Baseline Survey Report

EPBC 2017/8090

Burnett Creek Offset Site

Prepared for EnviroCapital as the approved offset provider for Pointcorp Heritage Park Pty Ltd

27 July 2021

Job No. 9694

Document Control

Document: Offset Site Baseline Surveys for Burnett Creek under EPBC 2017/8090 prepared by Saunders Havill Group for EnviroCapital as the approved offset provider for Pointcorp Heritage Park Pty Ltd.

Document Issue

Issue	Date	Prepared By	Checked By
A	27/07/2021	LT	AR

Prepared by

ABN 24 144 972 949
www.saundershavill.com

Reports and plans by others may be included in this document.

Table of Contents

Plans

Tables

Figures

Abbreviations and Acronyms

AU	Assessment Unit
DAM	Declared Area Map
DAWE	Department of Agriculture, Water and the Environment
DES	Department of Environment and Science (Qld)
DoR	Department of Resources (Qld) (formerly DNRME, Department of Natural Resources, Mines and Energy)
EDQ	Economic Development Queensland (Qld)
EPBC	*Environment Protection and Biodiversity Conservation Act 1999*
GHFF	Grey-headed Flying-fox *(Pteropus poliocephalus)*
NCA	*Nature Conservation Act 1992* (Qld)
NCPR	Nature Conservation (Plants) Regulation 2020
OMU	Operational Management Unit
PDA	Priority Development Area (herein referencing the Greater Flagstone Priority Development Area)
PMAV	Property Map of Assessable Vegetation
RAI	Relative Abundance Index
RE	Regional Ecosystem
SEQ	South-east Queensland
SHG	Sunders Havill Group
VMA	*Vegetation Management Act 1992* (Qld)
WONS	Weeds of National Significance

Terminology

Burnett Creek property means entire Lot 100 on WD682.

Burnett Creek offset site means part of Lot 100 on WD682 covering an area of 150.497 ha which has been legally secured to compensate for impacts associated with approved development EPBC2017/8090.

1. Introduction

The *Environmental Management Division* of Saunders Havill Group (SHG) was engaged by EnviroCapital as the approved offset provider for Pointcorp Heritage Park Pty Ltd (the Proponent) to prepare a Baseline Survey Report for the Burnett Creek offset site associated with the impact for the approved 'Park Ridge Residential Development' located at Clarke Road, Park Ridge (EPBC Act reference 2017/8090). The approval pertains to the construction of a residential development comprising of industrial, mixed use and residential development covering 116.35 hectare (ha) incorporating a 12.96 ha area for environmental management and conservation.

The Park Ridge Residential Development was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and subsequently declared a "Controlled Action" requiring assessment by "Preliminary Documentation" pursuant to section 18 and 18A (listed threatened species and communities) (EPBC 2017/8090) on the 19th March 2017. The trigger for the controlling provision was due to potential impacts on the Koala (*Phascolarctos cinereus*) and the Grey-headed Flying-fox (GHFF) (*Pteropus poliocephalus*), which are both listed as 'vulnerable' under the EPBC Act.

As part of the Preliminary Documentation requirements, a proposal was developed to compensate for the impacts from clearing of up to 89.93 ha and functional loss of 28.01 ha of Koala habitat and GHFF foraging habitat. This offset was approved by a delegate of the Minister as part of the EPBC Act Approval for 2017/8090. The offset includes the dedication and rehabilitation of a total of 401.7 ha of land across two (2) offset sites referred to as the Burnett Creek Offset Site and Lyons Offset site. This report documents the baseline survey results for the Burnett Creek Offset Site. The baseline survey results for the Lyons Offset Site will be contained within a separate report. Additionally, the proposed management and rehabilitation actions required across both offset sites to achieve the offset are provided within a subsequent Offset Management Plan.

The project was approved under the EPBC Act subject to conditions on 23 November 2020 with effect until 30 June 2045. Condition 6 of the approval requires that the approval holder must complete and provide the Department with the results and dates of the following surveys:

a. The vegetation condition attributes for each Regional Ecosystem (RE), specifying the baseline habitat quality assessment data for each operation management unit (OMU);
b. The number and condition of winter or spring flowering GHFF foraging species across the offset site;
c. The species stocking rate for the Koala and GHFF;
d. The extent of weed cover;
e. The number of non-native predators in each season, including in areas adjacent to the offset site;
f. The number of Koala mortalities attributable to non-native predators; and
g. The baseline conditions in respect of each of the outcomes specified in conditions 9-11.

The surveys must be conducted by a suitably qualified person, consistent with the Department's approved survey guidelines and designed to provide results that are representative of the entire areas of the Burnett Creek offset site.

This report has been prepared to satisfy the requirements of the conditions of approval accompanying the controlled action determination.

1.1. Offset site summary

Two (2) offset sites were secured to deliver the offset required under the EPBC Act approval:

- Burnett Creek; and
- Lyons.

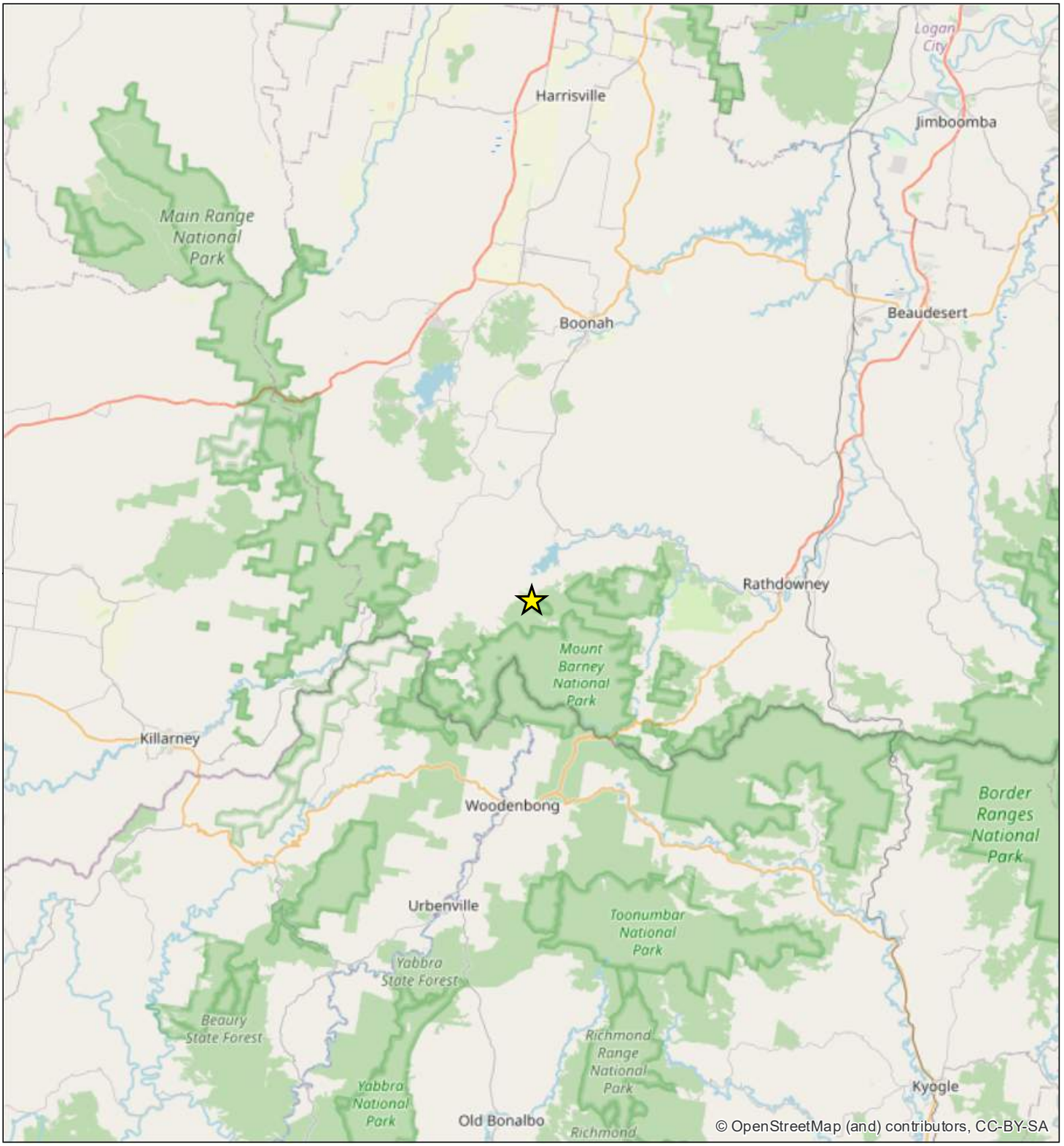
In accordance with Condition 5(a) of the EPBC Act approval conditions the approval holder must legally secure at least 151.3 ha of land at the Burnett Creek Offset Site and at least 250.4 ha of land at the Lyons Offset Site. During the Voluntary Declaration process to legally secure the offset sites under the Queensland *Vegetation Management Act 1999*, only 150.497 ha of suitable land was available at the Burnett Creek Offset Site. This shortfall was remedied through increasing the land secured across the Lyons Offset Site. This matter is discussed further in the subsequent Offset Management Plan

The Burnett Creek site is also located in the Scenic Rim Regional LGA, 46 kilometres (km) south of the Natural Bridge and approximately 6 km from the Queensland-New South Wales state border. The Offset Site is zoned rural and located within the boundary of the Flinders Karawatha Corridor and South East Queensland Regional Plan — Regional Biodiversity Corridor. Key details relating to the Burnett Creek offset site are located in Error! Reference source not found..

Table 1: Burnett Creek offset site summary

Address	Burnett Creek Road, Burnett Creek
Lot / Plan	Part Lot 100 on WD682
Property Area	200.747 ha
Offset Area	150.497 ha
Tenure	Freehold
Local government area	Scenic Rim Regional Council
Date legally secured	11 March 2021

Although only part of Lot 100 on WD682 (Burnett Creek property) has been secured for the offset associated with EPBC 2017/8090, the entire property is to be managed for conservation. Management actions will therefore be performed over the entire site. As such, surveys have been extended to the entire Burnett Creek property.



Legend

☆ Offset site location

Figure 2

Site Context - Burnett Creek

ENVIRO CAPITAL

on behalf of Pointcorp Heritage Park Pty Ltd

saunders havill group

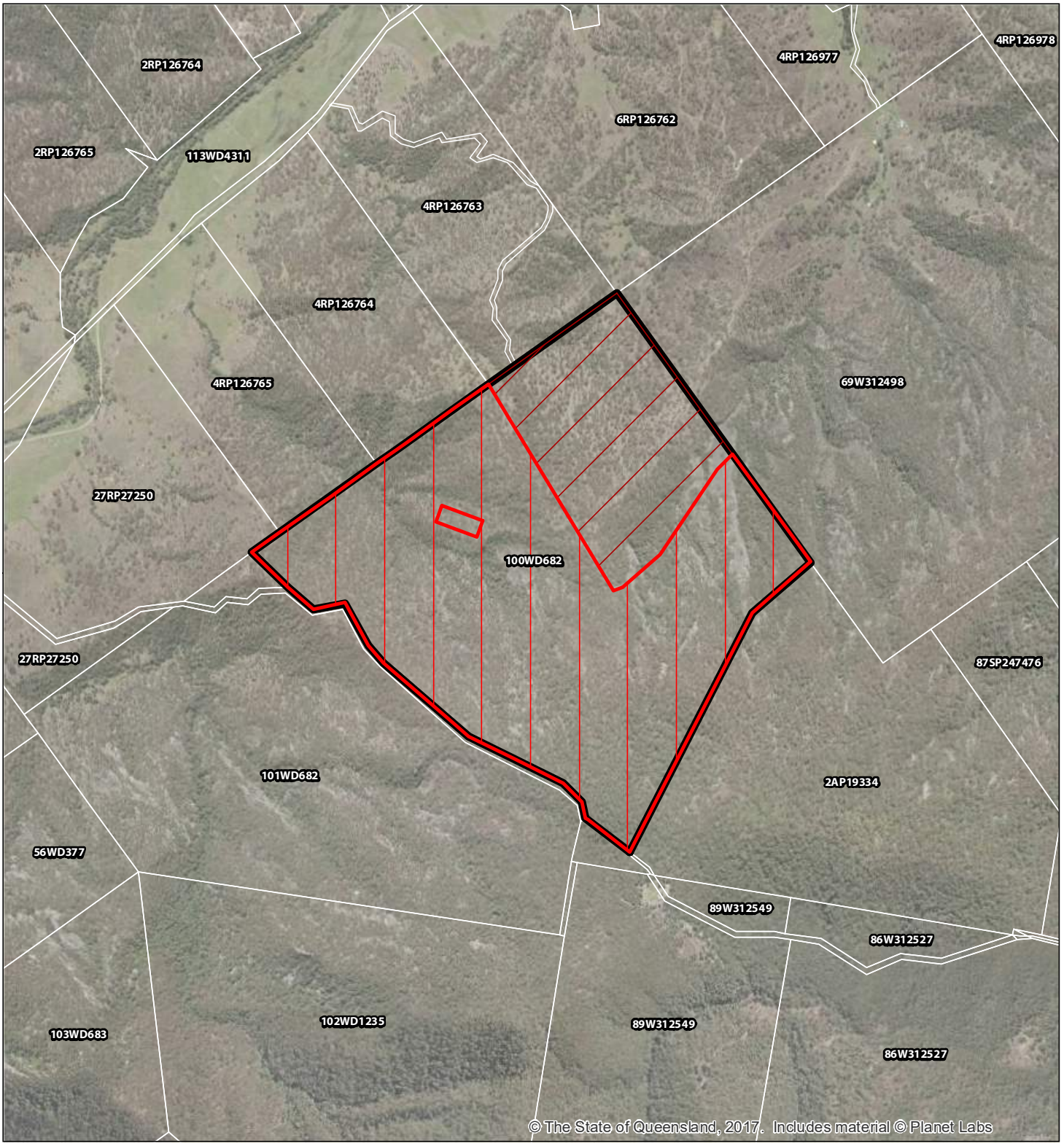
File ref. 9694 E Figure 1 BL2021 Site Context BC B
Date *27/07/2021*
Project *Burnett Creek Road, Burnett Creek*

0 1 2 4 6 8 10 12 14 16 *km*

N

Scale (A4): 1:500,000 [GDA 1994 MGA Z56]

Layer Source: © State of Queensland (Department of Natural Resources, Mines and Energy) 2021.



Legend

- Offset site DCDB
- Existing legally secured offset area (2019/000446)
- Offset area (150.497 ha)
- Qld DCDB

Figure 2

Site Aerial - Burnett Creek

ENVIRO CAPITAL

on behalf of Pointcorp Heritage Park Pty Ltd

saunders havill group

File ref. 9694 E Figure 2 BL2021 Site Aerial BC B
Date *27/07/2021*
Project *Burnett Creek Road, Burnett Creek*

0 100 200 400 600 800 *m*

N

Scale (A4): 1:20,000 [GDA 1994 MGA Z56]

Layer Source: © State of Queensland (Department of Natural Resources, Mines and Energy) 2021

2. Baseline survey methodology

These surveys have been conducted by the Saunders Havill Group, and suitably qualified personnel consistent with the Department's approved survey guidelines, and designed to provide results that are representative of the entire Burnett Creek offset site.

Condition 6 states that within 6 months of the date of the approval, the approval holder must complete baseline surveys of the Burnett Creek Offset Site including the following surveys:

a. vegetation condition attributes for each Regional Ecosystem (RE), specifying the baseline habitat quality assessment data for each operation management unit (OMU);
b. number and condition of winter or spring flowering GHFF foraging species across the offset site;
c. species stocking rate for the Koala and GHFF;
d. extent of weed cover;
e. number of non-native predators in each season, including in areas adjacent to the offset site;
f. number of Koala mortalities attributable to non-native predators; and
g. baseline conditions in respect of each of the outcomes specified in conditions 9-11.

The methodology of each survey detailed within the following sections incorporates the required baseline surveys outlined above. A summary of the surveys conducted is provided within **Table 2**.

