Part A – EPBC Approval (EPBC2015/7530)

Australian Government
Department of Agriculture, Water and the Environment

APPROVAL

Master Planned Residential Development, Greater Flagstone Priority Development Area, Undullah, Queensland (EPBC 2015/7530)

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)	Pioneer Fortune Pty Ltd
ACN or ABN of approval holder	165 133 620
Action	To construct and operate a master planned residential development on Lot 3 on RP45236, Lot 3 on RP49296, and Lot 28 on S311174 in the Greater Flagstone Priority Development Area, Undullah, Queensland [see EPBC Act referral 2015/7530].

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.

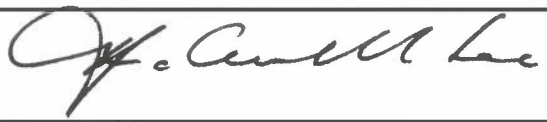
Controlling Provisions

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

Period for which the approval has effect

This approval has effect until 1 February 2050.

Decision-maker

Name and position	Andrew McNee Assistant Secretary, Assessments and Governance Branch
Signature	
Date of decision	5 February 2020

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. For the protection of the **Koala** and **Grey-headed Flying-fox**, the approval holder:
    a. May undertake **minor clearing** within **On-site Conservation area B**;
    b. Must not **clear** more than 50 ha of **Koala Habitat** and **Grey-headed Flying-fox foraging habitat** within the **development area**, until the approval holder has demonstrated to the **Department** that a minimum of 300 ha of new **Koala Habitat** and **Grey-headed Flying-fox foraging habitat** has been planted within **Environmental Management Zone 3** and **Environmental Management Zone 4** within the **Avonvale and Cherry Gully Stations Offset area**; and the requirements of condition 3 have been met;
    c. Must not **clear** more than 100 ha of **Koala habitat** and **Grey-headed Flying-fox foraging habitat** within the **development area**, until the outcomes required under sub-conditions 16(b) and 17(b) have been achieved; and
    d. Must not **clear** more than 529 ha of **Koala habitat** and **Grey-headed Flying-fox foraging habitat** within the **development area**.
2. For the protection of the **Koala Habitat** and **Grey-headed Flying-fox foraging Habitat**, the approval holder must implement the **Natural Environment Overarching Site Strategy** at the **project site** for the period of effect of the approval. In particular the approval holder must:
    a. Engage a qualified **Fauna Spotter catcher** during **clearing** and **construction** to minimise the risk of injury or death to **Koalas**;
    b. Install temporary **Koala exclusion fencing** around each stage of **construction** work, immediately after **clearing** and prior to the commencement of **construction**, to prevent **Koalas** entering any area where **construction** is occurring. Temporary **Koala exclusion fencing** must remain in place until all **construction** activities within any fenced area are completed;
    c. Implement measures to restrict dogs from entering **On-site Conservation area A** and **On-site Conservation area B** unless they are controlled on a lead, and provide prominent, easily understood signage at each entry point specifying that all dogs must be kept on lead;
    d. Implement traffic calming measures and install prominent signage to limit vehicle speeds to minimise the risk of injury or deaths of **Koalas** occurring on residential roads at the **project site**;
    e. Provide **Fauna Movement Solutions** including (but not limited to) **Koala exclusion fencing**, and underpasses where roads intercept conservation areas and/or where bridges do not otherwise provide for fauna movement; and
    f. Install prominent, easily understood **Koala** awareness signage where roads in the **development area** are located adjacent to **On-site Conservation area A** and/or **On-site Conservation area B,** following construction.
3. Within 3 years of the date this approval decision, the approval holder must **legally secure On-site Conservation area A.** Within 20 **business days** of **legally securing** this area, the approval holder must provide the **Department** with written evidence demonstrating that **On-site Conservation area A** has been **legally secured**.
4. The approval holder must manage **On-site Conservation area A** and **On-site Conservation area B** so as to meet the requirements of these conditions until such time as it can provide the

Department with written evidence demonstrating that the **Council** has accepted responsibility for on-going management of **On-site Conservation area A** and **On-site Conservation area B**.

5. To compensate for the **clearing** of 529 ha of **Koala Habitat**, the functional loss of 51 ha of **Koala Habitat**, and 529 ha of **Grey-headed Flying-fox foraging Habitat**, the approval holder must:
    a. **Legally secure** a minimum of 1,131.5 ha of the **Avonvale and Cherry Gully Stations Offset area** prior to the **commencement of the action**; and
    b. Within 20 **business days** of **legally securing** the **Avonvale and Cherry Gully Stations Offset area**, provide the **Department** with written evidence demonstrating that **Avonvale and Cherry Gully Stations Offset area** has been **legally secured**, and **Shapefiles** of the **offset attributes**.
    c. Within 6 months of approval, the approval holder must commence **management activities** at the **Avonvale and Cherry Gully Stations Offset area**.

    Note: Uses or activities at the offset site are not permitted if they are not compatible with the primary purpose of conservation.

6. During **year 1**, the approval holder must complete baseline surveys of the entire **Avonvale and Cherry Gully Stations Offset area** to determine the **extent of weed cover** and **seasonal feral animal** abundance. The baseline surveys must be undertaken by a **suitably qualified field ecologist** in accordance with a scientifically valid, robust, and repeatable methodology.

7. Within 3 months of completion of the baseline surveys required under condition 6, the approval holder must engage a **suitably qualified field ecologist** to update the **Avonvale and Cherry Gully Stations Offset area Management Plan**, to include the following:
    a. the results of the baseline surveys required under condition 6;
    b. the detailed **baseline Habitat quality assessment data** for each **environmental management zone** on the **Avonvale and Cherry Gully Stations Offset area** as provided in the **preliminary documentation** and **Direct Offset Chapter**;
    c. the **Species Stocking Rate scoring table**;
    d. the outcomes specified in conditions 10 - 18; and
    e. a program to monitor and report on progress against performance and completion criteria including the ecological outcomes specified in conditions 10 - 18.

8. The updated **Avonvale and Cherry Gully Stations Offset area Management Plan** must be **published** on the approval holder's **website** and remain **published** for the period this approval has effect. The approval holder must implement the **published** updated **Avonvale and Cherry Gully Stations Offset area Management Plan** for the duration of the approval, and must achieve the outcomes required under conditions 10 - 18.

9. The approval holder must publish each **Avonvale and Cherry Gully Stations Offset area Management Plan Annual Report** on the **website** within 40 **business days** following the end of the 12 month period reported on in the Annual Report. The approval holder must keep each **Avonvale and Cherry Gully Stations Offset area Management Plan Annual Report published** from the date it is first **published** until the end of the period of effect of this approval.

Pest and Weed Management

10. The approval holder must demonstrate a reduction in the abundance of **feral animals** at the **Avonvale and Cherry Gully Stations Offset area** by the end of **year 5**, relative to the abundance determined by the baseline surveys, and ensure that the abundance of **feral animals** is then

maintained at, or reduced below, the **year 5** abundance for the rest of the period of effect of the approval.

11. The approval holder must demonstrate that the **extent of weed cover** at the **Avonvale and Cherry Gully Stations Offset area** is:

    a. less than 20% at the end of **year 5**; and

    b. less than 5% at the end of **year 10** and for the rest of the period of effect of the approval.

Stock Exclusion

12. For the protection of **Koala Habitat**, the approval holder must demonstrate by the end of **year 3** that **fauna friendly stock exclusion fencing** has been installed around the entire perimeter of the **Avonvale and Cherry Gully Stations Offset area**. The approval holder must ensure that the **fauna friendly stock exclusion fencing** is maintained and effective for its purpose for the period of effect of the approval.

Habitat Quality Improvement

13. The approval holder must undertake ecological work to restore the **Regional Ecosystems** in the **Avonvale and Cherry Gully Stations Offset area** in accordance with the **Avonvale and Cherry Gully Stations Offset area Management Plan** and the **Direct Offset Chapter**.

14. The approval holder must achieve the following outcomes in **Environmental Management Zone 1**:

    a. A 57% increase, relative to the **baseline Habitat quality assessment data**, in the average **Koala Species Stocking Rate score** by the end of **year 6**, and subsequently maintain or exceed that average **Koala Species Stocking Rate score** for the remainder of the period of effect of the approval.

    b. Average tree canopy cover at >50% - <200% of the **benchmark** for **Regional Ecosystem** 12.11.14 by the end of **year 6** and subsequently maintain average tree canopy cover in that range for the remainder of the period of effect of the approval.

    c. Average **recruitment of woody perennial species** in the **ecologically dominant layer** greater than 75% by the end of **year 6** and subsequently maintain or exceed that rate of recruitment for the remainder of the period of effect of the approval.

    d. The number of **Large trees** >50% of the **benchmark** for the **Regional Ecosystem** by the end of **year 6** and this number subsequently maintained or exceeded for the remainder of the period of effect of the approval.

    e. An average of at least 6 different **winter or spring flowering Grey-headed Flying-fox foraging species** in each **assessment plot** by the end of **year 6**, and subsequently maintain or exceed this outcome for the remainder of the period of effect of the approval.

15. The approval holder must achieve the following outcomes in **Environmental Management Zone 2**:

    a. An 80% increase, relative to the **baseline Habitat quality assessment data**, in the average **Koala Species Stocking Rate score** by the end of **year 16**, and subsequently maintain or exceed that average **Koala Species Stocking Rate score** for the remainder of the period of effect of the approval.

    b. Average tree canopy cover at >50% - <200% of the **benchmark** for **Regional Ecosystem** 12.11.14 by the end of **year 16**, and subsequently maintain average tree canopy cover in that range for the remainder of the period of effect of the approval.

    c. Average **recruitment of woody perennial species** in the **ecologically dominant layer** greater than 75% by the end of **year 16**, and subsequently maintain or exceed that rate of recruitment for the remainder of the period of effect of the approval.

d. The number of **Large trees** >50% of the **benchmark** for the **Regional Ecosystem** by the end of **year 16**, and this number subsequently maintained or exceeded for the remainder of the period of effect of the approval.

e. An average of at least 6 different **winter or spring flowering Grey-Headed Flying-fox foraging species** in each **assessment plot** by the end of **year 6** and subsequently maintain or exceed this outcome for the remainder of the period of effect of the approval.

Habitat Creation

16. The approval holder must achieve the following outcomes in **Environmental Management Zone 3**:

a. Recreate the **pre-clearing Regional Ecosystem** by planting 399 ha of new **Koala Habitat** and **Grey Headed Flying-fox foraging Habitat.**

b. All planting works must be completed by the end of **Year 5**.

c. A 350% increase, relative to the **baseline Habitat quality assessment data**, in the average **Koala Species Stocking Rate score** by the end of **year 10**.

d. Average tree canopy cover at >10% - <50% of the **benchmark** for each **Regional Ecosystem** by the end of **year 10**.

e. Average **recruitment of woody perennial species** in the **ecologically dominant layer** greater than 50% by the end of **year 10**.

f. An average of at least 6 different **winter or spring flowering Grey-Headed Flying-fox foraging species** in each **assessment plot** by the end of **year 10**, and subsequently maintain or exceed this diversity of foraging species for the remainder of the period of effect of the approval.

g. A 700% increase, relative to the **baseline Habitat quality assessment data**, in the average **Koala Species Stocking Rate score** by the end of **year 20**, and subsequently maintain or exceed that average **Koala Species Stocking Rate score** for the remainder of the period of effect of the approval.

h. Average Tree canopy cover at >50% - <200% of the **benchmark** for each **Regional Ecosystem** by the end of **year 20**, and subsequently maintain average tree canopy cover in that range for the remainder of the period of effect of the approval.

i. Average recruitment of **woody perennial species** in the **ecologically dominant layer** greater than 75% by the end of **year 20**, and subsequently maintain or exceed that rate for the remainder of the period of effect of the approval.

j. The number of **Large trees** >50% of the **benchmark** for each **Regional Ecosystem** by the end of **year 20**, and this number subsequently maintained or exceeded for the remainder of the period of effect of the approval.

17. The approval holder must achieve the following outcomes in **Environmental Management Zone 4**:

a. Recreate the **pre-clearing Regional Ecosystem** 12.3.7 or 12.3.3 by restoring 166.6 ha of new **Koala Habitat** and **Grey-headed Flying-fox foraging Habitat.**

b. All revegetation planting works completed by the end of **Year 4.**

c. A 30% increase, relative to the **baseline Habitat quality assessment data**, in the average **Koala Species Stocking Rate score** by the end of **year 10.**

d. Average tree canopy cover at >10% - <50% of the **benchmark** for each **Regional Ecosystem** 12.3.7 by the end of **year 10**.

e. Average **recruitment of woody perennial species** in the **ecologically dominant layer** greater than 50% by the end of **year 10.**

f. An average of at least 6 different **winter or spring flowering Grey-Headed Flying-fox foraging species** in each **assessment plot** by the end of **year 10** and this diversity subsequently maintained or exceeded for remainder of the period of effect of the approval.

g. A 60% increase relative to the **baseline Habitat quality assessment data**, in the average **Koala Species Stocking Rate score** at **year 20**, and subsequently maintain or exceed that average **Koala Species Stocking Rate score** for the remainder of the period of effect of the approval.

h. Average Tree canopy cover at >50% - <200% of the **benchmark** for each **Regional Ecosystem** by the end of **year 20** and subsequently maintain average tree canopy cover in that range for the remainder of the period of effect of the approval.

i. Average recruitment of **woody perennial species** in the **ecologically dominant layer** greater than 75% by the end of **year 20**, and subsequently maintain or exceed that rate for the remainder of the period of effect of the approval.

j. The number of **Large trees** >50% of the **benchmark** for the **Regional Ecosystem** by the end of **year 20**, and this number subsequently maintained or exceeded for the remainder of the period of effect of the approval.

18. The approval holder must demonstrate by **year 5** that a minimum of 50% of planting stock used in all offset area vegetation has been grown from seed harvested from **Koala food trees** and **Grey-headed Flying-fox foraging tree species** on or immediately adjoining the offset area land holdings.

19. The approval holder must engage a **suitably qualified independent expert** to undertake an assessment of the **Avonvale and Cherry Gully Stations Offset area** at the end of each of **year 6, year 10, year 16** and **year 20** to assess whether the outcomes required in conditions 10 – 18 have been, or are likely to be, achieved. The findings of each assessments must be documented and **published** within 6 months of the end of each of **year 6, year 10, year 16** and **year 20**, and be provided to the **Department** within five (5) **business** days of each being **published**.

20. If, at any time during the period of effect of the approval, the **Minister** is not satisfied that any of the requirements or outcomes under conditions 10 – 18 have been or are likely to be achieved or maintained, the **Minister** may request (in writing) further evidence from the approval holder as to how the requirements or outcomes of these conditions will be achieved or maintained. If requested by the **Minister**, the approval holder must:

    i. provide a report to the **Department** that documents the cause of the potential or actual non-achievement of required outcomes, the corrective actions to be taken (including timeframes for reporting to the **Department** the success of those actions) and the contingency measures that will be implemented to prevent further occurrences;

    ii. revise the updated **Avonvale and Cherry Gully Stations Offset area Management Plan**, applying the advice of a **suitably qualified field ecologist** and within a timeframe determined by the **Minister**, to include the corrective actions and contingency measures and a program of when and how the relevant contingency measures and corrective actions will be implemented;

    iii. submit the revised **Avonvale and Cherry Gully Stations Offset area Management Plan** to the **Department** for the **Minister's** approval, within a timeframe determined by the **Minister;** and

    iv. implement the approved **Avonvale and Cherry Gully Stations Offset area Management Plan**.

Part B – Standard administrative conditions

Notification of date of commencement of the action

21. The approval holder must notify the **Department** in writing of:

    a. the date of **commencement of the action** within 5 **business days** after the date of **commencement of the action**; and

    b. the date of commencement of **construction** within 5 **business days** after the date of commencement of **construction**.

22. 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

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

24. 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.

25. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a **plan** or conditions of this approval, is prepared in accordance with the **Department's** *Guidelines for biological survey and mapped data* (2018) and submitted electronically to the **Department** in accordance with the requirements of the **plan** within 10 **business days**.

Annual compliance reporting

26. 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

27. 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:

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

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

c. 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.

28. 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:

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

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

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

Independent audit

29. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted as requested in writing by the **Minister**.

30. 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 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.

31. 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.

Completion of the action

32. 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:

Assessment plot means the area within a rectangular plot of dimensions 100 metres (approximately following the contour of the land) by 20 metres .

Avonvale and Cherry Gully Stations Offset area means all the areas marked with bright green and spots designated as 'Offset area' in the map at Attachment C, located off Littles Road, Toogoolawah, Queensland as shown in Attachment E.

Avonvale and Cherry Gully Stations Offset area Management Plan means the *Avonvale and Cherry Gully Stations Offset Management Plan*, dated 1 October 2019 and provided as part of the final **preliminary documentation**.

Avonvale and Cherry Gully Stations Offset area Management Plan Annual Report means each annual report compiled by the Offset provider (to report on all **management activities**, surveys, results and outcomes within a 12 month operational period), as required in the **Avonvale and Cherry Gully Stations Offset area Management Plan.**

Baseline Habitat quality assessment data means the Koala Modified Habitat Quality Assessment Tool data Tables OC16, OC17, OC18, OC19, OC20, OC21, OC22 and OC23, and the Grey Headed Flying-fox

Foraging Habitat Assessment Tables OC30, OC31, OC32, OC33, OC34, OC35, OC36 and OC37 in the **Direct Offset Chapter**, which provide the baseline and future scoring for the **Avonvale and Cherry Gully Stations Offset area.**

Benchmark means the quantitative value for the relevant BioCondition attribute specified for each **Regional Ecosystem** by the Queensland Herbarium, as described in *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland* (version 2.2, 2015 or a subsequent version approved by the Queensland Government). The attribute values for each **regional ecosystem** are located on the Queensland Government website at https://www.qld.gov.au/__data/assets/pdf_file/0026/67382/seq-benchmarks.pdf and are revised from time to time.

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/Clearing 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). **Clearing** does not include any relevant prescribed burns or actions undertaken for bushfire management, where required.

Commencement of the action/commencement/commence means the first instance of any specified activity associated with the action including **clearing**, **construction**, and/or **management activities** at the **Avonvale and Cherry Gully Stations Offset area**. **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 so long as these are located where it will have no impact on the **protected matters**;

iii. protect environmental and property assets from fire, weeds and feral animals, including 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**; and

v. undertake soil sampling or geotechnical investigations provided these cause only minor physical disturbance and are required in advance of formal commencement of site works.

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**. This includes but is not limited to information detailing:

vi. the date, location and extent of **protected matter** habitat cleared within the development area;

vii. the location, extent and quality of **protected matter** habitat within the **Avonvale and Cherry Gully Stations Offset area**;

viii. **weed extent** within the **Avonvale and Cherry Gully Stations Offset area**;

ix. **feral animal** numbers within the **Avonvale and Cherry Gully Stations Offset area**;

x. **Koala density** and **Grey-Headed Flying-fox** presence at the **Avonvale and Cherry Gully Stations Offset area.**

Completion of the action means the time at which all approval conditions (except condition 33) have been fully met.

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; and

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; building of roads; but excluding the installation of temporary fences and signage. **Construction** does not include the erection of a temporary sales centre so long as this does not require new road access and is located where it will have no impact on the **protected matters**.

Council means the local government authority responsible for the local government area encompassing the **project site**, currently Logan City Council.

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

Development area means the area designated as 'Development area' on the map at Attachment B indicated by red cross hatching.

Diameter at breast height is the diameter of a tree's trunk measured at 1.3 metres from the ground.

Direct Offset Chapter means the Direct offset chapter which was provided as commercial in confidence as part of the **preliminary documentation** provided to the **Department**.

Ecologically dominant layer means the tree layer making the greatest contribution to the overall biomass of the vegetation community.

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

Environmental Management Zone 1 means the area designated as 'ENVIRONMENTAL MANAGEMENT ZONE 1 – Remnant Habitat [257.7 ha]' within the **Avonvale and Cherry Gully Stations Offset area** as shown at Attachment D.

Environmental Management Zone 2 means the area designated as 'ENVIRONMENTAL MANAGEMENT ZONE 2 – Mixed Value Regrowth Vegetation [308.2 ha]' within the **Avonvale and Cherry Gully Stations Offset area** as shown at Attachment D.

Environmental Management Zone 3 means the area designated as 'ENVIRONMENTAL MANAGEMENT ZONE 3 – Open Country – Category X vegetation [399.0 ha]' within the **Avonvale and Cherry Gully Stations Offset area** as shown at Attachment D.

Environmental Management Zone 4 means the area designated as 'ENVIRONMENTAL MANAGEMENT ZONE 4 – Degraded Creeks, Gullies & Drainage Lines [166.6 ha]' within the **Avonvale and Cherry Gully Stations Offset area** as shown at Attachment D.

Extent of weed cover means the proportion (expressed as a percentage) of the total land area in which any square metre contains any part of a non-native plant species known to restrict the movement of **Koala** and/or degrade the quality of **Koala Habitat** and/or habitat for **Grey-headed Flying-fox**, or its ability to regenerate. Such weeds include *Lantana camara* and *Lantana montevidensis.*

Fauna friendly stock exclusion fencing means fencing designed to prevent access by cattle to offset areas while providing for the free movement of **Koalas** and **Grey-headed Flying-foxes**.

Fauna Movement Solutions means appropriate measures to minimise the risk of injury or deaths of **Koalas** during and post-construction, such as fauna exclusion fencing, fauna underpasses or overpasses, and/or bridges. Examples can be found in the *Koala Sensitive Design Guideline: A guide to koala sensitive designed measures for planning and development activities, November (Queensland Department of Environment and Heritage Protection, 2012).*

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 vegetation clearance activities.

Feral animals means non-native feral animals known to predate on the **Koala.**

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

Grey-headed Flying-fox foraging Habitat means areas of vegetation that contain **Grey-headed Flying-fox** foraging trees, including **winter or spring flowering Grey-headed Flying-fox foraging species**.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent means a person(s) that does not have an individual, or by employment or family affiliation, any conflicting or competing interests with the approval holder, the approval holder's staff, representatives or associated persons; or the project, including any personal, financial, business or employment relationship, other than receiving payment for undertaking the role for which the condition requires an independent person.

Independent audit means an audit conducted by a **suitably qualified independent expert** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

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

Koala density means the number and/or utilisation and distribution of **Koalas** per unit area as determined in field surveys over the entire **Avonvale and Cherry Gully Stations Offset area** undertaken by a **suitably qualified field ecologist** using a scientifically robust and repeatable methodology over a timeframe that serves as a sound basis for comparison.

Koala food trees means a species of tree of 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 exclusion fencing means fencing which prevents the movement of koalas from one area to another. Suitable examples are found in *Koala Sensitive Design Guideline: A guide to koala sensitive designed measures for planning and development activities, (Queensland Department of Environment and Heritage Protection, 2012)* and in the *EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory),* Commonwealth of Australia, 2014.

Koala Habitat means any vegetation that contains **Koala food trees** and scores five or more using the habitat assessment tool provided in Table 4 of the **Koala referral guidelines**.

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

Koala Species Stocking Rate score means the score achieved using the **Species Stocking Rate scoring table** and is recorded as a score out of four (4) in the baseline Modified Habitat Quality Assessment

undertaken in the **preliminary documentation** and included in tables OC16, OC18, OC20 and OC21 in the **Direct Offset chapter**.

Large tree/s means living trees with a **Diameter at breast height** greater than the **Diameter at breast height** threshold specified in the **benchmark** for the relevant **Regional Ecosystem** and measured in accordance with the *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (Version 1.2) (Queensland Department of Environment and Heritage Protection, 2017), or any subsequent version. This may include both eucalypt and non-eucalypt trees depending on the relevant **Regional Ecosystem**.

Legally secure means to protect for conservation for the duration of the impact, on the title of the land, under an enduring protection mechanism, such as a voluntary declaration under the *Vegetation Management Act 1999* (Qld) or as a nature refuge under the *Nature Conservation Act 1992* (Qld), or another enduring protection mechanism agreed to in writing by the **Department.**

Management activities means activities to be undertaken at the **Avonvale and Cherry Gully Stations Offset area**, including (but not limited to):

i. Detailed baseline surveys to determine **extent of weed cover** and **seasonal feral animal** abundance;

ii. Management of weeds and **feral animals**;

iii. Installation of fauna friendly stock exclusion fencing;

iv. Ecological work to restore the **Regional Ecosystems** in **Environment Management Zone 1** and **Environment Management Zone 2**;

v. Activities associated with planting new **Koala Habitat** and **Grey-headed Flying-fox foraging habitat** in **Environment Management Zone 3** and **Environment Management Zone 4**, such as the seed harvesting program, nursery design and setout.

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

Minor clearing means **clearing** required only for the purpose of approved linear infrastructure and environmental works associated with the installation of roads, fauna underpasses, storm water outlets, weed management, or erosion and waterway stability works where approved by the Queensland Government in accordance with the **Natural Environment Overarching Site Strategy**. **Minor clearing** must be temporary and areas subject to **minor clearing** must be promptly revegetated with species native to the **regional ecosystem** in which the **minor clearing** is undertaken.

Monitoring data means the data required to be recorded under the conditions of this approval.

Natural Environment Overarching Site Strategy means the *Wyatt Road Undullah Greater Flagstone Priority Development Area Natural Environment Overarching Site Strategy Version 3.0* prepared by Saunders Havill Group, approved by Queensland Government on 20 June 2017 (approval no. DEV2012/248), or a subsequent version approved by the Queensland Government.

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

i. **EPBC Act** reference number

ii. Physical address of the offset area;

iii. Coordinates of the boundary points in decimal degrees;

iv. Geo-referenced shapefiles of the polygons comprising **Environmental Management Zones 1, 2, 3** and **4**;

v. **Protected matters** that the offset compensates for;

vi. Any additional **EPBC Act** listed threatened species and communities that are benefiting from the offset; and

vii. Size of the offset in hectares.

On-site Conservation area A means the area of **Koala Habitat** and **Grey-headed Flying-fox foraging Habitat** marked with dark green spots on bright green identified as 'Conservation area A' in Attachment B.

On-site Conservation area B means the area of **Koala Habitat** and **Grey- headed Flying-fox foraging Habitat** marked with green cross hatching on bright green identified as 'Conservation area B' in Attachment B.

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).

Pre-clearing Regional Ecosystem means the vegetation identified in the **preliminary documentation** or based on ground truthed surveys, as being present in a **Regional Ecosystem** prior to **clearing**.

Preliminary documentation means the final Preliminary Documentation, *Lots 3 on RP45236, 3 on RP49296 and 28 on S311174 in the Greater Flagstone Priority Development Area Part A Preliminary Documentation Report*, Saunders Havill Group 07 November 2019, the preliminary documentation also includes a separate **Direct Offset Chapter**.

Project site means the 1,024 ha area as enclosed by the pink line at Attachment A and as identified within the thick black lines designated as 'Project site' on the map at Attachment B, located at Wyatt Road, Undullah, Queensland.

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

Publish/ed/ing means make publicly available on the **website** for the duration of this approval.

Recruitment of woody perennial species means the proportion of the dominant canopy (**ecologically dominant layer**) species with evidence of recruitment and is measured in accordance with the *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (Version 1.2) (Queensland Department of Environment and Heritage Protection, 2017), or any subsequent version.

Regional Ecosystem means a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil as classified by the Queensland Government under the *Vegetation Management Act 1999 (Qld).*

Seasonal in respect of surveys means to survey to determine abundance separately for each season (summer, autumn, winter and spring).

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 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.

Species Stocking Rate scoring table means Table OC15 in the **Direct Offset chapter** of the **preliminary documentation** used to determine baseline and future species stocking rate scores at the **Avonvale and Cherry Gully Stations Offset area.**

Suitably qualified field ecologist means a person who has professional qualifications and at least three (3) years of work experience designing and implementing surveys for **Koala** and **Grey-headed Flying-fox**, and can give an authoritative assessment and advice on the presence and habitat requirements, including habitat management and restoration for **Koala** and **Grey-headed Flying-fox,** using relevant protocols, standards, methods and/or literature.

Suitably qualified independent expert means an **independent** person who has professional qualifications, training, skills and at least 5 years experience in 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.

Winter or spring flowering Grey-headed Flying-fox foraging species means tree species which provide flowering resources in winter and/or spring for the **Grey-headed Flying-fox**.

Year 1 means the period within one year from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured**.

Year 3 means the period within three years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured**.

Year 4 means the period within four years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured**.

Year 5 means the period within five years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured.**

Year 6 means the period within six years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured.**

Year 7 means the period within seven years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured.**

Year 10 means the period within ten years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured.**

Year 16 means the period within sixteen years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured.**

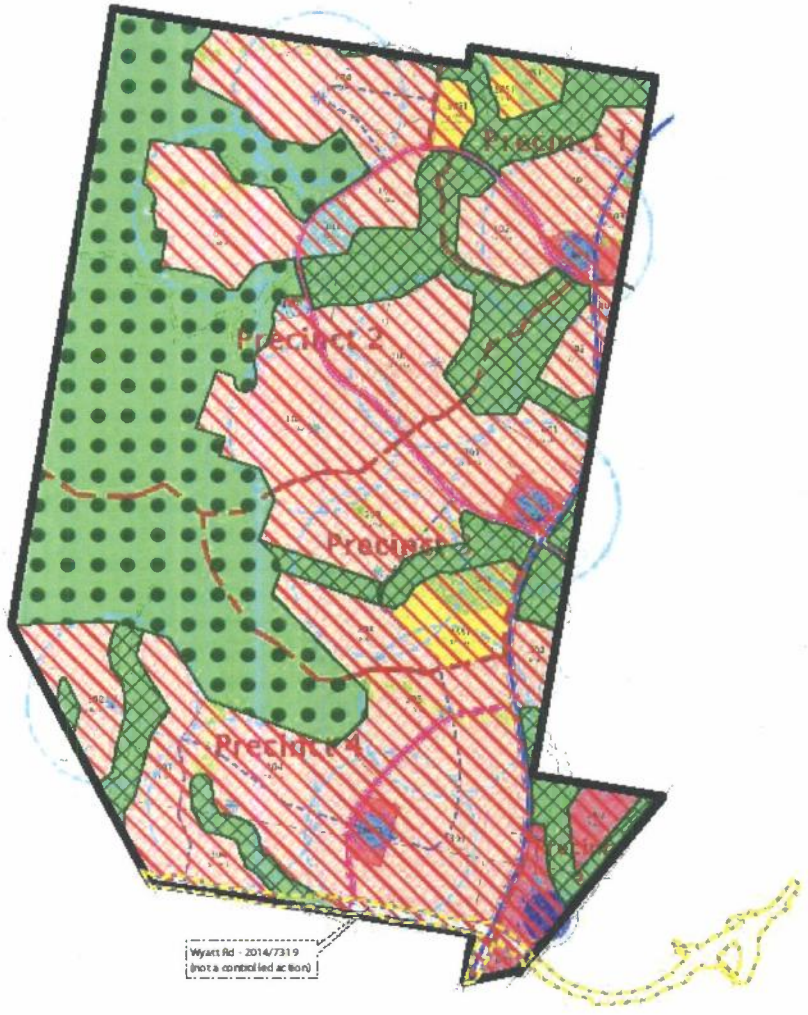
Year 20 means the period within twenty years from the date when the **Avonvale and Cherry Gully Stations Offset area** is **legally secured.**

ATTACHMENTS

Attachment A: Project site Aerial

Attachment B: Plan of Proposed Action site

Plan of Proposed Action site



Land Uses
Urban Residential Neighbourhoods
Centres
District Centre
District Centre
Neighbourhood Centre
Kororoit Creek Integrative Community Centre
Roads
35m Arterial Road (ICDP)
35m Arterial Road (ICDP)
25m Trunk Connector
19.5 Connector
15m Access
15m Access
6.5m Lane
Open Space
Environmental / Buffers / Waterways
District Sports
District Recreation
Neighbourhood Recreation Park
400m walkable neighbourhood (around N/R)
Urban Linkages (integrated into layout)
Education Facilities
State Primary School 2.5ha SPS1
State Secondary School 12.0ha SSS1

THG

Legend
Project site
EPBC 2014/7319-not a controlled action
Conservation Area A
Conservation Area B
Development area

0 100 200 400 600 800 m

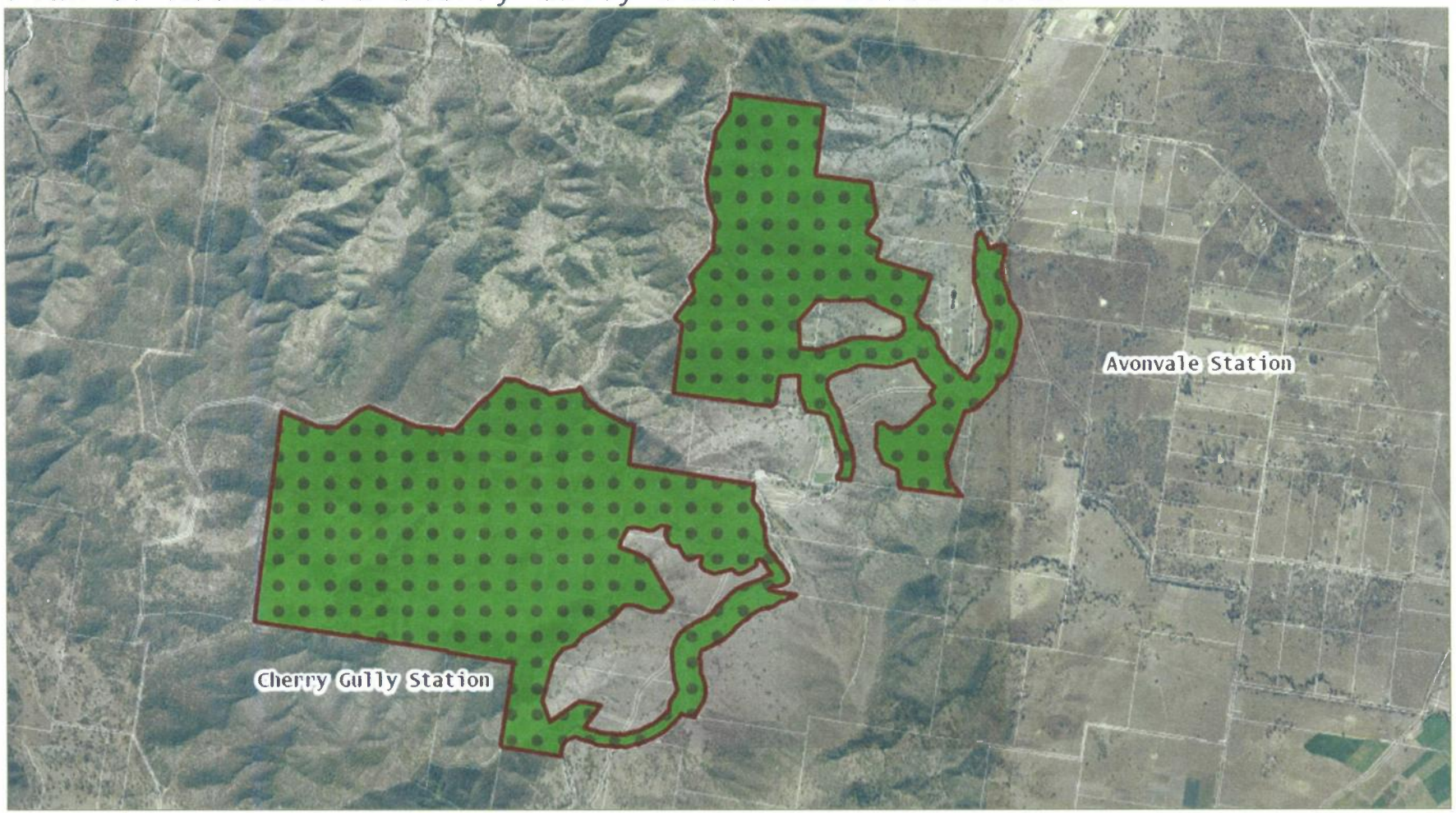
saunders havill group

Pioneer Fortune Pty Ltd

Undullah Project

Attachment C: Plan of Avonvale and Cherry Gully Stations Offset area

Plan of Avonvale & Cherry Gully Stations Offset Area



Avonvale & Cherry Gully Stations - Offset Management Plan (OEM)

EPBC 2015/7530

0 200 400 800 1,200

3/02/2020 1:30,000

References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019

Legend

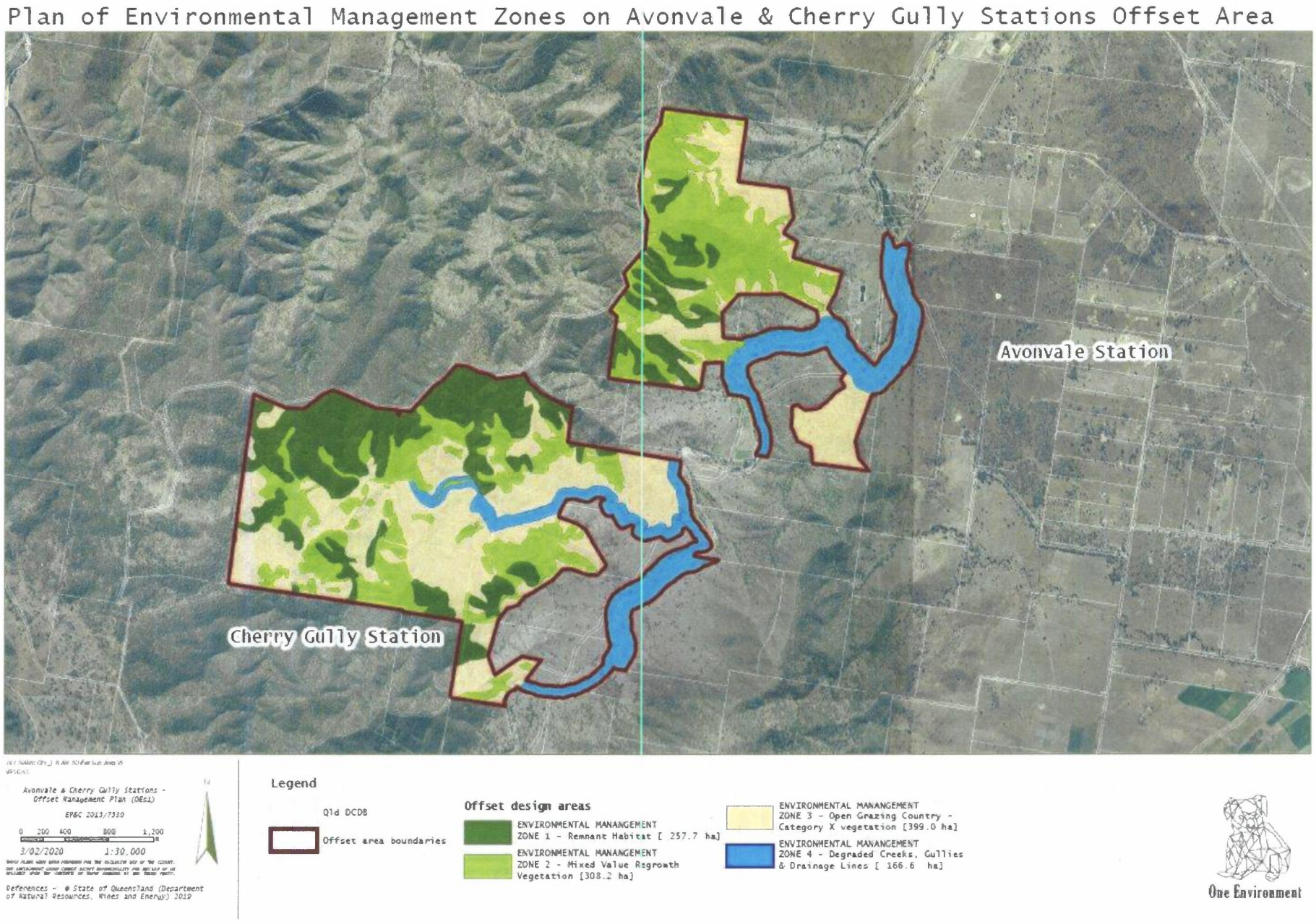
Qld DCDB

Offset area boundaries

Offset area

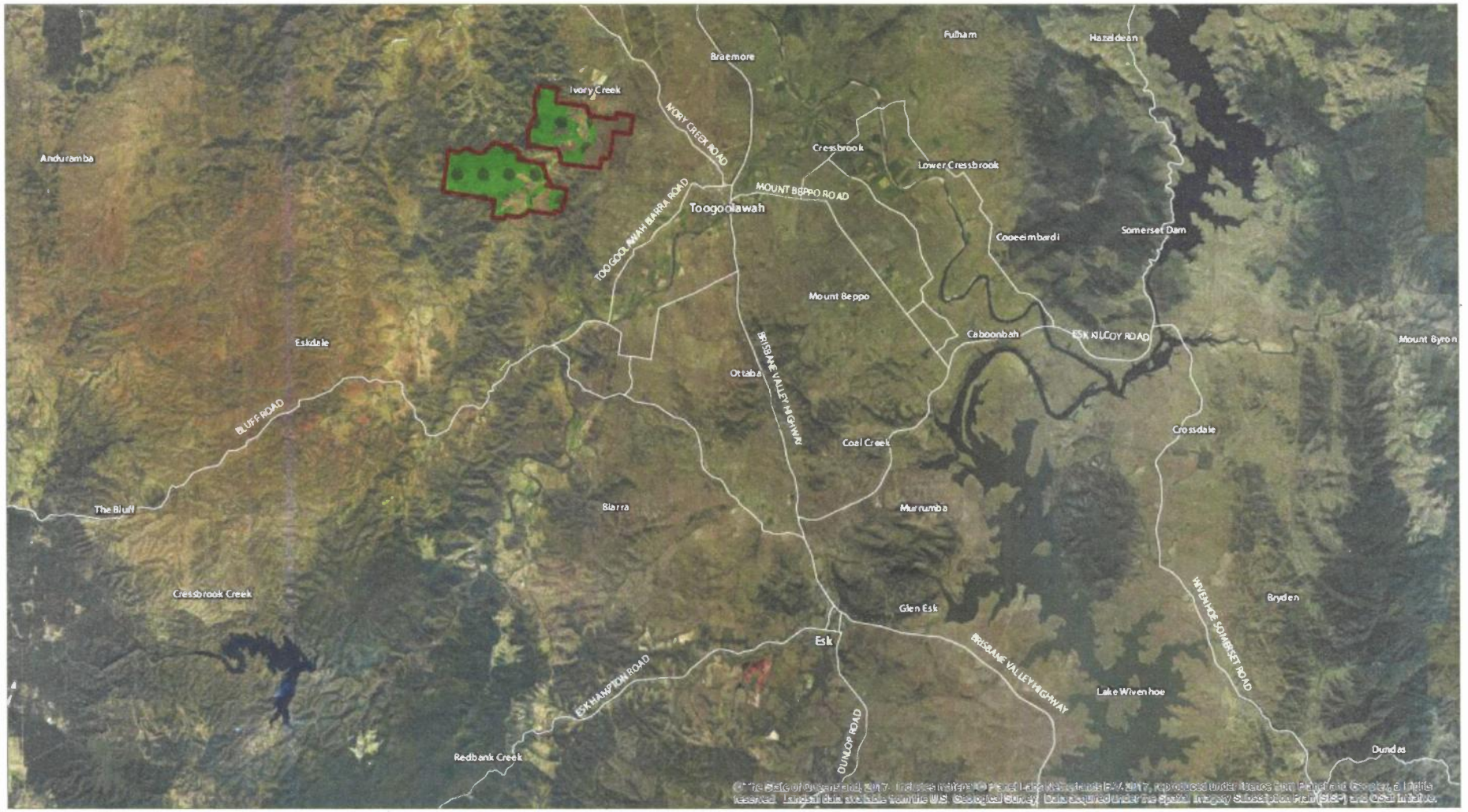
One Environment

Attachment D: Plan of Management Zones on Avonvale and Cherry Gully Stations Offset area



