Part A – EPBC ACT APPROVAL (EPBC2019/8516)

Australian Government
Department of Agriculture, Water and the Environment

APPROVAL

Residential development, Collingwood Park, Ipswich, Queensland, (EPBC 2019/8516)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999 (Cth).* Note that section 134(1A) of the **EPBC Act** applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	Weiya Development Pty Ltd
ACN or ABN of approval holder	ABN 31 161 405 732
Action	To construct a new residential development at Lot 801 on SP157194, Lot 1 on RP22251 and Lot 2 on RP22251, Collingwood Park 186, 218 and Lot 2 Collingwood Drive, Collingwood Park, Ipswich, Queensland.

Approval decision

My decision on whether or not to approve the taking of the action for the purposes of the controlling provision for the action is as follows.

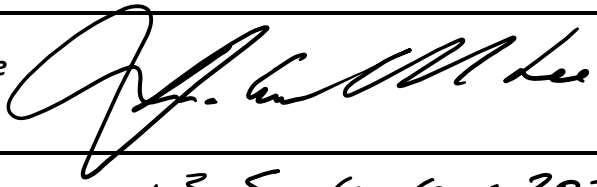
Controlling Provision

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve

Period for which the approval has effect

This approval has effect until 31 December 2051.

Decision-maker

Name and position	Andrew McNee Assistant Secretary Environmental Assessments Queensland and Sea Dumping Branch
Signature	
Date of decision	3 September 2021

Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

1. The approval holder:

   a) must not **clear** more than 24.89 hectares of **Koala habitat** and **Grey-headed Flying-fox foraging habitat** within the **development area**;

   b) must retain the 2.21 hectares **Koala habitat** and **Grey-headed Flying-fox foraging habitat** in **Goodna Creek riparian buffer**; and

   c) must not **clear** outside of the **development area**.

2. To minimise the risk of injury or death to **Koalas** and **Grey-headed Flying-fox** within the **development area** during **clearing** and **construction**, the approval holder must:

   a) ensure that a qualified **fauna spotter catcher** is present during all **clearing** and is given sufficient authority to guide all **clearance** to ensure that **Koalas** and **Grey-headed Flying-foxes** have safely moved out of the **development area** identified for **clearing**, of their own volition, before **Koala habitat** and **Grey-headed Flying-fox foraging habitat** is **cleared**; and

   b) install temporary **Koala exclusion fencing** around all **construction** works. Temporary **Koala exclusion fencing** must be installed immediately after any **clearing** and prior to the commencement of any **construction** so as to prevent any **Koala** entering during **construction**. Temporary **Koala exclusion fencing** must remain in place around any **construction** area until all **construction** activities within the fenced area are completed.

2. For the ongoing protection of the **Koala** population at the **development area**, the approval holder must install and maintain for the duration of the approval, **fauna movement solutions** on all roads that run adjacent to **Goodna Creek riparian buffer**, including **Koala awareness signage,** speed management measures and fauna friendly crossings. The approval holder must ensure a maximum speed limit of no greater than 40 km / hour is enforced during the **construction** phase in the **development area** at all times until a government entity assumes control of all roads in the **development area**.

3. To compensate for the **clearing** of 24.89 hectares of **Koala habitat** and **Grey-headed Flying-fox foraging habitat,** the approval holder must:

   a) **Legally secure** at least 34.7 ha of land at the **Scenic Ridge Offset Management Zone 1** area prior to the **commencement of the action**; and

   b) within 20 **business days** of **legally securing** the **Scenic Ridge Offset Management Zone 1** area, provide the **Department** with written evidence demonstrating that the **Scenic Ridge Offset Management Zone 1** area has been **legally secured** (e.g. **legal security documentation**), including **shapefiles** and the **offset attributes**.

4. The approval holder must, within one month of this approval decision, submit an Offset Management Plan for **Scenic Ridge Offset Management Zone 1** for approval by the **Minister**. The approval holder must not **commence works** within the **Phase 2 Area** until the Offset Management Plan for **Scenic Ridge Offset Management Zone 1** has been approved by the **Minister** in writing. The approval holder must implement the Offset Management Plan approved by the **Minister** for **Scenic Ridge Offset Management Zone 1**.

5. The Offset Management Plan for **Scenic Ridge Offset Management Zone 1** must be consistent with the **Department's Environmental Management Plan Guidelines**, and must include the following:

   a) A summary of the residual impacts to **Koala habitat** and **Grey-headed Flying-fox foraging habitat** that will be compensated for by the offset. This summary must include the area(s) of habitat for **protected matters** and its condition and quality at all impact sites which the particular offset is to address.

   b) Detailed survey methodologies for determining baselines on the proposed offset for feral animal abundance and extent of weed cover, modified habitat quality assessment for **Koala,** and a **Grey-headed Flying-fox** habitat assessment; and detailed methodologies for specifying baseline levels based on the survey data.

   c) The environmental objectives, relevant to **Koala** and **Grey-headed Flying-fox,** and a reference to the **EPBC Act** approval conditions and other applicable conditions of approval (including State approval conditions), if any, to which the Offset Management Plan refers.

   d) A table of commitments made in the Offset Management Plan to achieve the environmental objectives, and a reference to where the commitments are detailed in the Offset Management Plan.

   e) Reporting and review mechanisms, and documentation standards to demonstrate compliance with management and environmental commitments in the Offset Management Plan.

   f) An assessment of risks to achieving environmental objectives and risk management strategies that will be applied.

   g) Impact avoidance, mitigation and/or repair measures, and their timing.

   h) A monitoring program, which must include:

      i. measurable performance indicators to monitor attainment of the offset completion criteria;

      ii. trigger values for corrective actions; and

      iii. the timing and frequency of monitoring to detect trigger values and changes in the performance indicators.

   i) Proposed corrective actions, if trigger values are reached or performance indicators not attained.

Part B – Standard administrative conditions

Notification of date of commencement of the action

6. The approval holder must notify the **Department** in writing of the date of **commencement of the action** within 10 **business days** after the date of **commencement of the action**.

7. If the **commencement of the action** does not occur within 5 years from the date of this approval, then the approval holder must not **commence the action** without the prior written agreement of the **Minister**.

Compliance records

8. The approval holder must maintain accurate and complete **compliance records**.

9. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note: **Compliance records** may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department**'s website or through the general media.

Annual compliance reporting

10. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:

    a. publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;

    b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within 5 **business days** of the date of publication;

    c. keep all **compliance reports** publicly available on the **website** until this approval expires;

    d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website;** and

    e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within 5 **business days** of publication.

Note: **Compliance reports** may be published on the **Department**'s website.

Reporting non-compliance

11. The approval holder must notify the **Department** in writing of any **incident**, non-compliance with the conditions, or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than 2 **business days** after becoming aware of the **incident** or non-compliance. The notification must specify:

    f. any condition which is or may be in breach;

    g. a short description of the **incident** and/or non-compliance; and

    h. the location (including co-ordinates), date, and time of the incident and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.

12. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying:

    i. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;

    j. the potential impacts of the **incident** or non-compliance; and

    k. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

13. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted for the three-year period from the date of this approval and subsequently as requested in writing by the **Minister**.

14. For each **independent audit**, the approval holder must:
    a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;
    b. only commence the **independent audit** once the independent auditor and the audit criteria have been approved in writing by the **Department**; and
    c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.
15. The approval holder must publish the audit report on the **website** within 10 **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.

Submission and publication of plans

16. The approval holder must:
    a. submit **plans** electronically to the **Department**;
    b. unless otherwise agreed to in writing by the **Minister**, publish each **plan** on the **website** within 20 **business days** of the date that the **plan** was approved by the **Minister** in writing;
    c. exclude or redact **sensitive ecological data** from **plans** that are to be published on the **website** or provided to a member of the public; and
    d. keep **plans** published on the **website** until the end date of this approval.

Completion of the action

17. Within 30 **business days** after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

In these conditions, except where contrary intention is expressed, the following definitions are used:

Business day means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Clear, Cleared, Clearing, Clearance means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

Commence the action / Commencement of the action means the first instance of any specified activity associated with the action including **clearing** and **construction**. **Commencement of the action** does not include minor physical disturbance necessary to:

i. undertake pre-clearance surveys or monitoring programs
ii. install signage and /or temporary fencing to prevent unapproved use of the project area
iii. protect environmental and property assets from fire, weeds and pests, including installation of temporary fencing, and use of existing surface access tracks
iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters.**

Commence works means the first instance of any specified activity associated with the action including breaking ground, clearing and construction.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The Department's preferred spatial data format is **shapefile**.

Completion of the action means the date on which the **Minister** advises in writing (in response to a request from the approval holder) that the approval holder is not required to submit any further compliance reports.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**

ii. consistent with the **Department's** *Annual Compliance Report Guidelines* (2014)

iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period

iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work.

Department means the Australian Government agency responsible for administering the **EPBC Act**.

Development area means the area enclosed by the bold black line designated as the 'Proposed Action Area' on Attachment B, and as per the coordinates in Attachment E, comprising Lot 801 on SP157194, Lot 1 on RP22251, Lot 2 on RP22251 and 186, 218 and Lot 2 Collingwood Drive, Collingwood Park, Queensland.

EPBC Act means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

Environmental Management Plan Guidelines means *Environmental Management Guideline. Commonwealth of Australia 2014*.

Fauna movement solutions means, but is not limited to, **Koala awareness signage**, speed management measures and fauna friendly crossings, such as a poles, canopy bridges and culverts, undertaken as described in the Queensland Department of Transport and Main Roads (2010) Fauna Sensitive Road Design Guidelines Volume 2.

Fauna spotter catcher means a person licenced under the Queensland *Nature Conservation Act 1992* to detect, capture, care for, assess, and release wildlife disturbed by **clearance** activities who has at least three years experience undertaking this work with **Koalas**.

Goodna Creek riparian buffer means the area adjacent to Goodna Creek shaded green and designated 'Habitat retention area' on the map at Attachment A and bounded by a line joining the coordinates designated 'Habitat retention area' in Attachment E to this decision.

Grey-headed Flying-fox(es) means *Pteropus poliocephalus* - Grey-headed Flying-fox listed as threatened species under the **EPBC Act**.

Grey-headed Flying-fox foraging habitat means areas of vegetation that contain **Grey-headed Flying-fox** foraging trees such as Eucalyptus, Angophora and Corymbia species, including winter and spring flowering species.

Incident means any event which has the potential to do, or does, impact on one or more **protected matters** other than as authorised by this approval.

Independent audit means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines, Commonwealth of Australia 2019.*

Koala(s) means the Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) listed as a threatened species under the **EPBC Act**.

Koala awareness signage means prominent, legible, clearly understood signage for the purpose of alerting drivers that **Koalas** may be in the vicinity.

Koala exclusion fencing means fencing which prevents the movement of **Koalas**. Suitable examples of **Koala exclusion fencing** design are provided in *Koala-sensitive Koala-sensitive Design Guideline: A guide to koala sensitive designed measures for planning and development activities, version 2.0 (Queensland Department of Environment and Science, 2020)*.

Koala habitat means any forest or woodland containing species that are known Koala food trees, or shrubland with emergent food trees (as defined in the **Koala referral guidelines**). Koala food trees means a species of trees of the genus *Angophora*, *Corymbia*, *Eucalyptus*, *Lophostemon* or *Melaleuca*, with a height of more than 4 metres or with a trunk circumference more than 31.5 centimetres at 1.3 metres above the ground, the leaves of which are known to be consumed by the **Koala**.

Koala referral guidelines means the **Department**'s *EPBC Act referral guidelines for the vulnerable koala (combined population of Queensland, New South Wales and the Australian Capital Territory*), Department of the Environment, 2014.

Legally secure (d/ing) means to provide ongoing conservation protection on the title of the land, under an enduring protection mechanism, such as voluntary declaration under the *Vegetation Management Act 1999* (Qld) or another enduring protection mechanism agreed to in writing by the **Department**.

Legal security documentation means documentation associated with legally securing offset site(s), including (but not limited to) management plans.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Offset attributes means an 'xls' file capturing relevant attributes of the offset area, including:

a) **EPBC Act** reference number;

b) physical address;

c) coordinates of the boundary points in decimal degrees;

d) **protected matters** that the offset compensates for;

e) any additional **EPBC Act** listed threatened species and communities that are benefitting from the offset; and

f) size in hectares.

Phase 2 Area means the entire area shaded blue designated 'Phase 2 Area' in the map at Attachment D.

Plan(s) means any of the documents required to be prepared, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans and/or strategies).

Protected matter(s) means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect.

Scenic Ridge Offset Management Zone 1 is located on Lot 15 on W311675, on Geiger Road, Allandale, Queensland. Scenic Ridge Offset Management Zone 1 covers the area located within the red line designated as 'Offset management zone 1 (34.7 ha)' on the map at Attachment C.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0.*

Shapefile(s) means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes**.**

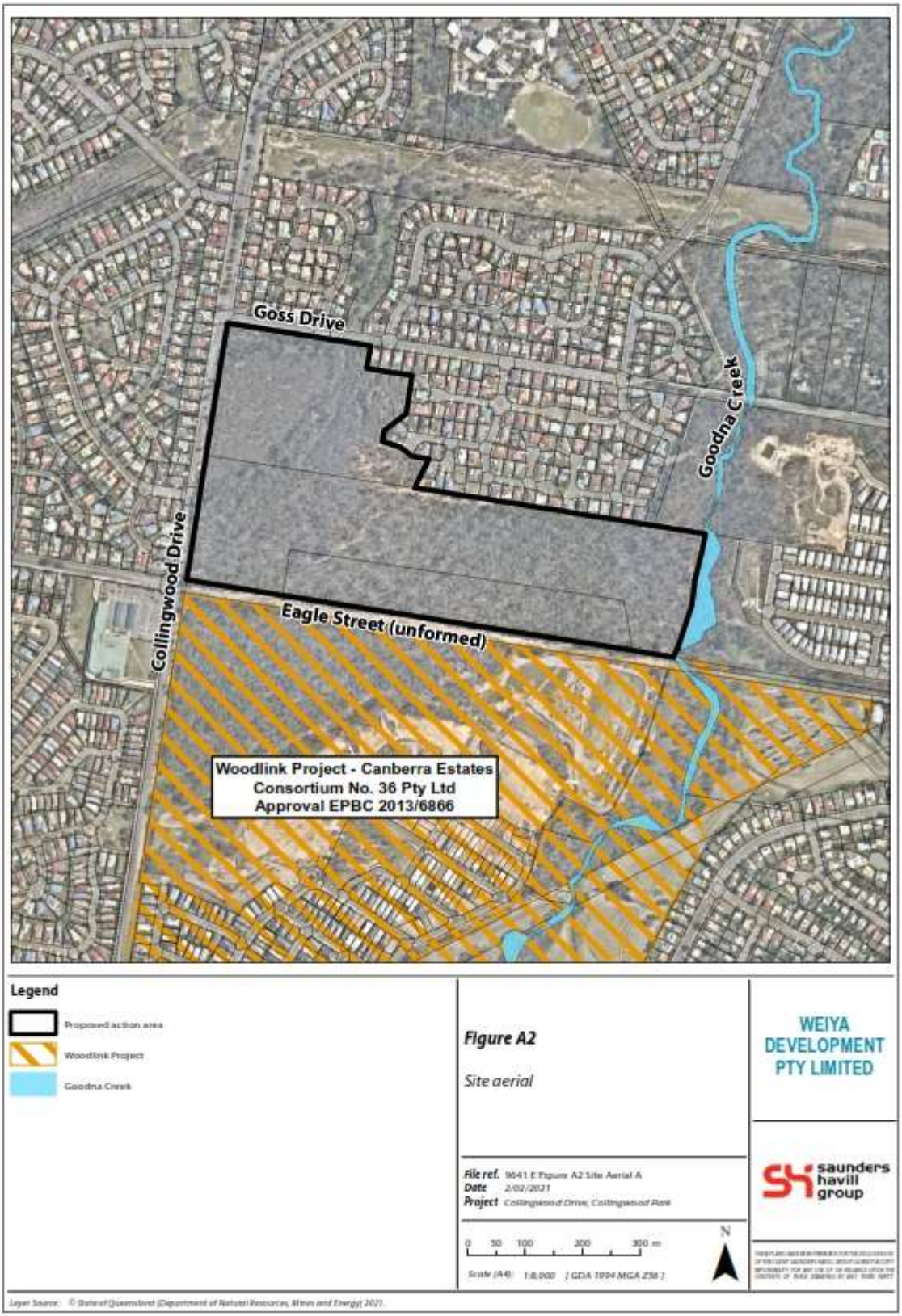
Suitably qualified person means a person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

ATTACHMENTS

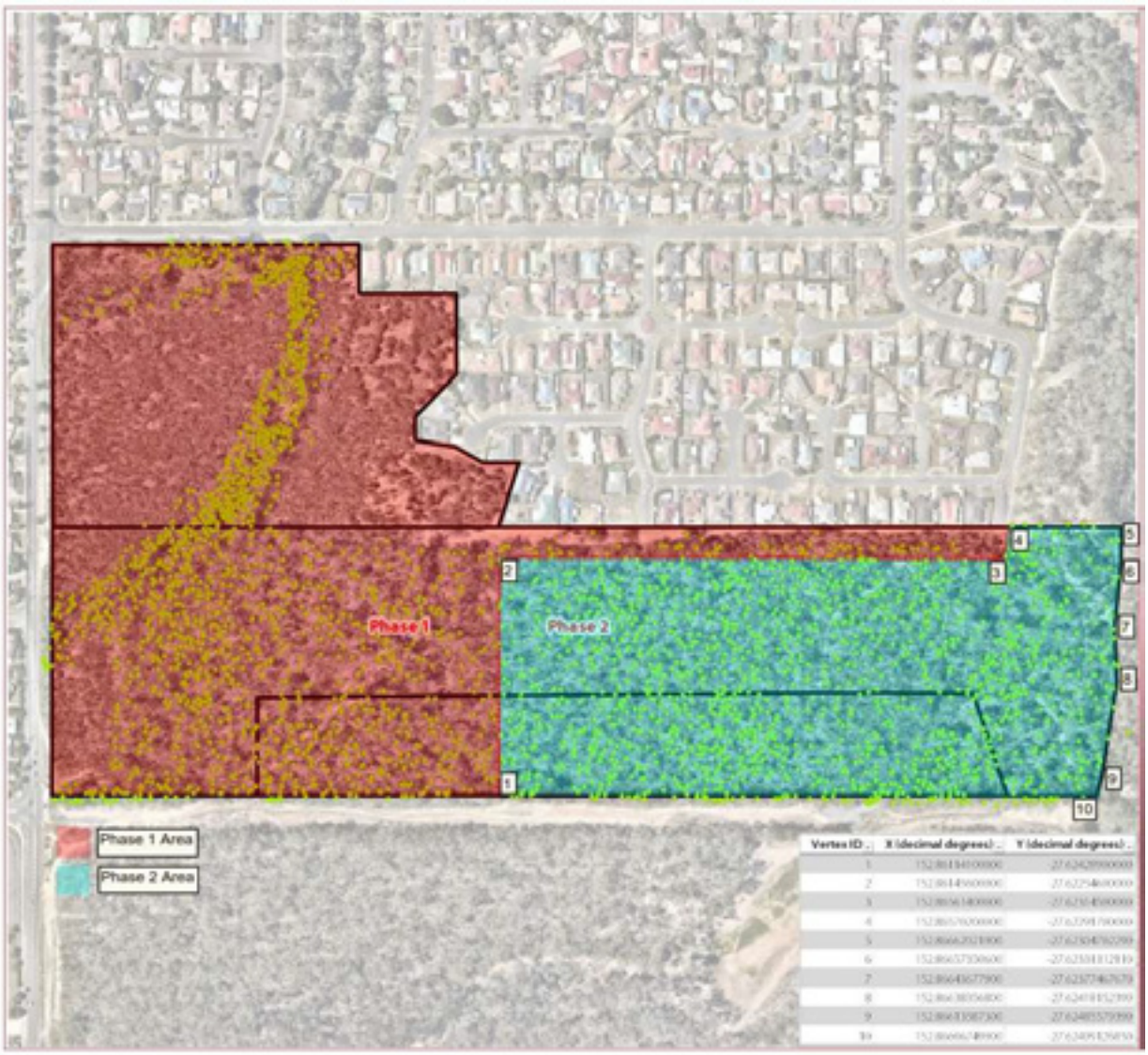
Attachment A: 2.21 hectares habitat retention area (green area)

Attachment B: Location of development area delineated by bold black line area. Collingwood Park development location is within Lot 801 on SP157194, Lot 1 on RP22251 and Lot 2 on RP22251.



Attachment C: Map of the Scenic Ridge Offset Management Zone 1

Attachment D: Phase 1 and Phase 2 Areas



Attachment E: Coordinates in decimal degrees for the development area and retention area adjacent to Goodna Creek at Collingwood Park.

Vertex ID	X Coordinate (decimal degrees)	Y Coordinate (decimal degrees)	Boundary
1	152.85865905200	-27.62054612520	Proposed action area
2	152.85883154300	-27.61981156660	Proposed action area
3	152.86070783300	-27.62007643390	Proposed action area
4	152.86064438500	-27.62043309200	Proposed action area
5	152.86144521200	-27.62054612520	Proposed action area
6	152.86133893600	-27.62114354230	Proposed action area
7	152.86094458400	-27.62140779310	Proposed action area
8	152.86091309900	-27.62158311940	Proposed action area
9	152.86123026900	-27.62167652000	Proposed action area
10	152.86144220700	-27.62182266290	Proposed action area
11	152.86174128100	-27.62186487830	Proposed action area
12	152.86148229300	-27.62231510190	Proposed action area
13	152.86578190200	-27.62292761410	Proposed action area & Habitat retention area
14	152.86662021900	-27.62304702290	Proposed action area & Habitat retention area
15	152.86661719100	-27.62306427770	Proposed action area & Habitat retention area
16	152.86659799100	-27.62317364990	Proposed action area & Habitat retention area
17	152.86657350600	-27.62331312110	Proposed action area & Habitat retention area
18	152.86643677900	-27.62377467670	Proposed action area & Habitat retention area
19	152.86638356800	-27.62418152390	Proposed action area & Habitat retention area
20	152.86613587300	-27.62485579390	Proposed action area & Habitat retention area
21	152.86608593300	-27.62495474370	Proposed action area & Habitat retention area
22	152.86606749900	-27.62499126850	Proposed action area
23	152.85745085000	-27.62376535730	Proposed action area
24	152.85780523800	-27.62179116190	Proposed action area
25	152.85818190900	-27.61971985490	Proposed action area
26	152.86600828600	-27.62321576530	Habitat retention area
27	152.86561040200	-27.62330707970	Habitat retention area
28	152.86561625900	-27.62329128680	Habitat retention area
29	152.86562430500	-27.62326956660	Habitat retention area
30	152.86562624100	-27.62326335910	Habitat retention area
31	152.86566233200	-27.62316625620	Habitat retention area
32	152.86575722100	-27.62296980970	Habitat retention area
33	152.86656138400	-27.62308998930	Habitat retention area
34	152.86648465000	-27.62310643800	Habitat retention area
35	152.86627612000	-27.62315429670	Habitat retention area
36	152.86600828600	-27.62321576530	Habitat retention area
37	152.86603747200	-27.62494294270	Habitat retention area
38	152.86600599100	-27.62493845880	Habitat retention area
39	152.86415147700	-27.62467430130	Habitat retention area
40	152.86418378400	-27.62449445210	Habitat retention area
41	152.86476010000	-27.62457648140	Habitat retention area
42	152.86481648000	-27.62458450590	Habitat retention area

43	152.86487434200	-27.62459274150	Habitat retention area
44	152.86497178000	-27.62454079940	Habitat retention area
45	152.86505914400	-27.62443575860	Habitat retention area
46	152.86516193600	-27.62430331270	Habitat retention area
47	152.86520899600	-27.62423275560	Habitat retention area
48	152.86524419100	-27.62417998780	Habitat retention area
49	152.86533669100	-27.62407038380	Habitat retention area
50	152.86543431600	-27.62396535560	Habitat retention area
51	152.86545100100	-27.62393818110	Habitat retention area
52	152.86545158100	-27.62393496120	Habitat retention area
53	152.86545217200	-27.62393165350	Habitat retention area
54	152.86545315800	-27.62392617470	Habitat retention area
55	152.86545432400	-27.62391968650	Habitat retention area
56	152.86545962200	-27.62389019440	Habitat retention area
57	152.86545996300	-27.62388829530	Habitat retention area
58	152.86546171700	-27.62387853480	Habitat retention area
59	152.86546537000	-27.62385819330	Habitat retention area
60	152.86546843400	-27.62384113530	Habitat retention area
61	152.86547170300	-27.62382294960	Habitat retention area
62	152.86547247500	-27.62381865630	Habitat retention area
63	152.86547336000	-27.62381373550	Habitat retention area
64	152.86547421600	-27.62380898390	Habitat retention area
65	152.86547518700	-27.62380356450	Habitat retention area
66	152.86547703000	-27.62379331470	Habitat retention area
67	152.86547720500	-27.62379233960	Habitat retention area
68	152.86549627900	-27.62368614290	Habitat retention area
69	152.86549657700	-27.62368448020	Habitat retention area
70	152.86549711200	-27.62368151410	Habitat retention area
71	152.86550349400	-27.62364598000	Habitat retention area
72	152.86551068400	-27.62360594110	Habitat retention area
73	152.86551089200	-27.62360478250	Habitat retention area
74	152.86551890600	-27.62356017160	Habitat retention area
75	152.86551988100	-27.62355473960	Habitat retention area
76	152.86552043400	-27.62355165770	Habitat retention area
77	152.86552066100	-27.62355036860	Habitat retention area
78	152.86552127200	-27.62354816840	Habitat retention area
79	152.86552283800	-27.62354510030	Habitat retention area
80	152.86552465200	-27.62354017320	Habitat retention area
81	152.86552546600	-27.62353796560	Habitat retention area
82	152.86588283200	-27.62343586180	Habitat retention area
83	152.86587629900	-27.62333931020	Habitat retention area
84	152.86602146900	-27.62330598760	Habitat retention area
85	152.86609240900	-27.62328970390	Habitat retention area
86	152.86641904600	-27.62321472620	Habitat retention area
87	152.86652724300	-27.62318988980	Habitat retention area
88	152.86654454400	-27.62318591860	Habitat retention area

PART B – APPROVED OFFSET MANAGEMENT PLAN

Australian Government
Department of Agriculture, Water and the Environment

2019/8516

Mr Wei Wang
Managing Director
Weiya Development Pty Ltd
Suite 208 2-8 Brookhollow Avenue
BAULKHAM HILLS NSW 2153

Dear Mr Wang

EPBC 2019/8516: Residential development, Collingwood Park, Ipswich, Queensland – Approval of Offset Management Plan

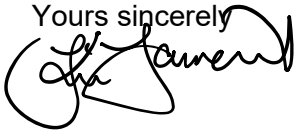
On 7 October 2021, Saunders Havill Group wrote to the Department of the Agriculture, Water and the Environment on your behalf seeking approval of the Scenic Ridge Offset Management Plan in accordance with conditions 5 and 6 of the above project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Officers of the Department have advised me of the Offset Management Plan and the requirements of the conditions of the approval for this project. On this basis, and as a delegate of the Minister for the Environment, I have decided to approve the *Scenic Ridge Offset Management Plan version 5 dated 15 March 2022*. This plan must now be implemented.

As you are aware, the Department has an active monitoring program which includes monitoring inspections, desk top document reviews and audits. Please ensure that you maintain accurate records of all activities associated with, or relevant to, the conditions of approval so that they can be made available to the Department on request.

Should you require any further information please contact Brooke Connors at postapproval@awe.gov.au.

Yours sincerely



Kim Farrant
Assistant Secretary
Environment Assessments (Vic, Tas) and Post Approvals Branch
Environment Approvals Division

25 March 2022

Scenic Ridge Offset Management Plan

WEIYA DEVELOPMENT PTY LTD

EPBC 2019/8516

HABITAT EXCHANGE SOLUTIONS

Document Control

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1. Introduction

Weiya Development Pty Ltd has engaged Habitat Exchange Solutions Pty Ltd to coordinate and deliver a Koala habitat and Grey-headed Flying Fox (GHFF) foraging habitat environmental offset to compensate for significant impacts on Matters of National Environmental Significance (MNES) as part of the Collingwood Drive, Collingwood Park residential development and associated infrastructure. As per Item 5 of the further information letter for Preliminary Documentation submission, an environmental offset is to be prepared in accordance with the Department of Agriculture, Water and the Environment (DAWE) EPBC Act – Environmental Offset Policy (October 2012).

Habitat Exchange Solutions Pty Ltd will deliver the overall 'conservation gain' for the Koala and Grey-headed Flying-fox as part of a single site offset solution located on Scenic Ridge (refer to **Figure 3**). Scenic Ridge is located on Geiger Road, Allandale. The property is within the Scenic Rim Regional Council and is approximately 7 km west of the Boonah township.

This Offset Management Plan (OMP) dated 08 December 2021 outlines the existing site values and proposed management actions to be undertaken at the Scenic Ridge offset management zone 1 (OMZ1). The OMP does not include a detailed analysis on the value or assessment of the actions, risks or threats at the offset land relative to the EPBC Offset Assessment Guide. A summary of the EPBC Offset Assessment Guide is provided within **Section 3.5** of this OMP. All detailed technical information which was provided in the Collingwood Park Project Preliminary Documentation prepared by Saunders Havill Group (2021) is included in **Appendix A**. This OMP focuses on the direct management actions which will provide a conservation gain for the Koala and Grey-headed Flying-fox and which align with the principles and structure outlined in the DAWE's Environmental Management Plan Guidelines (2014).

The vegetation surrounding the offset property is known to support Koalas, while the offset property retained a number of key existing threats and supports areas with all necessary essential habitat features for the reinstatement and creation of new high functioning koala habitat. Additionally, the dominant tree species within the pre-clear regional ecosystem which are proposed for revegetation on the offset land are recognised as food species for the Grey-headed Flying-fox.

Scenic Ridge is presently utilised as cattle grazing land. HES has entered into commercial terms to legally secure, improve and long-term manage 34.7 ha of land at Scenic Ridge for the sole purpose of delivering the environmental offset outcomes documented in this OMP to achieve a conservation gain for the Koala and Grey-headed Flying-fox.

1.1 Purpose of Offset Management Plan

The Scenic Ridge offset management zone 1 (OMZ1) has been selected and designed to compensate for 100% of the Collingwood Park Project's significant impact on Koala and 100% of the impact on

Grey-headed Flying-fox foraging habitat. The offset proposal is a direct land-based solution which consists entirely of establishment of new habitat.

The Purpose of this Offset Management Plan (OMP) is to:

- Provide details and timing on the legally binding mechanism to secure the OMZ1 values at the Offset property;
- Provide baseline values for a range of key habitat quality indicators in the offset OMZ1 for repetitive use in measuring and monitoring habitat improvement commitments;
- Outline the specific management actions and tasks to be undertaken in OMZ1 for managing threats, pests and improving Koala and Grey-headed Flying-fox habitat values;
- Outline restrictions and operational controls on existing agricultural and grazing land uses;
- Establish robust and scientifically driven metrics, monitoring and reporting procedures to ensure the offset delivery achieves the predicted conservation gain for the species;
- Assign responsibilities for tasks, actions, operational controls, measuring, reporting, corrective actions and funding for all works at the offset land;
- Identify, account for and manage risks associated with all or part of the offset outcomes not succeeding (Adaptive Management).

Further, **Table 1**, demonstrates how this OMP has complied with the EPBC2019/8516 conditions of approval:

Table 1: EPBC2019/8516 conditions of approval and compliance information

Approval Condition (EPBC2019/8516)	Location of Compliance
5. The approval holder must, within one month of this approval decision, submit an Offset Management Plan for Scenic Ridge Offset Management Zone 1 for approval by the Minister. The approval holder must not commence works within the Phase 2 Area until the Offset Management Plan for Scenic Ridge Offset Management Zone 1 has been approved by the Minister in writing. The approval holder must implement the Offset Management Plan approved by the Minister for Scenic Ridge Offset Management Zone 1.	Offset Management Plan submitted on 6 October 2021. Works have not commenced within the Phase 2 Area.
6. The Offset Management Plan for Scenic Ridge Offset Management Zone 1 must be consistent with the Department's Environmental Management Plan Guidelines	This OMP has been developed in accordance with the Department's Environmental Management Plan Guidelines.

6a. A summary of the residual impacts to Koala habitat and Grey-headed Flying-fox foraging habitat that will be compensated for by the offset. This summary must include the area(s) of habitat for protected matters and its condition and quality at all impact sites which the particular offset is to address.	Section 2 of this OMP provides a summary of the residual impacts to Koala habitat and GHFF foraging habitat. Detailed results in included in Appendix A. Additionally, the working MHQA and GHFF FHA spreadsheets have been provided to DAWE.
6b. Detailed survey methodologies for determining baselines on the proposed offset for feral animal abundance and extent of weed cover, modified habitat quality assessment for Koala, and a Grey-headed Flying-fox habitat assessment; and detailed methodologies for specifying baseline levels based on the survey data.	MHQA and GHFF FHA survey methodologies are provided in Section 1.7. Management specific survey methodologies are included in Section 5.0. The raw data has been provided to DAWE Post Approvals.
6c. The environmental objectives, relevant to Koala and Grey headed Flying-fox, and a reference to the EPBC Act approval conditions and other applicable conditions of approval (including State approval conditions), if any, to which the Offset Management Plan refers.	Reference to the Draft Koala Recovery Plan and the Grey-headed Flying-fox Recovery Plan is provided in Section 3.4.
6d. A table of commitments made in the Offset Management Plan to achieve the environmental objectives, and a reference to where the commitments are detailed in the Offset Management Plan.	A summary table of commitments is provided in Table 19, while a detailed breakdown of the offset management plan commitments is provided in Table 20 and Table 21.
6e. Reporting and review mechanisms, and documentation standards to demonstrate compliance with management and environmental commitments in the Offset Management Plan.	Section 5.0 provides the management action monitoring and reporting responsibilities, while Section 6 provides details on the corrective actions to be implemented should the offset not be meeting the interim and completion criteria stipulated in Table 20 and Table 21.
6f. An assessment of risks to achieving environmental objectives and risk management strategies that will be applied.	A detailed risk assessment is provided in Section 7 of the Offset Management Plan.
6g. Impact avoidance, mitigation and/or repair measures, and their timing.	Details of the impact site development footprint, staging and avoidance and mitigation measures is outlined in Section 2 of the Offset Management Plan.
6h. A monitoring program (which must include)	Details of the management action monitoring regimes is included in Section 5 of the Offset Management Plan.

	Additionally, an annual Offset Area Annual Report is to be prepared which documents the progress of the offset area, with major milestone reporting to be undertaken at Year 5, Year 10, Year 15 and Year 20.
6h (i). measurable performance indicators to monitor attainment of the offset completion criteria	The major milestone reporting to be undertaken at Year 5, Year 10, Year 15 and Year 20 is to assess the offset area on the measurable performance indicators outlined in Table 20 and Table 21 and if the offset is trending towards achieving the completion criteria.
6h (ii). trigger values for corrective actions	Section 6 of the Offset Management Plan provides details on the corrective actions and when these corrective actions are triggered.
6h (iii). the timing and frequency of monitoring to detect trigger values and changes in the performance indicators.	Details of the management action monitoring regimes is included in Section 5 of the Offset Management Plan. Additionally, an annual Offset Area Annual Report is to be prepared which documents the progress of the offset area, with major milestone reporting to be undertaken at Year 5, Year 10, Year 15 and Year 20.
6h (iv). Proposed corrective actions, if trigger values are reached or performance indicators not attained	Section 6 of the Offset Management Plan provides details on the corrective actions and when these corrective actions are triggered.

1.2 Offset Management Plan Limitations

This document is an Offset Management Plan (OMP). The OMP aligns with relevant principles and sections of the Environmental Management Plan Guideline (2014), however is designed for on-ground implementation and not specific value assessment against the EPBC Offset Assessment Guide. The assessment of values for Risk of Loss and Quality are included and justified within the technical information provided in **Appendix A** (Saunders Havill, 2021). A summary of the EPBC Offset Assessment Guide is provided within **Section 3.5** of this OMP. Quality value changes in this assessment are derived from specific actions listed in this OMP and thus where applicable assessment metrics have been listed in the measurement targets of Management Action Tables included in Section 5.0.