Table 2: Survey Methodology Summary

Condition	Methodology	Burnett Creek
6 (a)	Modified Habitat Quality Assessment (MHQA)	3 June 2019 & 28 February 2020
6 (b)	MHQA-Stem Density	3 June 2019 & 28 February 2020 6, 7, 13 & 27 May 2021
6 (c)	Koala - Regularised grid-based Spot Assessment Technique (RGB-SAT)	6, 7, 13 & 27 May 2021
	GHFF – MHQA-Stem Density	3 June 2019 & 28 February 2020
6 (d)	Random diurnal meander recording extent, MHQA and targeted non-native plant transect assessments	6, 7, 13 & 27 May 2021 3 June 2019 & 28 February 2020
6 (e) & (f)	Motion Sensor Camera survey	8 April to 13 May 2021

Condition	Methodology	Burnett Creek
6 (g)	MHQA	3 June 2019 & 28 February 2020

Table 3: Surveyor Details

Name	Position	Qualifications	Survey Date
Andrew Ridley	Senior Environmental Scientist	Bachelor of Science	6, 7, 13 & 27 May 2021
David Havill	Senior Ecologist	Bachelor of Applied Science (Natural Systems and Wildlife Management) Diploma of Arboriculture	3 June 2019 & 28 February 2020 8 & 9 April 2021
Amy Westman	Ecologist	Bachelor of Science (Zoology)	6, 13 & 27 May 2021
Liam Brzezinski	Ecologist	Bachelor of Environmental Management (Natural Systems and Wildlife)	8 & 9 April 2021
Laura Thorley	Environmental Scientist	Bachelor of Environmental Management (Natural Systems and Wildlife)	7 May 2021

As demonstrated within **Table 3**, all surveys were conducted by a suitably qualified person with professional qualifications and experience related to the nominated subject matter, ensuring an independent assessment and analysis in accordance with relevant standards and methodologies.

2.1. Offset Site Assessment Units

The Burnett Creek Offset site were separated into assessment units (AU) for the baseline surveys. Vegetation was categorised according to status, remnant and non-remnant. Within each of these categories each Regional Ecosystem (RE) (remnant or pre-clear) is a separate AU. The Burnett Creek offset site was separated into AUs to ensure each habitat type was assessed to provide results that are representative of the entire offset site.

The Burnett Creek offset site consists of three (3) AUs, one (1) within each different RE (refer **Table 4**).

Table 4: Assessment Units – Burnett Creek

Assessment Unit	VMA Status	Regional Ecosystem	Area (ha)
AU1	Category B (remnant)	RE12.8.20	59.99 ha
AU2	Category B (remnant)	RE12.9-10.2	70.42

Assessment Unit	VMA Status	Regional Ecosystem	Area (ha)
AU3	Category B (remnant)	RE12.11.3	20.89

Further, a 350m grid was applied over the Burnett Creek property to stratify sampling, reducing bias and increasing repeatability of SAT and camera trap surveys. As discussed within **Section 1.1**, surveys have been extended to the entire Burnett Creek property as the entire property is to be managed for conservation. Thus, the 350m grid was applied over the entire Burnett Creek property.

Grid cells were separated by 350m for monitoring across the Burnett Creek property after a literature review of home ranges for targeted species, being Koala (SAT), cat, dog and foxes (non-native koala predators). Home ranges for Koalas vary depending on gender and, availability and quality of habitat. Thus, home ranges increase in size with limited habitat and food resources. Home ranges have been estimated between 10 - 135 ha depending on these factors.

In South East Queensland (SEQ), the average distance between natal and breeding home ranges was similar for males and females, at approximately 3.5 km (Dique *et al.* 2003b). Maximum dispersal distances were up to about 10 km for males and females (Dique *et al.* 2003b). Other studies have reported moves of just over and 16 km in rural south-east Queensland (White 1999).

Feral cat and dog home ranges are usually much larger as they are highly mobile. McGregor *et al.* 2015 found that home ranges for feral cats ranged from 397 ha for females to 855 ha for males. The *NSW Wild Dog Management Strategy 2017-2021* (NSW DPI 2017) cat home ranges vary from 160-2060 ha or larger. As such, a 700m grid cell separation is recommended for feral dog monitoring.

The application of 350m grid cells for SAT and Camera trap locations were determined appropriate for the Burnett Creek property based on the home ranges of target animals and property size.

2.2. Diurnal Searches

Diurnal searches for direct observations of fauna or signs of fauna activity and potentially suitable habitat resources are an important component of fauna surveys. Searches were conducted for direct observations of fauna or signs of fauna activity and potential habitat resources were conducted simultaneously with all other surveys conducted throughout the surveying period and across the Burnett Creek Offset site (detailed in following sections). As such, these surveys were conducted between the 6 and 27 May 2021.

As discussed within **Section 2.1**, the offset site was separated into quadrants in representative habitats to ensure that each offset site was systematically searched. The results of these surveys are therefore considered an accurate representation of the entire offset site. The use of quadrants and assessment units ensures the effort can be repeated over time for comparisons. Importantly, these searches targeted direct observations of

koalas, koala scat, koala food trees, GHFF roost sites and GHFF foraging species. Where identified significant habitat resources or signs of fauna activity were located using a GPS.

As noted within the *Survey Guidelines for Australia's threatened manmmals* (Department of Sustainability, Environment, Water, Pollution and Communities, 2011), the time taken to effectively search a subject site varies considerably according to the size and nature of the area. For large sites and remote areas, such as the Burnett Creek offset site, constraints required the identification of potential habitat resources through ground-truthing after reviewing vegetation maps, aerial photographs and imagery. The size and topography of the offset site contributed to time constraints limiting the search area. This limitation was reduced with the use of AUs and the RGB approach, ensuring results are representative of the entire area.

2.3. Modified Habitat Quality Assessment

This survey method addresses Condition 6(a)-(d) and (g) compiling details including;

- The vegetation condition attributes for each RE;
- number and condition of winter or spring flowering GHFF foraging species across the offset site;
- species stocking rate for the Koala and GHFF;
- extent of weed cover; and
- baseline conditions in respect of each of the outcomes specified in conditions 9-11.

These values were incorporated into a larger habitat assessment 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 MNES.

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

The 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 and GHFF 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 15 condition characteristics being:

- recruitment of woody perennial species in Ecologically Dominant Layer (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 SAT (*Phillips et al.* 2011). The SAT survey results indicated a 'low' Koala activity across both the impact and offset sites (refer **Section 2.3.1** for details). Utilising these Koala activity levels, and inferring the results with current available published scientific literature, an estimated Koala carrying capacity (stocking rate) was determined.

Table 5: Koala MQHA Stocking Rate Scoring

Species Stocking Rate (40%)			
SAT survey results	**Low (<22.52% (East Coast Med-High))**	**Medium (>22.52% but <32.84% (East Coast Med-High))**	**High (>32.84% (East Coast Med-High))**
	20	30	40

A 100 m X 20 m plot was used to gather the data required for the MHQA. Eight (8) plots were conducted across the Burnett Creek. Five (5) 1 m x 1 m quadrats, located 10 m apart and on alternate sides along the transect we performed within each plot. Each of the ground cover component was assessed so that the cover totals 100%. Although not all components are used in the scoring, assessment of all attributes improves the ability to estimate cover of the assessable attributes.

Photo Set 1: The 100m x 20m plot within offset site, centre line shown by measuring tape.

Photo Set 2: 1m x1m quadrants within transect.

2.3.1 Species Stocking Rate

Koalas are difficult to detect and occur at low densities in many parts of their range. The most appropriate survey method and design depends on the type of data that is desired (i.e. presence/absence, abundance, habitat preference, density, tree species preference) and the size/complexity of the site. Gathering more complex data (i.e. density) or surveying larger, more complex sites will generally require more time and resources. The benefits of more thorough surveys are a higher level of confidence in the assessment and more information on which to plan and make decisions (DoE, 2014).

The direct and indirect sampling techniques can be categorised into three different approaches;

- total counts;
- partial counts; and
- indices.

Total counts are direct visual observations where each individual is counted within a survey area. This technique is popular with large easy to detect and identifiable animals. It determines the total number of

individuals within the sampling site. This method is not always viable over large areas or where animals are hard to detect.

Partial counts using line transect with distance sampling or strip transects where individuals are counted within a predetermined distance of the transect. Distance sampling with line transects can be used to determine relative density/abundance of a population based on the recorded distance from the line to the animal and the angle at which the animal is from the observer.

Indices using animal signs such as scats, tracks or scratches are used to indicate presence/absence and activity within habitats. Animal signs can be sampled along line transects, strip transects or selection of specific habitat element. Munks *et al.* 1996 found that due to koala behaviour they require more effort to survey using visual observations. Sullivan *et al.* 2002 advocates for the use of faecal pellet counts for sampling as this method requires less effort. Indices have been included within the baseline koala surveys and discussed further in **Section 3.2**.

For actions with a large footprint, or landscape-scale impacts, baseline monitoring which evaluates koala abundance, movement and habitat preferences in the area proposed to be affected by the project are considered necessary. This may involve a combination of direct and indirect survey methods in the study area, particularly if there is limited desktop data available. These surveys will be important for the implementation of mitigation measures and offsets (DoE, 2014).

To satisfy the approval conditions, a baseline koala density survey is required to measure progress towards achieving the performance criteria as prescribed within the approval conditions (ref. EPBC 2017/8090). The Burnett Creek were both surveyed using direct methods, including;

- Diurnal Searches; and
- Opportunistic observations during other works (i.e. habitat transects, motion sensor camera traps, SAT, etc.).

Given Koalas are largely nocturnal and travel during the night, it is difficult to survey an animal as elusive and cryptic as the Koala, which has contributed to the lack of a standardised survey method (Phillips and Callaghan 2011). Visual observations through spotlighting is considered to be one of the most effective methods for detecting Koalas as the animal is more active and eyes reflect light.

Transects were conducted within appropriate habitats to detect fauna. Due to the remoteness of the Burnett Creek offset site, habitats were not able to be sampled on two separate nights. However, fauna signs such as tree scratches and faecal pellets identified during diurnal searches can be used as indicators of presence within a habitat and provide an estimate for abundance or density.

<u>Regularised Grid-Based Spot Assessment Technique</u>

As discussed above, indirect methods can be use to determine presence/absence of fauna. Indices using animal signs including scats, tracks and scratches can indicate species presence and habitat use. Koala activity levels and density were determined by utilising SAT. Surveys are undertaken in accordance with the methodology developed by Phillips and Callaghan (2011) and specified in the *EPBC Act Referral Guidelines for*

the Vulnerable Koala. The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage and is therefore uses indices to determine presence/absence.

The SAT involves identifying a non-juvenile tree of any species within the site that is either observed to have a Koala or scats, or is known to be a food tree or otherwise important for Koalas, and recording any evidence of Koala usage of that tree including presence, identifiable scratches or scats. The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been surveyed.

The number of trees showing evidence of Koala activity is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within one metre radius of the trunk. After approximately two person minutes of searching for scats, the base of the trunk is observed for scratches and the crown for Koala (Phillips and Callaghan 2011).

This approach results in an activity level; low, medium or high for the study area. Activity levels derived from SAT sites should only be interpreted in the context of location specific habitat use. Low activity levels can be associated with low density populations, density is usually affected by primary food tree availability (Phillip and Callaghan 2011; Phillips and Callaghan 2000; Phillips *et al.* 2000).

The RGB-SAT sampling is typically applied at a rate of 1:10-20ha at a landscape using intervals from 200-500m (Phillips and Hopkins 2007, Hopkins *et al* 20070, Biolink 2017; Biolink 2019). Utilising the RGB-SAT method reduces sampling biases and ensures the results provide a representative of the entire Burnett Creek offset site. The grid size was tailored to the offset site size and estimated density and therefore detectability of pellets. To ensure detection of results and accurate representation of each offset site a 350m grid was selected resulting in a minimum of eleven (11) at Burnett Creek property, nine (9) of which are located within the Burnett Creek offset site.

The Koala SAT survey methodology is considered an accurate technique when estimating low-density Koala populations (Mossaz 2010). Research by Rhodes *et al.* (2015) indicates that within the Ipswich region the Koala density is approximately 0.03 Koalas/ha. Rhodes *et al.* (2015) attribute the low population density to a negative relationship identified between temperature and Koala densities. Therefore, when estimating a Koala density in an area that is known to be 'low', the SAT survey methodology is considered to provide an accurate determination on the activity levels (Mossaz 2010).

Although the SAT survey methodology is considered an accurate technique when estimating low-density koala populations there is a number of limitations. The abundance and density of Koalas cannot be determined through this method. However, fixed amount of sampling gives fixed proportion of population and the value of index usually increases with population density.

Stable populations have higher rate of faecal pellet deposition (Lunney *et al.* 1998), leading to bias occupational rate where multiple SAT sites can be occupied by only the one animal (Phillips and Hopkins

2008). Home ranges can be large depending on sex of the animal and availability of preferred food trees (Phillip and Callaghan 2011).

The selection of SAT sites is also very important as they may be in places where there is either really high or low activity rates which can skew results. As such, the RGB-SAT approach was used to reduce bias and ensure the results were representative of the offset site. The size of the grids were tailored to each site for greater detection of results. However, Cristescu *et al.* 2012, found that detectability varied up to 16% between plots of different ground cover.

There are a number of benefits to this survey method, most importantly, it is a relatively fast and repeatable process which can be applied to large areas such as the offset areas. It is a passive method of sampling and does not require disturbance of the target species and is easy to repeat. This method establishes if the area is occupied by Koalas, their possible distribution within the area and identifies habitat quality through the tree preference and distribution data. As the SAT method is easy to repeat with reproducible results conducting a study over time will be able to determine possible changes in distribution over time and the reason for this change.

2.4. Grey-headed Flying-fox Foraging Habitat Assessment

The impact and the offset sites have been assessed using a GHFF Foraging Habitat Assessment (FHA) tool developed by the Saunders Havill Group 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 focused 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 GHFF 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. Refer to **Table 6** for the benchmark scoring values for this condition characteristic.
- 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. Refer to **Table 6** for the benchmark scoring values for this condition characteristic.
- 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*). Refer to **Table 6** for the benchmark scoring values for this condition characteristic.
- 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. Refer to **Table 6** for the benchmark scoring values for this condition characteristic.

- 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 its importance as a winter flowering species as acknowledged in the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017). Refer to **Table 6** for the benchmark scoring values for this condition characteristic.
- 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. Refer to **Table 6** for the benchmark scoring values for this condition characteristic.

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 (i.e. eight (8) located across the Burnett Creek offset site).

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. Refer to **Table 7** for the benchmark scoring values for this context characteristic.
- 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). Refer to **Table 7** for the benchmark scoring values for this context characteristic.
- 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 20 km buffer of the site measured. This context characteristic is measured using GIS. Refer to **Table 7** for the benchmark scoring values for this context characteristic.
- 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. Refer to **Table 7** for the benchmark scoring values for this context characteristic.
- 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. Refer to **Table 7** for the benchmark scoring values for this context characteristic.
- 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 (DoEE, Australian Government, 2019). Refer to **Table 7** for the benchmark scoring values for this context characteristic.

2.4.1 Species Stocking Rate

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 (refer **Table 8**).

As stated within the *Survey Guidelines for Australian Threatened Bats*, the GHFF occupies most areas in their distribution in highly irregular patterns, and therefore surveys based on animal sightings are unlikely to be reliable. A more effective survey method is to conduct vegetation surveys to identify feeding habitat.