Attachment E: Offset Area Context Plan

Offset Area Context Plan



Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 100 200

6/01/2020 1:150,000

References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019

Legend

Offset site boundaries

Offset area

Major roads (road types 1-4)

One Environment

Part B – Offset Area Management Plan

One Environment

Avonvale & Cherry Gully Stations

Offset Area Management Plan 2022

Avonvale & Cherry Gully Stations – Offset Area Management Plan	**Title**
OEs1:v1.5(a) – March 2022	**OMP Reference**
EPBC 2015/7530	**EPBC Reference**
Pioneer Fortune Pty Ltd	**Client**
2 March 2022 / Revision 5	**Date / Revision**

Table of Contents

Figures

Tables

Plans

Attachments

Attachment 1: Methodologies for Assessing Koala Habitat and Grey-headed Flying-fox Foraging Habitat
(Modified Quality Habitat Assessment – MQHA – Koala)
(Grey-headed Flying-fox Foraging Habitat Assessment – GHFF FHA)

Attachment 2: Feral Animal Memorandum

Attachment 3: Management Action Progress Tables

Glossary / Abbreviations

ACR	Annual Compliance Report
Conservation Gain	EPBC Act Policy – *maintains or increases the viability or reduces threats or damage to a protected matter*
DAF	Queensland Government Department of Agriculture and Fisheries
DAWE	Commonwealth Government Department of Agriculture, Water and the Environment
DES	Queensland Government Department of Environment & Science
DEHP	Queensland Department of Environment and Heritage (Now DES)
EPBC	*Environment Protection & Biodiversity Conservation Act 1999*
EPBC Act Offset Policy	*Environment Protection & Biodiversity Conservation Act 1999 – Environmental Offset Policy – October 2012 (Australian Government)*
EDQ	Queensland Government Department of Economic Development Queensland
EMZ	Environmental Management Zone (The Offset Area is described in 4 EMZs)
Functional Loss	Where habitat is not being directly cleared or removed, however due to barriers, threats or fragmentation will no longer function for the use of the protected matter.
GHFF	Grey-headed Flying-fox
GHFF FHA	Grey-headed Flying-Fox Foraging Habitat Assessment – Hybrid based assessment tool for valuing GHFF foraging habitat at the impact and offset site.
MNES	Matters of National Environmental Significance
MQHA	Modified Quality Habitat Assessment – Tool for assessing koala habitat value based on an amalgamation of the Queensland Government & Commonwealth Government Offset Assessment Criteria.
Offset Provider	One Environment
Offset Land	The combined Avonvale and Cherry Gully Stations = 1,718ha (4,247 acres)
Offset Area	1,131.50ha (2,610.7 acres) – portion within the Offset Land committed to the Offset Outcomes
Offset Period	20 years
OMP / Offset Management Plan	Avonvale & Cherry Gully Stations – Offset Area Management Plan 2022 [Ref: OEs:1.5(a) – dated 02/03/22]
OAAR	Offset Area Annual Report (31 August anniversary date)
PDA	Priority Development Area (As declared by the Queensland Government)
PD	Preliminary Documentation Submission by the Saunders Havill Group 2019
Proponent	Pioneer Fortune Pty Ltd
SPP	State Planning Policy (Queensland Government)
The Guide	*Environment Protection & Biodiversity Conservation Act 1999 – Environmental Offset Policy – October 2012 (Australian Government) – Assessment Guide*
GTHQ	Guide to determining Terrestrial Habitat Quality (Queensland Government – Version 1.2 April 2017)
Undullah Project	Greater Flagstone Residential Development, Undullah, Queensland (EPBC 2015/7530)
UQ	University of Queensland
VDEC	Voluntary Declaration (Offset Area legally secured on 2 March 2021)
VMA	*Vegetation Management Act 1999*
WONS	Weeds of National Significance

1. Introduction

The Proponent has engaged the Offset Provider to coordinate and deliver a major Koala and Grey-headed Flying-fox habitat environmental offset as compensation for significant impacts to Matters of National Environmental Significance (**MNES**) as part of the Greater Flagstone Residential Development (**Undullah Project**). An offset prepared in accordance with the Commonwealth Government's, Department of Agriculture, Water and the Environment (**DAWE**) *EPBC Act 1999 – Environmental Offset Policy – October 2012* (**EPBC Offset Policy**) is a requested requirement of the Preliminary Documentation submission for EPBC Application 2015/7530. The offset contained within this management plan has undergone assessment and approval by DAWE. This management plan has been updated to incorporate the requirements of Condition 7 of the EPBC Act approval (EPBC2015/7530).

The offset will deliver an overall *'conservation gain'* for the species as part of a large single site offset solution located on Avonvale and Cherry Gully Cattle Stations (**Offset Site –** Refer to PLAN 1). As per Condition 5 of the EPBC approval, 1,131.50 ha of the Offset Site were legally secured. The **Offset Area** was legally secured via Voluntary Declaration (**VDEC)** on 2 March 2021. The Offset Site is located approximately 5km west of the Toogoolawah Township and 53km north west of Brisbane. The land holding is entirely based within the Local Government jurisdiction of the Somerset Regional Council (Formerly the Esk Shire Council).

This Avonvale and Cherry Gully Stations Offset Area Management Plan 2022, dated the 2 March 2022 (**Offset Management Plan / OMP**) outlines the existing values and management actions to be completed at the Offset Site. The OMP does not include detailed analysis on the value or assessment of the actions, risks or threats at the offset land relative to the *Offset Assessment Guide* (**The Guide**). A response to The Guide is provided within the technical chapters of the Undullah Project Preliminary Documentation Report (*Saunders Havill Group, 2019*). This OMP focuses on the direct management actions aligning with the principles and structure outlined in the DAWE's *Environmental Management Plan Guidelines* (2014).

The offset site is known to support Koalas, retains a number of key existing threats and supports areas with all necessary essential habitat factors for the reinstatement and creation of new high functioning koala habitat. Similarly, the dominant tree species existing and proposed for revegetation on the land are highly ranked as food species for the Grey-headed Flying-fox and located within 16.6km of the Esk and 35km of the Lowood Flying-fox camps, both of which report consistently high numbers (>3,000-4,000) of animals. The approved Offset Area is predominantly located within the strategically designated bioregional biodiversity corridor of the recently adopted *ShapingSEQ - South East Queensland Regional Plan 2017*, (State of Queensland, 2017). The corridor mapping in this document is non regulatory, however aspirationally is included through the Offset Site to link the *Deongwar State Forest*, *Esk National Park* in the south to the *Bernarking State Forest* and *Mount Binga National Park* to the north.

The Offset Site is an active cattle grazing and feedlot operation which has been managed by the same farming family for 3 generations. The Offset Provider has contracted the land for purchase, for the sole purpose of delivering the environmental offset outcomes documented in this OMP.

1.1. Purpose of Offset Management Plan

The approved Offset Area compensates for 100% of the Undullah Project significant impact on Koala and 137% of the impact on Grey-headed Flying-fox foraging habitat. The approved offset is a direct land-based solution which includes a mix of protection of existing habitat, enhancement of degraded habitat and establishment of new habitat.

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

1. Provide details of the legal security of the Offset Area values at the Offset Site.
2. Provide baseline values for a range of key habitat quality indicators in the offset Environmental Management Zones (EMZ) for repetitive use in measuring and monitoring habitat improvement commitments.
3. Outline the specific management actions and tasks to be undertaken in each EMZ for managing threats, pests and improving Koala and Grey-headed Flying-fox habitat values.
4. Outline restrictions and operational controls on existing agricultural and grazing land uses.
5. Establish robust and scientifically driven metrics, monitoring and reporting procedures to ensure the offset delivery achieves the predicted *conservation gain* for the species.
6. Assign responsibilities for tasks, actions, operational controls, measuring, reporting, corrective actions and funding for all works at the offset land.
7. Identify, account for and manage risks associated with all or part of the offset outcomes not succeeding (Adaptive Management).

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, Australian Government, Department of Environment, 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 Preliminary Documentation (Saunders Havill, 2019) submission for the Undullah project. 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.

The Avonvale and Cherry Gully Stations combine to form a very large Offset Site, which includes a diversity of ecological and geographical characteristics. Survey methods deployed over the land incorporate standard practices from the Guide to Determining Terrestrial Habitat Quality: A toolkit for assessing land based offsets under the Queensland Government Offsets Policy, Version 1.2, April 2017, Queensland Government, combined with the specific stocking rate factors from the How to use the offsets assessment guide, Australian Government (Combined in this OMP to be referred to as the Modified Quality Habitat Assessment – MQHA for the Koala and the Grey-Headed Flying-fox Foraging Habitat Assessment GHFF FHA).

1.3. Responsible Entities for this OMP

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. Project Proponent – Contact Mr. Jack Wen

The Proponent is the owner and operational developer of the Greater Flagstone Master Planned Community Project (**Undullah Project**). Responsibilities include:

- Obtain and comply with all conditions of the EPBC approval for the project.
- Fund the purchase of the offset land.
- 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. Offset Provider – Mr. Darren Jonsson

The Offset Provider is a purpose-built environmental offset which is responsible for:

- 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 Offset Area.
- Corrective actions for any non-compliance activities.
- Stakeholder relationships – Adjoining grazing operations, Somerset Regional Council, local school and community environmental groups.
- Review, Amendment and Adaptive Management changes of the approved OMP over the life of the offset.

3. Environmental Consultant – Saunders Havill Group

Saunders Havill Group provide the tertiary trained and experienced field ecologists in support of approval and ongoing compliance for the offset land and Environmental Management Zones. Responsibilities include:

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

1.4. Structure of this OMP

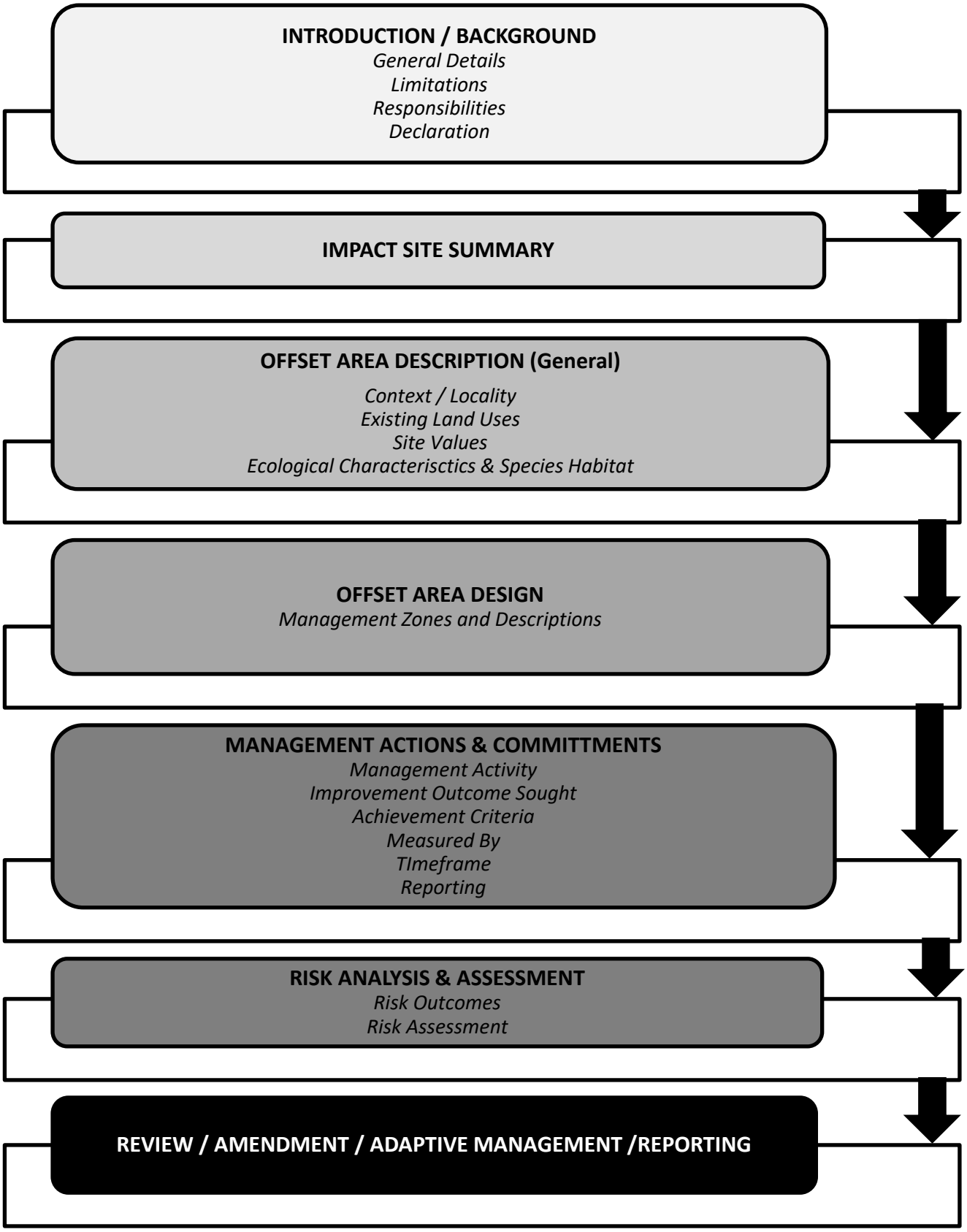
There are seven (7) core chapters to this OMP as highlighted in FIGURE 1 – OMP Structure Diagram. **Section 1** outlines background information to the OMP setting the overall principles designed to be achieved at the Offset Site. **Section 2** provides a brief context to the Undullah project and the impacts triggering the need for compensation of Koala and Grey-headed Flying-fox habitat.

Sections 3 and **4** cover the general suitability of the Offset Land and discuss the specific design of Environmental Management Zones within the Offset Area. **Section 5** is wholly concerned with 9 separate management action areas itemised through a tabulated format. The management tables have been drafted as a stand-alone template that can be extracted from the broader document for direct implementation on-site.

Section 6 outlines a number of key risks and threatening processes that were considered in the preparation of the management tables.

The final chapters of this OMP (**section 7**) outline the adaptive management principles adopted for corrective actions and the specific Offset Area Management Plan Reporting requirements.

Figure 1: OMP Structure Diagram



1.5. OMP Declaration of Accuracy

Declaration of accuracy

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

Signed _____

Full name (please print) _____

Organisation (please print) One Environment

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. Legally Securing the Offset Area

The V-DEC was lodged and legally secured by evidence of encumbrance on Registered Land Title on 2 March 2021. The legal security of the offset area occurred prior to the commencement of any clearing works on the Impact Site (Ripley Road Project) (which commenced on 12 July 2021).

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 Offset Area will be declared as achieving items (a), (c), (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
f) another area that contributes to the conservation of the environment.

2. Impact Site (Summary)

The impact site is titled the Greater Flagstone Residential Development and is located at Wyatt Road, Undullah, Queensland, which is approximately 25 km south-east of Ipswich City and 27 km south-west of Logan City. The land comprises of the following cadastral allotments (refer to FIGURE 2 – Impact Site Allotments & Aerial):

- Lot 3 on RP45236; and
- Lot 3 on RP49296; and
- Lot 28 on S311174.

The land tenure is freehold and is located within Logan City Council Local government jurisdiction, however is included in the Declared Greater Flagstone Priority Development Area (**PDA**) where it retains an *urban living* and *environmental protection* land use zoning. The project's inclusion within the PDA means that the approval authority is the Queensland Government Department of Economic Development (**EDQ**) (refer to TABLE 1 - Impact Site Details).

The surrounding landscape contains a mixture of cleared agricultural land, vacant and operational development sites and bushland. The majority of adjoining allotments, including those to the north, east, south and south-west are included within the Greater Flagstone PDA and all retain major approvals for development works. The south-east boundary adjoins the Sydney-Brisbane railway line and rural residential allotments contained within the existing Flagstone East residential community. The Flinders-Karawatha Bioregional Corridor flanks the impact sites western boundary.

2.1. Proposed Action

The EDQ approved master planned residential development covers 580 ha (of which all 580 ha contains habitat) of the 1,024 ha site and will provide approximately 7,500 residences for approximately 20,100 people in the southern Flagstone area. Flagstone will be a large integrated urban community of about 100,000 people living in attractive, compact neighbourhoods, and provided with a wide range of facilities and services located in a network of accessible activity centres and low impact business and industry areas (refer to FIGURE 3 – Approved Plan of Development for the Undullah Project).

2.2. MNES Impact Summary

The assessment of the construction and operational impacts associated with the proposed development indicate that a portion of the impacts are avoided and mitigated through retained areas and management measures. Residual impacts will be created from the direct loss of 529 hectares of critical Koala habitat and Grey-headed Flying-fox foraging habitat and the additional 'functional loss' of 51 hectares of critical Koala habitat.

Results of the Modified Habitat Quality Assessment (**MHQA**) tool indicate that the critical Koala habitat on the impact site scored a value of 6 (out of 10), while the results of the Grey-headed Flying-fox Foraging Habitat

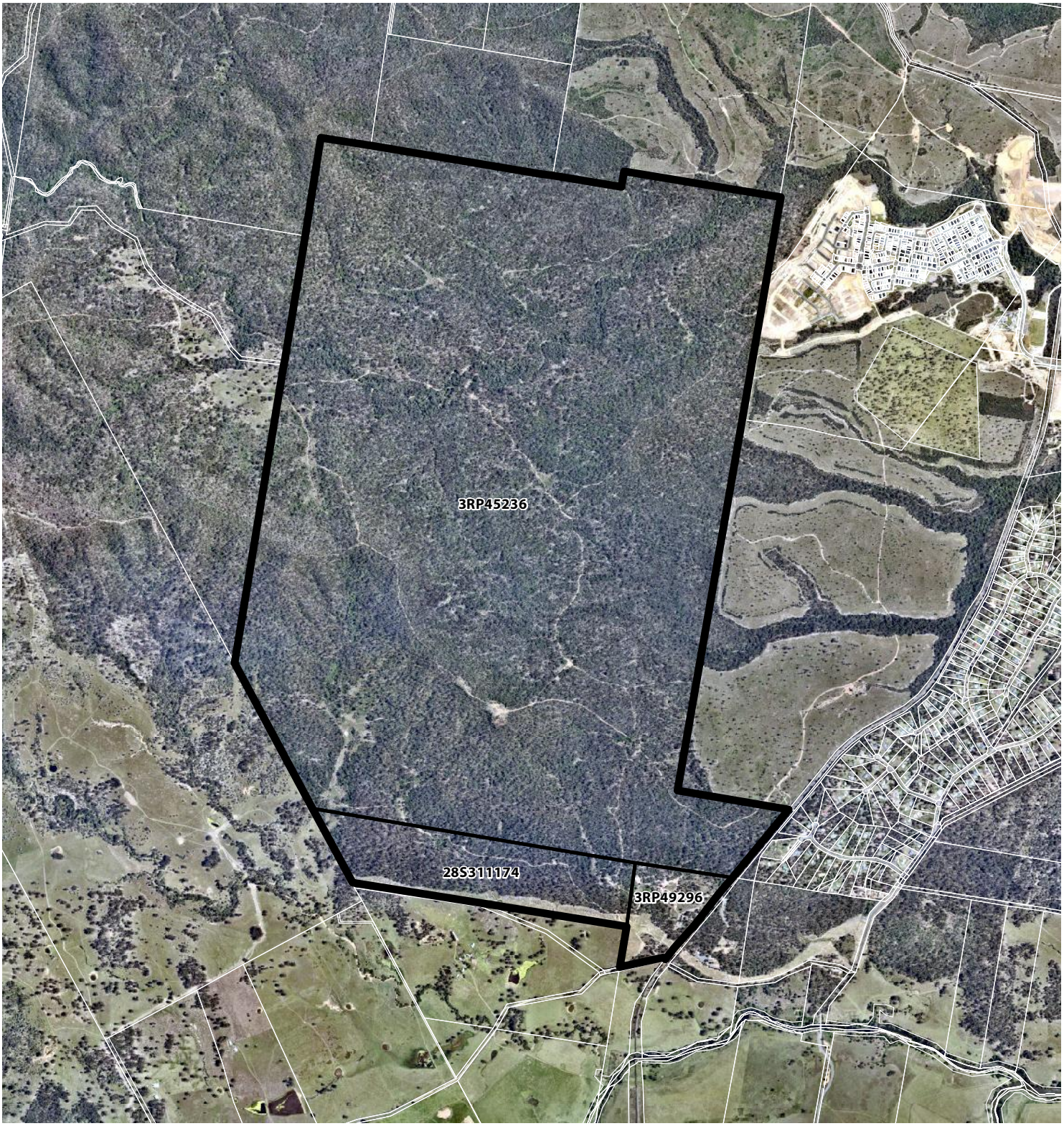
Assessment (GHFF FHA) tool indicate that the GHFF foraging habitat on the impact site scored a value of 5 (out of 10). Refer the Greater Flagstone Residential Development - Preliminary Documentation, *Saunders Havill Group, 2019*. Overall, the Undullah Development will see the direct removal or fragmentation of 529 hectares of *critical habitat* for the Koala and *foraging habitat* for the GHFF, and the additional *'functional loss'* of 51 hectares of Koala habitat, however, the remaining 307 hectares of critical habitat and 399 hectares of foraging habitat will be retained within conservation areas and major corridors. As such, the residual impacts on the Koala as a result of the development will be the loss and 'functional loss' of 580 hectares of critical habitat with a MHQA score of 6 and the residual impact on the GHFF as a result of the development will be the loss of 529 hectares of foraging habitat with a GHFF FHA score of 5.

Table 1: Impact Site (Summary Details)

Attribute	Site Summary Details
EPBC Reference	2015/7530
Locality	Undullah – Greater Flagstone Priority Development Area
Lot / Plan	Lot 3 on RP45236, Lot 3 on RP49296, Lot 28 on S31174
Land Size	1,024 hectares (2,560 acres)
Proposal Description	The proposed master planned residential development covers 580 ha of the 1,024 ha site and will provide approximately 7,500 residences for approximately 20,100 people in the southern Flagstone area. A total of 444 ha of the impact site will be dedicated as conservation land and open space. Within the 580ha development zone all 580ha of habitat has been mapped.
Impact Summary	Removal of 529 ha of critical Koala habitat and the 'functional loss' of 51 ha of critical Koala habitat at a MHQA score of 6. Removal of 529 ha of GHFF foraging habitat at a GHFF FHA score of 5.
Mean Temperature Range (°C)	12.6 – 26.5°C
Mean Annual Rainfall (mm)	907 mm
2018 Rainfall (mm)	827.60 mm
Topography	Undulating country ranging from incised alluvial creek systems to foot hills and upper ridgelines. Slope various from 0 to 30%.
Soils (Land Zone Classifications)	Land Zone 3 – Alluvium (river and creek flats) Land Zone 9 – 10 – Undulating country on fine grained sedimentary rocks and sandstone ranges
VMA Vegetation Classification	Category X (non-remnant) Category B (remnant) ('endangered', 'of concern' & 'least concern')

Broad Vegetation Group Koala Habitat Suitability (Rhodes *et al.* 2015)	BVG 10b 'low suitability' (majority of impact site) BVG 16a/16c 'high suitability' (creeks, gullies and drainage features)
Dominant Tree Species	*Corymbia citriodora* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia intermedia* (Pink Bloodwood), *Corymbia tessellaris* (Moreton Bay Ash) and *Eucalyptus moluccana* (Gum-topped Box)
MHQA Results	Koala Habitat Score of 6 / 10
GHFF FHA Results	Grey-headed Flying-fox Foraging Habitat Score of 5 / 10
Distance to Offset Site	93 km

Figure 2 *Impact Site Allotments*



Legend

Impact Site Alloments

Qld DCDB

N

0 200 400 800 1,200 m

29/05/2019 *1:30,000*

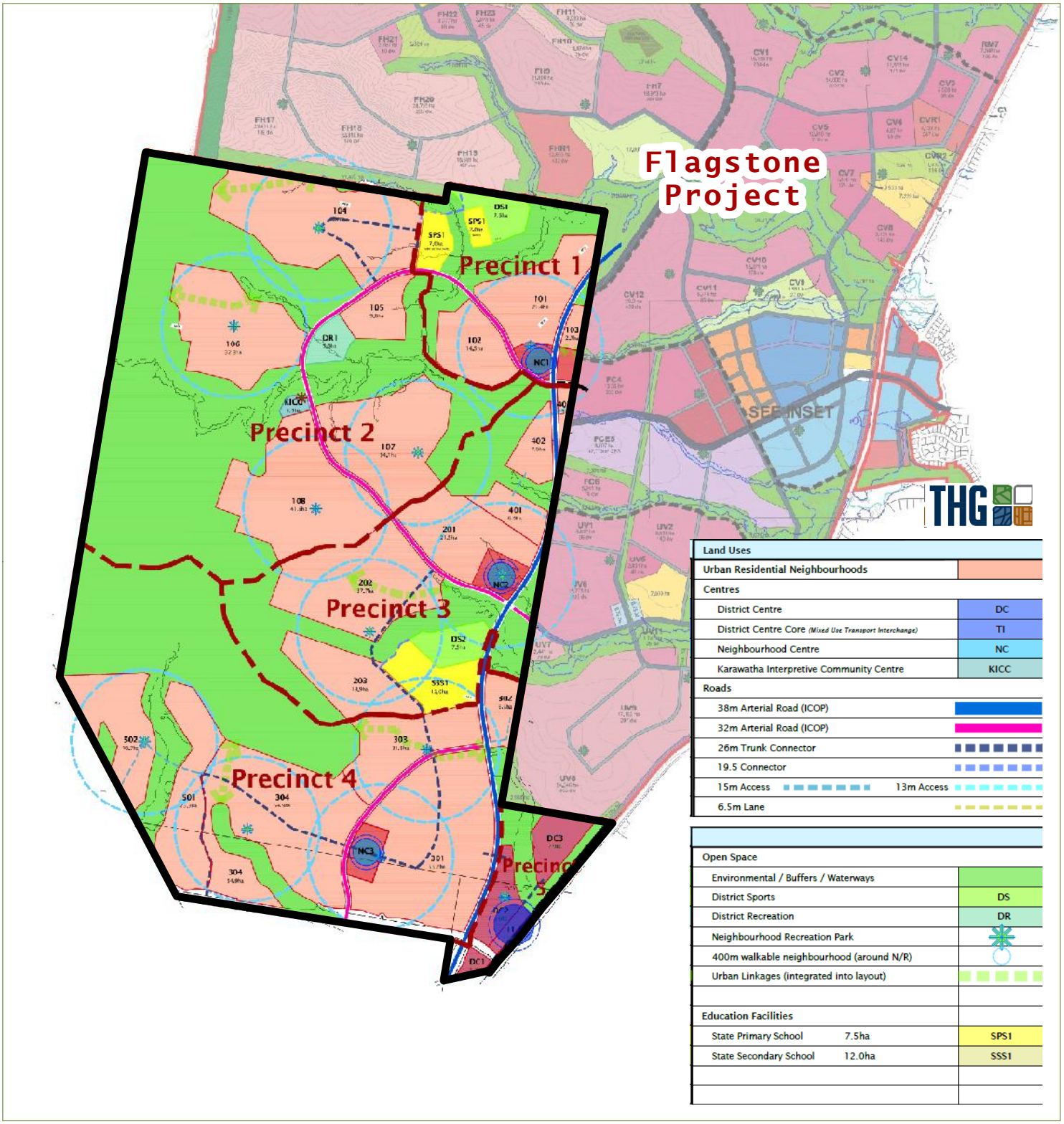
One Environment

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019, © Nearmap.com 2019

Figure 3 *Approved Plan of Development*



Legend

Impact Site

One Environment

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

N

0 200 400 800 1,200 m

29/05/2019 *1:30,000*

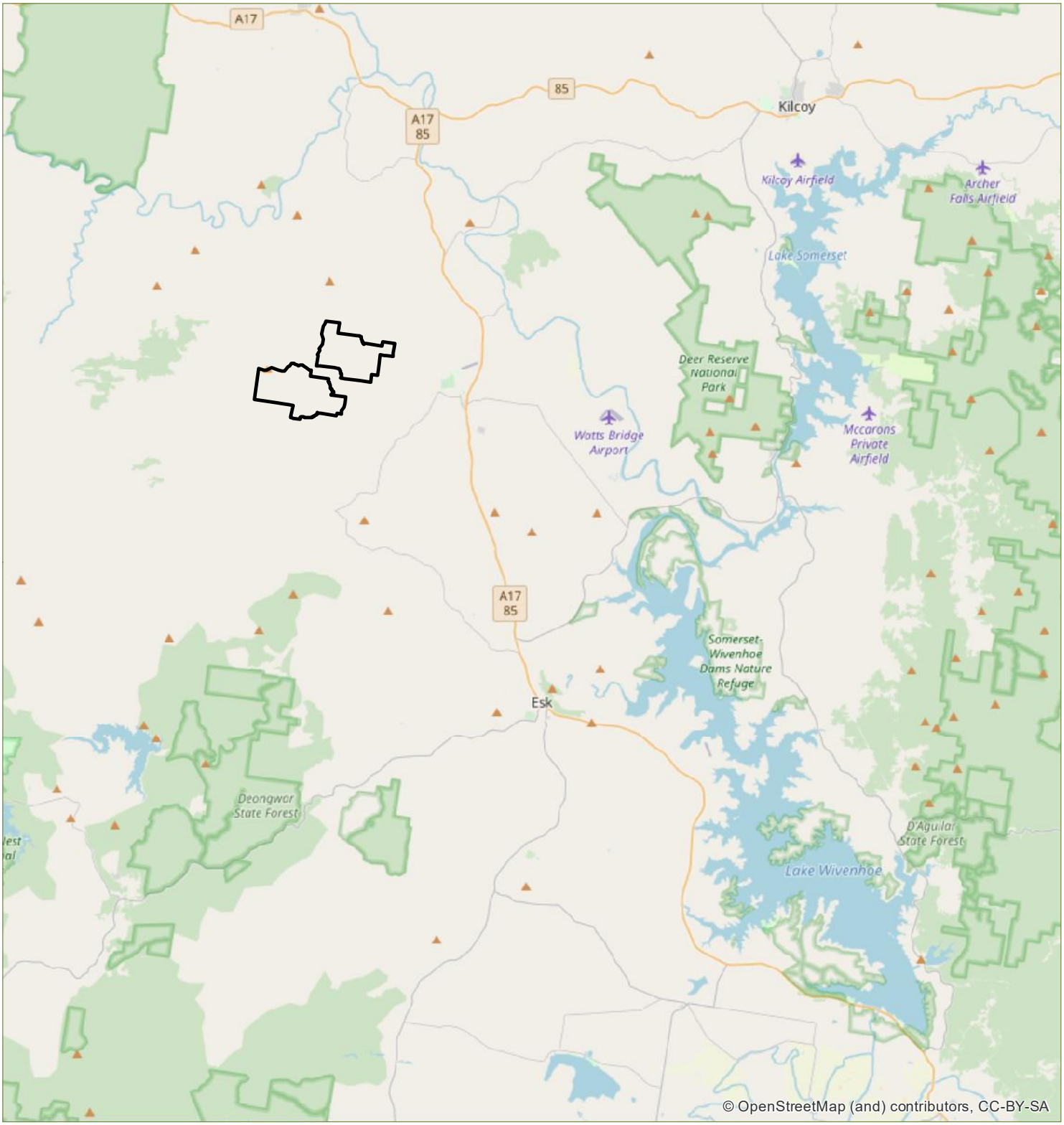
3. Offset Site (Summary)

The Avonvale and Cherry Gully Stations Offset Site is located on Littles Road, Toogoolawah. The properties are within the Somerset Regional Council and are approximately 5.8 km directly west of the Toogoolawah township (Refer FIGURE 4 - Offset Site Context). Refer to TABLE 2 - Offset Site Details including the cadastral allotment descriptions. The land tenure of the of the Offset Site is freehold and retains a *rural* land use zoning under the Somerset Regional Council planning scheme. The Offset Site is accessed via Littles Road from the north which is a rural road connecting to Toogoolawah via Ivory Creek Road (refer to PLAN 1 – Offset Site Allotments & Aerial). The Offset Site is located 93 km north-west of the impact site (refer to PLAN 2 – Impact / Offset Site Context).

Cattle grazing and a successful beef cattle farming enterprise has generationally and continues to operate across the Avonvale and Cherry Gully Stations. The intensity of operations has occurred at varying levels over the past seven (7) decades, with intensive feed lot production operating consistently over the past decade. Discussions with the landholders indicates that cattle operations across the two (2) properties has ranged from carrying 500 head of cattle to 1,200 head of cattle at any one time. Avonvale retains an Environmental Authority for a feedlot permit (F1-0048) for between 1,000 and 10,000 animals issued by the Queensland Government's Environmental Protection Agency (Now Department of Environment & Science). Land to the immediate north, south and west are all large cattle grazing farms, whereas land adjoining to the east are smaller scaled agricultural and animal farms closer to the township.

(Site Photos – Farm Operation)

Figure 4 *Offset Site Local Context*



Legend

Offset Site boundaries

One Environment

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

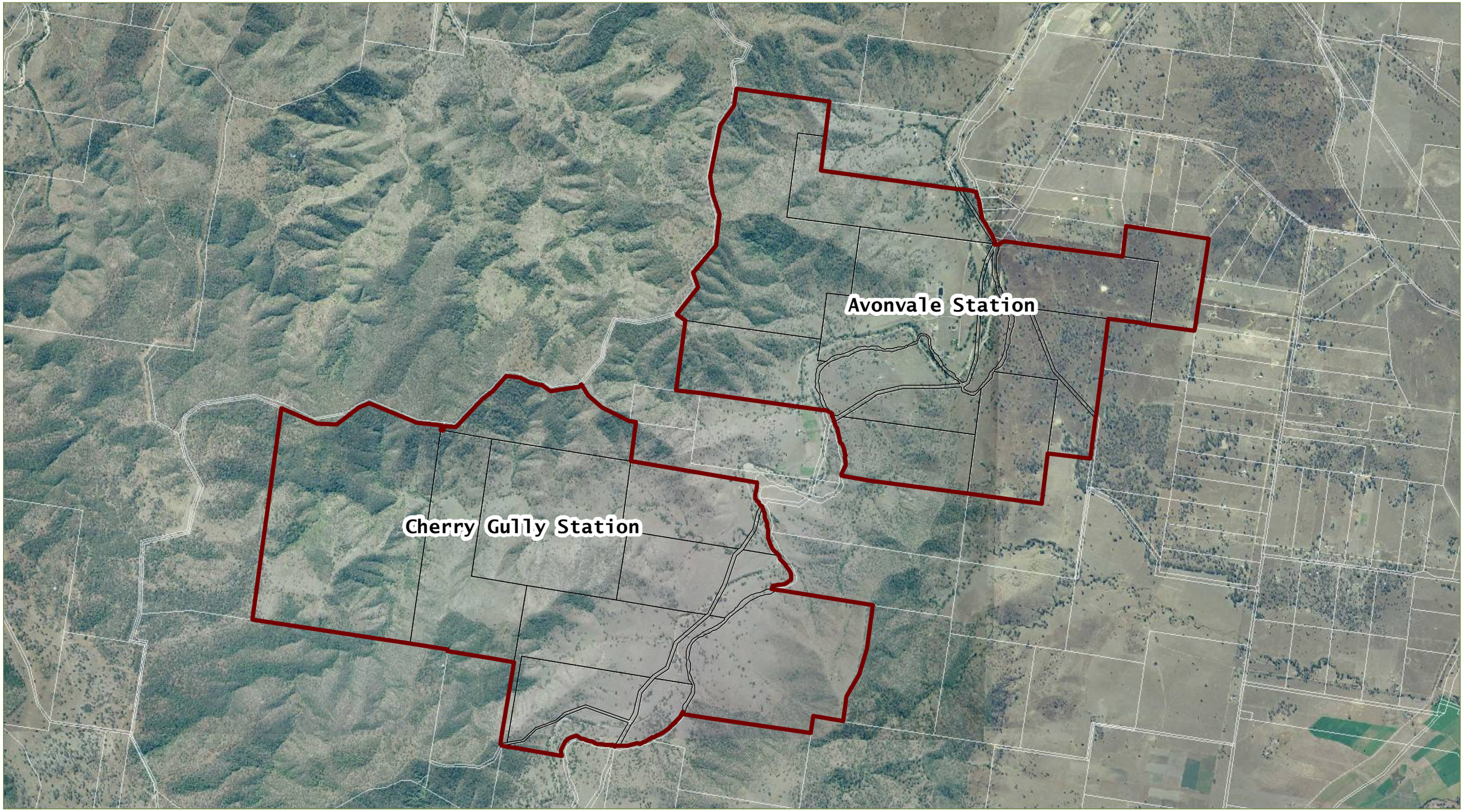
N

0 1 2 4 6 8 10 km

29/05/2019 *1:300,000*

References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019

PLAN 1 - Site Boundaries



FILE NAME: OEs_1 PLAN 1 SiteBoundaries V1

VERSION 1

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

31/05/2019 *1:30,000*

N

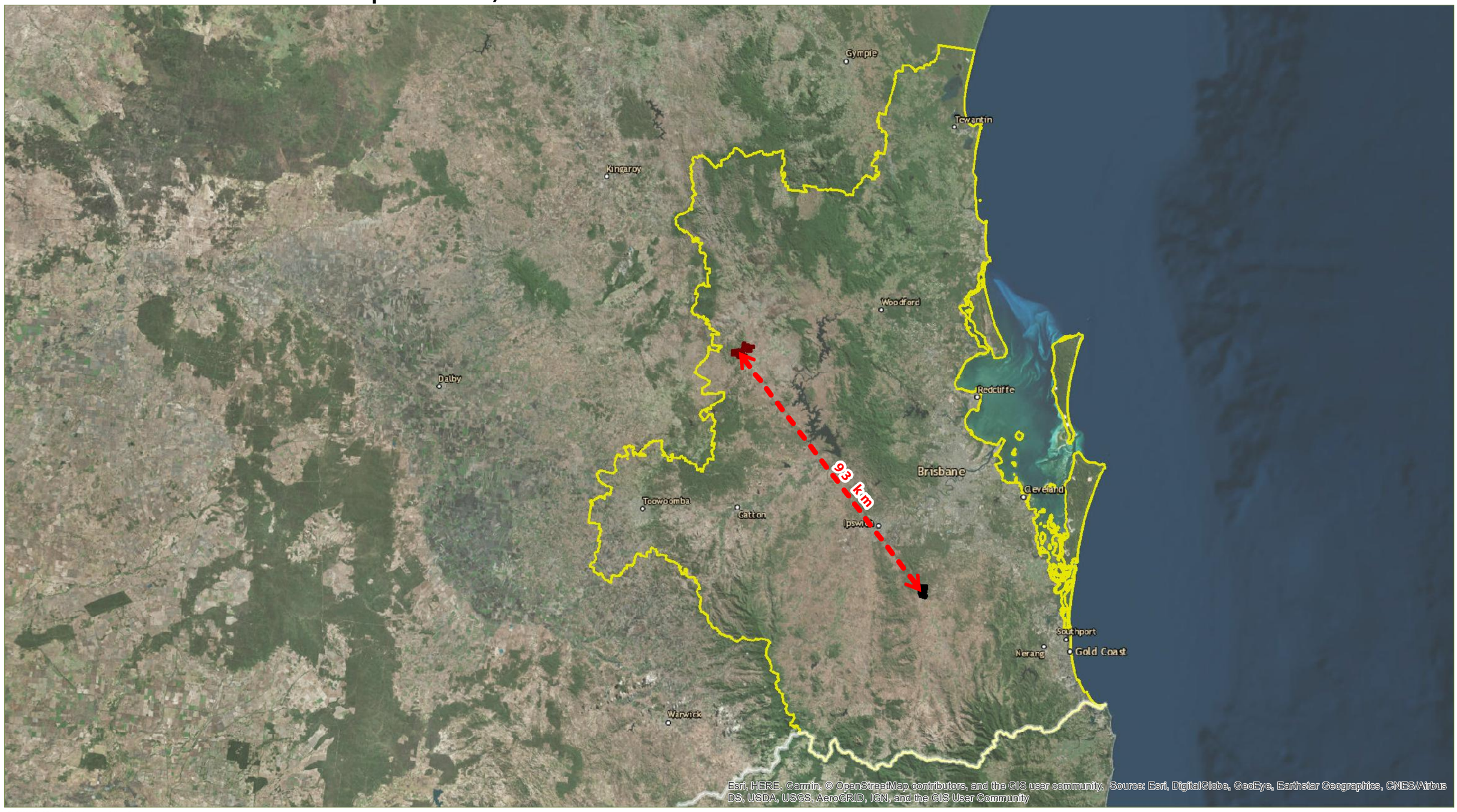
References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019

Legend

- Qld DCDB
- Offset site boundaries
- Offset site alloments

One Environment

PLAN 2 - Impact / Offset Site Context



FILE NAME: OEs_1 PLAN 2 Impact_Offset Context V1

VERSION 1

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 5 10 20 30 40 50 km

30/05/2019 *1:1,250,000*

N

References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019

Legend

- South East Queensland Boundary
- Offset site boundaries
- Impact site

One Environment

Table 2: Offset Site (Summary Details)

Attribute	Site Summary Details
EPBC Reference	2015/7530
Locality	Ivory Creek In the Somerset Regional Council Area
Lot / Plan	Refer to Plan 1
Approved Offset Area	1,131.50 hectares
Mean Temperature Range (°C)	13.5 – 26°C
Mean Annual Rainfall (mm)	987 mm
2018 Rainfall (mm)	859.8 mm (Somerset Region was declared a drought zone in 2018)
Topography	Undulating country ranging from wide open alluvial creek systems, with adjoining flood plains to lower foot hills and upper ridgelines. Slope various from 0 to 38%.
Soils (Land Zone Classifications)	Land Zone 3 – Alluvium (river and creek flats) Land Zone 9 – 10 – Undulating country on fine grained sedimentary rocks and sandstone ranges Land Zone 11 – Hills and lowlands on metamorphic rocks
VMA Vegetation Classification	Category X (non-remnant) Category C (regrowth) ('of concern' & 'least concern') Category B (remnant) ('of concern' & 'least concern')
Broad Vegetation Group Koala Habitat Suitability (Rhodes *et al.* 2015)	BVG 13c 'suitable' (majority of offset site) BVG 16a/16c 'high suitability' (creeks, gullies and drainage features)
Dominant Tree Species	*Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalytpus melanophloia (*Silver-leaved Ironbark), *Corymbia intermedia* (Pink Bloodwood), *Lophostemon confertus* (Brush Box) and *Corymbia erythrophloia* (Variable-barked Bloodwood)
Baseline MHQA Results	EMZ 1 – Koala Habitat Score of 6 EMZ 2 – Koala Habitat Score of 6 EMZ 3 – Koala Habitat Score of 3 EMZ 4 – Koala Habitat Score of 5
Baseline GHFF FHA Results	EMZ 1 – GHFF Foraging Habitat Score of 6 EMZ 2 – GHFF Foraging Habitat Score of 5 EMZ 3 – GHFF Foraging Habitat Score of 4 EMZ 4 – GHFF Foraging Habitat Score of 4
Distance to Offset Site	93 km

3.1. Offset Site Values

The Offset Site can be broadly categorized into 4 areas based on existing ecological values and the intensity of current land uses:

1) Open Grazing Country (Paddocks and Plains)
2) Creek, Gully and Drainage Lines (Degraded)
3) Mixed Maturity Regrowth Vegetation
4) Remnant Vegetation Communities

3.1.1 Open Grazing Country (Paddocks and Plains)

Avonvale and Cherry Gully is dominated by cleared cattle grazing land with areas of scattered paddock trees retained for shade purposes or sapling regrowth in highly degraded locations. These non-vegetated areas are predominantly located on the lower slopes and flats of the properties, adjacent to Ivory Creek and Cherry Gully, both of which are the major water supply for the beef cattle operations.

