone the property from 'Rural' to 'Regional Open Space' or 'Conservation' under the GBRS. Main Roads will discuss long term management options with DBCA and the Shire of Harvey. Until an alternative management structure is in place, Main Roads will maintain ownership and fund and manage the property for the purpose of conservation.

Due to the limited availability of suitable land containing the Honeymyrtle shrubland TEC closer to the Controlled Action area, this site was selected because of the presence of Honeymyrtle shrubland TEC.

10.3 MNES Values

The Tredrea Road offset site contains the following MNES value pertaining to this Offset Strategy:

- 3.6 ha of Honeymyrtle shrubland TEC with habitat quality of '1'.

10.4 Net Gain

The net gain from the implementation of this offset will be:

- Revegetation and restoration of 3.6 ha of Honeymyrtle shrubland TEC from quality score '1' to '4'.

10.5 Management Actions

Main Roads proposes to develop and implement a revegetation plan that that will include the following activities:

10.5.1 Revegetation and Restoration Plan

- Main Roads will develop a Revegetation and Restoration Plan for the offset site that incorporates the actions and activities listed below
- Main Roads will fund the implementation of the Revegetation and Restoration Plan within the offset site.

10.5.2 Revegetation

- Revegetation works will consist of site preparation (fencing, weed control, ripping / furrow-lining (if required) and pest control), seeding / planting and ongoing management
- Revegetation will be undertaken with a suite of species suitably representative of the Honeymyrtle shrubland TEC.

10.5.3 Fencing

- Install fencing if required to restrict and control unauthorised access, and protect existing native vegetation, e.g. from illegal dumping to reduce the potential spread of weeds
- Specification of fences will be determined prior to installation and will depend on the size, location and topography of the offset site, and threatening processes present.

10.5.4 Pest Animal Control

- Pest management will be carried out using best practices in accordance with DPIRD advice and governed by the BAM Act
- Control measures for rabbits and other pest animals will be implemented if they are observed to be adversely impacting the quality of native vegetation.

10.5.5 Fire Management

- Develop and implement a fire management plan as part of the revegetation plan and implement within the offset site for the duration of this Strategy.

10.5.6 Weed Control

- Develop and implement a weed control program, including monitoring
- A weed control program will be developed based on the weed mapping results to ensure successful establishment of the revegetation
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery and revegetation establishment.

10.5.7 Phytophthora Dieback Management

- Develop a dieback management plan and implement this plan within the offset site for the duration of this Strategy
- The dieback management plan may include measures such as: frequency of dieback monitoring, requirement for hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

10.5.8 Surveys and Monitoring

- Conduct a baseline vegetation survey to confirm the extent and condition of Honeymyrtle shrubland TEC
- Conduct revegetation monitoring at regular intervals throughout the offset duration to gauge progress towards achievement of habitat quality of a score of '4'.

10.6 Targets

Monitoring and management activities and targets for the Tredrea Road offset site are outlined in **Table 30**.

Table 30 - Schedule of Monitoring and Management Activities and Targets for Tredrea Road Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Develop and implement site Revegetation and Restoration Plan	Develop Revegetation and Restoration Plan to enhance and improve vegetation within the site	Plan developed by end of 2026 Planting to commence in 2027	Plan developed by end of 2026 Planting to commence in 2027
Honeymyrtle Shrubland TEC	Implement Revegetation and Restoration Plan Undertake monitoring of vegetation condition	Implement Revegetation and Restoration Plan for 20 years from approval of this strategy	Improve and maintain overall vegetation condition of 'Good' (4) or better

10.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counter-balance significant residual impacts are summarised in **Table 31**.

Table 31 – Honeymyrtle Shrubland TEC Justification of Offset Calculator Values – Tredrea Road

Attribute	Value	Justification
Start Quality	**1**	Honeymyrtle shrubland TEC habitat occurs within the offset site and is of 'Degraded – Completely Degraded' condition.
Future quality without offset	**1**	Quality of the site is unlikely to improve without active revegetation and restoration management.
Future quality with offset	**4**	Revegetation and restoration activities will improve the overall vegetation condition of Honeymyrtle shrubland TEC within the offset site and reduce the impact of threatening processes. Implementation of revegetation and associated management action will significantly improve the quality of vegetation within the site.
Time over which loss is averted (years)	**20**	The site will be managed by Main Roads. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years to achieve the desired species diversity, vegetation cover/structure and weed density.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	Moderate-high level of confidence that management actions will achieve results within the predicted timeframe.