Table 6: GHFF FHA Site Condition (40%) Scoring Benchmarks

Score	Description
Vegetation Condition Scoring	
5	Category X / non-remnant
10	Category C / regrowth
20	Category B / remnant
Species Richness Scoring	
0	0 GHFF foraging species
5	1 – 3 GHFF foraging species
10	4 – 6 GHFF foraging species
20	> 6 GHFF foraging species
Flower Score (average) Scoring	
2	0.01 – 0.25
5	0.26 – 0.50
8	0.51 – 0.75
10	0.76 – 1.00
Timing of Biological Shortages Scoring	
5	Food shortages

Score	Description
3	Pregnancy and birthing
3	Lactation
3	Mating and conception
3	Migration paths
3	Fruit industries
Total (/20)	Combine total of above
Quality of Foraging Habitat (trees >0.65 wt p*r) Scoring	
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
Non-Native Plant Cover Scoring	
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 7: GHFF FHA Site Context (30%) Scoring Benchmarks

Score	Description
Size of Patch Scoring	
0	< 5 hectares
2	5 – 25 hectares
5	26 – 100 hectares
7	101 – 200 hectares
10	> 200 hectares
Connectedness Scoring	
0	< 1 active Grey-headed Flying-fox camp within a 20 km radius

Score	Description
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
Context Scoring	
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
Ecological Corridors Scoring	
0	Not within an ecological corridor
6	Sharing a common boundary with an ecological corridor
10	Within an ecological corridor
Threats to Species Scoring	
1	High level threat to the species
5	Moderate level threat to the species
10	Low level threat to the species
Role of Site Location to Species Overall Population in the State Scoring	
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

Table 8: Species Stocking Rate (40%) Scoring Benchmarks (RE12.9-10.2)

Score	Stem Density Results (T1 and T2)
1	0 – 200 stems per hectare
2	201 – 300 stems per hectare
4	301 – 400 stems per hectare
6	401 – 430 stems per hectare
8	431 – 460 stems per hectare
10	461 – 490 stems per hectare
8	491 – 520 stems per hectare
6	521 – 550 stems per hectare
4	551 – 600 stems per hectare
2	600 + stems per hectare

2.5. Weed Cover Survey

Together with the MHQA methodology outlined above, this survey method was utilised to address Condition 6(d) and determine the extent of weed cover across the offset site.

Where time and resources are limited estimating plant populations should be simplified through sampling of random or fixed points. Sampling rather than attempting to measure everything over the whole site, estimates of the whole rather than a precise and complete record reducing resources and time. Measurements may be taken at random points on each visit or at fixed points that are revisited. While there are statistical reasons for choosing random points, revisiting fixed points provides greater confidence that changes have occurred over time rather than natural variation at the site (Auld, B. 2009). Fixed points were established over the Burnett Creek offset site using the AUs and RGB approach to stratify sampling to ensure each area of interest is sampled and result in a representative measure across the entire site (refer to **Figure 1**).

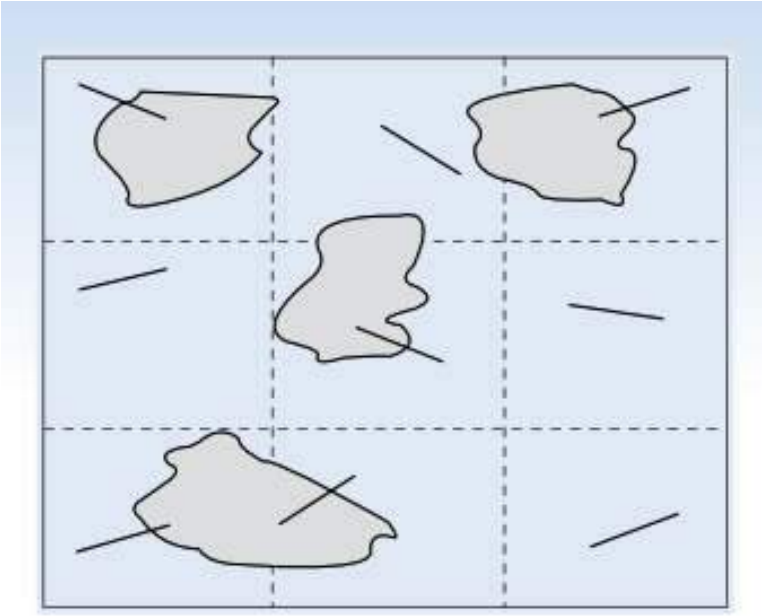


Figure 3. The area has been divided or 'stratified' into equal parts to ensure greater coverage from a limited number of sampling points.

Figure 3: Stratified sampling method (extract- Figure 3: Auld, B 2009)

Mapping an entire site accurately for weeds and native vegetation would not normally be attempted except for very small sites. So, maps would not usually form part of a quantitative monitoring program but could be used to indicate gross changes in vegetation cover, if updated over time (Auld, B. 2009).

A combination of three (3) survey methods was used to measure non-native plant coverage across the Burnett Creek offset site including, MQHA, targeted weed transects (stratified sampling) and mapping of ground-truthed weed extent. All of these survey techniques were used to complement one another to build a baseline measurement to ensure improvements can be measured over the offset site management period.

Weed coverage has been incorporated into the 100m x 20m plot performed for MHQA (refer **Section 3.3.1**). All non-native plant cover was assessed by estimating the cover of exotic species over the 100 m x 20 m plot and is recorded as a percentage of overall vegetation. This data is recorded within Part E of the habitat quality assessment sheet records the non-native plant species and percentage of cover (refer to **Appendix B**).

Targeted weed transects were also conducted across the Burnett Creek offset site. As discussed, transects were stratified across the offset site to sample each offset site using the RGB approach. Each transect was 100m in length and estimated the abundance of non-native plant cover. This is most conveniently done by measuring their ground cover which is the perpendicular projection of aerial parts of plants on to the ground, for a given area this is often measured as a percentage of the whole area (refer to **Figure 2**).

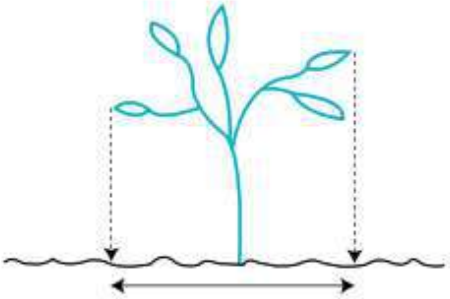


Figure 5. Ground cover of a plant indicated by the horizontal arrowed line.

Figure 4: Measuring ground cover (extract- Figure 5: Auld, B. 2009)

The width of a transect can be reduced to a single line: a line-transect. Using a tape measure stretched between two fixed points as a line-transect is a convenient way to estimate cover of different species as lengths along the tape (refer to **Figure 3**). This technique was applied to the Burnett Creek offset site.

Figure 8. Using one edge of a tape measure to estimate the percent cover of flatweed or cat's ear amongst grass and plant litter.

Figure 5: Line transect methodology (extract- Figure 8: Auld, B. 2009)

Further, where patches of weed cover were identified within the Burnett Creek offset site, these were located using a hand-held GPS. Sampling points overlap a number of these patches providing further detail for future site management.

2.6. Non-native Koala Predator Survey

To address Condition 6 (e) and (f) an assessment of non-native Koala predators was conducted via the use of camera trapping along with assessing and recording evidence of predators (e.g. scats, tracks, den count and traces) and/or Koala mortalities attributable to predators. Non-native Koala predators means any animal not native to Australia that is known to predate on Koalas of any age.

Camera traps have the advantage of potentially obtaining a wide range of significant information. Automatic camera systems are triggered by an animal passing in front of a sensor that detects movement, changes in ambient light, or a thermal differential (Moen & Lindquist 2004). Cameras allow for the detection of species that are difficult to study due to their elusive and nocturnal habits (Mace *et al.* 2004). They are less time consuming, less costly, and less invasive than long-term direct observation of animals. They are also beneficial in studying animals in inaccessible or difficult to access locations such as dens and nest cavities, or in rugged terrain (Mace *et al.* 1994). In addition, they enable the collection of valuable information about multiple species within any given community (Rosellini *et al.* 2008) and provide data that is more permanent and less disputable than data gathered by direct observation.

The use of camera trapping and den count is considered to be an effective method in capturing, assessing and monitoring pest management.

Motion-triggered infrared camera trap

Camera trapping involves setting up a fixed motion-triggered infrared camera to capture images or video of animals which pass in front of camera or are lured by bait. This set-up identifies fauna activity beyond the scope of direct observational studies and in the absence of potential observer impacts.

Infrared sensing cameras with an infrared flash were deployed, which use motion to trigger. Cameras were attached 30-50 cm from the ground on a tree or post, and directed towards the bait which is placed about 1.5-2 m from the mounted camera. The bait generally consisted of chicken bones/carcasses. The programming was consistent across all cameras, and cameras were set up in a consistent manner to maintain similar detection probabilities. For detecting Koala predators, cameras were placed in the vicinity of an animal trail. Cameras may be placed in alternate locations where active trails are identified.

Again, this survey was used in combination with the RGB approach, stratifying the survey over the Burnett Creek property. Six (6) cameras were deployed across the Burnett Creek property, four (4) located within the Burnett Creek offset site between 8 April and 13 May 2021.

As discussed within **section 2.1**, the number of cameras deployed at the Burnett Creek property were determined using the 350m grid to stratify sampling, reducing bias and increasing repeatability. Grid cells were separated by 350m for monitoring across the Burnett Creek property after a literature review of home ranges for targeted species, being Koala (SAT), cat, dog and foxes (non-native koala predators).

A relative abundance index (RAI) is to be calculated for non-native Koala predators, cats, dogs and foxes, using the formula RAI= D/TN x 100, where D is numbers of detection and TN is the total number of camera-trap days

(all cameras combined). This methodology ensures that the surveys are representative of the entire offset site and repeatable for future monitoring requirements.

Figure 6: Camera trap set-up at Burnett Creek offset site (Camera 3).

Further, a non-native predator control program is to be implemented (to be outlined in the Offset Management Plan). Throughout the duration of control program, the results of each trapping, baiting and shooting event will be reported to provide evidence that progress is made towards achieving the targets outlined within approval Conditions 6 (e) and (f). This will be shown through a decrease in records of lethal predator control.

2.7. Limitations

Direct observation of koalas is most successful when conducted between August and January as resident females with back-young are more easily observed during this time (DoE 2013). This survey work occurred between 8 April – 27 May 2021 and therefore reduced detectability and lower activity levels was an expected limitation.

High rainfall can impact surveys as it can interfere with placement of faecal pellets and/or speed up decomposition. According to the Bureau of Meteorology (BoM) Wilsons Peak (the nearest weather station to the Burnett Creek offset site) received 367.4 mm rainfall from in March 2021, more than double the monthly average (139.4 mm). Therefore, faecal pellets may have been washed away by surface runoff in the lead up to the survey and/or experienced an increased rate of decomposition. Additionally, approximately 56.4 mm of rainfall was received throughout May 2021 during the SAT surveys further reducing detectability.

Droughts can also impact surveys as Koalas move away from their core habitat to find food and habitat. Historically Wilsons Peak's mean rainfall for summer (December to February) is 472 mm. The same period in 2020-2021 recorded 456 mm which is largely consistent with the average suggesting sampling was representative of the typical conditions.

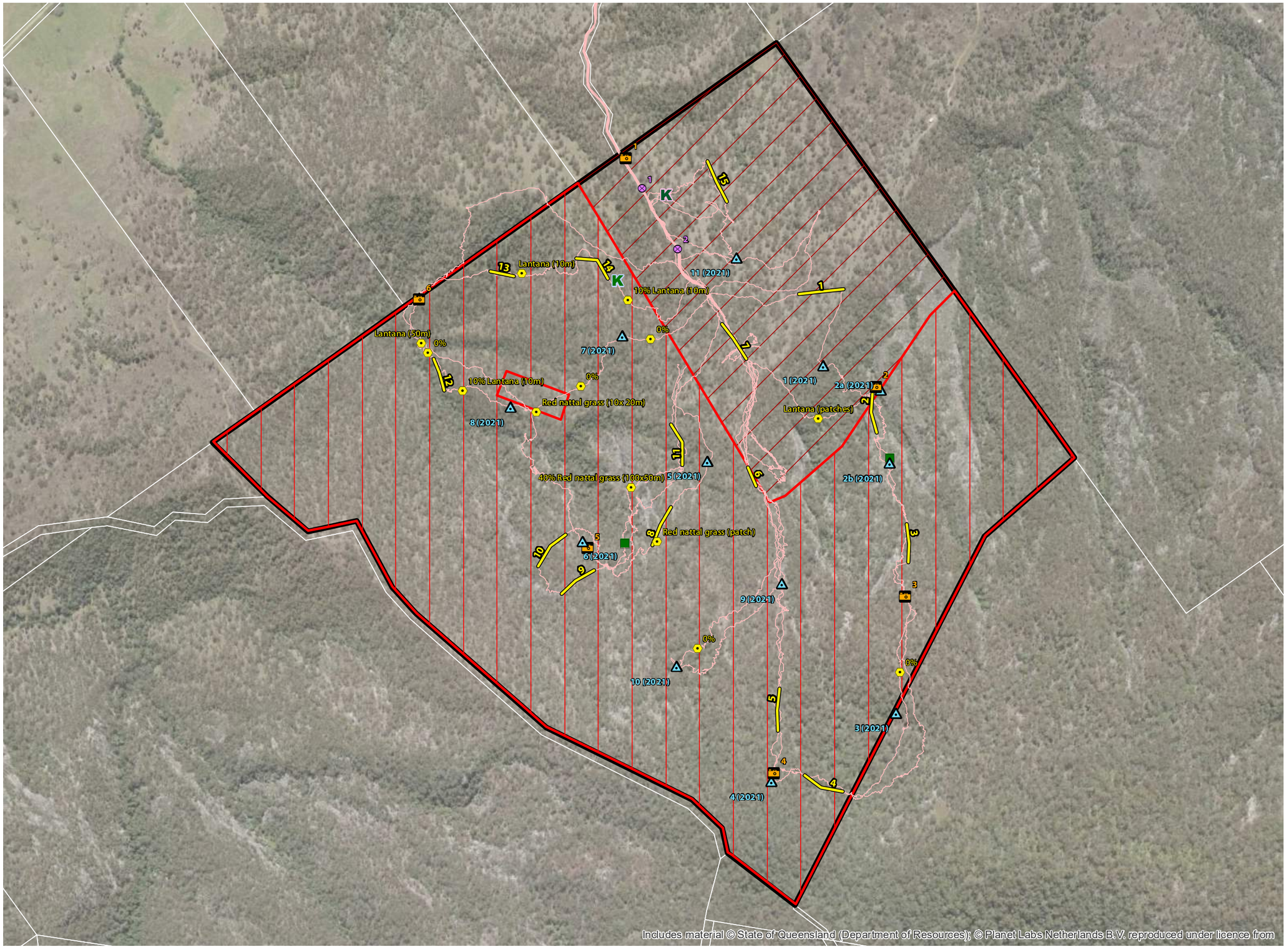
During camera trap surveying, an attempt to capture every animal several times over should be made to increase probability of species identification, however this could lead to individuals being counted multiple times. This limitation is moderated by camera set-up using bursts settings and the implementation of an independence threshold of two (2) minutes. Therefore, every observation of an animal two (2) minutes after the first observation is considered a new observation. Additionally, for the Burnett Creek the entire property has been sampled as vertebrate pest management should apply a landscape-wide approach if possible.

As noted within the *Survey Guidelines for Australia's threatened manmmals* (Department of Sustainability, Environment, Water, Pollution and Communities, 2011), the time taken to effectively search a subject site varies considerably according to the size and nature of the area. For large sites and remote areas, such as the Burnett Creek offset site, constraints required the identification of potential habitat resources through ground-truthing after reviewing vegetation maps, aerial photographs and imagery. The size and topography of the offset site contributed to time constraints limiting the search area. This limitation was reduced with the use of AUs and the RGB approach, ensuring results are representative of the entire area.

The terrain across the Burnett Creek is difficult to traverse with numerous ridges and cliff faces. As such, where possible surveys were conducted as close as possible to points dictated by the 350m grid applied.

It is noted that some surveys were not conducted during peak activity seasons (Spring & Summer) however this is not expected to impact the baseline fauna or flora survey results as resident populations would be present on-site and flowering and fruiting species are identifiable within off-peak seasons. It is recommended future monitoring is conducted within the optimal seasons to ensure overall site variability is captured over the management period.

1. Survey Effort



Legend

- Qld DCDB
- Offset site DCDB
- Existing legally secured offset area (2019/000446)
- Offset area (150.497 ha)
- Motion detection camera
- Grey-headed Fly-fox Survey
- Koala (female)
- Koala (male)
- Koala scat
- SAT
- Weed observations
- Weed transect
- GPS Tracklog

0 100 200 300 400 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:9,000 @ A3

N

Issue	Date	Description	Drawn	Checked
B	27/07/2021	Preliminary	TC	LT

ENVIRO CAPITAL

on behalf of
Pointcorp Heritage
Park Pty Ltd

NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey.