1.3 Responsible Entities for this Offset Management Plan

Excluding the regulatory role completed by the Commonwealth Government for the assessment and approval of the offset and the Queensland Government for registering and declaring the Voluntary Declaration the following entities retain key responsibilities for implementation of this OMP:

1. Weiya Development (Project Proponent)

Weiya Development Pty Ltd are the owner and operational developer of the Collingwood Park Project. Responsibilities include:

- Obtain and comply with all conditions of the EPBC approval for the project.
- Enter into a commercial agreement with Habitat Exchange Solutions for the delivering of EPBC compliant offsets.
- Fund all management actions / tasks as listed in the approved OMP at the offset land.
- Report on the EPBC approval in Annual Compliance Reports or as triggered within conditions.

2. Habitat Exchange Solutions Pty Ltd (Offset Provider)

Habitat Exchange Solutions Pty Ltd (HES) is a purpose-built environmental offset company. Responsibilities include:

- All on-ground implementation of the OMP.
- Monitoring and reporting on OMP actions, tasks and outcomes.
- Appointment of relevant experts or experienced contractors to undertaken specified tasks within the OMZ1.
- Corrective actions for any non-compliance activities.
- Stakeholder relationships – Adjoining grazing operations and Scenic Rim Regional Council.
- Review, Amendment and Adaptive Management changes of the approved OMP over the life of the offset.

3. Saunders Havill Group (Environmental Consultant)

Saunders Havill Group provide the tertiary trained and experienced field ecologists in support of approval and ongoing compliance for the offset land and Offset Management Zone(s). Responsibilities include:

- Collection, interrogation and analysis of robust scientifically justified survey data for use as the baseline values at the offset property.
- Repeating surveys as per the currency in this Offset Management Plan or as per conditions of approval for measuring improvement outcomes.
- Preparation and lodgment of the Legally Binding Mechanism (VDEC) with the Queensland Government.
- Audit offset reports against approval conditions as part of the Collingwood Park Project Annual Compliance Reports

1.4 Structure of this Offset Management Plan

There are seven (7) sections of this OMP:

- Section 1 – Introduction, background and overall offset design principles;
- Section 2 – Impact site summary;
- Section 3 – Offset property summary and general suitability of the offset land;
- Section 4 – OMZ1 design;
- Section 5 – Offset land management actions and key OMZ1 timings;
- Section 6 – Risk management and identification of threatening processes; and
- Section 7 – Adaptive management and OMP reporting requirements.

Refer to **Figure 1** for an overview of the OMP structure.

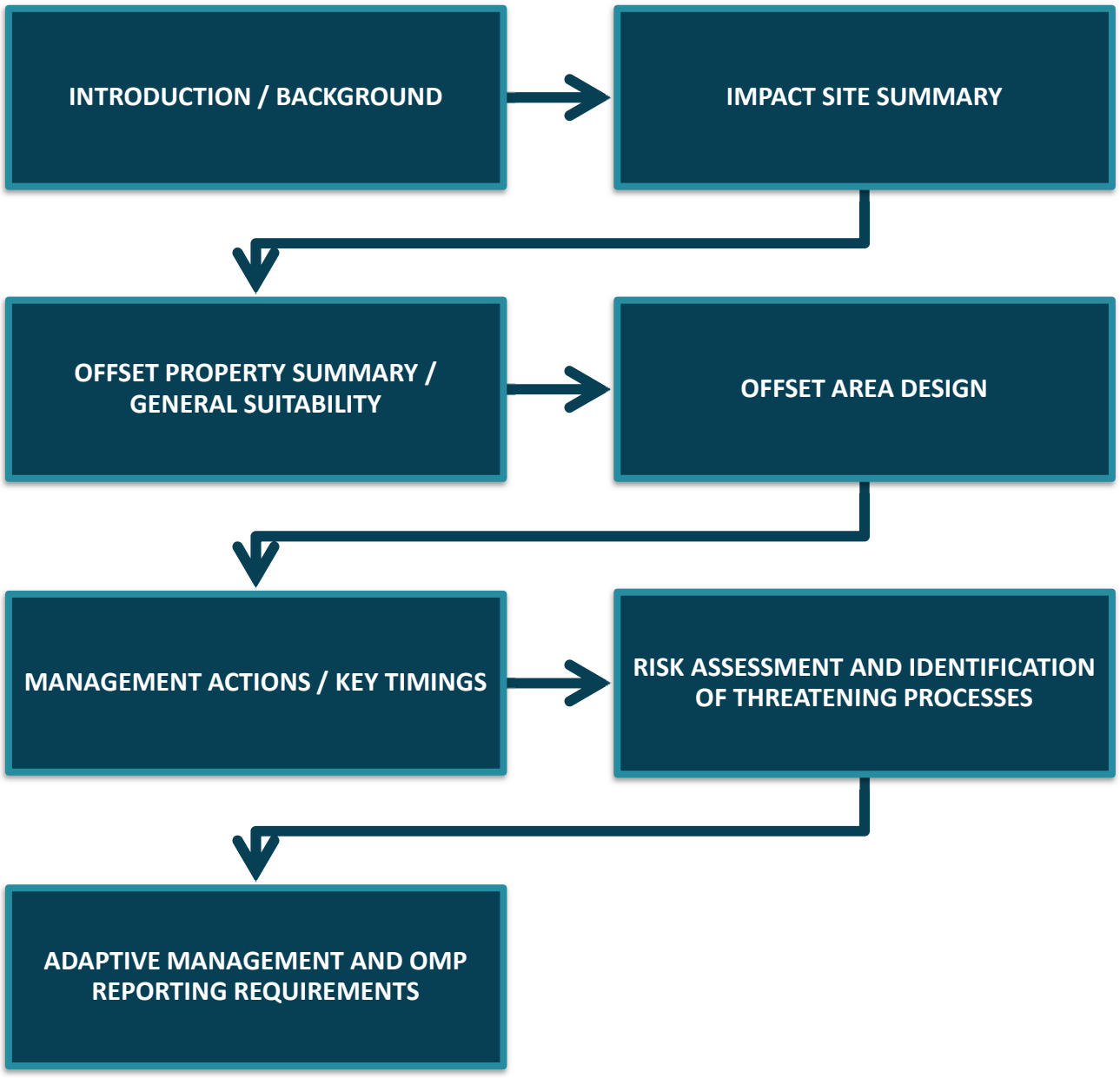


Figure 1: **OMP Structure**

1.5 Offset Management Plan Declaration of Accuracy

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

Signed _____

Full name (please print) _____

Organisation (please print) _Habitat Exchange Solutions_____

Date _____/_____/_____

491 Providing false or misleading information to authorised officer etc.

(1) A person is guilty of an offence if the person:

(a) provides information or a document to another person (the ***recipient***); and

(b) knows the recipient is:

(i) an authorised officer; or

(ii) the Minister; or

(iii) an employee or officer in the Department; or

(iv) a commissioner;

performing a duty or carrying out a function under this Act or the regulations; and

(c) knows the information or document is false or misleading in a material particular.

(2) The offence is punishable on conviction by imprisonment for a term not more than 1 year, a fine not more than 60 penalty units, or both.

Note: Subsection 4B(3) of the *Crimes Act 1914* lets a court fine a body corporate up to 5 times the maximum amount the court could fine a person under this subsection

1.6 Legal Security of Offset Management Zone 1

Legal certainty on the offset land and actions is provided through the direct purchase of the land by Habitat Exchange Solutions Pty Ltd (Offset Provider). A legal contract has been executed between the Offset Provider and the Proponent (Weiya Development Pty Ltd), which outlines the obligations of each party in relation to funding, land acquisition, implementation of the approved Offset Management Plan, warranties and insurances.

The Scenic Ridge offset management zone 1 (OMZ1) and its values (as finalised through the EPBC Act Approval) will be legally secured through a Voluntary Declaration (V-DEC) declared under the Queensland Government's *Vegetation Management Act 1999* (VMA). A V-DEC protects land and values and is binding on future owners. The Queensland Government describes the benefits of the VDEC as "*One of the strengths of a declaration is that it provides greater protection to areas of land containing environmentally valuable native vegetation*".

The declaration and management plan will be noted on the land title, which informs prospective buyers of current declarations and management plans and where copies are available. This information is important to the property market as future owners will be bound by the plan and declaration (Queensland Government, 2017).

The legally securing of the land will be made through declaring the areas as having High Nature Conservation Values. Based on the VMA criteria the OMZ1 will be declared as achieving items (d) and (f) below:

To be considered for declaration as an area of high nature conservation value, the area must be one or more of the following:

a) *a wildlife refugium—an area where a species or a group of species has retreated due to a threatening process (e.g. climatic change);*
b) *a centre of endemism—an area containing concentrations of species that are largely restricted to the area;*
c) *an area containing a vegetation clump or corridor that contributes to the maintenance of biodiversity;*
d) *an area that makes a significant contribution to the conservation of biodiversity;*
e) *an area that contributes to the conservation value of a wetland, lake or spring; or*
f) *another area that contributes to the conservation of the environment.*

The V-DEC will be lodged and legally secured by evidence of encumbrance on Registered Land Title prior to the commencement of any clearing works on the Impact Site (Collingwood Park Project). As noted this protects the vegetation by way of purpose-built regulation on the title so all future land owners are aware of the restrictions prior to purchase.

1.7 Survey Methodology

Modified Habitat Quality Assessment Tool

The offset property has been assessed using a modified version of the Queensland State Governments *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017. The purpose of this guideline is to provide a methodology for proponents to determine the habitat quality of a site under the Queensland Environmental Offsets framework. The guideline is a step-by-step methodology explaining how to measure habitat quality for land-based offsets. This methodology has been adopted and tailored/modified to assess the impacts and offsets relating to Matters of National Environmental Significance (MNES).

The traditional terrestrial habitat quality assessment assesses three (3) core indicators—site condition, site context and species habitat index.

The modified habitat quality assessment (MHQA) combines the three (3) core indicators into two (2) (site condition and site context) with each Site Condition being weighted 40% of the final score and Site Context being weighted 30% of the final score. The balance of the weighting (30 %) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate has been added to the MHQA to better incorporate MNES, and for the purpose of this preliminary documentation, the vulnerable-listed Koala MNES. The following section details the methodology utilised to assess the site condition, site context and species stocking rate under the MHQA.

Site Condition (40 %)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset property is suitable to establish a desired capacity to support the prescribed environmental matters being offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community, and is benchmarked against the expected range for a relatively undisturbed community.

The site condition assessment under the MHQA is assessed using fifteen (15) condition characteristics being:

- recruitment of woody perennial species in EDL;
- native plant species richness – trees;
- native plant species richness – shrubs;
- native plant species richness – grasses;
- native plant species richness – forbs;
- tree canopy height;
- Sub-canopy cover;
- tree canopy cover;
- native grass cover;
- organic litter;

- large trees;
- coarse woody debris;
- non-native plant cover;
- quality and availability of food and foraging habitat; and
- quality and availability of shelters.

Assessment methodology of the above condition characteristics do not differ from the traditional habitat quality assessment. In developing the MHQA to better incorporate MNES, two (2) species habitat index characteristics, being, quality and availability of food and foraging habitat and quality and availability of shelters have been added to the site condition indicator.

Site Context (30 %)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors. Under the MHQA, site context is measured using the following seven (7) characteristics:

- size of patch;
- connectedness;
- context;
- ecological corridors;
- role of site location to species overall population in the state;
- threats to the species; and
- species mobility capacity.

Unlike the traditional habitat quality assessment methodology where site connectedness is assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Koala habitat. Whilst remnant eucalypt forest vegetation is critical habitat for Koala, equally Koalas can utilise areas of non-remnant vegetation or high value regrowth vegetation that does not yet achieve remnant status. Therefore, site context under the MHQA accounts for surrounding Koala habitat rather than remnant vegetation.

In developing the MHQA, three (3) species habitat index characteristics were nominated—role of site location to overall species population in the state, threats to the species and species mobility capacity.

Species Stocking Rate (30 %)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. Given the discreet nature of the Koala and limited to no published literature on habitat carrying capacity of the species, the species stocking rate scoring methodology has been derived through the collation of site specific surveys and surrounding contextual habitat analysis. **Table 2** outlines the attributes utilised to assess species stocking rate.

Table 2: Species Stocking Rate Scoring

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	/10
Species usage of the site (habitat type and evidenced usage)	/15
Approximate density (per ha)	/30
Key source population for breeding	/10
Key source population for dispersal	/5
Necessary for maintaining genetic diversity	/15
Near the limit of the species range	/15
Total Species Stocking Rate Score	/70
Species Stocking Rate Score – out of 3	

Grey-headed Flying-fox Foraging Habitat Assessment Tool

The offset propertys have been assessed using a GHFF Foraging Habitat Assessment (GHFF FHA) tool developed by the Saunders Havill Group (2019) which adopts characteristics of the Queensland State Governments *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017, while also integrating published scientific literature on GHFF foraging habitat.

The traditional terrestrial habitat quality assessment assesses three (3) core indicators—site condition, site context and species habitat index.

The GHFF FHA tool combines the aspects of the three (3) core indicators and published scientific literature into two (2) (site condition and site context) with site condition being weighted with 40 % and site context weighted at 30 % of the final score. The balance of the weighting (30 %) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate assessment incorporated in the GHFF FHA tool is focussed on 'foraging habitat' for GHFF rather than GHFF stocking rates (presence/absence of the species). This assessment of 'foraging habitat' for species stocking rate has been incorporated in the GHFF FHA tool as Grey-headed Flying-fox roosting camp or species presence was not observed on-site, however, suitable foraging habitat for the species was evident. Therefore, the density of foraging habitat available on-site is considered an appropriate assessment benchmark for species stocking rate.

The following section details the methodology utilised to assess the site condition, site context and species stocking rate under the GHFF FHA.

Site Condition (40 %)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset property is suitable to establish a desired capacity to support the prescribed

environmental matters being offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community, and is benchmarked against the expected range for a relatively undisturbed community.

The site condition assessment under the GHFF FHA is assessed using six (6) condition characteristics being:

- Vegetation condition;
- Species richness (canopy trees);
- Flower scores (average);
- Timing of biological shortages;
- Quality of foraging habitat (trees >0.65 wt p*r); and
- Non-native plant cover.

Assessment methodology of the above condition characteristics is outlined below:

- Vegetation condition – This condition characteristic is assessed using the Queensland *Vegetation Management Act 1999* vegetation community status definition, being Category B (remnant), Category C (high-value regrowth) and Category X (non-remnant). This characteristic is scored from a desktop mapping perspective and verified on-ground during assessment.
- Species richness (canopy trees) – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. Within the plot, all canopy tree and subcanopy tree specimens are recorded. It should be noted that non-GHFF foraging species are also documented.
- Flower scores (average) – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining the flower score of the recorded canopy species. The individual score for each flowering GHFF foraging tree is then divided by the number of species recorded (GHFF foraging and non-GHFF foraging trees) to produce an average. The benchmark values for this condition characteristic have been derived from the findings published by Eby and Law (2008) (*Ranking the feeding habitat of Grey-headed flying foxes for conservation management*).
- Timing of biological shortages – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining the ability of the canopy species in the vegetation community to produce foraging habitat during biological shortages (food shortages, pregnancy and birthing, lactation, mating and conception, migration paths and fruit industries). It should be noted that this condition characteristic is weighted and 'food shortages' has been weighted heavier than the balance of the characteristics which are equal, as 'food shortages' is recognised as a major issue.
- Quality of foraging habitat – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for*

conservation management (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining which canopy species recorded contain a flower score greater than 0.65 wt p*r and is recognised as a significant food plant by Eby and Law (2008). It should be noted that species recorded that are not prescribed a value by Eby and Law (2008) but are recognised as GHFF foraging trees, have been given an average weighted value of related species or, in the case of *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given it's importance as a winter flowering species as acknowledged in the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017).

- Non-native plant cover – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. All non-native plant cover was assessed by estimating the cover of exotic species over the 100 m X 20 m plot.

It should be noted that for on-ground assessment purposes, the 100 m X 20 m plot utilised for the GHFF FHA overlaps with the on-ground condition characteristics of the koala MHQA.

Site Context (30 %)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors. Under the GHFF FHA, site context is measured using the following six (6) characteristics:

- Size of patch;
- Connectedness (active GHFF roost camps in a 20 km radius);
- Context (percentage of GHFF foraging habitat in a 20 km radius);
- Ecological corridors;
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius); and
- Threats to the species.

Assessment methodology of the above context characteristics is outlined below:

- Size of patch – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the directly connected patch of GHFF foraging habitat to site measured. This context characteristic is measured using GIS. The benchmark values for this context characteristic are those used in the traditional habitat quality assessment.
- Connectedness – This context characteristic is assessed by analysing the number of active GHFF roost camps (over the past year of monitoring (11/17 – 11/18)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government).
- Context – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the percentage of GHFF foraging habitat within a twenty (20) kilometre buffer of the site measured. This context characteristic is measured using GIS.

- Ecological corridors – This context characteristic is assessed using the traditional habitat quality assessment methodology which involves determining the proximity of the site to state, bioregional, regional or sub-regional corridors.
- Threats to species – This context characteristic is assessed by analysing the published scientific literature regarding threats to GHFF and determining the number and severity of the threatening processes observed at or adjacent to the site.
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius) – This context characteristic is assessed by analysing the number of active GHFF roost camps level 3 or greater (over the past year of monitoring (11/17 – 11/18)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government).

Species Stocking Rate (30 %)

The GHFF FHA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. As discussed above, species stocking rate for GHFF associated with this proposed action is related to the density of GHFF foraging habitat at the site at the time of undertaking the survey.

Baseline GHFF foraging tree surveys were undertaken by utilising the stem count methodology provided in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland (version 5.0)* (Neldner et al. 2019).

This methodology involves assigning the strata for canopy (T1) and subcanopy (T2) and then counting the number of individual tree specimens within the 100 m X 20 m plot. A tree that branches into two or more stems above 30 cm above the ground is counted as one individual. This data was then analysed and GHFF foraging tree density per hectare was extrapolated and determined.

The species stocking rate scoring was determined by analysing the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan 2019) and the stem density per hectare associated with the technical description of the regional ecosystem.

Table 3: GHFF FHA Vegetation Condition Scoring

Score	Description
5	Category X / non-remnant
10	Category C / regrowth
20	Category B / remnant

Table 4: GHFF FHA Species Richness Scoring

Score	Description
0	0 GHFF foraging species
5	1 – 3 GHFF foraging species
10	4 – 6 GHFF foraging species

20	> 6 GHFF foraging species

Table 5: GHFF FHA Flower Score (average) Scoring

Score	Description
2	0.01 – 0.25
5	0.26 – 0.50
8	0.51 – 0.75
10	0.76 – 1.00

Table 6: GHFF FHA Timing of Biological Shortages Scoring

Score	Description
2.5	Food shortages
1.5	Pregnancy and birthing
1.5	Lactation
1.5	Mating and conception
1.5	Migration paths
1.5	Fruit industries
Total (/10)	Combine total of above

Table 7: GHFF FHA Quality of Foraging Habitat (trees >0.65 wt p*r) Scoring

Score	Description
0	0 significant GHFF foraging tree species
5	1 – 3 significant GHFF foraging tree species
10	4 – 6 significant GHFF foraging tree species
20	> 6 significant GHFF foraging tree species

Table 8: GHFF FHA Non-Native Plant Cover Scoring

Score	Description
1	> 50 % non-native plant cover
5	25 – 50 % non-native plant cover
10	5 – 25 % non-native plant cover
20	< 5 % non-native plant cover

Table 9: GHFF FHA Size of Patch Scoring

Score	Description
0	< 5 hectares
2	5 – 25 hectares
5	26 – 100 hectares
7	101 – 200 hectares
10	> 200 hectares

Table 10: GHFF FHA Connectedness Scoring

Score	Description
0	< 1 active Grey-headed Flying-fox camp within a 20 km radius
3	1 – 3 active Grey-headed Flying-fox camp within a 20 km radius
6	4 – 6 active Grey-headed Flying-fox camp within a 20 km radius
10	> 6 active Grey-headed Flying-fox camp within a 20 km radius

Table 11: GHFF FHA Context Scoring

Score	Description
0	< 10 % Grey-headed Flying-fox foraging habitat within a 20 km radius
3	10 – 30 % Grey-headed Flying-fox foraging habitat within a 20 km radius
6	31 – 75 % Grey-headed Flying-fox foraging habitat within a 20 km radius
10	> 75 % Grey-headed Flying-fox foraging habitat within a 20 km radius

Table 12: GHFF FHA Ecological Corridors Scoring

Score	Description
0	Not within an ecological corridor
6	Sharing a common boundary with an ecological corridor
10	Within an ecological corridor

Table 13: GHFF FHA Threats to Species Scoring

Score	Description
1	High level threat to the species
5	Moderate level threat to the species
10	Low level threat to the species

Table 14: GHFF FHA Role of Site Location to Species Overall Population in the State Scoring

Score	Description
1	1 – 2 active level 3 Grey-headed Flying-fox camp within a 20 km radius
6	2 – 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius
10	> 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius

2. Impact Site

The impact site is located at Collingwood Drive, Collingwood Park, Queensland, and is located approximately 10 km east of the Ipswich Town Centre. The project area is bound by Collingwood Drive to the west, Goodna Creek to the east and residential development to the north. The unformed Eagle Street and future Woodlinks residential development exists to the south of the project area (EPBC Act reference 2013/6866). The land comprises of the following cadastral allotments (refer to **Figure 2**):

- Lot 801 on SP157194
- Lot 1 on RP22251; and
- Lot 2 on RP22251.

The land tenure is freehold and is located within the Ipswich City Council local government area, where it retains a low-density residential land use zoning.

2.1 Proposed Action

The proposed action (residential development and associated infrastructure) covers approximately 24.68 ha of the 27.161 ha site. The proposed residential development will provide 323 residential allotments, open space and retained lineal creek corridor (Goodna Creek). Refer to Figure 2 for the Ipswich City Council (ICC) approved plan of development.

2.2 Matters of National Environmental Significance Impact Summary

The assessment of the construction and operational impacts associated with the proposed development indicates that 24.68 ha of the site will be either directly cleared or indirectly 'functionally lost'. Residual impacts will be created from the direct loss and functional loss of 24.68 ha of critical Koala habitat and Grey-headed Flying-fox foraging habitat.

Results of the Modified Habitat Quality Assessment (MHQA) tool indicate that the critical Koala habitat on the impact site contains a score of 4 (out of 10), while the results of the Grey-headed Flying-fox Foraging Habitat Assessment (GHFF FHA) tool indicates that the GHFF foraging habitat contains a score of 4 (out of 10). Refer to **Appendix B** for further detailed results.

In summary, the Weiya Development Pty Ltd Collingwood Park development will see the direct removal or fragmentation ('functional loss') of approximately 24.68 ha of critical habitat for the Koala and foraging habitat for the GHFF. The residual impacts on the Koala as a result of the development will be the loss and functional loss of 24.68 ha of critical habitat with a MHQA score of 4 and the residual impact on the GHFF as a result of the development will be the loss and functional loss of 24.68 ha of foraging habitat with a GHFF FHA score of 4. Therefore, the quantum impact on critical Koala habitat and GHFF foraging habitat is **9.87 ha**. Refer to **Table 1** for a detailed summary of the Impact Site.

Table 15: Impact Site Summary

Attribute	Details
EPBC Reference	2019/8516
Local Government Area	Ipswich City Council
Lot / Plan	Lot 801 / SP157194 Lot 1 / RP22251 Lot 2 / RP22251
Land Size (hectares)	27.161 ha
Proposal Description	The proposed action (residential development and associated infrastructure) covers approximately 24.68 ha of the 27.161 ha site. The proposed residential development will provide 323 residential allotments, open space and retained lineal creek corridor (Goodna Creek).
Impact Summary	Direct removal or fragmentation ('functional loss') of approximately 24.68 ha of critical habitat for the Koala and foraging habitat for the GHFF. The residual impacts on the Koala as a result of the development will be the loss and functional loss of 24.68 ha of critical habitat with a MHQA score of 4 and the residual impact on the GHFF as a result of the development will be the loss and functional loss of 24.68 ha of foraging habitat with a GHFF FHA score of 4. Therefore, the quantum impact on critical Koala habitat and GHFF foraging habitat is **9.87 ha**. Refer to **Appendix A** for detailed results.
Mean Temperature Range (°C)	13.1°C – 26.9°C
Mean Annual Rainfall (mm)	726.9 mm
2020 Rainfall (to December 2020) (mm)	591.7 mm
Topography	The eastern portion of the referral area generally has an average slope of 5% from west to east, the steepest areas of the site (in the west) have slopes in excess of 10%. Elevation across the site ranges from 20 m above sea level (ASL) in association with Goodna Creek to 60 m ASL in the south-western site extent.
Land Zone	Land Zone 3 – alluvium (river and creek flats) Land Zone 9 – undulating country on fine grained sedimentary rocks Land Zone 10 – sandstone ranges on coarse grained sedimentary rocks
VMA Vegetation Classification	Category X (non-remnant) Category B (remnant)
Pre-clear Regional Ecosystem Koala Suitability (DES 2020)	RE12.3.3 – High Ranking RE12.9-10.17 – High Ranking RE12.9-10.19a – Medium Ranking

Dominant Tree Species	*Corymbia citriodora* (Spotted Gum), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia henryi* (Large-leaved Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark).
Baseline MHQA Results	Weighted Average Koala Habitat Score of 4
Baseline GHFF FHA Results	Weighted Average GHFF Foraging Habitat Score of 4
Distance to Offset property	45 km

2.3 Proposed Development Staging

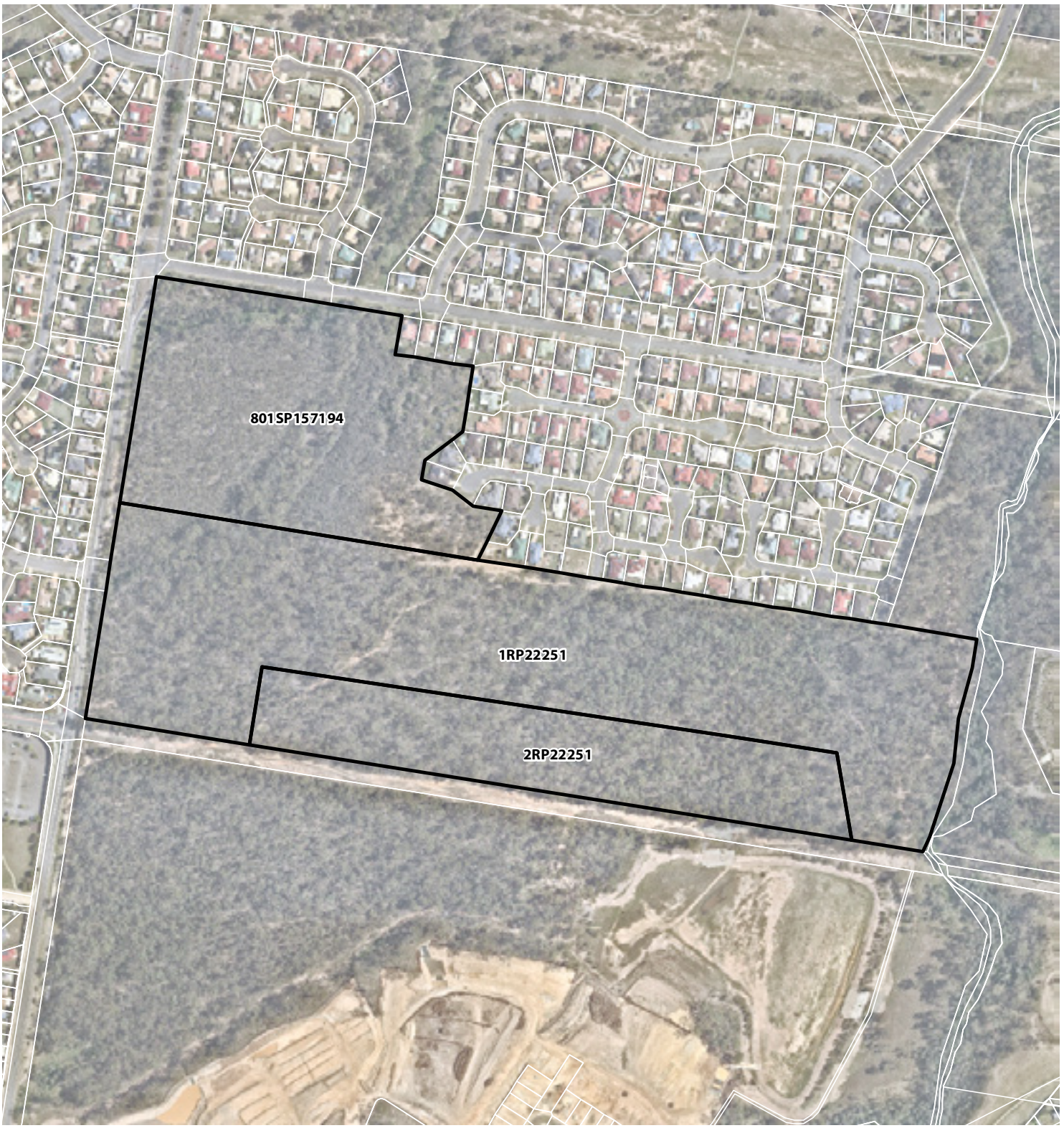
To reduce the time lag between the loss of MNES habitat at the impact site and the recreation of compensatory habitat at the offset property, the proposed action has been phased. The proposed action phasing has been approved in two distinct phases as shown in **Insert 1**. As per Condition 2 of approval, the approval holder must not commence works within the Phase 2 Area until the OMP has been approved by the Minister.

2.4 Proposed Development Avoidance and Mitigation Measures

A number of avoidance and mitigation measures are proposed to reduce identified impacts on the Koala, GHFF and Greater Glider, and their habitat. These include:

- Retention of the Goodna Creek corridor
- Rehabilitation and restoration of the Goodna Creek corridor
- Fauna friendly road designs and crossing
- Fauna sensitive streetscaping and landscaping
- Site based management plans

Figure 2 Impact Site Allotments



HABITAT EXCHANGE SOLUTIONS

Legend

Impact Site Alloments

Qld DCDB

N

0 50 100 200 Metres

11/05/2021 *1:5,500*

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

Version - B

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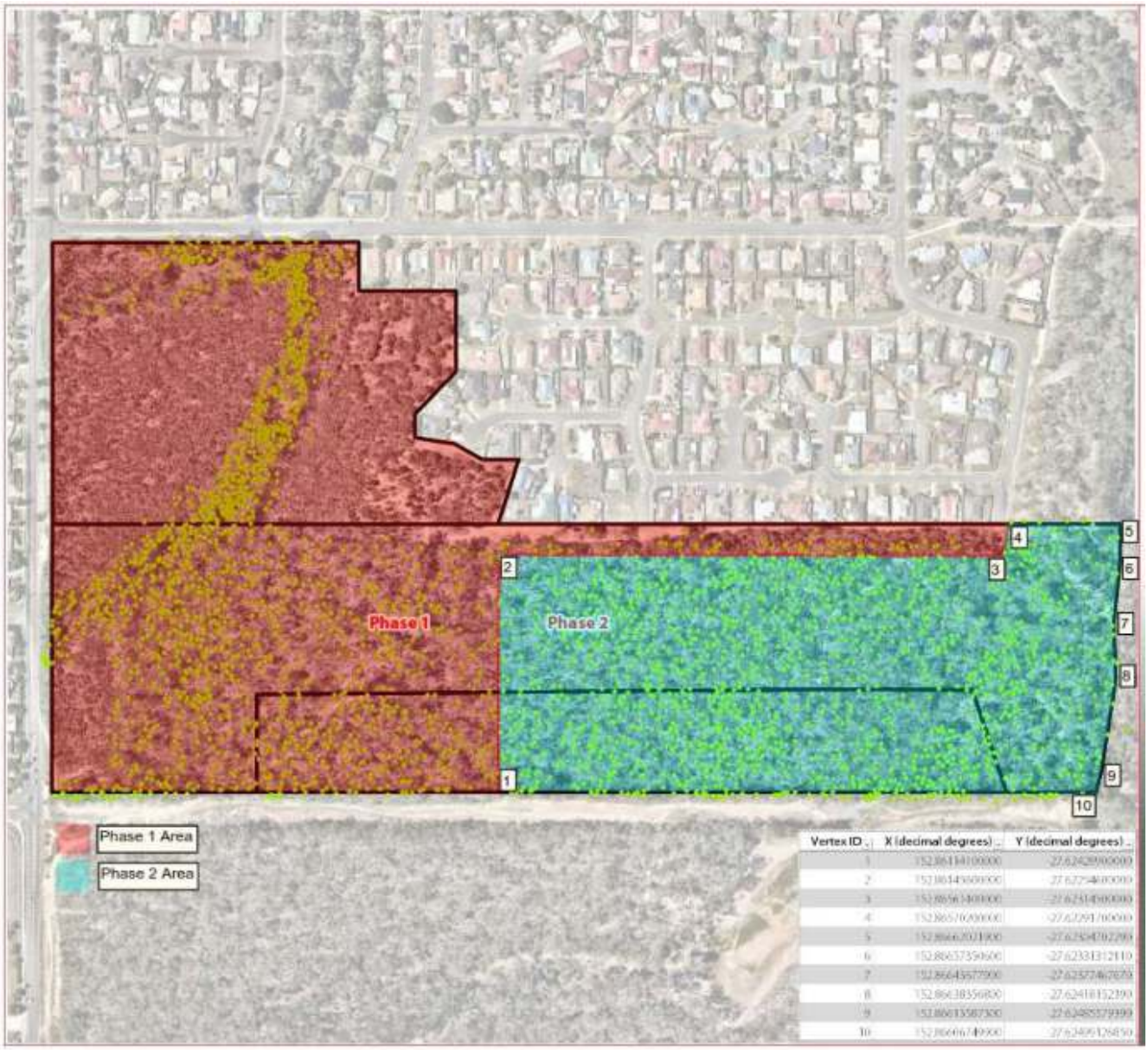

Insert 1: Approved clearing phases derived from the EPBC approval

3. Offset Property

Scenic Ridge is located on Geiger Road, Allandale. The property is within the Scenic Rim Regional Council and is approximately 7 km west of the Boonah township. The Scenic Ridge property is entirely contained on Lot 15 on W311675 (refer to **Figure 3**).

The land tenure of Scenic Ridge is freehold, where it retains a rural land use zoning under the Scenic Rim Planning Scheme 2020. The offset property can be accessed via Geiger Road to the north which is a rural road off Allandale Road. From boundary to boundary, the offset property is located approximately 45 km south of the impact site.

The land has historically been utilised as cattle grazing enterprise at varying intensities throughout the decades. As shown in the 1955 historical aerial imagery (refer to **Insert 2**), the site had been extensively cleared and maintained. To date, the site has retained the extensively cleared values, with limited regrowth allowed to establish before being cleared and managed by the landholder to improve grazing pastures.

Insert 2: **1955 historical aerial imagery of the proposed offset property.**

For the purpose of clarity in interpreting this OMP, the offset property is defined as the 'black line' shown in **Figure 3** and the Scenic Ridge offset management zone 1 (OMZ1) is the area within the 'red line' shown on **Figure 3**.

Figure 3 Offset Site Allotments

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Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1

N

0 50 100 200 300 400 Metres

11/05/2021 *1:11,500*

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

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3.1 Offset Property Values

The offset land at Scenic Ridge comprises of open grazing, non-remnant vegetation. The non-remnant vegetation consists of cleared grazing land, with isolated clusters of native sapling regrowth. Direct and indirect evidence of wild dogs was recorded throughout the offset property.

A certified Property Map of Assessable Vegetation (PMAV) is in place across the property which retains the Category X classification across the majority of the land. Where land has this classification, the *Vegetation Management Act 1999* does not have the regulatory capacity to protect the vegetation.