Where juvenile regrowth and saplings were observed within the non-remnant vegetation areas, the species consisted of *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Angophora subvelutina* (Broad-leaved Apple) and *Corymbia intermedia* (Pink Bloodwood).

3.1.2 Creek, Gully and Drainage Lines (Degraded)

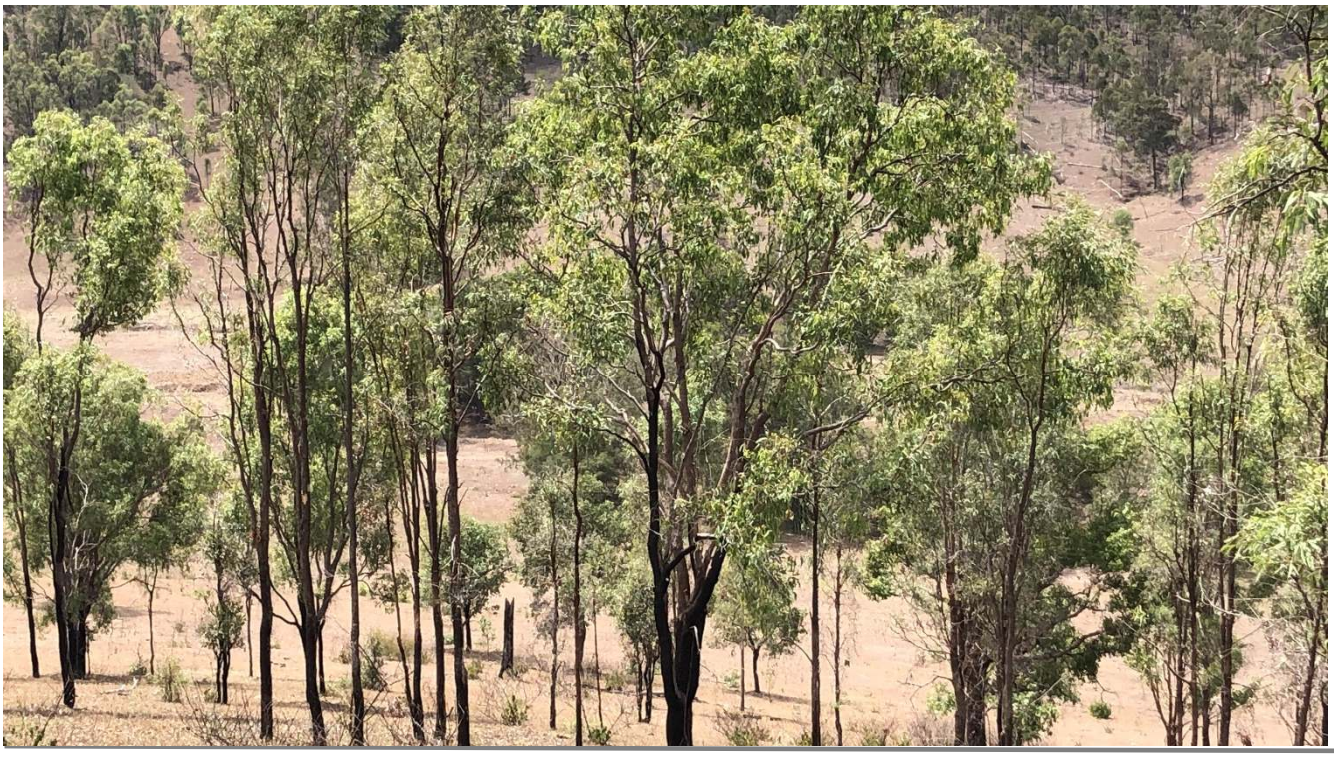
The creeks, gullies and drainage lines across the Avonvale and Cherry Gully Stations are a mix of grassed eroded embankments interspersed with retained mature *Eucalyptus tereticornis* (Forest Red Gum) and clusters of *Melaleuca bracteata* (Black Tea-tree) and *Casuarina cunninghamiana* (River She-oak). Beyond the scattered narrow linear strands of vegetation retained on large sections of the waterway, embankments form open grass depressions through fenced cattle paddocks. Cherry Gully and Ivory Creek are currently utilised by the beef cattle farming operations as a natural supply of water and source of shade.

Where retained mature *Eucalyptus tereticornis* (Forest Red Gum) and clusters of *Melaleuca bracteata* (Black Tea-tree) and *Casuarina cunninghamiana* (River She-oak) are observed, the species are representative of 'least concern' RE12.3.7.

3.1.3 Mixed Maturity Regrowth Vegetation

The regrowth vegetation on the Avonvale and Cherry Gully stations consists of predominantly 'low' to 'moderate' quality regrowth *eucalypt* dominated vegetation communities. Throughout the regrowth vegetation communities, the tree species composition is similar, however, some areas contain a dominance of *Acacia* spp. The major impact on the quality of the regrowth vegetation communities is the presence of weed infestations and their relative density.

Ecological site surveys observed that the regrowth vegetation across the offset sites is dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark) with sub-dominant elements of *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia tesselaris* (Moreton Bay Ash), *Corymbia intermedia* (Pink Bloodwood), *Lophostemon confertus* (Brush Box) and *Eucalyptus melanphoia* (Silver-leaved Ironbark).



3.1.4 Remnant Vegetation Communities

The remnant vegetation on the Avonvale and Cherry Gully stations consists of degraded through to intact ecosystem communities. Beyond the tree species, structure and composition the remnant areas varied in the level of weed infestation and fire damage.

The remnant vegetation across the offset sites is dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark) with sub-dominant elements of *Eucalyptus melanophloia* (Silver-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia intermedia* (Pink Bloodwood), *Lophostemon confertus* (Brush Box) and *Corymbia erythophloia* (Variable-barked Bloodwood). This vegetation community dominates the moderate slopes to ridgelines, and as the land falls through to the flats and foothills, more *Eucalyptus tereticornis* (Forest Red Gum) become prevalent. In sections the upper ridgelines display metamorphic rock and incised gully lines where the contours converge to convey overland flow and drainage from the upper catchment. The recorded 'remnant' vegetation community is described as 'of concern' RE12.11.14 which is dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia intermedia* (Pink Bloodwood).

3.2. Koala Offset Values / Suitability

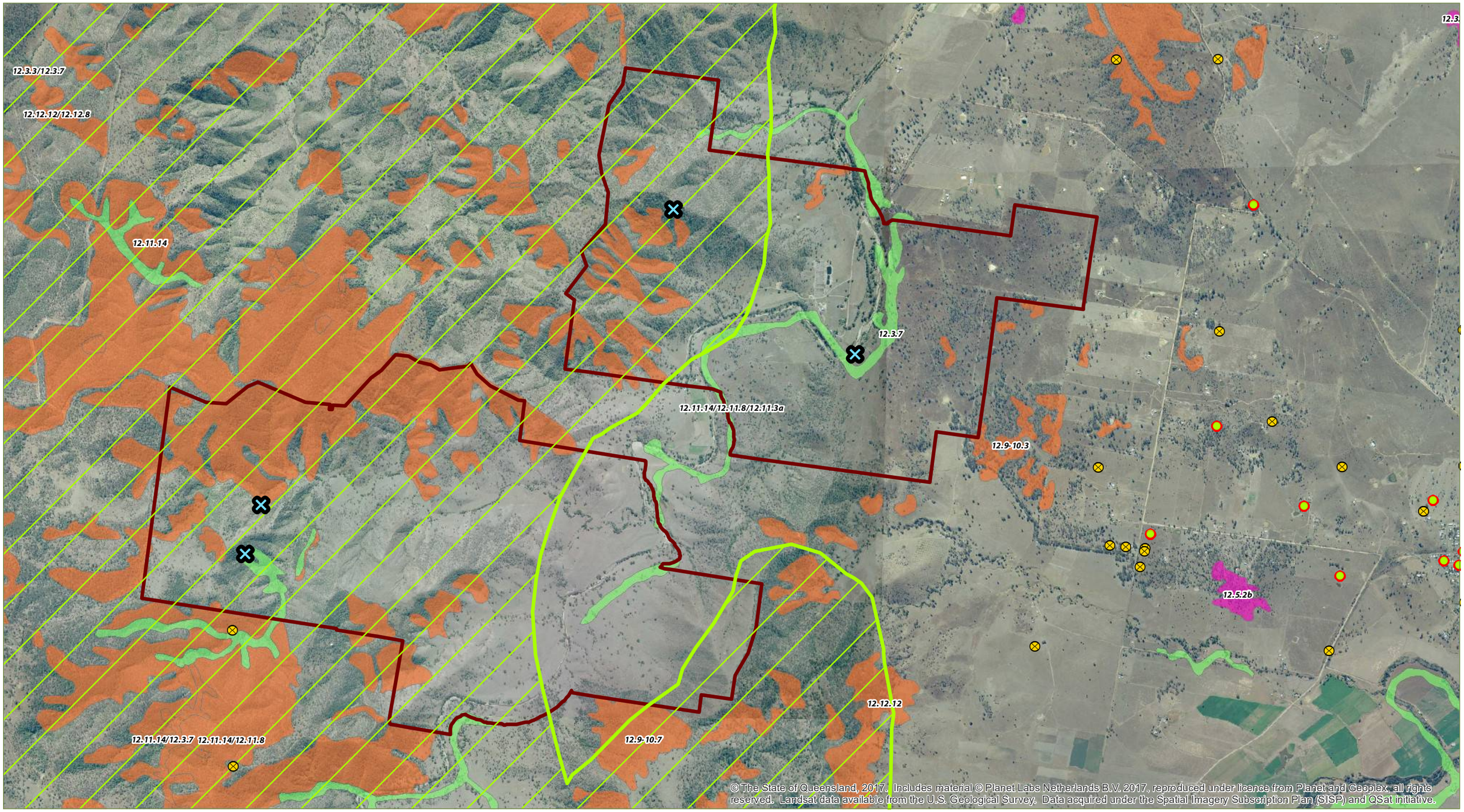
The Offset Area was assessed and approved by DAWE based on the following:

- The Offset Site 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 Site includes substantially more areas containing land zones, Broad Vegetation Groups and species mix listed as "Highly Suitable" for the koala (*Rhodes, et al. 2015*).
- The Offset Site is used by Koalas with 4 records made during preliminary offset assessment surveys. Under current operations (Business as usual) the site provides opportunities for key threatening processes with a deceased koala carcass recorded on-site and seven (7) nearby records of injured or killed animals.
- The Somerset Regional Council, particularly the sub area reflected by the former Esk Shire Council is known to support a sizable and healthy Koala population. The University of Queensland (UQ) Koala Research Unit has been conducting various bodies of research since 2013 into the region's koala population, with particular interest in its capacity to resist disease and thrive by comparison to most other locations in South East Queensland. The immediate Township of Toogoolawah (approximately 5 km from the Offset Site) has taken a local interest in the future of the region's koala population and using a combination of Government and Private land holders land tenures designated and planted out a new koala corridor on the edge of town.
- All works and the ongoing maintenance of the corridor is through volunteers including the Local State High School [A.R.R.O.W. (2018)].
- There is a total of 23 records (27 including site records) in close proximity to the offset site which is extremely high for a rural context.
- More broadly the Offset Site and particularly the component committed as the Offset Area is predominantly located within and adjoining the State-Wide Regional Terrestrial Corridor #29 mapped in the *ShapingSEQ - South East Queensland Regional Plan 2017*, (State of Queensland, 2017). The State-Wide Regional Terrestrial Corridor #29 extends south from Emu Creek to Mount Lawson capturing *Deongwar State Forest*, *Ravensbourne National Park* and *Lockyer National Park* (DEHP 2016). There are no regulatory provisions controlling or achieving this regional biodiversity corridor with the State Government yet to develop a program to incentivise ecological stewardship on large privately-owned farm holdings. This Offsite Site provides a major opportunity to establish this strategic outcome.

Refer to PLAN 3 – Showing Contextual and Site Koala Values:

- Location of Bioregional Corridor Extent
- Suitable Habitat and Revegetation Locations for Koalas
- Local and Site Collected Records for the Koala

PLAN 3 - Contextual / Site Koala Values



FILE NAME: OEs_1 PLAN 3 Contextual Site Koala Values V1

VERSION 1

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

5/06/2019 *1:30,000*

N

References - © State of Queensland (Department of Natural Resources, Mines and Energy & Department of Environment & Science) 2019

Legend

- SEQ Regional Plan - Biodiversity Corridors
- Offset site boundaries
- Koala hospital incident location
- Qld Gov. NCA koala location record
- Koala onsite location record (ecology survey 2019)

VM regional ecosystem map v11 (Remnant Vegetation)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem

One Environment

3.3. Grey-headed Flying-fox Values / Offset 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 effected. 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 Offset Area was assessed and approved by the DAWE based on the following:

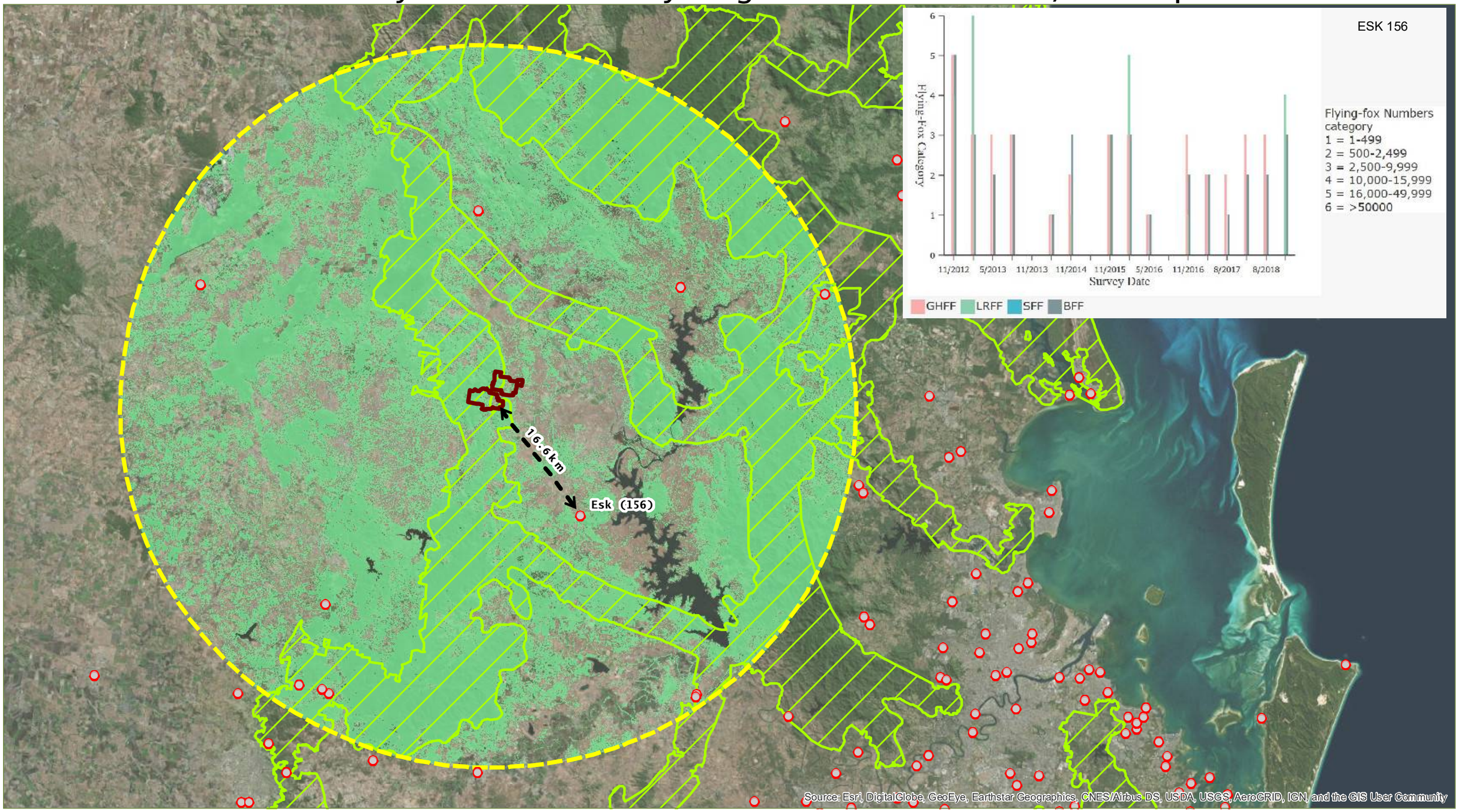
- A number of the dominant tree species existing and proposed to be planted on the Offset Site provide flower and fruit during the Winter and Spring periods (Refer TABLE 3).
- The Offset Site is located 16.6 km from the Esk (156) Camp Site, which on the Department of Environment's National Flying Fox Monitoring Viewer retains one of the larger and consistently recorded colonies of Grey-headed Flying-fox in South East Queensland.
- The Cherry Gully East Offset Site will result in the legally securing of large tracts of foraging habitat listed as habitat critical to the survival within close proximity to a major known camp site.
- The site already provides winter and spring flowering trees, which will be increased and expanded through rehabilitation and revegetation works. As noted under the koala values the offset site also occurs contextually amongst a large bioregional corridor where existing tracts of like habitat have been mapped.

Table 3: Winter / Spring Flowering – Fruiting Tree Species – Offset Site

Offset Site Tree Species	**FLOWERING PERIOD**	**SPRING**	**WINTER**
Eucalyptus crebra (narrow-leaved ironbark)	Throughout Year	yes	yes
Eucalyptus tereticornis (forest red gum)	June- Nov	yes	yes
Eucalytpus melanophloia (silver-leaved ironbark)	Oct-Mar	yes	-
Melalueca bracteate (black tea-tree)	Spring	yes	
Lophostemon confertus (brush box)	Sept- Feb	yes	-
Corymbia erythrophloia (variable-barked bloodwood)	Feb-April	-	-
Corymbia tessellaris (moreton bay ash)	Nov-Jan	yes	-
Corymbia citriodora (spotted gum)	April- Nov	yes	yes
Angophora subvelutina (broad leaved apple)	Nov-Dec	-	-
Eucalyptus siderophloia (ironbark)	May-Sept	yes	yes
Corymbia erythphloia (brown bloodwood)	Dec-Jan	-	-

Refer to PLAN 4 for Grey-headed Flying-fox Regional Ecosystems, the Esk (156) Camp site and corridor mapping around the Offset site.

PLAN 4 - Grey-headed Flying-fox Values / Camp Sites



FILE NAME: OEs_1 PLAN 4 GHFF Values Camp Site V1

VERSION 1

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 4 8 12 16 20 km

31/05/2019 *1:525,000*

N

References - © State of Queensland (Department of Natural Resources, Mines and Energy & Department of Environment & Science) 2019

Legend

- SEQ Regional Plan - Biodiversity Corridors
- Offset site boundaries
- Flying-fox Camp locations
- Grey-headed Flying-fox habitat - Remnant & Regrowth Potential
- 50km offset site buffer

One Environment

3.4. General Suitability EPBC Offset Policy Criteria

Table 4: Offset Site (General Suitability)

No.	Offset Suitability Criteria	Avonvale / Cherry Gully Stations 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) Improving existing habitat for both protected matters by rehabilitating 257ha of remnant vegetation and 308 ha of mixed regrowth vegetation. b) Creating new habitat for both protected matters through revegetating 399 ha of Category X vegetation and reinstating 166.6 ha along creeks and waterways. c) Introducing, funding and continually improving Offset Area Management Actions to reduce and manage threats (wild dogs, Lantana) in protected and 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 1,131.50 ha environmental offset within 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 Undullah Project for GHFF (137%) and Koala Habitat (100%). 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 (264.50 ha) • Koala (348 ha)

		To achieve and offset for both of these impacts the Offset Area provides a direct land based outcome over 1,131.50 ha mixing existing habitat with created habitat outcomes.
5	*effectively account for and manage the risks of the offset not succeeding*	The Offset Area is a direct large singular proposed land-based outcome in a strategic location known to support both habitat an animals from the impacted protected matters. This Offset Management Plan identifies 8 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 Environmental 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 Undullah Project occurs in the Greater Flagstone Priority Development Area (PDA) declared by the State Government for the fast-tracking of new housing fronts to ensure South East Queensland can cater for the predicted demand. There are few environmental controls at the impacts site with the Queensland Government's *Environmental Offset Act 2014* not being applicable. The relatively economical PDA Implementation Guideline 17 applies a small financial figure to the clearing of Koala habitat ($5,000-$15,000 per Ha) subject to state mapping, however this guideline 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 offset site is currently utilised for cattle and feedlot 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 Area 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 has been legally secured prior to the commencement of any clearing on the Impact site. The Offset Area and its values have been legally secured through a Voluntary Declaration (V-Dec) declared under the Queensland Government's *Vegetation Management Act 1999* on 2 March 2021. .

8	*have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced*	The Offset Site has been purchased and operated by the Offset Provider. The Proponent will resource the purchase of the land and fund all actions listed under the Approved Offset Area Management Plan. An executed legal contract (Offset Provider Deed) is in place outlining the legal and committed relationship of the funding and delivery of the offset outcomes. The Offset Site has been contracted to purchase subject to a conditional due-diligence period. Clearly articulated goals are set within this Offset Management Plan for each proposed action within each Environmental Management Zone (EMZ). 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 this OMP are designed to be measured, monitored, audited and enforced year upon year during the life of the offset.

4. Offset Area Design

The Offset Area covers the dominant portion of the land holdings at both the Avonvale and Cherry Gully Stations (Offset Site). The Offset Area has been designed to consolidate existing and mixed habitat values on the western portion of both properties and provide reconnected habitat to and along riparian gullies and on high moisture alluvial soils. Broadly areas selected as part of the offset achieve one of the following outcomes:

- Preservation of existing remnant aged Koala and Grey-headed Flying-fox habitat.
- Expansion and consolidation of remnant habitat areas with mixed quality regrowth vegetation enhanced through a range of rehabilitation measures.
- Habitat recreation by revegetating cleared land into habitat in logical infill locations to maximise the area and width of dedicated offset land.
- Habitat recovery and re-connection through strategically located restoration and revegetation along site waterways, gullies and alluvial soils. Reinstating and enhancing waterway habitat also provides for direct wildlife connectivity between on / off-site habitat tracts to the east and west of the Ivory Creek Corridor.

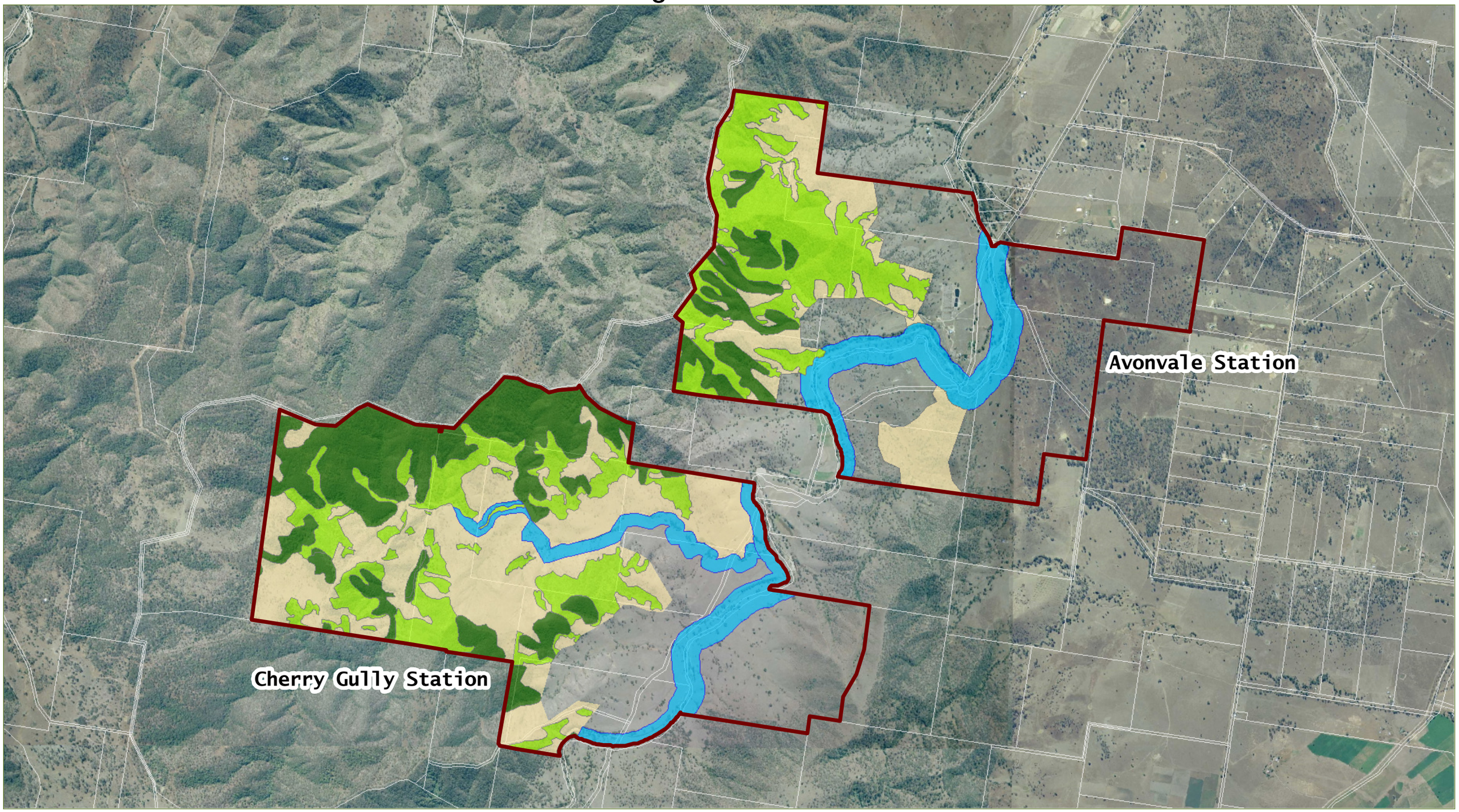
For the purposes of management and improvement monitoring the Offset Area is divided into 4 distinct Environmental Management Zones (EMZ) based on existing habitat condition and desired environmental offset principals. Section 4.0 of this OMP provides a brief description of each EMZ and outlines core objectives sought within the EMZ as part of the overall offset outcome. The designation of the Offset Area into EMZs 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 Site.

Refer to PLAN 5 for the Overall Offset Area Design designating the spatial extent of each Environmental Management Zone (EMZ).

The total Offset Area is 1,131.50ha (2,610.75 acres) which is categorised into the following Four (4) management zones:

- Environmental Management Zone 1 – Remnant Habitat (257.7ha)
- Environmental Management Zone 2 – Mixed Value Regrowth Vegetation (308.20ha)
- Environmental Management Zone 3 – Open Grazing Country [Category X Vegetation] (399.00ha)
- Environmental Management Zone 4 – Degraded Creeks, Gullies and Drainage Lines (166.60ha)

PLAN 5 - Offset Area Design



FILE NAME:OEs_1 PLAN 3 Offset Sub Area V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

11/12/2019 *1:30,000*

N

References - © State of Queensland (Department of Natural Resources, Mines and Energy) 2019

Legend

Qld DCDB

Offset site boundaries

Offset design areas

ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Habitat [257.7 ha]

ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]

ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [399.0 ha]

ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]

One Environment

4.1. Environmental Management Zone 1 – Remnant Habitat

Environmental Management Zone 1 (EMZ 1) covers an area of 257.7ha and is characterized by mapped and on-ground verified remnant open woodland Eucalyptus vegetation. The mid and understorey vegetation throughout EMZ 1 varied with prior disturbance and weed incursion, however generally the canopy species where amongst the largest and most structurally intact on the offset property.

The primary management objectives for EMZ 1 is for the preservation of canopy tree structure, diversity and density. This will be achieved through a number of measures including:

1. Exclusion of stock from remnant areas (EMZ 1) located within the Offset Area.
2. Ceasing of all tordening activities within EMZ 1 areas *(tordening is the ring barking of trees to reduce canopy density and maximise the growth of animal grazing grasses – deliberate manipulation of canopy cover to remove over- shadowing*).
3. Prohibiting intermittent tree harvesting and native forest practice occurring ad-hoc within remnant areas.
4. Removal and management of existing weed incursion – particularly of Weeds of National Environmental Significance (WONS – Namely Lantana cultivars).
5. Assisted natural regeneration of native endemic species in locations exposed through weed removal.
6. Targeted control of feral animals (specifically wild dogs and Dingos) as part of the entire offset property. 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.
7. Management of human access and disturbance through the use of fencing and gates.
8. Collection of remnant / healthy regrowth tree seeds, with a priority focus on trees known to have been utilized by the local koala population for feeding and shelter. These seeds are to be used in revegetation and rehabilitation over other Environmental Management Zones.
9. Passive management of fuel loads and wild fire risk factors.

Further details on specific management actions for EMZ 1 are located in the Tabulated Management Actions in Section 5.0 of this Offset Management Plan. PLAN 6 includes the location of Environmental Management Zone 1 in the Offset Area and includes some indicative imagery of the values in this zone.

4.2. Environmental Management Zone 2 – Mixed Value Regrowth Vegetation

Environmental Management Zone 2 (EMZ 2) is the largest zone within the Offset Area covering 308.20ha of land. The zone is characterized by a wide-ranging condition of regrowth vegetation attributes typically defined by vegetation maturity the currency period between recent or historical disturbance. EMZ 2 is the only part of the site which includes some areas of non-habitat regrowth formed as pioneer monocultures (predominantly wattles) in the early and mid phase of primary ecological succession. With intervention these areas can be transitioned into open eucalyptus woodlands at a faster rate than fresh revegetation areas.

The primary management objective for Environmental Management Zone 2 is to support and fast-track the transition of regrowth vegetation to remnant open eucalyptus woodlands. This will be achieved through:

1. Removal of weed infestations (Lantana) stagnating native tree growth rates and precluding the natural regeneration of further koala habitat and GHFF foraging trees species and other supporting trees, shrubs, ground covers and grasses.
2. Removal of cattle grazing and access from EMZ 2 to minimise the weed dispersal source and the trampling of regrowth and compacting of soil.
3. Undertake a range of assisted Natural Regeneration approaches including infill revegetation plantings.
4. Targeted control of feral animals (specifically wild dogs and Dingos) as part of the entire offset property. 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.
5. Management of human access and disturbance through the use of fencing and gates.
6. Collection of healthy regrowth tree seeds, with a priority focus on trees known to have been utilized by the local koala population for feeding and shelter. These seeds are to be used in revegetation and rehabilitation over other Environmental Management Zones.
7. Passive management of fuel loads and wild fire risk factors.

Further details on specific management actions for EMZ 2 are located in the Tabulated Management Actions in Section 5.0 of this Offset Management Plan. PLAN 7 includes the location of Environmental Management Zone 2 in the Offset Area and includes some indicative imagery of the values in this zone.

4.3. Environmental Management Zone 3 – Open Grazing Country (Category X Vegetation)

Environmental Management Zone 3 is defined through its primary role of habitat creation and covers 399.00ha of the Offset Area. Existing habitat values for the Koala and Grey-headed Flying-fox (GHFF) range from marginal (paddock trees) to non-existing (grass plains). There are disconnected locations throughout EMZ 3 where native vegetation values occur in a cluster or strand of healthy specimens, however these were not observed or considered to be contribute to the functional role of habitat available for koalas and GHFF.

The revegetation and reinstatement of native vegetation throughout EMZ 3 results in Three (3) critical objectives, including:

- Expand available Koala and Grey-headed Flying-fox resources through new habitat; and
- Infill existing high (EMZ 1) and moderate (EMZ 2) Koala and Grey-headed Flying-fox habitat values to create a large contiguous conservation Offset Area with reduced perimeter edge to total Offset Area ratios (minimise edge influences and maximise function); and
- Connect values in EMZ 1 and 3 with the moisture rich alluvial soils adjoining the creeks, waterways, gullies and flats (designated as EMZ 4).

EMZ 3 occurs predominantly on Land Zone 3 country which is noted by the Queensland Government and university researchers (*Central Queensland university, 2017*) to support the highest use koala habitat and therefore most desired for revegetation works. EMZ 3 will achieve its management objectives through:

1. Removing weed sources and dense matted pasture grasses from the soil profile in preparation for mass planting of native trees and other species known to support the Koala and Gray-headed Flying-fox.
2. Sequential and long term removal of cattle uses from EMZ 3 zone through fencing.
3. Mass replanting with native tube stock and seedlings endemically collected from site and propagated in the on-site purpose built nursery.
4. Plant maintenance, weed and pest management through the varying stages of revegetation to mature self sustaining regrowth ecosystems.

Further details on specific management actions for EMZ 3 are located in the Tabulated Management Actions in Section 5.0 of this Offset Management Plan. PLAN 8 includes the location of Environmental Management Zone 3 in the Offset Area and includes some indicative imagery of the values in this zone.

4.4. Environmental Management Zone 4 – Degraded Creeks, Gullies and Drainage Lines

The Offset Site is incised by two major waterways and includes numerous gully lines and drainage features most of which are designated for revegetation and rehabilitation in Environmental Management Zone 4 (EMZ 4). Primarily the works in EMZ 4 leverage from the creation of two new major Koala Habitat tree and Grey-headed Flying-fox tree corridors. The Ivory Creek corridor is to be reinstated to a width varying between 230m to 270m wide meandering through the Offset Area on a north south alignment. The Cherry Gully corridor will be created to a width between 120m and 150m wide connecting site habitat in an east-west direction. Collectively the rehabilitation of these riparian tree habitat corridors makes up 166.60ha of the Offset Area.

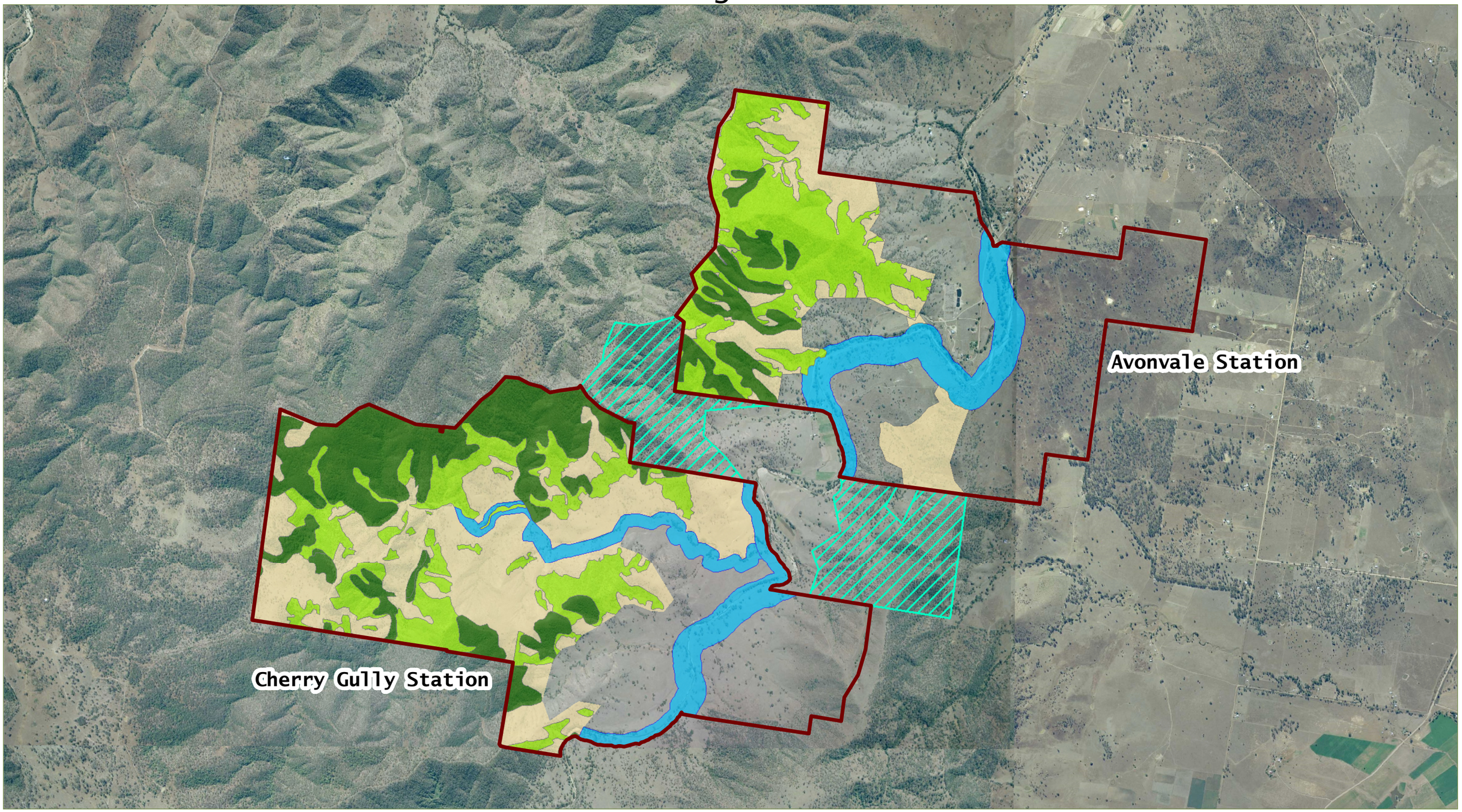
Throughout the broader rural regional landscape within the vicinity of the Offset Site there remain a mix of cleared, remnant and regrowth values, however overwhelmingly values remain on the ridge lines and foothills. The higher moisture soils of the waterways combined with direct access to reliable water sources were the first to be cleared and used for agricultural and grazing land uses. Reinstating the Koala and Grey-headed Flying-fox tree species through this zone completes the connectivity jig-saw of the offset design resulting in improved habitat function and use of the 3 other EMZs. Additionally the created habitat with direct connection to the foothills and ridge lines vegetation will improve the climate resilience for both species. The GHFF will have access to an increased abundance of higher moisture tree species supporting flowering and fruiting resources as part of the existing foraging habitat. The Koala will be able to safely access rich alluvial soil Koala tree species, immediate adjacent to natural water flows. The inclusion of EMZ 4 allows for a local shift in habitat uses during times of varying climatic conditions (eg access to water during drought conditions / access to ridgelines during flood conditions).