Layer Sources
Qld State Cadastre and Mapping layers © State of Queensland (Department of Natural Resources and Mines) 2021. Updated data available at http://qldspatial.information.qld.gov.au/catalogue//

3. Baseline Survey Results

3.1. Species Stocking Rate

As outlined within Section 2 above, the species stocking rates for Koala and GHFF were incorporated into the MHQA. This section discusses the survey results required to calculate the species stocking rates for both Koala and GHFF.

3.1.1 Koala

To satisfy the approval conditions, a baseline koala density survey is required to measure progress towards achieving the performance criteria as prescribed within the approval conditions (ref. EPBC 2017/8090). The Burnett Creek offset site was surveyed using direct methods, including, diurnal searches and opportunistic observations during other survey works.

Diurnal searches and opportunistic observations resulted in the identification of two (2) Koalas. One (1) Koala (adult male) was identified within the Burnett Creek offset site, another Koala (adult female) was identified within the wider Burnett Creek property external the offset site (refer **Plan 8**).

Table 9: Direct Koala observations summary

Location	Date	Age	Sex
Burnett Creek offset site	13/05/2021	Adult	Male
Burnett Creek property	27/05/2021	Adult	Female

Photo Set 3: Koalas recorded within Burnett Creek property. Adult male located within the Burnett Creek offset site (left) and adult female located external the Burnett Creek offset site (right).

Indirect methods can be used to determine presence/absence of fauna. Indices using animal signs including scats, tracks and scratches can indicate species presence and habitat use. Koala activity levels and density were determined by utilising SAT. Surveys are undertaken in accordance with the methodology developed by Phillips and Callaghan (2011) and specified in the *EPBC Act Referral Guidelines for the Vulnerable Koala*. The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage and is therefore uses indices to determine presence/absence. Phillips & Callaghan (1995) found this technique is suitable for use in conjunction with stratified/random or systematic survey techniques but has proved especially powerful when applied at the landscape-scale using a RGB sampling design and appropriate spatial modelling techniques.

RGB-SAT sampling aims to provide a simple, unbiased and robust sampling tool that addresses the issue of determining and delineating koala metapopulation boundaries for the purposes of providing conservation and planning certainty (Phillips, S. and Hopkins, M. 2007). A systematic approach was used to survey for evidence of koala activity. In order to ensure a uniform and unbiased distribution of sampling effort throughout the study area, a 350m x 350m grid was applied on a map of the Burnett Creek property and the resulting grid-cell intersections selected as sampling.

Eleven (11) SAT surveys were completed across the Burnett Creek property in May 2021, eight (8) of which are located within the Burnett Creek offset site. Ten (10) SAT surveys were completed within the remnant mapping, and one (1) within the non-remnant mapping. All, except one (1) within remnant vegetation, yielded a 'low Koala activity level' result (based on East Coast med-high area/density) (Phillips and Callaghan 2011) (refer to **Table 10**). Refer to **Appendix A** for raw SAT data.

Table 10: SAT Survey Summary – Burnett Creek

SAT	Date	Total Percentage	Vegetation Status	Activity Category	Within Offset Site
1	6 May 2021	6.67%	Remnant	Low	
2	6 May 2021	3.33%	Remnant	Low	
3	6 May 2021	0%	Remnant	Low	✓
4	6 May 2021	0%	Remnant	Low	✓
5	7 May 2021	3.33%	Remnant	Low	✓
6	7 May 2021	0%	Remnant	Low	✓
7	13 May 2021	16.67%	Remnant	Low	✓
8	13 May 2021	6.67%	Remnant	Low	✓
9	27 May 2021	10.00%	Remnant	Low	✓
10	27 May 2021	23.33%	Remnant	Medium (Normal)	✓
11	27 May 2021	16.67%	Non-remnant	Low	

The usage of this methodology detailed by Phillips and Callaghan (2011) is considered an effective way of accurately gauging Koala density within a site. However, there are limitations to the method including the mobility of Koalas, total number entering and exiting the site, and mortality rates. However, given the time of year these surveys were undertaken (off-peak season) it can be assumed that the results are representative of the resident Koalas which would inhabit that offset site year-round and are not transient individuals which come and go during mating season (August to February). Other factors which may contribute to the low scores include the difficulty in identifying scats using the SAT method. This method relies heavily on the observer's ability to spot scat amongst ground cover which can vary significantly between SAT locations. Cristescu *et al.* 2012, found that detectability varied up to 16% between plots of different ground cover.

The Koala SAT survey methodology is considered an accurate technique when estimating low-density Koala populations (Mossaz 2010). Research by Rhodes *et al.* (2015) indicates that within the Ipswich region the Koala density is approximately 0.03 Koalas/ha. Rhodes *et al.* (2015) attribute the low population density to a negative relationship identified between temperature and Koala densities. Therefore, when estimating a Koala density in an area that is known to be 'low', the SAT survey methodology is considered to provide an accurate determination on the activity levels (Mossaz 2010).

As there was only one (1) observation across the Burnett Creek offset site, Koala carrying capacity has been estimated using SAT survey results, scientific literature and data for the SEQ Koala population. The Koala carrying capacity has been estimated in the MHQA to coincide with the latest available published scientific literature and data for the SEQ Koala population.

A recent study undertaken by Rhodes *et al.* (2015) revealed that the density of Koala populations in SEQ ranges from 0.004 Koalas/ha to 6.54 Koalas/ha, with the average Koala density across the region being 0.04 Koalas/ha. These findings are supported by Melzer *et al.* (1994) who indicates that the Koala population in SEQ ranges from 0.005 Koalas/ha to 2.5 Koalas/ha. The more recent study by Rhodes *et al.* (2015) found that the negative relationship between temperature and Koala densities is consistent with other studies elsewhere (Adams-Hosking *et al.* 2011, Lunney *et al.* 2014) and is associated with low Koala densities in the Ipswich City Council region, where temperatures are relatively high. Within the Ipswich City Council region, the Rhodes *et al.* (2015) study detected thirty-six (36) Koalas over 1,078 transect hectares, resulting in a Koala density of 0.033 Koalas/ha.

Using the available published scientific literature and SAT results (refer to **Table 10**), it can be inferred that the Burnett Creek offset site demonstrates low Koala activity levels (Phillips *et al.* (2011), and therefore contain an estimated Koala density ranging from 0.02 to 0.08 Koalas/ha. Therefore, using these Koala density estimations and Koala habitat, 150.497 ha, the offset site has an estimated Koala carrying capacity of between three (3) and twelve (12) (refer to **Table 11**). It should be noted that due to the lack of available published scientific literature of Koala densities in SEQ, these carrying capacity estimates are subject to ongoing adaptive management as data and scientific literature becomes available.

Table 11: Offset Site Koala Carrying Capacity Estimate

Offset Site	Area (ha)	Density (Koalas/ha)	Carrying Capacity (Koalas)
Burnett Creek	150.497 ha	0.02 to 0.08	3 (3.009)– 12 (12.039)

3.1.2 Grey-headed Flying-fox

The GHFF occupies most areas in their distribution in highly irregular patterns, and therefore surveys based on animal sightings are unlikely to be reliable. A more effective survey method is to search appropriate databases and other sources for the locations of camps, and to conduct vegetation surveys to identify feeding habitat. As discussed in **Section 2.4**, the following methods in accordance with the *Survey guidelines for Australia's threatened bats* of were employed:

1. Prior to the survey.

   A review of known flying fox camps was conducted for the project area, and the wider general area (refer to **Section 4.3**).
2. Daytime field surveys for camps.

   Surveying for Flying-fox camps is considered to be appropriate through walking transects, watching for flying bats and listening for their distinctive calls. Due to the distinctness and clear visibility of flying-fox camps, GHFF presence was assessed by focusing on daytime field surveys for camps, in conjunction with vegetation surveys/habitat assessment as per **Section 3.4**.
3. Surveys of vegetation communities and food plants.

   Foraging habitat assessments were conducted and are discussed in **Section 3.3.**
4. Night time surveys.

   Evening searches were also conducted via walking transects and spotlighting whilst walking transects can survey for individuals using the site for foraging purposes. Flying-fox camp investigations were completed for known camps in the nearby area to confirm GHFF presence/absence, and were undertaken during the day when flying-fox are typically roosting.

<u>Desktop Review</u>

This species roosts in large aggregations or camps in close proximity (20 km or less) to a regular food source, often in stands of riparian rainforest, Paperbark or Casuarina forest (Eby, 1995). Camps provide resting habitat, sites of social interactions and refuge for animals during significant phases of their annual cycle, such as birth, lactation and conception (Parry-Jones and Augee 1992).

The GHFF occurs in the coastal belt from Rockhampton in central Queensland to Melbourne in Victoria (Tidemann, 1998; refer to **Figure 7**). However, only a small proportion of this range is used at any one time, as the species selectively forages where food is available. As a result, patterns of occurrence and relative abundance within its distribution vary widely between seasons and between years. At a local scale, the species is generally present intermittently and irregularly (Eby & Lunney 2002). At a regional scale, broad trends in the distribution of plants with similar flowering and fruiting times support regular annual cycles of migration (Eby & Lunney 2002). It is infrequently found west of the Great Dividing Range (Tidemann 1998). The species occurs

at a higher latitude than any other megachiropteran (megabat) species (Aston 1987; Menkhorst & Dixon 1985; Parry-Jones & Augee 1991).

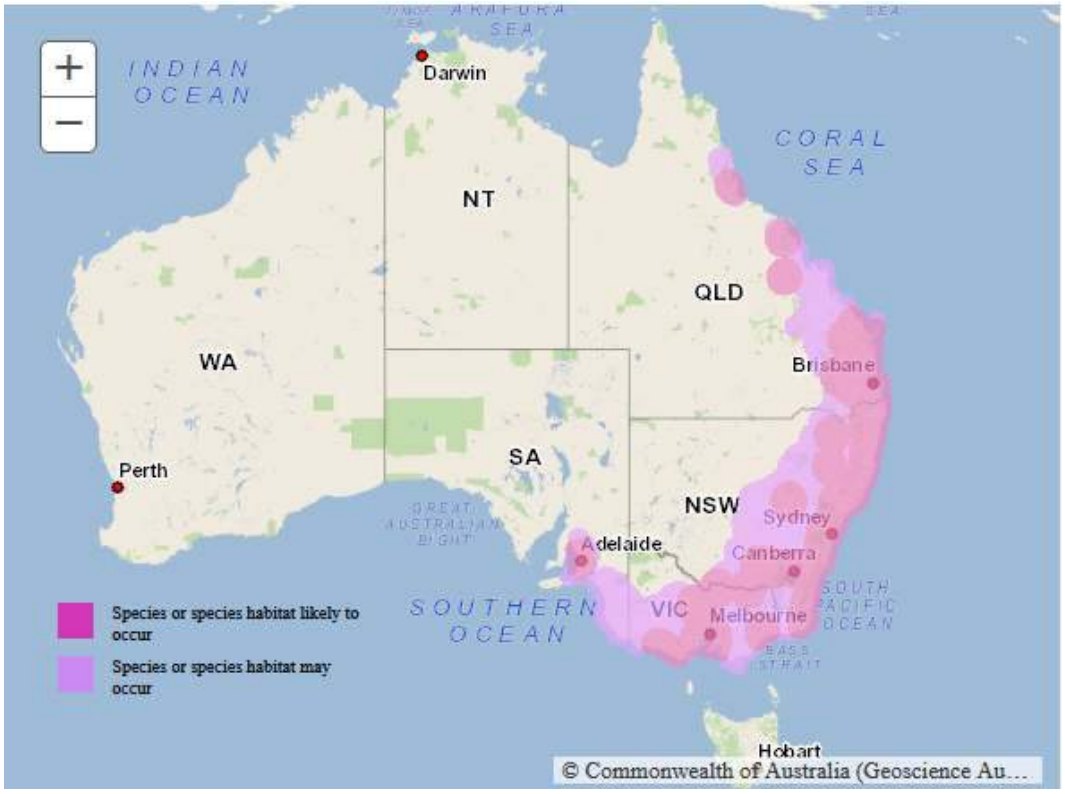


Figure 7: Grey-headed Flying-fox (*Pteropus poliocephalus*) Distribution Map (DAWE SPRAT, 2021)

A review of WildNet records indicate that the closet GHFF records occur within approximately 23km of the Burnett Creek site. Data derived from the DAWE national Flying-fox monitoring program indicates that three (3) flying-fox camps are known to occur within 25km of the Burnett Creek offset site, again one (1) of these is considered inactive (refer to **Table 12**).

Table 12: Flying-fox camps proximate Burnett Creek Offset Site (DAWE, 2021)

Camp ID	Location	Approximate Distance (km)	GHFF Records	BFF Records	Survey Date
551	Kooralbyn, Routley Drive	24.88	-	500-2,499	8/2020
568	Rathdowney, John street	22.87	Flying-fox camp has not been surveyed and is considered inactive		
289	Bicentenial Park, Boonah	24.82	2,500-9,999	2,500-9,999	5/2014

The Burnett Creek offset site contains suitable foraging habitat for the GHFF (refer to **Table 18**). RE mapping demonstrates that the site contains a variety of flowering and fruiting foraging species to support individuals

and larger populations. However, fruiting and flowering usually occurs between spring-autumn. These findings were ground-truthed through on-site surveys (refer to **Section 3.4**).

Table 13: Regional Ecosystem Summary – Burnett Creek offset site

VMA Status	RE	Description	AU
Category B	RE12.8.20	Shrubby woodland with *Eucalyptus racemosa subsp. racemosa* or *E. dura* on Cainozoic igneous rocks	1
Category B	RE12.9-10.2	*Corymbia citriodora subsp. variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks	2
Category B	RE12.11.3	*Eucalyptus siderophloia, E. propinqua* +/- E. *microcorys, Lophostemon confertus, Corymbia intermedia*, *E. acmenoides* open forest on metamorphics +/- interbedded volcanics	3

Site Surveys

A wide range of methods can be used to count bats. Murphy *et al.* (2008) identified just two methods that could be implemented rapidly and at large spatial scales; fly-out counts, where animals are counted in the air as they exit a camp, and ground counts, where animals are counted during the day in the camp. Following review of recommended methodologies for population density calculations within provided by CSIRO (A monitoring method for the Grey-headed Flying-fox, (*Pteropus poliocephalus)* (Westcott *et al.* 2011)), fly-out counts and ground-counts relating to flying-fox exiting camps and being situated within camps during the day were considered suitable for estimating abundance.

The offset site was traversed by foot to identify GHFF presence or absence in the form of camps on-site. DAWE determined that the development was a controlled action as it will result in the clearing of vegetation identified as suitable foraging habitat for the GHFF (EPBC2017/8090). As such, the approved development does not directly impact on this species as no roosts/camps were identified within the impact site. Therefore, the GHFF foraging habitat assessment is considered more important in regard to the offset requirements.

The methods utilised for the GHFF presence survey included desktop and a range of on-site surveys in accordance with the *Survey guidelines for Australia's threatened Bats*. Although some fruiting and flowering species were identified on-site, future surveys should be conducted during peak flowering and fruiting seasons (Spring and Summer) to ensure individuals foraging on-site are captured.

3.2. Modified Habitat Quality Assessment

3.2.1 Koala

A total of eight (8) MHQAs were conducted across the Burnett Creek offset site, with the first seven (7) completed in June 2019, and the one (1) completed in February 2020. Three (3) were conducted in AU1 and AU2 and two (2) conducted within AU3 being the smaller unit (refer **Appendix B** for results data, and Error! Reference source not found. for results summary).

The Burnett Creek offset site scored a 2.57 out of 3 for site context based on 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 (refer to **Plan 2** for context analysis). The site condition, site context score and species stocking rate (2.29 out of 3) combined to provide a habitat quality score of 6.67 (rounded to 7.00).