10.8 Offset Calculator Values

The offset calculator for the Tredrea Road offset site is provided in **Appendix F** and the values are summarised in **Table 32** below.

Table 32 - Offset Calculator Values for Tredrea Road Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
Honeymyrtle Shrubland TEC	3.6	1	1	4	100.06

Figure 8 - Tredrea Road Offset Site

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11. Jandakot Regional Park Offset Site

11.1 Site Description

Jandakot Regional Park comprises approximately 2,362 ha of land and is a mosaic stretching from the southern end of Jandakot Airport to the south of Casuarina Prison (Conservation Commission 2010). A 16 ha portion of Jandakot Regional Park (Reserve numbers 4015/619 and 1892/770) is proposed as an offset for BWSCP TEC (**Figure 9**). The Jandakot Regional Park offset site is situated within the Swan Coastal Plain IBRA Region and is approximately 3.1 km east of the Controlled Action.

One Beard (1990) pre-European vegetation association 1001 is mapped within the offset site and is described as Medium very sparse woodland; Jarrah, with low woodland; *Banksia* and *Casuarina*.

One Heddle *et al.* (1980) vegetation complex is mapped within the offset site, the Bassendean Complex – Central and South, which is described as woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark).

Initial site observations indicate the offset site contains BWSCP TEC in 'Good – Very Good' condition. Jandakot Regional Park is known to contain areas of BWSCP TEC (Conservation Commission 2010), with the 16 ha offset site within mapped areas of BWSCP (DoE 2016). The existing threats to MNES within the offset site include weeds, kangaroo grazing and edge effects from adjacent land uses and potential future development. Without active management, the quality of BWSCP within the offset site is expected to decline over time.

11.2 Suitability of the Site as an Offset Site

The Jandakot Regional Park offset site lies within land currently managed by DBCA. Main Roads will liaise with DBCA to fund management within the offset site for 20 years after approval of this Strategy, after which time, management will revert back to DBCA.

11.3 MNES Values

The existing MNES within the Jandakot Regional Park offset site pertaining to this Offset Strategy is:

- 16 ha of BWSCP TEC with habitat quality score '5'.

11.4 Net Gain

The net gain from the implementation of this offset will be:

- Preventing decline of vegetation within the site from quality score '5' to '4'
- Enhancing vegetation within the site from quality score '5' to '6'.

11.5 Management Actions

To achieve the net gain stated in **Section 11.4**, Main Roads proposes to undertake the following activities in conjunction with DBCA.

11.5.1 Restoration Management Plan

- Main Roads, in consultation with DBCA, will develop a Restoration Management Plan for the offset site that incorporates the actions and activities listed below
- Main Roads will fund the implementation of the Restoration Management Plan within the offset site.

11.5.2 Fencing

- Install or upgrade fencing where required, to restrict and control unauthorised access, and protect existing native vegetation
- Specification of fences will be determined prior to installation and will depend on the size, location and topography of the offset site, and threatening processes present.

11.5.3 Pest Animal Control

- Carry out pest animal control as required where BWSCP TEC values are being adversely impacted
- Pest management will be carried out using best practices in accordance with DPIRD advice and governed by the BAM Act.

11.5.4 Weed Control

- Develop and implement a weed control program, including monitoring
- Weed control will continue annually throughout the first five years of implementation of the Offset Strategy, after which, the frequency will be reduced to that required based on observations during monitoring inspections of impacts on vegetation condition recovery and revegetation establishment.

11.5.5 Phytophthora Dieback Management

- Develop and implement a dieback management plan for the duration of this strategy
- The dieback management plan may include measures such as: frequency of dieback monitoring, hygiene stations, signage, Phosphite treatment or limestone sheeting of particular tracks.

11.5.6 Surveys and Monitoring

- Conduct flora and vegetation surveys to establish current baseline vegetation condition and confirm any unconfirmed vegetation values present
- Conduct vegetation monitoring within the offset site at regular intervals throughout the offset duration to gauge progress towards achievement of offset targets.