The management objectives for EMZ focus on the reinstatement habitat and tree species on moisture rich soils directly connected to EMZ 1, 2 and 3 and other surrounding land habitat not forming part of the Offset Area. This will be achieved through:

1. Removal of weed infestations and sources – waterways contain highest recordings of Lantana clumps and communities.
2. Apply cattle restrictions on access to and through EMZ 4. Due to the incised nature of the waterways zones some controlled access in designated locations is required to water and cross paddock mustering.
3. Revegetation with native tube stock and seedlings endemically collected from site and propagated in the on-site purpose built nursery.
4. Plant maintenance, weed and pest management through the varying stages of revegetation to mature self sustaining regrowth ecosystems.
5. Fixing and on-going maintenance of high risk erosion and sedimentation areas.
6. Targeted control of feral animals (specifically wild dogs and Dingos) as part of the entire offset property. 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.
7. Management of human access and disturbance through the use of fencing and gates.

Further details on specific management actions for EMZ 4 are located in the Tabulated Management Actions in Section 5.0 of this Offset Management Plan. PLAN 9 includes the location of Environmental Management Zone 4 in the Offset Area and includes some indicative imagery of the values in this zone.

PLAN 5 - Offset Area Design



FILE NAME: OEs_1 PLAN 5 Offset Area Design V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

8/04/2022 *1:30,000*

References - © State of Queensland 2022

N

Legend

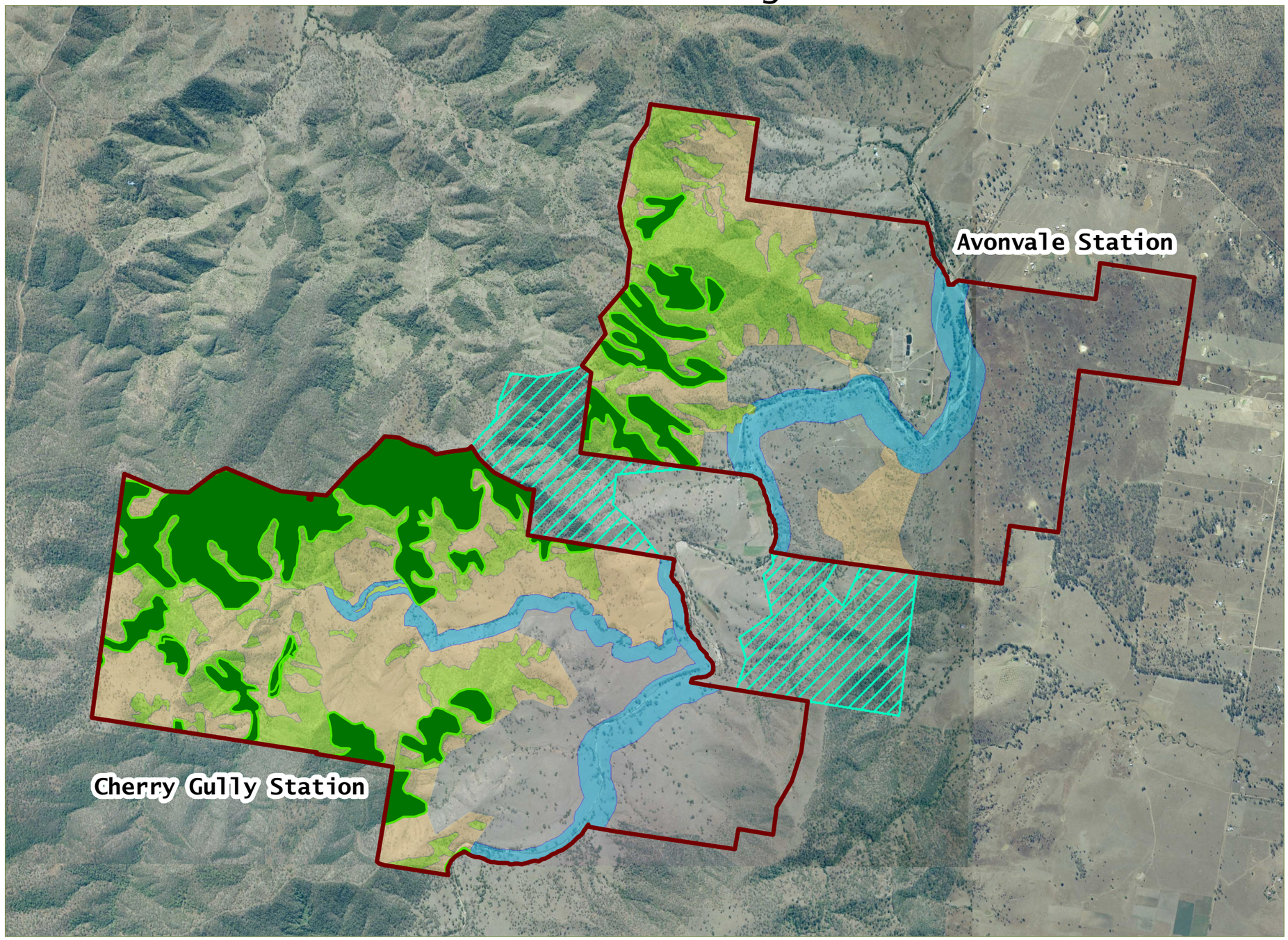
Offset site boundaries

Offset design areas

- ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Habitat [257.7 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [399.0 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]
- Future offset area subject to external land-holder negotiations (not part of EPBC 2015/7530)

One Environment

PLAN 6 - Offset Area Design - Zone 1: Remnant Habitat



FILE NAME: OEs_1 PLAN 6 Offset Area Design Z1 V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

8/04/2022 *1:30,000*

References - © State of Queensland 2022

N

Legend

Offset site boundaries

Offset design areas

ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Vegetation [257.7 ha]

ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]

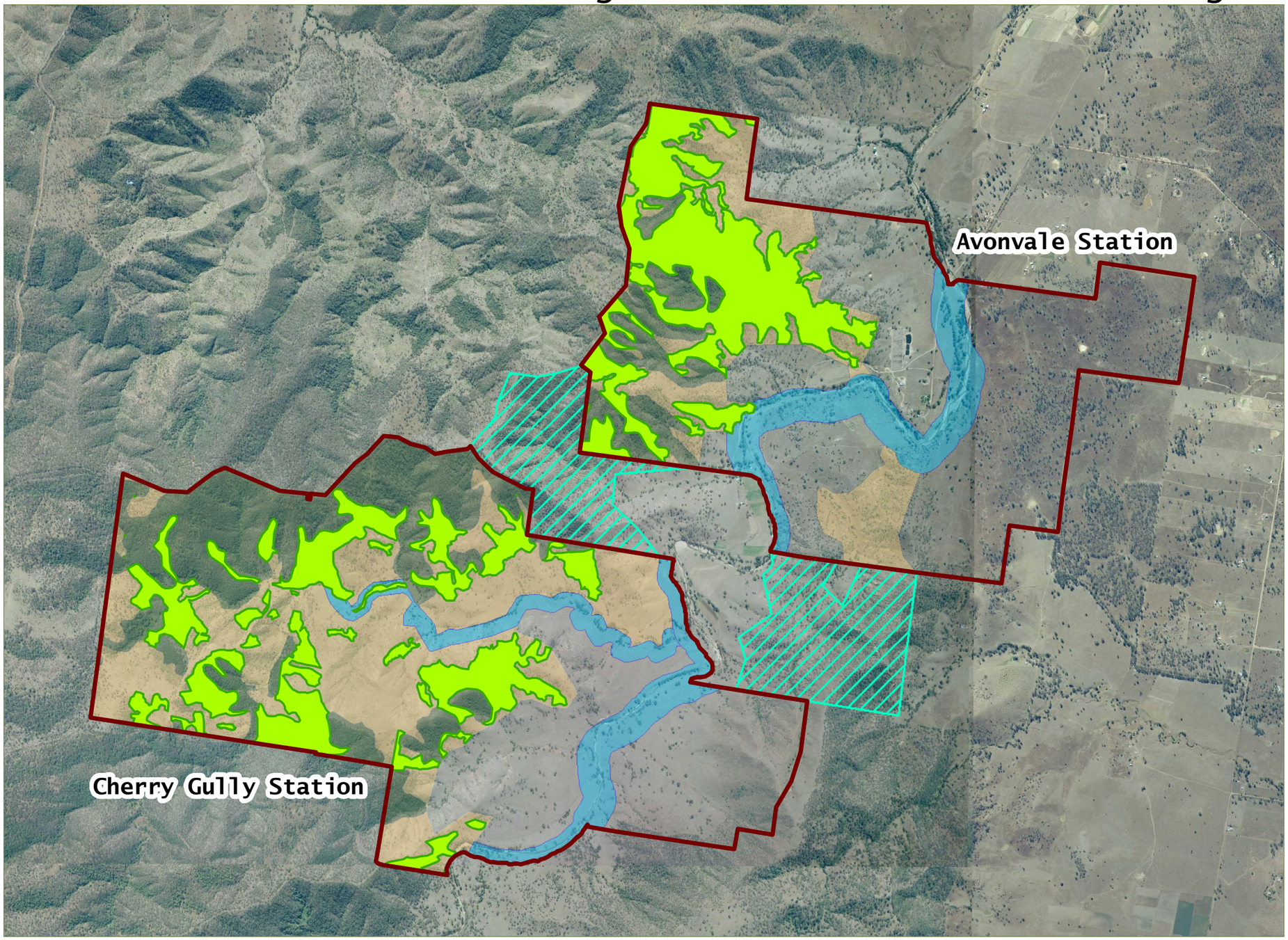
ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [399.0 ha]

ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]

Future offset area subject to external land-holder negotiations (not part of EPBC 2015/7530)

One Environment

PLAN 7 - Offset Area Design - Zone 2: Mixed Value Regrowth Vegetation



FILE NAME: OEs_1 PLAN 7 Offset Area Design Z2 V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

8/04/2022 *1:30,000*

N

Legend

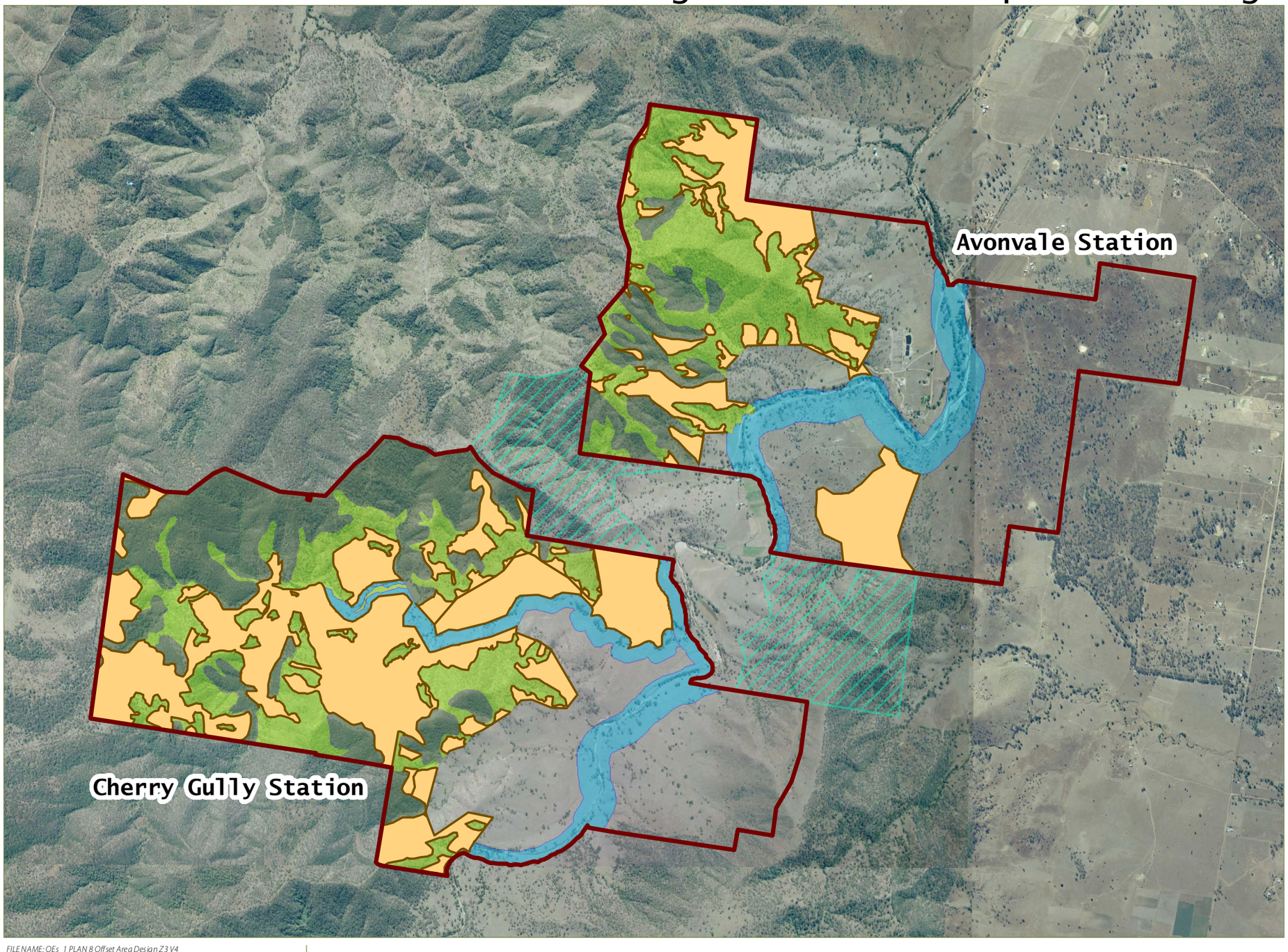
Offset site boundaries

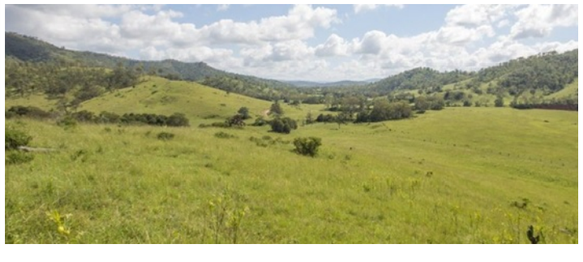
Offset design areas

- ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Vegetation [257.7 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [399.0 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]
- Future offset area on land-holding (not part of EPBC 2015/7530)
- Future offset area subject to external land-holder negotiations (not part of EPBC 2015/7530)

One Environment

PLAN 8 - Offset Area Design - Zone 3: Open Grazing Country





FILE NAME: OEs_1 PLAN 8 Offset Area Design Z3 V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

8/04/2022 *1:30,000*

N

Legend

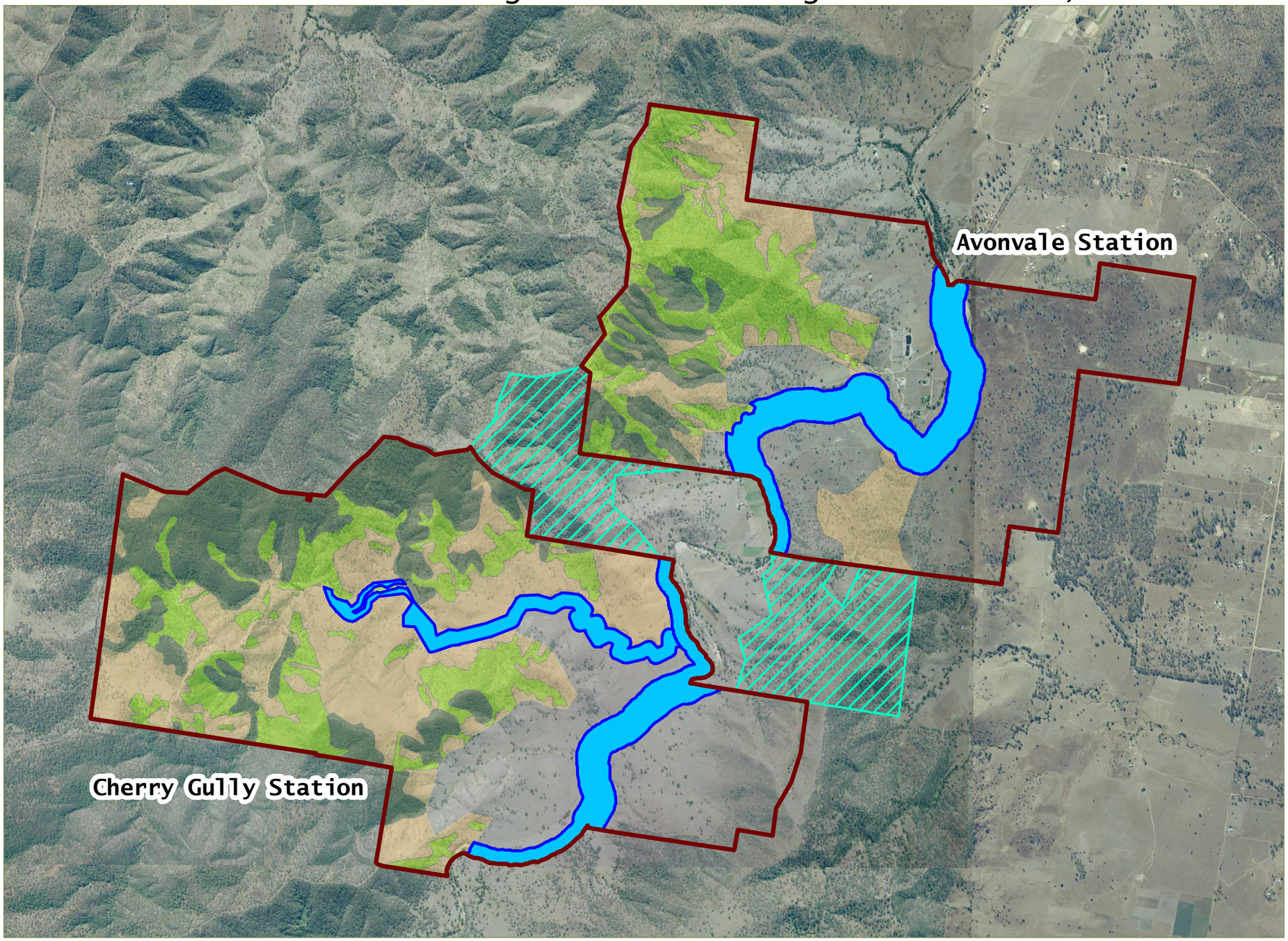
Offset site boundaries

Offset design areas

- ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Vegetation [257.7 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [399.0 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]
- Future offset area subject to external land-holder negotiations (not part of EPBC 2015/7530)

One Environment

PLAN 9 - Offset Area Design - Zone 4: Degraded Creeks, Gullies and Drainage Lines



FILE NAME: OEs_1 PLAN 9 Offset Area Design Z4 V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

8/04/2022 *1:30,000*

N

References - © State of Queensland 2022

Legend

Qld DCDB

Offset site boundaries

Offset design areas

ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Vegetation [257.7 ha]

ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]

ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [399.0 ha]

ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]

Future offset area subject to external land-holder negotiations (not part of EPBC 2015/7530)

One Environment

5. Offset Land Management Actions

There are 9 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.

This section includes the following:

- The results of the baseline surveys (Condition 7a)
- The detailed baseline habitat quality assessment data for each EMZ (Condition 7b)
- The species stocking rate scoring tables (Condition 7c)
- The outcomes specified in Condition 10 – 18 of the approval (Condition 7d)
- A program to monitor and report on progress against performance and completion criteria (Condition 7e).

Actions to be completed in accordance with this OMP include:

- Action 1: Vertebrate Pest Management (Primarily Targeting Wild Dogs & Dingos)
- Action 2: Weeds of National Significance (Reduction & Management)
- Action 3: Stock Management
- Action 4: Access Management, Trespass and Neighbouring Stock Mustering Controls
- Action 5: Wildfire Management
- Action 6: Flooding, Erosion and Sedimentation Management
- Action 7: Native Seed Collection & Propagation
- Action 8: Regeneration & Rehabilitation Management
- Action 9: Revegetation (Habitat Creation) Activities

Each of these management actions is tabulated into a more detailed format. The tables are set out to respond to the following criteria:

Outcome: *What is the action / task designed to achieve and why is it necessary?*
Action Description: *What are the tasks proposed?*
Action Location(s): *Where on site is the action proposed?*
Action Timing: *When and how will the action / task be implemented, started, completed?*
Responsibility: *Who will complete the action and who will provide the funding?*
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*
Adaptive Management: *Whats the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*

Avonvale & Cherry Gully Offset Area Offset Management Plan

Action Management Tables

5.1. **Action 1**: Vertebrate Pest Management (Primarily Targeting Wild Dogs & Dingos)

The Department of Agriculture & Fisheries (DAF) – Biosecurity Queensland maps wild dogs through the Somerset Regional Council Area as 'common'. Dingos and wild dogs are listed as a 'class 2' pest in the Somerset Regional Council Pest Management Plan and noted within many contemporary newspaper articles and Council's meeting minutes as increasing in population since 2013 [Ref: Elsome, D (2018)]. Council have introduced a wild dog bounty program providing $25 for each scalp provided as evidence. Council also provide baiting and training on use of baiting to land holders, however do not retain their own pest management officer.

The current owners and farm staff of the Avonvale and Cherry Gully Stations have antidotally noted wild dogs as an issue for stock and that the problem is shared by all surrounding cattle grazers. Site surveys located wild dogs, and in specific records a dingo, through the vegetated and cleared portions of the Offset Area. Additionally, the remnants of a dead koala was recorded on-site with evidence suggesting the mortality was most likely the result of a dog attack. There are 23 local records for koalas of which 7 are noted as severely injured or killed animals.

A core role of the Action 1 Offset Management Tasks will be for the prolonged control and reduction in wild dogs over the offset land for the offset period.

Site Images of Wild Dogs / Koala Carcass and Other Pest Species:




Table 5: Offset Area – Action 1 – Management Actions

Action Description: *What are the tasks proposed?*	– Reduce the occurrence of Vertebrate pest species (Namely wild dog and dingos) to below 5% of the baseline survey within the Offset Area within 5 years from the commencement of the offset. – Reduce koala injury or mortality within the Offset Area to zero (0) within 5 years from the commencement of the offset. – Maintain reduced occurrence and koala injury and mortality rates for the life of the offset (20 years – reduction achieved in 5 years maintained reduced rates for 15 years)
Action Location(s): *Where on site is the action proposed?*	– Vertebrate Pest Management is to occur in all Environmental Management Zones of the Offset Area (EMZ 1, 2, 3 and 4). – Vertebrate Pest Management will be extended to the entire land holding covering retained grazing areas to ensure dispersal and ambush targets are located and controlled.
Action Timing: *When and how will the action / task be implemented, started, completed?*	Year 1 – Complete Detailed Baseline / Seasonal Pest Management Survey • Establish an on-site monitoring program to deliver baseline data for measuring occurrence and incidence reduction of specific control techniques (eg baiting / shooting /trapping). Methods to include: o Formal recording of site and surrounding stock losses o Remote sensor cameras with baited cages o Scat occurrence, age and type surveys o Develop and implement an on-site recording protocol for incidental observations of pest management species by Station and Offset Staff. Year 1 – Consult with Somerset Regional Council and or Regional Pest Management Representative to discuss best methods and the broader strategy for the region. Year 2 – Development initial Pest Management Implementation Strategy and consult with adjoining land holders for coordinated approaches to wild dog population reduction. Years 1 – 5 – Commence Targeted Pest Management Activities

	• Quarterly targeted pest management program. • Implement 1080 baiting program in accordance with Somerset Regional Council's recommended guidelines • Include annual trapping event targeting wild dog and dingo species. Years 1 – 5 - Decommissioning and removal of any pest species denning, foraging or breeding features located during the baseline studies (eg. Destroy fox dens observed along the Ivory Creek embankment). Year 5 – Remobilise and Replicate Detailed Baseline / Seasonal Pest Management Survey – Compare and report on data in year 5 Offset Area Annual Report (OAAR) 5 to demonstrate that completion criteria has been met (less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area), along with proposed adaptive management amendments to the Targeted Pest Management Activities. Years 6-10 – Continue to implement Pest Management Strategy / Actions – In accordance with any recommended adaptive management changes incorporated in response to Year 5 baseline surveys as documented in the OAAR. Year 10 - Remobilise and Replicate Detailed Baseline / Seasonal Pest Management Survey – Compare and report on data in year 10 OAAR to ensure that completion criteria has continued to be met (less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area), along with proposed amendments to the Targeted Pest Management Activities. Years 11-15 – Continue to implement Pest Management Strategy / Actions – In accordance with any recommended adaptive management changes incorporated in response to Year 10 baseline surveys as documented in the year 10 OAAR. Year 15 - Remobilise and Replicate Detailed Baseline / Seasonal Pest Management Survey – Compare and report on data in year 15 OAAR (less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area), along with proposed amendments to the Targeted Pest Management Activities.

	Years 16-20 – Continue to implement Pest Management Strategy / Actions – In accordance with any recommended adaptive management changes incorporated in response to Year 15 baseline surveys as documented in the year 15 OAAR. Year 20 - Remobilise and Replicate Detailed Baseline / Seasonal Pest Management Survey – Compare and report on data in year 20 to demonstrate that completion criteria has been met (less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area).
Responsibility: *Who will complete the action and who will provide the funding?*	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, zoologists or environmental scientist with a minimum of 5 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. – Hunting / Shooting Program to occur in accordance with all relevant Queensland Government permits and regulations. – Existing operational farm staff and offset implementation staff to be educated towards the contribution of pest species record keeping. 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 ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	Completion of baseline surveys and range estimate of vertebrate pest species 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). 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 vertebrate pest species on-site (below 5% of the baseline survey results) • Vertebrate pest species 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 • Nil occurrence of injury or mortality of vertebrate pest species on site koala populations Year 5 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 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) 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. Or 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. 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 vertebrate pest management strategy (provided as conditioned in the relevant Annual Compliance Report for the Approved Action).
Risks & Adaptive Management: *what's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	Without intervention and management actions the risk of vertebrate pest species impacts on the koala are assessed as 'High' in Section 6 of this Offset Area Management Plan. This is based on regional and local government data on wild dogs combined with a number of on-site dog and dingo sightings and koala mortality evidence collected during preliminary surveys. The pest management strategies incorporate intensive implementation methods and three (3) 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 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 • Allow the site strategy to assimilate into any new broader threat abatement programs. The vertebrate pest 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 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 fluctuations in pest populations such as wild dogs.
Baseline Survey Results: ***Year 1*** *baseline survey results for the offset land management action*	

Feral Animal Register - Avonvale and Cherry Gully Station (Jul 2020-Jan 2022)

Event / Incident	Date:	Person / Party	Approximate Time	Description	Feral Animals Spotted	Action
1	16/07/2020	Bradley Westmac	Over-night	Hunting Event - Western allotments of Cherry Gully Station	0	0
2	31/08/2020--10/09/2020	SHG	4 x Baited Camera Traps	Baited Camera Traps - 3 in Cherry Gully / 1 In Avonvale - Ivory Creek	1	0
3	11/01/2021	Jeff Carr	Dawn and Dusk Weekend	Hunting Event - Ivory Creek / Cherry Gully intersection	1	0
4	23-24/03/2021	Farm Staff (DB)	Morning	Dead Dog found in Avonvale - Attributed to LGA baiting program	1	1
5	5/04/2021	Bradley Westmac	Overnight	Hunting event - Avonvale West	1	0
6	8/04/2021	Jeff Carr	Night	Hunting Event - Charry Gully - Dog located and killed	1	1
7	25/04/2021	Jeff Carr	Night	Hunting event Iveroy Creek	0	0
8	28/04/2021	SHG	Day – While setting up cameras	In Remnant vegetation on Chrry Gully - Wild Dog observed crossing track	1	0
9	28/04/2021-08/05/2021	SHG	4 x Baited Camera Traps	Baited Camera Traps - 3 in Cherry Gully / 1 In Avonvale - Ivory Creek	2	0
10	4/06/2021	Bradley Westmac	Night	Hunting Event - Avonvale west	0	0

	11	11/11/2021	Bradley Westmac	Night	Hunting Event - Avonvale west	0	0
	12	8/01/2022	Jeff Carr	2 x Weekend Nights	Hunting event - Cherry Gully	1	0
	13	12/01/2022	Farm Staff (DB)	Day	Wild Dog shot attacking calf	1	1
					Totals	**10**	**3**
Management Action Completion Criteria and Interim Completion Criteria (based on baseline survey results)	• **Baseline Survey Results (Year 1):** 10 feral animals • **Interim Completion Criteria (Year 5):** Have a reduction in the abundance of feral animals, relative to the abundance determined by the baseline surveys (Condition 10) o Less than 5% of the baseline survey results = one feral animal • **Completion Criteria (Year 10, Year 16 & Year 20):** Ensure that the abundance of feral animals is then maintained at, or reduced below, the Year 5 abundance for the rest of the period of effect of approval (Condition 10) o Less than 5% of the baseline survey results = one feral animal						

5.2. **Action 2**: Weeds of National Significance (Reduction & Management)

Preliminary site surveys and observations over the Avonvale and Cherry Gully land holdings recorded a total of 23 weed species, of which 3 are scheduled as declared weeds under the *Land Protection (Pest and Stock Route Management) Act 2002* or now listed as 'restricted invasive' plants under the *Biosecurity Act 2014*. The most regularly recorded and in locations abundant species are *Lantana camara* and *Lantana montevidensis*. The Queensland Government Department of Agriculture and Fisheries (DAF) maps the Somerset Region as containing widespread common and abundant infestations of Lantana. The Somerset Regional Council 2013-2018 Pest Management Plan schedules Lantana amongst the priority pest species noting it as abundant and widespread through the region with a 'high' capacity to spread and a 'low' capacity for Council to successfully control.

Lantana is a Weed of National Significance under the EPBC Act. In 2006 Lantana was nominated by the **NSW Government Office of Environment and Heritage** to be listed as a key threating process under the EPBC Act:

"The invasion, establishment and spread of Lantana camara impacts negatively on native biodiversity including many EPBC listed species and communities."

(Source: Key Threatening Process Nomination Form)

"Lantana is a Weed of National Significance. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts. Lantana forms a dense, impenetrable thickets that take over native bushland."

(Source: Weed Management Guide – Weeds of National significance – Lantana – National heritage Trust)

"L. camara may change soil microhabitat through shading, self-mulching, and altered water and nutrient balances. Lamb (1988, cited in Swarbrick et al. 1995) identified an increase in soil nitrate in eucalypt woodland following Lantana invasion, to the benefit of the Lantana and other weeds, and to the detriment of some native species, and a decline in other nutrients. Gentle and Duggin (1998) point to Lantana's ability to aggressively compete for and sequester surface-soil nutrients, such as are made available by disturbance episodes, and verified experimentally Lantana's ability to out-compete and suppress an analogous native coloniser of mesic forests (Choricarpia leptopetala, Myrtaceae). "

(Source: Lantana camara - key threatening process listing – NSW Government)

Lantana occurs on the offset landholding both in open paddock areas as isolated clusters and thickets and as a dominant shrub or creeper through regrowth and remnant areas. Within open areas existing farm practices result in periodical pesticide application limiting spread, however this does not occur within

sporadic and densely vegetated areas where the infestations are considered too established for the costs of treatment to result in an economical return for the grazing benefit.

Lantana infestations suppress and inhibit the natural regeneration of regrowth vegetation on-site which directly limits the growth rates and regeneration of primary and secondary Koala tree species 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 additionally form a barrier to terrestrial species, which would include limiting the Koalas ability to access areas containing and over-canopy of Koala food trees (many of these areas were impenetrable for human survey).

Site Images of Lantana Infestations

Table 6: Offset Area – Action 2 – Management Actions

Action Description: *What are the tasks proposed?*	– Removal and control of all major Lantana infestations from within the Offset Area using a variety of mechanical and herbicide methods. Lantana infestations are to be reduced to below 5% of the Offset Area. – Ongoing maintenance rotations to retain Lantana extents within the Offset Area at or below the reduced extent achieved through weed management actions. – Prevent the further spread or establishing of new Lantana outbreaks within the Offset Area (primarily by excluding cattle from EMZ 1, 2 and 3). –
Action Location(s): *Where on site is the action proposed?*	– Management of Lantana is to occur in the entire Offset Area, however initial works to focus on the existing infestations in EMZ 1 and 2.
Action Timing: *When and how will the action / task be implemented, started, completed?*	Year 1 – Complete Detailed Baseline / Weed Extent Survey • Use an Antenna based GPS system to map the full extent (as description polygons) of all Lantana areas within the Offset Area (achieve a total ha extent of weed infestations / occurrences within the Offset Area). Results of baseline weed extent surveys to be included in year 1 Offset Area Annual Report for inclusion in the updated OMP. Year 1 – Exclude stock (cattle) access from Lantana infestation areas within the Offset Area (grazing cattle provide the most continuous source of Lantana spread. By year 5 the entire Offset Areas will retain cattle exclusion fencing – Refer Stock Restrictions management actions – Action 3) Years 2-5 – Commence detailed weed management control activities within the Offset Area. Methods deployed based on extent of infestation, existing native values, topography, waterways and other sensitive receiving environments: • 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;

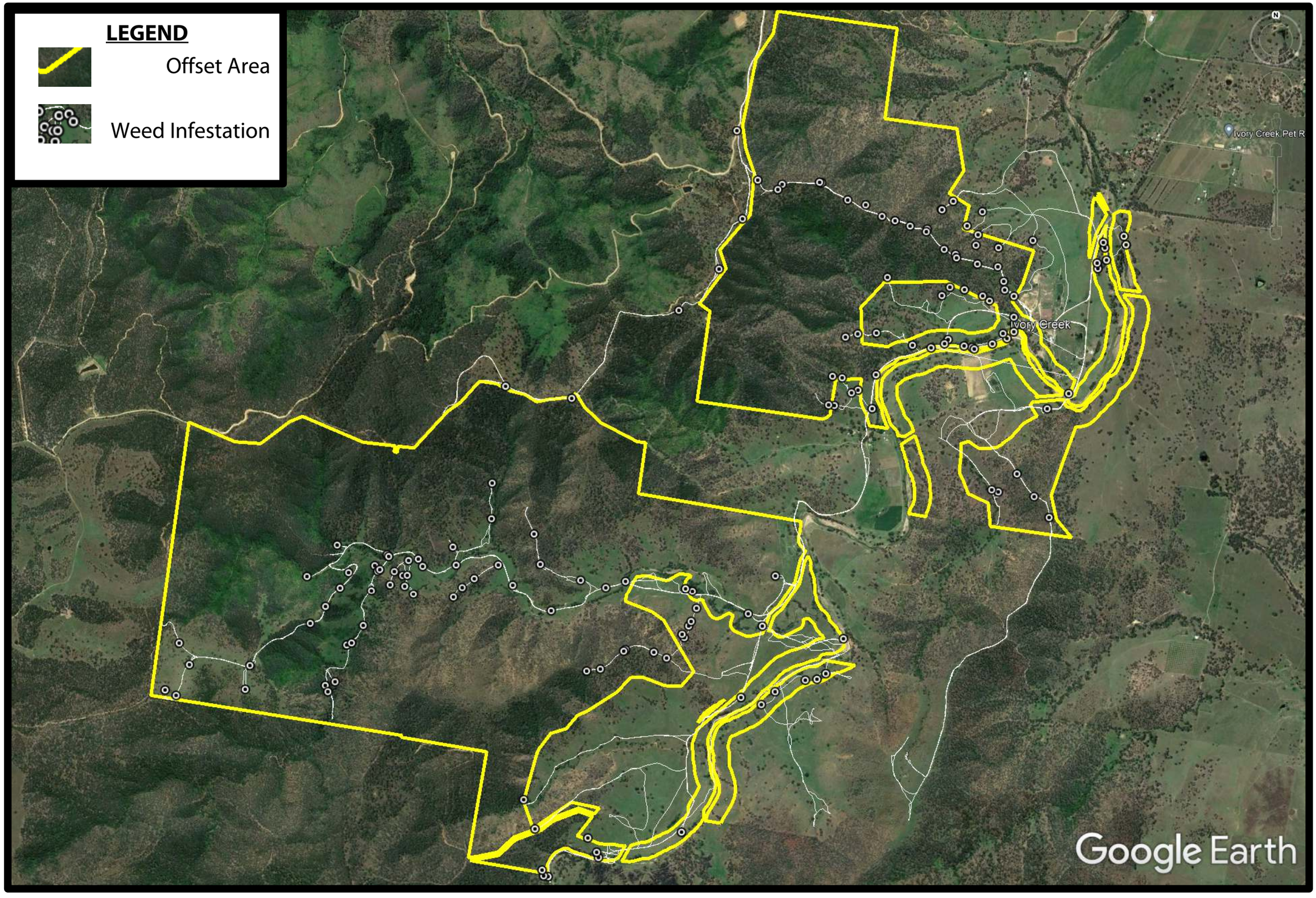
	• Apply broadscale herbicide and spot spray during high germination summer periods (Nov-March). Utilise organic based Lantana targeted herbicides which minimise impacts on native vegetation regenerating within and surrounding Lantana patches. Demonstrate a downward trend in the weed extent, vigor and health annually through years 2-5, achieving a significant reduction in *Lantana spp*. extent within the Offset Area by year 5, with less than 20% of the Offset Area to contain weed infestations. Actions and downward trend to be reported annually in the OAAR. 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. Years 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 Offset Area by year 10, with less than 5% of the Offset Area to contain weed infestations. Actions and downward trend to be reported annually in the OAAR. Year 10 - Remobilise and Replicate Detailed Weed Extent Re-Survey through the Offset Area – 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 Offset Area to contain weed infestations. Years 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. 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%-of the Offset Area contains weed infestations.

	Actions and results provided in Year 11-19 of continuation of Year 10 adaptive management detailed weed management control methods (provided as conditioned in the relevant Annual Compliance Report for the Approved Action).
Responsibility: *Who will complete the action and who will provide the funding?*	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: – Base line and repeat surveys to be completed by a senior tertiary trained ecologist, or environmental scientist with a minimum of 5 years industry field experience. – 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. Preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	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 20% of the Offset Area. Replicate baseline surveys in year 5 to demonstrate less than 20% of the Offset Area contains *Lantana spp*. 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 spp*. 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 spp*. extent within the Offset Area by year 10, with less than 5% of the Offset Area to contain weed infestations. Year 10 OAAR to include repeat survey methods, results data and comparative analysis less than 5% of the Offset Area contains *Lantana spp.* 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 spp*. below the 5%-of the Offset Area. 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 spp*. is maintained below 5% of the Offset Area provided as conditioned in the relevant Annual Compliance Report for the Approved Action).
Risks & Adaptive Management: *what's the procedure for correcting or*	The primary weed issue through the Offset Area 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.

amending the action if the proposed outcomes are not being achieved?	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
Baseline Survey Results: *Year 1 baseline survey results for the offset land management action*	Detailed weed extent surveys utilising handheld GPS and ortho-rectified drone aerial imagery were undertaken within the offset area during March and August 2021. Due to the size of the offset area, it was not viable to access all areas. As such, the data has been extrapolated across the entire area. Detailed survey results indicate that ~101.83 ha of the total offset area contains weed infestations. Refer to **Insert 1** for the baseline weed survey extent.
Management Action Completion Criteria and Interim Completion Criteria (based on baseline survey results)	• **Baseline Survey Results (Year 1):** 101.835 ha of weed infestations OR 9% of the Offset Area • **Interim Completion Criteria (Year 5):** Less than 20% of the offset area to contain weed infestations (226.30 ha) • **Interim Completion Criteria (Year 10):** Less than 5% of the offset area to contain weed infestations (56.575 ha) • **Interim Completion Criteria (Year 16):** Maintain less than 5% of the offset area weed infestations (56.575 ha) • **Completion Criteria (Year 20):** Maximum of 56.575 ha of the offset area to contain weed infestations

Insert 1: Baseline Weed Mapping



5.3. **Action 3**: Stock Management

Avonvale and Cherry Gully are operational cattle stations. Avonvale retains an active 'Environmental Authority' (Permit F1-0048) under the Queensland Government's *Environmental Protection Act 1994* for the operation of feedlot facilities between 1,000 and 10,000 animals. Both properties retain extensive rotational pasture paddocks and selectively vegetated paddocks for the raising of weaners. The facility is used in conjunction with larger cattle land holdings by the same family in central Queensland with nearly all parts of the properties playing a role in the cattle breeding, production and re-stocking cycle. Cattle or evidence of recent cattle use was observed in all locations of preliminary ecological surveys, with the level of recent intensity directly correlating to the condition of residual biodiversity values.

The pressure and impacts brought on the land holding's Koala and Grey-headed Flying-fox values include:

1) The need for wholesale clearing to periodically expand pasture paddocks.
2) Cycle tordening and selective clearing to limit canopy cover of native trees to minimise suppression of grass feed.
3) Direct trampling and compacting of regeneration areas.
4) Spread of weed species and infestations which are also supported by minimising canopy cover and prevention of regeneration.

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 economical factors, however primarily the rise and fall of the cattle price. Regardless the long term and current highest and best use for the land is the continuation of the feedlot operation. 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).

Although it is not critical for the complete removal of cattle from an area to obtained improved ecological outcomes this land is being purchased for environmental offset outcomes and thus cattle will be restricted from Environmental Management Zones 1, 2 and 3. This will be particularly important where areas of intensive assisted natural regeneration and revegetation are occurring.

Environmental Management Zone 4, which is primarily contained within a 230-270m wide corridor along Ivory Creek will continue to support a reduced volume and controlled use for grazing purposes. This land is currently 90% cleared and unfenced and used intensively for grazing. Wholesale Koala and Grey-headed Flying-fox tree planting will occur within this zone to provide access and habitat along the alluvial rich soils adjacent to water sources. A similar finish is proposed to Cherry Gully. The creeks and gully lines incise the property making complete exclusion for cattle impossible. Controlled access to water and the periodical mustering of animals between paddocks will continue to occur within areas of Environmental Management Zone 4. There will be no impact on the use of all of the new tree plantings in this zone for the Grey-headed Flying-fox, however the periodical grazing / mustering of stock will limit the reinstatement of a full ground and understorey regional ecosystem communities in access locations.