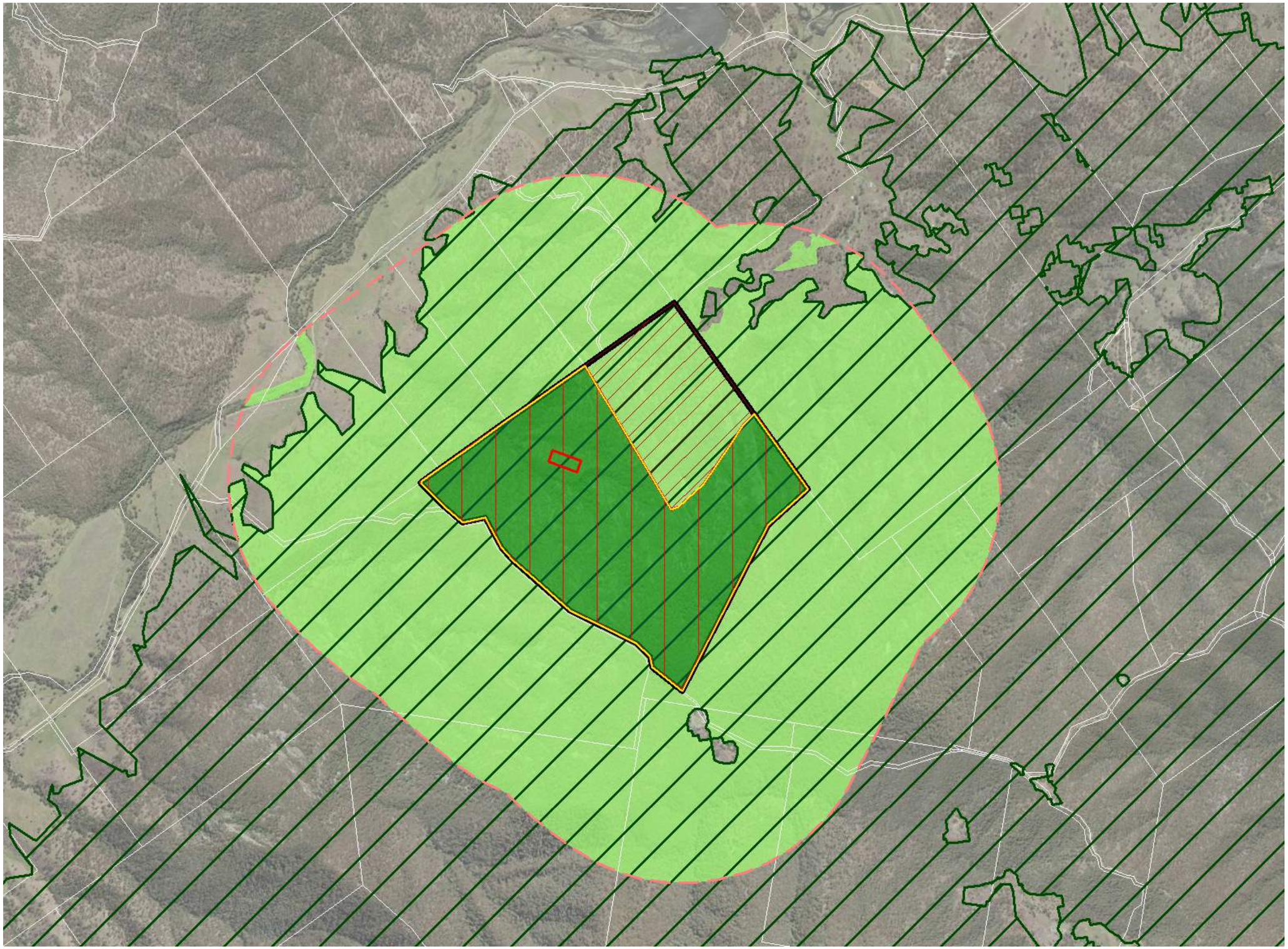
Table 14: Modified Habitat Quality Assessment Tool (non-remnant) [Koala]

Attribute	Condition Characteristics	AU1 Score (RE12.8.20)	AU2 Score (RE12.9-10.2)	AU3 Score (RE12.11.3)
Site Condition (30%)	Recruitment of woody perennial species in EDL	3.67/5	2/5	0/5
	Native plant species richness – trees	3.33/5	3.33/5	3.75/5
	Native plant species richness – shrubs	2.5/5	1.67/5	1.25/5
	Native plant species richness – grasses	2.5/5	3.33/5	2.5/5
	Native plant species richness – forbs	2.5/5	2.5/5	1.25/5
	Tree canopy height	5/5	5/5	5/5
	Tree canopy cover	4/5	4.17/5	4.5/5
	Shrub canopy cover	5/5	4.33/5	3/5
	Native grass cover	4.33/5	3.67/5	5/5
	Organic litter	3/5	4.33/5	3/5
	Large trees	3.33/15	5/15	7.5/15
	Coarse woody debris	2/5	4/5	2/5
	Non-native plant cover	8.33/10	8.33/10	10/10
	Quality and availability of food and foraging habitat	5/10	5/10	5/10

Attribute	Condition Characteristics	AU1 Score (RE12.8.20)	AU2 Score (RE12.9-10.2)	AU3 Score (RE12.11.3)
	Quality and availability of shelter habitat	5/10	5/10	5/10
	Site Condition Score	**60/100**	**62/100**	**58.75/100**
	Site Condition Score (out of 3)	**1.79**	**1.85**	**1.76**
Site Context (30%)	**Size of the patch**	10/10	10/10	10/10
	Connectedness	5/5	5/5	5/5
	Context	5/5	5/5	5/5
	Ecological corridors	6/6	6/6	6/6
	Role of site location to species overall population in the State	5/5	5/5	5/5
	Threats to the species	7/15	7/15	7/15
	Species mobility capacity	10/10	10/10	10/10
	Site Context Score	**48/56**	**48/56**	**48/56**
	Site Context Score (out of 3)	**2.57**	**2.57**	**2.57**
Species Stocking Rate (40%)	**Presence detected on or adjacent to site (neighbouring property with connecting habitat)**	10	10	10
	Species usage of the site (habitat type & evidenced usage)	15	15	15
	Approximate density (per ha)	10	10	10
	Role/importance of species population on site	5	5	5
	Species Stocking Rate Score	**40/70**	**40/70**	**40/70**
	Species Stocking Rate Score (out of 4)	**2.29**	**2.29**	**2.29**
Site Condition Score		**1.79**	**1.85**	**1.76**
Site Context Score		**2.57**	**2.57**	**2.57**
Species Stocking Rate Score		**2.29**	**2.29**	**2.29**
Habitat Quality Score		**6.64**	**6.71**	**6.62**
Assessment Unit Area (ha)		**60**	**70.42**	**20.89**

Attribute Condition Characteristics	AU1 Score (RE12.8.20)	AU2 Score (RE12.9-10.2)	AU3 Score (RE12.11.3)
Total offset area (ha)	**151.3**	**151.3**	**151.3**
Assessment Unit Size Weighting	**0.40**	**0.47**	**0.14**
Weighted Habitat Quality Score	**2.63**	**3.12**	**0.91**
Score	**6.67 (rounded to 7)**		

2. Koala Context Assessment



Legend

- Qld DCDB
- Offset site DCDB
- Existing site VDEC
- Offset area (150.497 ha)
- Koala critical habitat onsite
- 1km buffer
- Percentage of area boundary length connecting habitat critical to the survival of the Koala on and off site – 100%
- Percentage of habitat critical to the survival of the Koala within 1 km of the area (92%)
- Size of habitat critical to the survival of the Koala patch >200m corridor connectivity (>10,000 ha)

0 200 400 600 800 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:20,000 @ A3

N

Issue	Date	Description	Drawn	Checked
B	27/07/2021	Preliminary	TC	LT

ENVIRO CAPITAL

on behalf of
Pointcorp Heritage
Park Pty Ltd

NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey.

Layer Sources
Qld State Cadastre and Mapping layers © State of Queensland (Department of Natural Resources and Mines) 2021. Updated data available at http://qldspatial.information.qld.gov.au/catalogue//

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

3.2.2 Grey-headed Flying-fox Foraging Habitat

As discussed within **Section 3.2**, a total of eight (8) MHQAs were conducted, with three (3) were conducted in AU1 and AU2 and two (2) conducted within AU3 being the smaller unit. GHFF foraging habitat assessments were conducted in conjunction with each of these transects (refer **Appendix C** for results data **Table 15** for results summary).

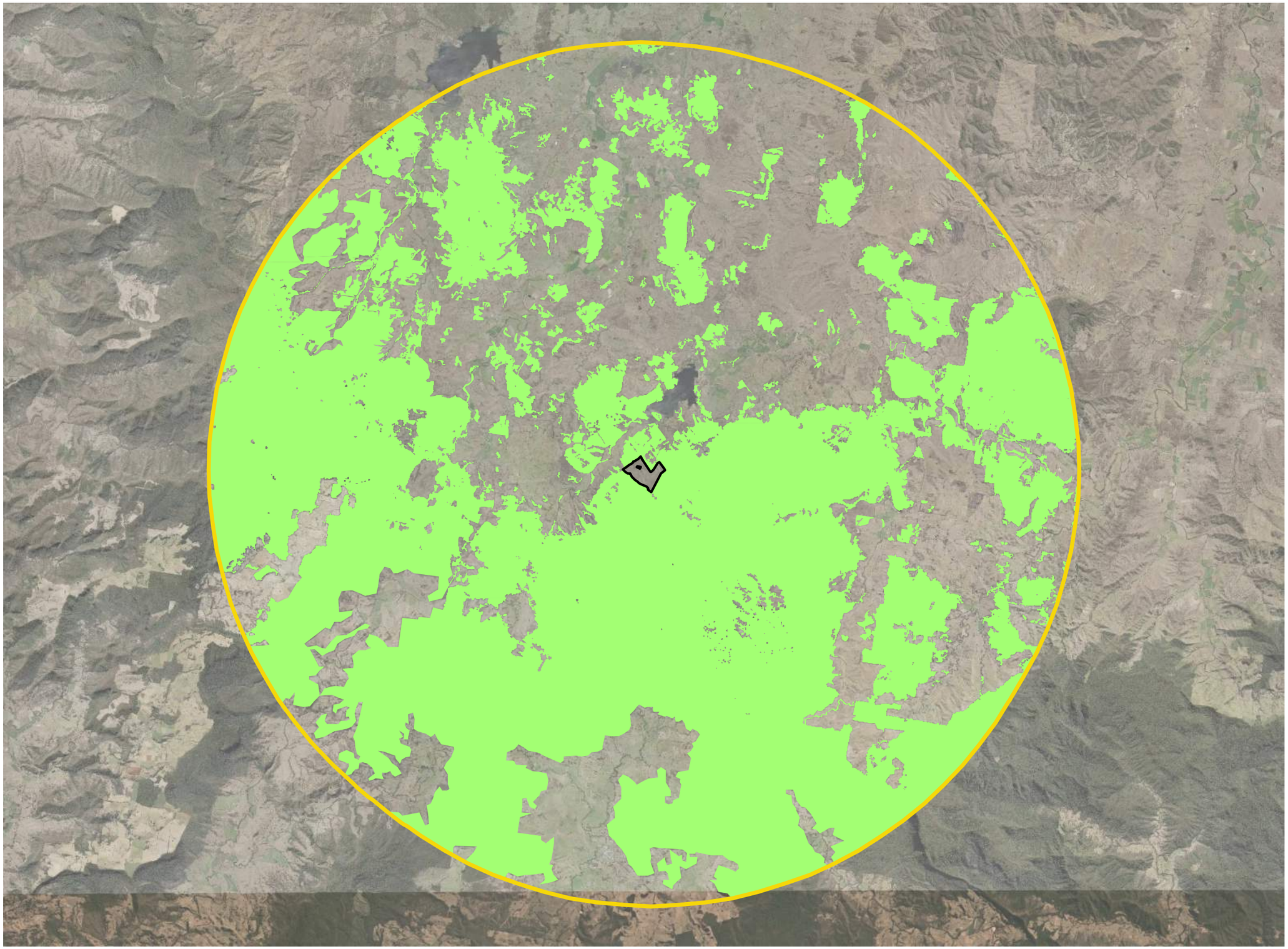
The Burnett Creek offset site scored a 1.55 out of 3 for site context based on size of patch, connectedness, context, ecological corridors, role of site location to species overall population in the State and threats to the species (refer to **Plan 3** for context analysis). Species stocking rate was consistent between AU1 and AU2, however significantly increased within AU3 yielding 0.6 out of 3 and 1.5 out of 3 respectively. The site condition, site context score and species stocking rate combined to provide a habitat quality score of 5.08 (rounded to 5).

Table 15: Burnett Creek Offset Site Grey-headed Flying-fox Habitat Quality

Attribute	Condition characteristics	AU1 Score (RE12.9-10.4)	AU2 Score (RE12.9-10.12)	AU3 Score (RE12.3.11)
Site Condition (40 %)	Vegetation Condition	20/20	20/20	20/20
	Species Richness	11.67/20	13.3/20	15/20
	Flower Score	6/10	6/10	5/10
	Timing of Biological Shortages	10/10	10/10	8.75/10
	Quality of Foraging Habitat	3.33/20	5/20	5/20
	Non-native Plant Cover	16.67/20	16.67/20	20/20
	Site condition score	67.67/100	71/100	73.75/100
	Site condition score (out of 4)	**2.71**	**2.84**	**2.95**
Site Context (30 %)	Size of the patch	10/10	10/10	10/10
	Connectedness	0/10	0/10	0/10
	Context	6/10	6/10	6/10
	Ecological corridors	10/10	10/10	10/10
	Role of site location to species overall population in the State	0/10	0/10	0/10

Attribute	Condition characteristics	AU1 Score (RE12.9-10.4)	AU2 Score (RE12.9-10.12)	AU3 Score (RE12.3.11)
	Threats to the species	5/10	5/10	5/10
	Site context score	31/60	31/60	31/60
	Site context score (out of 3)	**1.55**	**1.55**	**1.55**
Species Stocking Rate (30 %)	GHFF large trees	2/10	2/10	5/10
	Species stocking rate score	0.6/10	2/10	5/10
	Species stocking rate score (out of 3)	**0.6**	**0.6**	**1.5**
Total quality score		4.86	4.99	6.00
Assessment unit area		60	70.42	20.89
Total offset area		151.3	151.3	151.3
Size Weighting		0.40	0.47	0.14
Area weighted score		1.93	2.32	0.83
Total (out of 10)		**5.08 (rounded to 5)**		

3. Grey-headed Flying-fox Context Assessment



Legend

- Offset area (150.497 ha)
- 20km Context buffer
- Percentage of GHFF habitat in 20km context area from offset area is 55%
- GHFF roost camp - recently recorded activity (no records)
- GHFF roost camp - level 3 =< population recently recorded (no records)

