Cranbrook Rail Upgrade Offset Proposal (CPS 10003-1)

Draft for Comment

4 September 2023

Table of Contents

List of Figures

List of Tables

List of Appendices

1 Introduction

Cooperative Bulk Handling Limited (CBH) proposes to upgrade the rail loadout facility at the existing Cranbrook Grain Receival Site (the Project), situated approximately 330 km south-east of Perth and 90 km north of Albany. The project area is located within the Shire of Cranbrook in the Great Southern region and is situated along the southern edge of the Cranbrook townsite (Figure 1).

The Project is expected to result in the clearing of 1.09 ha of native vegetation. The project has been reviewed and revised to limit the amount of clearing to the smallest extent possible, and where clearing is unavoidable, to limit Project impacts and avoid where possible higher quality vegetation or important vegetation communities.

As a part of the application to clear native vegetation under Part V of the *Environmental Protection Act 1986* (EP Act), CBH has also proposed 2.79 ha of mitigation planting to address residual impacts associated with the proposed clearing. After understanding the impacts from the clearing and considering the mitigation planting, CBH has been advised by the Department of Water and Environmental Regulation (DWER) that significant residual impacts remain which will require offsets.

This document describes the Offset Proposal to compensate for the residual impacts from the proposed clearing activities for the Cranbrook rail upgrade project.

1.1 Project description

Established in 1933, CBH is Australia's largest co-operative and a leader in the Australian grain industry with operations extending along the value chain from fertiliser to grain storage, handling, transport, marketing and processing. Owned and controlled by approximately 3,700 WA grain growing businesses, CBH's purpose is to sustainably create and return value to WA grain growers through its core business activities: operations, marketing and trading, and fertiliser. The CBH storage and handling system is world class, receiving and exporting around 90% of WA's grain harvest through a network of more than 130 grain receival sites and four export terminals.

WA's regional freight task relies heavily on road, rail and port infrastructure, but these assets are ageing and imposing increasing costs on supply chains. WA's regional freight network faces a number of challenges, including:

- A growing and changing freight task
- An ageing and under-performing road and rail infrastructure
- An increasing use of larger vehicles
- Pressure to increase supply chain productivity
- Poor road safety outcomes

Freight transport bottlenecks and a lack of capacity along key agricultural rail and road freight routes, limit export volumes during periods of the year for WA growers where prices received would be at their highest.

Since 2018, CBH has been working closely with the Western Australian (WA) Government on an agricultural supply chain freight strategy - the Revitalising Agricultural Region Freight (RARF) Strategy. The RARF identified several infrastructure projects to improve freight productivity, efficiency and safety. In early 2020, the WA Government commissioned an independent expert to undertake a study on estimating the costs to reinstate Tier 3 rail lines within WA.

This report, published in September 2020, was submitted by the WA Government to Infrastructure Australia (IA) for funding. Initially, three lines were funded (York to Quairading, Kulin to Narrogin and Kondinin to Merredin) but this was subsequently expanded to include

sidings at Cranbrook, Broomehill, Brookton and Moora, and renamed the Agricultural Supply Chain Initiative (ASCI).

The ASCI was entered on the IA's infrastructure priority initiative list in February 2021. ASCI Package 1 has been jointly funded by the Commonwealth and WA Governments, with $160 million and $40 million respectively.

CBH has made improving the out-loading capabilities of WA's grain supply chain a major focus. Consecutive record harvests in 2021-22 and 2022-23, saw over 21.3 million tonnes (Mt) in each year delivered to the CBH system, and highlights the need to improve the network to ensure grain can be moved efficiently to ports to meet market demand, and maximise the economic output for the State and our grower members. There are also a number of social benefits in this approach including:

- Improving rail projects through minimising trucks on roads
- Increasing road safety
- Minimising interactions between people and vehicles, providing a safer and more family friendly working environment for CBH staff

The Project is required to cater for the growing quantities of grain receivals around the Cranbrook region and surrounding catchments, which is driven by improved cropping and farming techniques, and higher yielding seed varieties being planted by regional (and WA) growers. The reliance on rail reduces trucking movements on both Local and State government roads and reduces the reliance on trucking capacity and operating costs for CBH. In addition, the financial burden on Local and State governments to maintain road access and improve road user safety is reduced.

The CBH facility at Cranbrook is one of the top ten sites in the network with regards to rail tonnage movements and is forecast to grow significantly. There is a defined shortfall in CBH's current state-wide export capacity relative to its future targets. Cranbrook has been identified as a priority site in the Albany zone for increased rail loading capability to address this shortfall.

Planned upgrades include:

- Construction of a 6.6 KT Fixed Rail Loading (FRL) Facility
- Construction of a new rail siding, capable of stabling and loading a 60-wagon train, and
- Installation of a batch weigher over the rail siding to improve rail loading accuracy

In order for construction of the proposed upgrade to proceed, clearing of 1.09 ha of remnant native vegetation inside a 5.82 ha project area will be required.

The 5.82 ha project area is inclusive of all ancillary infrastructure such as signalling, communication equipment, access for maintenance and emergency vehicles, fences and gates, stations, and stormwater drainage. The location of all infrastructure was informed by data collected from flora, vegetation and fauna surveys. The study analysed multiple options to improve rail loading performance at Cranbrook. As there are several inter-related constraints to consider, CBH has determined that installation of a 2 km long siding extending the existing siding and construction of a 6.6 kt FRL Facility was the preferred option.

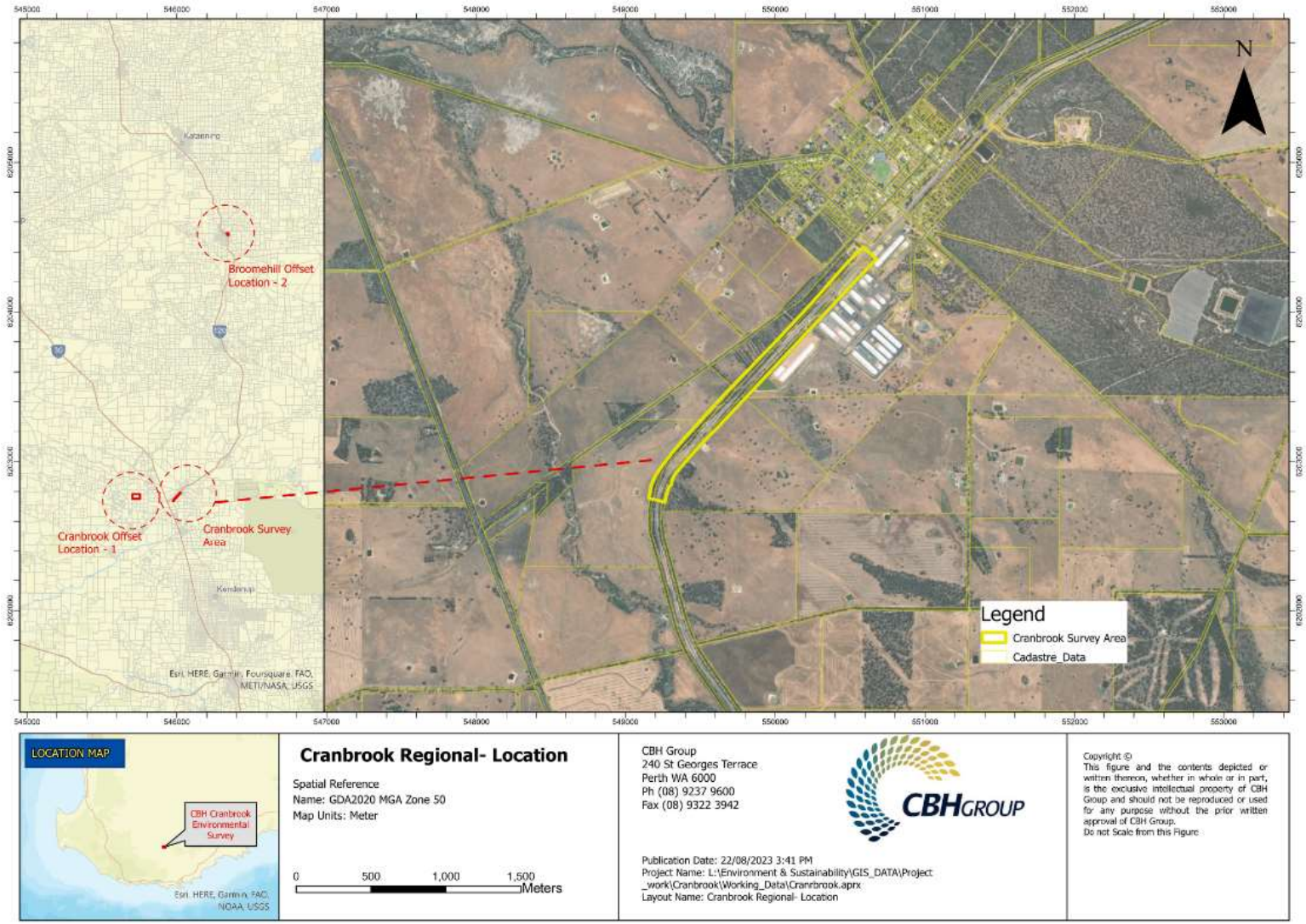

Figure 1: Regional Location

1.2 Project location

Cranbrook is located approximately 330 km southeast of Perth and approximately 90 km northwest of Albany. The development footprint is situated immediately south of the Cranbrook townsite within the Shire of Cranbrook in the Great Southern region.