Fauna friendly stock exclusion fencing is the ultimate proposed solution for restricting stock from accessing environmental Offset Areas. The created unfenced boundary of the Offset Area is approximately calculated as 14km of new fencing. Fencing is costly and time consuming and is programmed to roll out inline with works within the various Environmental Management Zones, however will all be in place within 3 years of the commencement of the action and offset (refer to PLAN 10 for the indicative Offset Area fencing locations). Alternatively, within two years of the legal security of the Offset Area, livestock are to be removed from the entirety of the Avonvale and Cherry Gully Stations.

Table 7: Offset Area – Action 3 – Management Actions

Action Description: *What are the tasks proposed?*	– Prevention and management of stock from the Offset Area using fauna friendly stock exclusion fencing OR removal of all livestock from the Avonvale and Cherry Gully Stations
Action Location(s): *Where on site is the action proposed?*	– All Environmental Management Zones will be fenced (EMZ 1, 2, 3 and 4) – Refer to PLAN 10 for the indicative Offset Area fencing locations; OR – Livestock is to be removed from the entirety of the Avonvale and Cherry Gully Stations
Action Timing: *When and how will the action / task be implemented, started, completed?*	Years 1-3 o Fencing in accordance with the indicative Offset Area Fencing Plan (PLAN 10) will commence immediately at an approximate rate of 30% per year and be completed by the End of Year 3. o Alternatively, all livestock is to be removed from Avonvale and Cherry Gully Stations. o A status update on completed fencing locations will be provided in the Offset Area Annual Report for inclusion in the ACR. Years 4-20 – All fencing will be inspected annually and reported on in the Offset Area Annual Report. OR Year 4-20 – Annual status update to confirm that livestock have continued to be excluded from Avonvale and Cherry Gully Station. This is to be reported on in the Offset Area Annual Report. *Fencing is proposed as a permanent outcome and thus there is no currency on removal.*
Responsibility: *Who will complete the action and who will provide the funding?*	The Offset Provider will establish, resource and fund the construction, monitoring, maintenance and reporting on all fencing (using fencing contractors where deemed appropriate) OR The Offset Provider will remove all livestock from Avonvale and Cherry Gully Station.

	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 ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– All fencing shown on the indicative Offset Area Fencing Plan (PLAN 10) being in place by year 3 reporting OR all livestock has been removed from the entirety of Avonvale and Cherry Gully Station by year 3 reporting. – Interim fencing to approximately 30% occurring per annum for each Offset Area Annual Report period. – Nil stock breaches into Offset Areas from year 4-20 (post completion of all fencing). – No reporting of stock impacts as justification for not achieving: o Habitat quality improvements o Weed spread targets – Annual documented evidence of fence monitoring and maintenance rectifications in each Offset Area Annual Reporting period from years 4-20.
Risks & Adaptive Management: *What's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	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 Offset Area 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 Management, Trespass and Neighbouring Stock Mustering Controls

Avonovale and Cherry Gully are surrounded to the north, west and south by large cattle grazing land holdings and the east by a number of smaller agricultural farms. On land holdings at this scale the it is common for neighbours to access and muster through un-owned adjoining land parcels to connect fragmented land holdings. Additionally, an adjoining land holder may cut a new access track in adjoining un-owned land without permission because of the perceived benefit to both parties, which is typically the case in farming operations.

The impacts of unlawful access and stock mustering mimic those listed in the 'general stock management' section of this management plan (trampling, compacting, weed spread, fence destruction). Without a system for identifying and preventing or controlling access, trespass and adjoining mustering the actions established for on-site stock management will be undermined.

Table 8: Offset Area – Action 4 – Management Actions

Action Description: *What are the tasks proposed?*	– Prevention / control of unauthorised access, stock mustering and trespass through the Offset Area.
Action Location(s): *Where on site is the action proposed?*	– All Environmental Management Zones will be fenced (EMZ 1, 2, 3 and 4), however particularly targeting EMZ contiguous with adjoining land holder boundaries.
Action Timing: *When and how will the action / task be implemented, started, completed?*	Years 1 o Inspection and rectification of all external fence boundaries o Notification of Offset Areas, purpose and outcomes to all adjoining land owners. Remaining Actions: o Access gates and signage to be installed where Offset Area fencing crosses tracks required to be maintained for external land holder access (As fencing is installed) o No new access tracks through the Offset Area unless to support offset outcomes
Responsibility: *Who will complete the action and who will provide the funding?*	The Offset Provider is responsible for funding and undertaking all actions relating to access, trespass and neighbouring stock mustering. 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 ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– Copy of notification letter provided to adjoining land holders. – Evidence (photos) or erected signage and gates at Offset Area / existing track fencing conflict points. – Fence monitoring as per Stock Management commitments – No evidence of stock influence in outcomes scheduled for the Offset Area habitat (Eg no stock impacts on the MHQA or GHFF FHA).

Risks & Adaptive Management: *What's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	Given there is not legal requirement for access or mustering through the land holding (eg no easement, etc) if necessary enforcement options are available, however its considered extremely unlikely this would be required provided alternative access and mustering points are established which don't conflict offset outcomes.

5.5. **Action 5**: Wildfire Management

The Queensland Government's State Planning Policy mapping tool shows the site contains areas of areas of Very High, High and Medium Potential for Bushfire intensity (refer to FIGURE 5 in section 6.1). Similar mapping is contained within the Somerset Regional Council hazard assessment overlays (refer to FIGURE 5 in section 6.1). On ground the fuel was generally observed as lower than the high level mapping as vegetated areas had been thinned out to maxmise grazing grasses on the ground layer which also precluded the build up of loose leaf litter.

The offset land retains a mix of mature and regrowth vegetation communities which will be expanded through new revegetation links and corridors. The last recorded wildfires within the vicinity of the Offset Site occurred in September 2018 and involved the evacuation of some residents of the adjoining Toogoolawah township. Avonvale and Cherry Gully Stations were not effected by these fire events. The land retains only sections of vegetation interspersed with open pasture land and includes a system of firebreaks and access tracks for the protection of stock and farming infrastructure. This fire management system will be maintained and evolved as parts of the site transfer from open pasture to revegetation as part of the offset works.

This offset proposal and the actions in this management plan include a number activities which support the expansion and condition of Grey-headed Flying-fox and Koala habitat through removal of cattle grazing uses. One unwanted outcome of this habitat creation will be increased fuel loads and vegetated areas supporting the establishment or potential spread of wildfires. High intensity wildfires scold the biodiversity of bushland and the vast majority of terrestrial species, including the koala, perish. Extreme fire events burnout the canopy of keystone bushland species and temporarily removing seed, fruit and flowering resources from Grey-headed Flying-fox habitat. Ultimately burned open Eucalyptus woodland communities will recover from fire, however a major event may set the offset outcomes back by a number of years.

As the changed uses on site increase the potential for bushfire, coupled with increasing fire intensity events generally experienced in South East Queensland the need for ongoing and refined bushfire management is an important component of the Offset Area.

Table 9: Offset Area – Action 5 – Management Actions

Action Description: *What are the tasks proposed?*	– Managing existing and created bushland habitat within the Offset Area to prevent and / or minimise the impact of high intensity wildfires. This will be achieved through:
	  – Conversion of the current on-site bushfire management approach into a management plan supported of the changed environmental offset outcomes.
	  – Periodical and controlled low intensity burns occurring in a mosaic configuration every 8-10 years through the Offset Area of the property.
	  – Creation and alteration of existing fire breaks in support of habitat improvement, expansion and revegetation areas (consider new tracks and breaks in replanting programs).
	  – Monitoring of fuel loads through the Offset Area.
	  – Establishment of safety and emergency response protocols for wildfire events.

Action Location(s): *Where on site is the action proposed?*	– In years 1-7 the offset risks are primarily limited to Environmental Management Zones 1 and 2 which retain the necessary vegetation cover to support the establishment and spread of wildfire. – In years 8-20 all Environmental Management Zones.

Action Timing: *When and how will the action / task be implemented, started, completed?*	<u>Years 1</u>
	  – Continuation of existing fire break infrastructure maintenance (firebreaks and trails)
	<u>By Year 2</u>
	  – Develop Offset Area Wildfire Management Plan, as a minimum plan to include:
	  – Results of base line fuel load surveys
	  – Method and metric for maintaining fuel loads and decreased risk levels
	  – Plan of fire tracks, trails and breaks
	  – Program for mosaic low intensity control burns
	  – Plan to be endorsed by the Queensland Rural Fire Brigade

	<u>Years 3-20</u> – Implement Offset Area Wildfire Management Plan
Responsibility: *Who will complete the action and who will provide the funding?*	The Offset Provider is responsible for funding appropriate qualified bushfire consultants for fuel load monitoring and preparation of the Offset Area Wildfire Management Plan. Plan to be endorsed by the Queensland Rural Fire Brigade / Implementation of the plan, specifically the mosaic low intensity back burns to occur under relevant permits and instruction from the Rural Fire Brigade. 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 ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– No reported deaths of Koalas or GHFF from wildfire within the OAAR. – No reduction (temporary or permanent) in the available foraging trees for Grey-headed Flying-fox and food trees for Koalas during the offset period as a result of wildfire. – Offset Area Wildfire Management Plan included within Year 2 Offset Area Annual Report and incorporated into ACR. – All Wildfire Management Plan activities (tracks, burns, fuel load reduction, etc) undertaken to be outlined within relevant Offset Area Annual Report.
Risks & Adaptive Management: *What's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	As fire is a natural occurrence within open Eucalypt woodland and within time bushland will recover from even major events the risks of the Wildfire Management Plan not preventing a wildfire within the Offset Area low is considered of medium consequence. If a major wildfire event occurs within the Offset Area during the offset period the following adaptive management actions will occur: 1. An post wildfire audit of the damage and cause of the wildfire (where it commenced, direction and area it moved through, which Environmental Management Zones sustained the greatest damage and why, recommendations on actions which could be incorporated to avoid or minimise any future events)

	2. An Offset Area Recovery Plan would be prepared scheduling actions to expedite the recovery and reinstatement of values destroyed by fire. 3. A revised Offset Area Wildfire Management Plan would be developed adopting recommendations and strategies from the post wildfire event audit.

5.6. **Action 6**: Flooding, Erosion and Sedimentation Management

Presently less than 10% of the full land holding is mapped as having any potential to flood using the Queensland Government's Hazard Mapping which incorporates climate change predicted increases in rain intensity and volumes (refer to FIGURE 6 in section 6.2). As one of the fundamental principles of this offset design is to connect the vegetated areas on the low ridges and foothills to the alluvial soils and riparian corridors nearly all of the mapped potential flood zones are incorporated into the Offset Area. Presently these areas are 90% cleared grassed, eroded creek banks and gully lines with only sporadic strands of mesic native vegetation communities and isolated Eucalyptus trees.

Within the broad flood mapping, onsite there is only isolated and acute evidence of flood based erosion which occurs inside the high banks of Ivory Creek or Cherry Gully and aligns with particular geomorphological features (eg. sharp bend caused by rock outcrops). Erosion is also more prevalent where wholesale clearing has occurred along creeks and drainage gullies. Substantial replanting of Grey-headed Flying-fox foraging and Koala food trees is proposed within and adjoining Ivory Creek (finished corridor 230-270m) and Cherry Gully (finished corridor 120-150m).

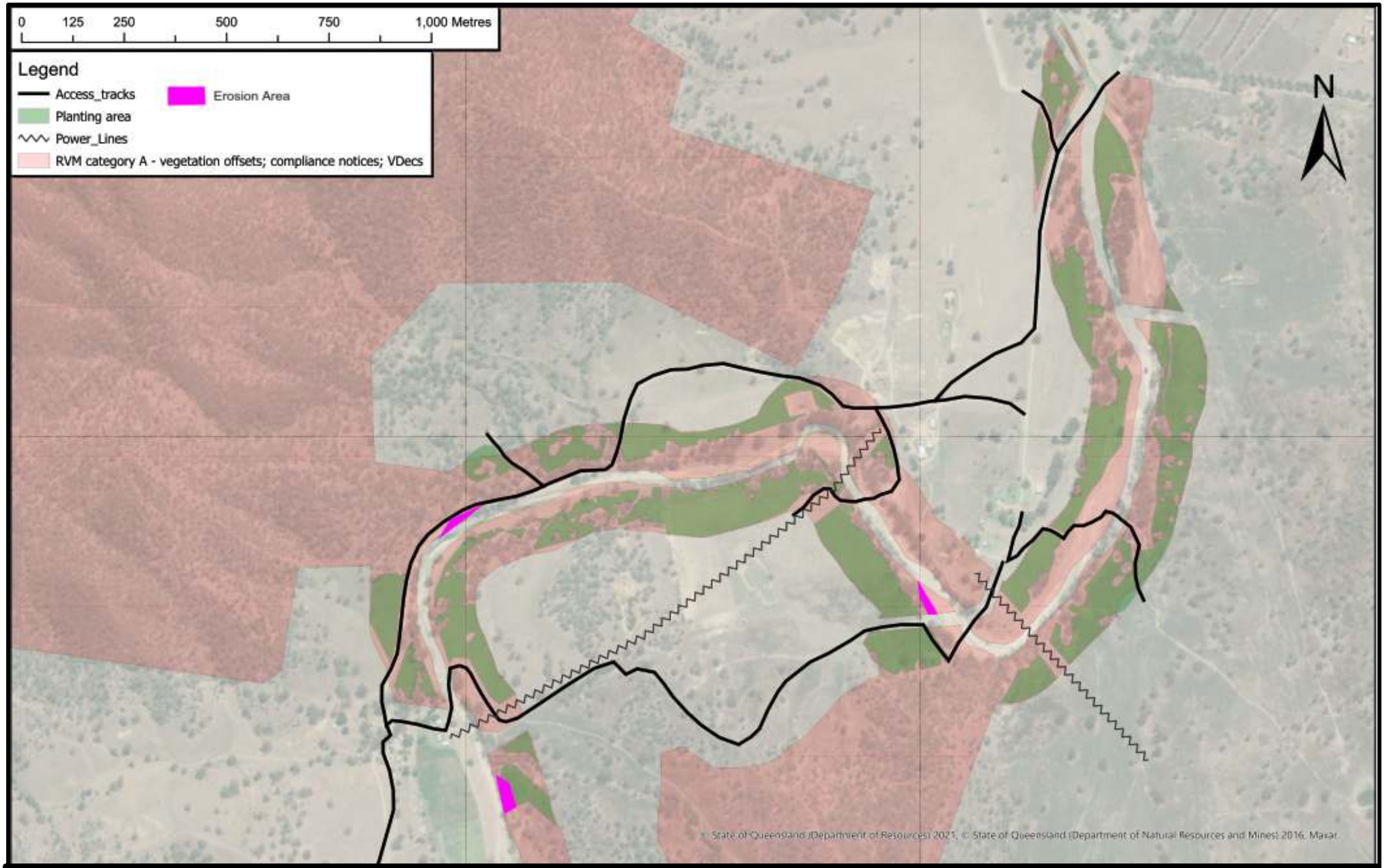
Given the abundance of flood free land with existing or proposed habitat for both species within the Offset Area the risk of a flood event or major erosion resulting in injury or death to the Koala of Grey-headed Flying-fox is low. However, the potential for flood events, even at the local scale, to wholesale remove replanted offset vegetation and or bury other revegetation areas in deposited sediments is realistic should these potential hazards not be considered as part of the offset implementation.

Table 10: Offset Area – Action 6 – Management Actions

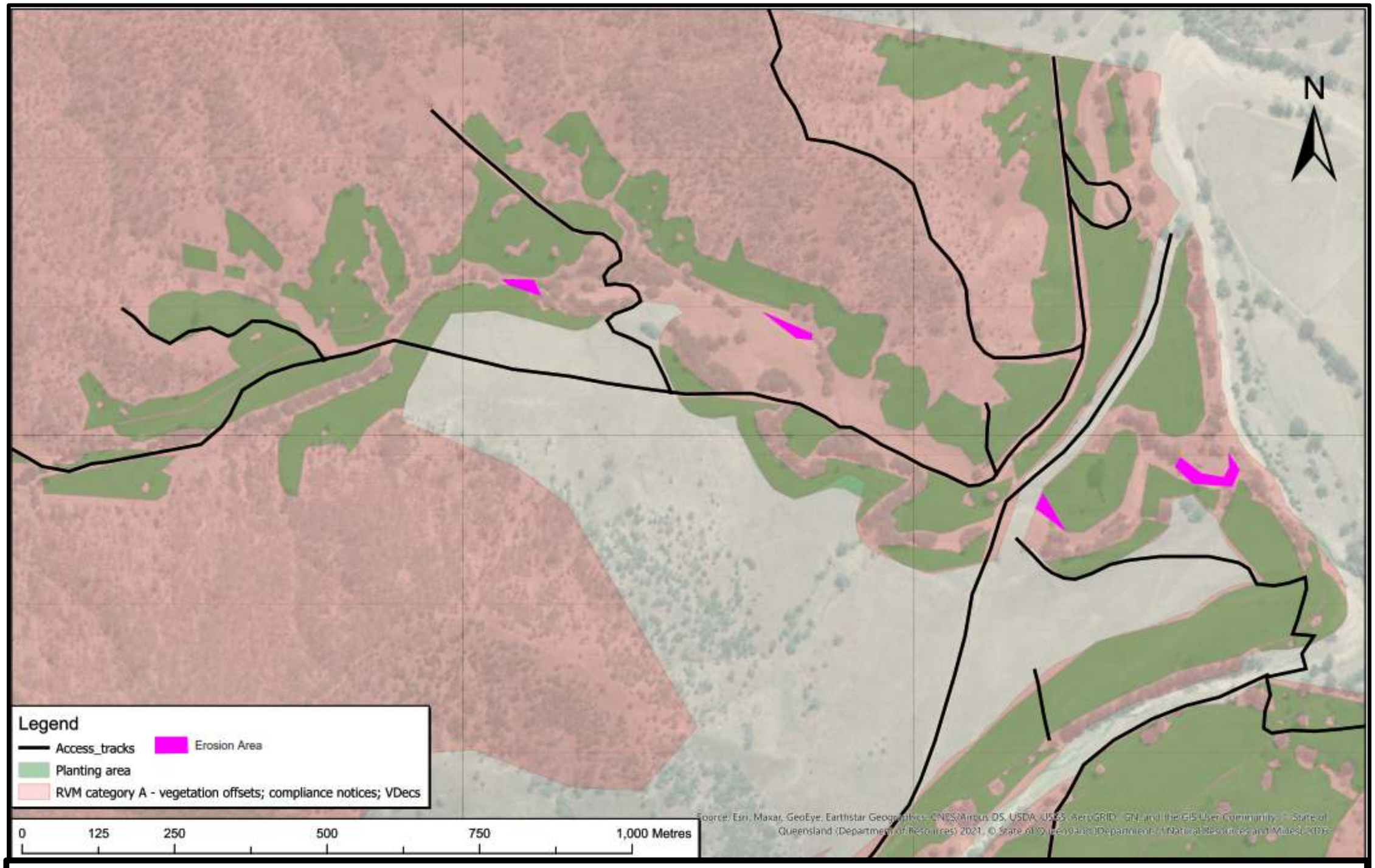
Action Description: *What are the tasks proposed?*	Ensuring Offset Area riparian and alluvial replanting and revegetation is not removed or reduced because of losses caused through flooding, erosion and sedimentation.
Action Location(s): *Where on site is the action proposed?*	– This management action applies exclusive to Environmental Management Zone 4 – Degraded Creeks, Gullies and Drainage Lines (EMZ 4)
Action Timing: *When and how will the action / task be implemented, started, completed?*	<u>Year 1</u> o Identify and map on-site locations of erosion and flood risk within the Offset Area. o Incorporate mapped flood/ erosion risk areas into revegetation plans and programs o Finalise EMZ 4 detailed revegetation and replanting plans and program. Refer to **Insert 2** for the erosion mapping. <u>Years 2-4</u> o Progressively implement EMZ 4 detailed revegetation and replanting plans and program including the following activities to prevent or minimise the impacts of flooding, erosion and sedimentation: ▪ Implement stabilisation of high risk areas prior to replanting. ▪ Avoid planting between high bank or high water mark during summer months at increase risk to high volume / high intensity rain and flash flooding (Nov to Feb) ▪ Use jute mate or other stabilization methods to support replanting in high risk locations.
Responsibility: *Who will complete the action and who will provide the funding?*	The Offset Provider is responsible for funding appropriate qualified bushland regeneration and revegetation experts in the design and implementation of replanted works through EMZ 4.

	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 ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– Loss of replanted habitat within EMZ4 set at a maximum of 10% for the entire offset period. – A combination of UAV footage, photo monitoring, inclusive of identified high risk locations and direct on-ground polygon mapping will be used to measure the extent of replanted habitat in EMZ 4. – EMZ 4 is programmed to commence replanting in Year 2 and continue through to Year 4 of the Offset Period. Within this period the following measurement and monitoring opportunities will occur: o Year 1 - Inclusion of proposed detailed replanting plan for EMZ 3 and 4. o Years 2-4 Annual evidence via listed surveys of commencement and sequential implementation of new plantings to EMZ 4. – Direct post flood or major rain event (Q2 event or greater) audit of impacts to Offset Area replanting – Reporting to demonstrate impact resulting in lost replanting areas species to remain under 10% of EMZ 4 (if less than 10% then impacts will be quantified and reported in relevant OAAR / if 10% impact or loss is exceeded then reporting and proposed rectification will be provided to the Department within 2 weeks of the recording the non-compliance.
Risks & Adaptive Management: *What's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	– If greater than 10% of the replanting / revegetation species in EMZ 4 are lost through a flood or erosion event rectification and replanting works incorporating more extensive stabilisation methods and materials will be completed within 12 months of the event (non-compliance must be reported to the Department within two (2) weeks of identification, with rectification to be completed within 12 months). – Ultimately the Offset Period is not considered complete if 90% or greater of the mapped EMZ 4 zone is not successfully replanted

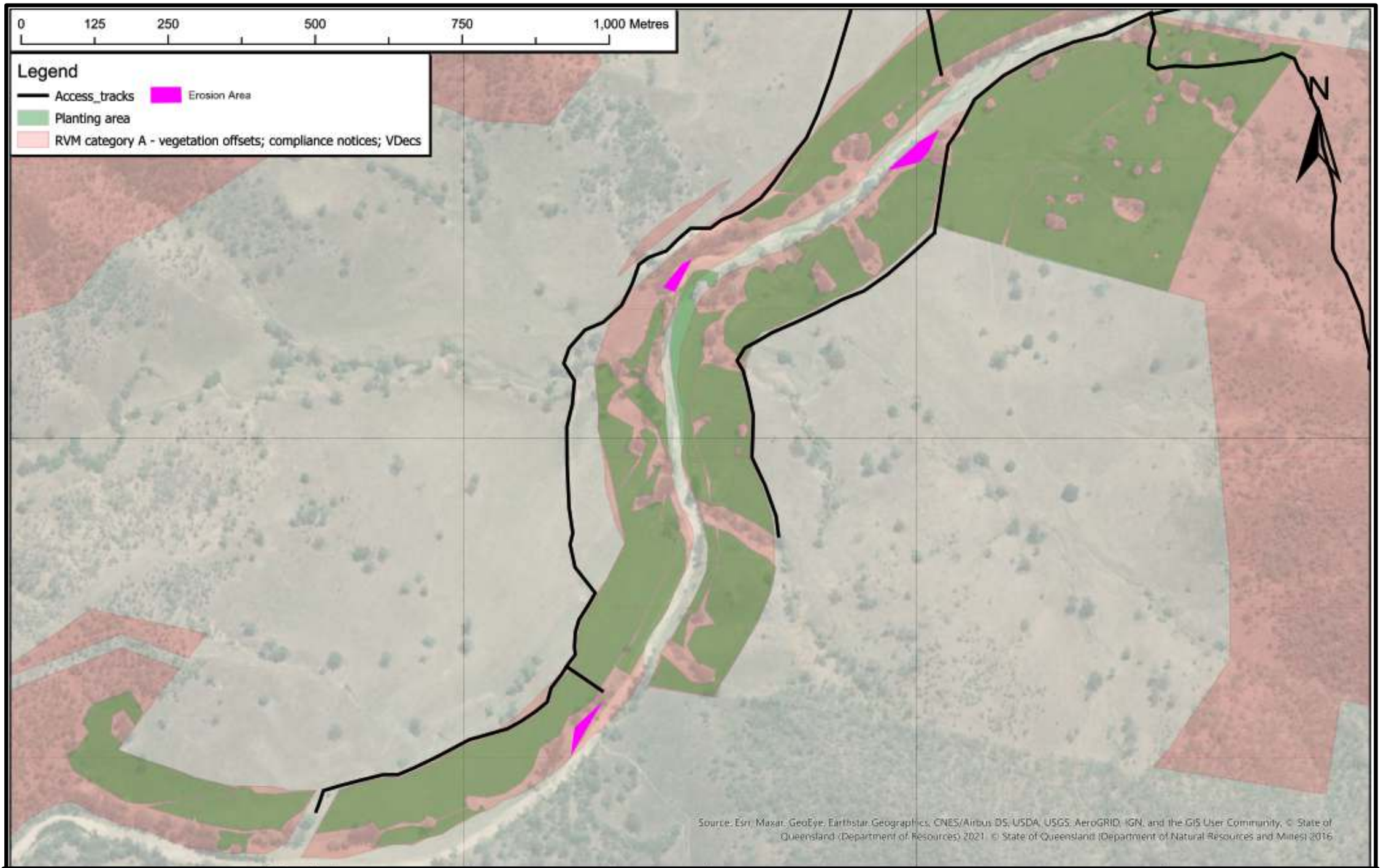
Insert 2: Erosion Mapping



AVONVALE EROSION POINT LOCATIONS AND REVEGETATION MAP



CHERRY GULLY NORTH EROSION POINT LOCATIONS AND REVEGETATION MAP



CHERRY GULLY SOUTH EROSION POINT LOCATIONS AND REVEGETATION MAP

5.7. **Action 7**: Native Seed Collection & Propagation

The Avonvale and Cherry Gully properties include a high number of Grey-headed Flying-fox foraging tree species and primary and secondary koala feed tree species in nearly all vegetated portions of the land holding. This site specific mix of plants and animals, particularly within the mature remnant areas, have naturally adapted to survive and thrive within the local environmental characteristics (climate, slope, soils). During preliminary surveys, Koalas were observed utilising site habitat. Within the offset design, 565.60 ha of land will be transitioned from either open paddocks, degraded creek lines and disturbed immature regrowth into open woodland habitat. To achieve this outcome will require a mix of blanket revegetation and substantial infill planting. To maximise the success of replanting areas this Offset Management Plan proposes the direct collection of site seed to be propagated and germinated in a purpose built on-site nursery or propagated and germinated in an external nursery off-site.

The benefits of using local site seed provenance in habitat creation is widely established through research, including:

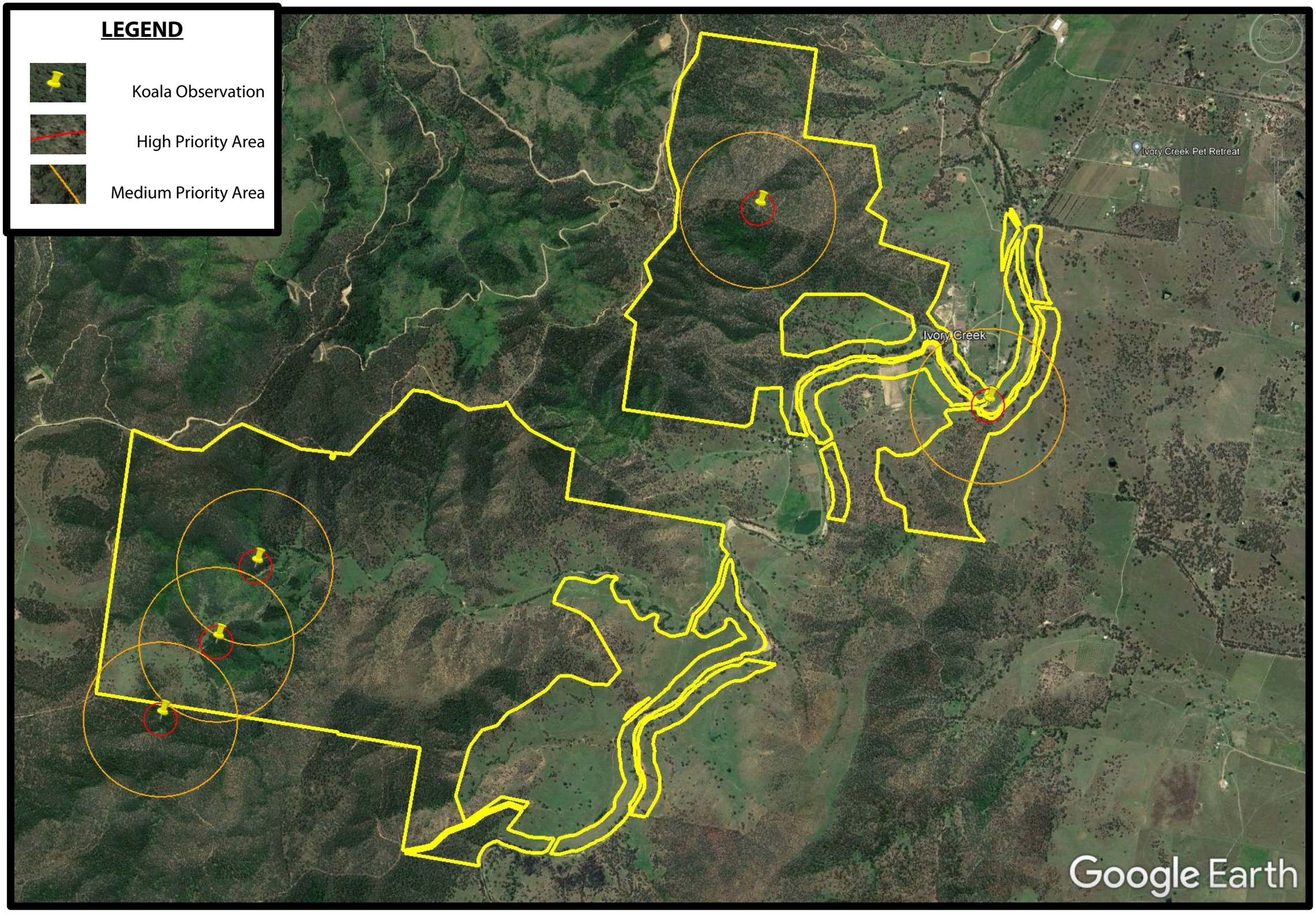
- The use of local or site based materials from locally adapted ecosystems to minimise the potential for establishment failure and mortality
- Maintains the local/ sub regional genetic architecture of plant and animal species
- Limits the altering or disruption of local ecosystem variations and segregations (Ecotypes)
- Limits the capacity to import external pathogens through offsite plant and soil stock

Table 11: Offset Area – Action 7 – Management Actions

Action Description: *What are the tasks proposed?*	– Sourcing, collecting and storing of local seed provenance from EMZ 1 and 2 for propagation and reuse in replanting of EMZ 3 and 4. – Establishment of an on-site nursery for the storage, propagation and germination of native plant seedlings for use in revegetation areas.
Action Location(s): *Where on site is the action proposed?*	– Onsite nursery to be established external to the Offset Area, adjoining an existing dam or watering facility with access to other available farm infrastructure (power / equipment / facilities / machinery sheds). – Seed collection programs will occur in line with various tree species flowering / fruiting seasons through EMZ 1 and 2 (and or any other localities over the entire land holding where suitable seed can be sourced) – Harvested native seedlings to be germinated into tube stock for use in revegetation planting in EMZ 3 and 4 in accordance with revegetation programs.
Action Timing: *When and how will the action / task be implemented, started, completed?*	<u>Year 1</u> – Develop a seed collection program for EMZ 1 and 2 areas based on the flowering / fruiting seasons for dominant Grey-headed Flying-fox and Koala trees species with priority focus on specimens that are known to be utilized by the local koala population. – Consult immediately adjoining land holders for permission to harvest seed from adjoining vegetated areas to maximise year 1 collection volumes (where necessary). – Undertake seed collection program within Year 1 (Collection commences when offset commences) – Establish site nursery for storage, propagation and germination of collected site seeds or establish a contract and relationship with an external nursery for storage, propagation and germination of collected site seeds Refer to **Insert 3** for the seed collection program priority areas.

	Years 2-5 – Continue seed collection program annually until sufficient stock to complete all offset works is achieved. – Expand and operate on-site purpose built nursery to cater for collected seed, germination and transition of seedlings to tubestock for reuse in site planting. Year 5 – Demonstrate by Year 5 that a minimum of 50% of planting stock used in all offset area vegetation has been grown from seed harvested from Koala food trees and Grey-headed Flying-fox foraging tree species on or immediately adjoining the offset area land holdings.
Responsibility: *Who will complete the action and who will provide the funding?*	The Offset Provider is responsible for: – Developing the seed collection program using appropriate qualified experts (Accredited Bushland Regenerators) to determined seed collection timeframes relative to targeted species. – Fund the construction of the on-site nursery and employ necessary experienced and trained staff to operate and harvest on-site stock. – Preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– Minimum 50% of all replanted stock being sourced from site (target is 100 %) – Measured through annual nursery stock take providing data on: – Volume of seed collected within the annual period – % of collected seed successfully germinated and propagated into tube stock – Number of plants distributed from the on-site nursery to revegetation areas (provided as a total number and as a % proportion of total plants replanted). – Nursery Stocktake statistics to be included as an appendices to OAAR.

Risks & Adaptive Management: *Whats the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	Failure to achieve on-site seed propagation will result in the shortfall needing to be purchased from local native plant nurseries (Fernwood and Pine Mountain Nursery are both within 30 km of the offset site). The risk of this outcome primarily occur in the additional costs with outsourcing this activity and the potential increase in stock mortality and need for rectification plantings. Additional minor risks which can be managed through warranties and certifications derive from the potential introduction of pathogens through external nursery stock and soil. Failure to achieved the minimum 50% sourcing of replanted stock from site will be documented in the given Offset Area Annual Report, including details on: – % of plants achieved from site – Reasons for failure to achieve site seed source targets – Changes to collection program or nursery operations to rectify shortfall in subsequent annual period.


LEGEND
Koala Observation
High Priority Area
Medium Priority Area
Ivory Creek Pet Retreat
Ivory Creek
Google Earth

5.8. **Action 8**: Regeneration & Rehabilitation Management

Approximately 50% of the total Offset Area relies on rehabilitation through weed management and extensive regeneration to achieve targeted improvements in the quality and condition of the habitat. These areas are designated as Environmental Zones 1 (Remnant) and 2 (Regrowth). Within both mapped management zones there is a tapestry of sub zones differentiated the age, density and conditions of existing native vegetation which reflects the converse of sub areas altered by the type and extent of disturbance, degradation and damage. To achieve scheduled improvements in the condition and health of Grey-headed Flying-fox foraging and koala habitat in the shortest timeframe this Offset Area Management Plan will utilise all four (4) restoration approaches outlined in the South East Queensland Ecological Framework – Guideline (Natural Regeneration, Assisted Natural Regeneration, Reconstruction and Fabrication).

The definition of ecological restoration utilised by the Society of Ecological Restoration international (SERI) is:

"Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed."

The benefits of ecological restoration activities which tailor the specific regeneration approach based on remaining attributes of the area and the desired outcome are well established. At Avonvale and Cherry Gully major human intervention has occurred over the generations in the establishment, expansion and operation of a cattle feedlot facility. Despite this in Environmental Management Zones 1 (Remnant) and 2 (Regrowth) a good foundation of ecological characteristics remain and will form the basis on which expansion and conditional improvement in habitat will be achieved.

Regeneration and rehabilitation outcomes overlap significantly into the management of major infestations of Weeds of National Significance (WONS) or as documented in this management plan for this Offset Site primarily Lantana. In some locations the best ecological restoration approach for a sub area may not be known until the results of weed removal and control are completed. All existing vegetation areas over the site have been assessed using the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools to establish a base score. The baseline MHQA and GHFF FHA data is included in **Table 13**, **Table 14** and **Table 15**. In addition to the baseline data, **Table 13**, **Table 14** and **Table 15** also outline the completion criteria to be achieved in Year 6, Year 10, Year 16 and Year 20.

Table 12: Offset Area – Action 8 – Management Actions

Action Description: *What are the tasks proposed?*	– Undertaking a range of ecological restoration approaches in on-site areas of established and degraded vegetation to improve the quality, function, condition and availability of Grey-headed Flying-fox and Koala Habitat. Specific activities will include:
	  – Excluding ongoing disturbance uses (cattle grazing) from regeneration zones
	  – Minor scale weed removal in locations where existing values would be lost under a blanket control method.
	  – Fixing soil and seed bank issues post weed management.
	  – Supporting the natural succession of native regrowth plants.
	  – Spreading of seed rich organic leaf litter into exposed areas created through weed removal.
	  – Spot and cluster infill replanting.

Action Location(s): *Where on site is the action proposed?*	– Rehabilitation and regeneration works will occur primarily within Environmental Management Zones 1 and 2 where existing base values provide sufficient foundation characteristics to improve habitat condition. There are isolated patches and strands of vegetation within EMZ 4 where rehabilitation techniques will also be implemented.

Action Timing: *When and how will the action / task be implemented, started, completed?*	<u>Year 1</u>
	  – Undertake detailed restoration work management areas mapping (stratify larger EMZ area into specific treatment zones)
	  – Establish photo monitoring points and protocols (georeferenced star picket at photo monitoring locations)
	Refer to **Insert 4** and **Insert 5** for the EMZ 1 & EMZ 2 treatment stratification areas and photo monitoring locations
	
	<u>Year 2</u>
	  – Complete treatment within the work management areas

	Years 3-6 – Complete full treatment to Environmental Management Zones 1 and 2 – Monitor and maintain treated areas on 6 month rotations. – Report in each relevant Offset Area Annual Report the extent of new areas treated and completed areas maintained including documented evidence of all activities. Year 6 – Replicate MHQA & GHFF FHA transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools. – Report on results / progress improvement in condition within the Year 6 Offset Area Annual Report – include a detailed review of the effectiveness of restoration procedures applied and adaptive management changes for future implementation. Years 7-20 – Monitor and maintain treated areas on a 12 month basis (or as considered appropriate based results). – Report in each relevant Offset Area Annual Report interim monitoring and maintenance activities. Year 10, 16 & 20 – Replicate MHQA & GHFF FHA transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools. – Report on results / progress improvement in condition within the Year 6 Offset Area Annual Report – include a detailed review of the effectiveness of restoration procedures applied and adaptive management changes for future implementation.

Responsibility: *Who will complete the action and who will provide the funding?*	The Offset Provider is responsible for: – Funding the appointment of trained Accredited Bushland regenerators for the completion of: o Mapping treatment zones and finalisation of the work management areas. o The implementation of the ecological regeneration works –with all works completed within 6 years. o 12 monthly maintenance rotations and interim monitoring. o Major monitoring and reporting events (Year 6, 10, 16 & 20) – Preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– Achievement of the completion criteria for Year 6, Year 10, Year 16 and Year 20 as outlined in **Table 13** and **Table 14** below. – Evidence within photo monitoring of increased recruitment of koala food and habitat trees and grey-headed flying fox foraging trees. Reporting on Regeneration and Rehabilitation activities will occur with each 12 month Offset Area Annual Report with major surveys results and adaptive management changes documented at Year 6, 10, 16 & 20 *(note specific weed extent surveys and infestation reduction targets contained within management Table 6 – Weeds of National Significance)*
Risks & Adaptive Management: *what's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	The success of ecological restoration outcomes is a derivative of the funds invested and level of intervention required to achieve the targeted improvement. Interim (annual) monitoring is proposed to allow early evaluation of the success of the various restoration techniques. Additionally, the treatment of areas in increments will allow more effective methods to be

	wholesale employed as each subsequent area commences. Major milestone reporting at Year 6, 10, 16 & 20 will highlight if measures are on track or have achieved targeted results or if significant changes in management activities are required. If interim or final results are not achieved the intensity will be increased and if necessary alternative approaches adopted.