Where scattered juvenile regrowth canopy trees were observed, the species consist of *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia citriodora* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum). Given the sparse, juvenile nature of the scattered canopy species, the vegetation does not meet the Queensland Government's definition of 'remnant' or 'high-value regrowth'. Where observed, the species within this vegetation community are representative of 'least concern' RE12.9-10.2. Further, cross-reference with the pre-clear regional ecosystem mapping indicates that the dominant regional ecosystem across the non-remnant vegetation area is 'least concern' RE12.9-10.2.

Photo Plate 1: Current vegetation values across Scenic Ridge (offset property).

Table 16: Offset property Summary

Attribute	Details
EPBC Reference	2019/8516
Local Government Area	Scenic Rim
Lot / Plan	Lot 15 / W311675
Land Size (hectares)	239.97 ha
Proposed OMZ1 (hectares)	34.7 ha
Mean Temperature Range (°C)	13.1°C – 27.1°C
Mean Annual Rainfall (mm)	759.3 mm
2020 Rainfall (to December 2020) (mm)	644 mm
Topography	Undulating country ranging lower slopes in the north-west and east and rising to a ridge in the centre of the site which runs north-south.
Land Zone	Land Zone 9 – undulating country on fine grained sedimentary rocks Land Zone 10 – sandstone ranges on coarse grained sedimentary rocks
VMA Vegetation Classification	Category X (non-remnant)
Pre-clear Regional Ecosystem Koala Suitability (DES 2020)	RE12.9-10.2 – Medium Ranking
Dominant Tree Species	*Corymbia citriodora* (Spotted Gum), *Eucalyptus siderophloia* (Grey Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum)
Baseline MHQA Results	OMZ1 – Koala Habitat Score of 2
Baseline GHFF FHA Results	OMZ1 – GHFF Foraging Habitat Score of 3
Distance to Impact Site	45 km

3.2 Koala Offset Values / Suitability

The Offset property is located within South East Queensland and in the same Bioregional Zone as the impact site. Both areas share near identical mean temperatures, rain fall and slope parameters. By comparison, the offset property is connected to substantially more suitable koala habitat which supports a viable koala population. Evidence of koala was observed adjacent to the offset property, with direct observations historically recorded surrounding the site. Where scattered juvenile regrowth koala feed trees were observed, the species consist of *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia citriodora* (Spotted Gum), *Lophostemon confertus* (Brush Box) and *Eucalyptus tereticornis* (Forest Red Gum).

It is considered that koala usage of the offset property is anticipated at Year 10 following the successful establishment of the rehabilitation plantings and sufficient time to allow the trees to be established as non-juvenile koala habitat trees (NJKHTs).

This assumption of koala usage is considered conservative when compared to two case studies included in the Koala habitat revegetation guidelines: A practical guide to identify, connect and revegetate koala habitat in New South Wales (Wenger and Taws, 2019).

As per Case Study 1 (included in **Appendix C**), the Tweed Shire Council planted 23.25 ha of new koala habitat in 2010, with an eight-year monitoring program undertaken to understand the changes in koala distribution, activity and occupancy in the Tweed Council area. The study found that over the eight-year period (from 2010 to 2018), two-thirds of monitored koala habitat planting sites were used by koalas, with many sites used within 2.5 years of planting.

Further, Case Study 4 (included in **Appendix C**), intended to understand whether koalas would use young eucalyptus plantations on the Liverpool Plains. The results found that koala presence or absence was strongly linked to the amount of remnant vegetation within 5 km of the sites, with sites surrounded by large areas of remnant vegetation more likely to be utilised by the koalas. Additionally, koalas were documented utilising trees as young as 2 years old for foraging, and trees 4-7 years old for foraging and shelter. This study found that young eucalypt plantations of preferred koala tree species can provide valuable koala habitat, provided they are located close to large areas of remnant forest and woodland.

In summary, as demonstrated by Wenger and Taws (2019), koalas are known to utilise koala restoration plots, with usage of eucalyptus plantations as early as two years old. Therefore, given the OMZ1 is adjoining a large tract of remnant vegetation and koala usage is not assumed until Year 10 of the offset program, it is likely that koala usage will be recorded at this time, and constant annual offset reporting will document this usage if observed prior to Year 10.

More broadly, the Scenic Ridge property adjoins the *South East Queensland Regional Plan – Regional Biodiversity Corridor and the State-wide Regional Terrestrial Corridor #34* (Mount Barney to Karawatha Terrestrial Corridor). The State-wide Regional Terrestrial Corridor #34 extends from Mount Barney National Park to Flinders Peak to Karawatha (via. Knapp Creek, Flinders Peak and Mount Perry Conservation Parks) (DEHP 2016). The State-wide Regional Terrestrial Corridor #34 is significant as it links a major east-west State terrestrial corridor to four (4) regional terrestrial corridors in the north, intersects with riparian corridors, incorporates altitudinal and climatic gradients, connects large fragmented patches of lowland remnant vegetation to remnant at higher elevations at the southern end point of the corridor, links protected area estates and falls partially within the Great Eastern Ranges corridor. Further, the Scenic Ridge property is identified as a 'future linkage' under the Scenic Rim Biodiversity Strategy 2015-2025 which provides a critical connection between the Wyaralong – Kooralbyn Core Habitat area the Mt Barney Core Habitat area. Restoration of this property will release the realisation of this critical linkage and establish the strategic outcome of the property.

Refer to the following plans showing Contextual and Site Koala Values:

- **Plan 1:** Location of Bioregional Corridor Extent
- **Plan 2:** Scenic Rim Biodiversity Strategy 2015-2025 Corridor Mapping
- **Plan 3:** Suitable Habitat and Revegetation Locations for Koalas
- **Plan 4:** Local and Site Collected Records for the Koala

PLAN 1 - Biodiversity Corridors

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FILE NAME: 9641 E 01 Location of Bioregional Corridor Extent B

Version - B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 50 100 200 300 400 Metres

11/05/2021 *1:9,500*

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1
- SEQ Regional Plan - Biodiversity Corridors

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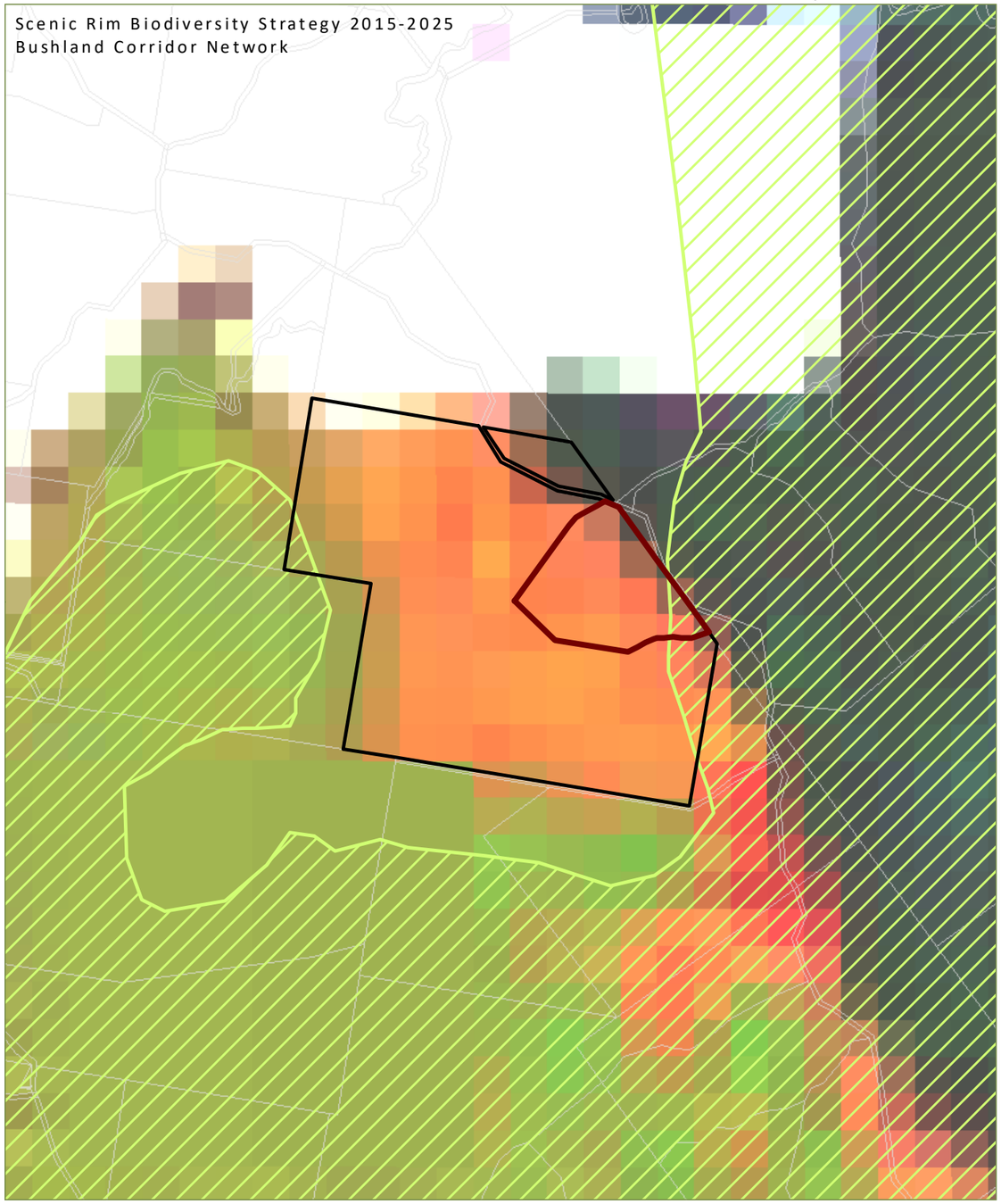
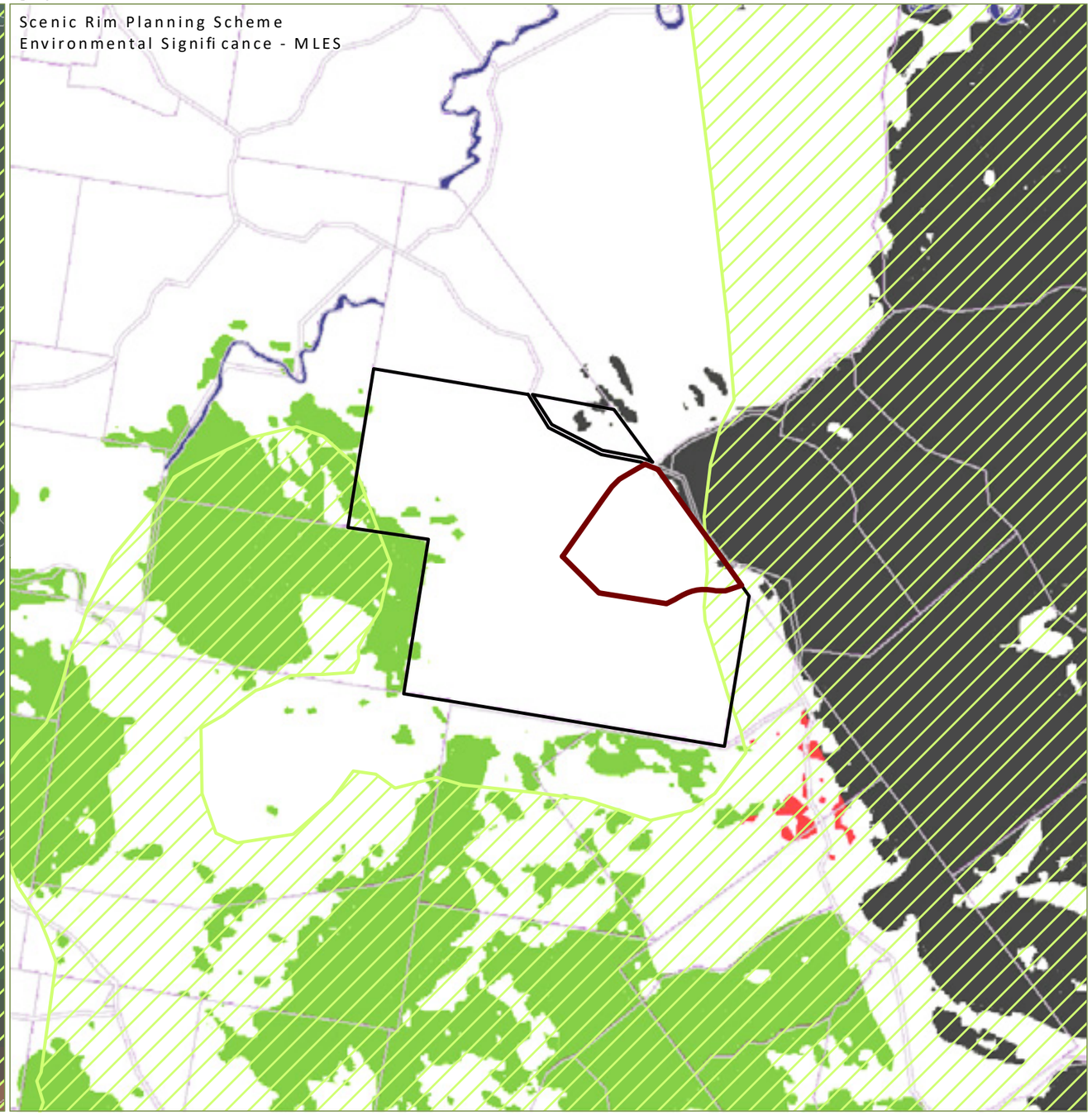
PLAN 2 - Scenic Rim Biodiversity Strategy 2015-2025





FILE NAME: 9641 E 02 Scenic Rim Biodiversity Strategy Corridor B
Version B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

0 100 200 400 600 800 Metres

11/05/2021 *1:25,000*

N

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1
- SEQ Regional Plan - Biodiversity Corridors

Bushland Corridor Network

- Future Linkage
- Node
- Core

Matters of Local Environmental Signifcance

- Critical Linkage
- Node Corridor
- Core Corridor

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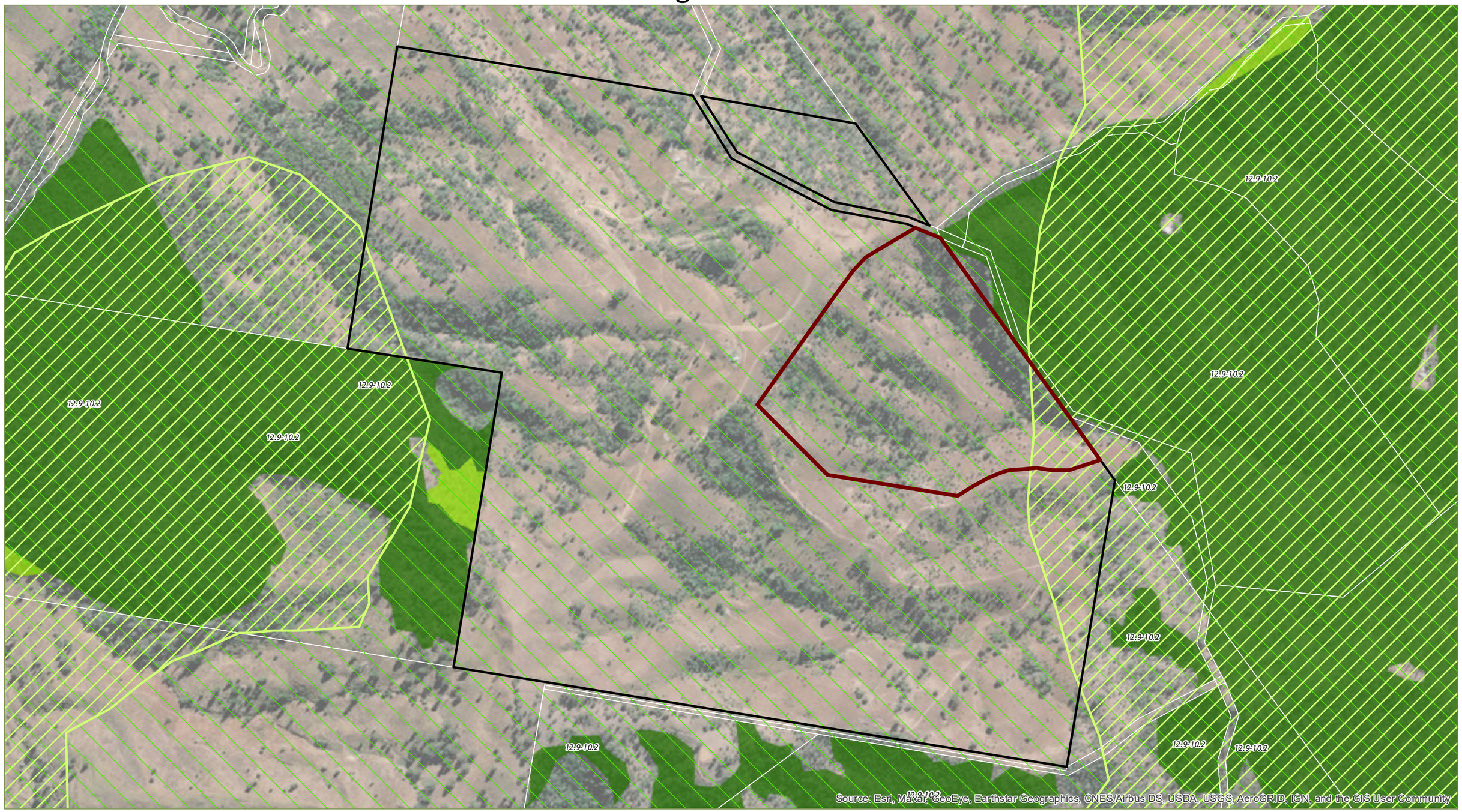
PLAN 3 - Suitable Koala Habitat & Revegetation Locations



FILE NAME: 9641 E 03 Suitable Habitat and Revegetation Koala B
Version - B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 50 100 200 300 400 Metres

11/05/2021 *1:9,500*

Legend

- QId DCDB
- Offset site alloments
- Offset management zone 1
- Pre-clear RE 12.9-10.2
- Locally Refined Koala Habitat Areas
- Core Koala Habitat Areas
- SEQ Biodiversity Areas

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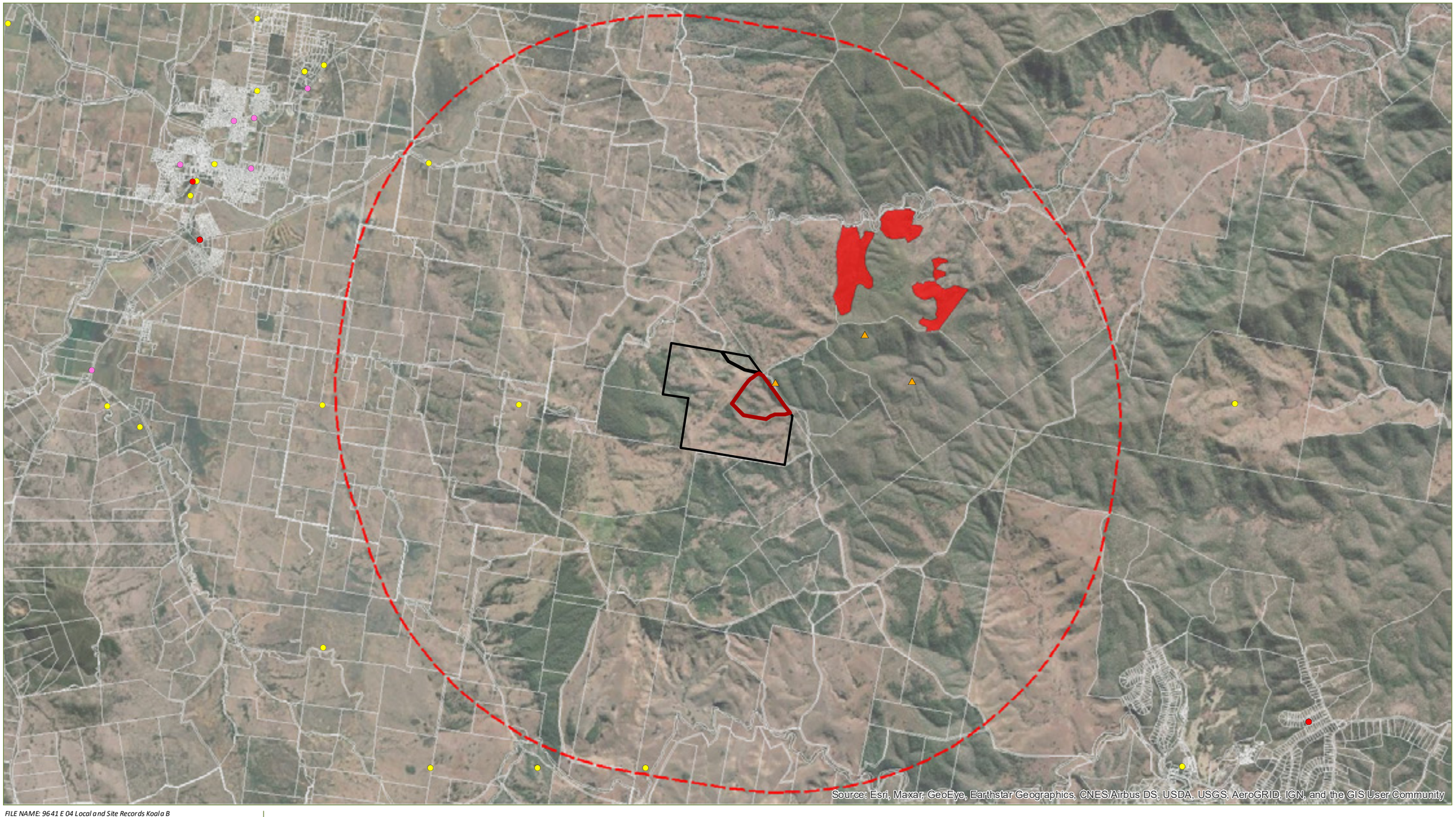
PLAN 4 - Local and Site Collected Records for the Koala



FILE NAME: 9641 E 04 Local and Site Records Koala B

Version - B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 0.5 1 2 Kilometres

11/05/2021 *1:56,000*

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1
- ALA Koala records
- Wildnet Koala locations
- Koala hospital records
- Koala scat
- 5km buffer
- Approved Koala Offset (EPBC 2013/6864)

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3.3 Grey-headed Flying-fox Offset Values / Suitability

By comparison to research and precedence with the Koala, less is known on both impacts and offsets for Grey-headed Flying-fox, particularly when camps or roosting sites are not directly affected. Research notes scarcity of food sources particularly in the Winter and Spring periods as resulting in animal weight loss and seasonal movement of camp numbers (Eby et al, 2008). Tree species known to provide nectar, flower or fruit resources for the Grey-headed Flying-fox within 50km of a known population (Camp site) are considered to achieve the definition of Foraging habitat critical to the survival of the species. The nearest GHFF roosting camps are located approximately 8.9 km north-west of the offset property located proximal to Boonah (Boonah, Bicentenial Park and 9 km south-east of the offset property in Kooralbyn (Kooralbyn (Routley Drive).

Evidence of GHFF presence at the Kooralbyn (Kooralbyn (Routley Drive) roost was documented on 14 December 2021, as shown in **Photo Plate 2.**

Photo Plate 2: GHFF evidence recorded at the Kooralbyn roost location.

A number of the dominant tree species existing and proposed to be planted on the offset property provide flower and fruit during the Winter and Spring periods (Refer to **Table 3**).

Table 17: Winter / Spring Flowering – Fruiting Tree Species – Offset property

Offset property tree specie(s)	Flowering period (inclusive)	Winter	Spring
Eucalyptus crebra	Variable throughout the year	Yes	Yes
Eucalyptus tereticornis	June – November	Yes	Yes

Eucalyptus melanophloia	October – March	Yes	No
Corymbia citriodora	October – July	Yes	Yes
Corymbia tessellaris	December – March	Yes	No
Eucalyptus siderophloia	May – September	Yes	Yes
Lophostemon confertus	September – February	Yes	No
Angophora leiocarpa	October – January	Yes	No
Eucalyptus moluccana	February – March	No	No

3.4 General Suitability EPBC Offset Policy Criteria

Table 18: OMZ1 General Suitability – EPBC Offset Policy Criteria

No.	*Offset Suitability Criteria*	Scenic Ridge OMZ1 Justification
1	*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 OMZ1 delivers a conservation gain for the Koala and Grey-headed Flying-fox through: a) The creation of new habitat for both protected matters through the revegetation of 34.7 ha. b) Providing new connectivity with surrounding habitat for the protected matters. c) Introducing, funding and continually improving OMZ1 Management Actions to reduce and manage threats (wild dogs, Lantana) in created habitat areas. d) Averting the direct and indirect losses via declaring the land a Voluntary Declaration area for High Value Conservation under the *Vegetation Management Act 1999*. This removes future wholesale and selective clearing opportunities and through the management plan removes ongoing impacts caused by livestock intrusion into habitat areas. e) Provides a 34.7 ha environmental offset adjoining a regional mapped biodiversity conservation corridor. The key ecological threatening processes to the koala include land-use practices which cause the loss and fragmentation of habitat and habitat degradation (Department of Agriculture, Water and the Environment 2021). Therefore, by actively restoring cleared paddocks into koala habitat and protecting this restored koala habitat which adjoins a large tract of remnant vegetation which forms part of the SEQ Bioregional Corridor, this offset addresses the primary ecological threatening

		processes to Koalas and aids in the recovery of the koala population in South East Queensland. Recovery Objective 1 for the GHFF as per the National Recovery Plan for the Grey-headed Flying-fox *Pteropus poliocephalus* (DAWE 2021) is to identify, protect and increase native foraging habitat that is critical to the survival of the GHFF. This offset intends to rehabilitate 34.7 ha of habitat utilising tree species which are known to be utilised by the GHFF, in particularly, species known to flower during the winter months. As such, this offset is aids in the recovery of the GHFF and the objectives of the National Recovery Plan for the species.
2	*be built around direct offsets but may include other compensatory measures*	The OMZ1 includes legally securing the land area and undertaking necessary improvements to achieve a greater than 100% offset outcome for impacts calculated on the Weiya Development Pty Ltd Collingwood Park Project for GHFF Foraging Habitat (102.78%) and Koala Habitat (102.78%). The OMZ1 is wholly achieved through direct delivery to land.
3	*be in proportion to the level of statutory protection that applies to the protected matter*	Both the Koala and the Grey-headed Flying-fox are scheduled within the EPBC Act as 'Vulnerable'. Under the International Union for Conservation of Nature data the probability of annual extinction is 0.2. This factor applies through the meta data of the Offset Guide assessment calculation sheets for which each species has been assessed as achieving greater than 100% offset through the proposed OMZ1.
4	*be of a size and scale proportionate to the residual impacts on the protected matter*	Direct and indirect impacts for the protected matters have been calculated at the impacts site using the Modified Habitat Quality Assessment (MHQA) for the Koala and the Grey-headed Flying-fox Foraging Habitat Assessment (FHA) methods. Within the Assessment Guide calculator the Quantum Impact for each species is listed as: • Grey-headed Flying-fox (9.87 ha) • Koala (9.87 ha) To achieve and offset for both of these impacts the OMZ1 provides a direct land-based outcome over 34.7 ha entirely through habitat recreation activities on historically cleared land devoid of native vegetation.

5	*effectively account for and manage the risks of the offset not succeeding*	The OMZ1 is a singular proposed land-based outcome in a strategic location known to support both habitat and animals from the impacted protected matters. This Offset Management Plan identifies 7 key risks to some or all of the offset principles and outcomes not being achieved. Each of these risks have influenced the specific management actions proposed in the relevant Offset Management Zone where the risk may occur and more importantly the monitoring, measuring of success and adaptive management for the offset succeeding. Further, the offset provider intends to engage third party, suitably qualified professional(s) to ensure that the management outcomes of the offset land are achieved and risk of the offset not succeeding is mitigated. Repetitive monitoring and survey replication is a feature of the Offset Management Plan to ensure adaptive management changes are made as soon as identified and throughout the life of the offset.
6	*be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs*	The Weiya Development Pty Ltd Collingwood Park Project occurs in Collingwood Park, where the site has been earmarked for residential development to cater for the growing South East Queensland population. There are few environmental controls at the impacts site with the Queensland Government's *Environmental Offset Act 2014* not being applicable. The relatively economical Ipswich Registry of Fees and Charges (6.4.1 – Vegetation Retention Contributions as per Implementation Guideline 19) contribution of $6,530 per hectare is applicable to vegetation clearing within the Ipswich Local Government Area. This fee and charge does not link to the EPBC requirements for offset. There are no guidelines or controls around offset or rehabilitation for the Grey-headed Flying-fox. Further, the proposed OMZ1 (Scenic Ridge) is currently utilised for cattle grazing activities, and not protected or managed for conservation purposes. <u>Therefore, without the triggering of the EPBC Act and the Controlled Action Assessment the offset as proposed in the Offset Management Plan is not required for either of the protected matters and the offset property would not be protected in perpetuity for conservation purposes.</u>

7	*be efficient, effective, timely, transparent, scientifically*	Through conditions of approval the OMZ1 will be legally secured prior to the commencement of any clearing on the Impact site. The OMZ1 and its value (as finalised through the EPBC Act Approval) will be legally secured through a Voluntary Declaration (V-Dec) declared under the Queensland Government's *Vegetation Management Act 1999*. A V-Dec protects land and values and is binding on future owners. The declaration and management plan will be noted on the land title, which informs prospective buyers of current declarations and management plans and where copies are available. This information is important to the property market as future owners will be bound by the plan and declaration. The legally securing of the land will be made through declaring the area as having High Nature Conservation Values. The V-Dec will be lodged and legally secured by evidence of encumbrance on Registered Land Title prior to the commencement of any clearing works on the Impact Site. The completion criteria for this Offset Management Plan are not considered to have been met until after the period of effect of approval for the EPBC Act Part 9 approval has expired (being EPBC Act approval 2019/8516). The V-Dec over the offset property must not be removed, and the land owner, land manager, approval holder, and all other persons associated with the action must not seek to remove nor consent to the removal of the V-Dec from the offset property, until the approval expires. The Offset Management Plan schedules a list of existing or specifically designed scientific methodologies for the measuring of base line and improved outcomes for the protected matters. The OMP also requires the use of tertiary trained and experienced experts along with appropriately certified and experienced contractors for the implementation of a host of actions.
8	*have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced*	The Offset property is owned by HES who have entered into a legal contract to deliver and manage the outcomes listed in the Offset Management Plan and conditioned in EPBC 2019/8516. Clearly articulated goals are set within this Offset Management Plan for each proposed action within the Offset Management Zone (OMZ1). Collectively these goals link directly to the achievement of the overall

		conservation gain for the protected matters as designed, assessed and calculated through the selection and delivery of the OMZ1. The management actions in **Section 5** of the OMP are designed to be measured, monitored, audited and enforced year upon year during the life of the offset.

3.5 EPBC Offset Assessment Guide Summary

The completed EPBC offset assessment guide calculator sheets is included in **Appendix A**, with a summary of the EPBC offset assessment guide calculator inputs included below.

- **Impact area (hectares) –** 24.89 ha
- **Impact area habitat quality score –** Koala (4/10) / Grey-headed Flying-fox (4/10)
- **Impact area quantum impact (hectares) –** 9.96 QI ha
- **OMZ1 (hectares) –** 34.70 ha
- **OMZ1 start habitat quality score –** Koala (3/10) / Grey-headed Flying-fox (3/10)
- **Time until ecological benefit –** 20 years
- **Time over which loss is averted –** 20 years
- **Risk of loss without the offset –** 0 %
- **Risk of loss with the offset –** 0 %
- **OMZ1 future quality score without offset –** Koala (3/10) / Grey-headed Flying-fox (3/10)
- **OMZ1 future quality score with offset –** Koala (7/10) / Grey-headed Flying-fox (7/10)
- **Confidence in averted loss (risk of loss) values –** 100 %
- **Confidence in result (quality score increase) values –** 75 %
- **Total % of Impact Area Offset –** 100.46%

4. Offset Management Zone 1 Design

The OMZ1 is located on the north-eastern boundary of the Scenic Ridge property and has been designed to provide a direct connection to adjoining remnant habitat, while also expanding the South East Queensland (SEQ) bioregional corridor beyond the mapped extents. The offset aims to achieve the following outcomes:

- Habitat creation by revegetating cleared land into habitat in logical infill locations to expand the extents of habitat availability in the broader Allandale locality and SEQ bioregional corridor;
- Habitat connectivity through strategically located revegetation adjoining existing remnant habitat and the SEQ bioregional corridor. Reinstating and enhancing habitat on the Offset Land provides for improved MNES connectivity between on / off site habitat tracts to the north and east; and
- Provide habitat creation in an identified 'future linkage' corridor for a 'core' and 'node' habitat area in the Scenic Rim regional council area as per the Scenic Rim Biodiversity Strategy 2015-2025.

Section 4.1 below provides a brief description of the OMZ and outlines core objectives sought within the OMZ as part of the overall offset outcome. The designation of the Offset Area into an OMZ is specifically linked to Environmental Management Action Tables in Section 5.0 of the OMP allowing itemised tasks to reference specific geographical areas within the Offset property.

Refer to **Plan 5** for the Overall OMZ1 Design designating the spatial extent of the Offset Management Zone (OMZ).

4.1 Offset Management Zone 1 – Open Grazing Paddock

OMZ1 existing habitat values for the Koala and Grey-headed Flying-fox range from scattered juvenile growth and isolated paddock trees to currently not present, where OMZ1 is dominated by cleared grass paddock. There are isolated pockets located within OMZ1OMZ1 where native regrowth is present, however these isolated areas were not observed or considered to contribute to the functional role of habitat availability for koalas or GHFF due to their isolated nature.

The habitat restoration proposed within OMZ1 achieves the following objectives:

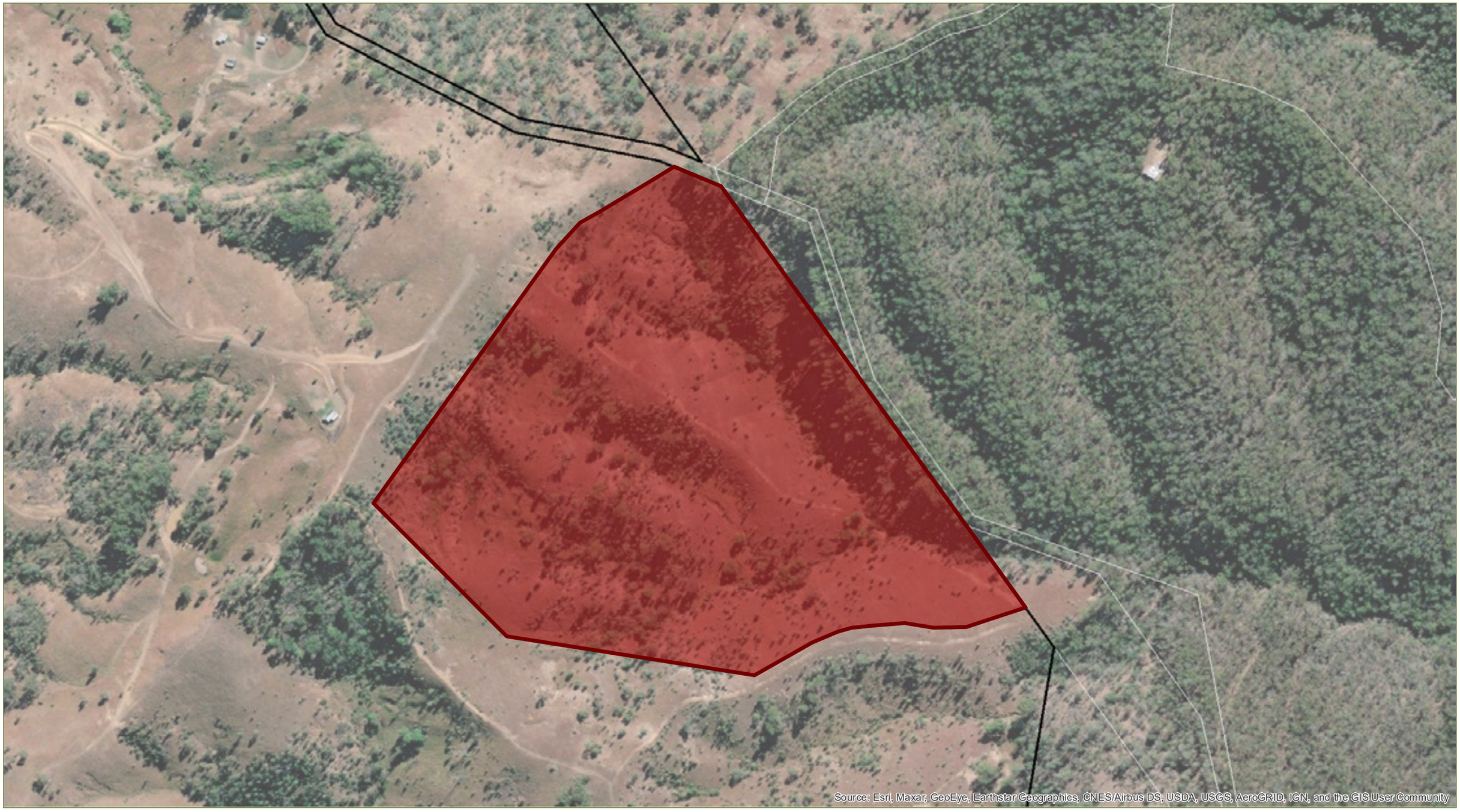
- Create new Koala and GHFF habitat through revegetation;
- Provide connectivity to adjoining Koala and GHFF habitat;
- Expand the SEQ bioregional corridor through habitat recreation; and
- Releases the realisation of the 'future linkage' under the Scenic Rim Biodiversity Strategy 2015-2025 which provides a critical connection between the Wyaralong – Kooralbyn Core Habitat area the Mt Barney Core Habitat area.