The development footprint is surrounded by land to the southeast zoned ‘Industrial’ and ‘Rural’, to the west zoned 'Recreation and Open Space' and to the northwest and north-northeast zoned 'Residential'. Much of the surrounding area has been historically cleared for urban residential development (Cranbrook townsite), Great Southern Highway and areas of dryland agriculture (predominantly cereal cropping) (Department of Planning, Lands and Heritage, 2018).

The development footprint comprises Lot 1505, Hardy Street Road reserve (unmade road identified as Landgate ID 3464480), Carlisle Street Road reserve (unmade road identified as Landgate ID 3464480) and Rail Reserves 10315 and 16969.

2 Requirement for Offset

2.1 Western Australian offsets policy and guidance

Environmental offsets are most often applied to proposals subject to environmental impact assessment and as a condition of permits for clearing of native vegetation under the EP Act, but may be considered in relation to other legislation, including planning developments under the *Planning and Development Act 2005* and mining proposals under the *Mining Act 1978* (Government of Western Australia 2011, 2014).

The WA environmental offsets framework consists of the following policy and guidance documents:

- Policy (Government of Western Australia 2011) – outlines principles for the use of offsets; developed to provide certainty, predictability and transparency to government and businesses
- Guidelines (Government of Western Australia 2014) – complement the policy by clarifying how environmental offsets will be determined and applied
- Register (Government of Western Australia 2022b) – a central public record of all offset agreements in WA, providing transparency and accountability
- Metric calculator and guideline (DWER 2021) – a calculator to assist help quantify offsets and guidelines on how to use it
- DRAFT Procedure for environmental offsets metric inputs (DWER 2022) – a draft procedure to improve the consistency and transparency of offset calculations, noting the need for guidance on metric inputs

Environmental offsets under State legislation should only be applied where the residual impacts of a project are determined to be significant, after avoidance, minimisation and rehabilitation have been applied.

2.2 Proposed clearing

The proposed action includes clearing of 1.09 ha of remnant native vegetation inside a 5.82 ha Disturbance Footprint including the removal of 0.89 ha of Eucalypt Woodlands of the Western Australian Wheatbelt (Wheatbelt Woodland TEC).

On 7 July 2023, after considering the proposed Mitigation and Revegetation Plan, DWER advised that significant residual impacts still remained, and that environmental offsets were required. DWER advised that offsets would be required for:

- Wheatbelt Woodland TEC
- Carnaby's cockatoo foraging habitat
- Significant remnant vegetation

2.3 Avoidance and mitigation

CBH has worked with project designers and engineers to undertake an extensive options analysis and to avoid and minimise impacts to environmental values as far as reasonably practicable.

This design work has enabled CBH to avoid and reduce impacts to key environmental values as follows:

- Reduction of potential clearing of the Eucalypt Woodlands of the Western Australian (Wheatbelt Woodlands) ecological community listed as Priority 3 (P3) by the Department of Biodiversity, Conservation and Attractions (DBCA) to 0.89 ha
- Reduction of impacts to mapped native vegetation communities to 1.09 ha of which 0.94 ha is in Good condition and 0.14 ha is in Very Good condition

- Avoidance of all trees suitable for breeding by Carnaby's cockatoo and by reducing as far as possible impacts to Wandoo (*Eucalyptus wandoo*) and Flat-topped Yate (*Eucalyptus occidentalis*) and to specimens that do not contain hollows

In addition, a range of mitigation strategies are proposed to further minimise indirect impacts to native vegetation and fauna. These will be described in detail in a Construction Environmental Management Plan (CEMP), which will be prepared prior to the commencement of vegetation clearing/construction. Management and monitoring actions to minimise potential impacts on surrounding vegetation and habitat, will include strategies related to access control, dust management, weed and disease hygiene management, fire management and fauna management.

2.4 Residual impact to be offset

After following the mitigation hierarchy, the project is considered to result in residual impacts to native vegetation that comprises:

- 1.09 ha of native vegetation
- 0.9 ha of Carnaby's cockatoo habitat
- 0.89 ha of Eucalypt Woodlands Western Australian Wheatbelt TEC

The development footprint is located in the Avon-Wheatbelt Interim Biogeographical Regionalisation for Australia (IBRA) region in the Avon Wheatbelt P2 subregion (AW2 – Rejuvenated Drainage subregion). The Avon Wheatbelt is described as an area of proteaceous scrub heaths, rich in endemics, mixed eucalypt, *Allocasuarina huegeliana* and Jam York Gum woodlands and includes woodlands of Wandoo, York Gum and Salmon Gum with Jam and Casuarina (Beecham 2001).

The vegetation types that will be disturbed as a result of the development are shown in Table 1.

Table 1: Area of vegetation disturbance

Vegetation type	Disturbance (ha)
EdMW: *Eucalyptus decipiens* mid mallee woodland over *Baumea juncea* and **Asparagus asparagoides* low closed sedgeland/vineland	0.0303
LeCqApS: *Leptospermum erubescens*, *Calothamnus quadrifidus* and **Acacia pycnantha* mid shrubland over *Verticordia subulata*, *Banksia fraseri var.fraseri* and *Melaleuca carrii* low open shrubland with *Allocasuarina huegeliana* and *Eucalyptus occidentalis* low isolated trees	0.1644
EwEoW: *Eucalyptus wandoo* and *Eucalyptus occidentalis* mid woodland over *Gahnia trifida*, *Lepidosperma sp*. and *Hakea marginata* low sedgeland/grassland	0.2010
EwEoW/EoW mosaic: Mosaic of *Eucalyptus wandoo* and *Eucalyptus occidentalis* mid woodland and *Eucalyptus occidentalis* low open woodland	0.6942
X: Cleared/No Native Vegetation	4.7342
Total native vegetation	**1.0899 ha**
Total development footprint	**5.8240 ha**
Wheatbelt Woodlands TEC	0.8951

3 Proposed offset sites

3.1 Site identification process

CBH have investigated a number of offset pathways and options including potential land acquisition in collaboration with DWER and DBCA, as well as considering onsite offsets.

CBH has relied upon previous advice from DBCA that had been sought by DWER in forming recommendations for what would be considered a suitable offset site for the proposed action. This advice identified that an offset site for the Cranbrook project should:

- Be in Good condition or better
- Be located within 20 km distance of the application area
- Should be relatively large (e.g., >5 ha)
- Have favourable edge-to-area ratios (e.g., be square rather than long and narrow)
- Have vegetated linkages to other conservation reserves.

Specifically, for Carnaby's Cockatoo, DBCA has provided advice that the acquisition and permanent protection (in perpetuity) of habitat with mature Salmon Gum or Wandoo trees (with or without hollows) within 50 km of the site may be considered an appropriate offset for the loss of Carnaby's Cockatoo habitat trees.

CBH has investigated the suitability of two sites for the purpose of offsets, namely:

- Site 1, Broomehill - Lot 1260 on DP 409752 and Lot 530 on DP 222197
- Site 2, Cranbrook - Lot 55 and 56 Climie Road, Cranbrook

3.2 Site information

3.2.1 Site 1 Broomehill

Lot 1260 on DP 409752 and Lot 530 on DP 222197 (collectively to be described as the 'Broomehill offset') have formed part of an offset proposal that was presented to DWER as part of the application and approval for CPS 9445-1. The entire package that encompassed the Broomehill offset comprised of three proposed lots totalling approximately 10.95 ha owned by CBH and zoned as industrial.

The areas were surveyed by GHD in May 2022 and the results identified that Wheatbelt Woodland TEC is considered present within Lot 530 and Lot 1260, as the vegetation types VT01 and VT02 both meet the key characteristic criteria for this TEC (GHD 2022). During the Broomehill assessment, DWER determined that Lots 530 and 1260 provided 7.06 ha of WWTEC in very good to excellent condition. An area of 6.7 ha has been allocated to the CPS 9445-1 leaving an available portion of 0.36 ha (Figure 2) for CPS 10003-1 (this assessment).