Table 13: EMZ 1 MHQA Completion Criteria

Assessment Unit - Regional Ecosystem	EMZ 1 - Remnant RE12.11.14															
	RE12.11.14	Transect 1	Transect 2	Transect 3	Transect 4	Average of Transect(s)	% Benchmark	Baseline Score	Year 6	Year 6 Score Increase Justification	Year 10	Year 10 Score Increase Justification	Year 16	Year 16 Score Increase Justification	Year 20	Year 20 Score Increase Justification
SITE CONDITION																
Recruitment of woody perennial species in EDL	100	57	57	57	57	57.00	57.00	3	5		5		5		5	
Native plant species richness - trees	6	11	6	5	5	6.75	112.50	5	5		5		5		5	
Native plant species richness - shrubs	7	4	1	6	3	3.50	50.00	2.5	5		5		5		5	
Native plant species richness - grasses	8	1	3	2	5	2.75	34.38	2.5	5		5		5		5	
Native plant species richness - forbs	23	6	6	8	7	6.75	29.35	2.5	2.5	Recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)	2.5	Maintain recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)	2.5	Maintain recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)	2.5	Maintain recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)
Tree canopy height (Canopy)*	24	19.25	19.25	19.25	19.25	19.25	80.21	5	5		5		5		5	
Tree canopy height (Sub-canopy)*	13	10.25	10.25	10.25	10.25	10.25	78.85	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)	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)
						*Average tree canopy height		5	5		5		5		5	
Tree canopy cover (Canopy)**	39	42	42	42	42	42	107.69	5	5	Maintain a tree canopy cover at a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark)	5	Maintain a tree canopy cover at a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark)	5	Maintain a tree canopy cover at a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark)	5	Maintain a tree canopy cover at a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark)
Tree canopy cover (Sub-canopy)**	21	20	20	20	20	20.00	95.24	5	5	Maintain a tree sub-canopy cover at a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark)	5	Maintain a tree sub-canopy cover at a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark)	5	Maintain a tree sub-canopy cover at a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark)	5	Maintain a tree sub-canopy cover at a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark)
						**Average tree canopy cover		5	5		5		5		5	
Shrub canopy cover	4	6.45	6.45	6.45	6.45	6.45	161.25	5	5	Establish a minimum of 17 large trees per hectare (50% of the large tree benchmark)	5	Maintain a minimum of 17 large trees per hectare (50% of the large tree benchmark)	5	Maintain a minimum of 17 large trees per hectare (50% of the large tree benchmark)	5	Maintain a minimum of 17 large trees per hectare (50% of the large tree benchmark)
Native grass cover*	45	38.6	38.6	38.6	38.6	38.60	85.78	3	5	Maintain weed coverage to be less than 20% of the entire EMZ 1 area (baseline weed coverage to be established in Year 1)	5	Weed coverage to be less than 5% of the entire EMZ 1 area (baseline weed coverage to be established in Year 1)	5	Maintain weed coverage of less than 5% of the entire EMZ 1 area (baseline weed coverage to be established in Year 1)	5	Maintain weed coverage of less than 5% of the entire EMZ 1 area (baseline weed coverage to be established in Year 1)
Organic litter*	30	14	14	14	14	14.00	46.67	3	3		3		3		3	
Large trees (euc plus non-euc) (per ha)	33	2	2	2	2	2.00	6.06	5	10		10		10		10	
Coarse woody debris (per ha)	260	194.25	194.25	194.25	194.25	194.25	74.71	5	5		5		5		5	
Non-native plant cover	0	11.25	11.25	11.25	11.25	11.25	11.25	5	5		10		10		10	
Quality and availability of food and foraging habitat	NA	10	10	10	10	10.00	-	10	10		10		10		10	
Quality and availability of shelter	NA	10	10	10	10	10.00	-	10	10		10		10		10	
							Site Condition Score (/100)	71.5	85.5		90.5		90.5		90.5	
							Overall Site Condition Score - out of 3	2.15	2.57		2.72		2.72		2.72	
SITE CONTEXT																
Size of patch	10	10	10	10	10	10		10	10		10		10		10	
Connectedness	5	5	5	5	5	5		5	5		5		5		5	
Context	5	4	4	4	4	4		4	4		4		4		4	
Ecological Corridors	6	6	6	6	6	6		6	6	Less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	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	5	5	5	5	5		5	5		5		5		5	
Threats to the species	15	7	7	7	7	7		7	15		15		15		15	
Species mobility capacity	10	7	7	7	7	7		7	7		7		7		7	
							Site Context Score (/56)	44	52		52		52		52	
							Overall Site Context Score - out of 3	2.36	2.79		2.79		2.79		2.79	
SPECIES STOCKING RATE																
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70	21	21	21	21	21		21	33	Increase in SAT survey results as per the Species Stocking Rate Table	33	Maintain SAT survey result increases as per the Species Stocking Rate Table	33	Maintain SAT survey result increases as per the Species Stocking Rate Table	33	Maintain SAT survey result increases as per the Species Stocking Rate Table
							Species Stocking Rate Score (/40)	21.00	33		33		33		33	
							Overall Species Stocking Rate Score - out of 4	2.10	3.30		3.30		3.30		3.30	
Overall Assessment Unit Score								6.60	8.65		8.80		8.80		8.80	

	Species Stocking Rate Table		
	Raw SAT Result	SSR Score (Baseline)	Target SSR Score (YEAR 6)
SAT Survey 1	33.33%	10	10
SAT Survey 2	10.00%	3	7
SAT Survey 3	16.67%	4	8
SAT Survey 4	16.67%	4	8
Final SSR Score (out of 40)		21	33
Final SSR Score (out of 4)		2.1	3.3

Score	SAT Survey Results
0	No scats recorded
2	East coast (med – high) less than 5 %
3	East coast (med – high) 5 % or greater, but less than 15 %
4	East coast (med – high) 15 % or greater, but less than 22.52 %
6	East coast (med – high) 22.52 % or greater, but less than 25 %
7	East coast (med – high) 25 % or greater, but less than 27 %
8	East coast (med – high) 27 % or greater, but less than 29 %
9	East coast (med – high) 29 % or greater, but less than 32.84 %
10	East coast (med – high) greater than 32.84 %

Table 14: EMZ 2 MHQA Completion Criteria

Assessment Unit - Regional Ecosystem	EMZ 2 - Regrowth RE12.11.14																
	RE12.11.14	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Average of Transect(s)	% Benchmark	Baseline Score	Year 6	Year 6 Score Increase Justification	Year 10	Year 10 Score Increase Justification	Year 16	Year 16 Score Increase Justification	Year 20	Year 20 Score Increase Justification
SITE CONDITION																	
Recruitment of woody perennial species in EDL	100	56	56	56	56	56	56.00	56.00	3	3		3		5		5	
Native plant species richness - trees	6	8	8	5	5	5	6.20	103.33	5	5		5		5		5	
Native plant species richness - shrubs	7	2	1	3	2	2	2.00	28.57	2.5	2.5		2.5		5		5	
Native plant species richness - grasses	8	2	3	5	3	3	3.20	40.00	2.5	2.5		2.5		5		5	
Native plant species richness - forbs	23	3	7	4	5	4	4.60	20.00	0	0		0		2.5	Recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)	2.5	Recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)
Tree canopy height (Canopy)*	24	17.8	17.8	17.8	17.8	17.8	17.80	74.17	5	5		5		5		5	
Tree canopy height (Sub-canopy)*	13	9.5	9.5	9.5	9.5	9.5	9.50	73.08	5	5		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)
							*Average tree canopy height		5	5		5		5		5	
Tree canopy cover (Canopy)**	39	16.5	16.5	16.5	16.5	16.5	16.5	42.31	2	2	Maintain a minimum of six tree species (100% of the tree species richness benchmark)	2	Maintain a minimum of six tree species (100% of the tree species richness benchmark)	5	Tree canopy cover to be a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark)	5	Tree canopy cover to be a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark)
Tree canopy cover (Sub-canopy)**	21	36.86	36.86	36.86	36.86	36.86	36.86	175.52	5	5	Weed coverage to be less than 20% of the entire EMZ 2 area (baseline weed coverage to be established in Year 1)	5	Weed coverage to be less than 5% of the entire EMZ 2 area (baseline weed coverage to be established in Year 1)	5	Tree canopy cover to be a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark)	5	Tree canopy cover to be a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark)
							**Average tree canopy cover		3.5	3.5		3.5		5		5	
Shrub canopy cover	4	7.52	7.52	7.52	7.52	7.52	7.52	188.00	5	5		5		5	Establish a minimum of 17 large trees per hectare (50% of the large tree benchmark)	5	Maintain a minimum of 17 large trees per hectare (50% of the large tree benchmark)
Native grass cover*	45	34.4	34.4	34.4	34.4	34.4	34.40	76.44	3	3		3		5		5	
Organic litter*	30	30	30	30	30	30	30.00	100.00	5	5		5		3	Maintain weed coverage of less than 5% of the entire EMZ 2 area (baseline weed coverage to be established in Year 1)	3	Maintain weed coverage of less than 5% of the entire EMZ 2 area (baseline weed coverage to be established in Year 1)
Large trees (euc plus non-euc) (per ha)	33	1	1	1	1	1	1.00	3.03	5	5		5		10		10	
Coarse woody debris (per ha)	260	116.6	116.6	116.6	116.6	116.6	116.60	44.85	2	2		2		5		5	
Non-native plant cover	0	26.2	26.2	26.2	26.2	26.2	26.20	26.20	3	5		10		10		10	
Quality and availability of food and foraging habitat	NA	10	10	10	10	10	10.00	-	10	10		10		10		10	
Quality and availability of shelter	NA	10	10	10	10	10	10.00		10	10		10		10		10	
								Site Condition Score (/100)	64	66.5		71.5		90.5		90.5	
								Overall Site Condition Score - out of 3	1.92	2.00		2.15		2.72		2.72	
SITE CONTEXT																	
Size of patch	10	10	10	10	10	10	10		10	10		10		10		10	
Connectedness	5	5	5	5	5	5	5		5	5		5		5		5	
Context	5	4	4	4	4	4	4		4	4		4		4		4	
Ecological Corridors	6	6	6	6	6	6	6		6	6	Less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	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	5	5	5	5	5	5		5	5		5		5		5	
Threats to the species	15	7	7	7	7	7	7		7	15		15		15		15	
Species mobility capacity	10	7	7	7	7	7	7		7	7		7		7		7	
								Site Context Score (/56)	44	52		52		52		52	
								Overall Site Context Score - out of 3	2.36	2.79		2.79		2.79		2.79	
SPECIES STOCKING RATE																	
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	50	20	20	20	20	20	20		20	20	Maintain baseline SAT survey results as per the Species Stocking Rate Table	20	Maintain baseline SAT survey results as per the Species Stocking Rate Table	36	Increase in SAT survey results as per the Species Stocking Rate Table	36	Maintain SAT survey result increases as per the Species Stocking Rate Table
								Species Stocking Rate Score (/50)	20.00	20		20		36		36	
								Overall Species Stocking Rate Score - out of 4	1.60	1.60		1.60		2.88		2.88	
Overall Assessment Unit Score									5.88	6.38		6.53		8.38		8.38	

	Species Stocking Rate Table		
	Raw SAT Result	SSR Score (Baseline)	Target SSR Score (YEAR 16)
SAT Survey 1	10.00%	3	7
SAT Survey 2	36.67%	10	10
SAT Survey 3	3.33%	2	6
SAT Survey 4	3.33%	2	6
SAT Survey 5	13.33%	3	7
Final SSR Score (out of 50)		20	36
Final SSR Score (out of 4)		1.6	2.88

Score	SAT Survey Results
0	No scats recorded
2	East coast (med – high) less than 5 %
3	East coast (med – high) 5 % or greater, but less than 15 %
4	East coast (med – high) 15 % or greater, but less than 22.52 %
6	East coast (med – high) 22.52 % or greater, but less than 25 %
7	East coast (med – high) 25 % or greater, but less than 27 %
8	East coast (med – high) 27 % or greater, but less than 29 %
9	East coast (med – high) 29 % or greater, but less than 32.84 %
10	East coast (med – high) greater than 32.84 %

Table 15: EMZ 1 & EMZ 2 GHFF FHA Completion Criteria

Assessment Unit - Regional Ecosystem	AU 1 - REMNANT			AU 2 - REGROWTH		
Site Reference		RE12.11.14			RE12.11.14	
	OUT OF (X/10)	Score	Score	OUT OF (X/10)	Score	
Vegetation Condition	**20**	20	20	**20**	10	10
Species Richness	**20**	10	20	**20**	5	20
Flower Score	**10**	5	8	**10**	5	8
Timing of Biological Shortages	**10**	8	10	**10**	10	10
Quality of Foraging Habitat	**20**	5	20	**20**	5	20
Non-native Plant Cover	**20**	10	20	**20**	5	20
Site Condition Score		58	98		40	88
MAX Site Condition Score	***X***	*100*	*100*	***X***	*100*	*100*
Site Condition Score - out of 4	**X**	**2.32**	**3.92**	**X**	**1.60**	**3.52**
Size of patch	**10**	10	10	**10**	10	10
Connectedness	**10**	6	6	**10**	6	6
Context	**10**	6	6	**10**	6	6
Ecological Corridors	**10**	10	10	**10**	10	10
Role of site location to species overall population in the state	**10**	5	5	**10**	5	5
Threats to the species	**10**	10	10	**10**	10	10
Site Context Score		47	47		47	47
MAX Site Context Score	***X***	*60*	*60*	***X***	*60*	*60*
Site Context Score - out of 3	**X**	**2.35**	**2.35**	**X**	**2.35**	**2.35**

GHFF Foraging Tree Density	**40**	24	31	**50**	22	38
Species Stocking Rate Score		24	31		22	38
MAX Species Stocking Rate Score	***X***	*40*	*40*	***X***	*50*	*50*
Species Stocking Rate Score - out of 3	**X**	**1.80**	**2.33**	**X**	**1.32**	**2.28**
Total		**6.47**	**8.60**		**5.27**	**8.15**

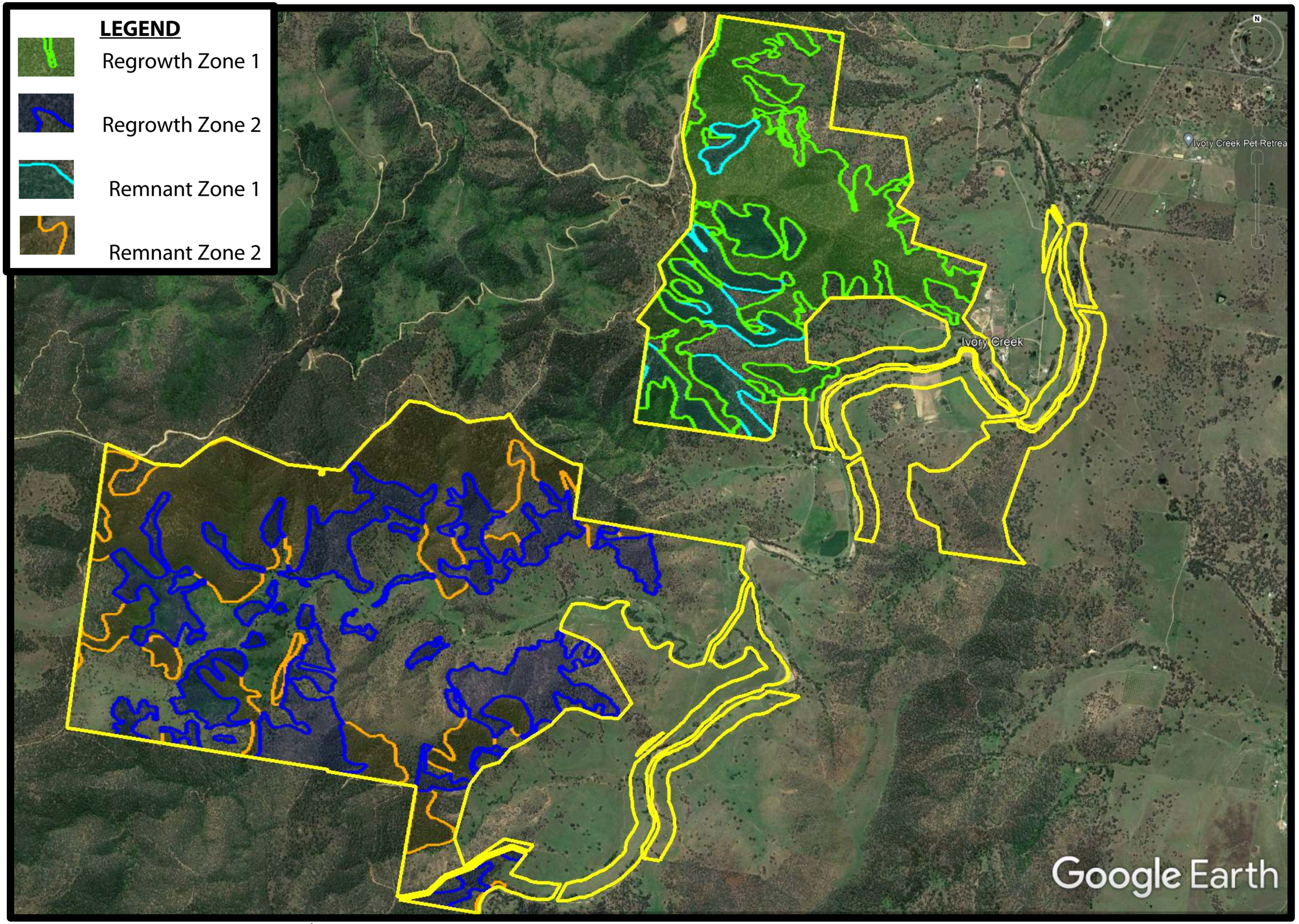
SSR INCREASE TABLE

Rem	Baseline Score	Target Score	Regrowth	Baseline Score	Target Score
370	7	7			
310	7	10	345	10	10
300	5	7	545	3	7
375	5	7	450	3	7
			695	3	7
			835	3	7
	24	31		22	38
	1.8	2.325		1.32	2.28

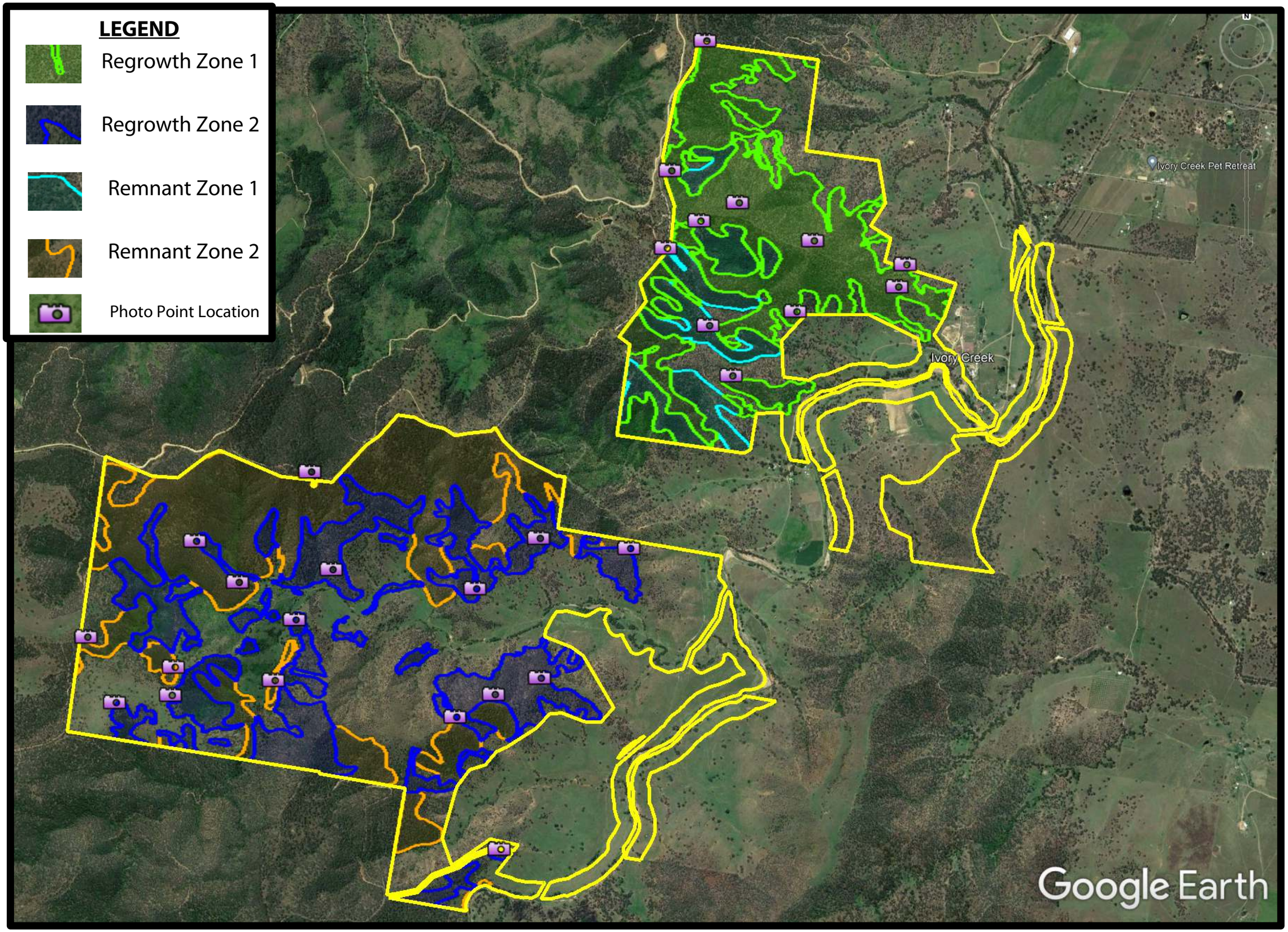
SSR SCORING TABLE

RE12.11.14	
Score	**Stem Density Results (T1 and T2)**
1	0 – 200 stems per hectare
2	201 – 250 stems per hectare
5	251 – 300 stems per hectare
7	301 – 325 stems per hectare
10	326 – 350 stems per hectare
7	351 – 375 stems per hectare
5	376 – 400 stems per hectare
4	401 – 450 stems per hectare
2	450 + stems per hectare

Insert 4: EMZ 1 & EMZ 2 Stratification Mapping



Insert 5: EMZ 1 & EMZ 2 Indicative Photo Monitoring Locations



5.9. **Action 9**: Revegetation (Habitat Creation) Activities

The creation of new habitat is to occur within a number of key strategic locations as part of the Avonvale and Cherry Gully offset design proposal, including:

(A) To infill broad hectare cleared zones between major habitat patches to establish a large contiguous conservation zone for the ongoing function of Koalas and Grey-headed Flying-fox.
(B) Strategically link existing ridgeline and foothill dominant retained vegetation areas with alluvial mesic soils, water sources and riparian corridors.
(C) Significantly expand and connect available habitat for Koalas and Grey-headed Flying-fox along riparian creek and gully lines.

Revegetation will occur through the transitioning of grassed grazing lands into vegetated ecosystems supporting habitat and primarily covers Environmental Management Zones 3 and 4. EMZ 3 includes broad ha disturbance areas between remnant and regrowth communities and retains a mix of pasture grass, juvenile regrowth clusters and weeds. EMZ 4 is defined as the 120-150m corridor along Cherry Gully and the 230-270m corridor along Ivory Creek. These corridors are also dominated by grazing paddocks and grass, however contain isolated trees and lineal strands of mature vegetation along selected areas of the embankment.

In total approximately 565ha is proposed for revegetation / habitat creation. Revegetation is a high cost and high labour intensive task from preparation to commencement through to the first 5 years of establishment. To maximise success revegetation is proposed in 2 tranches of work. Only planning and preparation works are proposed within year 1 of the offset while collected site seed is propagated and harvested for use.

Where vegetation does occur within Environmental Management Zones 3 and 4 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. The baseline MHQA and GHFF FHA data is included in **Table 16** and **Table 17**. In addition to the baseline data, **Table 16** and **Table 17** also outline the completion criteria to be achieved in Year 6, Year 10, Year 16 and Year 20.

Table 16: Offset Area – Action 9 – Management Actions

Action Description: *What are the tasks proposed?*	– Ceasing grazing uses within areas identified for revegetation. – Tilling / cultivating grazing grassed area for treatment of pasture grass seedbank in preparation for planting. – Revegetation in accordance with the pre-clear regional ecosystem planting mix inclusive of canopy species dominated by Grey-headed Flying-fox foraging tree species and primary and secondary Koala food tree species. – Monitoring and maintaining works to self-sustaining regrowth community.
Action Location(s): *Where on site is the action proposed?*	– Revegetation works will occur primarily within Environmental Management Zone 3 and 4 where existing base values are either absent or occur as individual trees, lineal strands of native trees interspersed with grass and small clusters of juvenile regrowth.
Action Timing: *When and how will the action / task be implemented, started, completed?*	<u>Year 1</u> – Finalise locations, sequence and timing for revegetation program. – Cultivate and prepare Tranche 1 area in preparation for year 2 planting. – Create Tranche 1 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary) – Establish photo monitoring points and protocols for Tranche 1 areas (georeferenced star picket at photo monitoring locations) Refer to **Insert 6** and **Insert 7** for the proposed planting tranches and photo monitoring locations. <u>Year 2</u> – Complete Tranche 1 revegetation zone – Cultivate and prepare Tranche additional Tranche 1 area in preparation for year 3 planting.

	– Create Tranche 1 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary) – Establish photo monitoring points and protocols for Tranche 1 areas (georeferenced star picket at photo monitoring locations) <u>Year 3</u> – Complete Tranche 1 revegetation zone – Cultivate and prepare Tranche 2 area in preparation for year 4 planting. – Create Tranche 2 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary) – Establish photo monitoring points and protocols for Tranche 2 areas (georeferenced star picket at photo monitoring locations) – Monitor and maintain Tranche 1 <u>Year 4</u> – Complete Tranche 2 revegetation zone – Cultivate and prepare additional Tranche 2 area in preparation for year 5 planting. – Create Tranche 2 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary) – Establish photo monitoring points and protocols for Tranche 2 areas (georeferenced star picket at photo monitoring locations) – Monitor and maintain Tranche 1 & 2 <u>Year 5</u> – Complete Tranche 2 revegetation zone – Monitor and maintain Tranche 1 and Tranche 2

	Years 6-20 – Monitor and maintain all revegetation zones, inclusive of rectification and replacement works for failed areas or plant dieback. Year 10 – Replicate MHQA & GHFF FHA transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools. – Report on results of both surveys within the Year 10 Offset Area Annual Report inclusive of any adaptive management changes. Year 16 – Replicate MHQA & GHFF FHA transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools. – Report on results of both surveys within the Year 16 Offset Area Annual Report inclusive of any adaptive management changes. Year 20 – Replicate MHQA & GHFF FHA transect surveys in accordance with the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment tools. – Report on results of both surveys within the Year 20 confirming targeted improvements in the quality condition scoring has been achieved.

Responsibility: *Who will complete the action and who will provide the funding?*	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. – Preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project ACR.
Measured & Monitored By: *How will the action be measured, how will the outcome of the action be measured, by what method and timing?*	– Achievement of the completion criteria for Year 6, Year 10, Year 16 and Year 20 as outlined in **Table 16** and **Table 17** below. – Evidence within photo monitoring of established habitat containing Koala food and habitat trees and Grey-headed Flying fox foraging trees. Plan of completed revegetation extent in Years 2-5 Offset Area Annual Reports demonstrating sequential completion of all 6 tranches of revegetation. Reporting on revegetation activities will occur with each 12 month Offset Area Annual Report with major surveys results and adaptive management changes documented at Year 10, 16 & 20.
Risks & Adaptive Management: *what's the procedure for correcting or amending the action if the proposed outcomes are not being achieved?*	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). 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.

Table 17: EMZ 3 MHQA Completion Criteria

Assessment Unit - Regional Ecosystem	EMZ 3 - Cleared Open Grazing Country (RE12.11.14)															
	RE12.11.14	Transect 1	Transect 2	Transect 3	Transect 4	Average of Transect(s)	% Benchmark	Baseline Score	Year 6	Year 6 Score Increase Justification	Year 10	Year 10 Score Increase Justification	Year 16	Year 16 Score Increase Justification	Year 20	Year 20 Score Increase Justification
SITE CONDITION																
Recruitment of woody perennial species in EDL	100	19	19	19	19	19.00	19.00	0	0		3		3		5	
Native plant species richness - trees	6	1	6	4	4	3.75	62.50	2.5	2.5		5		5		5	
Native plant species richness - shrubs	7	1	1	1	0	0.75	10.71	0	0		0		2.5		2.5	Recruitment of a minimum of five species (75% or greater of the recruitment of woody perennial species in EDL benchmark)
Native plant species richness - grasses	8	5	5	2	3	3.75	46.88	2.5	2.5		2.5		2.5	Maintain recruitment of a minimum of three tree species (50% of the recruitment of woody perennial species in EDL benchmark)	2.5	
Native plant species richness - forbs	23	4	3	3	3	3.25	14.13	0	0		0		2.5		2.5	Maintain a minimum of six tree species (100% of the tree species richness becnchmark)
Tree canopy height (Canopy)*	24	18.5	18.5	18.5	18.5	18.50	77.08	5	5		5	Recruitment of a minimum of three tree species (50% of the recruitment of woody perennial species in EDL benchmark)	5	Maintain a minimum of six tree species (100% of the tree species richness becnchmark)	5	
Tree canopy height (Sub-canopy)*	13	4.45	4.45	4.45	4.45	4.45	34.23	3	3		3		3		5	Maintain a minimum of two shrub species (25% of the shrub species richness benchmark)
						*Average tree canopy height		4	4		4	Establish a minimum of six tree species (100% of the tree species richness becnchmark)	4	Establish a minimum of two shrub species (25% of the shrub species richness benchmark)	5	Maintain a minimum of six forb species (25% of the forb species richness benchmark)
Tree canopy cover (Canopy)**	39	8.25	8.25	8.25	8.25	8.25	21.15	2	0	Maintain weed coverage to be less than 20% of the entire EMZ 3 area (baseline weed coverage to be established in Year 1)	2		2	Establish a minimum of six forb species (25% of the forb species richness benchmark)	5	
Tree canopy cover (Sub-canopy)**	21	1.95	1.95	1.95	1.95	1.95	9.29	0	0		2	Tree canopy cover to be a minimum of 3.9m (10% of the tree canopy cover (canopy) benchmark	2		5	Tree canopy cover to be a minimum of 19.5m (50% of the tree canopy cover (canopy) benchmark
						**Average tree canopy cover		1	1		2		2	Tree canopy cover to be a minimum of 3.9m (10% of the tree canopy cover (canopy) benchmark	5	
Shrub canopy cover	4	1.97	1.97	1.97	1.97	1.97	49.25	3	3		3	Tree sub-canopy cover to be a minimum of 2.1m (10% of the tree canopy cover (sub-canopy) benchmark	3	Tree sub-canopy cover to be a minimum of 2.1m (10% of the tree canopy cover (sub-canopy) benchmark	5	Tree sub-canopy cover to be a minimum of 10.5m (50% of the tree canopy cover (sub-canopy) benchmark
Native grass cover*	45	83.75	83.75	83.75	83.75	83.75	186.11	5	5		5		5		5	
Organic litter*	30	2.25	2.25	2.25	2.25	2.25	7.50	0	0		0	Weed coverage to be less than 5% of the entire EMZ 3 area (baseline weed coverage to be established in Year 1)	3	Organic litter to be 3.3% of 1m X 1m quadrats (10% of the organic litter benchmark)	3	Maintain organic litter at 3.3% of 1m X 1m quadrats (10% of the organic litter benchmark)
Large trees (euc plus non-euc) (per ha)	33	1	1	1	1	1.00	3.03	5	5		5		5		10	Establish a minimum of 17 large trees per hectare (50% of the large tree benchmark)
Coarse woody debris (per ha)	260	211	211	211	211	211.00	81.15	5	5		5		5	Maintain weed coverage less than 5% of the entire EMZ 3 area (baseline weed coverage to be established in Year 1)	5	
Non-native plant cover	0	12	12	12	12	12.00	12.00	5	5		10		10		10	Maintain weed coverage less than 5% of the entire EMZ 3 area (baseline weed coverage to be established in Year 1)
Quality and availability of food and foraging habitat	NA	1	1	1	1	1.00	-	1	1		1		10		10	
Quality and availability of shelter	NA	1	1	1	1	1.00		1	1		1		5		5	
							Site Condition Score (/100)	35	35		46.5		67.5		80.5	
							Overall Site Condition Score - out of 3	1.05	1.05		1.40		2.03		2.42	
SITE CONTEXT																
Size of patch	10	10	10	10	10	10		10	10		10		10		10	
Connectedness	5	5	5	5	5	5		5	5		5		4		4	
Context	5	4	4	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
Ecological Corridors	6	6	6	6	6	6		6	6	Less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6		6		6	
Role of site location to species overall population in the state	5	5	5	5	5	5		5	5		5		5		5	
Threats to the species	15	1	1	1	1	1		1	15		15		15		15	
Species mobility capacity	10	4	4	4	4	4		4	4		4		4		7	
							Site Context Score (/56)	35	49		49		48		51	
							Overall Site Context Score - out of 3	1.88	2.63		2.63		2.57		2.73	
SPECIES STOCKING RATE																
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	40	3	3	3	3	3		3	3	Maintain baseline SAT survey results as per the Species Stocking Rate Table	12	Increase in SAT survey results as per the Species Stocking Rate Table	12	Maintain SAT survey result increases as per the Species Stocking Rate Table	24	Increase in SAT survey results as per the Species Stocking Rate Table
							Species Stocking Rate Score (/40)	3.00	3		12		12		24	
							Overall Species Stocking Rate Score - out of 4	0.30	0.30		1.20		1.20		2.40	
Overall Assessment Unit Score								3.23	3.98		5.22		5.80		7.55	

Species Stocking Rate Table

	Raw SAT Result	SSR Score (Baseline)	Interim Target SSR Score (YEAR 10)	Target SSR Score (YEAR 20)
SAT Survey 1	0.00%	0	3	6
SAT Survey 2	13.33%	3	3	6
SAT Survey 3	0.00%	0	3	6
SAT Survey 4	0.00%	0	3	6
Final SSR Score (out of 40)		**3**	**12**	**24**
Final SSR Score (out of 4)		**0.3**	**1.2**	**2.4**

Score	SAT Survey Results
0	No scats recorded
2	East coast (med – high) less than 5 %
3	East coast (med – high) 5 % or greater, but less than 15 %
4	East coast (med – high) 15 % or greater, but less than 22.52 %
6	East coast (med – high) 22.52 % or greater, but less than 25 %
7	East coast (med – high) 25 % or greater, but less than 27 %
8	East coast (med – high) 27 % or greater, but less than 29 %
9	East coast (med – high) 29 % or greater, but less than 32.84 %
10	East coast (med – high) greater than 32.84 %

Table 18: EMZ 4 MHQA Completion Criteria

Assessment Unit - Regional Ecosystem	EMZ 4 - Degraded Creeks, Gullies and Drainage Lines (RE12.3.7)														
	RE12.11.14	Transect 1	Transect 2	Transect 3	Average of Transect(s)	% Benchmark	Baseline Score	Year 6	Year 6 Score Increase Justification	Year 10	Year 10 Score Increase Justification	Year 16	Year 16 Score Increase Justification	Year 20	Year 20 Score Increase Justification
SITE CONDITION															
Recruitment of woody perennial species in EDL	100	10	10	10	10.00	10.00	0	0		3		3		5	
Native plant species richness - trees	6	6	4	6	5.33	88.89	2.5	2.5		5		5		5	
Native plant species richness - shrubs	8	2	1	0	1.00	12.50	0	0		0		0		0	
Native plant species richness - grasses	6	1	1	2	1.33	22.22	0	0		0		0		0	
Native plant species richness - forbs	17	1	2	2	1.67	9.80	0	0		0		0		0	Recruitment of a minimum of five tree species (75% of the recruitment of woody perennial species in EDL benchmark)
Tree canopy height (Canopy)*	22	29.33	29.33	29.33	29.33	133.32	5	5		5	Recruitment of a minimum of three tree species (50% of the recruitment of woody perennial species in EDL benchmark)	5	Maintain recruitment of a minimum of three tree species (50% of the recruitment of woody perennial species in EDL benchmark)	5	
Tree canopy height (Sub-canopy)*	12	14.67	14.67	14.67	14.67	122.25	5	5		5		5		5	Maintain a minimum of six tree species (100% of the tree species richness becnchmark)
					*Average tree canopy height		5	5		5	Establish a minimum of six tree species (100% of the tree species richness becnchmark)	5	Maintain a minimum of six tree species (100% of the tree species richness becnchmark)	5	
Tree canopy cover (Canopy)**	31	35.3	35.3	35.3	35.3	113.87	5	5	Maintain weed coverage to be less than 20% of the entire EMZ 4 area (baseline weed coverage to be established in Year 1)	2	Maintain a minimum tree canopy cover of 3.9m (10% of the tree canopy cover (canopy) benchmark)	2	Maintain a minimum tree canopy cover of 3.9m (10% of the tree canopy cover (canopy) benchmark)	5	Tree canopy cover to be a minimum of 15.5m (50% of the tree canopy cover (canopy) benchmark)
Tree canopy cover (Sub-canopy)**	23	14.67	14.67	14.67	14.67	63.78	5	5		2		2		5	Tree sub-canopy cover to be a minimum of 11.5m (50% of the tree canopy cover (sub-canopy) benchmark
					**Average tree canopy cover		5	5		2	Maintain a minimum tree sub-canopy cover of 2.1m (10% of the tree canopy cover (sub-canopy) benchmark)	2	Maintain a minimum tree sub-canopy cover of 2.1m (10% of the tree canopy cover (sub-canopy) benchmark)	5	
Shrub canopy cover	22	4.36	4.36	4.36	4.36	19.82	3	3		3		3		3	Establish a minimum of 30 large trees (50% of the large tree benchmark)
Native grass cover*	8	54.67	54.67	54.67	54.67	683.38	5	5		5	Weed coverage to be less than 5% of the entire EMZ 4 area (baseline weed coverage to be established in Year 1)	5	Maintain weed coverage less than 5% of the entire EMZ 4 area (baseline weed coverage to be established in Year 1)	5	
Organic litter*	27	26	26	26	26.00	96.30	5	5		5		5		5	Maintain weed coverage less than 5% of the entire EMZ 4 area (baseline weed coverage to be established in Year 1)
Large trees (euc plus non-euc) (per ha)	60	14	14	14	14.00	23.33	5	5		5		5		10	
Coarse woody debris (per ha)	667	119.67	119.67	119.67	119.67	17.94	2	2		2		2		2	
Non-native plant cover	0	16.67	16.67	16.67	16.67	16.67	5	5		10		10		10	
Quality and availability of food and foraging habitat	NA	1	1	1	1.00	-	1	1		1		1		5	
Quality and availability of shelter	NA	5	5	5	5.00	-	5	5		5		5		10	
					Site Condition Score (/100)		43.5	43.5		51		51		70	
					Overall Site Condition Score - out of 3		1.31	1.31		1.53		1.53		2.10	
SITE CONTEXT															
Size of patch	10	10	10	10	10		10	10		10		10		10	
Connectedness	5	5	5	5	5		5	4		4		4		4	
Context	5	4	4	4	4		4	4		4		4		4	
Ecological Corridors	6	6	6	6	6		6	6	Less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	Maintain less than 5% of the year 1 baseline survey results and zero (0) koala mortalities or injury in the Offset Area	6	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	5	5	5	5		5	5		5		5		5	
Threats to the species	15	1	1	1	1		1	15		15		15		15	
Species mobility capacity	10	4	4	4	4		4	4		4		4		7	
					Site Context Score (/56)		35	48		48		48		51	
					Overall Site Context Score - out of 3		1.88	2.57		2.57		2.57		2.73	
SPECIES STOCKING RATE															
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	40	20	20	20	20		20	20	Maintain baseline SAT survey results as per the Species Stocking Rate Table	26	Increase in SAT survey results as per the Species Stocking Rate Table	26	Maintain SAT survey result increases as per the Species Stocking Rate Table	32	Increase in SAT survey results as per the Species Stocking Rate Table
					Species Stocking Rate Score (/40)		20.00	20		26		26		32	
					Overall Species Stocking Rate Score - out of 4		2.00	2.00		2.60		2.60		3.20	
Overall Assessment Unit Score							5.18	5.88		6.70		6.70		8.03	

	Species Stocking Rate Table			
	Raw SAT Result	SSR Score (Baseline)	InterimTarget SSR Score (YEAR 10)	Target SSR Score (YEAR 20)
SAT Survey 1	80.00%	10	10	8
SAT Survey 2	36.67%	10	10	8
SAT Survey 3	0.00%	0	3	8
SAT Survey 4	0.00%	0	3	8
Final SSR Score (out of 40)		20	26	32
Final SSR Score (out of 4)		2	2.6	3.2

Score	SAT Survey Results
0	No scats recorded
2	East coast (med – high) less than 5 %
3	East coast (med – high) 5 % or greater, but less than 15 %
4	East coast (med – high) 15 % or greater, but less than 22.52 %
6	East coast (med – high) 22.52 % or greater, but less than 25 %
7	East coast (med – high) 25 % or greater, but less than 27 %
8	East coast (med – high) 27 % or greater, but less than 29 %
9	East coast (med – high) 29 % or greater, but less than 32.84 %
10	East coast (med – high) greater than 32.84 %

Table 19: EMZ 3 & EMZ 4 GHFF FHA Completion Criteria

Assessment Unit - Regional Ecosystem	AU 3 - CLEARED OPEN GRAZING COUNTRY			AU 4 - DEGRADED CREEKS, GULLIES AND DRAINAGE LINES		
Site Reference		RE12.11.14			RE12.3.7	
	OUT OF (X/10)	Score	Score	**OUT OF (X/10)**	Score	Score
Vegetation Condition	**20**	5	10	**20**	5	10
Species Richness	**20**	5	20	**20**	5	20
Flower Score	**10**	2	8	**10**	8	8
Timing of Biological Shortages	**10**	4	10	**10**	10	10
Quality of Foraging Habitat	**20**	0	20	**20**	5	10
Non-native Plant Cover	**20**	10	20	**20**	10	20
Site Condition Score		26	88		43	78
MAX Site Condition Score	***X***	*100*	*100*	***X***	*100*	*100*
Site Condition Score - out of 4	**X**	**1.04**	**3.52**	**X**	**1.72**	**3.12**
Size of patch	**10**	10	10	**10**	10	10
Connectedness	**10**	6	6	**10**	6	6
Context	**10**	6	6	**10**	6	6
Ecological Corridors	**10**	10	10	**10**	10	10
Role of site location to species overall population in the state	**10**	5	5	**10**	5	5
Threats to the species	**10**	10	10	**10**	10	10
Site Context Score		47	47		47	47
MAX Site Context Score	***X***	*60*	*60*	***X***	*60*	*60*
Site Context Score - out of 3	**X**	**2.35**	**2.35**	**X**	**2.35**	**2.35**

GHFF Foraging Tree Density	**40**	4	28	**40**	4	18	
Species Stocking Rate Score		4	28		4	18	
MAX Species Stocking Rate Score	***X***	*40*	*40*	***X***	*30*	*30*	
Species Stocking Rate Score - out of 3	**X**	**0.30**	**2.10**	**X**	**0.40**	**1.80**	
Total		**3.69**	**7.97**		**4.47**	**7.27**	