11.6 Targets

Main Roads will develop a set of management activities and targets for the offset site as outlined in **Table 33**.

Table 33 - Schedule of Management Activities and Targets for Jandakot Regional Park Offset Site

Action/Aspect	Description of Methodology	Timing	Target
Develop and implement Restoration Management Plan	In consultation with DBCA, develop Restoration Management Plan to protect and enhance the site	Complete by end of 2026	Complete by end of 2026
BWSCP TEC	Implement Restoration Management Plan Undertake monitoring of vegetation condition	Implement management plan for 20 years from approval of this strategy	Improve to achieve, then maintain, overall vegetation condition of 'Very Good' (6) or better

11.7 Justification of Offset Calculator Values

Justification of values applied to the EPBC Environmental Offset Calculator to assess the adequacy of the proposed offset strategy, in order to counterbalance significant residual impacts are summarised in **Table 34**.

Table 34 – BWSCP TEC Justification of Offset Calculator Values – Jandakot Regional Park

Attribute	Value	Justification
Start Quality	**5**	Main Roads is proposing to restore 16 ha of degraded BWSCP TEC vegetation as an offset for BWSCP TEC. The offset site is part of the broader Jandakot Regional Park and Bush Forever Site 347 (Wandi Nature Reserve and adjacent Bushland, Wandi/Oakford). Vegetation condition for the proposed offset is considered to be 'Good-Very Good' condition.
Future quality without offset	**4**	Considering the existing threatening processes (weeds, kangaroo grazing and edge effects) and lack of active management, the vegetation quality within the offset site is expected to decline over time without suitable management.
Future quality with offset	**6**	Management actions, addressing potential threats such as kangaroo grazing, weed and dieback infestation will improve the quality of the vegetation over time.
Time over which loss is averted (years)	**20**	The site will be managed by DBCA for long-term conservation purposes. The maximum time over which loss is averted has been applied.
Time until ecological benefit (years)	**20**	It is estimated that it will take 20 years of management to achieve the improvement in habitat quality.
Risk of loss without offset (%)	**0**	Risk of loss scores do not apply to this offset.
Risk of loss with offset (%)	**0**	Risk of loss scores do not apply to this offset.
Confidence in result (%) risk of loss	**100**	A very high degree of confidence has been assigned.
Confidence in result (%) future quality	**67**	High level of confidence that management actions will achieve results within the predicted timeframe.

11.8 Offset Calculator Values

Offset calculators for Jandakot Regional Park offset site are provided in **Appendix G** and the values are summarised in **Table 35**.

Table 35 - Offset Calculator Values for Jandakot Regional Park Offset Site

MNES	Offset Size (ha)	Start Quality	Future Quality without Offset	Future Quality with Offset	Offset Value (%)
BWSCP TEC	16.0	5	4	6	23.20

Figure 9 - Jandakot Regional Park Offset Site

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12. Consistency with EPBC Act Offsets Policy

This Offset Strategy has been developed to be consistent with the EPBC Act Environmental Offset Policy. **Table 36** shows how each of the offset policy principles has been addressed in this Offset Strategy.