0 2 4 6 8 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

N

Issue	Date	Description	Drawn	Checked
B	27/07/2021	Preliminary	TC	LT

ENVIRO CAPITAL

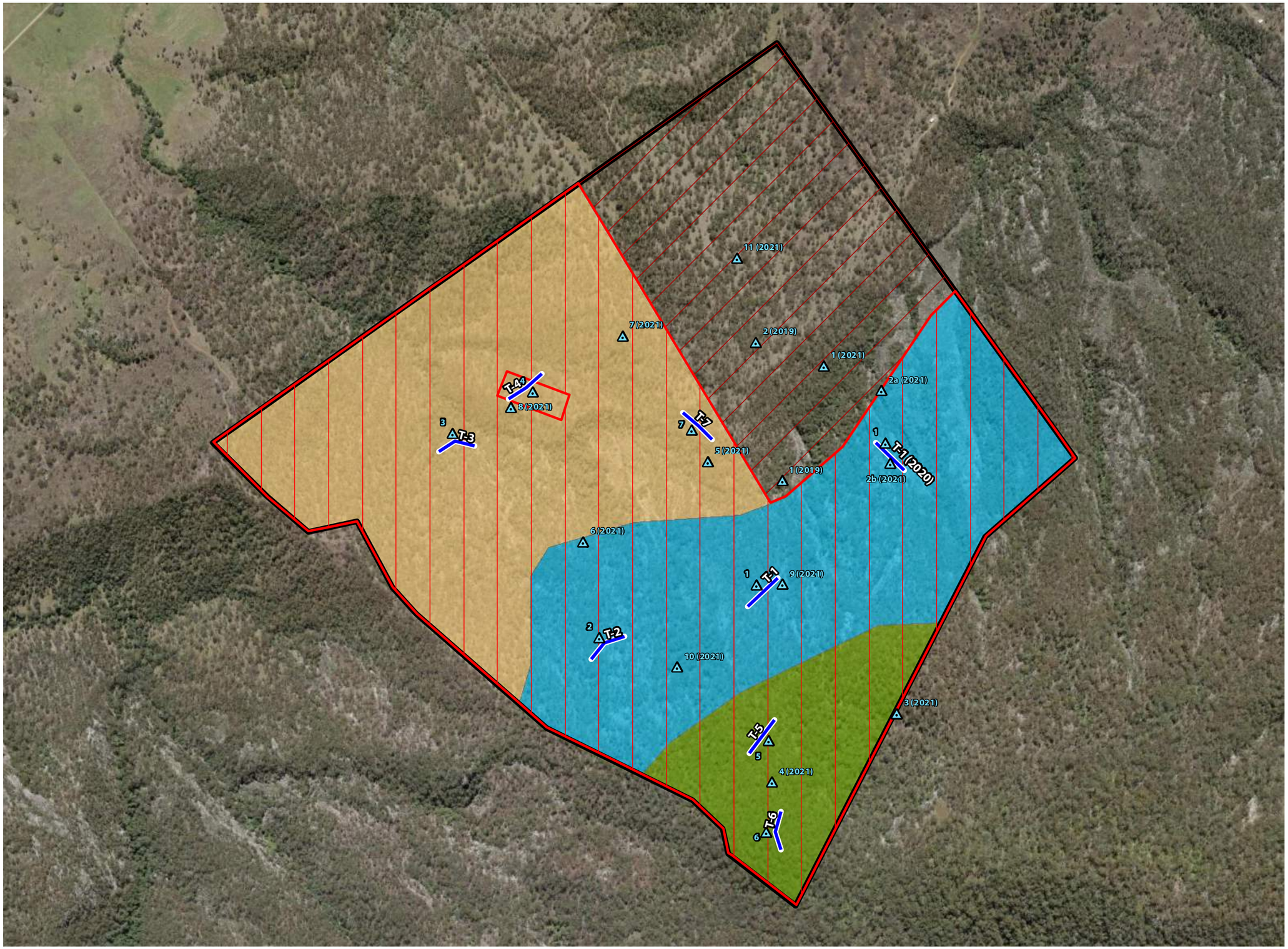
on behalf of
Pointcorp Heritage
Park Pty Ltd

NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey.

Layer Sources
Qld State Cadastre and Mapping layers © State of Queensland (Department of Natural Resources and Mines) 2021. Updated data available at http://qldspatial.information.qld.gov.au/catalogue//

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

4. Habitat Quality Survey



Legend

- Offset site DCDB
- Existing legally secured offset area (2019/000446)
- Offset area (150.497 ha)
- Habitat quality transects
- SAT survey

Assessment Units

- Unit 1 - 60 ha
- Unit 2 - 70.42 ha
- Unit 3 - 20.89 ha

0 100 200 300 400 m

N

Transverse Mercator | GDA 1994 | Zone 56 | 1:9,000 @ A3

Issue	Date	Description	Drawn	Checked
B	28/07/2021	Preliminary	TC	LT

ENVIRO CAPITAL

on behalf of
Pointcorp Heritage
Park Pty Ltd

NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey.

Layer Sources
Qld State Cadastre and Mapping layers © State of Queensland (Department of Natural Resources and Mines) 2021. Updated data available at http://qldspatial.information.qld.gov.au/catalogue//

3.3. Weed Cover

Weed cover across the Burnett Creek property were recorded using three (3) complimentary techniques; MQHA, targeted weed transects, and locating and mapping weed cover extents (refer to **Section 2.7** for survey methodology).

The MHQA surveyed weed cover simultaneously with other habitat quality indicators across the Burnett Creek offset site. A summary of these results are provided in **Table 16**. The average across the Burnett Creek offset site within the MQHA transects is 1.61%. These surveys are easily repeated to ensure non-native plant cover over the offset site decreases over the management period.

Table 16: MHQA Non-native Plant Cover Summary – Burnett Creek Offset Site

AU	Area (ha)	Transect ID	Vegetation Status	RE	Non-native plant cover (%)
1	59.99 ha	T1 (2020), T1 & T2	Remnant	RE12.8.20	2.25%
2	70.42	T3, T4 & T7	Remnant	RE12.9-10.2	2.6%
3	20.89	T5 & T6	Remnant	RE12.11.3	0.0%
Offset Site Average					**1.61%**

Fifteen (15) weed cover transects were conducted across the Burnett Creek property, twelve (12) of which are located within the Burnett Creek offset site. These transect differentiate between non-native plant cover and weeds of national significance (WONS). Utilising the weed cover methodology the average non-native plant cover and WONS is 5.96% and 2.66%, respectively (refer to **Table 17**). Transects 3, 8, 12 and 13 were recorded with greater than %5 non-native plant cover, the greatest of which was Transect 12 with 35%. A list of the recorded weed species is provided in **Table 18**. Refer to **Appendix D** for raw non-native plant cover transect data.

Table 17: Weed Cover Transects – Burnett Creek Offset Site

Transect ID	AU	Non-native plant cover (%)	WONS (%)
WT2	1	0.0%	0.0%
WT3	1	5.1%	2.1%
WT4	3	1.4%	0.0%
WT5	3	1.5%	0.0%
WT6	2	1.4%	0.3%
WT8	2	12.0%	0.0%
WT9	1	0.0%	0.0%

Transect ID	AU	Non-native plant cover (%)	WONS (%)
WT10	1	2.0%	0.0%
WT11	2	0.0%	0.0%
WT12	2	35.0%	27.5%
WT13	2	8.7%	2.0%
WT14	2	4.4%	0.0%
Offset Site Average		**5.96%**	**2.66%**

Table 18: Recorded Weed Species – Burnett Creek Offset Site

Scientific Name	Common Name	WONS
Bidens pilosa	Cobbler's Pegs	
Crassocephalum crepidioides	Thickhead	
Desmodium uncinatum	Silver-leaf Desmodium	
Heliotropium amplexicaule	Blue Heliotrope	
Lantana camara	Lantana	✓
Lantana montevidensis	Creeping Lantana	
Melinis repens	Red Natal Grass	
Passiflora suberosa	Corky Passion Vine	
Senecio madagascariensis	Fireweed	✓
Solanum nigrum	Blackberry Nightsahde	

Additionally, where patches of non-native plant cover were identified within the offset site, these were located with a hand-held GPS and the extent of the patch were mapped to guide future management actions within the Burnett Creek offset site (refer to **Plan 5**).

3.4. Non-native Koala Predator Survey

Field surveys did not identify any evidence of Koala mortalities.

Six (6) motion activated cameras were deployed across the Burnett Creek property, four (4) within the Burnett Creek offset site from 8 April to 13 May 2021. Surveys across the entire Burnett Creek property are relevant for the baseline surveys of the offset site and future monitoring and management actions to be implemented following the approval of the Offset Management Plan.

The Burnett Creek property cameras detected only one (1) individual non-native Koala predator over a total of 175 survey nights (refer to **Table 19**). Other native and non-native species were capture during this survey. A full list of animals captured throughout this survey is provided in **Appendix E**.

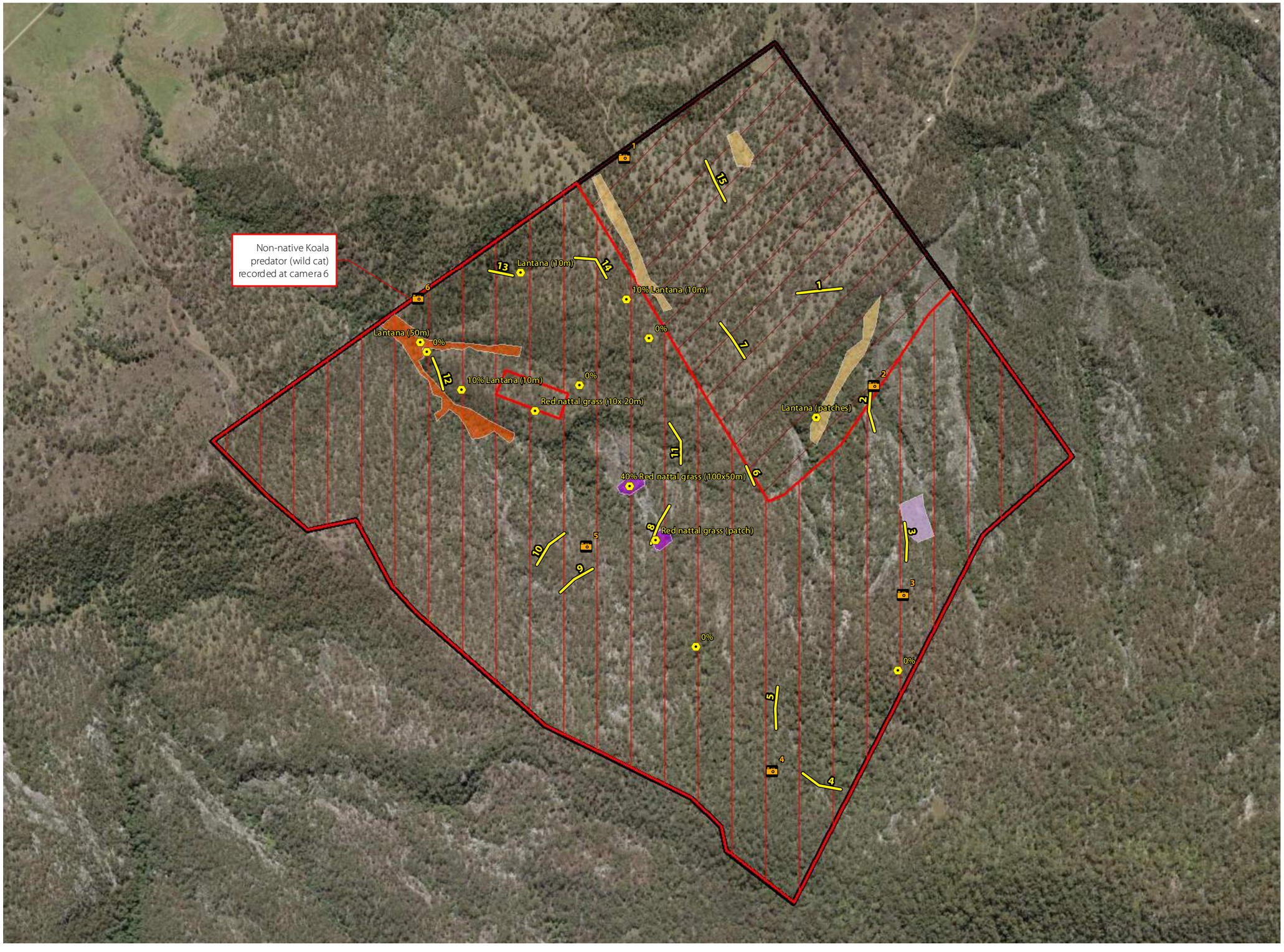
A relative abundance index (RAI) was calculated for non-native Koala predators, cats, dogs and foxes, using the formula RAI= D/TN x 100, where D is numbers of detection and TN is the total number of camera-trap nights (all cameras combined). Thus, the RAI for Burnett Creek property is **0.57**.

Table 19: Non-native Koala Predator Survey Results Summary – Burnett Creek property

Camera	Survey Duration (nights)	Species	Detection	Within offset site	RAI
1	28	Nil	-		
2	28	Nil	-		
3	28	Nil	-	✓	
4	28	Nil	-	✓	**0.57**
5	28	Nil	-	✓	
6	35	Cat (*Felis catus*)	1	✓	
Total	**175**		**1**		

Photo 1: Cat captured on Burnett Creek property Camera 6.

5. Non-native Plant and Predators



Legend

- Offset site DCDB
- Existing legally secured offset area (2019/000446)
- Offset area (150.497 ha)
- Motion detection camera
- Weed observations
- Weed transect
- Red natal grass - 20%
- Red natal grass - 5%
- Lantana - 50%
- Lantana - 10%

0 100 200 300 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:9,000 @ A3

N

Issue	Date	Description	Drawn	Checked
A	28/07/2021	Preliminary	TC	LT

ENVIRO CAPITAL

on behalf of
Pointcorp Heritage Park Pty Ltd

NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey.

Layer Sources
Qld State Cadastre and Mapping layers © State of Queensland (Department of Natural Resources and Mines) 2021. Updated data available at http://qldspatial.information.qld.gov.au/catalogue//

4. Reference List

Aston, H.I. 1987. Influx of the grey-headed flying-fox *Pteropus poliocephalus* (Chiroptera: Pteropodidae) to the Melbourne area, Victoria in 1986. *Victorian Naturalist*. 102:9-11.

Auld, B. 2009. Guidelines for monitoring weed control and recovery of native vegetation. New South Wales, Department of Primary Industries.

Cristescu, R., Goethals, K., Banks, P., Carrick, F., and Frere, C. 2012. Experimental evaluation of koala scat persistence and detectability with implications for pellet-based fauna census. International Journal of Zoology 2012: 1-12.

Department of Industry, 2017. NSW Wild Dog Management Strategy 2017-2021. State of New South Wales.

Dique, D., H. Preece & D. De Villiers (2003a). *Koalas in Pine Rivers Shire: distribution, abundance and management*. Brisbane, Queensland: Parks and Wildlife Service. Available from: http://www.derm.qld.gov.au/register/p00718aa.pdf.

Dique, D.S., J. Thompson, H.J. Preece, D.L. de Villiers & F.N. Carrick (2003b). Dispersal patterns in a regional koala population in south-east Queensland. *Wildlife Research*. 30:281-290.

Eby, P. (1995). The biology and management of flying foxes in NSW. *Species Management Report, No 18*. Hurstville: NSW parks and Wildlife Service.

Eby, P. & D. Lunney (2002). Managing the Grey-headed Flying-fox as a threatened species in NSW. *Proceedings of the Royal Zoological Society of New South Wales*. Mosman, Sydney: Royal Zoological Society of New South Wales.

Lunney, D., Phillips, S., Callaghan, J. and Coburn, D. 1998. A new approach to determining the distribution of Koalas and conserving their habitat: a case study from Port Stephens Shire on the central coast of New South Wales. Pacific Conservation Biology 4: 186–96.

McGregor, H.W. Legge, S., Potts, J., Jones, M.E. and Johnson, C.N. 2015. Densite and home range of feral cats in north-western Australia. Wildlife Research 42, 223–231.

Melzer, A. and Lamb, D. 1994. Low density populations of the Koala (Phascolarctos cinereus) in Central Queensland. Proceedings of the RoyalSociety of Queensland 104: 89–93.

Menkhorst, P.W. & J.M. Dixon (1985). Influxes of the grey-headed flying-fox *Pteropus poliocephalus* (Chiroptera, Pteropodidae) to Victoria in 1981 and 1982. *Australian Mammalogy*. 8:117-121.

Munks, S., Corkrey, R. and Foley, W. 1996.Characteristics of arboreal marsupial habitat in the semi-arid woodlands of northern Queensland. Wildlife Research, 271: 417-27.

Murphy, H. T., Westcott, D. A., Fletcher, C. S. and McKeown, A., (2008). Determining an effective, scientifically robust census method for the grey-headed flying fox, Department of the Environment, Heritage and the Arts. 72pp.

Parry-Jones, K. & M. Augee (1992). Movements of Grey-headed Flying-foxes *(Pteropus poliocephalus)* to and from a Colony Site on the Central Coat of New South Wales. *Wildlife Research*. 19:331-340.

Parry-Jones, K. & M.L. Augee (1991). Food Selection by Grey-headed Flying Foxes *(Pteropus poliocephalus)* Occupying a Summer Colony Site near Gosford, New South Wales. **In:** *Wildlife Research*. 18:111-124.