SSR INCREASE TABLE

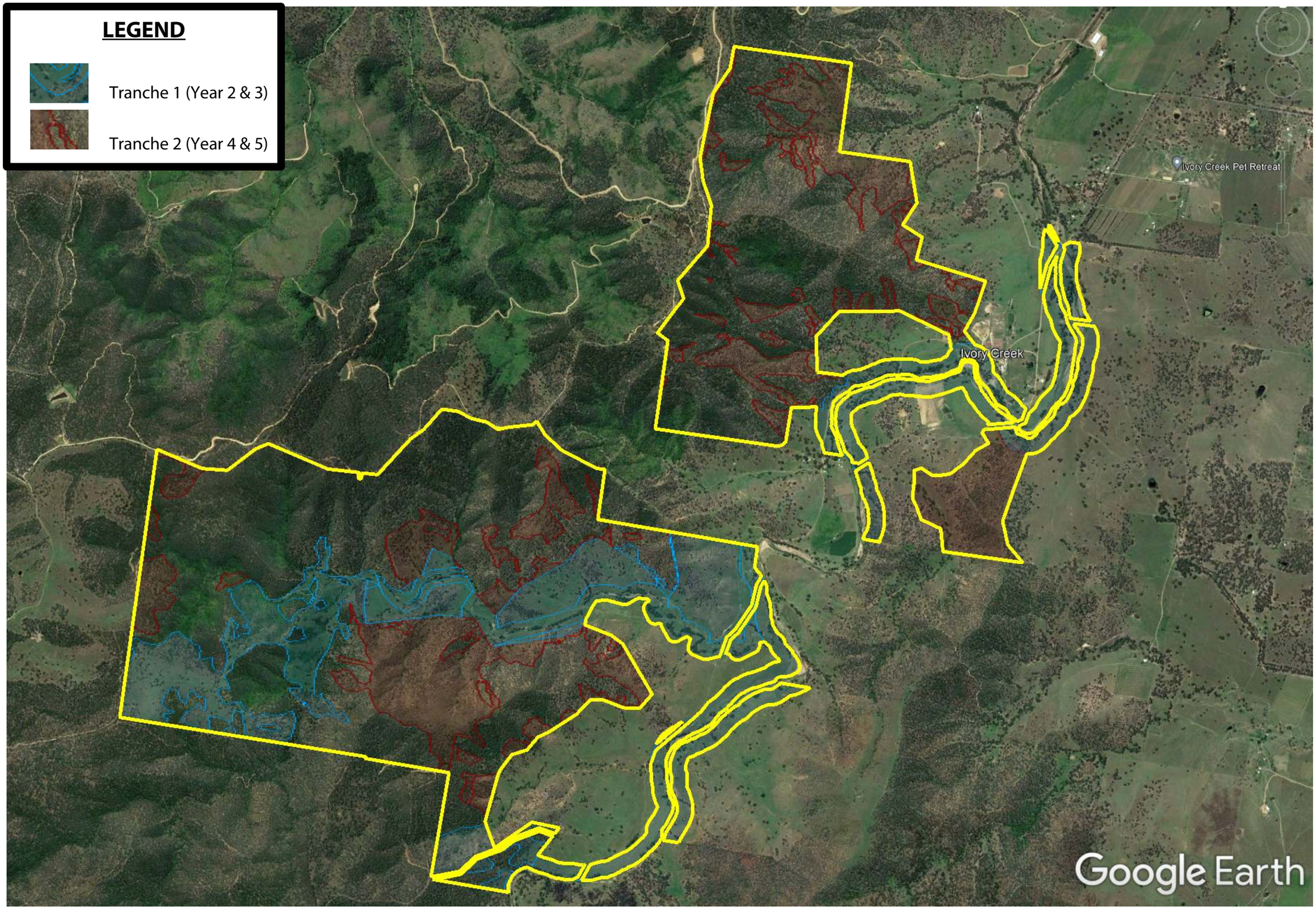
Non-rem	Baseline Score	Target Score	WW Corridor	Baseline Score	Target Score
0	1	7	245	2	6
55	1	7	140	1	6
10	1	7	35	1	6
0	1	7			
	4	28		4	18
	0.3	2.1		0.4	1.8

SSR SCORING TABLE

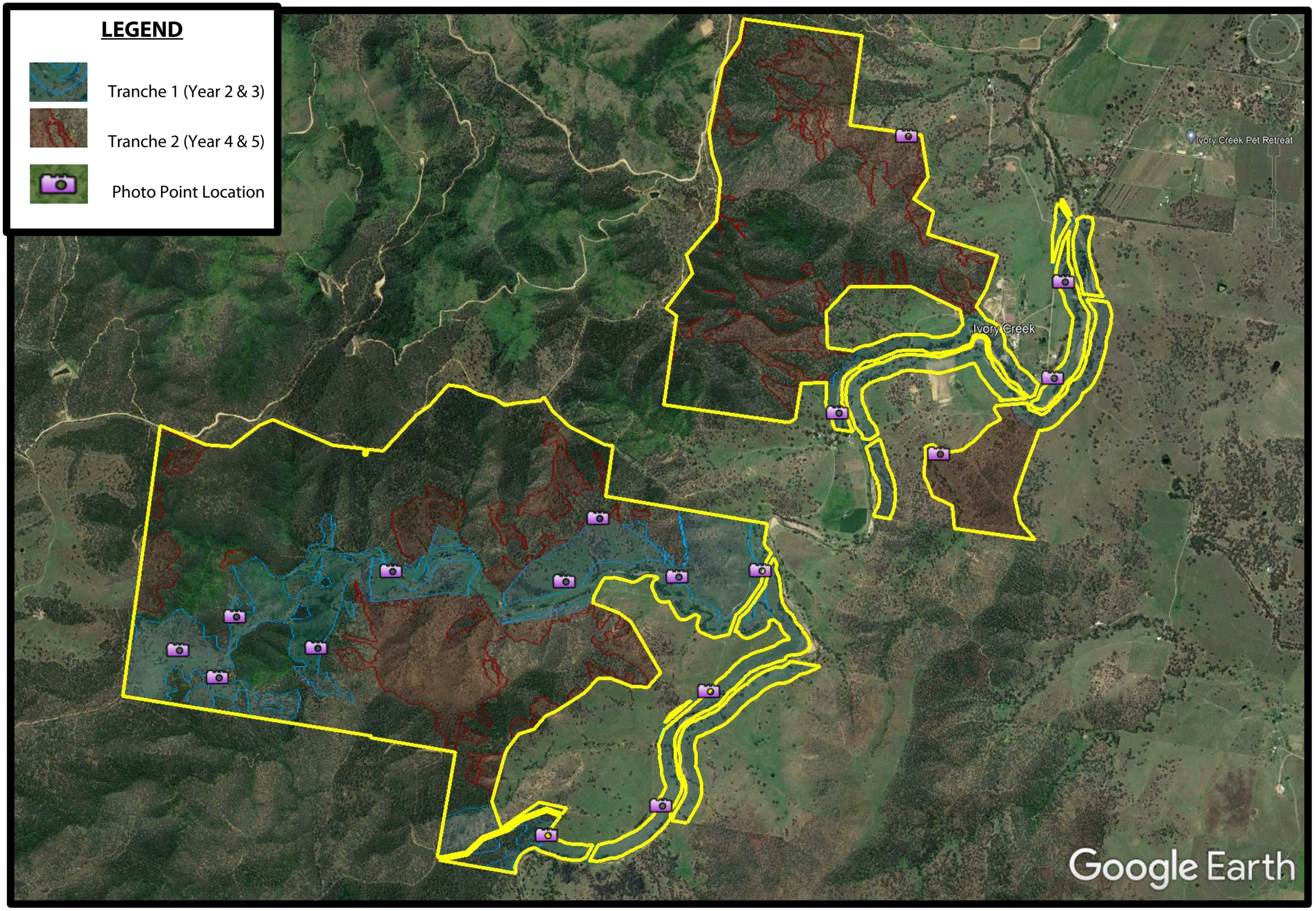
RE12.11.14	
Score	**Stem Density Results (T1 and T2)**
1	0 – 200 stems per hectare
2	201 – 250 stems per hectare
5	251 – 300 stems per hectare
7	301 – 325 stems per hectare
10	326 – 350 stems per hectare
7	351 – 375 stems per hectare
5	376 – 400 stems per hectare
4	401 – 450 stems per hectare
2	450 + stems per hectare

RE12.3.7	
Score	**Stem Density Results**
1	0 – 200 stems per hectare
2	201 – 300 stems per hectare
4	301 – 350 stems per hectare
6	351 – 370 stems per hectare
8	371 – 390 stems per hectare
10	391 – 410 stems per hectare
8	411 – 430 stems per hectare
6	431 – 450 stems per hectare
4	450 - 500 stems per hectare
2	500 + stems per hectare

Insert 6: EMZ 3 & EMZ 4 Indicative Planting Tranche Locations



Insert 7: EMZ 3 & EMZ 4 Indicative Photo Monitoring Locations



PLAN 10 - Indicative Offset Area Fencing

Avonvale Station

Cherry Gully Station

FILE NAME: OEs_1 PLAN 10 Fencing V4

VERSION 4

Avonvale & Cherry Gully Stations - Offset Management Plan (OEs1)

EPBC 2015/7530

0 200 400 800 1,200 m

8/04/2022 *1:30,000*

References - © State of Queensland 2022

N

Legend

- Offset site boundaries
- Existing Property Fence
- New Offset Area Fencing

Offset design areas

- ENVIRONMENTAL MANANGEMENT ZONE 1 - Remnant Habitat [257.7 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 2 - Mixed Value Regrowth Vegetation [308.2 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 3 - Open Grazing Country - Category X vegetation [362.6 ha]
- ENVIRONMENTAL MANANGEMENT ZONE 4 - Degraded Creeks, Gullies & Drainage Lines [166.6 ha]

* New Fencing to be fauna friendly cattle exclusion fencing

One Environment

5.10. Summary Monitoring Schedule

Monitoring Year	Report	Responsibility
Year 1	Offset Area Annual Report	Offset Provider (One Environment)
Year 2	Offset Area Annual Report	Offset Provider (One Environment)
Year 3	Offset Area Annual Report	Offset Provider (One Environment)
Year 4	Offset Area Annual Report	Offset Provider (One Environment)
Year 5	Offset Area Annual Report	Offset Provider (One Environment)
Year 6	Independent Offset Area Report (major milestone report)	Suitably qualified professional
Year 7	Offset Area Annual Report	Offset Provider (One Environment)
Year 8	Offset Area Annual Report	Offset Provider (One Environment)
Year 9	Offset Area Annual Report	Offset Provider (One Environment)
Year 10	Independent Offset Area Report (major milestone report)	Suitably qualified professional
Year 11	Offset Area Annual Report	Offset Provider (One Environment)
Year 12	Offset Area Annual Report	Offset Provider (One Environment)
Year 13	Offset Area Annual Report	Offset Provider (One Environment)
Year 14	Offset Area Annual Report	Offset Provider (One Environment)
Year 15	Offset Area Annual Report	Offset Provider (One Environment)
Year 16	Independent Offset Area Report (major milestone report)	Suitably qualified professional
Year 17	Offset Area Annual Report	Offset Provider (One Environment)
Year 18	Offset Area Annual Report	Offset Provider (One Environment)
Year 19	Offset Area Annual Report	Offset Provider (One Environment)
Year 20	Independent Offset Area Report (major milestone report)	Suitably qualified professional

6. Risk Assessment & Management

A limited number of risks associated with climate change, pest control, large scale rehabilitation and grazing land uses are evaluated for the Offset Site. 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). Upon approval and commencement of the offset works the Offset Site, inclusive of areas not forming part of the Offset Area (Balance Grazing Land) will be owned and operated by One Environment (Offset Provider). This freehold ownership model provides very strong confidence against existing land use threats and the capacity to ensure all management actions are completed within committed timeframes and effective. The following risk factors are considered in more detail in this OMP:

1. Climate Change Risk 1 – Wildfire
2. Climate Change Risk 2 – Flooding
3. Climate Change Risk 3 – Drought
4. Climate Change Risk 4 – Climate Factors – Shifting Habitat Range
5. Planting Stock Failure
6. Pest Management (Wild Dog Populations)
7. Weed Invasion / Expansion (Weeds of National Significance – Lantana)
8. Stock Management, Unlawful Access & Land Clearing (Cattle Operations Impacts)

6.1. Climate Risk 1 – Wildfire

The offset land retains a mix of mature and regrowth vegetation communities which will be expanded through new revegetation links and corridors. All site areas of existing vegetation are reflected as medium to high and very high risk fuel loads for wildfire in both State Government and Somerset Regional Council Mapping (Refer FIGURE 5 for Wildfire Hazard Mapping). The last recorded wildfires within the vicinity of the Offset Site occurred in September 2018 and involved the evacuation of some residents of the adjoining Toogoolawah Township. Avonvale and Cherry Gully Stations were not effected by these fire events. The land retains only sections of 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 and evolved as parts of the site transfer from open pasture to revegetation as specific Offset Works are sequentially completed.

The overall assessment of Wildfire Risks is that their occurrence is possible within the life of the offset and consequences of such an event would be moderate. Without intervention and management Wildfire is evaluated as a MEDIUM Risk to this offset project.

Climate Risk 1 – Wildfire: Risk Evaluation

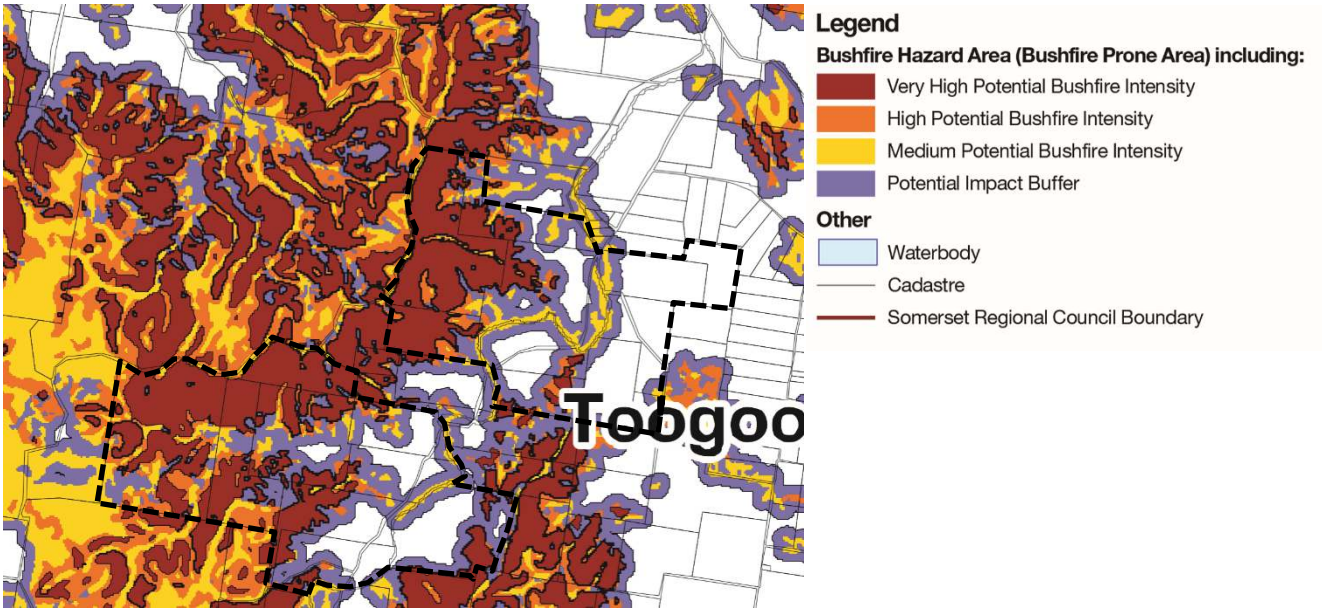
Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Possible	Might occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts

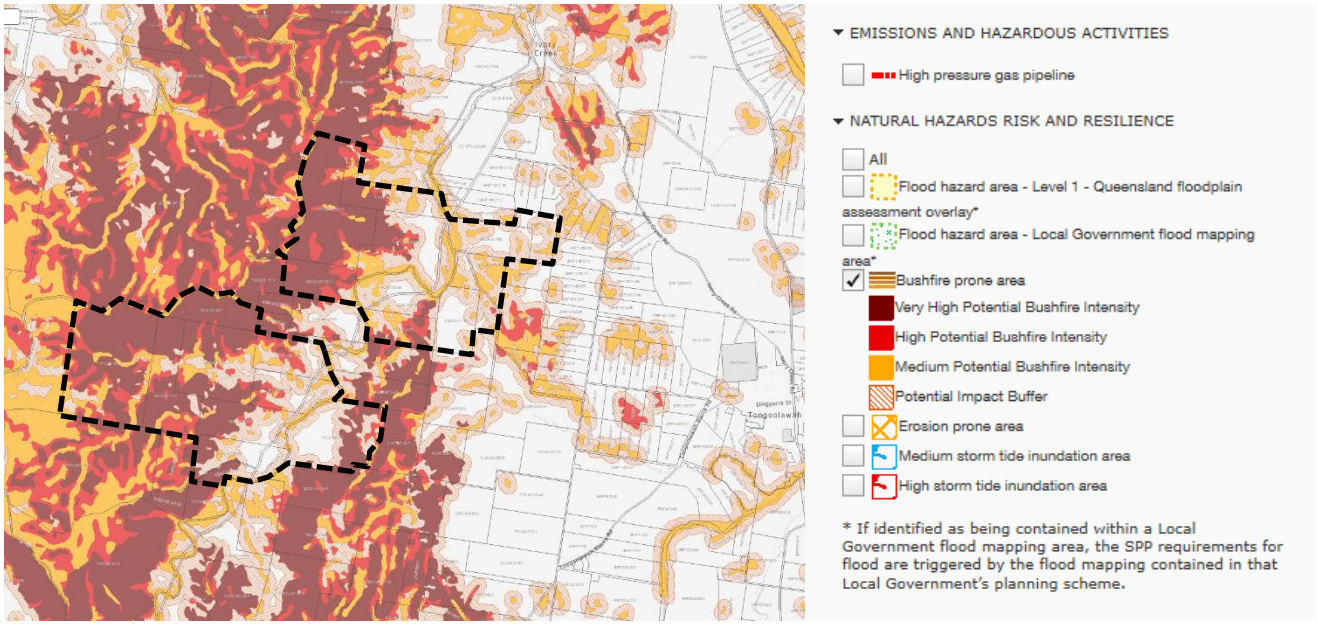
	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Possible	*Low*	**Medium**	*Medium*	*High*	*Severe*

Climate Risk 1 – Wildfire: Risk Management Actions (Refer TABLE 9 for Detailed Wildfire Management Actions)

- Maintain the existing bushfire breaks between adjacent land holders and access tracks through and around areas of mature and regrowth vegetation.
- Establish new tracks and fire breaks as necessary as part of the increased vegetation cover created through revegetation and rehabilitation.
- Establish an Offset Area Wildfire Management Plan which caters for excessive dry periods and or high risk build up of wildfire fuel loads. If necessary undertake mosaic understorey low intensity back burning exercises to reduce fuel load risks.
- Work with local Qld Rural Fire Brigade, Somerset Regional Council Representatives and adjoining land owners to minimise wildfire risks at the regional scale.
- Consider taking out insurance for plant stock replacements.

Figures 5: Somerset Regional Council – Bushfire Hazard Area and Queensland Government State Planning – Natural Hazard Risk and Resilience Mapping





6.2. Climate Change Risk 2 - Flooding

The local township of Toogoolawah and surrounding creek and river catchments are known for periodical flooding. The offset land retains only small sections located directly along Ivory Creek which are mapped or known for any level of even minor flooding (Refer FIGURE 6 for Potential Flood Hazard areas mapped by State and Local Government). A portion of this potential flood hazard land is proposed for replanting as part of the reinstatement of Koala and GHFF habitat. These flood plain areas are deliberately selected to create habitat opportunities as part of the degraded riparian features across the site. As the majority of the offset land 90% is located external to any potential flood areas this risk is considered low and more applicable to impacting replanting efforts rather than directly causing harm to the Koala or GHFF.

Climate Change Risk 2 - Flooding: Risk Evaluation

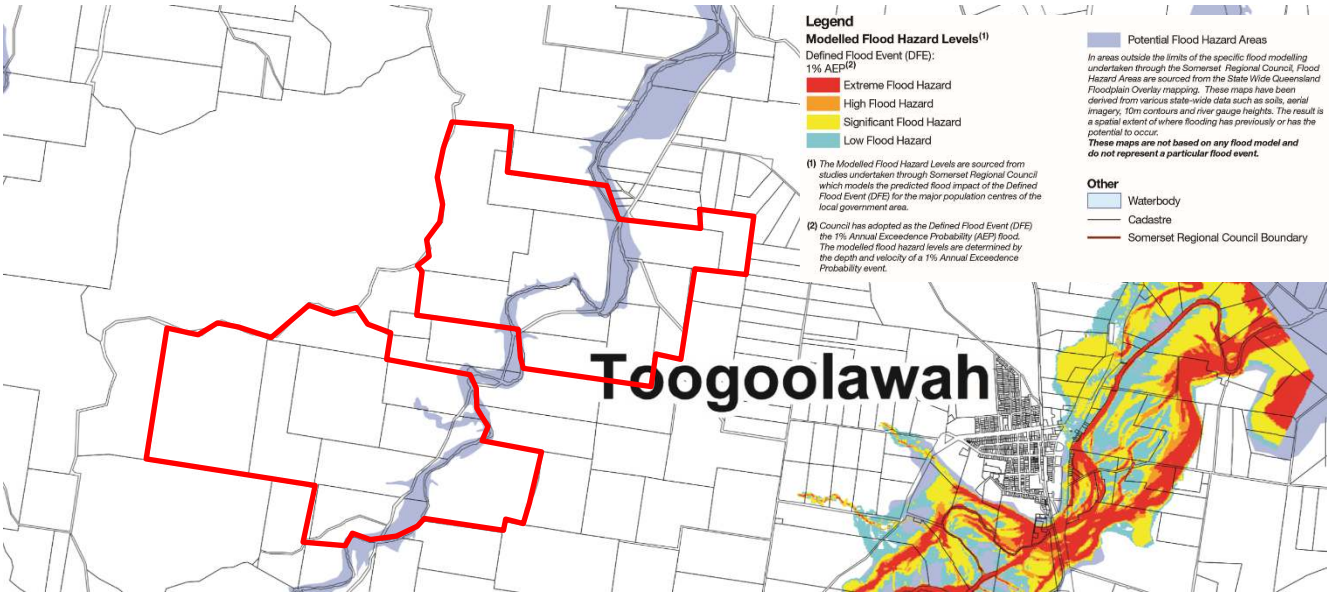
Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Possible	Might occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Minor	Minor incident of environmental damage that can be reversed

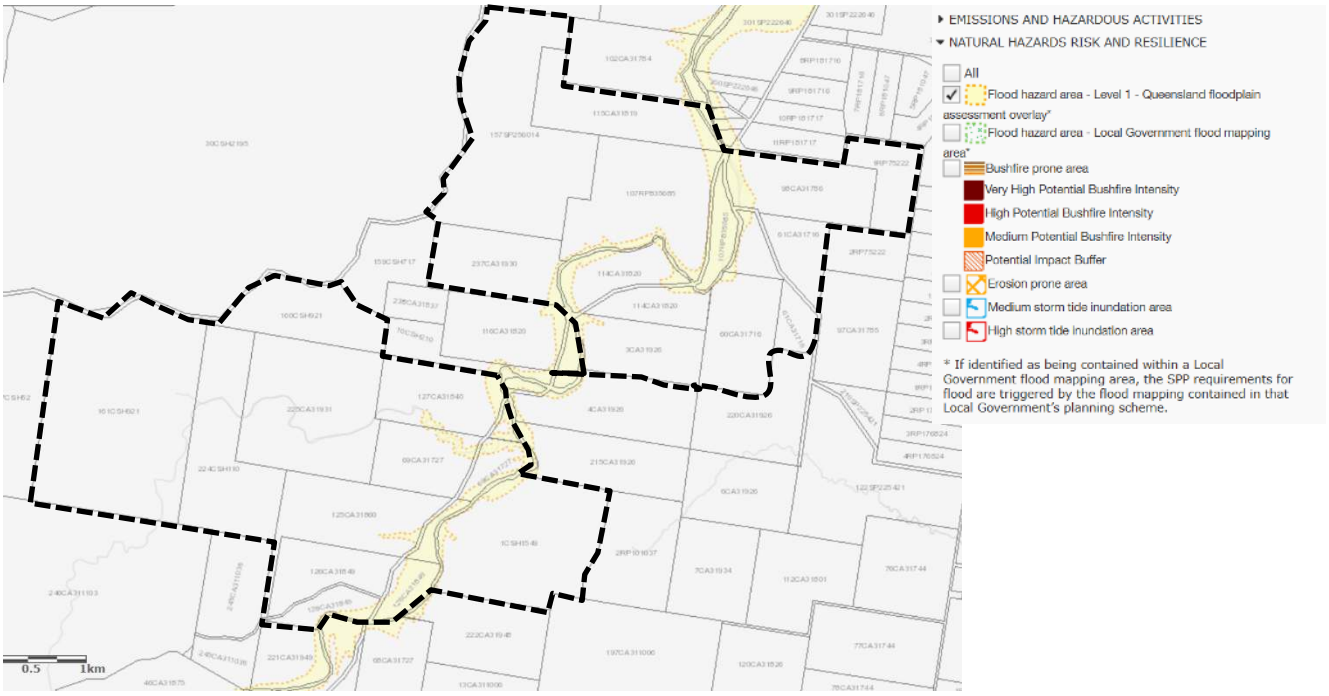
	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Possible	**Low**	*Medium*	*Medium*	*High*	*Severe*

Climate Change Risk 2 - Flooding: Risk Management Actions

- Ensure replanting of new Koala and GHFF trees within flood zones occurs outside of the summer higher rain periods and known months of elevated localised flood risk.
- Include stabilization matting, tree stakes, etc for plantings within higher risk zones of erosion from rising flood waters or fast movement channel or embankment flows.
- Consider taking out insurance for planting stock located within this zone to cover the cost of replacement works should a damaging rain / flood event occur.

Figure 6: Somerset Regional Council – Modelled Flood Hazard Levels and Queensland Government State Planning – Flood Hazard Mapping





6.3. Climate Change Risk 3 - Drought

In March 2017 the Queensland Government declared the Somerset Region amongst a number of Local Government Areas as a drought area for the purposes of accessing funding and concessions for rural land holders. The average rainfall in in 2018 at the nearest rain gage to the offset site recorded 859.8mm. This is down on the 81 year mean rainfall for the region of 987.7mm by 127mm, however is not substantially departed from other low years over this period. 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). Thus, despite the drought declaration the Offset Site maintains at a rainfall in excess of that considered optimal to support koala species.

At the micro climate scale the proposed offset includes substantial revegetation of riparian areas associated with Cherry Gully and Ivory Creek. Both of these areas will be connected to the vegetation communities occurring on the foothills and low ridges across the property. In essence this will involve replanting and access to riparian and alluvial soils substantially richer in moisture content.

Climate Change Risk 3 - Drought: Risk Evaluation

Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Likely	Will probably occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Minor	Minor incident of environmental damage that can be reversed

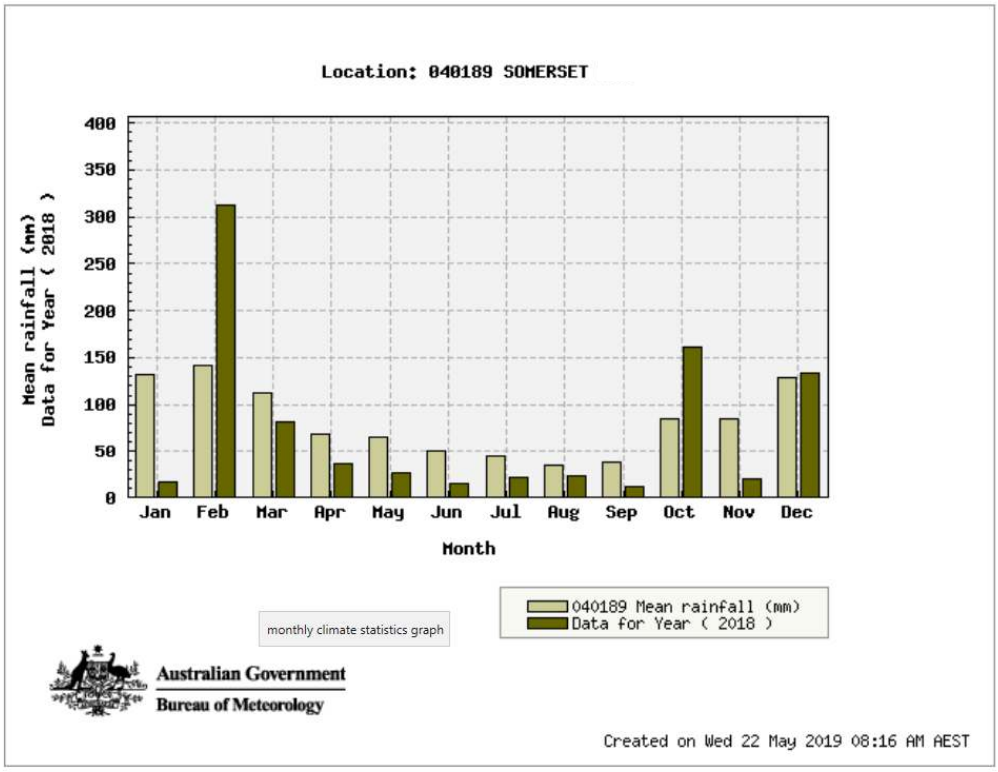
	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Possible	**Low**	*Medium*	*Medium*	*High*	*Severe*

Climate Change Risk 3 - Drought: Risk Management

- Ensure offset design includes replanting and connection to higher moisture content soils associated with alluvial and riparian areas of the site.
- Maintain site dams and waterbodies for use in offset rehabilitation works and as water sources for native animals.
- 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.

Figure 7: 2018 Mean Rainfall (Drought Declared Period) / 82 Year Mean Rainfall

(Source: BOM Website - http://www.bom.gov.au/jsp/ncc/cdio/cvg/av - Date Searched 16/04/19)



Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean rainfall (mm) for years 1936 to 2019	132.5	141.4	113.3	68.6	64.6	50.7	45.0	33.7	38.0	85.7	85.2	128.6	987.6	82
Statistics	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**	**Years**
Rainfall (mm) for year 2018	*17.4*	*312.6*	*81.6*	*35.6*	*26.6*	*15.6*	*21.6*	*23.0*	*12.0*	*160.7*	*19.7*	*133.4*	*859.8*	1

6.4. Climate Change Risk 4 – Climate Factors – 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 climate related threats already well documented. GHFF are also considered to be effected 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 easterward. 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 2018 was 859.8mm down on the 82 year average of 987.7mm, however these results have occurred while the LGA was declared in a drought situation and remain above the optimal 700mm listed in the Adaptation Study. Additionally, the mean recorded minimum and maximum temperatures for the region are 13.5 to 26 degrees, thus even with predicted temperature increases the offset land would remain around the noted 27 degree 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). Refer to FIGURE 8 for estimated location of the Offset Site based on predicted changes in habitat distributions in 2070.

At the site scale the offset design is founded in the re-establishment of connected koala habitat along riparian creeks and drainage lines and through higher moisture content alluvial soils. The design will connect existing low range and foothill habitat with creek flats and riparian vegetation communities.

Climate Change Risk 4 – Climate Factors – Shifting Habitat Range: Risk Evaluation

Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Likely	Will probably occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Minor	Minor incident of environmental damage that can be reversed

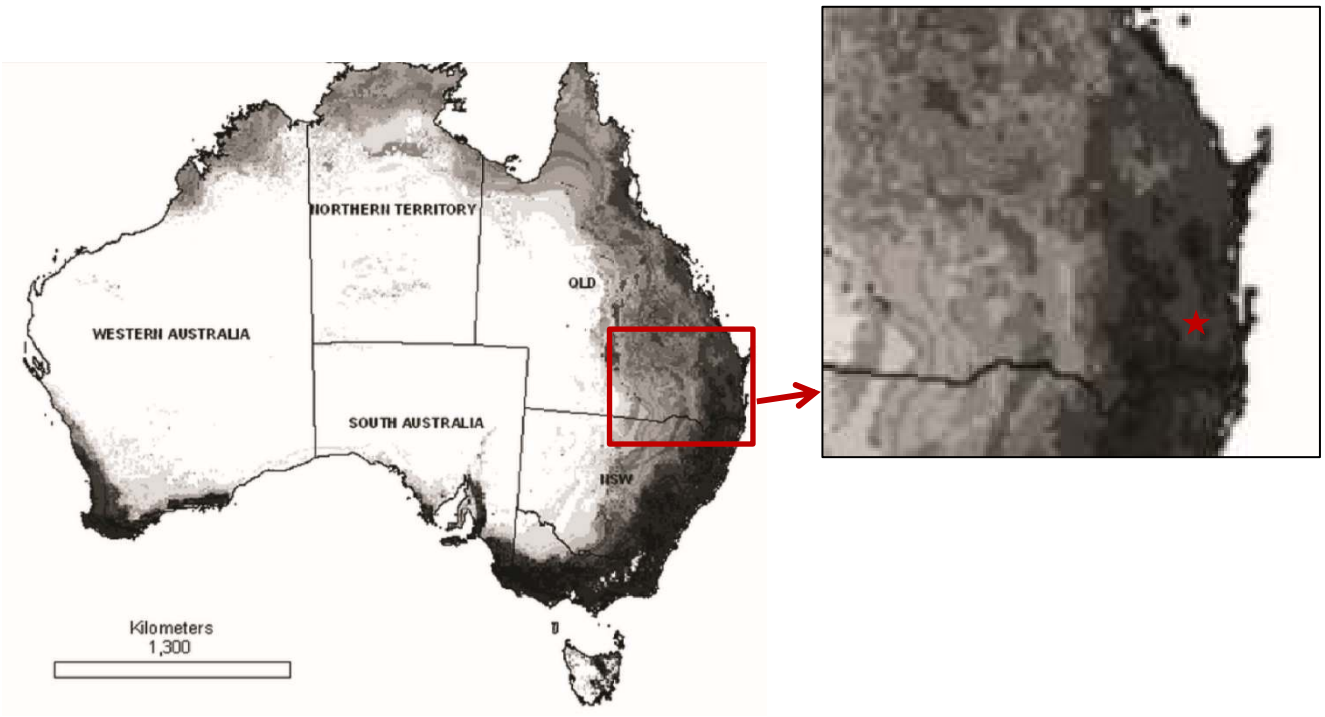
	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Likely	**Low**	*Medium*	*High*	*High*	*Severe*

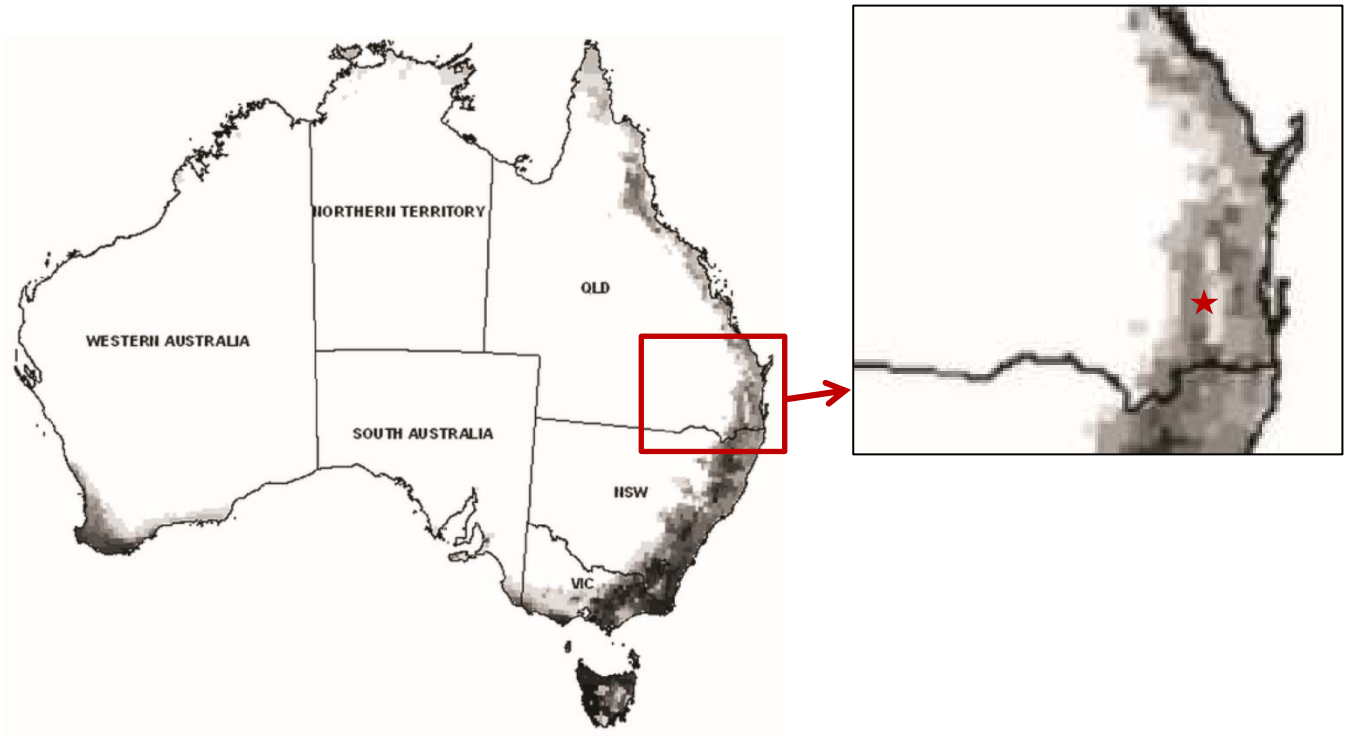
Climate Change Risk 4 – Climate Factors – Shifting Habitat Range: Risk Management

- Actions listed in the Risk Management sections for Wildfire, Flood and Drought (Tables 4, 5 and 6 of Section 5.0)

Figure 8: Modelled Habitat Distribution (2011 V 2070)

(Source: Adams-Hosking, et al, 2011)





6.5. Planting Stock Failure

Components of the Avonvale and Cherry Gully Offset Area design require significant wholesale replanting or small and large areas of infill planting amongst regrowth and mature vegetation. In projects which include large areas of wholesale planting 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
- Lack of appropriate planting area preparation – weed removal / pasture seed bank 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 economical impact for this project as the Offset Area will not achieve committed condition improvement and habitat expansion targets without rectification of planting works. An important component of the offset proposal is the establishment of an on-site nursery and the direct harvesting of tree species seedlings form vegetated zones within the offset land.

Planting Stock Failure: Risk Evaluation

Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Possible	Might occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Minor	Minor incident of environmental damage that can be reversed

	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Possible	**Low**	*Medium*	*Medium*	*High*	*Severe*

Planting Stock Failure: Risk Management

- Source plant seed stock and base soil from the Offset Site. Germinate and propagate site seed stock into tube stock at purpose built Offset Site nursery.
- 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.
- Undertake planting during warmer frost-free months.

6.6. Pest Management (Wild Dog Populations)

The Queensland Government Department of Agriculture & Fisheries (DAF) – Biosecurity Queensland map wild dogs through the Somerset Regional Council Area as 'common'. Dingos and wild dogs are listed as a 'class 2' pest in the Somerset Regional Council Pest Management Plan and noted with in many newspaper articles and Council's minutes as increasing in population and incidence since 2013. Council have introduced a wild dog bounty program providing $25 to private land holders per wild animal scalp delivered as evidence. Council also provides baiting and training on use of baiting to land holders, however do not retain their own pest management officer.

The current owners and farm staff of the Avonvale and Cherry Gully Stations have antidotally noted wild dogs as an issue for stock and that the problem is shared by all surrounding cattle grazers. Site surveys located wild dogs, and a specific record of a dingo, through the vegetated portions of the Offset Area. Additionally, the remnants of a dead koala was recorded on-site with evidence suggesting the mortality was most likely the result of a dog attack.

Data shows 23 records within 10km of the Offset Site (primarily between the site and the Toogoolawah Township). Seven (7) of these records list the animals as either dead or injured. While the data does not provide a cause for the injury 6 of the 7 death / injury records based on location are considered to be the result of either wild dog or domestic dog attack. One (1) of the records is located immediately adjacent to the Brisbane Valley Highway and thus is assumed as vehicle strike. The remaining 6 records occur within large partially vegetated rural land holdings without evidence of recent clearing thus increasing the likelihood of dog attack as death or injury cause.

Evidence collected from the Offsite Site and regional and local records show without intervention wild dogs are likely within the Offset Area. The consequences of wild dog and koala interactions are well documented and thus the impact and risk of uncontrolled wild dogs through the Offset Area is evaluated as a High Risk.

Pest Management (Wild Dog Populations): Risk Evaluation

Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Likely	Will probably occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
High	Substantial instances of environmental damage that could be reversed with intensive efforts

	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Likely	*Low*	*Medium*	**High**	*High*	*Severe*

Pest Management (Wild Dog Populations): Risk Management

- Undertake baseline and periodical surveys and monitoring of wild dog populations, locations and dispersal patterns within the Offset Site (Survey methods to include – direct observation / remote sensor camera and infra-red drone / sand traps for print record). Develop a base line of wild dog populations and 'hot spots' and key activity periods (eg dusk).
- Develop a purpose built offset site 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 site.
- Undertake stakeholder engagement with immediate land holders to foster joint sub regional scale action plan.
- Establish contact and recommended approaches with relevant Council staff (or contractors) undertaking similar works within the broader Somerset Region.

6.7. Weed Invasion / Expansion - *Lantana*

Preliminary site surveys and observations over the Avonvale and Cherry Gully land holdings recorded a total of 23 weed species, of which 3 are scheduled as declared weeds under the *Land Protection (Pest and Stock Route Management) Act 2002* or now listed as 'restricted invasive' plants under the *Biosecurity Act 2014*. The most regularly recorded and in locations abundant species are *Lantana camara* and *Lantana montevidensis*. The Queensland Government Department of Agriculture and Fisheries (DAF) maps the Somerset Region as containing widespread common and abundant infestations of Lantana. The Somerset Regional Council 2013-2018 Pest Management Plan schedules Lantana amongst the priority pest species noting it as abundant and widespread through the region with a 'high' capacity to spread and a 'low' capacity for Council to successfully control.