Table 36 - Consistency with the EPBC Act Environmental Offset Policy Principles

Offset Principle	Consideration
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 offsets will provide a conservation outcome that maintains or improves the viability of MNES. The proposed offset package includes land acquisition and land management actions. The proposed offset sites will counter-balance the residual impacts to MNES by at least 100% when assessed using the EPBC Act Offset Assessment Guide. The offsets package will protect and/or rehabilitate about 265.5 ha of land for conservation. The selection of sites protects MNES within proximity to the Controlled Action as well as within the wider region where the MNES also occur. Conservation of large, intact patches of TEC and Black-Cockatoo habitat results in a greater overall conservation benefit than many smaller areas. Larger patches of bushland sustain higher native species diversity and are less susceptible to disturbances such as edge effects. The Offset Strategy comprises a combination of land acquisition and rehabilitation offsets. Land acquisition offsets and land rehabilitation have been shown to be effective in producing a measurable environmental benefit (May *et. al.* 2017).
Suitable offsets must be built around direct offsets but may include other compensatory measures	The entire proposed offset package consists of direct offsets.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter	Offsets were calculated and assessed using the EPBC Act Offset Assessment Guide. This guide was developed to give effect to the Offset Policy's requirements. The EPBC Act Offset Assessment Guide has an inbuilt adjustment to ensure that offset is in proportion to the level of statutory protection that applies to the protected matter.
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter	The offsets package proposed in this Offset Strategy exceeds 100% of the offset requirement to ensure that the size and scale of the offset is proportionate to the residual impacts on the MNES. The contribution of each offset proposed in the Offset Strategy to the overall offset requirement has been calculated using the EPBC Act Offset Assessment Guide which utilises a balance sheet approach to quantify impacts and offsets.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding	The EPBC Act Offset Assessment Guide accounts for the risks of the offset not succeeding by weighting the scoring in the guide. Contingency actions will be implemented where a particular offset is not meeting targets to manage the risk of the offset not succeeding. The proposed offset package exceeds the 100% offset requirement and is considered to be low risk.

Offset Principle	Consideration
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 in the Offset Strategy are additional to any existing requirement or management plan.
Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable	Direct offsets are considered to be the most effective and efficient type of offset, when considered against other compensatory measures. The Offset Strategy is being implemented as soon as practicable following the acquisition of suitable offsets and offsets were already being implemented prior to the approval of this Offset Strategy. This Offset Strategy provides transparency for the implementation of suitable offsets. The offsets proposed will be scientifically robust and reasonable.
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.	The actions contained within this Offset Strategy are required to be implemented in accordance with the conditions of EPBC 2024/09841. Main Roads is mandated to publish an annual compliance report on its website. Additionally, it specifies that the details of measures within the Offset Strategy must be included in these reports, ensuring public accessibility and accountability.

13. Adaptive Management and Corrective Actions

This Offset Strategy has adopted an 'adaptive management' approach to ensure that the proposed outcomes of the strategy are met. Adaptive management allows for the implementation of management whilst monitoring what is most effective in achieving conservation outcomes. The implementation of adaptive management acknowledges the inherent risks associated with complex ecological systems, the implementation of this Offset Strategy and their interactions with the wider world.

Where the management actions and/or targets at a particular offset site are not being met, adaptive management and corrective actions will be implemented to ensure the success of the offset. Adaptive management measures may also be applied where those measures are likely to provide a better environmental outcome or where the measures proposed within the strategy will provide little to no benefit. For example, if monitoring was required in year five and a fire swept through the area in year four, monitoring would not be undertaken until such time as the monitoring is likely to provide useful information, e.g. two years following the fire event.

Measures to detect the need to implement corrective actions will include monitoring as described for each offset. Where monitoring results detect issues, a decline in vegetation/habitat condition or revegetation failure or issues, the following will be carried out:

- Evaluate the cause of the decline, failures or issues
- Determine the appropriate corrective or contingency actions.

Corrective actions may include:

- Supplementary planting or/or seeding
- Changes to species lists for planting and/or seeding
- Altered weed control scheduling
- Altered herbicides or weed management techniques
- Altered pest management
- Active dieback management, including phosphite treatment
- Additional or alternative access control, including fencing
- Engagement of additional resources.

13.1 Unplanned Events

Where an unplanned event occurs that potentially impacts the progress of revegetation or restoration, such as flooding, fire, drought, etc., the duration of implementation of management actions will be adjusted accordingly.

For example, if in year 12 of the intended 20-year management period, a major fire impacted the offset site, it may be appropriate to consider the revegetation or restoration progress has been pushed back by five years. Accordingly, following a two-year recovery period, the site should then be assessed against the year nine criteria, rather than the year 14 criteria. In this example, this approach would then result in the offset site being actively managed until year 25 rather than year 20.

14. Reporting and Accountability

14.1 Roles and Responsibilities

This Offset Strategy outlines the environmental management activities to be undertaken by Main Roads or its delegate in association with the offset areas for the Controlled Action. The actions contained within this Offset Strategy are required to be implemented in accordance with the conditions of EPBC 2024/09841.

The Director Environment and Heritage at Main Roads will maintain responsibility for implementation of the management actions specified in this Offset Strategy on behalf of Main Roads' Managing Director.