Phillips, S. and Callaghan, J. 2000.Tree species preferences of a Koala (Phascolarctos cinereus) population in the Campbelltown area south-west of Sydney, New South Wales. Wildlife Research 27: 569–75.

Phillips, S. and Callaghan, J. 2011. The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus. Australian Zoologist 35: 774-80.

Phillips, S., Callaghan, J. and Thompson, V. 2000.The tree species preferences of Koalas (Phascolarctos cinereus) inhabiting forest and woodland communities on Quaternary deposits in the Port Stephens area, New South Wales. Wildlife Research 27: 1–10.

Rhodes, J. R., Beyer, H. L., Preece, H.J. and McAlpine, C.A. 2015. South East Queensland Koala Population Modelling Study. UniQuest, Brisbane, Australia.

Sullivan, B. J., Baxter, G. S. and Lisle, A. T. 2002. Low-density koala (Phascolarctos cinereus) populations in the mulgalands of south-west Queensland. I. Faecal pellet sampling protocol. Wildlife Research, 29: 455-62.

Sullivan, B. J., Baxter, G. S., Lisle, A. T., Pahl, L. and Norris, W. M. 2004. Low-density Koala (Phascolarctos cinereus) populations in the mulgalands of south-west Queensland. IV. Abundance and conservation status. Wildlife Research 31: 19 –29.

Tidemann, C.R. (1998). Grey-headed Flying-fox, *Pteropus poliocephalus*, Temminck, 1824. Strahan, R., ed. *The Mammals of Australia*. Frenchs Forest: New Holland Publishers Pty Ltd.

Westcott, D.A., McKeown, A., Murphy, H.T. and Fletcher, C.S. 2011. A monitoring method for the grey-headed flying-fox, *Pteropus poliocephalus.* CSIRO Ecosystem Sciences.

5. Appendices

Appendix A

Koala SAT Survey Data

Appendix B

Koala MHQA Data

Appendix C

Grey-headed Flying-fox Foraging Habitat Assessment Data

Appendix D

Weed Transect Data

Appendix E

Non-native Koala Predator Data

Appendix A

Koala SAT Survey Data

Burnett Creek

SAT #	Positive Results (/30)	%	Activity Level
1	2	6.67%	Low
2	1	3.33%	Low
3	0	0.00%	Nil
4	0	0.00%	Nil
5	1	3.33%	Low
6	0	0.00%	Nil
7	5	16.67%	Low
8	2	6.67%	Low
9	3	10.00%	Low
10	7	23.30%	Medium
11	5	16.67%	Low
AVG	**2.36**	**7.88%**	**Low**

Table 2. Categorisation of Koala activity into Low, Medium (normal) and High use categories based on use of mean activity level ± 99 per cent confidence intervals (nearest percentage equivalents) from each of the three area/population density categories indicated in Table 1.

Activity category	Low use	Medium (normal) use	High use
Area (density)			
East Coast (low)	-	≥ 3.33% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western Plains (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

Burnett Creek

SAT Survey 1 (07.05.2021)				
Tree Number	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	550	N
2	*Allocasuarina torulosa*	She-oak	180	N
3	*Corymbia citriodora*	Spotted Gum	120	Y
4	*Allocasuarina torulosa*	She-oak	200	N
5	*Corymbia citriodora*	Spotted Gum	190	N
6	*Corymbia citriodora*	Spotted Gum	120	N
7	*Corymbia citriodora*	Spotted Gum	180	N
8	*Eucalyptus crebra*	Narrow-leaved Ironbark	100	N
9	*Corymbia citriodora*	Spotted Gum	200	N
10	*Corymbia citriodora*	Spotted Gum	110	N
11	*Corymbia citriodora*	Spotted Gum	210	N
12	*Allocasuarina torulosa*	She-oak	150	N
13	*Corymbia citriodora*	Spotted Gum	160	N
14	*Corymbia citriodora*	Spotted Gum	130	N
15	*Eucalyptus tindaliae*	Tindal's Stringybark	200	N
16	*Eucalyptus tindaliae*	Tindal's Stringybark	310	N
17	*Corymbia citriodora*	Spotted Gum	120	N
18	*Lophostemon confertus*	Brushbox	140	N
19	*Eucalyptus tereticornis*	Forest Red Gum	530	N
20	*Corymbia citriodora*	Spotted Gum	190	N
21	*Allocasuarina torulosa*	She-oak	150	N
22	*Corymbia citriodora*	Spotted Gum	330	N
23	*Allocasuarina torulosa*	She-oak	160	N
24	*Corymbia citriodora*	Spotted Gum	140	N
25	*Allocasuarina torulosa*	She-oak	190	N
26	*Allocasuarina torulosa*	She-oak	160	Y
27	*Corymbia citriodora*	Spotted Gum	150	N
28	*Corymbia citriodora*	Spotted Gum	440	N
29	*Lophostemon confertus*	Brushbox	180	N
30	*Corymbia citriodora*	Spotted Gum	210	N
Total Trees with Koala Scats				2
Total Percentage of Koala Use				6.67%
Koala Use (Based on East Coast Med-High Habitat)				Low

Burnett Creek

SAT Survey 2 (07.05.2021)				
Tree Numbe	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Eucalyptus dura*	Ironbark	210	Y
2	*Eucalyptus dura*	Ironbark	180	N
3	*Eucalyptus dura*	Ironbark	250	N
4	*Corymbia trachyphloia*	Brown Bloodwood	180	N
5	*Eucalyptus dura*	Ironbark	150	N
6	*Eucalyptus dura*	Ironbark	500	N
7	*Eucalyptus dura*	Ironbark	300	N
8	*Eucalyptus dura*	Ironbark	300	N
9	*Eucalyptus dura*	Ironbark	250	N
10	*Eucalyptus dura*	Ironbark	230	N
11	*Eucalyptus dura*	Ironbark	170	N
12	*Eucalyptus dura*	Ironbark	270	N
13	*Eucalyptus dura*	Ironbark	350	N
14	*Eucalyptus dura*	Ironbark	370	N
15	*Eucalyptus dura*	Ironbark	270	N
16	*Corymbia trachyphloia*	Brown Bloodwood	140	N
17	*Eucalyptus dura*	Ironbark	230	N
18	*Corymbia trachyphloia*	Brown Bloodwood	220	N
19	*Eucalyptus dura*	Ironbark	220	N
20	*Eucalyptus dura*	Ironbark	310	N
21	*Eucalyptus dura*	Ironbark	250	N
22	*Corymbia trachyphloia*	Brown Bloodwood	180	N
23	*Eucalyptus dura*	Ironbark	300	N
24	*Eucalyptus dura*	Ironbark	250	N
25	*Corymbia trachyphloia*	Brown Bloodwood	250	N
26	*Eucalyptus dura*	Ironbark	320	N
27	*Eucalyptus dura*	Ironbark	160	N
28	*Eucalyptus dura*	Ironbark	320	N
29	*Eucalyptus dura*	Ironbark	330	N
30	*Eucalyptus dura*	Ironbark	140	N
Total Trees with Koala Scats				1
Total Percentage of Koala Use				3.33%
Koala Use (Based on East Coast Med-High Habitat)				Low

SAT Survey 3 (06.05.2021)				
Tree Numbe	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Eucalyptus dura*	Ironbark	240	N
2	*Eucalyptus dura*	Ironbark	250	N
3	*Eucalyptus dura*	Ironbark	280	N
4	*Eucalyptus dura*	Ironbark	180	N
5	*Eucalyptus dura*	Ironbark	220	N
6	*Eucalyptus dura*	Ironbark	160	N
7	*Eucalyptus dura*	Ironbark	200	N
8	*Eucalyptus acmenoides*	White Mahogany	700	N
9	*Eucalyptus dure*	Ironbark	380	N
10	*Eucalyptus acmenoides*	White Mahogany	600	N
11	*Eucalyptus dura*	Ironbark	150	N
12	*Eucalyptus microcorys*	Tallowwood	720	N
13	*Eucalyptus acmenoides*	White Mahogany	530	N
14	*Allocasuarina torulosa*	She-oak	150	N
15	*Corymbia intermedia*	Pink Bloodwood	210	N
16	*Eucalyptus acmenoides*	White Mahogany	120	N
17	*Eucalyptus acmenoides*	White Mahogany	840	N
18	*Eucalyptus dura*	Ironbark	170	N
19	*Eucalyptus acmenoides*	White Mahogany	210	N
20	*Eucalyptus acmenoides*	White Mahogany	680	N
21	*Eucalyptus acmenoides*	White Mahogany	730	N
22	*Eucalyptus acmenoides*	White Mahogany	250	N
23	*Allocasuarina torulosa*	She-oak	140	N
24	*Eucalyptus dura*	Ironbark	180	N
25	*Eucalyptus dura*	Ironbark	240	N
26	*Eucalyptus dura*	Ironbark	300	N
27	*Eucalyptus dura*	Ironbark	240	N
28	*Eucalyptus dura*	Ironbark	220	N
29	*Eucalyptus dura*	Ironbark	250	N
30	*Eucalyptus dura*	Ironbark	170	N
Total Trees with Koala Scats				0
Total Percentage of Koala Use				0%
Koala Use (Based on East Coast Med-High Habitat)				Nil

SAT Survey 4 (06.05.2021)				
Tree Numbe	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	180	N
2	*Corymbia citriodora*	Spotted Gum	140	N
3	*Lophostemon confertus*	Brushbox	200	N
4	*Lophostemon confertus*	Brushbox	180	N
5	*Corymbia citriodora*	Spotted Gum	220	N
6	*Eucalyptus acmenoides*	White Mahogany	370	N
7	*Corymbia citriodora*	Spotted Gum	140	N
8	*Eucalyptus carnea*	Broad-leaved White Mahogany	340	N
9	*Angophora leiocarpa*	Smooth-barked Apple	320	N
10	*Eucalyptus carnea*	Broad-leaved White Mahogany	440	N
11	*Eucalyptus carnea*	Broad-leaved White Mahogany	320	N
12	*Corymbia citriodora*	Spotted Gum	150	N
13	*Angophora leiocarpa*	Smooth-barked Apple	180	N
14	*Eucalyptus carnea*	Broad-leaved White Mahogany	320	N
15	*Angophora leiocarpa*	Smooth-barked Apple	400	N
16	*Eucalyptus microcorys*	Tallowwood	400	N
17	*Eucalyptus carnea*	Broad-leaved White Mahogany	330	N
18	*Allocasuarina torulosa*	She-oak	150	N
19	*Allocasuarina torulosa*	She-oak	190	N
20	*Corymbia citriodora*	Spotted Gum	140	N
21	*Corymbia citriodora*	Spotted Gum	160	N
22	*Eucalyptus major*	Flooded Gum	350	N
23	*Angophora leiocarpa*	Smooth-barked Apple	370	N
24	*Corymbia intermedia*	Pink Bloodwood	230	N
25	*Eucalyptus major*	Flooded Gum	230	N
26	*Corymbia intermedia*	Pink Bloodwood	150	N
27	*Eucalyptus carnea*	Broad-leaved White Mahogany	420	N
28	*Angophora woodsiana*	Rough-barked apple	160	N
29	*Eucalyptus microcorys*	Tallowwood	300	N
30	*Corymbia citriodora*	Spotted Gum	300	N
Total Trees with Koala Scats				0
Total Percentage of Koala Use				0%
Koala Use (Based on East Coast med-high Habitat)				Nil

SAT Survey 5 (07.05.2021)				
Tree Number	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	610	N
2	*Eucalyptus carnea*	Broad-leaved White Mahogany	450	N
3	*Eucalyptus crebra*	Narrow-leaved Ironbark	200	N
4	*Eucalyptus acmenoides*	White Mahogany	260	N
5	*Angophora leiocarpa*	Smoth-barked Apple	450	N
6	*Eucalyptus acmenoides*	White Mahogany	300	N
7	*Eucalyptus crebra*	Narrow-leaved Ironbark	350	N
8	*Corymbia intermedia*	Pink Bloodwood	310	N
9	*Eucalyptus crebra*	Narrow-leaved Ironbark	410	N
10	*Allocasuarina torulosa*	She-oak	180	N
11	*Corymbia citriodora*	Spotted Gum	160	N
12	*Eucalyptus crebra*	Narrow-leaved Ironbark	460	N
13	*Corymbia citriodora*	Spotted Gum	200	N
14	*Allocasuarina torulosa*	She-oak	100	N
15	*Corymbia intermedia*	Pink Bloodwood	310	N
16	*Eucalyptus crebra*	Narrow-leaved Ironbark	320	N
17	*Eucalyptus acmenoides*	White Mahogany	520	N
18	*Eucalyptus crebra*	Narrow-leaved Ironbark	230	N
19	*Eucalyptus acmenoides*	White Mahogany	450	N
20	*Eucalyptus carnea*	Broad-leaved White Mahogany	650	N
21	*Eucalyptus carnea*	Broad-leaved White Mahogany	600	Y
22	*Corymbia citriodora*	Spotted Gum	350	N
23	*Eucalyptus crebra*	Narrow-leaved Ironbark	250	N
24	*Eucalyptus carnea*	Broad-leaved White Mahogany	700	N
25	*Corymbia citriodora*	Spotted Gum	400	N
26	*Eucalyptus carnea*	Broad-leaved White Mahogany	450	N
27	*Eucalyptus carnea*	Broad-leaved White Mahogany	300	N
28	*Corymbia citriodora*	Spotted Gum	450	N
29	*Eucalyptus carnea*	Broad-leaved White Mahogany	800	N
30	*Corymbia citriodora*	Spotted Gum	700	N
Total Trees with Koala Scats				1
Total Percentage of Koala Use				3.33%
Koala Use (Based on East Coast medium-hgih Habitat)				Low

Burnett Creek

SAT Survey 6 (07.05.2021)				
Tree Numbe	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	220	N
2	*Corymbia citriodora*	Spotted Gum	200	N
3	*Eucalyptus crebra*	Narrow-leaved Ironbark	160	N
4	*Corymbia citriodora*	Spotted Gum	180	N
5	*Eucalytpus crebra*	Narrow-leaved Ironbark	300	N
6	*Corymbia citriodora*	Spotted Gum	200	N
7	*Eucalyptus carnea*	Broad-leaved White Mahogany	450	N
8	*Corymbia citriodora*	Spotted Gum	120	N
9	*Eucalyptus crebra*	Narrow-leaved Ironbark	350	N
10	*Eucalyptus crebra*	Narrow-leaved Ironbark	140	N
11	*Eucalyptus crebra*	Narrow-leaved Ironbark	140	N
12	*Corymbia citriodora*	Spotted Gum	300	N
13	*Eucalyptus crebra*	Narrow-leaved Ironbark	220	N
14	*Eucalyptus dura*	Ironbark	240	N
15	*Eucalyptus dura*	Ironbark	160	N
16	*Eucalyptus dura*	Ironbark	220	N
17	*Eucalyptus crebra*	Narrow-leaved Ironbark	320	N
18	*Corymbia citriodora*	Spotted Gum	380	N
19	*Eucalyptus carnea*	Broad-leaved White Mahogany	300	N
20	*Corymbia citriodora*	Spotted Gum	550	N
21	*Eucalyptus crebra*	Narrow-leaved Ironbark	300	N
22	*Corymbia citriodora*	Spotted Gum	150	N
23	*Corymbia citriodora*	Spotted Gum	350	N
24	*Corymbia citriodora*	Spotted Gum	300	N
25	*Eucalyptus carnea*	Broad-leaved White Mahogany	400	N
26	*Corymbia citriodora*	Spotted Gum	320	N
27	*Eucalyptus carnea*	Broad-leaved White Mahogany	350	N
28	*Eucalyptus crebra*	Narrow-leaved Ironbark	300	N
29	*Corymbia citriodora*	Spotted Gum	350	N
30	*Corymbia citriodora*	Spotted Gum	420	N
Total Trees with Koala Scats				0
Total Percentage of Koala Use				0%
Koala Use (Based on East Coast med-high Habitat)				Nil