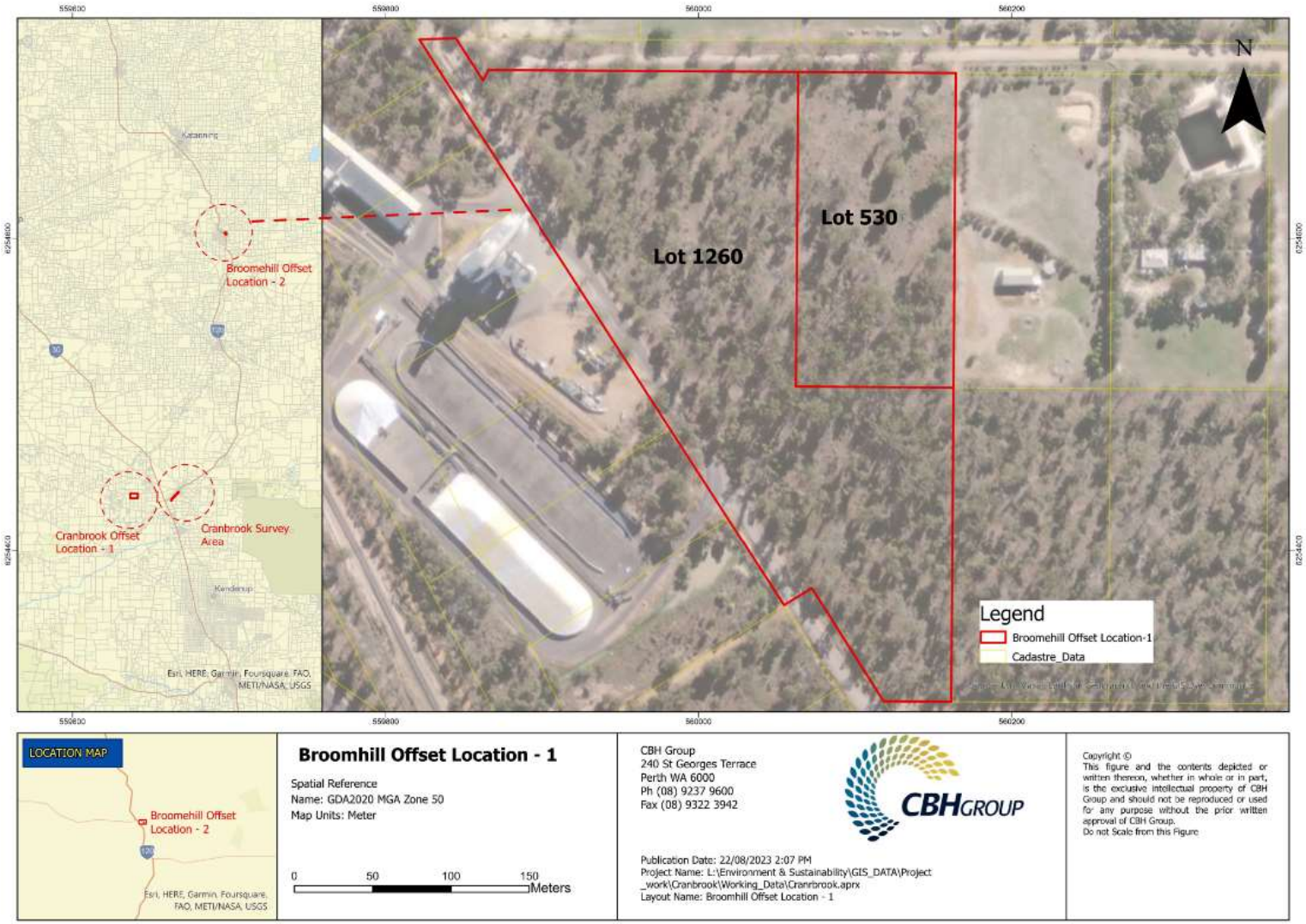

Figure 2: Site 1 Broomehill

3.2.2 Site 2 Cranbrook

Site 2 comprises of 134 ha across Lots 55 and 56 on Plan 230522 (collectively to be described as the 'Cranbrook offset' (Figure 3). The property was recently purchased by CBH (August 2023). A preliminary review of the site has been conducted by Eco Logical Australia (ELA) who conducted a visual assessment of the site in August 2022 (although only Lot 55). At the time, detailed survey of the site was not possible as the owner had not agreed to allow CBH to access their property. The visual assessment was undertaken from the public road (Climie Road). ELA are scheduled to complete a reconnaissance flora and vegetation survey of the site during the current spring survey window (August – November 2023). Bamford Consulting Ecologists (BCE) were requested to undertake a targeted black cockatoo assessment of the site in November 2022.

Initial visual inspection of the site by ELA advised the site is likely to contain Wandoo (Eucalyptus wandoo) Open Woodland, with occasional Flat-topped Yate (*E. occidentalis*), over *Banksia fraseri*, *Hakea lissocarpha*, *Hakea prostrata*, *Allocasuarina sp.*, *Hypocalymma angustifolium*, *Bossiaea eriocarpa* shrubland with an understorey of grasses (*Neurachne alopecuroidea, *Ehrharta calycina*), herbs (*Opercularia vaginata, Drosera* sp.) and sedges (*Lepidosperma leptostachyum*). The assessment by ELA is that this Wandoo woodland had floristic and structural affinities with the Wheatbelt Woodland TEC.

The black cockatoo assessment conducted by BCE identified three vegetation and substrate associations (VSAs) including Wandoo woodland, heath and drainage vegetation. VSAs are environments that contain habitats for fauna. While the BCE site visit did not include a detailed fauna assessment, BCE completed opportunistic sightings of fauna species during the visit. While no evidence of Carnaby's cockatoo was observed during the site visit, anecdotal evidence suggests that Carnaby's cockatoo are regular visitors to the site and breeding and roosting may occur given the availability of large wandoo trees with hollows, proximity to water and suitable foraging habitat.

Overall, BCE (2023) stated that the area 'is a patch of remnant intact vegetation in an otherwise highly fragmented and cleared agricultural landscape, therefore the vegetation and fauna it supports are of local significance'. The site is considered suitable for both fauna and Wheatbelt Woodland TEC based on these assessments, and advice provided by DWER on a review they completed of their databases indicates the lots are likely to contain vegetation that meets the requirement of being suitable Wheatbelt Woodlands TEC.

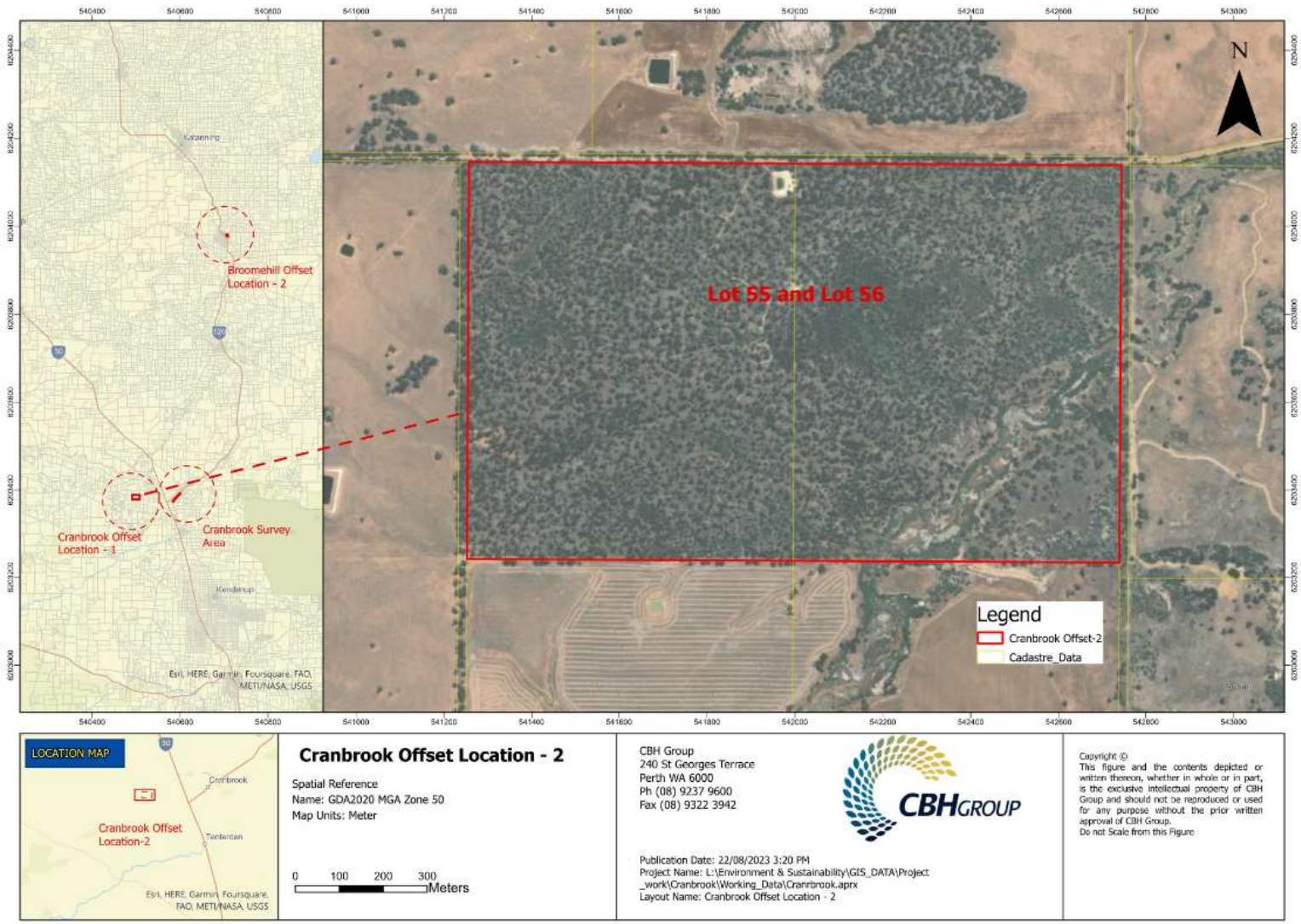

Figure 3: Cranbrook Offset, Site 2

3.3 Summary of offset site values

A summary of the values of the proposed offset sites for both Site 1, Broomehill and Site 2, Cranbrook are provided in Table 2.

Table 2: Summary of offset site values

Values	Site 1 Broomehill Lots 1260 & 530	Site 2 Cranbrook Lots 55 & 56
IBRA Subregion	Katanning (AVW02 – Avon Wheatbelt Region)	Within the Katanning (AVW02 – Avon Wheatbelt Region) and JF01 IBRA subregions., but north-west and south-west corners of site overlap Southern Jarrah Forest (JAF02 – Jarrah Forest Region).
Distance from proposed action	51 km north/northeast of Cranbrook	8 km west of Cranbrook
Land tenure	Owned by CBH	Owned by CBH
Land size	Approx. 7.89 ha	Approx. 134 ha
Wheatbelt Woodland TEC values	Combined area of 7.89 ha with a 7.07 ha patch of native vegetation in Very Good to Excellent condition. This patch is also connected to vegetation in adjacent properties.	Area comprising of two lots totalling 134 ha identified during surveys as having a portion of this likely to represent WWTEC.
Carnaby's Cockatoo values	Assessments confirm the area contains vegetation that could be suitable for roosting, breeding and foraging habitat for Carnaby's Cockatoo.	Assessments suggest the area contains vegetation that is suitable for both nesting and roosting, with tall Wandoo trees and a water point being key features. A reconnaissance flora and vegetation survey is scheduled for November 2023.
State values	Association 1085	Associations Tambellup 967 that overlaps the eastern half of site and Kendenup 968 which overlaps the western half of the site.
Impacts and threatening processes	Spray drift from nearby agricultural practices, grazing of livestock, edge effects, weeds and clearing	

4 Offset calculations

This section describes the proposed offset package and how the site will be managed and maintained to achieve conservation gains to address the residual impacts associated with clearing linked to the project.