14.2 Reporting

For each offset site, a monitoring report will be prepared annually for the first five years and at least every three years thereafter for the duration of the 20-year management period. The monitoring report will indicatively follow the format presented in **Table 37**. An annual compliance report will be prepared and made publicly available on Main Roads' website.

Table 37 - Indicative Format of Monitoring Report for Each Offset Site

Section	Potential Inclusions
Introduction	• Background • Objective • Scope of works • Summary of management activities for the period • Assumptions/limitations
Environmental Setting	• Climatic/weather conditions over the reporting period (rainfall, storms, dry periods) • Changes to topography, drainage or hydrology (surface water runoff, flow direction) • Environmental events such as flooding or fires • Wetlands (if applicable)
Management Activities	• Details of on-ground management works or other works undertaken as per the agreed management actions • Identification and justification for deviations from on-ground management works or other works specified in the operational works plan for the period • Identification and justification of any corrective actions (if required) implemented during the period • Result of any surveys, including monitoring surveys, undertaken (e.g. dieback mapping, weed mapping, flora and vegetation surveys) • Any observed or anecdotal results noted from the implementation of on-ground management works (i.e. observable reduction in feral animals or reduction in weeds)
Financial Arrangements	• Details of expenditure incurred during the management period • Identification of and justification for deviations in anticipated expenditure during the management period • Proposed re-allocation of funds from one management activity to another • Any proposed re-allocation of funds from one management period to another • Risk assessment for proposed funding changes for the upcoming management period
Stakeholder Consultation	• Details of any stakeholder consultation conducted
Figures	• Site layout • Locations of on-ground management activities (e.g. fencing, signage, weed control, track maintenance) • Locations of work areas (e.g. weed control, track maintenance) • Locations of observations (e.g. areas showing reduced feral animal activity) • Indications of proposed works areas for the upcoming management period • Provision of spatial data
Photographs	• Evidence of works implemented (e.g. fencing, signage, rubbish removal) • Evidence justifying deviations from operational works plan • Visible changes to the site and/or surrounds • Visible changes (improvement or degradation) to environmental values (e.g. vegetation condition, flora, fauna habitat, wetlands)
Conclusions	• Management activities completed to date • Comment on the effectiveness of management activities that have been implemented this far
Recommendations	• Recommendations for management activities for the upcoming management period • Recommendations for deviations to any management activities for the upcoming management period • Recommendations for funding allocation for management activities for the upcoming management period • Any other recommendations

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16. Appendices

Appendix A – Gabbadah 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	BWSCP TEC
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	Anketell Road Controlled Action	**Area**	14.56	Hectares	
			Quality	5	Scale 0-10	
			Total quantum of impact	7.28	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	7.28	Adjusted hectares	Gabbadah Offset Site	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	8.1	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	0.86	11.74%	No	
									Future area without offset (adjusted hectares)	8.1	**Future area with offset (adjusted hectares)**	8.1								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	6	**Future quality without offset (scale of 0-10)**	5	**Future quality with offset (scale of 0-10)**	7	2.00	67%	1.34	1.06				
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	7.28	0.86	11.74%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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.

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

Matter of National Environmental Significance	
Name	TWSCP TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Anketell Road Controlled Action	**Area**	40.99	Hectares	
			Quality	**3**	Scale 0-10	
			Total quantum of impact	12.30	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	12.30	Adjusted hectares	Gabbadah Offset Site	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	5.01	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	0.27	2.20%	No	
									Future area without offset (adjusted hectares)	5.0	**Future area with offset (adjusted hectares)**	5.0								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**5**	**Future quality with offset (scale of 0-10)**	**8**	3.00	67%	2.01	0.54				
Threatened species habitat																				
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!	
									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)**		0.00		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	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	12.297	0.27	2.20%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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 BC
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	Anketell Road Controlled Action	**Area**	56.98	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	28.49	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00					
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0					0.00	#DIV/0!	#DIV/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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	28.49	Adjusted hectares	Gabbadah Offset Site	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	89.16	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	5.96	20.93%	No		
									Future area without offset (adjusted hectares)	89.2	**Future area with offset (adjusted hectares)**	89.2									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**6**	**Future quality with offset (scale of 0-10)**	**7**	1.00	80%	0.80	0.67					

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	28.49	5.96	20.93%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix B – Lake Clifton 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.