OMZ1 occurs entirely on land zone 9-10. This land zone and remnant vegetation community on the adjoining allotments to the north-east are known to support koala usage, and as such, is permissible for habitat recreation. OMZ1 will achieve the above-mentioned objectives through the implementation of the following:

1. Legally secure the land via a Voluntary Declaration under the *Vegetation Management Act 1999* while values are being established;
2. Exclusion of stock from non-remnant areas located within the OMZ1;
3. Removal and management of existing weed infestations – particularly of Weeds of National Environmental Significance (WONS – namely Lantana cultivars);
4. Rehabilitation planting to create habitat
5. Targeted control of feral animals – specifically wild dogs as part of the entire OMZ1. Other feral animals known to the site, however not considered a threat to Koalas or Grey-headed Flying-fox, will be managed inter alia including rabbits, wild deer, feral pigs and goats; and
6. Management of human access and disturbance through the use of fencing and gates.

Further detail on specific management actions for OMZ1 are included in the following section (**Section 5**). **Plan 5** shows the location of OMZ1.

PLAN 5a - Offset Management Unit Area



FILE NAME: 9641 E 05 Offset Management Unit Area B

Version - B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 25 50 100 150 200 Metres

11/05/2021 *1:5,000*

Legend

- Qld DCDB
- Offset site alloments
- Offset management unit (34.7 ha)

THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT. HABITAT EXHANGE SOLUTIONS CANNOT ACCEPT REPONSIBILITY FOR ANY USE OF OR RELIANCE UPON THE CONTENTS OF THESE DRAWING BY ANY THIRD PARTY.

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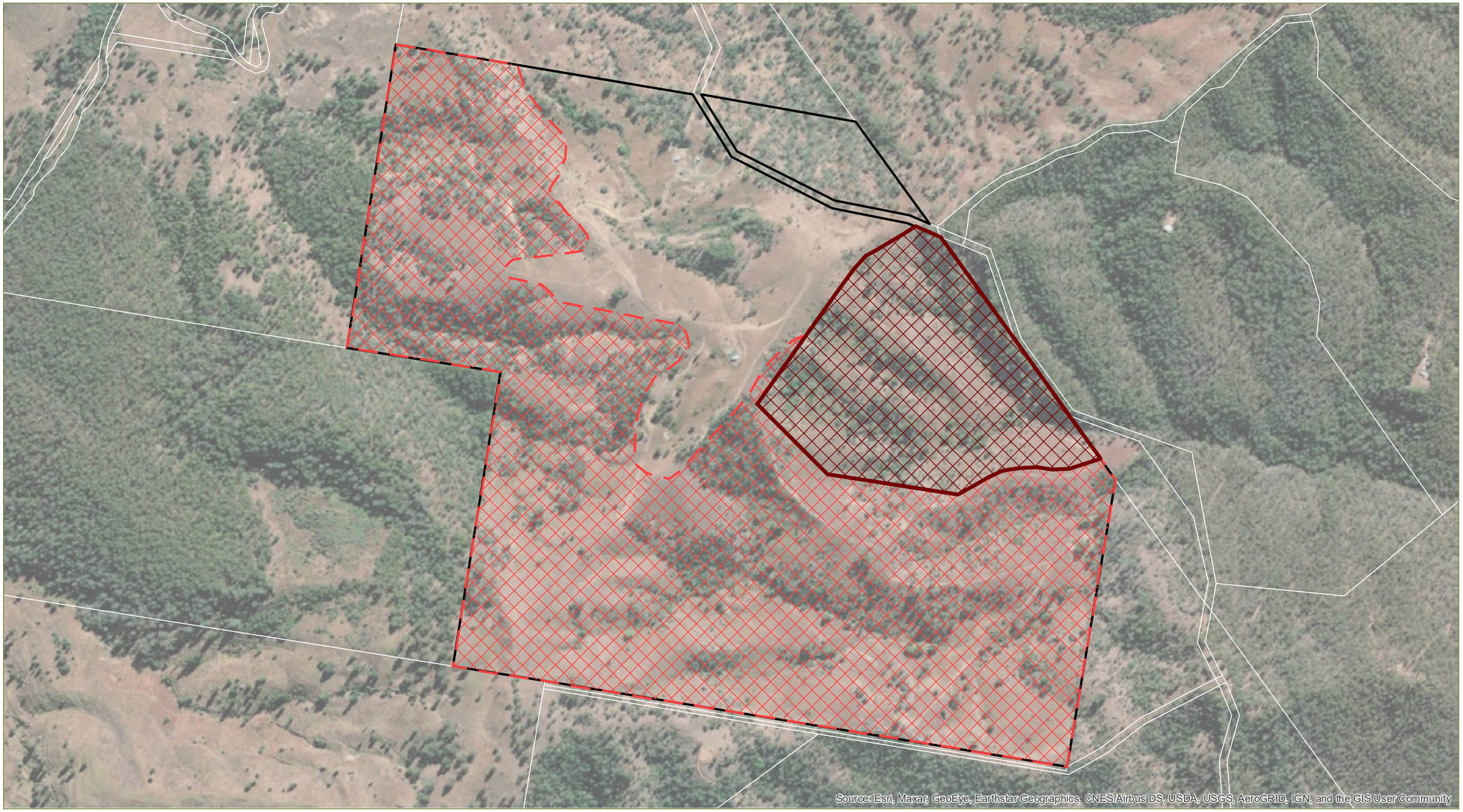
HABITAT EXCHANGE SOLUTIONS

PLAN 5b - Offset Management Zone Contextual Plan



FILE NAME: 9641 E 06 Future Offset B

Version B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 50 100 200 300 400 Metres

11/05/2021 *1:9,500*

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1 (34.7 ha)
- Future offset area (157.3 ha)

THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT. HABITAT EXCHANGE SOLUTIONS CANNOT ACCEPT REPONSIBILITY FOR ANY USE OF OR RELIANCE UPON THE CONTENTS OF THESE DRAWING BY ANY THIRD PARTY.

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HABITAT EXCHANGE SOLUTIONS

5. Offset Land Management Actions

There are five (5) management actions identified as relevant and necessary for the OMZ1 to achieve outcomes which will benefit MNES and in particular, the Koala and GHFF. The management actions focus on the recreation of habitat for the Koala, while also reducing threats to both species. Although there may be overlap between some of the management actions, all management actions are considered to contribute to the improvement of Koala and GHFF habitat on the Offset Land.

Where logical, performance indicators have been transcribed from the Offset Assessment Chapter included in the Preliminary Documentation Submission (*Saunders Havill Group, 2020*). This includes the use of the *Modified Quality Habitat Assessment* (MQHA) method for Koala habitat and the *Grey-headed Flying-fox Foraging Habitat Assessment* (GHFF-FHA) tool for measuring GHFF habitat to set benchmarks and targeted improvements within the OMZ1.

Actions to be completed in accordance with this OMP include:

- **Management Action 1:** Feral Animal Control (primarily targeting wild dogs)
- **Management Action 2:** Weeds of National Significance Control (reduction and management)
- **Management Action 3:** Livestock Control
- **Management Action 4:** Access and Trespass Management
- **Management Action 5:** MNES Habitat Restoration

The following detailed information is included in **Section 5.1 – Section 5.5**:

- Management action outcome;
- Management action location;
- Management action tasks and completion criteria;
- Management action risk reduction measures;
- Management action timing and preliminary completion criteria;
- Management action responsibility;
- Management action monitoring; and
- Management action risks and adaptive management.

A summary table of the management measures and commitments is included in **Table 19** below. It should be noted that all management measures are to be completed across the entirety of the OMZ1.

Table 19: Summary of Management Actions and Commitments

	Completion Criteria	Preliminary Completion Criteria	Monitoring Activity
Management Action 1 – Feral Animal Control			
Year 1	Complete detailed baseline / seasonal feral animal management survey(s) Consult Scenic Rim Regional Council and / or the Regional Pest Management Representative Develop a Pest Management Implementation Strategy	Baseline of pest animals established; Quarterly or bi-annually meeting organised with SRRC or the Regional Pest Management Representative; Finalise the Pest Management Implementation Strategy.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Year 5	Replicate the Year 1 detailed baseline / seasonal pest management survey(s) to demonstrate less than 5% of the Year 1 baseline survey results.	Implement the Pest Management Implementation Strategy (Year 2 - 5); Demonstrate that pest animals have been reduced to less than 5% of the year 1 baseline survey results.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Year 10, 15 & 20	Repeat the baseline surveys in year 10, 15 and year 20 to demonstrate a maintenance of year 5 statistically reduced vertebrate pest species incidence and or occurrence below the 5%-year 1 baseline survey results.	Implement the Pest Management Implementation Strategy (Year 5 - 20); Continue to demonstrate that pest animals have been reduced to less than 5% of the year 1 baseline survey results.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Adaptive Management	If greater than 5% of the baseline pest survey results remain in the Year 5 survey and reporting, Year 10 survey results to demonstrate that the less than 5% of the baseline survey has been achieved.		Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Management Action 2 - Weeds of National Significance Control			
Year 1	Complete detailed baseline / weed extent surveys utilising an antenna based GPS system	Complete mapping of all *Lantana spp*. infestations across the OMZ1; Detailed maps identifying the extent of *Lantana spp.* infestations; Specific total area of *Lantana spp.* infestations within the OMZ1; Exclusion of stock from the OMZ1	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website

Year 5	Replicate Detailed Weed Extent Re-Survey through the OMZ1 – Include plans and calculations in the Year 5 OAAR demonstrating less than 5% of the OMZ1 area to contains weed infestations.	Demonstrate that woody weed coverage across OMZ1 has been reduced by 95%; Demonstrate that all stock has been excluded from the OMZ1;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Year 10	Replicate Detailed Weed Extent Re-Survey through the OMZ1 – Include plans and calculations in the Year 10 OAAR demonstrating less than 5% of the OMZ1 area to contains weed infestations	Continue to demonstrate that woody weed coverage across OMZ1 has been reduced by 95%;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Year 15 & 20	Repeat of Baseline surveys in year 15 and year 20 to demonstrate a maintenance of year 10 significant reductions to the extent of Lantana spp. below 5% of the OMZ1 area to contains weed infestations	Continue to demonstrate that woody weed coverage across OMZ1 has been reduced by 95%;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Management Action 3 – Livestock Control			
Year 2	Complete all fencing as per the Indicative OMZ1 Fencing Plan	Demonstrate that the fencing is completed in year 1 and 2 until the entire OMZ1 is fenced;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Other	Annual inspection of the fencing integrity and stock breaches	Nil stock breaches into the OMZ1 from Year 3 - Year 20;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Management Action 4 - Access and Trespass Control			
Year 1	Inspection and rectification of all perimeter fencing	Provide evidence of the notification letter issued to the adjoining landholders;	
	Notification of offset areas, purpose and outcomes to all adjoining land holders		Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website

Other	Access gates and signage to be installed where OMZ1 fencing crosses tracks required to be maintained for access	Installation of access gates and signage throughout the OMZ1 to be completed by Year 2, when Action 3 is completed;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Management Action 5 – MNES Habitat Restoration			
Year 1	Finalise locations, sequence and timing for revegetation program	Revegetation is undertaken where identified to planting specifications and consistent with the pre-clear Regional Ecosystem type; All revegetation will be completed by end of Year 2, with the revegetation area totalling 34.7 ha; Minimum of 90% survival rate of the revegetation stock or equivalent stem density (ie. through natural regeneration) by the Year 10 major monitoring period;	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
	Cultivate and prepare OMZ1 (34.7ha) area in preparation for year 2 planting		
	Create OMZ1 water source for revegetation establishment (purpose located dam or broadscale irrigation)		
	Establish photo monitoring points and protocols for the OMZ1		
Year 2	Complete OMZ1 MNES habitat restoration (34.7ha)		Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Year 5	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring	Demonstrate MNES habitat restoration survival rate; Demonstrate an increase in the MHQA and GHFF FHA scores.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
	For the OMZ1, achieve a MHQA score of 3/10 and GHFF FHA score of 4/10		
Year 10	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species	Demonstrate an increase in the Koala usage in OMZ1 based on the baseline and future increased expected; Demonstrate an increase in the MHQA and GHFF FHA scores.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website

	stocking rate surveys and photo point monitoring For the OMZ1, achieve a MHQA score of 4/10 and GHFF FHA score of 5/10		
Year 15	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring For the OMZ1, achieve a MHQA score of 6/10 and GHFF FHA score of 7/10	Demonstrate an increase in the Koala usage in OMZ1 based on the baseline and future increased expected; Demonstrate an increase in the MHQA and GHFF FHA scores.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Year 20	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring For the OMZ1, maintain a MHQA score of 7/10 and GHFF FHA score of 8/10	Demonstrate the MHQA and GHFF FHA scores have been maintained from Year 15 final score achievements.	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website
Other			
Annually & Year 5, 10, 15 & 20	Complete Offset Area Annual Reports, with major milestone reporting completed in Year 5, Year 10, Year 15 and Year 20.	Provide the Offset Area Annual Reports to the proponent to be published with the Annual Compliance Report	Offset Area Annual Report (OAAR) to be published in the EPBC Approval Annual Compliance Report and on the Approval Holders website

5.1 Action 1: Feral Animal Control

Management Action Outcome

The Department of Agriculture and Fisheries (DAF) lists feral dogs as abundant and widespread throughout the Scenic Rim region. Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are listed as declared pest animals by Scenic Rim Regional Council, with the local council website documenting that the impact of wild dog activity has increased in the past 10 years due mainly to the increasing population in the region. Further, residents are increasingly engaged in raising livestock and poultry, resulting in a readily available food sources for wild dogs (SRRC 2021). The Scenic Rim Regional Council currently runs baiting, shooting and trapping programs throughout the region.

Presently, under the *Biosecurity Act 2014*, there is the 'general biodiversity obligation' for landholders to manage biosecurity risks that are under their control and take reasonable and practical steps in doing so. To determine the extent of management and to determine if it is necessary to take reasonable and practical steps in managing the biosecurity risk, the landholder is required to assess the risk and its potential harm (ie. extensive productivity loss). Currently, the landholder does not undertake feral animal control as it is assessed under the 'general biosecurity obligation' of the *Biosecurity Act 2014*, that feral animal threat to productivity does not have a positive cost benefit to the current land use (ie. the expenditure to undertake feral animal control would not result in enough economic gain in productivity to warrant implementation).

Evidence of wild dog predation on livestock was recorded on the offset property (refer to **Photo Plate 3**). Research by Pest Animal Management QLD (2020) found that the Scenic Rim region contains an abundance of wild dogs, with evidence indicating that calf predation has increased significantly. Refer to **Photo Plate 4** for evidence of wild dog predation of a calf in the Scenic Rim region (PAMQ 2020).

A core role of the management action 1will be for the prolonged control and reduction in feral dogs over the offset land for the offset period.

Photo Plate 3: Wild dog predation on livestock observed on the Offset property.

Photo Plate 4: Wild dog predation of livestock in the Scenic Rim Region (source: PAMQ 2020).

Management Action Location

- Feral animal control will be focussed within OMZ1;
- Incidental feral animal control will be extended to the entire Offset Land if the feral animal control measures are not resulting in the desired results.

Management Action Tasks and Completion Criteria

- Reduce the occurrence of feral animal species (namely wild dogs) to below 5 % of the baseline survey in the OMZ1 within 5 years from the commencement of the action;
- Maintain occurrences of feral animal species within the OMZ1 to 5 % or below of the baseline survey results for the life of the approval; and
- Ensure no koala injury or mortality occurs within the OMZ1 for the life of the approval.

Management Action Risk Reduction Measures

Management actions to reduce the risk of feral animal predation impacts on the offset land include:

- Undertake baseline and periodical surveys and monitoring of feral animal populations, locations and dispersal patterns within the Offset property (Survey methods to include – direct observation / remote sensor camera and sand traps for print record). Develop a base line of feral animal populations and 'hot spots' and key activity periods (eg dusk);
- Develop a purpose built offset property Pest Management Action Plan – method to include trapping, shooting, baiting. Develop an adaptive management approach to pest management which considers each method relative to the base line data collected to determine the most effective pest management measures for the offset property; and
- Undertake stakeholder engagement with immediate land holders to foster joint sub regional scale action plan.

Management Action Timing and Preliminary Completion Criteria

- **Year 1:** Complete detailed baseline / seasonal feral animal survey(s);
- **Year 1:** Develop a Pest Management Plan;
- **Year 2 – 5:** Implement the Pest Management Plan;
- **Year 5:** Replicate the Year 1 detailed baseline / seasonal pest management survey(s) to demonstrate less than 5% of the Year 1 baseline survey results;
- **Year 5 – 20:** Implement the Pest Management Plan; and
- **Year 10, Year 15 & Year 20:** Repeat the baseline surveys in year 10, 15 and year 20 to demonstrate a maintenance of year 5 statistically reduced vertebrate pest species incidence and or occurrence below the 5%-year 1 baseline survey results.

Management Action Responsibility

The Offset Provider will establish, resource and fund the pest management components of the Offset Management Plan. The following tasks will require specific expertise or appointed contractors to complete:

- Baseline and repeat surveys to be completed by a senior tertiary trained ecologist, zoologist or environmental scientist with a minimum of five years industry field experience;
- Use of 1080 or sodium fluoroacetate poisons is regulated under the *Health (Drugs and Poisons) Regulations 1996*. Deployment and use of this control method to be via a registered contractor holding relevant permits and demonstrated experience;
- Deployment and use of suitable wild dog traps and euthanasia to be in accordance with Queensland *Biosecurity Act 2014*; and
- Hunting / shooting program to occur in accordance with all relevant Queensland Government permits and regulations.

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

Management Action Monitoring

Completion of baseline surveys and range estimate of feral animal populations, seasonal locations, dispersal patterns and hot spots, including sighting and incidence (death / injury) data. Survey methods and results provided in Year 1 Offset Area Annual Report (and incorporated in Year 1 Annual Compliance Report for the Approved Action).

To determine the baseline level of feral animals within the OMZ1, a non-invasive survey technique utilising baited camera traps will be implemented, as per the methodology in the following section.

Interim actions and results provided in Year 2-4 Offset Area Annual Report. (provided as conditioned in the relevant Annual Compliance Report for the Approved Action).

Replicated baseline surveys in year 5, 10, 15 & 20 to demonstrate statistical reduction in:

- Incidental sighting and records of feral animals on-site (below 5% of the baseline survey results);
- Feral animal scat / track or imprint evidence at targeted survey locations;
- Reduced site population census on infrared drone and baited remote sensor camera surveys;
- Reduced scalp collection or animal kills on diurnal hunting (Shooting) events;
- Stock losses over the property; and
- Statistical reduction or nil occurrence of injury or mortality of vertebrate pest species on site koala populations.

Year 5 Offset Area Annual Report (OAAR) to include repeat survey methods, results data and comparative analysis demonstrating statistical reduction in vertebrate pest management evidence and impacts. Report to

include any adaptive management recommended changes to pest control and reduction methods to be deployed for years 6-10. Details of surveys, results and alterations to management strategies to be provided to proponent in the Year 5 OAAR for issue to DAWE in the Year 5 Annual Compliance Report for the Action.

Interim actions and results provided in Year 6-9 Offset Area Annual Report (provided as conditioned in the relevant Annual Compliance Report for the Approved Action)

Repeat of Baseline surveys in year 10, year 15 and year 20 to demonstrate a maintenance of year 5 statistically reduced vertebrate pest species incidence and or occurrence below the 5%-year 1 baseline survey results.

If greater than 5% of the baseline pest survey results remain in the Year 5 survey and reporting, then consultation with an expert in feral animal control is required to assist in adaptively managing the program and implementation to ensure a reduction of less than 5% of the baseline survey has been achieved.

Year 10 Annual OAAR to include repeat survey methods, results data and comparative analysis demonstrating a maintenance or statistical reduction in vertebrate pest species evidence and impacts. Report to include any adaptive management recommended changes to pest control and reduction methods to be deployed for years 11-19. Details of surveys, results and alterations to management strategies to be provided to proponent in the Year 10 OAAR for issue to the Department in the Year 10 Annual Compliance Report for the Action.

Repeat of Baseline surveys in year 15 and year 20 to demonstrate a maintenance of year 10 statistically reduced vertebrate pest species incidence and or occurrence below the 5%-year 1 baseline survey results.

Actions and results provided in Year 11-19 of continuation of Year 10 adaptive management feral animal management strategy (provided as conditioned in the relevant Annual Compliance Report for the Approved Action).

Baited Motion Sensor Camera Trap Methodology

Camera trapping involves setting up a fixed digital camera to capture images or video of animals which pass in front of a camera. It is a non-invasive technique designed to detect medium to large sized animals as they pass, although it is possible to detect smaller animals depending on the set-up. This set-up identifies fauna activity beyond the scope of direct observational studies and with the absence of potential observer impacts.

Infrared sensing cameras with an infrared flash are deployed, which use motion to trigger. Three cameras will be set up within the OMZ1. The cameras are to be systematically located to capture a representative of the OMZ1. The three cameras are to be deployed seasonally, with a focus on spring and summer, where wild dogs are known to be more active. Cameras are to be attached 30-100 cm from the ground on a tree or post, and directed towards landscape features. The cameras are to be left to record for a minimum of two weeks. The cameras are to be baited in order to target evidence of wild dogs and other potential threats to known MNES in the broader area.

Management Action Risks and Adaptive Management

Without intervention and active management, the risk of feral animal impacts on the Koala are assessed as 'high' (refer to **Chapter 6**). This is based on regional and local government data on feral animals combined with evidence of livestock predation recorded on-site and an abundance of research in the surrounding area indicating the prevalence of feral dogs. The pest management strategies incorporate intensive implementation methods and three major data collection survey events for confirming base case and successful reduction of pest management impacts.

The repeat survey points are designed to deliver data on outcomes being achieved. If the surveys do not demonstrate the targeted effectiveness the implementation strategy will be adjusted to:

- Adopt new management techniques;
- Increase successful techniques and reduce less successful management methods;
- Increase intensity of implementation program;
- Change the timing or locality of proposed target treatment locations or events; and
- Allow the site strategy to assimilate into any new broader threat abatement programs.

The feral animal management implementation strategy will use the baseline data to build a calendar of annual activities based around varying control methods, seasons and species. The threat abatement actions and outcomes within any calendar year will be reported on within the OAAR and will provide a number of lead indicators towards a reduction in occurrence and impacts. Major survey and review periods for independent review of the OMP are set at year 5 and year 10 to ensure the program achieves long term reduction and does not respond to specific stochastic events such a contextual fluctuation in pest populations such as feral dogs.

5.2 Action 2: Weeds of National Significance Control

Management Action Outcome

Preliminary site surveys and observations over the offset land recorded a number of weed species, with the most prevalent and inhibitive to Koala movement and habitat restoration being *Lantana camara*. The Scenic Rim Regional Council Biosecurity Plan aims to control declared pest plants within the region. This plan includes information and strategies for landholders to effectively manage pest species. *Lantana camara* is listed as a declared pest plant within the Scenic Rim region.

Lantana camara is listed as a 'weed of national significance' under the EPBC Act. Further, in 2006, the NSW Government nominated *Lantana camara* as a key threatening process under the EPBC Act.

Under the Queensland *Biosecurity Act 2014* it requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control, this is called the General Biosecurity Obligation (GBO). The GBO states that reasonable and practical is dependent on the current land use practices undertaken by the landholder. The GBO is a risk ratings-based approach, where risks are managed appropriately based on their threat to the land use practices. Given that the site is currently used for cattle grazing, the risk of weed species such as lantana to current land use practices is low, and therefore, under the GBO of the Biosecurity Act, these risks are managed in a low-risk way. As such, the proposed management actions are above and beyond what is currently completed on-site.

Lantana camara occurs on the offset land both in open paddock areas as isolated clusters and thickets and as a dominant shrub in gully lines. Within open areas existing farm practices result in periodical pesticide application limiting spread, however, this does not occur to the extent of entire eradication as the costs of treatment to result in an economical return for the grazing benefit are non-existent. An exact volume or extent of Lantana at the offset property has not been calculated.

Lantana infestations suppress and inhibit the natural regeneration of regrowth vegetation on-site which directly limits the growth rates and regeneration of non-juvenile koala habitat trees and Grey-headed Flying-fox foraging tree species. Although baseline data is limited to the survey events undertaken for this EPBC Application research infers the highly invasive and spreading nature of the species, coupled with the in-active management in areas would result in progressive increases as local climatic events align with optimal germination and seeding periods. In areas blanket layers of *Lantana camara* additionally form a barrier to terrestrial species, which would include limiting the Koalas ability to access areas containing and over-canopy of NJKHTs. Refer to **Photo Plate 4** for on-ground images of *Lantana camara* infestations on the offset land.

Photo Plate 4: Dense *Lantana camara* infestations observed on the offset land.

Management Action Location

- Management of weeds of national significance (WONS) is to occur in the entire OMZ1, with a particular focus on *Lantana camara*.

Management Action Tasks and Completion Criteria

- Removal and control of all major *Lantana camara* infestations from within the OMZ1 using a variety of mechanical and herbicide methods. *Lantana camara* infestations are to be reduced to below 5 % of the OMZ1 area. Areas identified as containing higher infestations are to be targeted during weed removal events.
- Ongoing maintenance to ensure that *Lantana camara* extents within the OMZ1 are retained at or below the 5 % of the total area through weed management actions; and
- Prevent the further spread or establishing of new *Lantana camara* outbreaks within the OMZ1 by excluding cattle from the offset management zone.

Management Action Risk Reduction Measures

Management actions to reduce the risk of weeds of national significant increased infestation impacts on the offset land include:

- Use an Antenna based GPS system to map the full extent (as description polygons) of all *Lantana camara* areas within the OMZ1 (achieve a total ha extent of weed infestations / occurrences within the OMZ1);
- Exclude stock (cattle) access from *Lantana camara* infestation areas within the OMZ1 (grazing cattle provide the most continuous source of *Lantana camara* spread);
- Undertake detailed weed management control activities within the OMZ1. The following methods are to be deployed:
    - Stick rake, grubbing, ploughing or slashing major accessible areas of Lantana where not on a slope greater than 15% or where no existing native values occur; and
    - Apply broadscale herbicide and spot spray during high germination summer periods (Nov-March). Utilise organic based Lantana targeted herbicides which minimise impacts on native vegetation regenerating within and surrounding Lantana patches.
- Undertake periodical weed maintenance rotations for removal / suppression of Lantana regeneration; and
- Incorporate adaptive management principles into weed management methods to streamline overall management to the most effective control types.

Management Action Timing and Preliminary Completion Criteria

- **Year 1:** Complete detailed baseline / weed extent survey utilising an antenna-based GPS system to map the full extent of all *Lantana camara* areas within the OMZ1. Results of baseline weed extent surveys to be included in year 1 Offset Area Annual Report for inclusion in the project ACR.

- **Year 1:** Exclude cattle from within the OMZ1. By Year 2, the entire OMZ1 will retain cattle exclusion fencing (refer to **Management Action 3**).
- **Year 2 – 5:** Commence detailed weed management control activities within the OMZ1. Methods deployed are to be based on extent of infestation, existing native vegetation values, topography and sensitive receiving environments. The following methods are to be deployed:
    - Stick rake, grubbing, ploughing or slashing major accessible areas of Lantana where not on a slope greater than 15% or where no existing native values occur; and
    - Apply broadscale herbicide and spot spray during high germination summer periods (Nov-March). Utilise organic based Lantana targeted herbicides which minimise impacts on native vegetation regenerating within and surrounding Lantana patches.
- **Year 2 – 5:** Demonstrate a downward trend in the weed extent, vigor and health annually through years 2-5, achieving a significant reduction in *Lantana spp*. extent within the OMZ1 by year 5, with less than 10% of the OMZ1 area to contains weed infestations. Actions and downward trend to be reported annually in the OAAR.
- **Year 5:** Replicate detailed weed extent survey through the OMZ1 – Include plans and calculations in the Year 5 OAAR demonstrating less than 10% of the year 1 baseline survey results.
- **Year 6 – 10:** Continue to implement detailed weed management control methods – In accordance with any recommended adaptive management changes incorporated in response to Year 5 replicated baseline surveys as documented in the year 5 OAAR. Demonstrate a downward trend in the weed extent, vigor and health annually through years 6-10, achieving a further reduction in *Lantana spp*. extent within the OMZ1 by year 10, with less than 5% of the year 1 baseline survey results. Actions and downward trend to be reported annually in the OAAR.
- **Year 10:** Remobilise and replicate detailed weed extent survey through the OMZ1 – Compare and report on data in year 10 OAAR along with proposed amendments to the targeted pest management activities. Include plans and calculations in the Year 10 OAAR demonstrating less than 5% of the year 1 baseline survey results.
- **Year 11 – 19:** Continue to implement Detailed Weed Management Control Methods – In accordance with any recommended adaptive management changes incorporated in response to Year 10 replicated baseline surveys as documented in the year 10 OAAR.
- **Year 15 & Year 20:** Repeat of baseline surveys to demonstrate a maintenance of Year 10 significant reductions to the extent of *Lantana spp.* below the 5%-year 1 baseline survey results.

Management Action Responsibility

The Offset Provider will establish, resource and fund all weed management components of the Offset Management Plan. The following tasks will require specific expertise or appointed contractors to complete:

- Baseline and repeat surveys to be completed by a senior tertiary trained ecologist, or environmental scientist with a minimum of 5 years industry field experience; and
- Use of any herbicides to be undertaken by a licensed contractor or strictly in accordance with the *Agricultural Chemicals Distribution Control Act 1996* and or in accordance with manufactures recommendations or label instructions.

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

Management Action Monitoring

Completion of baseline Lantana surveys providing an actual mapped extent of infestations and occurrences in hectares to be used as the benchmark for measuring improvement. Survey methods and results provided in Year 1 Offset Area Annual Report (And incorporated in Year 1 Annual Compliance Report for the Approved Action).

Interim actions and results provided in Year 2-5 Offset Area Annual Report (published as conditioned in the relevant Annual Compliance Report for the Approved Action). Year 2 to 5 annual results are to demonstrate a downward trend in weed extent and outbreak to less than 10% of the year 1 base case data.

Replicate baseline surveys in year 5 to demonstrate less than 20% of the year 1 baseline survey extents of *Lantana camara* infestations.

Year 5 OAAR to include repeat survey methods, results data and comparative analysis demonstrating less than 20% of the year 1 baseline survey extents of *Lantana camara* infestations. Report to include any adaptive management recommended changes to weed control methods to be deployed for years 6-10. Details of surveys, results and alterations to management strategies to be provided to proponent in the Year 5 OAAR for issue to the Department in the Year 5 Annual Compliance Report for the Action.

Interim actions and results provided in Year 6-9 Offset Area Annual Report (provided as conditioned in the relevant Annual Compliance Report for the Approved Action)

Replicate of baseline surveys in year 10 to demonstrate a downward trend in the weed extent, vigor and health annually through years 6-10, achieving a further reduction in *Lantana camara* extent within the OMZ1 by year 10, with less than 5% of the year 1 baseline survey results

Year 10 OAAR to include repeat survey methods, results data and comparative analysis less than 5% of the year 1 baseline survey extents of *Lantana camara* infestations. Report to include any adaptive management recommended changes to weed control to be deployed for years 11-19. Details of surveys, results and alterations to management strategies to be provided to proponent in the Year 10 OAAR for issue to the Department in the Year 10 Annual Compliance Report for the Action.

Repeat of baseline surveys in year 15 and year 20 to demonstrate a maintenance of Year 10 significant reductions to the extent of *Lantana camara* below the 5%-Year 1 baseline survey results. Actions and results provided in Year 11 – 19 Offset Area Annual Reports of continuation of Year 10 adaptive management weed control measures and the demonstration that *Lantana camara* is maintained below 5% of the year 1 baseline survey results provided as conditioned in the relevant Annual Compliance Report for the Approved Action.

Management Action Risks and Adaptive Management

The primary weed issue through the OMZ1 is Lantana. Mapping of Lantana populations and areas is relatively simple enabling the tables in this management plan to set a number of weed reduction and management targets.

Periodical repeat survey points are designed to deliver data on outcomes being achieved. If the surveys don't demonstrate the targeted effectiveness the implementation strategy will be adjusted to:

- Adopt new management techniques
- Increase successful techniques and reduce less successful management methods
- Increase intensity of implementation program
- Change the timing or locality of proposed target treatment locations or events

5.3 Action 3: Livestock Control

Management Action Outcome

The Scenic Ridge property has historically been utilised for cattle grazing operations (refer to **Insert 1**). The property has retained extensive pasture paddocks consisting of native grasses and artificially improved introduced pastures. Cattle grazing is consistently observed on the offset land, with the intensity of grazing directly related to the density of pasture available (ie. correlated with rainfall) and the beef market prices (refer to **Photo Plate 5** for cattle grazing evidence). Given the La Nina climatic season prediction for 2020-2021 and increased beef prices, the head of cattle on the offset land have increased.

Although there is some limited research that intensive cattle grazing can result in some positive biodiversity outcomes generally cattle farming re-engineers the landscape to support predator species.

The risks of ongoing cattle grazing on the land could vary from low to medium to high subject to the future maintenance or expansion of the grazing use which is driven by a number of economic factors, however primarily the rise and fall of the beef market. Regardless the long term and current highest and best use for the land is the continuation of cattle grazing. No reduction in risk or improvement in condition or value of the koala and Grey-headed Flying-fox habitat will occur without direct intervention and a change in use (such as this offset outcome).

Fauna friendly stock exclusion fencing is the ultimate proposed solution for restricting stock from accessing the Offset Area (OMZ1).

Photo Plate 5: Evidence of cattle grazing on the Scenic Ridge property.

Management Action Location

- Livestock control is to focus on OMZ1. OMZ1 is to be fenced with fauna friendly livestock exclusion fencing.

Management Action Tasks and Completion Criteria

- Prevention and management of livestock from the OMZ1 utilising fauna friendly livestock exclusion fencing.

Management Action Risk Reduction Measures

Management actions to reduce the risk of livestock control and access and trespass management impacts on the offset land include:

- Ownership of the land by the offset provider and therefore any residual grazing activities will be secondary land uses to the approved offset outcomes;
- Implementation of a legally binding mechanism (Voluntary Declaration under the *Vegetation Management Act 1999*) which provides protection of existing and created habitat values. The Voluntary

Declaration applies the regulations of the *Vegetation Management Act 1999* to the land title which remains regardless of the transfer of ownership or sale of the land; and

- Fauna friendly livestock exclusion fencing around the perimeter of the OMZ1.