Table 3: Summary of Wheatbelt Woodland TEC offset package

Description	Input	Assumption
Impact site		
Description	0.89 ha of Wheatbelt TEC	Mapped by Ecoscape
Area	0.89 ha	Clearing of Wheatbelt TEC within the project footprint
Quality	Very Good	Overall site score of 7 provided by DWER
Information source	Ecoscape 2022	Flora, vegetation and fauna survey performed by Ecoscape, referenced within NVCP 2022.
Offset site		
Proposed offset	**Land acquisition:** which contains Wheatbelt Woodland TEC. **Protection:** establishing an enduring legal mechanism to prevent clearing of Wheatbelt Woodland TEC. **Improvement of environmental values**: rehabilitation and revegetation activities to increase vegetation condition **Creation of Wheatbelt Woodland TEC:** in patches that do not currently meet TEC criteria.	**Land acquisition and protection** Site 1: Of the remaining 10.95 ha (owned by CBH), 0.36 ha of Wheatbelt Woodland TEC remains for offset purposes. A conservation covenant has already been placed over the portions identified within CPS 9445. Site 2: Two lots comprising of 134 ha in total. with utilisation of proposed 3.61 ha for offset residual impacts for CPS 10003. CBH has recently acquired this land, and will now work through the process to have a conservation convent placed over both lots

		On-ground management activities CBH to prepare a management plan for Site 2 to remove threatening processes, prevent further degradation and improve vegetation condition. **Rehabilitation:** Management actions such as access, fire, pest and weed control to maintain habitat quality and prevent further degradation over time will be performed. **Revegetation:** Infill and supplementary planting to improve vegetation assemblage and condition of any degraded areas or woodland patches that do not currently meet Woodland Wheatbelt TEC criteria, to create additional areas of Woodland Wheatbelt TEC and improve the overall site values and condition.
Time over which loss is averted	20	Assume maximum time as no further clearing envisaged.
Time until ecological benefit	1	The majority and most significant gains, to mitigate degradation and improve TEC woodland condition, will be noticeable within the first 12 months of management. The placement of a conservation covenant on the site would result in an initial ecological benefit within 12 months. However, creating new areas of TEC may take longer as revegetation efforts may take anywhere between 3-7 years to show success or failure depending on weather patterns, resilience of species used, drought etc.
Start area	3.97	Habitat retention, protection and rehabilitation of 3.97 ha of Wheatbelt Woodland TEC.
Start quality	7	An overall mean site score of 7 has been applied based on vegetation condition, site context and habitat attributes.
Risk of loss without offset	15%	The risk of losing vegetation or habitat without an offset is considered to be moderate within the next 20 years. The land zoned Rural can be gradually cleared with current exemptions afforded to agriculture, as well as the potential for this land to be developed. The risk of loss is also affected by the potential increase in habitat degradation from weed invasion and other indirect impacts (such as those from grazing).
Future quality without offset	6	A future quality without offset score of 6 reflects the potential reduction in vegetation/Wheatbelt TEC condition, through continued access, weed invasion, uncontrolled grazing of pests, rubbish dumping and potential for further clearing.
Risk of loss with offset	5%	As the offset areas will be formally recognised and secured under Conservation Covenant it will be awarded protection from potential future

		clearing and managed to reduce threatening processes as agreed with offset land managers. Whilst a Conservation Covenant status awards the maximum level of protection available, the value of 5% rather than 0% has been applied to the calculator to reflect the inability to have absolute uncertainty. This should, however, be recognised as a conservative approach.
Future quality with offset	7	A future quality with the offset score of 7 is expected as the vegetation quality in the 3.97ha part of the offset areas will be at least maintained (if not improved) through on-ground management activities including the ongoing control of weeds, restricting access through fencing, and removing rubbish. These management actions will assist in maintaining vegetation mostly in Excellent to Very Good condition and increasing the condition of lower condition areas. Where required infill and supplementary planting to be considered. This is based on the offset sites being in very good condition. As both offset sites will be formally recognised and secured under Conservation Covenant, both will be afforded protection from potential future clearing.
Confidence in result (%) – risk of loss (habitat/community)	80%	A high degree of confidence in risk of loss, based on conservative inputs.
% Direct Offset	82.4%	The offset coupled with the 17.7% mitigation rehabilitation planting credit meets the required 100%.

Table 4:4 Clearing of native vegetation within a highly cleared landscape

Description	Input	Assumption
Impact site		
Description	1.09 ha of native vegetation within a highly cleared landscape	Mapped by Ecoscape (2022)
Area	1.09 ha	Clearing of native vegetation that is within a highly cleared landscape
Quality	7	Vegetation quality was mapped as good to very good
Information source	Ecoscape (2022)	Flora, vegetation and fauna survey performed by Ecoscape, referenced within EndPlan Environmental report 2022.

Offset site		
Proposed offset	Land acquisition containing Wandoo (Eucalyptus wandoo) Open Woodland. **Protection:** establishing an enduring legal mechanism to prevent clearing of native vegetation Conservation Covenant **Improvement of environmental values**: rehabilitation and revegetation activities to increase vegetation condition.	**Land acquisition and protection** Site 1: Of the 10.95 ha owned by CBH, 0.36 ha of TEC remains for offset purposes. A conservation covenant has already been placed over the portions identified within CPS 9445. Site 2: Two lots comprising of 134 ha in total. with utilisation of proposed 3.61 ha for offset purposes. CBH has recently acquired this land and will now work through the process to have a conservation convent placed over both lots. **On-ground management activities** CBH to prepare a management plan for Site 2 to remove threatening processes, prevent further degradation and improve vegetation condition. **Rehabilitation:** Management actions such as access, fire, pest and weed control to maintain habitat quality and prevent further degradation over time will be performed **Revegetation:** Infill and supplementary planting to improve vegetation assemblage and condition of degraded areas to meet Very Good or higher of the Keighery (1994) scale.
Time over which loss is averted	20 years	Assume maximum time as no further clearing envisaged.
Time until ecological benefit	1 year	The majority and most significant gains, to mitigate further degradation and improve the condition of the native vegetation, will be noticeable within the first three years of management. The placement of a conservation covenant on the site would result in an initial ecological benefit within 12 months. However, creating new areas of TEC may take longer as revegetation efforts may take anywhere between 3-7 years to show success or failure depending on weather patterns, resilience of species used, drought etc. A conservative estimate of 3 years has been applied to present worse-case-scenario.
Start area	1.68 ha	Habitat retention, protection and rehabilitation
Start quality	7	An overall mean site score of 7 has been applied based on vegetation condition, site context and habitat attributes.
Risk of loss without offset	15%	The risk of losing vegetation or habitat without an offset is considered to be moderate within the next 20 years.

		The land zoned Rural can be gradually cleared with current exemptions afforded to agriculture, as well as the potential for this land to be developed. The risk of loss is also affected by the potential increase in habitat degradation from weed invasion and other indirect impacts (such as those from grazing).
Future quality without offset	6	A future quality without offset score of 6 reflects the potential reduction in vegetation/Wheatbelt TEC condition, through continued access, weed invasion, uncontrolled grazing of pests, rubbish dumping and potential for further clearing.
Risk of loss with offset	5%	As the offset area will be formally recognised and secured under Conservation Covenant it will be awarded protection from potential future clearing and managed to reduce threatening processes as agreed with offset land managers. Whilst status as a Conservation Covenant awards the maximum level of protection available, the value of 5% rather than 0% has been applied to the calculator to reflect the inability to have absolute uncertainty. This should, however, be recognised as a conservative approach.
Future quality with offset	7	A future quality with the offset score of 7 is expected as vegetation quality in the 1.68 ha part of the offset areas will be at least maintained (if not improved) through on-ground management activities including the ongoing control of weeds, restricting access through fencing, and removing rubbish. These management actions will assist in maintaining vegetation mostly in Excellent to Very Good condition and increasing the condition of lower condition areas. Where required, infill and supplementary planting to be considered. This is based on the offset sites being in very good condition. As the offset areas will be formally recognised and secured under Conservation Covenants, they will be awarded protection from potential future clearing.
Confidence in result (%) – risk of loss (habitat/community)	80%	A high degree of confidence in risk of loss, based on conservative inputs.
% Direct Offset	35.4%	The offset coupled with the 64.7% Mitigation rehabilitation planting credit meets the required 100%

Table 5: Summary of Carnaby's Cockatoo offset package

Description	Input	Assumption
Impact site		
Description	Low value breeding, roosting and foraging habitat for Black Cockatoos	Mapped by Ecoscape (2022)
Area	0.90 ha	Clearing of black cockatoo foraging habitat within the project footprint
Quality	57	Overall site score of 7 provided by DWER
Information source	Ecoscape (2022),	Flora and vegetation surveys conducted by Ecoscape November 2020, and email correspondence from DWER.
Offset site		
Proposed offset	**Land acquisition:** which contains native vegetation communities of Eucalypt woodlands (*Eucalyptus wandoo* Woodland, *Banksia fraseri, Hakea lissocarpha* and *Hakea prostrata* **Protection:** establishing an enduring legal mechanism to prevent clearing of native vegetation. **Improvement of environmental values**: rehabilitation and revegetation activities to increase vegetation condition.	**Land acquisition and protection**. Site 1: Of the 10.95 ha owned by CBH, 0.36 ha of TEC remains for offset purposes. A conservation covenant has already been placed over the portions identified within CPS 9445. Site 2: Two lots comprising of 134 ha in total. with utilisation of proposed 3.61 ha for offset purposes. CBH has recently acquired this land and will now work through the process to have a conservation convent placed over both lots. **On-ground management activities** to remove threatening processes, prevent further degradation and improve vegetation condition. **Rehabilitation:** management actions such as access, fire, pest and weed control to maintain habitat quality and prevent further degradation over time. **Revegetation:** infill and supplementary planting to improve vegetation assemblage and condition of degraded areas or woodland patches that do not currently meet TEC criteria, to create additional areas of TEC and improve the overall site values and condition.