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

Matter of National Environmental Significance	
Name	TWSCP TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Anketell Road Controlled Action	**Area**	40.99	Hectares	
			Quality	**3**	Scale 0-10	
			Total quantum of impact	12.30	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	12.30	Adjusted hectares	Lake Cliffon Offset Site	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	17.5	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	2.20	17.91%	No		
									Future area without offset (adjusted hectares)	17.5	**Future area with offset (adjusted hectares)**	17.5									
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	7.00	67%	4.69	1.26					
Threatened species habitat																					
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		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	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	12.297	2.20	17.91%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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 BC
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	Anketell Road Controlled Action	**Area**	56.98	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	28.49	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00					
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0					0.00	#DIV/0!	#DIV/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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	28.49	Adjusted hectares	Lake Clifton Offset Site	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	18.07	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	8.46	29.70%	No		
									Future area without offset (adjusted hectares)	18.1	**Future area with offset (adjusted hectares)**	18.1									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	7.00	80%	5.60	4.68					
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	28.49	8.46	29.70%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix C - Lake Mealup 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	BWSCP TEC
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	Anketell Road Controlled Action	**Area**	14.56	Hectares	
			Quality	5	Scale 0-10	
			Total quantum of impact	7.28	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	7.28	Adjusted hectares	Lake Mealup Offset Site (Restoration)	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	45	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	4.75	65.25%	No		
									Future area without offset (adjusted hectares)	45.0	**Future area with offset (adjusted hectares)**	45.0									
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	5	**Future quality without offset (scale of 0-10)**	4	**Future quality with offset (scale of 0-10)**	6	2.00	67%	1.34	1.06					
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	7.28	4.75	65.25%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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	TWSCP TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

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	Anketell Road Controlled Action	**Area**	40.99	Hectares	
			Quality	**3**	Scale 0-10	
			Total quantum of impact	12.30	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	12.30	Adjusted hectares	Lake Mealup Offset Site (Restoration)	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	40	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	2.16	17.54%	No		
									Future area without offset (adjusted hectares)	40.0	**Future area with offset (adjusted hectares)**	40.0								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**5**	**Future quality with offset (scale of 0-10)**	**8**	3.00	67%	2.01	0.54				
Threatened species habitat																				
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		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	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	12.297	2.16	17.54%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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.

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

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

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	Anketell Road Controlled Action	**Area**	56.98	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	28.49	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	28.49	Adjusted hectares	Lake Mealup Offset Site (Restoration)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	45	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	3.01	10.57%	No		
									Future area without offset (adjusted hectares)	45.0	**Future area with offset (adjusted hectares)**	45.0									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**6**	**Future quality with offset (scale of 0-10)**	**7**	1.00	80%	0.80	0.67					
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	28.49	3.01	10.57%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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	FRTBC
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	Anketell Road Controlled Action	**Area**	38.34	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	19.17	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	19.17	Adjusted hectares	Lake Mealup Offset Site (Restoration)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	45	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	3.49	18.22%	No		
									Future area without offset (adjusted hectares)	45.0	**Future area with offset (adjusted hectares)**	45.0									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**6**	**Future quality with offset (scale of 0-10)**	**7**	1.00	80%	0.80	0.78					
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	19.17	3.49	18.22%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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	TWSCP TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

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	Anketell Road Controlled Action	**Area**	40.99	Hectares	
			Quality	**3**	Scale 0-10	
			Total quantum of impact	12.30	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	12.30	Adjusted hectares	Lake Mealup Offset Site (Revegetation)	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	15.85	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	2.28	18.53%	No		
									Future area without offset (adjusted hectares)	15.9	**Future area with offset (adjusted hectares)**	15.9									
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**0**	**Future quality without offset (scale of 0-10)**	**0**	**Future quality with offset (scale of 0-10)**	**8**	8.00	67%	5.36	1.44					
Threatened species habitat																					
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		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	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	12.297	2.28	18.53%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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.