Management Action Timing and Preliminary Completion Criteria

- **Year 1:** Fencing of the OMZ1 (OMZ1) will commence immediately and will be completed by end of Year 1.
- **Year 1:** A status update on completed fencing locations will be provided in the Offset Area Annual Report (OAAR) for inclusion in the Annual Compliance Report (ACR).
- **Year 2 – 20:** All fencing is to be inspected annually and reported on in the OAAR.

It should be noted that fencing is proposed as a permanent outcome and thus, there is no currency on removal.

Management Action Responsibility

The Offset Provider will establish, resource and fund the construction, monitoring, maintenance and reporting on all fencing (using fencing contractors where deemed appropriate).

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

Management Action Monitoring

- All fencing shown on the **Plan 5** to be in place by Year 1 reporting;
- Nil stock breaches into OMZ1s from year 2-20 (post completion of all fencing);
- No reporting of stock impacts as justification for not achieving:
    - Habitat quality improvements; and
    - Weed spread targets.
- Annual documented evidence of fence monitoring and maintenance rectifications in each Offset Area Annual Reporting period from years 2-20.

Management Action Risks and Adaptive Management

Providing the right type of fencing is installed in the correct locations and monitored the risk of failure is extremely unlikely. Regardless any breach of cattle accessing the OMZ1 would be identified through the general course of offset establishment or maintenance or as part of the cattle operator's routine stock checks (typically daily). Damage as a result of a short-term breach is likely to be minimal and reversible through reinstatement works.

5.4 Action 4: Access and Trespass Management

Management Action Outcome

The Scenic Ridge property is surrounded to the south and north by large cattle grazing operations. The impacts of unlawful access and trespassing mimic those listed in the 'Livestock Control' management action section of this management plan (trampling, compacting, weed spread, fence destruction) (refer to **Section 5.3**). Without a system for identifying and preventing or controlling access and trespassing the actions established for on-site stock management will be undermined.

Management Action Location

- The OMZ1 will be fenced, however, the purpose of this management action is to target the boundary of the offset property which shares a common boundary with adjoining landholders.

Management Action Tasks and Completion Criteria

- Prevention / control of unauthorised access and trespass through the OMZ1.

Management Action Risk Reduction Measures

Management actions to reduce the risk of livestock control and access and trespass management impacts on the offset land include:

- Ownership of the land by the offset provider and therefore any residual grazing activities will be secondary land uses to the approved offset outcomes;
- Implementation of a legally binding mechanism (Voluntary Declaration under the *Vegetation Management Act 1999*) which provides protection of existing and created habitat values. The Voluntary Declaration applies the regulations of the *Vegetation Management Act 1999* to the land title which remains regardless of the transfer of ownership or sale of the land; and
- Fauna friendly livestock exclusion fencing around the perimeter of the OMZ1.

Management Action Timing and Preliminary Completion Criteria

- **Year 1:** Inspection and rectification of all external fence boundaries of the OMZ1;
- **Year 1:** Notification of OMZ1, purpose and outcomes to all adjoining land owners (where applicable); and
- **Other Action:** No new access tracks through the OMZ1 unless to support offset outcomes.

Management Action Responsibility

The Offset Provider is responsible for funding and undertaking all actions relating to access and trespass management.

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

Management Action Monitoring

- Evidence of erected fencing and notification to adjoining land owners (where applicable);
- Fence monitoring as per Management Action 3: Livestock Control; and
- No evidence of stock or illegal access influence in outcomes scheduled for the OMZ1 habitat improvement.

Management Action Risks and Adaptive Management

Given there is not legal requirement for access through the land holding (eg no formal access easement) if necessary enforcement options are available, however it is considered extremely unlikely this would be required provided alternative access points are established which do not conflict with the offset outcomes.

5.5 Action 5: MNES Habitat Restoration

Management Action Outcome

The entirety of the offset is to consist of MNES habitat restoration activities. The MNES habitat restoration is to:

- Be in accordance with the pre-clear regional ecosystem(s), being, RE12.9-10.2 and RE12.9-10.7;
- Expand the available Koala and Grey-headed Flying-fox resources through infill planting of broad hectare cleared land;
- Provide new connectivity with surrounding habitat for the protected matters and adjoins the bioregional conservation corridor; and
- Release the realisation of the mapped 'future linkage' under the Scenic Rim Biodiversity Strategy 2015-2025. This future linkage provides a critical linkage between the Wyaralong – Kooralbyn Core Habitat area the Mt Barney Core Habitat area.

MNES habitat restoration will occur through the transitioning of grassed grazing areas (OMZ1) into vegetated ecosystems supporting habitat for the koala and GHFF. In total the entire 34.7 ha is proposed for MNES habitat restoration. Restoration is a high cost and high labour intensive task from preparation to commencement through to the first 5 years of establishment. Only planning and preparation works are proposed within year 1 of the offset while beginning communication with a local nursery for stock will be conducted. All rehabilitation planting is to be completed by the end of Year 2.

The rehabilitation planting is to consist of the following species:

- *Corymbia citriodora* (Spotted Gum)
- *Angophora leiocarpa* (Smooth-barked Apple)
- *Eucalyptus crebra* (Narrow-leaved Ironbark)
- *Eucalyptus siderophloia* (Grey Ironbark)
- *Eucalyptus tereticornis* (Queensland Blue Gum)
- *Lophostemon confertus* (Brush Box)
- *Corymbia tessellaris* (Moreton Bay Ash)

At a minimum, the rehabilitation is to contain a density of 150 non-juvenile koala habitat tree stems per hectare.

Where vegetation does occur within the OMZ1, transects have been completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools to establish a base score. OMZ1 scored a 2/10 under this system for Koala habitat and a 3/10 for GHFF foraging habitat. As areas are restored, new transect locations will be established for future monitoring, however in years 1-5 for revegetation areas transect surveys will be replaced by a mix of photo monitoring / stem count / mortality rate and Projective Foliage Cover. After 5 years of established and maintained growth habitat quality transects will be re-introduced as part of survey and monitoring.

Management Action Location

- The entirety of OMZ1 is to contain MNES habitat restoration.

Management Action Tasks and Completion Criteria

- Ceasing grazing activities within the OMZ1;
- Tilling / cultivating grazed grass areas for treatment of pasture grass seedbank in preparation for planting;
- Revegetation in accordance with the pre-clear regional ecosystem technical description. The canopy planting mix is to consist of Grey-headed Flying-fox foraging tree species and non-juvenile Koala habitat tree species; and
- Monitoring and maintaining the MNES habitat restoration works until the OMZ1 is a self-sustaining regrowth vegetation community.

Management Action Risk Reduction Measures

Management actions to reduce the risk of plant stock failure impacts on the offset land include:

- Undertake soil testing for both the modified planting soil and for the planting locations;
- Match species to pre-clear regional ecosystem vegetation communities based on geography, soil and region specifications;
- Undertake planting in manageable mosaic to ensure monitoring, watering etc can be implemented as required;
- Use experienced contractors and bushland regenerators to undertake all revegetation and rehabilitation works. Ensure selected contractors included relevant insurances and payment retentions for success rates from part of contract obligations;
- Over plant all revegetation areas by 10% on allocated numbers to cater for a natural 10% failure rate; and
- Undertake planting during warmer frost-free months.

Management Action Timing and Preliminary Completion Criteria

- **Year 1:**
    - Undertake soil testing for both the modified planting soil and for the planting locations;
    - Finalise locations, sequence and timing of MNES habitat restoration program;
    - Cultivate and prepare the OMZ1 for year 2 planting;
    - Create OMZ1 water source for MNES habitat restoration activities (purpose located dam, temporary tank or slow-release gravity feed); and
    - Establish eight photo point monitoring locations and protocols for the OMZ1, as per **Figure 4**.
- **Year 2:**
    - Complete OMZ1 MNES habitat restoration activities (34.7 ha).

- **Year 3 – 20:**
    - Monitor and maintain the OMZ1 (34.7 ha MNES habitat restoration area) inclusive of rectification and replacement works for failed area or plant dieback.
- **Year 10:**
    - Complete transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools within established MNES habitat restoration area (OMZ1);
    - Undertake Koala Spot Assessment Technique to derive koala occurrence category for MNES habitat restoration area; and
    - Report on results of both surveys within the Year 10 Offset Area Annual Report inclusive of any adaptive management changes.
- **Year 15:**
    - Complete transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools within established MNES habitat restoration area (OMZ1);
    - Undertake Koala Spot Assessment Technique to derive koala occurrence category for MNES habitat restoration area; and
    - Report on results of both surveys within the Year 15 Offset Area Annual Report inclusive of any adaptive management changes.
- **Year 20:**
    - Complete transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools within established MNES habitat restoration area (OMZ1);
    - Undertake Koala Spot Assessment Technique to derive koala occurrence category for MNES habitat restoration area; and
    - Report on results of both surveys within the Year 20 Offset Area Annual Report inclusive of any adaptive management changes.

Figure 4: Photo point monitoring locations

Management Action Responsibility

The Offset Provider is responsible for:

- Funding the appointment of trained and experienced Bushland Regenerators or Revegetation contractors for the completion of all implementation works associated with revegetation areas (site preparation, planting, establishment and maintenance)
- Commissioning and funding tertiary trained ecologists for the survey, monitoring and reporting of interim and milestone revegetation outcomes.

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

Management Action Monitoring

Achievement of the results outlined in **Table 20** and **Table 21** from the replicated transect surveys completed in accordance with the Modified Habitat Quality Assessment methodology (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment methodology. Evidence through photo point monitoring of established habitat

containing NJKHTs and Grey-headed Flying-fox foraging trees. Plan of completed MNES habitat restoration extents in the Year 2 OAAR demonstrating the completion of all restoration works.

Spot Assessment Technique (SAT) surveys showing the establishment of koala usage within the OMZ1 will be undertaken every five years in accordance with milestone completion criteria.

Reporting on MNES habitat restoration activities will occur with each 12 month Offset Area Annual Report with major surveys results and adaptive management changes documented at Year 5, 10, 15 & 20.

Table 20: MHQA Completion Criteria

Assessment Unit - Regional Ecosystem	AU 1 - Non-remnant (RE12.9-10.2)														
	RE12.9-10.2 Benchmark	Transect 1	Transect 2	Average of Transect(s)	% Benchmark	Score	Year 5	Year 5 Score Increase Justification	Year 10	Year 10 Score Increase Justification	Year 15	Year 15 Score Increase Justification	Year 20	Year 20 Score Increase Justification
SITE CONDITION														
Recruitment of woody perennial species in EDL	100	0	0	0.00	0.00	0	0		0		3		3	
Native plant species richness - trees	6	3	3	3.00	50.00	2.5	2.5		5		5	Recruitment of two tree species (20% of the recruitment of woody perennial species in EDL benchmark)	5	Maintain recruitment of a minimum of two tree species (20% of the recruitment of woody perennial species in EDL benchmark)
Native plant species richness - shrubs	7	2	1	1.50	21.43	0	2.5		2.5		5	Maintain a minimum of six tree species (100% of the tree species richness benchmark)	5	Maintain a minimum of six tree species (100% of the tree species richness benchmark)
Native plant species richness - grasses	7	3	5	4.00	57.14	2.5	2.5		2.5		5	Establish a minimum of seven shrub species (100% of the shrub species richness benchmark)	2.5	Maintain a minimum of seven shrub species (100% of the shrub species richness benchmark)
Native plant species richness - forbs	13	5	4	4.50	34.62	2.5	2.5		2.5	Establish a minimum of six tree species (100% of the tree species richness benchmark)	2.5	Establish a minimum of seven grass species (100% of the grass species richness benchmark)		Maintain a minimum of seven grass species (100% of the grass species richness benchmark)
Tree canopy height (Canopy)*	21	10	10	10.00	47.62	3				Maintain a minimum of two shrub species (28.5% of the shrub species richness benchmark)		Tree species plantings to have a minimum of 5.25m height (25% of the tree canopy height benchmark)		Tree species plantings to have a minimum of 14.7m height (70% of the tree canopy height benchmark)
Tree canopy height (Sub-canopy)*	12	2	3	2.50	20.83	0		Establish a minimum of two shrub species (28.5% of the shrub species richness benchmark)		Tree species plantings to be a minimum of 5.25m height (25% of the tree canopy height benchmark)		Tree species plantings to have a minimum of 3m height (25% of the tree sub canopy height benchmark)		Tree species plantings to have a minimum of 8.4m height (70% of the tree sub canopy height benchmark)
				*Average tree canopy height		1.5	1.5	Shrub canopy cover to be a minimum of 0.6m (10% of the shrub canopy cover benchmark)	3	Tree species plantings to be a minimum of 3m height (25% of the tree sub canopy height benchmark)		Maintain a minimum shrub canopy cover of 0.6m (10% of the shrub canopy cover benchmark)		Tree canopy cover to be a minimum of 32m (50% of the tree canopy cover (canopy) benchmark)
Tree canopy cover (Canopy)**	64	0	0	0	0.00	0		Coarse woody debris to be a minimum of 50.6m (10% of the coarse woody debris benchmark)		Maintain a minimum shrub canopy cover of 0.6m (10% of the shrub canopy cover benchmark)	2	Tree canopy cover to be a minimum of 6.4m (10% of the tree canopy cover (canopy) benchmark)	5	Tree sub-canopy cover to be a minimum of 10m (50% of the tree canopy cover (sub-canopy) benchmark)
Tree canopy cover (Sub-canopy)**	20	0	0	0.00	0.00	0		Weed coverage to be less than 5% of the entire offset area (baseline weed coverage to be established in Year 1)		Organic Litter to be 4.8% of 1m X 1m quadrats (10% of the organic litter benchmark)	5	Tree sub-canopy cover to be a minimum of 2m (10% of the tree canopy cover (sub-canopy) benchmark)	5	Maintain a minimum shrub canopy cover of 6m (100% of the shrub canopy cover benchmark)
				**Average tree canopy cover		0	0		0	Maintain a minimum coarse woody debris of 50.6m (10% of the coarse woody debris benchmark)	5	Shrub canopy cover to be a minimum of 6m (100% of the shrub canopy cover benchmark)	3	Maintain organic litter at a minimum of 4.8% of 1m X 1m quadrats (10% of the organic litter benchmark)
Shrub canopy cover	6	0	0	0.00	0.00	0	3		3	Maintain weed coverage of less than 5% of the entire offset area (baseline weed coverage to be established in Year 1)	0	Maintain organic litter at a minimum of 4.8% of 1m X 1m quadrats (10% of the organic litter benchmark)	0	Maintain a minimum coarse woody debris of 50.6m (10% of the coarse woody debris benchmark)
Native grass cover*	21	18	90.4	36.13	172.06	5	5		5		2	Maintain a minimum coarse woody debris of 50.6m (10% of the coarse woody debris benchmark)	2	Maintain weed coverage of less than 5% of the entire offset area (baseline weed coverage to be established in Year 1)
Organic litter*	48	0.4	0	0.13	0.28	0	0		3		10	Maintain weed coverage of less than 5% of the entire offset area (baseline weed coverage to be established in Year 1)	10	
Large trees (euc plus non-euc) (per ha)	38	0	0	0.00	0.00	0	0		0		10		10	
Coarse woody debris (per ha)	506	72	34	35.33	6.98	0	2		2		2		2	
Non-native plant cover	0	2	11	4.33	6.33	5	10		10		10		10	
Quality and availability of food and foraging habitat	NA	1	1	1	-	1	5		5		10		10	
Quality and availability of shelter	NA	1	1	1	-	1	1		1		5		5	
				Site Condition Score (/100)		23	37.5		44.5		65.5		70.5	
				Overall Site Condition Score - out of 4		0.92	1.5		1.78		2.62		2.82	
SITE CONTEXT														
Size of patch	10	10	10	10		10	10		10		10		10	
Connectedness	5	2	2	2		2	2		2		2		2	
Context	5	4	4	4		4	4		4		4		4	
Ecological Corridors	6	4	4	4		4	4		4	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	4	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	4	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area
Role of site location to species overall population in the state	5	1	1	1		1	1		4		4		4	
Threats to the species	15	7	7	7		7	7		15		15		15	
Species mobility capacity	10	1	1	1		1	1		4		7		7	
				Site Context Score (/56)		29	29		43		46		46	
				Overall Site Context Score - out of 3		1.55	1.55		2.30		2.46		2.46	
SPECIES STOCKING RATE														
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70	5	5	5		5	5	KOALA DETECTED ADJACENT TO SITE = 5/10	15	KOALA DETECTED ON-SITE = 10/10 KOALA DISPERSING ON-SITE = 5/15 KOALA SAT SURVEY RESULTS (NIL) = 0/30		KOALA DETECTED ON-SITE = 10/10 KOALA FORAGING ON-SITE = 10/15 KOALA SAT SURVEY RESULTS (LOW) = 10/30		KOALA DETECTED ON-SITE = 10/10 KOALA FORAGING ON-SITE = 10/15 KOALA SAT SURVEY RESULTS (LOW) = 10/30
				Species Stocking Rate Score (/70)		5.00	5		15		30		30	
				Overall Species Stocking Rate Score - out of 3		0.21	0.21		0.64		1.29		1.29	
Overall Assessment Unit Score						2.69	3.26		4.73		6.37		6.57	

Table 21: GHFF FHA Completion Criteria

Assessment Unit - Regional Ecosystem	AU 1 - non-remnant RE12.9-10.2									
Site Reference	Transect 4	Transect 5	Transect 6	Average		Year 5	Year 10	Year 15	Year 20	OUT OF
	Raw Data	Raw Data	Raw Data	Score	AU Score	Score	Score	Score	Score	(X/X)
Vegetation Condition	cat X	cat X	cat X	5	5	5	5	10	10	20
Species Richness	2	1	2	1.67	5	10	10	20	20	20
Flower Score	0.72	0.81	0.6	0.71	8	8	8	8	8	10
Timing of Biological Shortages	All biological shortages covered by the species on-site	All biological shortages covered by the species on-site	All biological shortages covered by the species on-site	10	10	10	10	10	10	10
Quality of Foraging Habitat	1	1	1	1	5	10	10	20	20	20
Non-native Plant Cover	13%	3%	7%	7.66%	10	10	20	20	20	20
Site Condition Score					43	53	63	88	88	*X*
MAX Site Condition Score					*100*	*100*	*100*	*100*	*100*	*X*
Site Condition Score - out of 4					1.72	2.12	2.52	3.52	3.52	*X*
Size of patch	Patch size is greater than 200ha	Patch size is greater than 200ha	Patch size is greater than 200ha	10	10	10	10	10	10	10
Connectedness	0 active camps within 20km	0 active camps within 20km	0 active camps within 20km	0	0	0	0	0	0	10
Context	31-75%	31-75%	31-75%	6	6	6	6	6	6	10
Ecological Corridors	Sharing a common boundary	Sharing a common boundary	Sharing a common boundary	6	6	6	6	6	6	10
Role of site location to species overall population in the state	0	0	0	0	0	0	0	0	0	10
Threats to the species	10	10	10	10	10	10	10	10	10	10
Site Context Score					32	32	32	32	32	*X*
MAX Site Context Score					*60*	*60*	*60*	*60*	*60*	*X*
Site Context Score - out of 3					1.60	1.60	1.60	1.60	1.60	*X*
GHFF Foraging Tree Density	0	0	0	0	0	4	6	7	7	10
Species Stocking Rate Score					0	5	6	7	7	*X*
MAX Species Stocking Rate Score					*10*	*10*	*10*	*10*	*10*	*X*
Species Stocking Rate Score - out of 3					0.00	1.50	1.80	2.10	2.10	*X*
Total					3.32	5.22	5.92	7.22	7.22	

Management Action Risks and Adaptive Management

The potential for large scale revegetation to fail can occur from controllable factors (poor soil preparation, planting stock or maintenance regime) or external events (extreme frost, pest invasion, drought, flood or major wind). Losses from these factors will be catered for in two ways:

1) Contractual obligations of appointed bushland regenerators or revegetation contractors to ensure retention funds and minimum success rates (eg contractor responsible for replacement and re-establishing failed stock or areas); and
2) Contractor & Offset Provider will have insurance for major external events.

Criteria for successful offset outcomes for this zone are established in this management plan and the approval of the project. If revegetation fails, it will need to be replaced. If growth rates are below expectations the tenure of the offset period will increase until targeted outcomes have been demonstrated as achieved.

6. Corrective Actions

Table 22 outlines a number of triggers and corrective actions which are to be implemented in instances of non-compliance or the lack of success toward the gradual achievement of the completion criteria identified during internal (annual) monitoring and major milestone monitoring events (every 5 years).

Table 22: Triggers and Corrective Actions (including timeframes)

Triggers	Corrective Actions	Timeframes for Corrective Actions
Trees and plantings showing signs of ill health, decline or death.	• The restoration contractor will engage a suitably qualified professional to identify the likely cause of health decline • Apply recommended mitigation measure/s to improve growing conditions (as recommended by the suitably qualified professional) • Remove ill or dead plantings, undertake any remediation works and re-establishment planting	• Engage the suitably qualified professional within three months of detection • Implement recommended mitigation measures within six months of detection • Remove ill or dead plantings and undertake remediation works within six months of detection
Weed re-establishment	• Immediately treat all WoNs, particularly *Lantana camara,* with delicate methods to avoid impacts to restoration works (mechanically or chemically dependent on circumstances) • Undertake an investigation of the potential source point of seeding • Additional treatment and removal works are to be followed up during the next potential growth period to avoid any regeneration and potential seeding events	• Within three months of detection, noting that treatment during non-growth periods may be ineffective and are best targeted during growth periods for greater effectiveness • Within three months of detection • Within six months of initial detection
Plant failure (>10% of stock) during the establishment period	• Supplementary planting will be undertaken • Should the planting fail again, the contractor is to engage a	• Within six months or the next appropriate planting period (whichever comes first) of detection

	suitably qualified professional to identify the likely cause of plant failure • Apply recommended mitigation measure/s to improve growing conditions (as recommended by the suitably qualified professional)	• Within month of detection • Apply in alignment with the recommendations made by the suitably qualified professional
Coarse woody debris is failing to become present naturally	• The selective removal of limbs, shrubs, or trees (particularly from the shrub layer were forming dense thickets) • Importation of felled native timber from known impact areas where it would ordinarily be mulched and sent to land fill	• At the 5, 10, 15 and 20 year monitoring events • At the 5, 10, 15 and 20 year monitoring events
Growth rates not as expected	• Engage a suitably qualified professional to review the plantings and advise on methods to increase growth rates through other interventions • Undertake soil testing to determine what rate of soil ameliorants or fertilizers may be required to improve the chemical balance of the soils for improved plant growth • Revise management actions for offset • Discuss with the Department of Agriculture, Water and the Environment to negotiate changes to timeframes to meet the completion criteria • Revise OMP and submit to Minister for the Environment for approval	• Within three months of detection • Within three months of detection • Within 12 months of detection • Within 24 months of detection if the corrective actions have not amended the slowing growth rates • Within 24 months of detection if the corrective actions have not amended the slowing growth rates
Stochastic or nuisance events	• While such events (eg. Fire, flood, drought, vandalism etc) are rare and can be managed by	• Within six months of the event

	the contractor, where events take place, restoration works are to replace losses and reporting to the DAWE is required • Evidence of impacts and rectification measures are to be issued to the DAWE within three months	• Within six months of rectification
Ongoing presence of pest fauna (eg. Feral dogs)	• Where recurrent pest animal species are detected, re-engagement with the surrounding landholders and SRRC to re-deploy management measures. Should recurrent pest fauna be observed going forward, revised management measures to include more site specific measures including targeted baiting and/or trapping	• Within three months of continued presence identification
Monitoring and reporting illustrates that KPIs are unlikely to be achieved at the end of the 20 year management timeframe and other corrective actions are failing to progress the achievement of the KPI	• Engage a suitably qualified professional to review the plantings and advise on methods to increase growth rates through other interventions • Undertake soil testing to determine what rate of soil ameliorants or fertilizers may be required to improve the chemical balance of the soils for improved plant growth • The proponent / approval holder will request an extension to the 20 year management timeframe from the Minister • Revise the management actions for the offset	• Within three months of detection • Within three months of detection • Within 24 months of detection if corrective actions have not amended the slowing growth rates • Within 24 months of detection if corrective actions have not amended the slowing growth rates

	• Extend timeframes to meet completion criteria • Revise the OMP and submit to the Minister for the Environment for approval	• Within 24 months of detection if corrective actions have not amended the slowing growth rates • Within 24 months of detection if corrective actions have not amended the slowing growth rates

7. Risk Management

A limited number of risks associated with climate change, pest control, large scale rehabilitation and grazing land uses are evaluated for the Offset property. Risks are generally described and assessed against the likelihood and consequence model outlined in the Commonwealth Government's Department of Environment – *Environmental Management Plan Guidelines* (2014). The following risk factors are considered in more detail in this OMP:

- Risk 1: Wildfire;
- Risk 2: Drought;
- Risk 3: Shifting habitat range;
- Risk 4: Plant stock failure;
- Risk 5: Feral animal control;
- Risk 6: Weeds of National Environmental Significance increased infestations; and
- Risk 7: Livestock control and access and trespass management.

Table 23: Risk Rating Table (DAWE, 2022)

RISK MATRIX	
Likelihood (L): A qualitative measure of likelihood how likely is it that this event/circumstances will occur both before and after management activities are implemented	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Consequence (C): Qualitative measure of what will be the consequence/result if the issue does occur	
Minor	Minor incident of environmental damage that can be reversed (*e.g. short-term delays to achieving strategy objectives, implementing low-cost, well-characterised corrective actions*)
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. short-term delays to achieving strategy objectives, implementing well-characterised, high cost/effort corrective actions*)
High	Substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions*)
Major	Major loss of environmental amenity and real danger of continuing (*e.g. strategy objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies*)
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage (*e.g. strategy objectives are unable to be achieved, with no evidenced mitigation strategies*)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

7.1 Risk 1: Bushfire

The offset land retains little to no existing vegetation, however, its proximity to surrounding vegetation increases the risk of wildfire on the site, and as such, it is reflected as high and very high-risk fuel loads for wildfire in both State Government and Scenic Rim Regional Council mapping (refer to **Figure 5**). The last recorded bushfire within the vicinity of the offset property occurred in October 2020. The bushfire was contained by rural fire services and did not require residents to evacuate, with no recorded damage to people or property. The OMZ1 was not impacted by this bushfire.

The offset land retains limited vegetation interspersed with open pasture land and includes a system of boundary line firebreaks and access tracks for the protection of stock and farming infrastructure. This fire management system will be maintained as the offset property transitions from open pasture to MNES habitat restoration as specific offset activities are sequentially completed.

The overall assessment of bushfire risk is that their occurrence is **unlikely** within the life of the offset and consequences of such an event would be **moderate**. Without intervention and management, bushfire is evaluated as a **low risk** to this offset project. Refer to **Table 24** for the initial risk rating calculation.

Table 24: Bushfire Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions to reduce the risk of bushfire impacts on the offset land include:

- Maintain existing bushfire breaks between adjacent landholders, in particular along the boundaries where the State Planning Policy bushfire hazard mapping indicates there is a 'high' or 'very high' risk of bushfire occurring;
- Cooperate with the local Queensland rural fire service, Scenic Rim Regional Council and adjoining land owners to minimise bushfire risk at a regional scale; and
- Undertake a feasibility assessment on insurance for plant stock replacement.

Through the implementation of the management actions listed above and corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **rare** that it would occur within the life of the offset and the consequences of such an event would be **moderate**. With intervention and management, the residual risk of a bushfire is evaluated as a **low risk** to this offset project. Refer to **Table 25** for the residual risk rating calculation

Table 25: Bushfire Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High

	Rare	Low	Low	Low	Medium	High

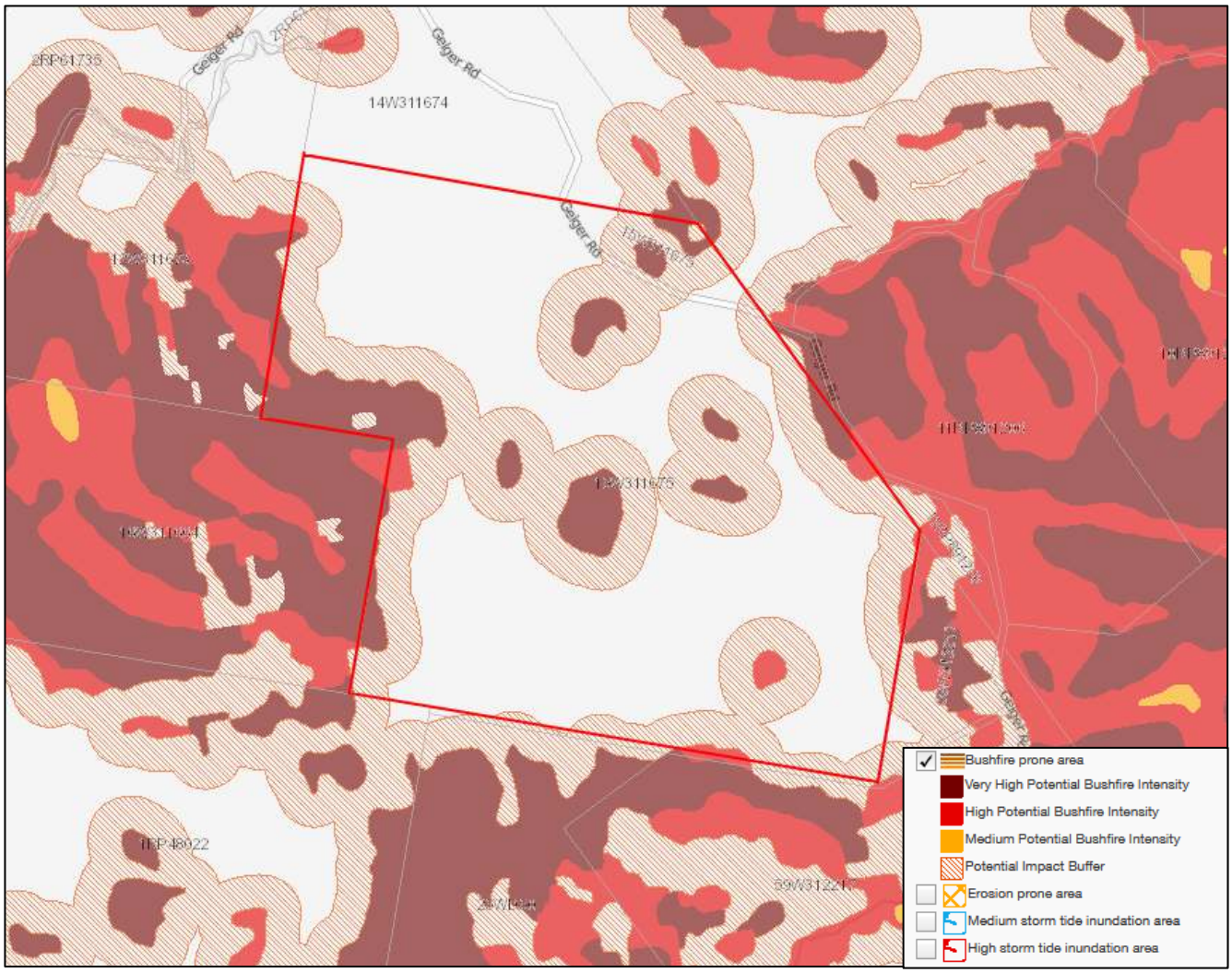


Figure 5: State Planning Policy bushfire hazard mapping (source: Queensland Government 2021)

7.2 Risk 2: Drought

In May 2019 the Queensland Government declared the Scenic Rim Regional Council amongst a number of Local Government Areas as a drought area for the purposes of accessing funding and concessions for rural land holders. As of 1 December 2020, this declaration remains, despite several localised recent rain events. The total rainfall received in Boonah (nearest rain data collection centre) totalled 268.00 mm. This is 490.1 mm below the historical annual rainfall average for the local area. In contrast, the year of 2020 resulted in 741.00 mm of rain recorded, while to date in 2021 (20 days), a total of 125 mm has already been recorded.

The Climate Change Adaptation Strategies for the Koala prepared by Christine Adams-Hosking concluded that the highest probability of koala presence occurred at a mean annual rainfall of 700mm (Adams-Hosking *et al.*

2011). Therefore, despite unprecedented drought conditions, the offset property maintains rainfall similar to the optimal range to support koala presences.

The overall assessment of drought risk is that its occurrence is **likely** within the life of the offset and consequences of such an event would be **moderate**. Without intervention and management, drought is evaluated as a **medium risk** to this offset project. Refer to **Table 26** for the initial risk rating calculation.

Table 26: Drought Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions to reduce the risk of drought impacts on the offset land include:

- Ensure offset design includes restoration and connection to higher moisture content soils associated with gully lines;
- Maintain site dams and waterbodies for use in offset MNES habitat restoration activities and as water sources for native animals; and
- Consider small 'turkey' dams as part of upper ridge rehabilitation for the purposes of water access for fauna and the creation of patches of high moisture soils and vegetation.

Through the implementation of the management actions listed above and corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **likely** that it would occur within the life of the offset and the consequences of such an event would be **moderate**. With intervention and management, the residual risk of a drought is evaluated as a **medium risk** to this offset project. Refer to **Table 27** for the residual risk rating calculation.

Table 27: Drought Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

7.3 Risk 3: Shifting Habitat Range

A number of contemporary case studies and research papers have investigated the combined weather characteristics of climate change on the current and future distribution of suitable Koala habitat into the future. Koalas are considered to be at risk of these factors because of their low tolerance to adapt to environmental changes combined with the number of existing non-climatic related threats already well documented. More recently both species and their habitat have been affected nationally by the 2019-2020 bushfires. GHFF are also considered to be affected by climate change, however most studies relate to the increased temperatures at the camp and roosting sites, with less material available on their foraging range. The proposed offset provides foraging habitat and thus not directly influence temperatures at the roosting locations, which periodically shift for a range of factors.

The Climate Change Adaptation Strategies for the Koala by Christine Adams-Hosking applied climate change distribution models for the koala and five of its essential eucalypt food trees to a conservation prioritisation framework ('Zonation'), to determine which Queensland local government areas (LGAs) were the highest priority for koala conservation and adaptation. The study included current (2011) and future predicted koala habitat distribution in 2070 showing a substantial migration eastward. The study further concludes that:

"*The highest probability of koala presence occurred at a mean maximum summer temperature of approximately 27oC and a mean annual rainfall of approximately 700 mm" (Adams-Hosking, C., Grantham, H. S., Rhodes, J.R., McAlpine, C. and Patrick T. Moss (2011). Modelling climate-change-induced shifts in the distribution of the koala. Wildlife Research, 38, 122–130)*.

As previously stated the offset land average rainfall in 2019 was 268 mm down on the annual rainfall average of 741 mm, however these results have occurred while the LGA was declared in a drought situation, with this being the lowest ever annual rainfall recording for the local area (Kalbar rainfall data collection centre first recorded rainfall data in 1887). Additionally, the mean recorded minimum and maximum temperatures for the region are 13.1°C to 27.1°C, thus even with predicted temperature increases the offset land would remain around the noted 27°C mean maximum parameter of the study. The land is also located within the current and 2070 koala habitat distribution maps based on the A1F1 climate change scenario (Adams-Hosking, et al, 2011).

At the site scale the offset design is founded in the re-establishment of connected koala habitat along gully lines and through higher moisture content soils. The design will connect existing low range and foothill habitat with gully lines and contiguous koala habitat within a known biodiversity corridor which contains all necessary habitat criteria.

The overall assessment of shifting habitat range risk is that its occurrence is **unlikely** within the life of the offset and consequences of such an event would be **high**. Without intervention and management, shifting habitat range is evaluated as a **low risk** to this offset project. Refer to **Table 28** for the initial risk rating calculation.

Table 28: Shifting Habitat Range Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions to minimise the risk of shifting habitat range on the offset land include implementing the risk management actions outlined in **Section 7.1, 7.2** and **7.3**.