Time over which loss is averted	20 years	Assume maximum time as no further clearing envisaged.
Time until ecological benefit	1 year	The majority and most significant gains, to mitigate further degradation and improve black cockatoo foraging habitat condition, will be noticeable within the first 12 months of management, and due to the placement of a conservation covenant on the site. However, creating new areas of suitable forging habitat may take longer as revegetation efforts may take anywhere between 3-7 years to show success or failure depending on weather patterns, resilience of species used, drought etc. A conservative estimate of 3 years has been applied to present worse-case-scenario.
Start area	3.26 ha	Habitat retention, protection and rehabilitation of 3.26 ha of Black Cockatoo Foraging Habitat in mostly Excellent condition, with some areas in Very Good condition. Where required, the creation and or improvement of suitable habitat in areas that do not currently meet this criteria.
Start quality	7	An overall mean site score of 7 has been applied based on vegetation condition, site context and habitat attributes.
Risk of loss without offset	15%	The risk of losing vegetation or habitat without an offset is considered to be moderate within the next 20 years. The land zoned Rural can be gradually cleared with current exemptions afforded to agriculture, as well as the potential for this land to be developed. The risk of loss is also affected by the potential increase in habitat degradation from weed invasion and other indirect impacts (such as those from grazing).
Future quality without offset	6	A future quality without offset score of 6 reflects the potential reduction in Black cockatoo Foraging Habitat condition, through continued access, weed invasion, uncontrolled grazing of pests, rubbish dumping and potential for further clearing.
Risk of loss with offset	5%	As the offset areas will be formally recognised and secured under Conservation Covenant it will be awarded protection from potential future clearing and managed to reduce threatening processes as agreed with offset land managers. Whilst status as a Conservation Covenant awards the maximum level of protection available, the value of 5% rather than 0% has been applied to the calculator to reflect the inability to have absolute uncertainty. This should, however, be recognised as a conservative approach.
Future quality with offset	7	A future quality with the offset score of 7 is expected as vegetation quality in the 3.26 ha part of the offset areas will be at least maintained (if not improved) through on-ground management activities including the

		ongoing control of weeds, restricting access through fencing, and removing rubbish. These management actions will assist in maintaining vegetation mostly in Excellent to Very Good condition and increasing the condition of lower condition areas. Where required, infill and supplementary planting to be considered to areas that do not meet black cockatoo foraging habitat criteria, as this will also improve the overall quality of the total 3.26 ha, ensure the long-term viability and increase overall site scores. As the offset areas will be formally recognised and secured under Conservation Covenant it will be awarded protection from potential future clearing.
Confidence in result (%) – risk of loss (habitat/community)	80%	A high degree of confidence in risk of loss, based on conservative inputs.
% Direct Offset	70.6%	The offset coupled with the 29.5% Mitigation rehabilitation planting credit meets the required 100%

4.1 Type of offset

The offset package includes land acquisition/protection and on ground management (Government of WA 2014). Land acquisition, protection and on-ground management are direct offsets and account for over the minimum 90% required for an offset (Government of WA 2011). As such, CBH believes no other offsets are required (i.e., indirect offsets).

The proposed offset package includes land acquisition as environmental values will be protected through improved security of tenure (i.e., a conservation covenant) and restricting the use of the land (access control and fencing).

On-ground management is also proposed as part of the offset package to maintain and improve habitat quality or vegetation condition throughout the offset sites.

4.2 Security of offset

All proposed offset Lots are currently privately owned by CBH and the protection of the offset sites will adhere to mechanisms for offsets on private lands including:

- Legally secured for conservation purposes in perpetuity
- Actively monitored for compliance, with covenant requirements enforced.

Following the previously endorsed “security of offset” process for Broomehill, CBH will consult with the Department of Primary Industries and Rural Development (DPIRD) that administers the SLC Act, and implement the following steps:

- CBH to engage a licensed surveyor to draw up an Interests Only Deposited Plan (IODP) that identifies the area to be protected by a covenant. The surveyor will then lodge the IODP with Landgate.
- Once this is lodged at Landgate, a copy of the IODP will be forwarded to DPIRD (with a digital map file, e.g. .shp or .dwg). DPIRD will complete the paperwork for the Covenant.
- The draft paperwork will then be sent to landholders for review (applicable to Lot 55 and 56 only). Once agreed DPRID will send the final paperwork and multiple copies will need to be printed, approved and signed by the proprietors, then returned to DPIRD for Commissioner signing.
- The copies will be: 1 x Statement of undertaking (A4 b&w) and 4 x Conservation Covenant documents (A3 colour single sided) for: Landgate (1), DPIRD file (1), Valuer General (1) Owner (minimum 1).
- Signed covenants to be lodged with Landgate for registration of the memorial on the Certificate of Title.

CBH’s preference is that in the long term the Offset Sites are managed by an appropriate government or private conservation body like the DBCA or Greening Australia with offset management activities to be funded by CBH subject to an agreement and ongoing reporting and auditing provisions. Until such a time that the land can be transferred, it will be managed by CBH in accordance with an Offset Management Plan (the Plan), expected to be required as a condition of approval.

4.3 Management activities

On-ground management activities across both offset sites will be undertaken, and will include targeted revegetation and supplementary planting, as well as rehabilitation activities such as the installation of fire breaks, clearing rubbish, installing/upgrading fencing and restricting access, and weed control where required on advice from a land rehabilitation specialist. On-ground management actions are intended to prevent further degradation and maintain the

quality and condition of existing environmental values, improve the quality and condition of degraded areas, and create additional habitat in areas devoid of any habitat values.

A brief overview of the proposed on-ground management activities is provided in Appendix B however, it should be noted that these will be described in further detail in an Offset Management Plan.

4.4 Conversation outcomes and timeframes

The main conservation outcome will be the enhancement and protection of habitat values for Wheatbelt Woodland TEC and native vegetation in a highly cleared surrounding landscape. This will assist in averting the future loss, degradation or damage to Wheatbelt Woodland TEC and/or habitat for fauna.

Conservation gains will be achieved over both the short and long term, with initial conservation gains expected within 12 months of implementation from site acquisition and lodgement of conservation covenants. On-ground management, such as removing threatening processes, will result in significant gains within the first 1-5 years of the management actions being implemented. The initial ecological benefits are expected over a short-term period and where required; consideration will be given to any longer-term management actions. The actual time to achieve conservation gain is summarised in Table 6.

Table 6: Time until conservation outcome is realised

Timing	Management actions	Conservation outcome
Short-term (1-5 years)	Baseline surveys Development of rehabilitation and management plans Grazing managed / removed where needed Fencing and signage (if required) established Weed control of primary target weeds within the first year of management Revegetation management (supplementary [buffer] planting if/where required)	Increase in nest hollow availability for Carnaby's Cockatoo Protection of habitat in perpetuity Decrease in weeds and competition Decreased risk of loss of MNES values Increase in species of relevance for Wheatbelt Woodland ecological community Increase in foraging species for Carnaby's Cockatoo Increased community awareness of the significance of conservation
Long term (>5 years)	Revegetation management Ongoing weed control where required Maintenance of fencing where required Maintenance of fire breaks where required	Long-term availability of nest hollows for Carnaby's Cockatoo Increased species diversity, biomass and resources Potential for increase in total vegetation cover and habitat condition or quality through regrowth and assisted regeneration

4.5 Relevance of offset

The proposed offset is proportionate to the level of impact and significance of the environmental values being impacted, that is the Vegetation Association Tambellup 967 described as scattered tall shrubs *Acacia* spp., Proteaceae and Myrtaceae. The current extent of Vegetation Association 967 is 16.86% of its pre-European extent at State level, 23.09% IBRA bioregion (Jarrah Forest) and subregion (Southern Jarrah Forest) levels, and 19.64% at the LGA (Shire of Cranbrook) level.