Lantana is a Weed of National Significance under the EPBC Act. In 2006 Lantana was nominated by the **NSW Government Office of Environment and Heritage** to be listed as a key threating process under the EPBC Act:

"The invasion, establishment and spread of Lantana camara impacts negatively on native biodiversity including many EPBC listed species and communities."
(Source: Key Threatening Process Nomination Form)

Lantana infestations suppress and inhibit the natural regeneration of regrowth vegetation on-site which directly limits the growth rates and regeneration of primary and secondary koala tree species and Grey-headed Flying Fox foraging 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 be resulting in a progressive increase as local climatic events align with optimal germination and seeding periods. In areas blanket layers of Lantana additionally form a barrier to terrestrial species, which would include limiting the koala's ability to access areas containing and over-canopy of koala food trees (many of these areas were impenetrable for human survey).

Weed Invasion / Expansion - Lantana: Risk Evaluation

Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Likely	Will probably occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts

	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Likely	*Low*	**Medium**	*High*	*High*	*Severe*

Weed Invasion / Expansion - Lantana: Risk Management

- Use an Antenna based GPS system to map the full extent (as description polygons) of all Lantana areas within the Offset Area (achieve a total ha extent of weed infestations / occurrences within the Offset Area).
- Exclude stock (cattle) access from Lantana infestation areas within the Offset Area (grazing cattle provide the most continuous source of Lantana spread).
- Undertake detailed weed management control activities within the Offset Area. Methods deployed based on extent of infestation, existing native values, topography, waterways and other sensitive receiving environments:
    - 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;
    - 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 generating within and surrounding Lantana patches.
- Undertake periodical weed maintenance rotations for removal / suppression of Lantana regeneration.
- Incorporate adaptive management principles into weed management methods to streamline overall management to the most effective control types.
- Explore the introduction of biological Lantana control measures to provide a long term (20 year plus) solution for management

6.8. Stock Management, Unlawful Access & Land Clearing (Cattle Operations Impacts)

As noted throughout this OMP Avonvale and Cherry Gully are operational cattle stations retaining an active 'Environmental Authority' (Permit F1-0048) under the Queensland Government's *Environmental Protection Act 1994* for the operation of feedlot facilities between 1,000 and 10,000 animals. Both properties retain extensive rotational pasture paddocks and selectively vegetated paddocks for the raising of weaners. The impacts of this operation on the environment occur at both acute (land clearing) and chronic (tordening for cattle grass cover) timeframes.

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 economical factors, however primarily the rise and fall of the cattle price. Regardless the long term and current highest and best use for the land is the continuation of the feedlot operation. 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 Offset Site is surrounded to the north, west and south by large cattle grazing land holdings and the east by a number of smaller agricultural farms. On land holdings at this scale the it is common for neighbours to access and muster through un-owned adjoining land parcels to connect fragmented land holdings. Additionally, an adjoining land holder may cut a new access track in adjoining unowned land without permission because of the perceived benefit to both parties, which is typically the case in farming operations.

The impacts of unlawful access and stock mustering mimic those listed in the 'general stock management' section of this management plan (trampling, compacting, weed spread, fence destruction).

Stock Management, Unlawful Access & Land Clearing (Cattle Operations Impacts): Risk Evaluation

Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)	
Likely	Will probably occur during the life of the project
Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)	
Minor	Minor incident of environmental damage that can be reversed

	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Likely	**Low**	*Medium*	*High*	*High*	*Severe*

Stock Management, Unlawful Access & Land Clearing (Cattle Operations Impacts): Risk Management

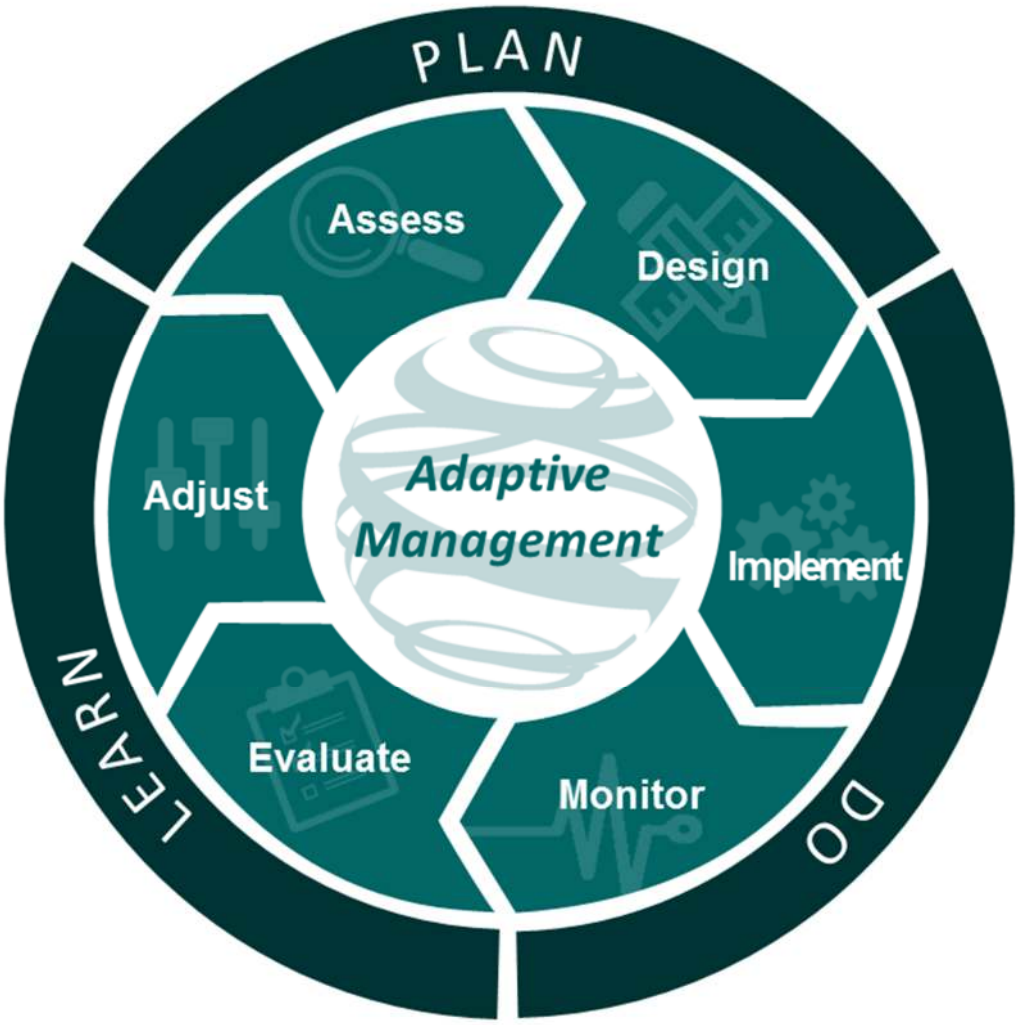
- Two important controls which significantly reduce the risk of Stock Management, Unlawful Access & Land Clearing (Cattle Operations Impacts) on the Offset Area are:
    - The land is being purchased and owned by the Offset Provider (any residual grazing uses will be secondary land uses to the approved offset outcomes)
    - The Voluntary Declaration (VDEC) provides a legally binding mechanism for the protection of existing and created values. The VDEC 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.
- Progressive stock exclusion fencing is to be installed to the extent of the Offset Area (Refer to PLAN 10 for Indicative Offset Area Fencing Plan).
- Consultation on the Offset Area and third party access for mustering / access will occur with adjoining land holders.

7. Adaptive Management / Reporting

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 Avonvale and Cherry Gully Offset site 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.

"Adaptive management is a systematic approach for improving environmental management by learning from management outcomes. We believe that protected areas management can benefit greatly from this approach which allows management to proceed despite uncertainty, and reduces this uncertainty through a systematic process for learning."
(Murray, 2019 - http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.137.9484)

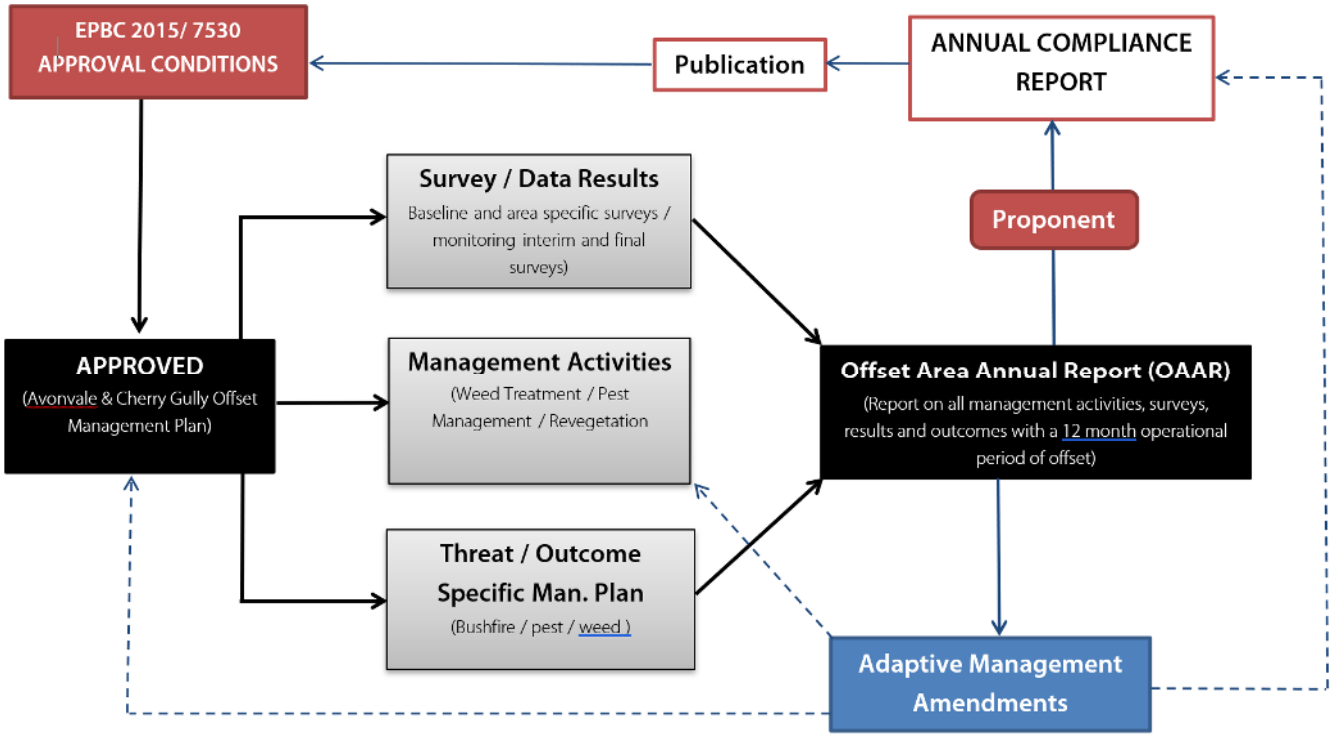
Figure 9: Adaptive Management Model
(https://essa.com/approach/)



7.1. Offset Management Plan Reporting Structure

As part of the commercial agreement between Pioneer Fortune 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 (Pioneer Fortune Pty Ltd) within 40 business days of each 12 months anniversary of the legal security of the offset area. 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.

Figure 9: Offset Actions Reporting Structure



8. References

Australian Government – Department of Environment (2012) – *Environment Protection and Biodiversity Conservation Act 1999* – Environmental Offset Policy (October 2012)

Australian Government – Department of Environment (2012- Guide) – *How to use the Offsets Assessment Guide*

Australian Government – Department of Environment (2014) – *Environmental Management Plan Guidelines – 2014*

Australian Government – Department of Environment (2015) – *Referral guideline for management actions in grey-headed and spectacled flying-fox camps – September 2015*

Australian Government – Department of Environment (2017) – *Draft Recovery Plan for the Grey-headed Flying-fox (Pteropus poliocephalus) - 2017*

Saunders Havill Group (2019) *Greater Flagstone Residential Development, Undullah (EPBC 2015/7530) – Preliminary Documentation Submission (Version 3.0)*

Queensland Government – Department of Natural Resources (2017), *Guide to declarations under the Vegetation Management Act – July 2017*

Queensland Government – Department of Environment 7 Heritage (2017), *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Government Environmental offset Policy (Version 1.2 April 2017)*

Rhodes JR, Chooi, FN; deVilliers, DL, Preece, HJ, McAlpine, CA and Possingham, HP, (2011). *Using integrated population modelling to quantify the implications of multiple threatening processes for a rapidly declining population. Biological Conservation 144 (3): 1081-1088.*

Eby, P. (1998). *An analysis of diet specialization in frugivore Pteropus poliocephalus in Australian subtropical rainforest. Australian Journal of Ecology. 23:443-456.*

Wilson (2013), *Thriving Somerset koalas give scientists hope for species survival* (ABC News – Accessed via - https://www.abc.net.au/news/2013-11-29/koalas-give-scientists-hope-for-their-survival/5123954).

A.R.R.O.W. Wildlife Rehabilitation (2018), *Facebook post with Toogoolawah State High School planting Koala Trees* [Posted 1 May 2018 – Accessed via - https://www.facebook.com/Arrowwildlife/]

Elsome, D (2018), *Increase in wild dog sightings worries land owners,* Gatton, Lockyer & Brisbane Valley Star – 30th of August 2018 [Accessed via - https://www.gattonstar.com.au/news/increase-in-wild-dog-sightings-worries-landowners/3505372/]

Adams-Hosking (2011) *Climate Change Adaptation Strategies for the Koala, Adaptation Case Study Series* – National Climate Change Adaptation Research Facility - Adaptation Research Network – Terrestrial Biodiversity

Chenoweth EPLa and Bushland Restoration Services (2012) *South East Queensland Ecological Restoration Framework: Guideline. Prepared on behalf of SEQ Catchments and South East Queensland Local Governments, Brisbane.*

Chenoweth EPLa and Bushland Restoration Services (2012) *South East Queensland Ecological Restoration Framework: Code of Practice. Prepared on behalf of SEQ Catchments and South East Queensland Local Governments, Brisbane.*

SER (2012), Society of Ecological Restorations [Accessed via - https://www.ser.org/]

NSW Government (2006), *Key Threatening Process – Lantana camara – Nomination Form* [Accessed via - https://www.environment.gov.au/system/files/pages/87ef6ac7-da62-4a45-90ec-0d473863f3e6/files/nomination-lantana-camara-invasion.pdf]

National Heritage Trust (2003) *Weed Management Guide – Lantana camara* [Accessed via - https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/wons/pubs/l-camara.pdf]

ESSA (2017) *Adaptive Management Approach* – ESSA Technologies [Accessed via - https://essa.com/approach/]

Murray (2019), *Adaptive Management: A Science-Based Approach To Managing Ecosystems In The Face Of Uncertainty* [Accessed via - http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.137.9484]

Melzer, et al (2015), *Importance of koala habitat associated with the Eton Range Realignment Project – Appendix 1 – Ranking koala habitat using Queensland's Regional Ecosystems*, Koala Research – Central Queensland University (06-11-15)

Attachments

Attachment 1: Methodologies for Assessing Koala Habitat and Grey-headed Flying-fox Foraging Habitat
(Modified Quality Habitat Assessment – MQHA – Koala)
(Grey-headed Flying-fox Foraging Habitat Assessment – GHFF FHA)

Methodology

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 being equally weighted at 30 % of the final score. The balance of the weighting (40 %) 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 (30 %)

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 (40 %)

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.

Baseline Koala activity levels were determined by utilising the Spot Assessment Technique (Phillips *et al.* 2011). The SAT survey results indicated a 'low – high' Koala activity across the offset site. Utilising these Koala activity levels, and inferring the results with current available published scientific literature, an estimated Koala carrying capacity (stocking rate) was determined.

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 (40 %)

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 OC1: GHFF FHA Vegetation Condition Scoring

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

Table OC2: 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 OC3: 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 OC4: 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 OC5: 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 OC6: 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 OC7: 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 OC8: 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 OC9: 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 OC10: 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 OC11: 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 OC12: GHFF FHA Role of Site Location to Species Overall Population in the State Scoring

Score	Description
0	< 1 active level 3 Grey-headed Flying-fox camp within a 20 km radius
5	1 – 3 active level 3 Grey-headed Flying-fox camp within a 20 km radius
10	> 3 active level 3 Grey-headed Flying-fox camp within a 20 km radius

Attachment 2 Feral Animal Memorandum

(EPBC 2015 / 7530) Feral Animal Surveys and Management

EPBC 2015/7530 for the Undullah master planned development includes the need for the offset site (Avonvale and Cherry Gully Stations Offset Area) to manage feral animals in accordance with conditioned criteria. Specifically condition 6 states:

*During **year 1,** the approval holder must complete baseline surveys of the entire **Avonvale and Cherry Gully Stations Offset area** to determine the **extent of weed cover** and **seasonal feral animal** abundance. The baseline surveys must be undertaken by a **suitably qualified field ecologist** in accordance with a scientifically valid, robust, and repeatable methodology*

And Condition 7 States

*The approval holder must demonstrate a reduction in the abundance of **feral animals** at the **Avonvale and Cherry Gully Stations Offset area** by the end of **year 5,** relative to the abundance determined by the baseline surveys, and ensure that the abundance of **feral animals** is then maintained at, or reduced below, the **year 5** abundance for the rest of the period of effect of the approval*

Within the approval and relative to these conditions the definition of Feral Animals is:

***Feral Animals** means non-native animals non to predate on the koala.*

Additionally Condition 7 of EPBC 2015/7530 requires this updated Offset Area Management Plan to incorporate the findings of baseline surveys in developing management strategies to achieve the outcomes of Condition 7. Within this Updated Anvonvale and Cherry Gully Station Offset Area Management Plan Section 5 specifically outlines management activities for the reduction and control of Feral Animals.

From a combination or survey data, observations and antedotel discussions with prior land-owners and farm staff feral or pest animal species known to frequent or exist at the offset site include:

- Dingos (*Canis lupus dingo*)
- Feral Domestic Dogs (*Canis lupus familiarus*)
- European Red Fox (*Vulpes vulpes*)
- Wild Pig / Boer (*Sus scrofa*)
- Red Deer (*Cervus elaphus*)

Of these animals dogs and dingoes and to a lesser extent Foxes are noted to predate on and form a major threat to the koala species. During ecological surveys completed in preparation of the Preliminary Documentation a deceased koala carcass was recorded within the Cherry Gully station. While precise cause of death is debatable the remains of the animal had clearly been mutilated by wild dogs or similar.

Pig and Deer Species are less overt in direct predation of the koala species, however they have other indirect impacts which may interfere with the conditioned outcomes of the environmental offset. This includes feeding on or trampling of new seedlings as part of mass revegetation of through Environmental Management Zones 3 and 4 and infill planting areas proposed amongst Environmental Management Zone 2. Additionally, the Red Deer Species which frequent the site have been observed feeding on the fresh berry of the Lantana bushes making them a source for seed dispersal.

Baseline Data

Thera are no precise survey methods for acquiring accurate census data on wild dogs and foxes within a geographically limited area (eg for a property). Rather there are methods for extrapolating data from surveys, observations and incidental events (calf attack) and sightings to determine seasonal trends and monitor impacts of the animals. The following methods have been adopted by the Offset Provider since taking ownership of the offset land in mid 2020:

1. Baited Camera Surveys (undertaken by SHG Ecologists)
2. Record Data Depository for Farm staff to report event or sighting
3. Observational records by consultants and contractors at the offset site
4. Contract Hunter 1 – Dates and Findings (Bradley Westmac)
5. Contract Hunter 2 – Dates and Findings (Jeff Carr)
6. Farm Staff Hunting Event – Occurs after animal attack

Given the impact of wild dogs on both the exiting and surrounding farm operational and native wildlife where safe and plausible observed wild dogs were shot. Table 5 provides a register of feral animal (wild dog) sightings and culling at the offset property from July 2020 to January 2022.

Feral Animal Register - Avonvale and Cherry Gully Station (Jul 2020-Jan 2022)

Event / Incident	Date:	Person / Party	Approximate Time	Description	Feral Animals Spotted	Action
1	16/07/2020	Bradley Westmac	Over-night	Hunting Event - Western allotments of Cherry Gully Station	0	0
2	31/08/2020--10/09/2020	SHG	4 x Baited Camera Traps	Baited Camera Traps - 3 in Cherry Gully / 1 In Avonvale - Ivory Creek	1	0
3	11/01/2021	Jeff Carr	Dawn and Dusk Weekend	Hunting Event - Ivory Creek / Cherry Gully intersection	1	0
4	23-24/03/2021	Farm Staff (DB)	Morning	Dead Dog found in Avonvale - Attributed to LGA baiting program	1	1
5	5/04/2021	Bradley Westmac	Overnight	Hunting event - Avonvale West	1	0
6	8/04/2021	Jeff Carr	Night	Hunting Event - Charry Gully - Dog located and killed	1	1
7	25/04/2021	Jeff Carr	Night	Hunting event Iveroy Creek	0	0
8	28/04/2021	SHG	Day – While setting up cameras	In Remnant vegetation on Chrry Gully - Wild Dog observed crossing track	1	0
9	28/04/2021-08/05/2021	SHG	4 x Baited Camera Traps	Baited Camera Traps - 3 in Cherry Gully / 1 In Avonvale - Ivory Creek	2	0
10	4/06/2021	Bradley Westmac	Night	Hunting Event - Avonvale west	0	0
11	11/11/2021	Bradley Westmac	Night	Hunting Event - Avonvale west	0	0
12	8/01/2022	Jeff Carr	2 x Weekend Nights	Hunting event - Cherry Gully	1	0
13	12/01/2022	Farm Staff (DB)	Day	Wild Dog shot attacking calf	1	1
				Totals	**10**	**3**

Additionally, on the Tuesday the 18th of January 2022 meeting was held between the Offset Provider and Somerset Regional Council Pest Management Officer, Mr Shane Teske. Council reviewed the feral management proposals and approval outcomes for the offset site and has made the following recommendations for future management:

1. Baiting 4 times per year. This is done in March, July, Sept and Nov.
2. No baiting occurs when raining as it makes the poison useless.
3. Offset Provider would manage the process with Shane.
4. Offset Provider would be required provide 72 hours notice to all neighbours.
5. Offset Provider supply all the meat, 250 gm pieces.
6. Detailed paperwork including liability coverage etc. is required ad would need to include a map showing lots on which baits are located.
7. Council would meet the Offset Provider on-site and inject the meat with 1080 poison supplied by Council. Council to provide 1080 poison free of cost.
8. Offset Provider to place the baits, 200m to 300m apart.
9. Baits remain in place for 7 days.
10. Uneaten baits must be collected, burned or deep buried after 7 days.
11. Dogs die in circa 24 hours. 1080 poison is specific to dogs.

The above 1080 program run by Council is currently on hold due to state government (biosecurity QLD health) making some "documentation changes", however expected to be up and running in time for a March 2022 commencement at the Avonvale and Cherry Gully Offset Site.

Attachment 3: Management Action Progress Tables

Condition Requirement	Completion Year	Completion Criteria
Condition 10. Reduction in the abundance of feral animals at the Avonvale and Cherry Gully Stations Offset Area by the end of Year 5, relative to the abundance determined by the baseline surveys	Year 5	Refer to Management Action 1
Condition 10. Ensure that the abundance of feral anmals is then maintained at, or reduced below, the Year 5 abundance for the rest of the period of effect of the approval	Year 6 - 20	Refer to Management Action 1
Condition 11a. Demonstrate that the extent of weed cover at the Avonvale and Cherry Gully Stations Offset Area is less than 20% at the end of Year 5	Year 5	Refer to Management Action 2
Condition 11b. Demonstrate that the extent of weed cover at the Avonvale and Cherry Gully Stations Offset Area is less than 5% at the end of Year 10 and for the rest of the period of effect of the approval	Year 10 - 20	Refer to Management Action 2
Condition 12. Demonstrate that by the end of Year 3 that fauna firendly stock exclusion fencing has been installed around the entire perimeter of the Avonvale and Cherry Gully Stations Offset Area.	Year 3	Refer to Management Action 3
Condition 12. Ensure that the fauna friendly stock exclusion fencing is maintained and effective for its purpose for the period of effect of the approval	Year 3 - 20	Refer to Management Action 3
Condition 18. Demonstrate by Year 5 that a minimum of 50% of planting stock used in all offset area vegetation has been grown from seed harvested from Koala food trees and Grey-headed Flying-fox foraging tree species on or immediately adjoining the offset area land holdings	Year 5	Refer to Management Action 7
Condition 19. Engage a suitably qualified independent expert to undertake an assessment of the Avonvale and Cherry Gully Station Offset Area to assess whether the outcomes required in Condition 10-18 have been or are likely to be achieved.	Year 6 Year 10 Year 16 Year 20	

Management Action Requirement	Year Required	Comments
Detailed baseline surveys	Year 1	Detailed baseline surveys have been conducted from **July 2020** until **2 March 2022**. Results of the detailed baseline surveys has been included in the updated OAMP.
Develop on-site monitoring program	Year 1	A Feral Animal Register has been developed to record all antidotal and targeted sightings and cullings of feral animals.
Consult with SRC	Year 1	Contact has been made with Somerset Regional Council (SRC) Pest Management Specialist (PMS). The SRC PMS is scheduled to attend site and commence the 1080 baiting program on 23 March 2022. This program is to be implemented on a quarterly basis.
Develop initial Pest Management Implementation Strategy	Year 2	
Undertake targeted pest management activities	Year 1	Targeted pest management has been undertaken in accordance with the Feral Animal Register. Further, a quarterly baiting program has been established with the SRC and is expected to commence in late March 2022.
Undertake targeted pest management activities	Year 2	
Undertake targeted pest management activities	Year 3	
Undertake targeted pest management activities	Year 4	
Undertake targeted pest management activities	Year 5	
Decommission and remove any pest species denning, foraging or breeding features	Year 1 - 5	Year 1 - No pest species denning, foraging or breeding features were observed. Year 2 - Year 3 - Year 4 - Year 5 -
Replicate detailed baseline surveys	Year 5	**KEY MONITORING MILESTONE FOR CONDITION 10**
Undertake targeted pest management activities	Year 6	
Undertake targeted pest management activities	Year 7	
Undertake targeted pest management activities	Year 8	
Undertake targeted pest management activities	Year 9	
Undertake targeted pest management activities	Year 10	
Replicate detailed baseline surveys	Year 10	**KEY MONITORING MILESTONE FOR CONDITION 10**
Undertake targeted pest management activities	Year 11	
Undertake targeted pest management activities	Year 12	
Undertake targeted pest management activities	Year 13	
Undertake targeted pest management activities	Year 14	
Undertake targeted pest management activities	Year 15	
Replicate detailed baseline surveys	Year 15	**KEY MONITORING MILESTONE FOR CONDITION 10**
Undertake targeted pest management activities	Year 16	
Undertake targeted pest management activities	Year 17	
Undertake targeted pest management activities	Year 18	
Undertake targeted pest management activities	Year 19	
Undertake targeted pest management activities	Year 20	
Replicate detailed baseline surveys	Year 20	**KEY MONITORING MILESTONE FOR CONDITION 10**

Management Action Requirement	Year Required	Comments
Detailed baseline surveys	Year 1	Antenna based GPS surveys and detailed ortho-rectified drone aerial imagery has been undertake across the entirety of the offset area during Year 1. Results of the detailed baseline surveys has been included in the updated OAMP.
Exclude stock from the offset area	Year 1 - 5	Year 1 - Cattle have been removed from the entirety of the Avonvale and Cherry Gully Station properties. Year 2 - Year 3 - Year 4 - Year 5 -
Detailed weed management control activities	Year 2	
Detailed weed management control activities	Year 3	
Detailed weed management control activities	Year 4	
Detailed weed management control activities	Year 5	
Replicate detailed baseline surveys	Year 5	**KEY MONITORING MILESTONE FOR CONDITION 11**
Detailed weed management control activities	Year 6	
Detailed weed management control activities	Year 7	
Detailed weed management control activities	Year 8	
Detailed weed management control activities	Year 9	
Detailed weed management control activities	Year 10	
Replicate detailed baseline surveys	Year 10	**KEY MONITORING MILESTONE FOR CONDITION 11**
Detailed weed management control activities	Year 11	
Detailed weed management control activities	Year 12	
Detailed weed management control activities	Year 13	
Detailed weed management control activities	Year 14	
Detailed weed management control activities	Year 15	
Replicate detailed baseline surveys	Year 15	**KEY MONITORING MILESTONE FOR CONDITION 11**
Detailed weed management control activities	Year 16	
Detailed weed management control activities	Year 17	
Detailed weed management control activities	Year 18	
Detailed weed management control activities	Year 19	
Detailed weed management control activities	Year 20	
Replicate detailed baseline surveys	Year 20	**KEY MONITORING MILESTONE FOR CONDITION 11**

Management Action Requirement	Year Required	Comments
Fencing in accordance with the indicative Offset Area Fencing Plan	Year 1	Internal fencing of the Offset Area has not yet commenced. As per Management Action 3, alternatively, all livestock have been removed from the entirety of the Avonvale and Cherry Gully Station properties. Discussions have commenced with DAWE to amend Condition 13 of the approval to remove the requirement to fence the Offset Area if all livestock have been removed from the Avonvale and Cherry Gully Station properties.
Fencing in accordance with the indicative Offset Area Fencing Plan	Year 2	
Fencing in accordance with the indicative Offset Area Fencing Plan	Year 3	
Entirety of offset area fencing to be installed	Year 3	**KEY MILESTONE FOR CONDITION 12**
Fence inspection and report	Year 4	
Fence inspection and report	Year 5	
Fence inspection and report	Year 6	
Fence inspection and report	Year 7	
Fence inspection and report	Year 8	
Fence inspection and report	Year 9	
Fence inspection and report	Year 10	
Fence inspection and report	Year 11	
Fence inspection and report	Year 12	
Fence inspection and report	Year 13	
Fence inspection and report	Year 14	
Fence inspection and report	Year 15	
Fence inspection and report	Year 16	
Fence inspection and report	Year 17	
Fence inspection and report	Year 18	
Fence inspection and report	Year 19	
Fence inspection and report	Year 20	

Management Action Requirement	Year Required	Comments
Inspection and rectification of all external fence boundaries	Year 1	All external fence boundaries have been inspected during Year 1. No external fence boundaries required rectification.
Notification of Offset Areas. Purpose and outcomes to all adjoining land owners	Year 1	All adjoining owners of the Offset Area have been notified of the purpose and outcomes which are sought to be achieved. Communication with adjoining landholders is ongoing given the requirements when undertaking pest animal baiting programs.
Access gates and signage to be installed where the Offset Area fencing crosses tracks required to be maintained for external land holder access	Year 3	
No new access tracks through the Offset Area unless to support offset outcomes	Year 1	New access tracks through the Offset Area have been created to facilitate the mass replanting of EMZ 3 and EMZ 4. No other new access tracks have been created through the Offset Area. All other access tracks are existing and retained in their current form.
No new access tracks through the Offset Area unless to support offset outcomes	Year 2	
No new access tracks through the Offset Area unless to support offset outcomes	Year 3	
No new access tracks through the Offset Area unless to support offset outcomes	Year 4	
No new access tracks through the Offset Area unless to support offset outcomes	Year 5	
No new access tracks through the Offset Area unless to support offset outcomes	Year 6	
No new access tracks through the Offset Area unless to support offset outcomes	Year 7	
No new access tracks through the Offset Area unless to support offset outcomes	Year 8	
No new access tracks through the Offset Area unless to support offset outcomes	Year 9	
No new access tracks through the Offset Area unless to support offset outcomes	Year 10	
No new access tracks through the Offset Area unless to support offset outcomes	Year 11	
No new access tracks through the Offset Area unless to support offset outcomes	Year 12	
No new access tracks through the Offset Area unless to support offset outcomes	Year 13	
No new access tracks through the Offset Area unless to support offset outcomes	Year 14	
No new access tracks through the Offset Area unless to support offset outcomes	Year 15	
No new access tracks through the Offset Area unless to support offset outcomes	Year 16	
No new access tracks through the Offset Area unless to support offset outcomes	Year 17	
No new access tracks through the Offset Area unless to support offset outcomes	Year 18	
No new access tracks through the Offset Area unless to support offset outcomes	Year 19	
No new access tracks through the Offset Area unless to support offset outcomes	Year 20	

Management Action Requirement	Year Required	Comments
Continuation of existing fire break infrastructure maintenance (firebreaks and trails)	Year 1	Existing firebreaks and fire regimes have been continued during Year 1. External property boundaries have been cleared to maintain the existing fire management lines.
Develop an Offset Area Wildfire Management Plan	Year 2	
Implement Offset Area Wildfire Management Plan	Year 3	
Implement Offset Area Wildfire Management Plan	Year 4	
Implement Offset Area Wildfire Management Plan	Year 5	
Implement Offset Area Wildfire Management Plan	Year 6	
Implement Offset Area Wildfire Management Plan	Year 7	
Implement Offset Area Wildfire Management Plan	Year 8	
Implement Offset Area Wildfire Management Plan	Year 9	
Implement Offset Area Wildfire Management Plan	Year 10	
Implement Offset Area Wildfire Management Plan	Year 11	
Implement Offset Area Wildfire Management Plan	Year 12	
Implement Offset Area Wildfire Management Plan	Year 13	
Implement Offset Area Wildfire Management Plan	Year 14	
Implement Offset Area Wildfire Management Plan	Year 15	
Implement Offset Area Wildfire Management Plan	Year 16	
Implement Offset Area Wildfire Management Plan	Year 17	
Implement Offset Area Wildfire Management Plan	Year 18	
Implement Offset Area Wildfire Management Plan	Year 19	
Implement Offset Area Wildfire Management Plan	Year 20	

Management Action Requirement	Year Required	Comments
Identify and map on-site locations of erosion and flood risk within the Offset Area	Year 1	Erosion point locations within Ivory Creek on the Avonvale and Cherry Gully properties was mapped during Year 1 and included on the *Avonvale Erosion Point Locations and Revegetation Map, Cherry Gully North Erosion Point Locations and Revegetation Map and Cherry Gully South Erosion Point Locations and Revegetation Map* .
Incorporate mapped flood/erosion risk areas into revegtation plans and programs	Year 1	Erosion point locations within Ivory Creek on the Avonvale and Cherry Gully properties was mapped during Year 1 and included on the *Avonvale Erosion Point Locations and Revegetation Map, Cherry Gully North Erosion Point Locations and Revegetation Map and Cherry Gully South Erosion Point Locations and Revegetation Map* .
Finalise EMZ 4 detailed revegetation and replanting plans and programs	Year 1	The detailed revegetation and replanting plan and program has been finalised for EMZ4. Planting within the Tranche 1 area is to commence in April 2022
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 2	
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 3	
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 4	
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 5	
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 6	
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 7	
Progressively implement stabilisation methods of high risk planting areas, avoid planting between high bank or high water mark during summer months	Year 8	

Management Action Requirement	Year Required	Comments
Develop a seed collection program for EMZ1 and EMZ2 areas	Year 1	Collection of seed has been prioritised based on a radius of koala observations on-site. Where a koala has been observed on-site, priority seed collection areas have been identified. Priority of seed collection is as follows: High Priority - 100m of koala observation Medium Priority - 500m of koala observation Low Priority - >500m of koala observation Refer to the plan in the OAMP for the prioritised seed collection areas
Consult adjoining landholders for permission to harvest seed (where necessary)	Year 1	Due to the favourable weather conditions, harvesting seed from adjoining landholders was not necessary in Year 1.
Undertake the seed collection program	Year 1	Seed collection has commenced in Year 1
Establish site nursery for storage, propagation and germination of collected site seeds or establish a contract and relationship with an external nursery for storage, propagation and germination of collected site seeds.	Year 1	Due to the large scale mass planting associated with Tranche 1, the collected seed has been transported to an off-site nursery for storage, propogation and germination
Continue the seed collection program	Year 2	
Continue the seed collection program	Year 3	
Continue the seed collection program	Year 4	
Continue the seed collection program	Year 5	
Demonstrate that a minimum of 50% of planting stock used in all offset area vegetation has been grown from seed harvested from Koala food trees and Grey-headed Flying-fox foraging tree species on or immediately adjoining the offset area land holdings.	Year 5	

Management Action Requirement	Year Required	Comments
Undertake detailed restoration work management areas mapping (stratify larger EMZ area into specific treatment zones)	Year 1	EMZ 1 and EMZ 2 have been stratified into four zones, being Regrowth Zone 1, Regrowth Zone 2, Remnant Zone 1 and Remnant Zone 2 as per the plan included within the OAMP.
Establish photo monitoring points and protocols (georeferenced star picket at photo monitoring locations)	Year 1	Photo point monitoring locations have been GPS located within EMZ 1 & EMZ 2 as per the plan included within the OAMP.
Complete treatment in the work management areas for EMZ 1 & EMZ 2	Year 2	
Complete treatment in the work management areas for EMZ 1 & EMZ 2	Year 3	
Complete treatment in the work management areas for EMZ 1 & EMZ 2	Year 4	
Complete treatment in the work management areas for EMZ 1 & EMZ 2	Year 5	
Complete treatment in the work management areas for EMZ 1 & EMZ 2	Year 6	
Replicate MHQA & GHFF FHA surveys	Year 6	**KEY MILESTONE FOR CONDITION 14a - 14e (EMZ1)**
Monitor and maintain EMZ 1 & EMZ 2	Year 7	
Monitor and maintain EMZ 1 & EMZ 2	Year 8	
Monitor and maintain EMZ 1 & EMZ 2	Year 9	
Monitor and maintain EMZ 1 & EMZ 2	Year 10	
Replicate MHQA & GHFF FHA surveys	Year 10	**KEY MILESTONE FOR CONDITION 14a - 14e (EMZ1)**
Monitor and maintain EMZ 1 & EMZ 2	Year 11	
Monitor and maintain EMZ 1 & EMZ 2	Year 12	
Monitor and maintain EMZ 1 & EMZ 2	Year 13	
Monitor and maintain EMZ 1 & EMZ 2	Year 14	
Monitor and maintain EMZ 1 & EMZ 2	Year 15	
Monitor and maintain EMZ 1 & EMZ 2	Year 16	
Replicate MHQA & GHFF FHA surveys	Year 16	**KEY MILESTONE FOR CONDITION 14a - 14e (EMZ1)** **KEY MILSTONE FOR CONDITION 15a - 15e (EMZ2)**
Monitor and maintain EMZ 1 & EMZ 2	Year 17	
Monitor and maintain EMZ 1 & EMZ 2	Year 18	
Monitor and maintain EMZ 1 & EMZ 2	Year 19	
Monitor and maintain EMZ 1 & EMZ 2	Year 20	
Replicate MHQA & GHFF FHA surveys	Year 20	**KEY MILESTONE FOR CONDITION 14a - 14e (EMZ1)** **KEY MILSTONE FOR CONDITION 15a - 15e (EMZ2)**

Management Action Requirement	Year Required	Comments
Finalise locations, sequence and timing for revegetation program.	Year 1	The revegetation of EMZ 3 & EMZ 4 has been stratified into two Tranches (Tranche 1 & Tranche 2). Tranche 1 is to be completed in Year 2 and Year 3, while Tranche 2 is to be completed in Year 4 and Year 5. The indicative tranche revegetation areas is shown in the OAMP.
Cultivate and prepare Tranche 1 area in preparation for year 2 planting.	Year 1	The Tranche 1 area has been ripped and cultivated where necessary in preparation for planting. Planting is scheduled to commence in April 2022.
Create Tranche 1 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary)	Year 1	Tranche 1 is predominantly located along waterways or creeklines, and as such, water sources already exist
Establish photo monitoring points and protocols for Tranche 1 areas (georeferenced star picket at photo monitoring locations)	Year 1	Photo point monitoring locations have been GPS located within EMZ 3 & EMZ 4 as per the plan included within the OAMP.
Complete Tranche 1 revegetation zone	Year 2	
Cultivate and prepare Tranche 1 area in preparation for year 3 planting.	Year 2	
Create Tranche 1 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary)	Year 2	
Establish photo monitoring points and protocols for Tranche 1 areas (georeferenced star picket at photo monitoring locations)	Year 2	
Complete Tranche 1 revegetation zone	Year 3	
Cultivate and prepare Tranche 2 area in preparation for year 4 planting.	Year 3	
Create Tranche 2 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary)	Year 3	
Establish photo monitoring points and protocols for Tranche 2 areas (georeferenced star picket at photo monitoring locations)	Year 3	
Monitor and maintain Tranche 1	Year 3	
Complete Tranche 2 revegetation zone	Year 4	
Cultivate and prepare Tranche 2 area in preparation for year 5 planting.	Year 4	
Create Tranche 2 water source for revegetation establishment (purpose located dam or broadscale irrigation) (where necessary)	Year 4	
Establish photo monitoring points and protocols for Tranche 2 areas (georeferenced star picket at photo monitoring locations)	Year 4	
Monitor and maintain Tranche 1 & 2	Year 4	
All planting work completed within EMZ 4	Year 4	**KEY MILESTONE FOR CONDITION 17b**
Complete Tranche 2 revegetation zone	Year 5	
Monitor and maintain Tranche 1 & Tranche 2	Year 5	
All planting work completed within EMZ 3	Year 5	**KEY MILESTONE FOR CONDITION 16b**
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 6	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 7	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 8	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 9	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 10	
Replicate MHQA & GHFF FHA transect surveys	Year 10	**KEY MILESTONE FOR CONDITION 16a - 16f** **KEY MILESTONE FOR CONDITION 17a - 17f**
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 11	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 12	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 13	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 14	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 15	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 16	
Replicate MHQA & GHFF FHA transect surveys	Year 16	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 17	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 18	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 19	
Monitor and maintain all revegetation zones (inclusive of rectification and replacement works)	Year 20	
Replicate MHQA & GHFF FHA transect surveys	Year 20	**KEY MILESTONE FOR CONDITION 16g - 16j** **KEY MILESTONE FOR CONDITION 17g - 17j**