Through the implementation of the management actions listed in **Section 7.1, 7.2** and **7.3** and corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **high**. With intervention and management, the residual risk of a shifting habitat range is evaluated as a **low risk** to this offset project. Refer to **Table 29** for the residual risk rating calculation.

Table 29: Shifting Habitat Range Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

7.4 Risk 4: Plant Stock Failure

The entirety of the OMZ1 requires significant MNES habitat restoration activities. In projects that include wholesale restorations works, the risk exists for planting stock to fail in large volumes due to:

- Poor soil quality or incompatible match of soils to replanted vegetation types;
- Weather related impacts – frost / prolonged dry periods, excessive heat or cool periods;
- Poor quality planting stock or the sourcing of planting stock from a different geographic region; and
- Lack of appropriate planting area preparation – weed removal / pasture seed removal / cultivation, etc.

The majority of these challenges are expected to be managed through the use of experienced bushland regeneration experts and contractors with relevant insurance and payment retentions. Failure of planting stock

is primarily an economic impact for this project as the OMZ1 will not achieve committed condition improvement and habitat expansion targets without rectification of planting works.

The overall assessment of plant stock failure risk is that its occurrence is **possible** within the life of the offset and consequences of such an event would be **major**. Without intervention and management, plant stock failure is evaluated as a **high risk** to this offset project. Refer to **Table 30** for the calculation of risk rating.

Table 30: Plant Stock Failure Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions that will be implemented to reduce the risk of plant stock failure impacts on the offset land include:

- Undertake soil testing for both the modified planting soil and for the planting locations;
- Match species to pre-clear regional ecosystem vegetation communities based on geography, soil and region specifications;
- Undertake planting in manageable mosaic to ensure monitoring, watering etc can be implemented as required;
- Use experienced contractors and bushland regenerators to undertake all revegetation and rehabilitation works. Ensure selected contractors included relevant insurances and payment retentions for success rates from part of contract obligations;
- Over plant all revegetation areas by 10% on allocated numbers to cater for a natural 10% failure rate; and
- Undertake planting during warmer frost-free months.

Through the implementation of the management actions listed above and the corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **moderate**. With intervention and management, the residual risk of plant stock failure is evaluated as a **low risk** to this offset project. Refer to **Table 31** for the residual risk rating calculation.

Table 31: Plant Stock Failure Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

7.5 Risk 5: Feral Animal Control

The Department of Agriculture and Fisheries (DAF) lists feral dogs as abundant and widespread throughout the Scenic Rim region. Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are listed as declared pest animals by Scenic Rim Regional Council, with the local council website documenting that the impact of wild dog activity has increased in the past 10 years due mainly to the increasing population in the region. Further, residents are increasingly engaged in raising livestock and poultry, resulting in a readily available food sources for wild dogs (SRRC 2021). The Scenic Rim Regional Council currently runs baiting, shooting and trapping programs throughout the region.

Evidence of wild dog predation on livestock was recorded on the offset property. Research by Pest Animal Management QLD (2020) found that the Scenic Rim region contains an abundance of wild dogs, with evidence indicating that calf predation has increased significantly.

The overall assessment of feral animal control risk is that its occurrence is **possible** within the life of the offset and consequences of such an event would be **moderate**. Without intervention and management, feral animal control is evaluated as a **medium risk** to this offset project. Refer to **Table 32** for the calculation of risk rating.

Table 32: Feral Animal Control Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions to reduce the risk of feral animal predation impacts on the offset land include:

- Undertake baseline and periodical surveys and monitoring of feral animal populations, locations and dispersal patterns within the Offset property (Survey methods to include – direct observation / remote sensor camera and sand traps for print record). Develop a base line of feral animal populations and 'hot spots' and key activity periods (eg dusk);
- Develop a purpose built offset property Pest Management Action Plan – method to include trapping, shooting, baiting. Develop an adaptive management approach to pest management which considers each method relative to the base line data collected to determine the most effective pest management measures for the offset property; and
- Undertake stakeholder engagement with immediate land holders to foster joint sub regional scale action plan.

Through the implementation of the management actions listed above and the corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **possible** that it would occur within the life of the offset and the consequences of such an event would be **minor**. With intervention and management, the residual risk of feral animal control is evaluated as a **low risk** to this offset project. Refer to **Table 33** for the residual risk rating calculation.

Table 33: Feral Animal Control Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

7.6 Risk 6: Weeds of National Significance Increased Infestations

Preliminary site surveys and observations over the offset land recorded a number of weed species, with the most prevalent and inhibitive to Koala movement and habitat restoration being *Lantana camara*. The Scenic Rim Regional Council Biosecurity Plan aims to control declared pest plants within the region. This plan includes information and strategies for landholders to effectively manage pest species. *Lantana camara* is listed as a declared pest plant within the Scenic Rim region.

Lantana camara is listed as a 'weed of national significance' under the EPBC Act. Further, in 2006, the NSW Government nominated *Lantana camara* as a key threatening process under the EPBC Act.

Lantana camara occurs on the offset land both in open paddock areas as isolated clusters and thickets and as a dominant shrub in gully lines. Within open areas existing farm practices result in periodical pesticide application limiting spread, however, this does not occur to the extent of entire eradication as the costs of treatment to

result in an economical return for the grazing benefit are non-existent. An exact volume or extent of Lantana at the offset property has not been calculated.

Lantana infestations suppress and inhibit the natural regeneration of regrowth vegetation on-site which directly limits the growth rates and regeneration of non-juvenile koala habitat trees and Grey-headed Flying-fox foraging tree species. Although baseline data is limited to the survey events undertaken for this EPBC Application research infers the highly invasive and spreading nature of the species, coupled with the in-active management in areas would result in progressive increases as local climatic events align with optimal germination and seeding periods. In areas blanket layers of *Lantana camara* additionally form a barrier to terrestrial species, which would include limiting the Koalas ability to access areas containing and over-canopy of NJKHTs.

The overall assessment of weeds of national significant increased infestation risk is that its occurrence is **highly likely** within the life of the offset and consequences of such an event would be **high**. Without intervention and management, WoNS increased infestations is evaluated as a **high risk** to this offset project. Refer to **Table 34** for the calculation of risk rating.

Table 34: Weeds of National Significance Increased Infestations Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions to reduce the risk of weeds of national significant increased infestation impacts on the offset land include:

- Use an Antenna based GPS system to map the full extent (as description polygons) of all *Lantana camara* areas within the OMZ1 (achieve a total ha extent of weed infestations / occurrences within the OMZ1);
- Exclude stock (cattle) access from *Lantana camara* infestation areas within the OMZ1 (grazing cattle provide the most continuous source of *Lantana camara* spread);
- Undertake detailed weed management control activities within the OMZ1. The following methods are to be deployed:
    - Stick rake, grubbing, ploughing or slashing major accessible areas of Lantana where not on a slope greater than 15% or where no existing native values occur; and
    - Apply broadscale herbicide and spot spray during high germination summer periods (Nov-March). Utilise organic based Lantana targeted herbicides which minimise impacts on native vegetation regenerating within and surrounding Lantana patches.
- Undertake periodical weed maintenance rotations for removal / suppression of Lantana regeneration; and

- Incorporate adaptive management principles into weed management methods to streamline overall management to the most effective control types.

Through the implementation of the management actions listed above and the corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **minor**. With intervention and management, the residual risk of increased infestations of WoNS is evaluated as a **low risk** to this offset project. Refer to **Table 35** for the residual risk rating calculation.

Table 35: Weeds of National Significance Increased Infestations Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

7.7 Risk 7: Livestock Control and Access and Trespass Management

The Scenic Ridge property has historically been utilised for cattle grazing operations. The property has retained extensive pasture paddocks consisting of native grasses and artificially improved introduced pastures. Cattle grazing is consistently observed on the offset land, with the intensity of grazing directly related to the density of pasture available (ie. correlated with rainfall) and the beef market prices. Given the La Nina climatic season prediction for 2020-2021 and increased beef prices, the head of cattle on the offset land have increased.

The risks of ongoing cattle grazing on the land could vary from low to medium to high subject to the future maintenance or expansion of the grazing use which is driven by a number of economic factors, however primarily the rise and fall of the beef market. Regardless the long term and current highest and best use for the land is the continuation of cattle grazing. No reduction in risk or improvement in condition or value of the koala and Grey-headed Flying-fox habitat will occur without direct intervention and a change in use (such as this offset outcome).

The Scenic Ridge property is surrounded to the south and north by large cattle grazing operations. The impacts of unlawful access and trespassing mimic those listed in the 'Livestock Control' management action section of this management plan (trampling, compacting, weed spread, fence destruction). Without a system for identifying and preventing or controlling access and trespassing the actions established for on-site stock management will be undermined.

The overall assessment of livestock control and access and trespass management risk is that its occurrence is **possible** within the life of the offset and consequences of such an event would be **high**. Without intervention and management, livestock control and access and trespass management are evaluated as a **medium risk** to this offset project. Refer to **Table 36** for the calculation of risk rating.

Table 36: Livestock Control and Access and Trespass Management Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Management actions to reduce the risk of livestock control and access and trespass management impacts on the offset land include:

- Ownership of the land by the offset provider and therefore any residual grazing activities will be secondary land uses to the approved offset outcomes;
- Implementation of a legally binding mechanism (Voluntary Declaration under the *Vegetation Management Act 1999*) which provides protection of existing and created habitat values. The Voluntary Declaration applies the regulations of the *Vegetation Management Act 1999* to the land title which remains regardless of the transfer of ownership or sale of the land; and
- Fauna friendly livestock exclusion fencing around the perimeter of the OMZ1.

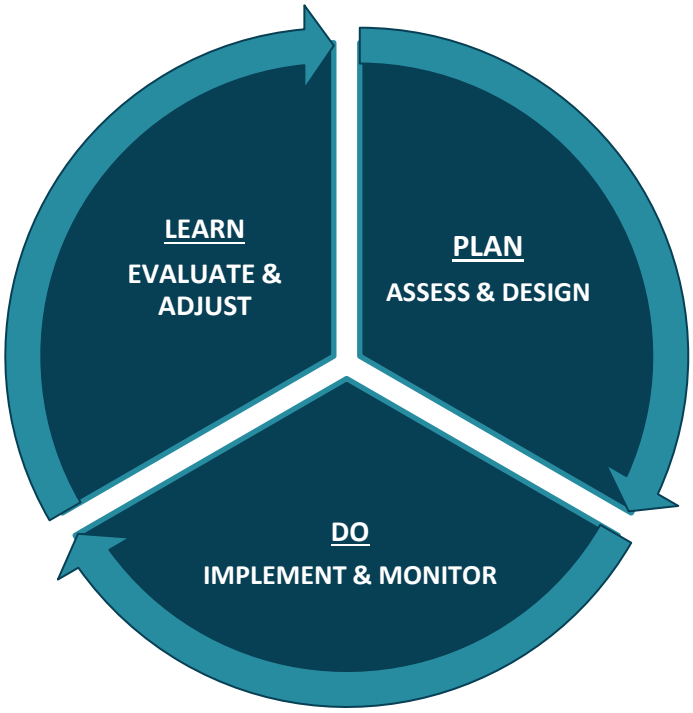
Through the implementation of the management actions listed above and the corrective actions listed in **Section 6**, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **minor**. With intervention and management, the residual risk of unauthorised livestock control, access or trespass is evaluated as a **low risk** to this offset project. Refer to **Table 37** for the residual risk rating calculation.

Table 37: Livestock Control and Access and Trespass Management Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

8. Adaptive Management

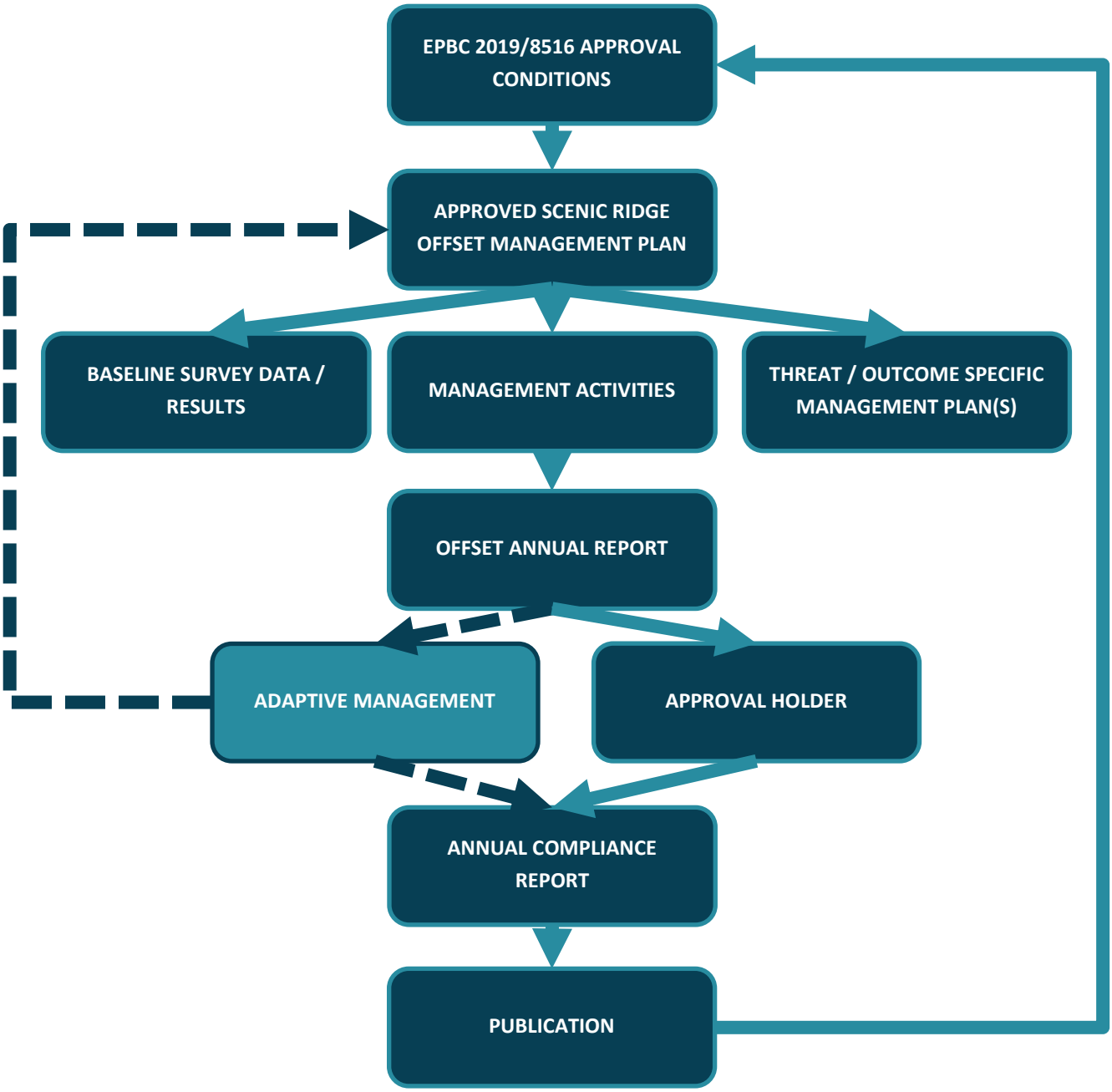
This Offset Management Plan adopts a number of 'adaptive management' procedures both as a governing principle and within specific management activities. Most management activity table topics incorporate detailed baseline survey and data collection to be periodically repeated through the Offset Period and utilised for iterative changes to management implementation, particularly for stochastic habitat risks and threats. The primary purpose of adaptive management procedures for the Scenic Ridge OMZ1 is to allow on-ground monitoring and experiences on the most effective measures to feed into amendments to the OMP which focus on best return in Grey-headed Flying-fox and Koala Habitat outcomes for investment made.



Offset Management Plan Reporting Structure

As part of the commercial agreement between HB Doncaster Pty Ltd and One Environment all surveys, results, management activities statuses, alterations or amendments are recorded within an Offset Area Annual Report (OAAR) By executed contract each Offset Area Annual Report is to be completed by the Offset Provider (One Environment) and issued to the Proponent (HB Doncaster Pty Ltd) within 30 days of each 12 months anniversary of the documented commencement of the action. This commitment is purposely documented to ensure adequate time is provided to the proponent to evaluate and utilise the Offset Area Annual Report in preparing the Approved Action Annual Compliance Report. Although the reports precise inclusion in the ACR will be

dictated by the proponent it is forecasted the Offset Area Annual Report will be an appendices to the ACR with specific aspects relevant to conditioned offset outcomes extracted and referenced within the compliance tables.



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Appendices

Appendix A – Preliminary Documentation: Detailed Offset Chapter

Appendix B – Impact Site MHQA and GHFF FHA Results

Appendix C – Case Study Examples

Appendix A – Preliminary Documentation: Detailed Offset Chapter

6. Offsets

The DAWE state that, *in the event that there are significant impacts that cannot be avoided or mitigated, an offset to compensate for any predicted or potential residual significant impacts on threatened species and ecological communities must be provided for each protected matter.*

This section responds to Item 5 of the PD request which requires, *the preliminary documentation must demonstrate how the offset proposal meets the principles specified in the EPBC Act Environmental Offsets Policy, including (but not limited to):*

a. *Directly contributes to the ongoing viability of the relevant EPBC listed species or ecological community.*
b. *Deliver an overall conservation outcome that improves or maintains the viability of the protected matter in the region, as compared to what is likely to have occurred under the status quo, i.e. if neither the action not the offset had taken place.*
c. *Deliver an outcome that is targeted as the conservation needs of a species. For example, where the primary threat to a species is the ongoing clearing of habitat across its range, revegetation to create new habitat may achieve a better outcome than improving or protecting existing area of habitat.*
d. *Legally securing the site for conservation purposes for at least the duration of the impact.*
e. *Be in a location that will deliver a conservation outcome over the long term. For example, refugia habitat likely to persist under a changing climate, or located within an area where connectivity will not be interrupted by future development, and/or be located as close to the impact site as possible to benefit the individuals or population directly affected by the proposed action.*

Weiya Development Pty Ltd have entered into a legal agreement with **Habitat Exchange Solutions Pty Ltd** (Offset Provider) (HES) for the delivery of environmental offsets for impacts on Koala habitat and Grey-headed Flying-fox foraging habitat. This Offset Assessment Chapter has been prepared by the Saunders Havill Group using technical information collected from the offset site and detailed management and improvement actions documented in the Habitat Exchange Solutions Scenic Ridge Offset Management Plan 2020 (*Habitat Exchange Solutions, December 2020 – Attachment OC1*).

To satisfy the environmental offset requirements for **Weiya Development Pty Ltd.** 9.96 hectares (ha) of quantum impact on habitat critical to the survival of the Koala and 9.96 ha of quantum impact on foraging habitat for the Grey-headed Flying-fox, **HES** will legally secure, revegetate and manage 34.7 ha of land located at Scenic Ridge. The Scenic Ridge property adjoins the *South East Queensland Regional Plan – Regional Biodiversity Corridor and the State-wide Regional Terrestrial Corridor #34* (Mount Barney to Karawatha Terrestrial Corridor) (refer to **Plan OC1** – Biodiversity Corridors). The State-wide Regional Terrestrial Corridor #34 extends from Mount Barney National Park to Flinders Peak to Karawatha (via. Knapp Creek, Flinders Peak and Mount Perry Conservation Parks) (DEHP 2016). The State-wide Regional Terrestrial Corridor #34 is significant as it links a major east-west State terrestrial corridor to four (4) regional terrestrial corridors in the north, intersects with riparian corridors, incorporates altitudinal and climatic gradients, connects large fragmented patches of

lowland remnant vegetation to remnant at higher elevations at the southern end point of the corridor, links protected area estates and falls partially within the Great Eastern Ranges corridor.

In order to establish the quantum impact on habitat critical to the survival of the Koala and foraging habitat for the Grey-headed Flying-fox, SHG undertook detailed ecological surveys of the impact site utilising the *Modified Habitat Quality Assessment* (MHQA) tool and the *Grey-headed Flying-fox Foraging Habitat Assessment* (GHFF FHA) tool. The results and data records are included in **Attachment OC2**. This data was collated and utilised to calculate the habitat value and improvement opportunities.

HES has entered into commercial terms to legally secure, improve and long-term manage 34.7 ha of land at Scenic Ridge. Following a number of preliminary ecological field surveys, the 34.7 ha offset site was assessed using the identical MHQA tool, GHFF FHA tool and relevant components of the DAWE *EPBC Act Environmental Offset Policy* (2012) including analysis using the *Offset Assessment Guide* (OAG). The OAG indicates the proposed Offset Area located at Scenic Ridge will offset 100% of the Weiya Development Pty Ltd Collingwood Park project's 9.96 hectare quantum impact on critical Koala habitat and 100% of the 9.96 hectare quantum impact on Grey-headed Flying-fox foraging habitat.

PLAN OC1 - Biodiversity Corridors

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FILE NAME: 9641 E OC1 Location of Bioregional Corridor Extent B

Version - B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 50 100 200 300 400 Metres

11/05/2021 *1:9,500*

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1
- SEQ Regional Plan - Biodiversity Corridors

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HABITAT EXCHANGE SOLUTIONS

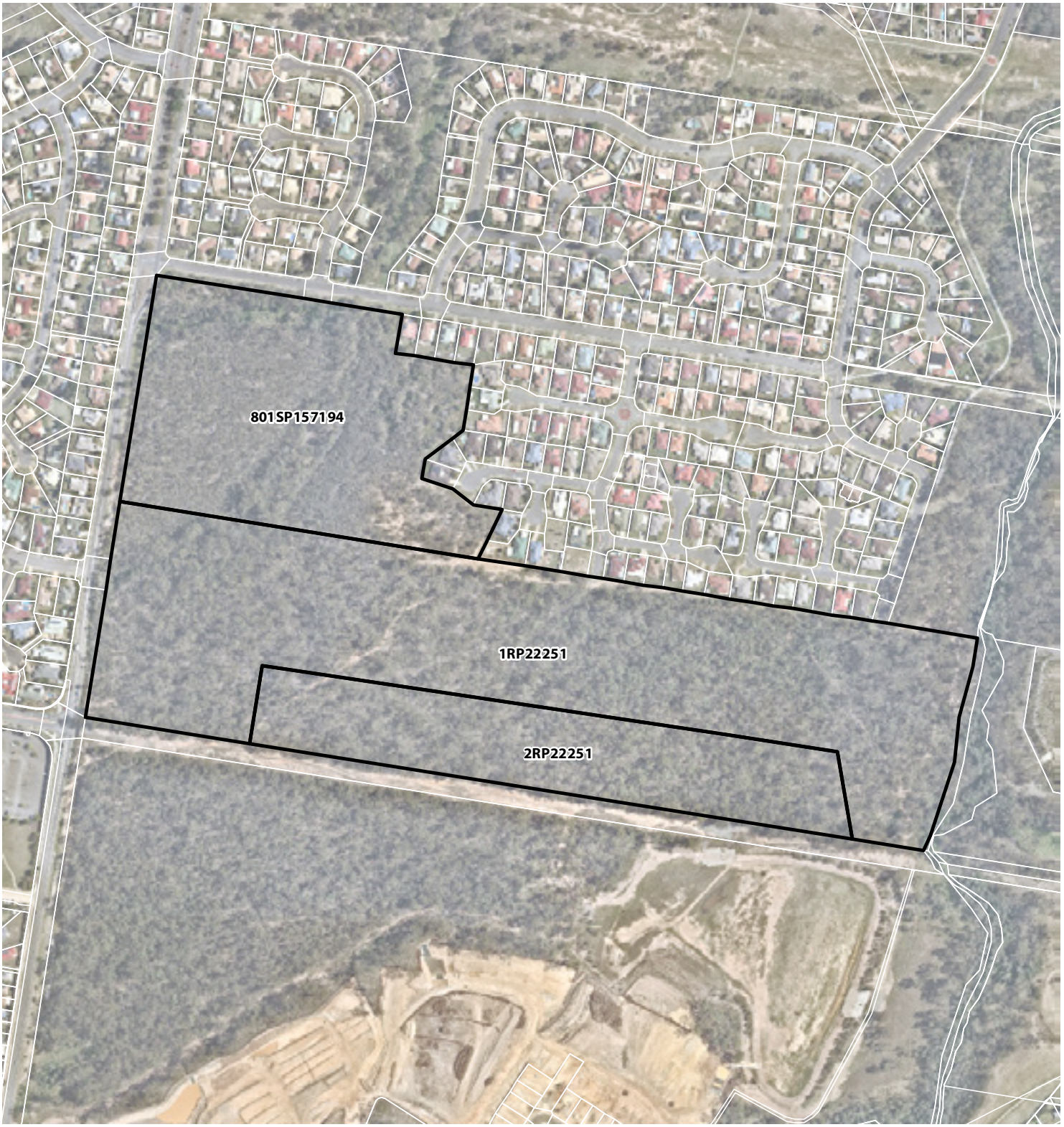
6.1. Impact Site Location and Details

The impact site is located at Collingwood Drive, Collingwood Park, Queensland, and is located approximately 10 km east of the Ipswich Town Centre. The project area is bound by Collingwood Drive to the west, Goodna Creek to the east and residential development to the north. The unformed Eagle Street and future Woodlinks residential development exists to the south of the project area (EPBC Act reference 2013/6866). The land comprises of the following cadastral allotments (refer to **Figure OC1**):

- Lot 801 on SP157194
- Lot 1 on RP22251; and
- Lot 2 on RP22251.

The land tenure is freehold and is located within the Ipswich City Council local government area, where it retains a low density residential land use zoning.

Figure OC1 Impact Site Allotments



HABITAT EXCHANGE SOLUTIONS

Legend

Impact Site Alloments

Qld DCDB

N

0 50 100 200 Metres

11/05/2021 *1:5,500*

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

Version - B

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6.2. Offset Site Location and Details

Scenic Ridge is located on Geiger Road, Allandale. The property is within the Scenic Rim Regional Council and is approximately 7 km west of the Boonah township. The Scenic Ridge property is entirely contained on Lot 15 on W311675 (refer to **Figure OC2**).

The land tenure of Scenic Ridge is freehold, where it retains a *rural* land use zoning under the Scenic Rim Planning Scheme 2020. The offset site can be accessed via Geiger Road to the north which is a rural road off Allandale Road. From boundary to boundary, the offset site is located approximately 45 km south of the impact site.

The land has historically been utilised as cattle grazing enterprise at varying intensities throughout the decades. As shown in the 1955 historical aerial imagery (refer to **Insert OC1**), the site had been extensively cleared and maintained. To date, the site has retained the extensively cleared values, with limited regrowth allowed to establish before being cleared and managed by the landholder to improve grazing pastures.

Insert OC1: 1955 historical aerial imagery of the proposed offset site.

Figure OC2 Offset Site Allotments

HABITAT EXCHANGE SOLUTIONS

Legend

Offset Site Alloments

Qld DCDB

N

0 50 100 200 300 400 Metres

11/05/2021 *1:11,500*

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

Version - B

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6.3. General Suitability EPBC Offset Policy Criteria

No.	Offset Suitability Criteria	Scenic Ridge Offset Area
1	*Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action*	The Offset Area delivers a conservation gain for the Koala and Grey-headed Flying-fox through: a) The creation of new habitat for both protected matters through the revegetation of 34.7 ha. b) Providing new connectivity with surrounding habitat for the protected matters. c) Introducing, funding and continually improving Offset Area Management Actions to reduce and manage threats (wild dogs, Lantana) in created habitat areas. d) Averting the direct and indirect losses via declaring the land a Voluntary Declaration area for High Value Conservation under the *Vegetation Management Act 1999*. This removes future wholesale and selective clearing opportunities and through the management plan removes ongoing impacts caused by livestock intrusion into habitat areas. e) Provides a 34.7 ha environmental offset adjoining a regional mapped biodiversity conservation corridor.
2	*be built around direct offsets but may include other compensatory measures*	The Offset Area includes legally securing the land area and undertaking necessary improvements to achieve a greater than 100% offset outcome for impacts calculated on the Weiya Development Pty Ltd Collingwood Park Project for GHFF Foraging Habitat (100.46%) and Koala Habitat (100.46%). The Offset Area is wholly achieved through direct delivery to land.
3	*be in proportion to the level of statutory protection that applies to the protected matter*	Both the Koala and the Grey-headed Flying-fox are scheduled within the EPBC Act as 'Vulnerable'. Under the International Union for Conservation of Nature data the probability of annual extinction is 0.2. This factor applies through the meta data of the Offset Guide assessment calculation sheets for which each species has been assessed as achieving greater than 100% offset through the proposed Offset Area.
4	*be of a size and scale proportionate to the residual impacts on the protected matter*	Direct and indirect impacts for the protected matters have been calculated at the impacts site using the Modified Habitat Quality Assessment (MHQA) for the Koala and the Grey-headed Flying-fox Foraging Habitat Assessment (FHA) methods. Within the Assessment Guide calculator the Quantum Impact for each species is listed as:

		• Grey-headed Flying-fox (9.96 ha) • Koala (9.96 ha) To achieve and offset for both of these impacts the Offset Area provides a direct land-based outcome over 34.7 ha entirely through habitat recreation activities on historically cleared land devoid of native vegetation.
5	*effectively account for and manage the risks of the offset not succeeding*	The Offset Area is a singular proposed land-based outcome in a strategic location known to support both habitat and animals from the impacted protected matters. This Offset Management Plan identifies 7 key risks to some or all of the offset principles and outcomes not being achieved. Each of these risks have influenced the specific management actions proposed in the relevant Offset Management Zone where the risk may occur and more importantly the monitoring, measuring of success and adaptive management for the offset succeeding. Further, the offset provider intends to engage third party, suitably qualified professional(s) to ensure that the management outcomes of the offset land are achieved and risk of the offset not succeeding is mitigated. Repetitive monitoring and survey replication is a feature of the Offset Management Plan to ensure adaptive management changes are made as soon as identified and throughout the life of the offset.
6	*be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs*	The Weiya Development Pty Ltd Collingwood Park Project occurs in Collingwood Park, where the site has been earmarked for residential development to cater for the growing South East Queensland population. There are few environmental controls at the impacts site with the Queensland Government's *Environmental Offset Act 2014* not being applicable. The relatively economical Ipswich Registry of Fees and Charges (6.4.1 – Vegetation Retention Contributions as per Implementation Guideline 19) contribution of $6,530 per hectare is applicable to vegetation clearing within the Ipswich Local Government Area. This fee and charge does not link to the EPBC requirements for offset. There are no guidelines or controls around offset or rehabilitation for the Grey-headed Flying-fox. Further, the proposed offset area (Scenic Ridge) is currently utilised for cattle grazing activities, and not protected or managed for conservation purposes.

		Therefore, without the triggering of the EPBC Act and the Controlled Action Assessment the offset as proposed in the Offset Management Plan is not required for either of the protected matters and the offset site would not be protected in perpetuity for conservation purposes.
7	*be efficient, effective, timely, transparent, scientifically*	Through conditions of approval the Offset Area will be legally secured prior to the commencement of any clearing on the Impact site. The Offset Area and its value (as finalised through the EPBC Act Approval) will be legally secured through a Voluntary Declaration (V-Dec) declared under the Queensland Government's *Vegetation Management Act 1999*. A V-Dec protects land and values and is binding on future owners. The declaration and management plan will be noted on the land title, which informs prospective buyers of current declarations and management plans and where copies are available. This information is important to the property market as future owners will be bound by the plan and declaration. The legally securing of the land will be made through declaring the area as having High Nature Conservation Values. The V-Dec will be lodged and legally secured by evidence of encumbrance on Registered Land Title prior to the commencement of any clearing works on the Impact Site. The completion criteria for this Offset Management Plan are not considered to have been met until after the period of effect of approval for the EPBC Act Part 9 approval has expired (being EPBC Act approval 2019/8516). The V-Dec over the offset site must not be removed, and the land owner, land manager, approval holder, and all other persons associated with the action must not seek to remove nor consent to the removal of the V-Dec from the offset site, until the approval expires. The Offset Management Plan schedules a list of existing or specifically designed scientific methodologies for the measuring of base line and improved outcomes for the protected matters. The OMP also requires the use of tertiary trained and experienced experts along with appropriately certified and experienced contractors for the implementation of a host of actions.
8	*have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced*	The Offset Site is owned by HES who have entered into a legal contract to deliver and manage the outcomes listed in the Offset Management Plan and conditioned in EPBC 2019/8516. Clearly articulated goals are set within this Offset Management Plan for each proposed action within the Offset Management Zone (OMZ).

		Collectively these goals link directly to the achievement of the overall *conservation gain* for the protected matters as designed, assessed and calculated through the selection and delivery of the Offset Area. The Management Tables in Section 5.0 of the OMP are designed to be measured, monitored, audited and enforced year upon year during the life of the offset.

6.4. Preliminary Offset Completion Criteria

There are 5 categories of actions listed as relevant and required through the Offset Area. Although in many actions there is overlap, primarily the specific tasks can be considered to either reduce or remove an existing threat or improve or create new habitat opportunities. Some actions apply specifically to the Koala species and others are designed to improve habitat and outcomes for both Koalas and Grey-headed Flying Fox. Some actions are limited to acute or specific locations, others apply to the entire Offset Area and selected actions will apply to the entire land holding, inclusive of areas retained for grazing. **Table OC1** outlines the preliminary offset area completion criteria for the proposed management actions.

Table OC1: Preliminary Offset Area Completion Criteria

	Completion Criteria	**Preliminary Completion Criteria**
Management Action 1 – Feral Animal Control		
Year 1	Complete detailed baseline / seasonal feral animal management survey(s) Consult Scenic Rim Regional Council and / or the Regional Pest Management Representative Develop a Pest Management Implementation Strategy	Baseline of pest animals established; Quarterly or bi-annually meeting organised with SRRC or the Regional Pest Management Representative; Finalise the Pest Management Implementation Strategy.
Year 5	Replicate the Year 1 detailed baseline / seasonal pest management survey(s) to demonstrate less than 5% of the Year 1 baseline survey results.	Implement the Pest Management Implementation Strategy (Year 2 -5); Demonstrate that pest animals have been reduced to less than 5% of the year 1 baseline survey results.
Year 10, 15 & 20	Repeat the baseline surveys in year 10, 15 and year 20 to demonstrate a maintenance of year 5 statistically reduced vertebrate pest species incidence and or occurrence below the 5%-year 1 baseline survey results.	Implement the Pest Management Implementation Strategy (Year 5 -20); Continue to demonstrate that pest animals have been reduced to less than 5% of the year 1 baseline survey results.
Adaptive Management	If greater than 5% of the baseline pest survey results remain in the Year 5 survey and reporting, Year 10 survey results to demonstrate that the less than 5% of the baseline survey has been achieved.	
Management Action 2 - Weeds of National Significance Control		
Year 1	Complete detailed baseline / weed extent surveys utilising an antenna based GPS system	Complete mapping of all *Lantana spp.* infestations across the Offset Area; Detailed maps identifying the extent of *Lantana spp.* infestations; Specific total area of *Lantana spp.* infestations within the Offset Area; Exclusion of stock from the Offset Area
Year 5	Replicate Detailed Weed Extent Re-Survey through the Offset Area – Include plans and calculations in the Year 5 OAAR demonstrating less than 20% of the year 1 baseline survey results.	Demonstrate that woody weed coverage across the Offset Area has been reduced by 80% in the OMZ; Demonstrate that all stock has been excluded from the Offset Area;

Year 10	Replicate Detailed Weed Extent Re-Survey through the Offset Area – Include plans and calculations in the Year 10 OAAR demonstrating less than 5% of the year 1 baseline survey results.	Demonstrate that woody weed coverage across the Offset Area has been reduced by 95% in the OMZ;
Year 15 & 20	Repeat of Baseline surveys in year 15 and year 20 to demonstrate a maintenance of year 10 significant reductions to the extent of Lantana spp. below the 5%-year 1 baseline survey results.	Continue to demonstrate that woody weed coverage across the Offset Area has been reduced by 95% in the OMZ;
Management Action 3 – Livestock Control		
Year 2	Complete all fencing as per the Indicative Offset Area Fencing Plan	Demonstrate that the fencing is completed in year 1 and 2 until the entire Offset Area is fenced;
Other	Annual inspection of the fencing integrity and stock breaches	Nil stock breaches into the Offset Area from Year 3 - Year 20;
Management Action 4 - Access and Trespass Control		
Year 1	Inspection and rectification of all perimeter fencing	Provide evidence of the notification letter issued to the adjoining landholders;
	Notification of offset areas, purpose and outcomes to all adjoining land holders	
Other	Access gates and signage to be installed where Offset Area fencing crosses tracks required to be maintained for access	Installation of access gates and signage throughout the Offset Area to be completed by Year 2, when Action 3 is to be completed;
Management Action 5 – MNES Habitat Restoration		
Year 1	Finalise locations, sequence and timing for revegetation program	Revegetation is undertaken where identified to planting specifications and consistent with the pre-clear Regional Ecosystem type; All revegetation is to be completed by end of Year 2, with the revegetation area totalling 34.7 ha; Minimum of 90% survival rate of the revegetation stock or equivalent stem density (ie. through natural regeneration) by the Year 10 major monitoring period;
	Cultivate and prepare offset area (34.7ha) area in preparation for year 2 planting	
	Create offset area water source for revegetation establishment (purpose located dam or broadscale irrigation)	
	Establish photo monitoring points and protocols for the offset area	
Year 2	Complete offset area MNES habitat restoration (34.7ha)	
Year 5	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring	Demonstrate MNES habitat restoration survival rate; Demonstrate an increase in the MHQA and GHFF FHA scores.
	For the OMZ, achieve a MHQA score of 4/10 and GHFF FHA score of 4/10	
Year 10	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring	Demonstrate an increase in the Koala usage in OMZ 1 based on the baseline and future increased expected; Demonstrate an increase in the MHQA and GHFF FHA scores.