Table 6: Consideration of WA offset principles with respect to the proposed offset

Principle	Response
Environmental offsets will only be considered after avoidance and mitigation options have been pursued.	CBH has implemented a lengthy mitigation process including redesigning the project footprint to avoid impacts to native vegetation, flora and fauna as far as practicable. As well as avoidance, a number of management strategies are proposed to reduce the risk of indirect impacts to areas of surrounding vegetation and habitat. Mitigation and management are described in Section 4.3.
Environmental offsets are not appropriate for all projects.	The proposed development will have a significant residual impact on the vegetation association 967, Wheatbelt Woodland TEC and Carnaby's Cockatoo and after the mitigation hierarchy has been applied. Offsets are therefore considered appropriate for this project.
Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted.	The proposed offsets relate to the environmental values being impacted, that is: vegetation association 967, Wheatbelt Woodland TEC and Carnaby's Cockatoo. The proposed offsets are proportionate to the significance of the environmental values being impacted with an impact to offset ratio greater than 1:1. The proposed offset will protect like for like (or better) environmental values relevant to vegetation association 967 and 968, Wheatbelt Woodland TEC and Carnaby's Cockatoo through a combination of land acquisition and protection, and habitat improvement/enhancement.
Environmental offsets will be based on sound environmental information and knowledge.	The proposed offsets are based on sound environmental information and knowledge. Ecological surveys have been conducted over the proposed offset sites. In addition, numerous literature and databases have been used to inform the offset proposal, as well as the metrics used in the calculator. Prior to on ground works, baseline surveys to inform management and monitoring programs will be undertaken. Technical experts will be engaged to assist with the baseline surveys, development of management plans, weed control and management activities, revegetation and monitoring programs.
Environmental offsets will be applied within a framework of adaptive management.	The proposed offsets will be managed in accordance with Offset Management Plans for each site, which will include an adaptive management framework to account for any potential risks or unintended consequences which may arise. The uncertainty of offset success is also included in the calculation of a suitable offset extent in accordance with the offset calculator. The Offset Management Plans will include objectives and appropriate targets/performance indicators to measure success of achieving the outcomes indicated in this Offset Proposal. It will also provide for appropriate monitoring and setting of triggers for implementation of remedial actions should monitoring indicate issues related to success.
Environmental offsets will be focussed on longer term strategic outcomes.	The proposed offsets have been designed to provide short-term and long-term conservation gains (i.e., strategic outcomes) for Wheatbelt Woodland TEC and Carnaby's Cockatoo and the vegetation associations 967 and 968. This will be achieved through the acquisition, improvement and long-term protection of habitat for Wheatbelt Woodland TEC and Carnaby's Cockatoo. The proposed offsets will be undertaken in accordance with Offset Management Plans for each site which will ensure a flexible approach to the security, management, and monitoring of offsets through an adaptive management framework approach. CBH is willing to work with DWER, DBCA and other relevant agencies to ensure that the anticipated environmental outcomes are realised.

4.6 Conclusion

Under the WA Offset Policy, environmental offsets are actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity (Government of WA 2014). Environmental offsets will be used as a last resort, after due consideration of avoidance and mitigation measures.

The proposed offset aims to maintain (and improve) the viability of native vegetation Associations 967 and 968 and in doing so it provides for significant improvements and protection for Wheatbelt Woodland TEC and Carnaby's Cockatoo habitat through land acquisition and protection, and rehabilitation of areas of habitat. The proposed offsets have been developed following a lengthy project design process to avoid and mitigate impacts associated with the proposed action.

The proposed offset is proportionate to the level of impact and significance of the environmental values being impacted and aligns with the Western Australian Offset Policy Principles, described in Table 6. The proposed offsets compensate for the significant residual impacts to native vegetation including vegetation associations 967, Wheatbelt Woodland TEC and Carnaby's Cockatoo, associated with the proposed action. Through implementation of an adaptive management framework, CBH has factored in risks of failure and provided contingency measures that can be implemented to ensure certainty of success.

Given all the above, the offset proposed is considered more than adequate with over 90% offset achieved for all environmental features; vegetation association 1085 (Broomehill) and 967 and 968 (Cranbrook), Wheatbelt Woodland TEC and Carnaby's Cockatoo.

5 References

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Appendix A: Methodology for assigning habitat scores

Quality score	Site condition	Foraging habitat quality[1] (Carnaby's Cockatoo)	Site context	Habitat attributes/species stocking rate
10	Pristine: Pristine or nearly so, no obvious signs of disturbance; 0% weed cover.	High: • Primary food sources (i.e., Woodlands with tree banksias or marri/jarrah) present at > 60% projected foliage cover; and • Vegetation may be in Good or higher condition with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium to long term).	**High site context means (any or all):** • The site is well connected to areas of native vegetation. • Generally has a low edge to area ratio. • Provides landscape-level connectivity. • Site is within the significant and/or highly impacted part of the species or ecological community's range. • The site location or occurrence of an environmental value comprises a high proportion of the known area, number of individuals or distribution.	**High habitat attributes means (any or all):** • The site has low threat levels compared with other areas of habitat. • The site provides foraging, nesting and/or dispersal habitat. • Where breeding habitat is a limiting factor for the species: breeding. Habitat would usually have a very high-quality score to recognise the importance of nesting habitat. • The species or community has been recorded or is considered highly likely to occur due to availability of suitable habitat and proximity of numerous nearby records.
9	Excellent: Vegetation structure intact; disturbance affecting individual species; weeds are non-aggressive species; 1–5% weed cover. For example, damage caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.			
8	Very good to Excellent	Moderate to High: • Primary food sources (i.e., Woodlands with tree banksias or marri/jarrah) with 40-60% projected foliage cover; • Primary food sources (i.e., Woodlands with tree banksias or marri/jarrah) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Secondary food sources with >60% projected foliage cover; • Pine plantations with trees more than 10 years old; and • Vegetation may be in Good or higher condition.		
7	Very good: Vegetation structure altered; obvious signs of disturbance; 5–25% weed cover. For example, disturbance to vegetation structure caused by repeated fires; the presence of some more aggressive weeds; dieback; logging; and grazing		**Moderate site context means (any or all):** • The site provides some connection to areas of native vegetation. • Adjoins or within proximity of an ecological linkage. • Vegetation at the site may be fragmented, but forms part of a network/movement corridor.	**Moderate habitat attributes (any or all):** • The site may have some threats evident but also displays some resilience. • The site provides foraging and/or dispersal habitat. • The species or community has not been recorded but
6	Good to Very good	Moderate: • Primary food sources (i.e., Woodlands with tree banksias or marri/jarrah)		

		present at 20-40% projected foliage cover; • Secondary food sources (i.e., Woodlands with primarily secondary food items such as Peppermint, Tuart, York gum, Wattles, etc.) present at 40-60% projected foliage cover; and • Vegetation may be in Degraded to Very Good condition.	• Provides landscape-level connectivity. • Site is within the significant and/or highly impacted part of the species or ecological community's range.	is considered to have the potential to occur.
5	Good: Vegetation structure significantly altered by very obvious signs of multiple disturbances; retains basic vegetation structure or ability to regenerate it; 25–50% weed cover. For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; and grazing.	Low to Moderate foraging value including: • Primary food sources (i.e., shrubby banksias, woodlands with banksias, marri or jarrah, Eucalypt Woodland/Mallee of small-fruited species) present at 5-20% projected foliage cover; • Secondary food sources (i.e., Woodlands with secondary food items such as Peppermint, Tuart, York gum, Wattles, being dominant) present at 20-40% projected foliage; and • Vegetation may be in Degraded or Good condition.		
4 **3**	Good to degraded	Low foraging value including: • Primary food sources (i.e., shrubby banksias, marri or jarrah trees or open woodland, open Eucalypt Woodland/Mallee of small-fruited species) present at 2-5%; • Secondary food sources (i.e., Woodlands with secondary food items such as Peppermint, Tuart, York gum, Wattles being dominant.) present at 10-20% projected foliage cover; • Vegetation in Degraded condition; • Short-term and/or seasonal food sources such as paddocks with melons or other known food-source weeds (e.g., Erodium spp.).	Low site context means (any or all): • Site is not connected to areas of native vegetation. • Site is not within an ecological corridor. • Generally fragmented vegetation (high edge to area ratio). • Site is within the species or ecological community's range.	Low habitat attributes means (any or all): • High degree of threats are evident (e.g., weed invasion, feral animals where relevant to the environmental value). • Little foraging and/or dispersal habitat available. • The species has not been recorded and is considered to potentially occur but only on an occasional basis.

2	Degraded: Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching good condition without intensive management; 50–75% weed cover. For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; and grazing	Negligible: • Primary food sources at < 2% % foliage cover, or secondary food sources at <10% PFC. This could include urban areas or cleared paddocks with scattered foraging trees; • Vegetation in Degraded or lower condition; • Short-term and/or seasonal food sources such as paddocks partly vegetated with melons or weeds (e.g., Erodium spp.).		
1	Degraded to Completely degraded			
0	Completely degraded: The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.	**Nil** No foraging species present.	No site context means: • Not within the known distribution for the species. • No breeding, foraging or dispersal resources in proximity to site. • No connectivity or ecological corridors.	No habitat attributes means (any or all): • Very high degree of threats are evident (e.g., weed invasion, feral animals where relevant to the environmental value). • No breeding, foraging and/or dispersal habitat available. • The species has not been recorded or is considered unlikely to occur.

Appendix B: On-ground management activities

BASELINE SURVEYS

CBH propose to engage a suitability qualified consultant to undertaken baseline surveys of both offset sites. This will include Detailed flora and vegetation surveys, weed surveys and black cockatoo habitat assessments. The surveys will provide baseline data, detailed mapping and monitoring locations for:

- Vegetation type and condition
- Wheatbelt Woodland TEC and Category
- Weeds
- Black cockatoo habitat values including foraging, breeding and roosting habitat including an assessment of quality
- Suitable locations for Artificial Nest Boxes
- Target areas identified for revegetation and site-specific management.