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

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

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	Anketell Road Controlled Action	**Area**	56.98	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	28.49	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	28.49	Adjusted hectares	Lake Mealup Offset Site (Revegetation)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	16.3	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	7.63	26.79%	No		
									Future area without offset (adjusted hectares)	16.3	**Future area with offset (adjusted hectares)**	16.3									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	7.00	80%	5.60	4.68					
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	28.49	7.63	26.79%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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.

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

Matter of National Environmental Significance	
Name	FRTBC
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

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	Anketell Road Controlled Action	**Area**	38.34	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	19.17	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00					
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0					0.00	#DIV/0!	#DIV/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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	19.17	Adjusted hectares	Lake Mealup Offset Site (Revegetation)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	16.3	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	8.86	46.21%	No		
									Future area without offset (adjusted hectares)	16.3	**Future area with offset (adjusted hectares)**	16.3									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	7.00	80%	5.60	5.43					
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	19.17	8.86	46.21%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix D – Myalup Beach Road 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	TWSCP TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

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	Anketell Road Controlled Action	**Area**	40.99	Hectares	
			Quality	**3**	Scale 0-10	
			Total quantum of impact	12.30	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	12.30	Adjusted hectares	Myalup Beach Road Offset Site	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	50	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	5.39	43.85%	No		
									Future area without offset (adjusted hectares)	50.0	**Future area with offset (adjusted hectares)**	50.0									
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**2**	**Future quality without offset (scale of 0-10)**	**2**	**Future quality with offset (scale of 0-10)**	**8**	6.00	67%	4.02	1.08					
Threatened species habitat																					
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		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	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	12.297	5.39	43.85%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix E – St Ronans 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.

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

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

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	Anketell Road Controlled Action	**Area**	56.98	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	28.49	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	28.49	Adjusted hectares	St Ronans Offset Site	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	7.36	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	3.45	12.10%	No		
									Future area without offset (adjusted hectares)	7.4	**Future area with offset (adjusted hectares)**	7.4									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	7.00	80%	5.60	4.68					
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	28.49	3.45	12.10%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

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	FRTBC
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	Anketell Road Controlled Action	**Area**	38.34	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	19.17	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	Yes		Adjusted hectares		**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		0.00	0.00					
Threatened species habitat																					
Area of habitat	Yes	19.17	Adjusted hectares	St Ronans Offset Site	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	12.6	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	6.85	35.72%	No		
									Future area without offset (adjusted hectares)	12.6	**Future area with offset (adjusted hectares)**	12.6									
					Time until ecological benefit	15	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	7.00	80%	5.60	5.43					
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	19.17	6.85	35.72%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix F – Tredrea Road 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.

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

Matter of National Environmental Significance	
Name	Honeymyrtle TEC
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Anketell Road Controlled Action	**Area**	1.94	Hectares	
			Quality	1	Scale 0-10	
			Total quantum of impact	0.19	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	0.19	Adjusted hectares	Tredrea Road Offset Site	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	3.6	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	0.19	100.06%	Yes		
									Future area without offset (adjusted hectares)	3.6	**Future area with offset (adjusted hectares)**	3.6								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	1	**Future quality without offset (scale of 0-10)**	1	**Future quality with offset (scale of 0-10)**	4	3.00	67%	2.01	0.54				
Threatened species habitat																				
Area of habitat	Yes		Adjusted hectares		**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**		0.00		0.00	0.00	0.00	#DIV/0!	#DIV/0!		
									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)**		0.00		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	0	0.00	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Area of community	0.194	0.19	100.06%	**Yes**	$0.00	N/A	$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Appendix G – Jandakot Regional Park 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.

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

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Anketell Road Controlled Action	**Area**	14.56	Hectares	
			Quality	5	Scale 0-10	
			Total quantum of impact	7.28	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	7.28	Adjusted hectares	Jandakot Regional Park	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	16	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	1.69	23.20%	No		
									Future area without offset (adjusted hectares)	16.0	**Future area with offset (adjusted hectares)**	16.0								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	5	**Future quality without offset (scale of 0-10)**	4	**Future quality with offset (scale of 0-10)**	6	2.00	67%	1.34	1.06				
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	7.28	1.69	23.20%	**No**	$0.00	#DIV/0!	#DIV/0!
					$0.00	**#DIV/0!**	**#DIV/0!**