	For the OMZ, achieve a MHQA score of 5/10 and GHFF FHA score of 5/10	
Year 15	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring	Demonstrate an increase in the Koala usage in OMZ 1 based on the baseline and future increased expected; Demonstrate an increase in the MHQA and GHFF FHA scores.
	For the OMZ, achieve a MHQA score of 6/10 and GHFF FHA score of 6/10	
Year 20	Replicate transects surveys completed in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools, species stocking rate surveys and photo point monitoring	Demonstrate the MHQA and GHFF FHA scores have been achieved
	For the OMZ, maintain a MHQA score of 7/10 and GHFF FHA score of 7/10	
Other		
Annually & Year 5, 10, 15 & 20	Complete Offset Area Annual Reports, with major milestone reporting completed in Year 5, Year 10, Year 15 and Year 20.	Provide the Offset Area Annual Reports to the proponent to be published with the Annual Compliance Report

6.5. Methodology

6.5.1 Modified Habitat Quality Assessment Tool

The offset sites have been assessed using a modified version of the Queensland State Governments *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017. The purpose of this guideline is to provide a methodology for proponents to determine the habitat quality of a site under the Queensland Environmental Offsets framework. The guideline is a step-by-step methodology explaining how to measure habitat quality for land-based offsets. This methodology has been adopted and tailored/modified to assess the impacts and offsets relating to Matters of National Environmental Significance (MNES).

The traditional terrestrial habitat quality assessment assesses three (3) core indicators—site condition, site context and species habitat index.

The modified habitat quality assessment (MHQA) combines the three (3) core indicators into two (2) (site condition and site context) with each Site Condition being weighted 40% of the final score and Site Context being weighted 30% of the final score. The balance of the weighting (30 %) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate has been added to the MHQA to better incorporate MNES, and for the purpose of this preliminary documentation, the vulnerable-listed Koala MNES. The following section details the methodology utilised to assess the site condition, site context and species stocking rate under the MHQA.

Site Condition (40 %)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset site is suitable to establish a desired capacity to support the prescribed environmental matters being offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community, and is benchmarked against the expected range for a relatively undisturbed community.

The site condition assessment under the MHQA is assessed using fifteen (15) condition characteristics being:

- recruitment of woody perennial species in EDL;
- native plant species richness – trees;
- native plant species richness – shrubs;
- native plant species richness – grasses;
- native plant species richness – forbs;
- tree canopy height;
- Sub-canopy cover;
- tree canopy cover;
- native grass cover;
- organic litter;
- large trees;
- coarse woody debris;

- non-native plant cover;
- quality and availability of food and foraging habitat; and
- quality and availability of shelters.

Assessment methodology of the above condition characteristics do not differ from the traditional habitat quality assessment. In developing the MHQA to better incorporate MNES, two (2) species habitat index characteristics, being, quality and availability of food and foraging habitat and quality and availability of shelters have been added to the site condition indicator.

Site Context (30 %)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors. Under the MHQA, site context is measured using the following seven (7) characteristics:

- size of patch;
- connectedness;
- context;
- ecological corridors;
- role of site location to species overall population in the state;
- threats to the species; and
- species mobility capacity.

Unlike the traditional habitat quality assessment methodology where site connectedness is assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Koala habitat. Whilst remnant eucalypt forest vegetation is critical habitat for Koala, equally Koalas can utilise areas of non-remnant vegetation or high value regrowth vegetation that does not yet achieve remnant status. Therefore, site context under the MHQA accounts for surrounding Koala habitat rather than remnant vegetation.

In developing the MHQA, three (3) species habitat index characteristics were nominated—role of site location to overall species population in the state, threats to the species and species mobility capacity.

Species Stocking Rate (30 %)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. Given the discreet nature of the Koala and limited to no published literature on habitat carrying capacity of the species, the species stocking rate scoring methodology has been derived through the collation of site specific surveys and surrounding contextual habitat analysis. **Table OC2** outlines the attributes utilised to assess species stocking rate.

Table OC2 Species Stocking Rate Scoring

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	/10
Species usage of the site (habitat type and evidenced usage)	/15
Approximate density (per ha)	/30
Key source population for breeding	/5
Key source population for dispersal	/5
Necessary for maintaining genetic diversity	/15
Near the limit of the species range	/15
Total Species Stocking Rate Score	/70
Species Stocking Rate Score – out of 3	

6.5.2 Grey-headed Flying-fox Foraging Habitat Assessment Tool

The offset sites have been assessed using a GHFF Foraging Habitat Assessment (GHFF FHA) tool developed by the Saunders Havill Group (2019) which adopts characteristics of the Queensland State Governments *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017, while also integrating published scientific literature on GHFF foraging habitat.

The traditional terrestrial habitat quality assessment assesses three (3) core indicators—site condition, site context and species habitat index.

The GHFF FHA tool combines the aspects of the three (3) core indicators and published scientific literature into two (2) (site condition and site context) with site condition being weighted with 40 % and site context weighted at 30 % of the final score. The balance of the weighting (30 %) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate assessment incorporated in the GHFF FHA tool is focussed on 'foraging habitat' for GHFF rather than GHFF stocking rates (presence/absence of the species). This assessment of 'foraging habitat' for species stocking rate has been incorporated in the GHFF FHA tool as Grey-headed Flying-fox roosting camp or species presence was not observed on-site, however, suitable foraging habitat for the species was evident. Therefore, the density of foraging habitat available on-site is considered an appropriate assessment benchmark for species stocking rate.

The following section details the methodology utilised to assess the site condition, site context and species stocking rate under the GHFF FHA.

Site Condition (40 %)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset site is suitable to establish a desired capacity to support the prescribed environmental matters being offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community, and is benchmarked against the expected range for a relatively undisturbed community.

The site condition assessment under the GHFF FHA is assessed using six (6) condition characteristics being:

- Vegetation condition;
- Species richness (canopy trees);
- Flower scores (average);
- Timing of biological shortages;
- Quality of foraging habitat (trees >0.65 wt p*r); and
- Non-native plant cover.

Assessment methodology of the above condition characteristics is outlined below:

- Vegetation condition – This condition characteristic is assessed using the Queensland *Vegetation Management Act 1999* vegetation community status definition, being Category B (remnant), Category

C (high-value regrowth) and Category X (non-remnant). This characteristic is scored from a desktop mapping perspective and verified on-ground during assessment.

- Species richness (canopy trees) – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. Within the plot, all canopy tree and subcanopy tree specimens are recorded. It should be noted that non-GHFF foraging species are also documented.
- Flower scores (average) – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining the flower score of the recorded canopy species. The individual score for each flowering GHFF foraging tree is then divided by the number of species recorded (GHFF foraging and non-GHFF foraging trees) to produce an average. The benchmark values for this condition characteristic have been derived from the findings published by Eby and Law (2008) (*Ranking the feeding habitat of Grey-headed flying foxes for conservation management*).
- Timing of biological shortages – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining the ability of the canopy species in the vegetation community to produce foraging habitat during biological shortages (food shortages, pregnancy and birthing, lactation, mating and conception, migration paths and fruit industries). It should be noted that this condition characteristic is weighted and 'food shortages' has been weighted heavier than the balance of the characteristics which are equal, as 'food shortages' is recognised as a major issue.
- Quality of foraging habitat – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining which canopy species recorded contain a flower score greater than 0.65 wt p*r and is recognised as a significant food plant by Eby and Law (2008). It should be noted that species recorded that are not prescribed a value by Eby and Law (2008) but are recognised as GHFF foraging trees, have been given an average weighted value of related species or, in the case of *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given it's importance as a winter flowering species as acknowledged in the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017).
- Non-native plant cover – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. All non-native plant cover was assessed by estimating the cover of exotic species over the 100 m X 20 m plot.

It should be noted that for on-ground assessment purposes, the 100 m X 20 m plot utilised for the GHFF FHA overlaps with the on-ground condition characteristics of the koala MHQA.

Site Context (30 %)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence

of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors. Under the GHFF FHA, site context is measured using the following six (6) characteristics:

- Size of patch;
- Connectedness (active GHFF roost camps in a 20 km radius);
- Context (percentage of GHFF foraging habitat in a 20 km radius);
- Ecological corridors;
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius); and
- Threats to the species.

Assessment methodology of the above context characteristics is outlined below:

- Size of patch – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the directly connected patch of GHFF foraging habitat to site measured. This context characteristic is measured using GIS. The benchmark values for this context characteristic are those used in the traditional habitat quality assessment.
- Connectedness – This context characteristic is assessed by analysing the number of active GHFF roost camps (over the past year of monitoring (11/17 – 11/18)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government).
- Context – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the percentage of GHFF foraging habitat within a twenty (20) kilometre buffer of the site measured. This context characteristic is measured using GIS.
- Ecological corridors – This context characteristic is assessed using the traditional habitat quality assessment methodology which involves determining the proximity of the site to state, bioregional, regional or sub-regional corridors.
- Threats to species – This context characteristic is assessed by analysing the published scientific literature regarding threats to GHFF and determining the number and severity of the threatening processes observed at or adjacent to the site.
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius) – This context characteristic is assessed by analysing the number of active GHFF roost camps level 3 or greater (over the past year of monitoring (11/17 – 11/18)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government).

Species Stocking Rate (30 %)

The GHFF FHA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. As discussed above, species stocking rate for GHFF associated with this proposed action is related to the density of GHFF foraging habitat at the site at the time of undertaking the survey.

Baseline GHFF foraging tree surveys were undertaken by utilising the stem count methodology provided in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland (version 5.0)* (Neldner et al. 2019).

This methodology involves assigning the strata for canopy (T1) and subcanopy (T2) and then counting the number of individual tree specimens within the 100 m X 20 m plot. A tree that branches into two or more stems above 30 cm above the ground is counted as one individual. This data was then analysed and GHFF foraging tree density per hectare was extrapolated and determined.

The species stocking rate scoring was determined by analysing the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan 2019) and the stem density per hectare associated with the technical description of the regional ecosystem.

Table OC3: GHFF FHA Vegetation Condition Scoring

Score	Description
5	Category X / non-remnant
10	Category C / regrowth
20	Category B / remnant

Table OC4: GHFF FHA Species Richness Scoring

Score	Description
0	0 GHFF foraging species
5	1 – 3 GHFF foraging species
10	4 – 6 GHFF foraging species
20	> 6 GHFF foraging species

Table OC5: GHFF FHA Flower Score (average) Scoring

Score	Description
2	0.01 – 0.25
5	0.26 – 0.50
8	0.51 – 0.75
10	0.76 – 1.00

Table OC6: GHFF FHA Timing of Biological Shortages Scoring

Score	Description
2.5	Food shortages
1.5	Pregnancy and birthing
1.5	Lactation

1.5	Mating and conception
1.5	Migration paths
1.5	Fruit industries
Total (/10)	Combine total of above

Table OC7: GHFF FHA Quality of Foraging Habitat (trees >0.65 wt p*r) Scoring

Score	Description
0	0 significant GHFF foraging tree species
5	1 – 3 significant GHFF foraging tree species
10	4 – 6 significant GHFF foraging tree species
20	> 6 significant GHFF foraging tree species

Table OC8: GHFF FHA Non-Native Plant Cover Scoring

Score	Description
1	> 50 % non-native plant cover
5	25 – 50 % non-native plant cover
10	5 – 25 % non-native plant cover
20	< 5 % non-native plant cover

Table OC9: GHFF FHA Size of Patch Scoring

Score	Description
0	< 5 hectares
2	5 – 25 hectares
5	26 – 100 hectares
7	101 – 200 hectares
10	> 200 hectares

Table OC10: GHFF FHA Connectedness Scoring

Score	Description
0	< 1 active Grey-headed Flying-fox camp within a 20 km radius
3	1 – 3 active Grey-headed Flying-fox camp within a 20 km radius
6	4 – 6 active Grey-headed Flying-fox camp within a 20 km radius
10	> 6 active Grey-headed Flying-fox camp within a 20 km radius

Table OC11: GHFF FHA Context Scoring

Score	Description
0	< 10 % Grey-headed Flying-fox foraging habitat within a 20 km radius
3	10 – 30 % Grey-headed Flying-fox foraging habitat within a 20 km radius
6	31 – 75 % Grey-headed Flying-fox foraging habitat within a 20 km radius
10	> 75 % Grey-headed Flying-fox foraging habitat within a 20 km radius

Table OC12: GHFF FHA Ecological Corridors Scoring

Score	Description
0	Not within an ecological corridor
6	Sharing a common boundary with an ecological corridor
10	Within an ecological corridor

Table OC13: GHFF FHA Threats to Species Scoring

Score	Description
1	High level threat to the species
5	Moderate level threat to the species
10	Low level threat to the species

Table OC14: GHFF FHA Role of Site Location to Species Overall Population in the State Scoring

Score	Description
1	1 – 2 active level 3 Grey-headed Flying-fox camp within a 20 km radius
6	2 – 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius
10	> 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius

6.6. Results

6.6.1 Impact Site – Modified Habitat Quality Assessment Tool

The Modified Habitat Quality Assessment (MHQA) tool was applied across the impact site to determine the impact site score of Koala habitat. Four (4) MHQA transects were completed across the impact site focussing on the three (3) dominant vegetation communities impacted by the proposed development, being 'non-remnant' RE12.9-10.19, 'remnant' RE12.9-10.19/129-10.3/12.9-10.2 and 'remnant' RE12.9-10.19. Results of the MHQA indicate that the 'non-remnant' RE12.9-10.19 vegetation community scored 3.14, 'remnant' RE12.9-10.19/129-10.3/12.9-10.2 vegetation community scored 5.25 and the 'remnant' RE12.9-10.19 vegetation community scored 5.33, with a weighted average impact site score of **4.44.**

6.6.2 Impact Site – Grey-headed Flying-fox Foraging Habitat Assessment Tool

The Grey-headed Flying-fox Foraging Habitat Assessment (GHFF FHA) tool was applied across the impact site to determine the impact site score of GHFF foraging habitat. Four (4) GHFF FHA transects were completed across the impact site focussing on the three (3) dominant vegetation communities impacted by the proposed development, being 'non-remnant' RE12.9-10.19, 'remnant' RE12.9-10.19/129-10.3/12.9-10.2 and 'remnant' RE12.9-10.19. Results of the GHFF FHA indicate that the 'non-remnant' RE12.9-10.19 vegetation community scored 3.62, 'remnant' RE12.9-10.19/129-10.3/12.9-10.2 vegetation community scored 5.02 and the 'remnant' RE12.9-10.19 vegetation community scored 5.02, with a weighted average impact site score of **4.47.**

6.7. Offset Site Vegetation Values

The offset land at Scenic Ridge comprises of open grazing, non-remnant vegetation. The non-remnant vegetation consists of cleared grazing land, with isolated clusters of native sapling regrowth. Direct and indirect evidence of wild dogs was recorded throughout the offset site.

A general description, photos and MHQA tool and GHFF FHA tool analysis is provided herein considering the current state of the land, condition reductions without offset (business as usual) and anticipated benefits resulting from offset securement.

A certified Property Map of Assessable Vegetation (PMAV) is in place across the property which retains the Category X classification across the majority of the land. Where land has this classification, the *Vegetation Management Act 1999* does not have the regulatory capacity to protect the vegetation.

Scenic Ridge Offset Management Plan 2020 (*Habitat Exchange Solutions, 2020)* categorises and maps values and management approaches into one (1) stratified Offset Management Zone covering the total Offset Area of 34.7 ha. This management zone is referred to as Offset Management Zone 1 – Open Grazing Paddock (non-remnant vegetation).

6.7.1 Open Grazing Paddock (Offset Management Zone 1)

The open grazing paddock on Scenic Ridge is dominated by cleared cattle grazing pastures with limited to no canopy trees. The entire 34.7 ha offset site consists of open grazing paddock. This non-remnant area extends from the central ridge of the offset area to the meandering drainage features and watercourses at the foothills of the ridges.

Where regrowth sapling canopy trees were observed, the species consist of *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia citriodora* (Spotted Gum), *Eucalyptus siderophloia* (Grey Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum). Given the sparse, juvenile nature of the scattered canopy species, the vegetation does not meet the Queensland Government's definition of 'remnant' or 'high-value regrowth'. Where observed, the species within this vegetation community are representative of 'least concern' RE12.9-10.2, with minor elements of 'of concern' RE12.9-10.7. Further, cross-reference with the pre-clear regional ecosystem mapping indicates that the dominant regional ecosystem across the non-remnant vegetation area is 'least concern' RE12.9-10.2. Therefore, given that the species observed within the open grazing paddock vegetation community were representative of 'least concern' RE12.9-10.2, the benchmark values for this regional ecosystem are to be used (where applicable) as the input values for the MHQA and GHFF FHA tools.

Photos 1 – 4: Vegetation representative of the open grazing paddock.

6.7.2 Open Grazing Paddock (Offset Management Zone 1) – Offset Suitability

The non-remnant vegetation is highly disturbed throughout and contains limited to no Koala and GHFF habitat values. The non-remnant areas are not protected through Local or State Government legislation, with clearing and grazing uses periodically progressing over a number of years. Weed control, pest management and wholesale restoration and replanting all form part of the management actions for the non-remnant areas which are summarised as follows:

1. *Legally secure the land via a Voluntary Declaration under the Vegetation Management Act 1999 while values are being established;*
2. *Exclusion of stock from non-remnant areas located within the offset area;*
3. *Removal and management of existing weed infestations – particularly of Weeds of National Environmental Significance (WONS – namely Lantana cultivars);*
4. *Rehabilitation infill planting to create logical habitat recreation;*
5. *Targeted control of feral animals – specifically wild dogs as part of the entire offset area. Other feral animals known to the site, however not considered a threat to Koalas or Grey-headed Flying-fox, will be managed inter alia including rabbits, wild deer, feral pigs and goats; and*
6. *Management of human access and disturbance through the use of fencing and gates.*

(Habitat Exchange Solutions, 2020 – Attachment OC1)

Refer to **Plan OC2** for the Offset Management Zone located across the offset site and **Plan OC3** for the Field Survey Effort.

6.8. Risk of Loss Discussion

The risk of loss for this application has been given a value of 0%.

A summary of the risk of loss is provided in **Table OC15**.

Table OC15 – Risk of Loss Factors

Zone Area	Risk of Loss "Without"	Risk of Loss "With"	Differential
Offset Management Zone 1 – Open Grazing Paddock [Non-remnant Vegetation] (34.7 ha)	0%	0%	0%

6.9. Offset Site – Modified Habitat Quality Assessment Tool

The Modified Habitat Quality Assessment (MHQA) tool was applied across the offset site to determine the starting quality of Koala habitat on the offset site. Three (3) MHQA transects were completed across the offset

area focussing on the one (1) dominant vegetation community, being, non-remnant vegetation (assessment benchmark RE12.9-10.2).

Given the discreet nature of the Koala and limited to no published literature on habitat carrying capacity of the species, the species stocking rate scoring methodology has been derived through derived the collation of site-specific surveys and surrounding contextual habitat analysis.

Given the lack of native canopy and subcanopy vegetation on the proposed offset site, evidence of koala usage on the offset was not observed. It should be noted that evidence of koala was observed on the adjacent property to the east (refer to **Photo 5**).

Photo 5: Koala scats observed on the adjacent property to the east.

Table OC16: Species Stocking Rate Scoring

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	/10
Species usage of the site (habitat type and evidenced usage)	/15

Approximate density (per ha)	/30
Key source population for breeding	/5
Key source population for dispersal	/5
Necessary for maintaining genetic diversity	/15
Near the limit of the species range	/15
Total Species Stocking Rate Score	/70
Species Stocking Rate Score – out of 3	

PLAN OC2 - Offset Management Zone

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FILE NAME: 9641 E OC2 Offset Management Zone B

Version - B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 25 50 100 150 200 Metres

11/05/2021 *1:5,000*

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1 (34.7 ha)

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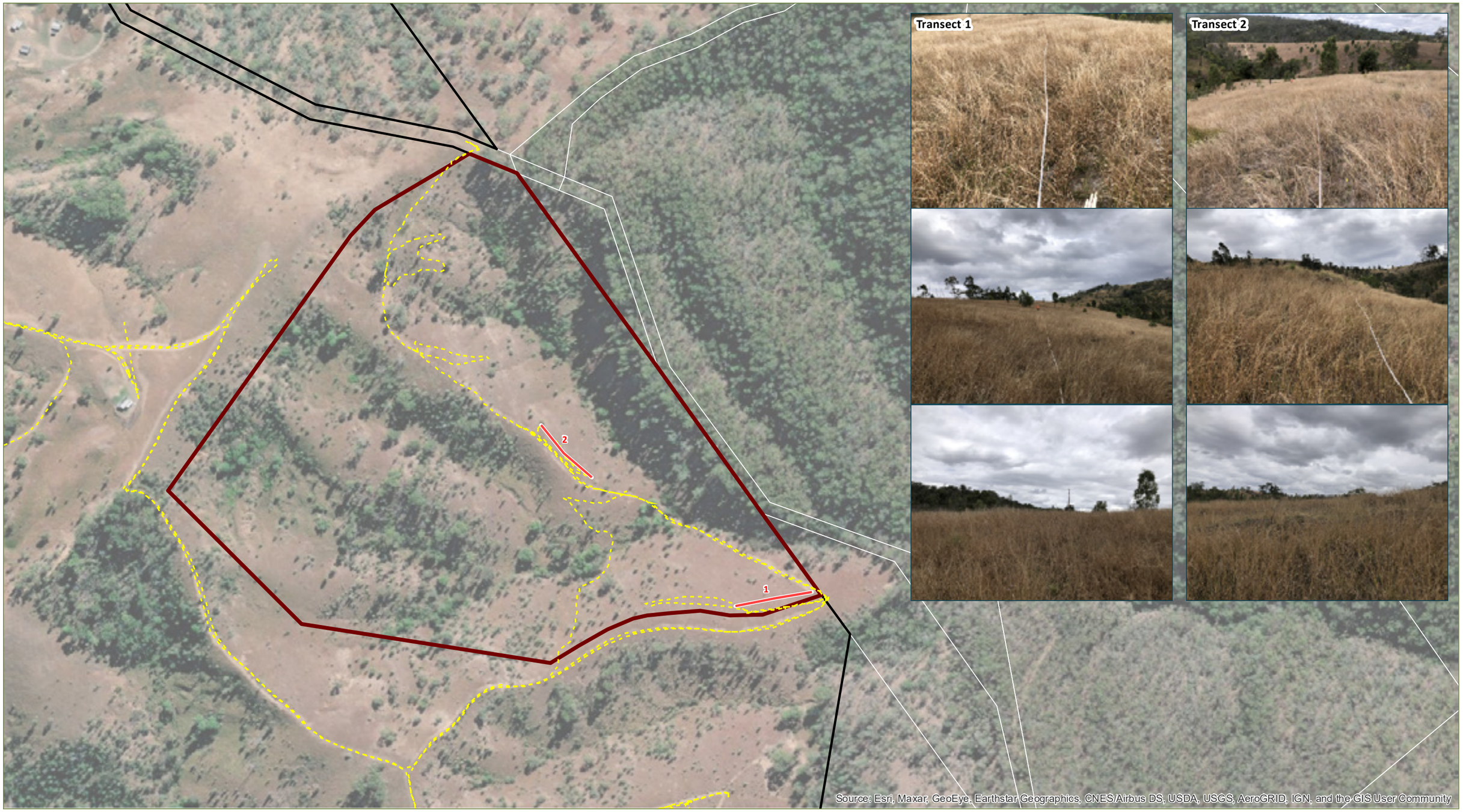
PLAN OC3 - Field Survey Effort



FILE NAME: 9641 E OC3 Field Survey Effort B

Version B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 25 50 100 150 200 Metres

11/05/2021 *1:5,000*

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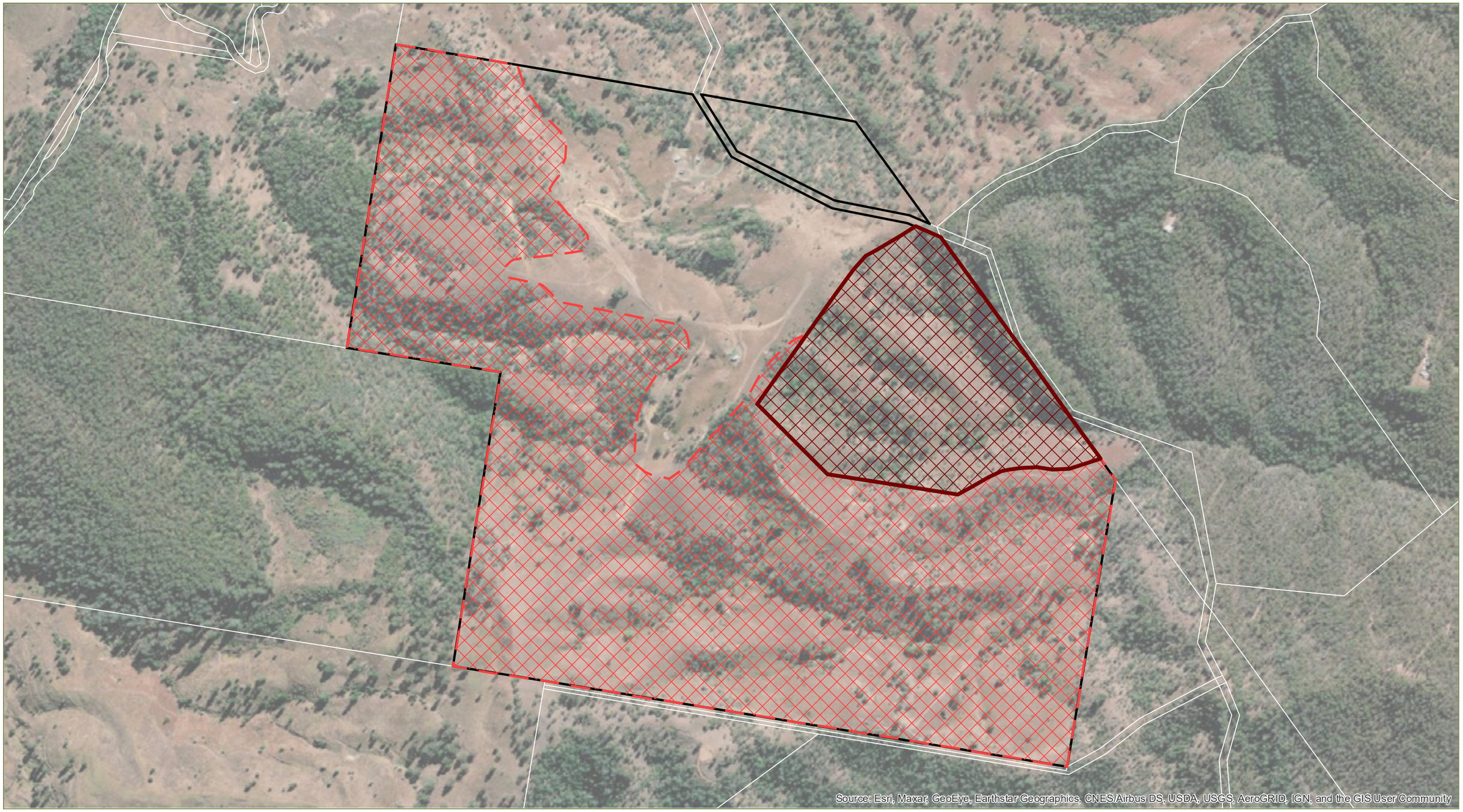
Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1 (34.7 ha)
- Habitat Transect
- GPS Tracklog

HABITAT EXCHANGE SOLUTIONS

PLAN OC4 - Offset Management Zone Contextual Plan



FILE NAME: 9641 E OC4 Future Offset B

Version B

Scenic Ridge
Offset Management Plan

EPBC 2019/8516

N

0 50 100 200 300 400 Metres

11/05/2021 *1:9,500*

Legend

- Qld DCDB
- Offset site alloments
- Offset management zone 1 (34.7 ha)
- Future offset area (157.3 ha)

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Table OC17: Modified Habitat Quality Assessment Tool (OMZ 1 – Open Grazing Paddock)

Attribute	Condition Characteristics	Score (RE12.9-10.2)	Values Increase 'WITH' Offset	Score (RE12.9-10.2)
Site Condition (40%)	Recruitment of woody perennial species in EDL	0/5	The site condition of the Open Grazing Paddock (OMZ 1) is proposed to undergo weed removal and control (Action 2), livestock control (Action 3), access and trespass control (Action 4) and MNES habitat restoration (Action 5). Implementation of these management actions throughout the Open Grazing Paddock (OMZ 1) in accordance with the Offset Management Plan will support the transition to regrowth and remnant vegetation communities across the offset site.	3/5
	Native plant species richness – trees	2.5/5		5/5
	Native plant species richness – shrubs	2.5/5		5/5
	Native plant species richness – grasses	2.5/5		5/5
	Native plant species richness – forbs	2.5/5		2.5/5
	Tree canopy height	1.5/5		5/5
	Tree canopy cover	0/5		5/5
	Shrub canopy cover	0/5		5/5
	Native grass cover	5/5		5/5
	Organic litter	0/5		3/5
	Large trees	0/15		0/15
	Coarse woody debris	2/5		2/5
	Non-native plant cover	5/10		10/10
	Quality and availability of food and foraging habitat	1/10		10/10
	Quality and availability of shelter habitat	1/10		5/10
	Site Condition Score	**23/100**		**70.5/100**
	Site Condition Score (out of 4)	**0.92**		**2.82**
	Average Site Condition Score (out of 4)	**0.92**		**2.82**
Site Context (30%)	Size of the patch	10/10	As part of the offset, the Offset Management Plan is to include an adaptive 'Feral Animal Control Program' (Action 1) which will be implemented in collaboration with: - Scenic Rim Regional Council and the Regional Pest Management Representative; and - Surrounding rural land holders and operating agricultural businesses. The implementation of this program for the life of the offset will result in an extremely low potential for wild dog attacks causing severe injury and death on Koalas.	10/10
	Connectedness	2/5		2/5
	Context	4/5		4/5
	Ecological corridors	4/6		4/6
	Role of site location to species overall population in the State	1/5		4/5
	Threats to the species	7/15		15/15

	Species mobility capacity	1/10	Through the implementation of Action 5 (MNES habitat restoration), in conjunction with Action 1, the species mobility capacity of the Koala will increase considerably, while the restoration of MNES habitat adjoining a state bioregional corridor will increase the role of the sites location to the species overall population in the state.	7/10
	Site Context Score	**29/56**		**46/56**
	Site Context Score (out of 3)	**1.55**		**2.46**
	Average Site Context Score (out of 3)	**1.55**		**2.46**
Species Stocking Rate (30%)	Koala Stocking Rate (refer to **Table OC18**)	5/70	Through the implementation of the Offset Management Plan and the following management actions, the threatening processes that would otherwise advance in extent and severity of impact on Koala habitat is reduced. The management actions to be implemented across the Open Grazing Paddock (OMZ 1) are: - Action 1: Feral Animal Control (primarily targeting wild dogs); - Action 2: Weeds of National Significance Control (reduction and management); - Action 3: Livestock Control; - Action 4: Access and Trespass Management; and - Action 5: MNES Habitat Restoration. The species stocking rate increase is anticipated to come from an improvement in the following: • **Presence:** Koala presence will increase from 'adjacent' to the site, to 'on-site'; • **Species usage:** Koala usage will increase from 'no usage', to 'foraging' on-site; and • **Approximate density:** Koala density (utilising the SAT method), will increase from 'no usage' to 'Low' SAT score koala usage.	35/70
	Species Stocking Rate Score (out of 3)	**0.21**		**1.29**
	Average Species Stocking Rate Score (out of 3)	**0.21**		**1.29**
Total (out of 10)		**2.69 (rounded to 3.00)**		**6.57 (rounded to 7.00)**

Table OC18: Species Stocking Rate Scores (present and future) (OMZ 1 – Open Grazing Paddock)

Species Stocking Rate Table		
Attribute	**Present Value**	**Future Value**
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10	10/10
Species usage of the site (habitat type and evidenced usage)	0/15	10/15
Approximate density (per ha)	0/30	10/30
Key source population for breeding	0/5	0/5
Key source population for dispersal	0/5	0/5
Necessary for maintaining genetic diversity	0/15	0/15
Near the limit of the species range	0/15	0/15
Total Species Stocking Rate Score	**5/70**	**30/70**
Species Stocking Rate Score – out of 3	**0.21**	**1.29**

Table OC19: Offset Assessment Guide calculator values justification (OMZ 1 – Open Grazing Paddock)

Attribute	Value	Justification (Summary)
Time over which loss is averted	20 years	– For the Scenic Ridge offset site, the *Voluntary Declaration* — the highest protection category under the *Vegetation Management Act 1999* — will legally secure the land and is proposed to be in place for a minimum of twenty (20) years. – The twenty-year period is sufficient time for the large majority of the offset land to return to a self-sustaining Koala habitat area (with assistance).
Time until Ecological Benefit	20 years	– The existing Koala habitat variability across the site results in realisation of ecological benefits at variable timeframes. – It's estimated that the Open Grazing Paddock areas will take 20 years to be habitat suitable to support a koala population.
Start Quality	3	– Refer to score derived above in Table OC17.
Future Quality (without)	3	– Refer to score derived above in Table OC17.
Future Quality (With)	7	– Refer to score derived above in Table OC17.
Risk of Loss (Without)	0%	– Refer to Section 6.8 for a detailed discussion on risk of loss.
Risk of Loss (With)	0%	– The offset land will be legally secured using a *Voluntary Declaration* which certifies the land as protected under the *Vegetation Management Act 1999*. This legislative instrument regulates new controls on the land as stipulated in the offset management plan and is attached to the land title. Regardless of owner or zoning, the *Voluntary Declaration* will ensure regenerating and reinstated values are protected up to the maturity where other legislation and mapping over-rides rural uses.
Confidence in result (Averted loss)	100%	– *Voluntary Declarations* are routinely used for the securement of environmental offsets and are approved all over Queensland representing a combination of both State and Commonwealth Government approvals. – There is high confidence that the certification of a *Voluntary Declaration* and resulting restriction placed on title will bring necessary regulation to protect Koala habitat values to be reinstated within the offset area.
Confidence in result (Quality)	75%	– Implementation of all management actions within the non-remnant area will be documented by the engaged offset provider. Employing a suitably qualified ecologist, zoologist or environmental scientist to complete this work has a positive impact on the confidence in result however this type of work has inherent risks. – The non-remnant areas require mass areas of revegetation and is at potential risk of plant mortality or absence of maintenance resulting in limited tree strike. This has a negative effect on the confidence in result compared to other management areas. Additionally, these areas will result in the largest increase in quality which warrants additional caution.