PREPARATION OF MANAGEMENT PLANS

CBH will engage a third-party conservation management organisation to develop detailed management plans for each offset site. This will include an Offset Management Plan for all three sites and a Revegetation Management Plan for Lots 55 and 56. All plans will include detailed descriptions of management objectives, performance indicators, management actions and contingency measures across both Offset Sites based on different management zones. All Plans will include objectives and appropriate targets/performance indicators to measure success of achieving the outcomes indicated in this Proposal. It will therefore also provide for appropriate monitoring and setting of triggers for implementation of remedial actions should monitoring indicate issues related to success.

Management activities described in the Plan will be developed with consideration for the following guidance for MNES:

- Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt (DoE 2015a)
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (Department of Parks and Wildlife [DPaW] 2013)
- Referral Guideline for 3 species of black cockatoo (DCCEEW 2022)
- Threat abatement plan for predation by feral cats (DoE 2015)
- Threat Abatement plan for Predation by the European Red Fox (DEWHA 2008)
- Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi* (DoEE 2018).

The Revegetation Management Plan for Lot 55 and 56 will include detailed mapping of vegetation communities, condition, Wheatbelt Woodland TEC and Category, and areas flagged for planting. This will include revegetation using salt tolerant species in salt-affected low-lying areas, as well as improving density of key species in low density patches. Management activities to control waterlogging/salinisation (i.e., drainage works) will also be considered.

All management plans will be developed using an adaptive management framework and will include contingency measures to account for risk of failure.

Revegetation

A revegetation program will be developed as part of the Revegetation Management Plan at Lot 55 and 56. Revegetation will include infill and supplementary planting, targeting degraded or cleared areas with the objective of increasing habitat/vegetation quality or condition and creating additional areas of, as applicable, Wheatbelt Woodland TEC, and Carnaby's Cockatoo habitat in areas devoid of vegetation or woodland patches that do not currently meet TEC/habitat criteria. This will be achieved through planting a mixture of ground cover and canopy Wheatbelt

Woodland TEC and/or Carnaby's Cockatoo species that are endemic to the area and known to be reliable in propagation.

Revegetation will include site preparation and intensive weed control in targeted areas to ensure native vegetation can become established.

Annual monitoring will be conducted to assess the need for extra planting and/or seeding to ensure the species composition and structure is similar to that of the surrounding vegetation and to ensure the success rate. A contingency plan will be developed as part of the Revegetation Management Plan to account for vegetation failing to establish.

FENCING AND ACCESS MANAGEMENT

Permanent fencing that excludes vehicles (except for management vehicles), people and grazers from entering the sites will be established around the periphery of each Offset Site. Access for management vehicles (including fire trucks) will be provided at location(s) where existing tracks occur. Fencing will be regularly inspected to check for any maintenance issues.

HYGIENE MANAGEMENT

Contractors or CBH staff entering the offset sites will be required to adhere to strict hygiene measures to minimise the potential for weeds or pathogens to be introduced or spread. Specific actions to be undertaken to minimise introduction and/or spread of weeds or pathogens will include:

- Ensuring that vehicles, tools, equipment and machinery brought onto the site are free of mud and soil
- Limiting vehicle access to the site to existing tracks
- Avoiding bringing soil, gravel or sand into the site
- If material must be bought onto site, it will be purchased from a soil supplier with Nursery Industry accreditation
- Observing susceptible plants and noting any deaths as part of annual reporting.

WEED MANAGEMENT

Weed management and control will be outlined within each site management plan and will be informed by a baseline survey with a focus on key species, Weeds of National Significance and/or Declared Plants under the *Biosecurity and Agriculture Management Act 2007*. A weed map will be created for each site, identifying areas that require targeted management to control invasive weeds, with these weeds to be actively managed by direct spraying or hand pulling, with the objective of eradication.

Weed control will be undertaken within the first 12 months of the offset being acquired and then repeated at least annually up to year 3 (or as required). Follow up weed management will be informed by visual inspections by maintenance contractors and results of annual monitoring.

FIRE MANAGEMENT

Firebreaks will be established and maintained as appropriate, with the objective of managing risk of fire to Wheatbelt Woodland TEC and Carnaby's Cockatoo habitat. Firebreaks will be planned such that clearing of Wheatbelt Woodland TEC and Carnaby's Cockatoo habitat will be avoided where possible.

Perimeter fencing will include at least one access point for maintenance and fire vehicles.

MONITORING

CBH propose to undertake long-term monitoring including:

- Success of Wheatbelt Woodland TEC revegetation.

Long-term monitoring will assist in understanding nesting behaviour in Carnaby's Cockatoo and revegetation techniques for Wheatbelt Woodland TEC and will add significant value to the outcomes of on-ground management.

Long-term monitoring programmes for each site and each environmental value will be developed as part of the Offset Management Plans.

Appendix C: Certainty of success

RISK AND CONTINGENCY

Table C1 provides an overview of potential risks of the management plans failing to achieve and/or maintain environmental objectives, and risk management strategies that will be applied. These will be described in further detail within the management plans, with contingency strategies that will be applied if management actions fail to achieve and/or maintain the overarching environmental objectives.

Table C1: Risk identification and management

Objective	Event or circumstance	Risk management	Residual Risk		
			Likelihood	Consequence	Risk
Legally secure the offset property for conservation purposes in perpetuity	Site/and or proposed management is not considered acceptable by covenanting agency	The condition of Degraded areas will be improved through revegetation and rehabilitation to ensure the Offset Sites meets basic covenanting requirements. CBH will consult with various covenanting agencies as required to find an appropriate fit.	Unlikely	Moderate	Low
	Future development proposal inconsistent with the offset intent in breach of covenant provisions	Maintain the offset site in CBH Asset Register. The covenant will be listed as a restriction on titles.	Rare	High	Low
Remove and/or manage key threats for a period of 20 years	Previous leaseholders or others continue to access the site and promote degradation	Review fencing and consideration of additional signage.	Unlikely	Moderate	Low
	Native vegetation fails to establish	Monitor against trigger values and implement contingency measures or adaptive management as required.	Unlikely	Moderate	Low
	Weed management is not adequate to contain weed spread	Monitoring and reporting requirements combined with an adaptive management framework will address failure of the proposed management to achieve the performance targets.	Unlikely	Moderate	Low
	Salinity issues continue to contribute to degradation	Monitoring and reporting requirements combined with an adaptive management framework will address failure of the proposed management to achieve the performance targets.	Unlikely	Moderate	Low
Maintain quality of TEC and Black cockatoo habitat for a	Inadequate land management practices lead to the deterioration of habitat quality	Monitoring and reporting requirements, combined with an adaptive management framework, will address failure of the proposed management to achieve the performance targets.	Unlikely	High	Medium

period of 20 years	Unplanned events (fire, drought, climate change) prevent realisation of performance targets	Plan for delays in completion, and revise management actions to reflect changed conditions.	Possible	High	Medium

DEMONSTRATED SUCCESS

A review of similar projects that have succeeded in providing adequate offsets for native vegetation is provided below in Table C2. These studies provide evidence of demonstrated success (i.e., that the environmental values can be recreated) for ecological communities and Carnaby's Cockatoo habitat (Government of WA 2014).

PROPONENT EXPERIENCE

CBH propose to engage suitability qualified experts to assist with the management of the Offset Sites including baseline surveys, development of management plans, on-ground works such as weed control and revegetation, and on-going monitoring.

Table C2: Evidence of success in achieving conservation gains through offsets

Project and client	Location	MNES	Description of offset	Outcome
A Decade of Rehabilitation Offsets **Tranen Revegetation Systems (2022)**	Yellagonga National Park	Banksia TEC Carnaby's Cockatoo	Banksia woodland (and Carnaby's Cockatoo habitat) rehabilitation over two stages (stage 1 commenced 2014, stage 2 2022). **Targets:** 1.6 plants/m2 100% trees, 80% large shrubs, 60% understorey species established from list of 58 local species 10% weed cover.	0.7 plants/m2 (below target) High native cover (approx. >70%) 43 of 58 species established (on target) Weeds above target but suppressed by canopy Site ready to be handed over to DBCA
Revegetation on WBR0016 **Main Roads WA**	Shire of Chittering	N/A	Revegetation of the Great Northern Highway between SLK 53.0 and SLK 53.8. Spraying, ripping and planting all occurred in June 2013.	Successful revegetation of approximately 1.5 ha of road reserve. Not specifically aimed at MNES, but revegetation included species suitable for use by Carnaby's Cockatoo.
Wheatbelt Revegetation Bank Main Roads WA	Wheatbelt	Wheatbelt Woodland TEC Carnaby's Cockatoo	Involves widening and revegetating road reserves in the Wheatbelt Designed to provide offsets for lower quality roadside vegetation in the Wheatbelt	Project is ongoing but aims to achieve: Revegetation bank will provide a pool of environmental offsets available for use by future projects Projects that utilise the bank will pay into the bank to fund more revegetation for future projects Offset cost to projects will be predictable
Abercorn Rd, The Lakes **WaterCorp and Greening Australia**	Jarrah Forrest Subregion	Carnaby's Cockatoo	Previously pastoral land, started in 2010 with the objective of '…achieving self-sustaining foraging habitat for the endangered Black Cockatoo species	Established 30 species of endemic understory species, all identified as critical Cockatoo habitat species to land that was previously cleared pastoral land Reduced threats from invasive weed species and improve vegetation by direct seeding

				approximately 54 kilograms of seed and planting 119,258 seedlings.
Monjebup Reserve **Bush Heritage**	Fitz-Stirling landscape	Carnaby's Cockatoo	Revegetation of 400 ha of Carnaby's Cockatoo habitat Planting of 10,000 seedlings over two years on Monjebup Reserve. Seedlings, predominantly Banksia (including Dryandra species), Hakea and Grevillea	6000 seedlings successfully planted and regenerated. Foraging evidence noted on trees planted 4-5 years ago. A further 4000 seedlings to be planted this year.
Draft Alkimos City Centre Activity Centre & Central Alkimos **Lend Lease**	Swan Coastal Plain	Carnaby's Cockatoo	Retention of 67 ha of Carnaby's Black Cockatoo in Alkimos Parks and Recreation Reserve Conservation management measures for maintenance and revegetation of habitat including installation of 12 artificial nest boxes or nesting hollows 1,138 ha of Carnaby's Black Cockatoo habitat in Gingin acquired and transferred to DBCA and $50,000 provided to Kaarakin Black Cockatoo Conservation Centre	Offset requirements achieved.

Appendix D: Native Vegetation Calculator

Site 1: Broomehill

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Clear Data

Key:

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

Environmental value (Step 1)	Sig rem veg	Significant impact (Step 2 Part A)	1.09
		Rehabilitation credit (Step 2 Part B)	0.00
		Significant residual impact (Step 2 Part C)	0.65

Area (Offset Site)

OFFSETS CALCULATION
Area

Offsets calculation

Description	Proposed offset (area in hectares)	0.36	Duration of offset implementation (maximum 20 years)	20.00	Offset value (applied to Step 2 Part C)	0.05
	Current quality of offset site (scale)	7.00	Time until offset site secured (years)	1.00	What-If Analysis	7.6%
	Future quality WITHOUT offset (scale)	6.00	Risk of future loss WITHOUT offset (%)	15.0%		
	Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	5.0%	What-If Analysis Reinstate Formula	
	Time until ecological benefit (years)	1.00				
	Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

Appendix D: Native Vegetation Calculator (Cont.)

Site 2: Cranbrook

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Clear Data

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

Environmental value (Step 1)	Sig rem veg	Significant impact (Step 2 Part A)	1.09
		Rehabilitation credit (Step 2 Part B)	0.00
		Significant residual impact (Step 2 Part C)	0.65

***Area* (Offset Site)**

OFFSETS CALCULATION
Area

Offsets calculation

Description	Proposed offset (area in hectares)	1.32	Duration of offset implementation (maximum 20 years)	20.00	Offset value (applied to Step 2 Part C)	0.18
	Current quality of offset site (scale)	7.00	Time until offset site secured (years)	1.00	What-if Analysis	27.8%
	Future quality WITHOUT offset (scale)	6.00	Risk of future loss WITHOUT offset (%)	15.0%		
	Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	5.0%	What-if Analysis Reinstate Formula	
	Time until ecological benefit (years)	1.00				
	Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

Appendix E: Wheatbelt Woodland TEC Calculator

Site 1: Broomehill

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Clear Data

Key:

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

Environmental value (Step 1)	Wheatbelt woodlands TEC	Significant impact (Step 2 Part A)	0.89
		Rehabilitation credit (Step 2 Part B)	0.00
		Significant residual impact (Step 2 Part C)	0.62

Area (Offset Site)

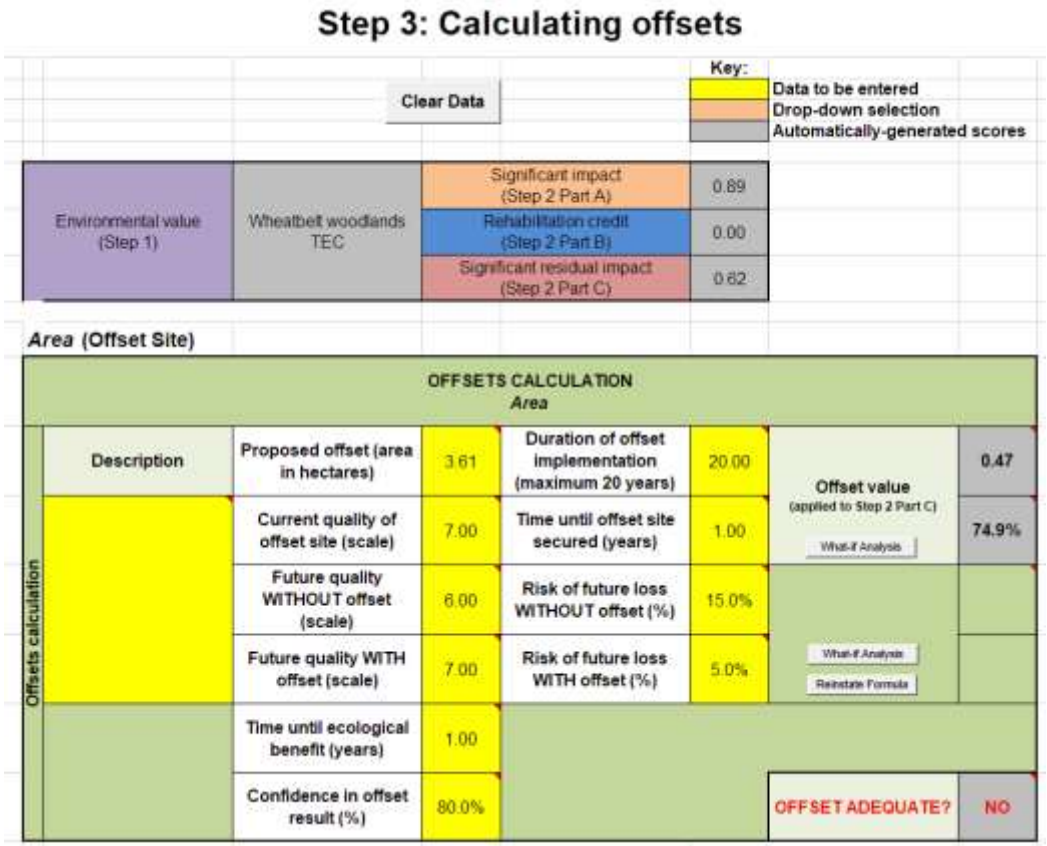
OFFSETS CALCULATION
Area

Offsets calculation

Description	Proposed offset (area in hectares)	0.36	Duration of offset implementation (maximum 20 years)	20.00	Offset value (applied to Step 2 Part C)	0.05
	Current quality of offset site (scale)	7.00	Time until offset site secured (years)	1.00	What-If Analysis	7.5%
	Future quality WITHOUT offset (scale)	6.00	Risk of future loss WITHOUT offset (%)	15.0%		
	Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	5.0%	What-If Analysis Reinstate Formula	
	Time until ecological benefit (years)	1.00				
	Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

Appendix E: Wheatbelt Woodland TEC Calculator (Cont.)

Site 2: Cranbrook



Step 3: Calculating offsets

Clear Data

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

Environmental value (Step 1)	Wheatbelt woodlands TEC	Significant impact (Step 2 Part A)	0.89
		Rehabilitation credit (Step 2 Part B)	0.00
		Significant residual impact (Step 2 Part C)	0.62

Area (Offset Site)

OFFSETS CALCULATION
Area

Offsets calculation

Description	Proposed offset (area in hectares)	3.61	Duration of offset implementation (maximum 20 years)	20.00	Offset value (applied to Step 2 Part C)	0.47
	Current quality of offset site (scale)	7.00	Time until offset site secured (years)	1.00	What-if Analysis	74.9%
	Future quality WITHOUT offset (scale)	6.00	Risk of future loss WITHOUT offset (%)	15.0%		
	Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	5.0%	What-if Analysis Reinstate Formula	
	Time until ecological benefit (years)	1.00				
	Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

Appendix F: Carnaby's Cockatoo Calculator

Site 1: Broomehill

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Clear Data

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

Environmental value (Step 1)	CBC foraging	Significant impact (Step 2 Part A)	0.90
		Rehabilitation credit (Step 2 Part B)	0.00
		Significant residual impact (Step 2 Part C)	0.63

Area (Offset Site)

OFFSETS CALCULATION *Area*

Offsets calculation

Description	Proposed offset (area in hectares)	0.36	Duration of offset implementation (maximum 20 years)	20.00	Offset value (applied to Step 2 Part C)	0.05
	Current quality of offset site (scale)	7.00	Time until offset site secured (years)	1.00	What-if Analysis	7.8%
	Future quality WITHOUT offset (scale)	6.00	Risk of future loss WITHOUT offset (%)	15.0%		
	Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	5.0%	What-if Analysis / Reinstate Formula	
	Time until ecological benefit (years)	1.00				
	Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO

Appendix F: Carnaby's Cockatoo Calculator (Cont)

Site 2: Cranbrook

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Clear Data

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

Environmental value (Step 1)	CBC foraging	Significant impact (Step 2 Part A)	0.90
		Rehabilitation credit (Step 2 Part B)	0.00
		Significant residual impact (Step 2 Part C)	0.63

Area (Offset Site)

OFFSETS CALCULATION
Area

Offsets calculation

Description	Proposed offset (area in hectares)	2.90	Duration of offset implementation (maximum 20 years)	20.00	Offset value (applied to Step 2 Part C)	0.40
	Current quality of offset site (scale)	7.00	Time until offset site secured (years)	1.00	What-if Analysis	62.8%
	Future quality WITHOUT offset (scale)	6.00	Risk of future loss WITHOUT offset (%)	15.0%		
	Future quality WITH offset (scale)	7.00	Risk of future loss WITH offset (%)	5.0%	What-if Analysis Reinstate Formula	
	Time until ecological benefit (years)	1.00				
	Confidence in offset result (%)	80.0%			OFFSET ADEQUATE?	NO