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	Koala
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

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		**Area**	24.89	Hectares	
			Quality	**4**	Scale 0-10	
			Total quantum of impact	9.96	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

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	9.96	Adjusted hectares	Koala	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	34.7	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	10.00	100.46%	Yes	
									Future area without offset (adjusted hectares)	34.7	**Future area with offset (adjusted hectares)**	34.7								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**7**	4.00	75%	3.00	2.88				
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

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	9.956	10.00	100.46%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

6.10. Offset Site – Grey-headed Flying-fox Foraging Habitat Assessment Tool

The Grey-headed Flying-fox Foraging Habitat Assessment (GHFF FHA) tool was applied across the offset site to determine the starting quality of GHFF foraging habitat on the offset site. Three (3) GHFF FHA transects were completed across the offset site focussing on the one (1) dominant vegetation type, being non-remnant vegetation (assessment benchmark RE12.9-10.2).

For consistency purposes, the scoring of the site context for the offset land utilised the same benchmark values as the impact site.

The GHFF FHA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. The species stocking rate for GHFF associated with this proposed action is related to the density of GHFF foraging habitat at the site at the time of undertaking the survey.

Baseline GHFF foraging tree surveys were undertaken by utilising the stem count methodology provided in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland (version 5.0)* (Neldner et al. 2019).

This methodology involves assigning the strata for canopy (T1) and subcanopy (T2) and then counting the number of individual tree specimens within the 100 m X 20 m plot. A tree that branches into two or more stems above 30 cm above the ground is counted as one individual. This data was then analysed and GHFF foraging tree density per hectare was extrapolated and determined.

The species stocking rate scoring was determined by analysing the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan 2019) and the stem density per hectare associated with the technical description of the regional ecosystem.

It should be noted that the technical description for RE12.9-10.2 does not contain a stem density per hectare. As such, given the surrounding pre-clear regional ecosystem identifies a composite regional ecosystem being RE12.9-10.2/RE12.9-10.7 surrounding the site, the stem density data for RE12.9-10.7 has been utilised as the benchmark for the scoring of the impact site. The technical description for RE12.9-10.7 notes that the 'remnant' RE12.9-10.7 vegetation community contains 480 stems per hectare.

Table OC20: Species Stocking Rate Scoring (RE12.9-10.2)

Score	Stem Density Results (T1 and T2)
0	<100 stems per hectare
2	101 – 149 stems per hectare
4	150 – 199 stems per hectare
5	200 – 249 stems per hectare
6	250 – 299 stems per hectare
7	300 – 349 stems per hectare
8	350 – 399 stems per hectare
9	400 – 479 stems per hectare
10	>480 stems per hectare

Table OC21: Grey-headed Flying-fox Foraging Habitat Assessment (OMZ 1 – Open Grazing Paddock)

Attribute	Condition Characteristics	Score (RE12.9-10.2)	Values Increase 'WITH' Offset	Score (RE12.9-10.2)
Site Condition (40%)	Vegetation condition	5/20	The site condition of the Open Grazing Paddock (OMZ 1) is proposed to undergo weed removal and control (Action 2), livestock control (Action 3), access and trespass control (Action 4) and MNES habitat restoration (Action 5). Implementation of these management actions throughout the Open Grazing Paddock (OMZ 1) in accordance with the Offset Management Plan will support the transition to regrowth and remnant vegetation communities across the offset site.	10/20
	Species richness	5/20		20/20
	Flower score	8/10		8/10
	Timing of biological shortages	10/10		10/10
	Quality of foraging habitat	5/20		20/20
	Non-native plant cover	10/20		20/20
	Site Condition Score	**43/100**		**88/100**
	Site Condition Score (out of 4)	**1.72**		**3.52**
	Average Site Condition Score (out of 4)	**1.72**		**3.52**
Site Context (30%)	Size of the patch	10/10	Site context characteristics for the GHFF are not proposed to increase with an offset. As the size of the patch, connectedness, context, ecological corridors and role of the site location to species overall population in the state are characteristics assessed at a larger scale and encompass external factors, the ability to improve these characteristics through an offset is limited. The threats to the GHFF on the offset sites are limited to non-existent, and therefore achieve a maximum score. It should be noted that as part of the koala offset, the Offset Management Plan is to include an adaptive 'Feral Animal Control Program' (Action 1) which will be implemented in collaboration with: - Scenic Rim Regional Council and the Regional Pest Management Representative; and - Surrounding rural land holders and operating agricultural businesses.	10/10
	Connectedness	0/10		0/10
	Context	6/10		6/10
	Ecological corridors	6/10		6/10
	Role of site location to species overall population in the State	0/10		0/10
	Threats to the species	10/10		10/10
	Site Context Score	**32/60**		**32/60**
	Site Context Score (out of 3)	**1.60**		**1.60**
	Average Site Context Score (out of 3)	**1.60**		**1.60**
Species Stocking Rate (30%)	GHFF Foraging Tree Density	0/30	Through the implementation of the Offset Management Plan and the following management actions, the threatening processes that would otherwise advance in extent and severity of impact on GHFF foraging habitat is reduced. The management actions to be implemented across the Open Grazing Paddock (OMZ 1) are: - Action 2: Weeds of National Significance (reduction and management); - Action 3: Livestock Management; - Action 4: Access and Trespass Management; - Action 5: MNES Habitat Restoration; These management actions and monitoring regime over the 20-year loss averted period is reasonably anticipated to lead an increase in the GHFF foraging habitat.	21/30
	Species Stocking Rate Score	**0/30**		**21/30**
	Species Stocking Rate Score (out of 3)	**0.00**		**2.10**
	Average Species Stocking Rate Score (out of 3)	**0.00**		**2.10**
Total (out of 10)		**3.32 (rounded to 3.00)**		**7.22 (rounded to 7.00)**

Table OC22: Species Stocking Rate Scores (present and future) (OMZ 1 – Open Grazing Paddock)

GHFF Foraging Tree Survey	Stem Density Raw Data (per/ha)	Species Stocking Rate Score	Future Species Stocking Rate Score (with 'offset')
1	0 per/ha	0/10	**9/10**
2	0 per/ha	0/10	**9/10**
3	0 per/ha	0/10	**9/10**
Total		**0/30**	**27/30**

Table OC23: Offset Assessment Guide calculator values justification (OMZ 1 – Open Grazing Paddock)

Attribute	Value	Justification (Summary)
Time over which loss is averted	20 years	– For the Scenic Ridge offset site, the *Voluntary Declaration* — the highest protection category under the *Vegetation Management Act 1999* — will legally secure the land and is proposed to be in place for a minimum of twenty (20) years. – The twenty-year period is sufficient time for the large majority of the offset land to return to self-sustaining GHFF foraging habitat (with assistance).
Time until Ecological Benefit	20 years	– The existing GHFF foraging habitat variability across the site results in realisation of ecological benefits at variable timeframes. – It's estimated that the Open Grazing Paddock will take 20 years to be habitat suitable for GHFF foraging habitat.
Start Quality	3	– Refer to score derived above in Table OC21.
Future Quality (without)	3	– Refer to score derived above in Table OC21.
Future Quality (With)	7	– Refer to score derived above in Table OC21.
Risk of Loss (Without)	0%	– Refer to Section 6.8 for a detailed discussion on risk of loss.
Risk of Loss (With)	0%	– The offset land will be legally secured using a *Voluntary Declaration* which certifies the land as protected under the *Vegetation Management Act 1999*. This legislative instrument regulates new controls on the land as stipulated in the offset management plan and is attached to the land title. Regardless of owner or zoning, the *Voluntary Declaration* will ensure regenerating and reinstated values are protected up to the maturity where other legislation and mapping over-rides rural uses.
Confidence in result (Averted loss)	100%	– *Voluntary Declarations* are routinely used for the securement of environmental offsets and are approved all over Queensland representing a combination of both State and Commonwealth Government approvals. – There is high confidence that the certification of a *Voluntary Declaration* and resulting restriction placed on title will bring necessary regulation to protect GHFF foraging habitat values to be reinstated within the offset area.
Confidence in result (Quality)	75%	– Implementation of all management actions within the non-remnant area will be documented by the engaged offset provider. Employing a suitably qualified ecologist, zoologist or environmental scientist to complete this work has a positive impact on the confidence in result however this type of work has inherent risks. – The non-remnant areas require mass areas of revegetation and is at potential risk of plant mortality or absence of maintenance resulting in limited tree strike. This has a negative effect on the confidence in result compared to other management areas. Additionally, these areas will result in the largest increase in quality which warrants additional caution.

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	GHFF
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

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		**Area**	24.89	Hectares	
			Quality	**4**	Scale 0-10	
			Total quantum of impact	9.96	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

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	9.96	Adjusted hectares	GHFF	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	34.7	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	100%	0.00	0.00	10.00	100.46%	Yes	
									Future area without offset (adjusted hectares)	34.7	**Future area with offset (adjusted hectares)**	34.7								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**7**	4.00	75%	3.00	2.88				
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

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	9.956	10.00	100.46%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Appendix B – Impact Site MHQA and GHFF FHA Results

Table A8: Assessment Unit 1 – Non-remnant (RE12.9-10.19) – MHQA results

Assessment Unit - Regional Ecosystem	AU 1 - Cat X (RE12.9-10.19)				
	RE12.9-10.19 Benchmark	Transect 5	Average of Transect(s)	% Benchmark	Score
SITE CONDITION					
Recruitment of woody perennial species in EDL	100	22	22	22	3
Native plant species richness - trees	5	9	9	180.00	5
Native plant species richness - shrubs	7	2	2	28.57	2.5
Native plant species richness - grasses	11	3	3	27.27	2.5
Native plant species richness - forbs	14	5	5	35.71	2.5
Tree canopy height (Canopy)*	28	7	7	25.00	3
Tree canopy height (Sub-canopy)*	9	0	0	0.00	0
*Average tree canopy height					5
Tree canopy cover (Canopy)**	55	85.9	85.9	156.18	5
Tree canopy cover (Sub-canopy)**	19	0	0	0.00	0
**Average tree canopy cover					2.5
Shrub canopy cover	15	0.8	0.8	5.33	0
Native grass cover*	19	5	5	26.32	1
Organic litter*	55	86	86	156.36	5
Large trees (euc plus non-euc) (per ha)	66	0	0	0.00	0
Coarse woody debris (per ha)	299	0	0	0.00	0
Non-native plant cover	0	10	10	57.00	0
Quality and availability of food and foraging habitat	NA	1	1	-	1
Quality and availability of shelter	NA	1	1	-	1
				Site Condition Score (/100)	27.5
				Overall Site Condition Score - out of 4	1.10
SITE CONTEXT					
Size of patch	10	10	10		10

Connectedness	**5**	2	2		**2**
Context	**5**	2	2		**2**
Ecological Corridors	**6**	0	0		**0**
Role of site location to species overall population in the state	**5**	4	4		**4**
Threats to the species	**15**	1	1		**1**
Species mobility capacity	**10**	7	7		**7**
				Site Context Score (/56)	**26**
				Overall Site Context Score - out of 3	**1.39**
SPECIES STOCKING RATE					
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	15	15		**15**
				Species Stocking Rate Score (/70)	**15.00**
				Overall Species Stocking Rate Score - out of 3	**0.64**
				Overall Assessment Unit Score	**3.14**

Table A9: Assessment Unit 1 – Non-remnant (RE12.9-10.19) – Species Stocking Rate Results

Species Stocking Rate	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	5/15
Approximate density (per ha)	0/30
Key source population for breeding	0/5
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15
Total Species Stocking Rate Score	**15/70**
Species Stocking Rate Score – out of 3	**0.64**

Table A10: Assessment Unit 2 – Remnant (RE12.9-10.19) – MHQA Results

Assessment Unit - Regional Ecosystem	AU 2 - Remnant Of Concern (RE12.9-10.19)				
	RE12.9-10.19 Benchmark	Transect 3	Average of Transect(s)	% Benchmark	Score
SITE CONDITION					
Recruitment of woody perennial species in EDL	100	43	43	43	3
Native plant species richness - trees	5	9	9	180.00	5
Native plant species richness - shrubs	7	1	1	14.29	0
Native plant species richness - grasses	11	4	4	36.36	2.5
Native plant species richness - forbs	14	6	6	42.86	2.5
Tree canopy height (Canopy)*	28	22	22	78.57	5
Tree canopy height (Sub-canopy)*	9	8	8	88.89	5
*Average tree canopy height					5
Tree canopy cover (Canopy)**	55	41	41	74.55	5
Tree canopy cover (Sub-canopy)**	19	31	31	163.16	5
**Average tree canopy cover					5
Shrub canopy cover	15	1.1	1.1	7.33	0
Native grass cover*	19	5	5	26.32	1
Organic litter*	55	89	89	161.82	5
Large trees (euc plus non-euc) (per ha)	66	37	37	56.06	10
Coarse woody debris (per ha)	299	0	0	0.00	0
Non-native plant cover	0	10	10	57.00	0
Quality and availability of food and foraging habitat	NA	10	10	-	10
Quality and availability of shelter	NA	10	10	-	10
				Site Condition Score (/100)	59
				Overall Site Condition Score - out of 4	2.36
SITE CONTEXT					
Size of patch	10	10	10		10
Connectedness	5	2	2		2

Context	**5**	2	2		**2**
Ecological Corridors	**6**	0	0		**0**
Role of site location to species overall population in the state	**5**	4	4		**4**
Threats to the species	**15**	1	1		**1**
Species mobility capacity	**10**	7	7		**7**
				Site Context Score (/56)	**26**
				Overall Site Context Score - out of 3	**1.39**
SPECIES STOCKING RATE					
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	35	35		**35**
				Species Stocking Rate Score (/70)	**35.00**
				Overall Species Stocking Rate Score - out of 3	**1.50**
				Overall Assessment Unit Score	**5.25**

Table A11: Assessment Unit 2 – Remnant (RE12.9-10.19) – Species Stocking Rate Results

Species Stocking Rate	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	10/15
Approximate density (per ha)	10/30
Key source population for breeding	0/5
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15
Total Species Stocking Rate Score	**35/70**
Species Stocking Rate Score – out of 3	**1.5**

Table A12: Assessment Unit 3 – Remnant (RE12.9-10.17) – MHQA results

Assessment Unit - Regional Ecosystem	AU 3 - Remnant - Least Concern (RE12.9-10.17)					
	RE12.9-10.17b Benchmark	Transect 2	Transect 4	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	83	91.5	91.5	5
Native plant species richness - trees	10	9	9	9	90.00	2.5
Native plant species richness - shrubs	5	2	2	2	40.00	2.5
Native plant species richness - grasses	6	4	4	4	66.67	2.5
Native plant species richness - forbs	17	8	8	8	47.06	2.5
Tree canopy height (Canopy)*	27	22	22	22	81.48	5
Tree canopy height (Sub-canopy)*	15	4	0	2	13.33	0
*Average tree canopy height						2.5
Tree canopy cover (Canopy)**	52	47.55	50.2	48.875	93.99	5
Tree canopy cover (Sub-canopy)**	31	34.05	26.5	30.275	97.66	5
**Average tree canopy cover						5
Shrub canopy cover	27	1.1	0	0.55	2.04	0
Native grass cover*	35	7.2	11	9.1	26.00	1
Organic litter*	55	81.3	78	79.65	144.82	5
Large trees (euc plus non-euc) (per ha)	30	5	5	5	16.67	5
Coarse woody debris (per ha)	401	355	354	354.5	88.40	5
Non-native plant cover	0	10	10	10	60.00	0
Quality and availability of food and foraging habitat	NA	10	10	10	-	10
Quality and availability of shelter	NA	10	10	10	-	10
Site Condition Score (/100)						61
Overall Site Condition Score - out of 4						2.44
SITE CONTEXT						
Size of patch	10	10	10	10		10

Connectedness	**5**	2	2	2		**2**
Context	**5**	2	2	2		**2**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	4	4	4		**4**
Threats to the species	**15**	1	1	1		**1**
Species mobility capacity	**10**	7	7	7		**7**
Site Context Score (/56)						**26**
Overall Site Context Score - out of 3						**1.39**
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	35	35	35		**35**
					Species Stocking Rate Score (/70)	**35.00**
					Overall Species Stocking Rate Score - out of 3	**1.50**
					Overall Assessment Unit Score	**5.33**

Table A13: Assessment Unit 3 – Remnant (RE12.9-10.17) – Species Stocking Rate Results

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	10/15
Approximate density (per ha)	10/30
Key source population for breeding	0/5
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15
Total Species Stocking Rate Score	35/70
Species Stocking Rate Score – out of 3	**1.50**

Table A14: MHQA Final Weighted Scores

MHQA Final Weighting	AU 1	AU 2	AU 3
Site Condition (/4)	1.10	2.36	2.44
Site Context (/3)	1.39	1.39	1.39
Species Stocking Rate (/3)	0.64	1.50	1.50
Assessment Unit Area (Impact) (ha)	9.97	2.40	12.52
Total Impact Area (ha)	24.89	24.89	24.89
Size Weighting	0.40	0.096	0.50
AU Weighted Score	1.25	0.51	2.68
Total Weighted Score	**4.44**		

4.3.2 Discussion

Results of the GHFF FHA using methodology detailed in **Section 4.3.1** are shown in **Table A27**. The impact site attained a score of **4 out of 10** (refer to **Plan A14** for the Grey-headed Flying-fox Foraging Habitat Plan).

Table A27: GHFF MHQA

		Maximum Score	Assessment Unit - Regional Ecosystem					
			AU 1 Non-remnant (RE12.9-10.19)		AU 2 Remnant (RE12.9-10.19)		AU 3 Remnant (RE12.9-10.17b)	
Site Condition (40%)	Vegetation Condition	**20**	5	AU1 is mapped as Category X	20	AU2 is mapped as Category B	20	AU3 is mapped as Category B
	Species Richness	**20**	10	T5 – six GHFF species: *E. fibrosa* *E. moluccana* *E. propinqua* *C. henryi* *C. citriodora* *A. leiocarpa*	10	T3 – six GHFF species *E. fibrosa* *E. propinqua* *E. acmenoides* *E. siderophloia* *C. henryi* *C. citriodora*	10	T2 *E. siderophloia* *E. moluccana* *E. fibrosa* *C. citriodora* T4 *E. tereticornis* *E. siderophloia* *E. propinqua* *E. carnea* *C. intermedia* *C. citriodora* *C. tessellaris*

		Maximum Score	Assessment Unit - Regional Ecosystem					
			AU 1 Non-remnant (RE12.9-10.19)		AU 2 Remnant (RE12.9-10.19)		AU 3 Remnant (RE12.9-10.17b)	
	Flower Score	**10**	8	T5 *E. fibrosa – 0.54* *E. moluccana – 0.65* *E. propinqua – 0.34* *C. henryi – 0.54* *C. citriodora – 0.65* *A. leiocarpa – 0.35*	8	T3 *E. acmenoides – 0.43* *E. fibrosa – 0.54* *E. propinqua – 0.34* *E. siderophloia – 0.81* *C. henryi - 0.54* *C. citriodora– 0.65*	8	T2 *E. siderophloia – 0.81* *E. moluccana – 0.65* *E. fibrosa – 0.54* *C. citriodora – 0.65* T4 *E. tereticornis – 0.88* *E. siderophloia – 0.81* *E. propinqua – 0.34* *E. carnea – 0.65* *C. intermedia – 0.86* *C. citriodora – 0.65* *C. tessellaris – 0.40*
	Timing of Biological Shortages	**10**	10	The species listed above cover all biological shortages.	10	The species listed above cover all biological shortages.	10	The species listed above cover all biological shortages.
	Quality of Foraging Habitat	**20**	0	No species within this AU are considered significant food plants for GHFF.	5	*E. siderophloia* is considered a significant food plant for GHFF.	5	*E. siderophloia*, *E. tereticornis* and *C. intermedia* are considered significant food plants for GHFF.
	Non-native Plant Cover	**20**	10	10 % non-native plant cover.	10	10 % non-native plant cover.	10	10 % non-native plant cover.
	Site Condition Score	**100**	**43**		**63**		**63**	
	Site Condition Score - out of 4	**4.00**	**1.72**		**2.52**		**2.52**	
Site Context (30%)	Size of patch	**10**	10	The size of patch connected to the site is approximately 240 ha	10	The size of patch connected to the site is approximately 240 ha	10	The size of patch connected to the site is approximately 240 ha
	Connectedness	**10**	10	There are 9 active GHFF camps within a 20 km radius of the site.	10	There are 9 active GHFF camps within a 20 km radius of the site.	10	There are 9 active GHFF camps within a 20 km radius of the site.
	Context	**10**	6	There is approximately 44 % of GHFF foraging habitat within a 20 km radius of the site.	6	There is approximately 44 % of GHFF foraging habitat within a 20 km radius of the site.	6	There is approximately 44 % of GHFF foraging habitat within a 20 km radius of the site.
	Ecological Corridors	**10**	0	The site does not function as part of an ecological corridor.	0	The site does not function as part of an ecological corridor.	0	The site does not function as part of an ecological corridor.

		Maximum Score	Assessment Unit - Regional Ecosystem					
			AU 1 Non-remnant (RE12.9-10.19)		AU 2 Remnant (RE12.9-10.19)		AU 3 Remnant (RE12.9-10.17b)	
	Role of site location to species overall population in the state	**10**	1	There are 2 active Level 3 GHFF camps within a 20 km radius of the site.	1	There are 2 active Level 3 GHFF camps within a 20 km radius of the site.	1	There are 2 active Level 3 GHFF camps within a 20 km radius of the site.
	Threats to the species	**10**	5	There is a moderate level of threat to the species on and adjacent to the site.	5	There is a moderate level of threat to the species on and adjacent to the site.	5	There is a moderate level of threat to the species on and adjacent to the site.
	Site Context Score	**60**	**32**		**32**		**32**	
	Site Context Score - out of 3	**3.00**	**1.60**		**1.60**		**1.60**	
Species Stocking Rate (30%)	GHFF Foraging Tree Density		11 per ha		178 per ha		T3 – 161 per ha T4 – 188 per ha	
	Species Stocking Rate Score	**10**	1		3		3	
	Species Stocking Rate Score - out of 3	**3.00**	0.30		0.90		0.90	
	Total		3.61		5.02		5.02	
	Area (hectares)		9.97		2.40		12.52	
	Weighting		0.401		0.096		0.503	
	Weighted Scores		1.45		0.48		2.53	
	Score		**4.46**					

Appendix C – Case Study Examples

7. Case studies

These case studies provide examples of koala habitat being successfully created, revegetated and/or enhanced across some of the koala management areas (KMAs) identified in NSW (see section 3.1).

Case study 1: Monitoring Koalas on the Tweed Coast (KMA 1)

Context: Remaining koala habitat on the Tweed Coast in north-eastern NSW is extremely fragmented. Patches of eucalypt forest or woodland large enough to sustain a viable koala population are restricted to areas between Kingscliff and Pottsville. The koala population in this area is listed as endangered. Tweed Shire Council has been implementing programs to protect koalas and improve their habitat for many years. The Tweed Coast Koala Plan of Management (KPoM) was adopted in 2015. Since then, Council has partnered with community organisations to plant 34,460 trees, providing 23.25 hectares of new koala habitat. They have also implemented other recovery actions such as purchasing land to protect koala habitat and creating koala zones to reduce vehicle strike. To assess whether the Tweed Coast KPoM was having an impact, Council implemented a rigorous monitoring program.

Aim: To understand changes in koala distribution, activity and occupancy within the Tweed Shire Council area between 2010 and 2018.

How: Koala scat surveys used the Regularised Grid-Based Spot Assessment Technique (see section 6.2). Permanent monitoring sites were established in a regular pattern of about 600-metre spacings. Survey sites were marked to ensure consistency through time. Surveys were conducted in 2010, 2015 and 2018; before, during and after the introduction of the Tweed Coast KPoM.

Results: Koala activity and distribution on the Tweed Coast declined substantially between 2010 and 2015, and increased in 2018 in some of the areas that were vacant in 2015. This suggests that some recovery and reconnection of populations has occurred. In the southern portion of the Tweed Coast, a large and stable resident population continues to persist in good quality habitat in the Pottsville Wetland (Figure 4). In the adjacent northern portion, the distribution and intensity of koala activity fluctuates over time.

Figure 4 Heat map showing changes in the intensity and the distribution of koala activity in the southern portion of the Tweed Coast between 2010 (left), 2015 (middle) and 2018 (right). Lower koala activity is indicated by blue shading, grading through red with yellow representing areas of highest koala activity. Yellow dots represent the locations of 56 sites that were surveyed in all three years. Source: Tweed Coast Koala Study 2018

Encouragingly, two-thirds of monitored koala habitat planting sites have been used by koalas. Many sites were used within 2.5 years of planting.

The koala population on the Tweed Coast remains unstable, small, fragmented, and at an occupancy rate that is well below sustainable. Continued monitoring (every 3 years) is vital to understand long-term koala population trends in the area.

Key messages:

- Following a rigorous, repeatable survey method across a region is a powerful way to understand changes in distribution and activity of a koala population.
- Through the implementation of threat abatement, recovery actions and development controls in the Tweed Coast KPoM the Tweed Council and local community are working towards the long-term protection of the Tweed Coast koala population. Continued population monitoring is essential.

More information: Tweed Shire Council

References:

Scott Hetherington (Senior Program Leader for Biodiversity, Tweed Shire Council), 2019, pers comm.

Tweed Shire Council 2015, Tweed Coast Comprehensive Koala Plan of Management 2015. Tweed Shire Council, Murwillumbah, NSW.

Tweed Shire Council 2019, Tweed Coast Koala Study 2018, Tweed Shire Council, Murwillumbah, NSW, www.tweed.nsw.gov.au/koalas.

Case study 2: Tree Parents Project, Bongil Bongil National Park (KMA 1)

Context: Bongil Bongil National Park is a 4300-hectare conservation reserve located 20 kilometres south of Coffs Harbour on the NSW north coast. The national park is renowned for its large koala population and provides high-quality habitat for an estimated 400 koalas. However, a significant proportion (around 660 hectares) of the park is occupied by even-aged stands of native eucalypt plantation species, such as blackbutt (*Eucalyptus pilularis*) and flooded gum (*Eucalyptus grandis*), that were planted in the early 1970s. These plantation species, although endemic to the NSW north coast, are not preferred koala use trees. The understorey of many of these plantations is now dominated by the weed species lantana (*Lantana camara*) and broad-leaved paspalum (*Paspalum mandiocanum*).

Aim: To convert 20 hectares of degraded eucalypt plantation within Bongil Bongil National Park to primary koala habitat using 10 teams of volunteers planting and nurturing 600 koala food trees for 3–4 years.

How: The NSW National Parks and Wildlife Service (NPWS) received funding through the Office of Environment and Heritage (OEH) Volunteer Grants Program. The project gathered 10 teams of volunteers from the local community. Each team was allocated two hectares and 60 preferred koala use trees to plant and manage. Tree species planted included *Eucalyptus microcorys*, *E. propinqua*, *E. robusta* and *Allocasuarina torulosa*. Each team was given tools, water and personal protective equipment to use when planting and maintaining their block. Plants were protected with wallaby-proof wire cages. Several years before planting, lantana was removed systematically by NPWS staff using splatter gun, hand pulling, cut, and paint- and spot-spray techniques.

NPWS trained the volunteers and supported them over 3–4 years to be good ‘tree parents’ by encouraging accountability, teamwork, experiential learning and competitiveness. Trophies were presented to teams with the tallest trees and highest plant survival.

Results: After 12 months, 96% of plants had survived. Dead plants were replaced and this increased the survival rate to 100%.

The plants grew quickly. The tallest tree (*E. robusta*) reached almost 3 metres in 12 months (Figure 5).

Within less than a year, a koala and joey were frequently sighted in remnant trees inside a planting block. Other koalas were seen in other blocks shortly after.

The program was so successful it was repeated in 2017 and another 600 koala trees were planted by volunteer tree parents. The survivorship of plants after 18 months replicated the 2015 results of 96%.

Figure 5 The winning swamp mahogany, grown by the 'Roos' in Block 7, almost 3 metres high at 12 months of age. Photo: Martin Smith/NPWS Coffs Coast Area

Key messages:

- Competitiveness of volunteers, supportive management and recognition of their dedication through awards can lead to high plant survival and growth rates.
- Good site preparation, weed control, protection from browsing animals, and follow-up maintenance can lead to excellent results.

More information: NPWS, Coffs Coast Area

Phone: 02 6652 0900 or email: info@environment.nsw.gov.au

References:

Martin Smith (NPWS senior ranger), pers comm. 2019

Martin Smith 2016, The Tree Parents Project, Bongil Bongil National Park. Project Review: The First Year 2015–16. NPWS, Coffs Coast Area.

OEH 2017, Volunteers invited to compete in local tree planting project to save koalas. Media release: www.environment.nsw.gov.au/news/volunteers-invited-to-compete-in-local-tree-planting-project-to-save-koalas

Case study 3: Koala connectivity corridor in the Cumberland Plain (KMA 2)

Context: The Cumberland Plain woodlands once covered 107,000 hectares of the western Sydney Basin. Only 6500 hectares, less than 6%, of the woodlands remain in small fragments surrounded by agriculture, housing and industry. Key koala habitat in the southern section of the Cumberland Plain has been significantly degraded, especially the mid- and ground-storey. Connection between koala habitat areas has also been impacted and remaining fragments are under intense pressure from urban development and weeds. Despite this, there is some evidence that koala numbers are slowly recovering in the woodlands.

Aim: To restore 0.8 hectares of degraded koala habitat at Cook Park in Ruse using native trees, shrubs and grasses. To strengthen a key koala corridor between the Georges River wildlife corridor and Smiths Creek, Campbelltown's largest urban bushland reserve. This will allow safer koala movement within the landscape.

How: Greening Australia received funding from WWF-Australia for this habitat restoration project. Three-thousand seedlings were planted in 2019 in three separate events, including a large community planting on Wild Koala Day when over 100 volunteers planted 1500 plants (Figure 6). The remaining seedlings were planted during events with a local school, Bushcare volunteers and Greening Australia staff. A thick layer of mulch was also added to cover the site and reduce weed competition. Most plants were groundcover species or shrubs (50 koala food trees were planted), because the existing canopy layer was relatively intact. Koala-friendly species were identified through consultation with experts from Campbelltown City Council.

Result: Koalas were sighted in remnant trees on the site within one year of revegetation actions. At the time of writing, the plantings were in good condition.

Key messages:

- It is possible to restore and connect koala habitat by enhancing degraded remnants, even when land availability is limited.
- Working with local stakeholders, such as the local council who have knowledge and expertise is important. Campbelltown City Council identified this site as an important koala corridor.
- Engaging the community in revegetation events is an effective way of getting a large amount of plants in the ground in a short amount of time.
- Raising awareness about local koalas is important.
- It is important to make use of local knowledge, as local experts will know what tree species koalas prefer in each area.

Figure 6 Community planting event at Cook Park in Ruse. Photo: Greening Australia

More information: Greening Australia, Western Sydney Office

Reference: Courtney Sullivan, Greening Australia Restoration Ecologist, 2019, pers comm

Case study 4: Koala use of young Eucalyptus plantations on the Liverpool Plains (KMA 6)

Context: The Liverpool Plains are among some of Australia's most productive and fertile agricultural lands. This region has been substantially cleared for intensive cropping, grazing and most recently mining, resulting in a reduction of woodland cover by more than 90%. Rising soil salinity from land clearing triggered a revegetation program between 2001 and 2004, which resulted in 400 hectares of eucalypt plantations being established on private land. These plantings had the added benefit of providing potential habitat for native animals. Gunnedah and the Liverpool Plains are a well-known hotspot for koalas, but it was unknown whether koalas would use the new plantings.

Aim: To understand whether koalas (and other animals) would use young eucalyptus plantations on the Liverpool Plains, and what factors influenced their use.

How: Researchers from the NSW Department of Primary Industries recorded koala presence and absence at 43 study sites: 27 eucalypt plantations, 11 remnant patches of forest and woodland, and 5 paddocks. Surveys included daylight searches, spotlight surveys, camera trap records and scat surveys. Two koalas were fitted with GPS collars and tracked for 5–7 months.

Results: Koalas were more likely to be found in remnant patches than young eucalypt plantations. Koalas were recorded at 64% of remnant patch sites compared to 26% of plantation sites. No koalas were recorded in paddock sites. Koala presence or absence was strongly linked to the amount of remnant vegetation within 5 kilometres. Sites surrounded by large areas of remnant vegetation were more likely to be used by koalas.

Koalas used trees as young as 2 years old for foraging, particularly river red gum (*Eucalyptus camaldulensis*), and trees 4–7 years old for foraging and shelter (Figure 7).

The two tracked koalas often used eucalypt plantations, woodland patches and isolated paddock trees, and showed a slight preference for eucalypt plantations.

Figure 7 Koalas commonly used young trees in eucalypt plantations – this tree was about 2 years old. Photo: Helen Engel

Key messages:

- Young eucalypt plantations of preferred koala tree species can provide valuable koala habitat, provided they are located close to large areas of remnant forest and woodland.

- A combination of remnant patches, plantations and scattered trees within the landscape provides a variety of complementary resources that koalas will use.
- Uptake and use of eucalypt plantations by koalas can be remarkably quick and extensive.
- Revegetation can help sustain a koala population and mitigate the impacts of habitat loss and fragmentation in the short term.

More information: Rod Kavanagh, NSW Senior Ecologist at Australian Wildlife Conservancy

References:

Kavanagh RP and Stanton MA 2012, Koalas use young Eucalyptus plantations in an agricultural landscape on the Liverpool Plains. *Ecological Management & Restoration*, 13: 3.

Stanton MA 2016, Rehabilitation: to what state and for which purpose? Poster presented at the 6th Annual Best Practice Ecological Rehabilitation of Mined Lands Conference.

Case study 5: Revegetation of high-quality koala habitat in the Wingecarribee Shire (KMA 2)

Context: Surveys conducted in the Wingecarribee Shire in 2017 by NSW Government staff estimated that over 3000 koalas reside in the region, making it the largest known population in southern NSW. Koala density is influenced by vegetation community type and condition. Within the region, higher koala densities correlate with higher soil fertility. A koala habitat restoration project in the Southern Highlands focused on two critically endangered ecological or vegetation communities: Robertson basalt tall open-forest and Southern Highlands shale forest and woodland. These two vegetation communities support a relatively high density of koalas and are considered the highest quality koala habitat in the region.

Aim: To engage local stakeholders to restore 42 hectares of high-quality koala habitat and endangered ecological communities by planting 2500 trees, including koala feed trees.

How: Three sites within the Upper Nepean State Conservation Area had been high-quality koala habitat but were later cleared for timber. The sites were in varying condition before planting, but typically had good natural regeneration of the ground cover and understorey. There was little regeneration of canopy species.

Revegetation species were selected based on official listing advice for the two endangered ecological communities and knowledge of experts including government staff. Only canopy species were planted. Due to dry conditions in spring 2018, planting was held over until autumn 2019.

Seedlings were sourced from local nurseries. Minimal spot-spraying of weeds was required due to the largely native groundcover. A hazard reduction burn at one site helped the planting process. Holes for seedlings were dug about eight metres apart, water crystals added, and seedlings were protected with 800-millimetre-tall galvanised mesh tree guards. The seedlings were watered at planting and then monthly.

Results: Preliminary results at the time of writing indicate a greater than 90% survival of seedlings. Monitoring at each site will include plant diversity surveys within fixed plots to understand the condition of the endangered ecological communities, recording seedling survival counts, as well as evidence of koala use (scats, scratches, tops of plants snapped).

Key messages:

- Good planning involves targeting areas of high-quality habitat for restoration and/or areas that have high connectivity value.
- Good site preparation, protection of seedlings from browsers and follow-up maintenance achieves good results.
- Targeting areas with potential high habitat value, such as good quality soils, will results in greater benefits to koalas.

More information: Department of Planning, Industry and Environment (DPIE) Illawarra

Reference:

Lachlan Wilmott, Threatened Species Officer, DPIE Illawarra Region, 2019, pers comm