Burnett Creek

SAT Survey 7 (13.05.2021)				
Tree Numbe	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	170	Y
2	*Eucalyptus acmenoides*	White Mahogany	330	Y
3	*Corymbia citriodora*	Spotted Gum	100	N
4	*Corymbia citriodora*	Spotted Gum	120	N
5	*Corymbia citriodora*	Spotted Gum	180	N
6	*Corymbia citriodora*	Spotted Gum	220	N
7	*Corymbia citriodora*	Spotted Gum	100	Y
8	*Eucalyptus tereticornis*	Fored Red Gum	410	Y
9	*Eucalyptus acmenoides*	White Mahogany	230	Y
10	*Corymbia citriodora*	Spotted Gum	100	N
11	*Corymbia citriodora*	Spotted Gum	190	N
12	*Corymbia citriodora*	Spotted Gum	320	N
13	*Corymbia citriodora*	Spotted Gum	180	N
14	*Corymbia citriodora*	Spotted Gum	270	N
15	*Corymbia citriodora*	Spotted Gum	230	N
16	*Eucalyotus acmenoides*	White Mahogany	280	N
17	*Corymbia citriodora*	Spotted Gum	190	N
18	*Corymbia citriodora*	Spotted Gum	710	N
19	*Corymbia citriodora*	Spotted Gum	130	N
20	*Corymbia citriodora*	Spotted Gum	270	N
21	*Corymbia citriodora*	Spotted Gum	210	N
22	*Corymbia citriodora*	Spotted Gum	150	N
23	*Corymbia citriodora*	Spotted Gum	700	N
24	*Corymbia citriodora*	Spotted Gum	310	N
25	*Corymbia citriodora*	Spotted Gum	180	N
26	*Eucalyptus crebra*	Narrow-leaved Ironbark	740	N
27	*Eucalyptus acmenoides*	White Mahogany	350	N
28	*Eucalyptus tereticornis*	Fored Red Gum	700	N
29	*Corymbia citriodora*	Spotted Gum	210	N
30	*Corymbia citriodora*	Spotted Gum	370	N
Total Trees with Koala Scats				5
Total Percentage of Koala Use				16.67%
Koala Use (Based on East Coast med-high Habitat)				Low

Burnett Creek

SAT Survey 8 (13.05.2021)				
Tree Numbe	***Species***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	270	N
2	*Eucalyptus crebra*	Narrow-leaved Ironbark	210	N
3	*Corymbia citriodora*	Spotted Gum	240	N
4	*Corymbia citriodora*	Spotted Gum	750	N
5	*Corymbia citriodora*	Spotted Gum	300	N
6	*Corymbia citriodora*	Spotted Gum	230	N
7	*Corymbia citriodora*	Spotted Gum	310	N
8	*Corymbia citriodora*	Spotted Gum	300	N
9	*Corymbia citriodora*	Spotted Gum	170	N
10	*Corymbia citriodora*	Spotted Gum	220	N
11	*Corymbia citriodora*	Spotted Gum	290	N
12	*Corymbia citriodora*	Spotted Gum	310	N
13	*Corymbia citriodora*	Spotted Gum	300	Y
14	*Corymbia citriodora*	Spotted Gum	150	Y
15	*Eucalyptus tereticornis*	Forest Red Gum	190	N
16	*Eucalyptus crebra*	Narrow-leaved Ironbark	140	N
17	*Eucalyptus crebra*	Narrow-leaved Ironbark	160	N
18	*Corymbia citriodora*	Spotted Gum	150	N
19	*Corymbia citriodora*	Spotted Gum	130	N
20	*Corymbia citriodora*	Spotted Gum	260	N
21	*Corymbia citriodora*	Spotted Gum	210	N
22	*Corymbia citriodora*	Spotted Gum	200	N
23	*Corymbia citriodora*	Spotted Gum	280	N
24	*Eucalyptus crebra*	Narrow-leaved Ironbark	700	N
25	*Corymbia citriodora*	Spotted Gum	110	N
26	*Eucalyptus crebra*	Narrow-leaved Ironbark	220	N
27	*Eucalyptus crebra*	Narrow-leaved Ironbark	200	N
28	*Eucalyptus crebra*	Narrow-leaved Ironbark	400	N
29	*Eucalyptus crebra*	Narrow-leaved Ironbark	120	N
30	*Corymbia citriodora*	Spotted Gum	200	N
Total Trees with Koala Scats				2
Total Percentage of Koala Use				6.67%
Koala Use (Based on East Coast med-high Habitat)				Low

SAT Survey 9 (27.05.2021)				
Tree Number	***Species name***	**Common Name**	**DBH (mm)**	**Scats**
1	*Eucalyptus dura*	Ironbark	230	N
2	*Eucalyptus dura*	Ironbark	230	N
3	*Eucalyptus dura*	Ironbark	250	N
4	*Eucalyptus dura*	Ironbark	260	N
5	*Corymbia trachyphloia*	Brown Bloodwood	250	N
6	*Eucalyptus dura*	Ironbark	320	N
7	*Eucalyptus dura*	Ironbark	170	N
8	*Eucalyptus dura*	Ironbark	270	N
9	*Eucalyptus dura*	Ironbark	250	N
10	*Eucalyptus dura*	Ironbark	100	N
11	*Eucalyptus dura*	Ironbark	200	N
12	*Eucalyptus dura*	Ironbark	320	N
13	*Eucalyptus dura*	Ironbark	220	N
14	*Eucalyptus dura*	Ironbark	310	N
15	*Eucalyptus dura*	Ironbark	300	N
16	*Eucalyptus dura*	Ironbark	330	N
17	*Eucalyptus dura*	Ironbark	200	N
18	*Eucalyptus dura*	Ironbark	310	N
19	*Eucalyptus dura*	Ironbark	210	N
20	*Eucalyptus dura*	Ironbark	350	N
21	*Eucalyptus dura*	Ironbark	370	N
22	*Eucalyptus dura*	Ironbark	250	N
23	*Eucalyptus dura*	Ironbark	300	N
24	*Eucalyptus dura*	Ironbark	280	N
25	*Angophora leiocarpa*	Smooth-barked Apple	290	Y
26	*Eucalyptus dura*	Ironbark	290	N
27	*Eucalyptus dura*	Ironbark	270	N
28	*Eucalyptus dura*	Ironbark	400	Y
29	*Eucalyptus dura*	Ironbark	220	Y
30	*Eucalyptus dura*	Ironbark	280	N
Total Trees with Koala Scats				3
Total Percentage of Koala Use				10%
Koala Use (Based on East Coast med-high Habitat)				Low

SAT Survey 10 (27.05.2021)				
Tree Number	***Species name***	**Common Name**	**DBH (mm)**	**Scats**
1	*Eucalyptus acmenoides*	White Mahogany	430	N
2	*Eucalyptus microcorys*	Tallowwood	380	N
3	*Corymbia intermedia*	Pink Bloodwood	180	N
4	*Eucalyptus acmenoides*	White Mahogany	470	N
5	*Eucalyptus microcorys*	Tallowwood	240	N
6	*Angophora leiocarpa*	Smooth-barked Apple	450	N
7	*Eucalyptus acmenoides*	White Mahogany	650	N
8	*Eucalyptus acmenoides*	White Mahogany	230	N
9	*Corymbia citriodora*	Spotted Gum	200	N
10	*Corymbia citriodora*	Spotted Gum	190	N
11	*Eucalyptus acmenoides*	White Mahogany	620	N
12	*Corymbia citriodora*	Spotted Gum	300	N
13	*Eucalyptus acmenoides*	White Mahogany	730	N
14	*Corymbia intermedia*	Pink Bloodwood	160	Y
15	*Eucalyptus acmenoides*	White Mahogany	200	Y
16	*Corymbia citriodora*	Spotted Gum	240	N
17	*Corymbia citriodora*	Spotted Gum	280	N
18	*Angophora leiocarpa*	Smooth-barked Apple	420	N
19	*Eucalyptus acmenoides*	White Mahogany	890	Y
20	*Corymbia citriodora*	Spotted Gum	130	Y
21	*Angophora leiocarpa*	Smooth-barked Apple	460	Y
22	*Eucalyptus acmenoides*	White Mahogany	500	Y
23	*Corymbia citriodora*	Spotted Gum	180	Y
24	*Eucalyptus acmenoides*	White Mahogany	830	N
25	*Corymbia citriodora*	Spotted Gum	220	N
26	*Eucalyptus acmenoides*	White Mahogany	150	N
27	*Eucalyptus acmenoides*	White Mahogany	160	N
28	*Allocasuarina torulosa*	She-oak	200	N
29	*Corymbia citriodora*	Spotted Gum	130	N
30	*Eucalyptus siderophloia*	Grey Ironbark	150	N
Total Trees with Koala Scats				7
Total Percentage of Koala Use				23.30%
Koala Use (Based on East Coast med-high Habitat)				High

Burnett Creek

SAT Survey 11 (27.05.2021)				
Tree Number	***Species name***	**Common Name**	**DBH (mm)**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	220	N
2	*Eucalyptus melanophloia*	Silver-leaved Ironbark	300	N
3	*Corymbia citriodora*	Spotted Gum	330	N
4	*Corymbia citriodora*	Spotted Gum	240	N
5	*Corymbia citriodora*	Spotted Gum	500	Y
6	*Corymbia citriodora*	Spotted Gum	300	N
7	*Corymbia citriodora*	Spotted Gum	380	N
8	*Corymbia citriodora*	Spotted Gum	310	N
9	*Eucalyptus siderophloia*	Grey Ironbark	200	N
10	*Corymbia citriodora*	Spotted Gum	360	N
11	*Corymbia citriodora*	Spotted Gum	280	Y
12	*Corymbia citriodora*	Spotted Gum	360	N
13	*Corymbia citriodora*	Spotted Gum	280	Y
14	*Corymbia citriodora*	Spotted Gum	310	Y
15	*Corymbia citriodora*	Spotted Gum	240	N
16	*Corymbia citriodora*	Spotted Gum	340	N
17	*Corymbia citriodora*	Spotted Gum	140	N
18	*Corymbia citriodora*	Spotted Gum	180	N
19	*Eucalyptus siderophloia*	Grey Ironbark	100	N
20	*Eucalyptus siderophloia*	Grey Ironbark	270	Y
21	*Corymbia citriodora*	Spotted Gum	290	N
22	*Corymbia citriodora*	Spotted Gum	330	N
23	*Eucalyptus siderophloia*	Grey Ironbark	250	N
24	*Eucalyptus siderophloia*	Grey Ironbark	250	N
25	*Corymbia citriodora*	Spotted Gum	350	N
26	*Corymbia citriodora*	Spotted Gum	180	N
27	*Corymbia citriodora*	Spotted Gum	280	N
28	*Eucalyptus crebra*	Narrow-leaved Ironbark	260	N
29	*Corymbia citriodora*	Spotted Gum	120	N
30	*Corymbia citriodora*	Spotted Gum	260	N
Total Trees with Koala Scats				5
Total Percentage of Koala Use				16.67%
Koala Use (Based on East Coast med-high Habitat)				Low

Appendix B

Koala MHQA Data

Habitat Quality Site Assessment Template…….. **PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD**

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: **An Impact Site** ☐ **An Offset Site** ☐ **an Advanced Offset Site** ☐

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Case reference		Project Name	

Part B – Nominated Approach (FOR IMPACT SITE ONLY)

Please Select Your Nominated approach: Rapid approach ☐ Standard Approach ☑

ii) **Standard Assessment** …… **(COMPLETE REMAINDER OF FORM)**

Part C - Site Data

Property	Burnett Creek	Date	03.06.2019

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		12.8.20	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum		0m Mark	Zone	Easting	Northing
WGS 84	☐				
GDA 94	☐	50m Mark	Zone	Easting	Northing
Plot bearing			Recorders		

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 1 and 2 - mapped as RE12.8.20/12.8.19

Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	7		
Scientific Name	*Eucalyptus acmenoides*	Common Name	White Mahogany
Scientific Name	*Angophera leiocarpa*	Common Name	Smooth-barked Apple
Scientific Name	*Eucalyptus dura*	Common Name	Smooth-branched Ironbark
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Allocasuarina torulosa*	Common Name	Forest Sheoak
Scientific Name	*Brachychiton sp.*	Common Name	
Scientific Name	*Corymbia trachyphloia*	Common Name	Brown Bloodwood
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Euccalyptus dura*	Common Name	Smooth-branched Ironbark
Scientific Name	*Eucalyptus acmenoides*	Common Name	White Mahogany
Scientific Name	*Angophera leiocarpa*	Common Name	Smooth-barked Apple
Scientific Name	*Corymbia trachyphloia*	Common Name	Brown Bloodwood

Shrub species richness:			
Total number of species	7		
Scientific Name	*Acacia elongata*	Common Name	Slender Wattle
Scientific Name	*Jacksonia scoparia*	Common Name	Dogwood
Scientific Name	*Xanthorrhoea*	Common Name	Grass Tree
Scientific Name	*Alyxia ruscifolia*	Common Name	Chain Fruit
Scientific Name	*Alphitonia excelsa*	Common Name	Soap Tree
Scientific Name	*Gleichenia dicarpa*	Common Name	Coral Fern
Scientific Name	*Jacksonia scoparia*	Common Name	Dogwood
Scientific Name	*Acacia elongata*	Common Name	Slender Wattle
Scientific Name	*Plectranthus sp.*	Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Panicum decompsitum*	Common Name	Native Millet
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Panicum decompsitum*	Common Name	Native Millet
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	9		
Scientific Name	*Dianella caerulea*	Common Name	Blue Flax-lily
Scientific Name	*Desmodium sp.*	Common Name	Hairy Desmodium
Scientific Name	*Drynaria sp.*	Common Name	Basket Fern
Scientific Name	*Cheilanthes distans*	Common Name	Bristle Cloak Fern
Scientific Name	*Lepidosperma sp.*	Common Name	
Scientific Name	*Hardenbergia violacea*	Common Name	Native Sarsparilla
Scientific Name	*Ozothamnus diosmifolius*	Common Name	Rice Flower
Scientific Name	*Hardenbergia violacea*	Common Name	Native Sarsparilla
Scientific Name	*Desmodium sp.*	Common Name	Hairy Desmodium
Scientific Name	*Pomacx umbellata*	Common Name	Pomax
Scientific Name	*Phylanthes?*	Common Name	
Scientific Name	*Dianella caerulea*	Common Name	Blue Flax-lily
Scientific Name	*Cheilanthes distans*	Common Name	Bristle Cloak Fern

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	2.50%		
Scientific Name	*Melinis repens*	Common Name	Red Natal Grass
Scientific Name	*Bidens pillosa*	Common Name	Cobblers Pegs
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	334.50		
1	4.00	26	
2	0.50	27	
3	15.00	28	
4	6.00	29	
5	12.00	30	
6	0.50	31	
7	0.80	32	
8	0.60	33	
9	8.00	34	
10	6.00	35	
11	4.00	36	
12	9.00	37	
13	0.50	38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	70.00%	47.50%	57.50%	50.00%	35.00%	52.00%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	5.00%	20.00%	12.50%	10.00%	35.00%	16.50%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	490	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	4	Number of large non eucalypt trees:	0
Total Number Large Trees:	4		

Median Tree Canopy Height Measurements	Canopy:	18.50	Sub-canopy:	7.50	Emergent:	

Number of ecologically dominant layer species regenerating:	56

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	56.40%	Sub-canopy:	11.90%	Emergent:	
Shrub canopy cover %	16.70%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION					
SCORE					

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES ☐ **PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED**

NO ☐ **PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED**

Part K - Species Habitat Attributes

Species Habitat Attributes

No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1				Description					
				Score					
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					
7				Description					
				Score					
8				Description					
				Score					
9				Description					
				Score					
10				Description					
				Score					
				Maximum Score					

Attach Landscape Photos Here

North

South

East

West

(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here: QLD Environmental Offsets

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for:	An Impact Site	☐	An Offset Site	☐	an Advanced Offset Site	☐

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Case reference		Project Name	

Part B – Nominated Approach (FOR IMPACT SITE ONLY)

Please Select Your Nominated approach: Rapid approach ☐ Standard Approach ☑

ii) **Standard Assessment** ..... **(COMPLETE REMAINDER OF FORM)**

Part C - Site Data

Property	Burnett Creek	Date	03.06.2019

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
2		12.11.3	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum		0m Mark	Zone	Easting	Northing
WGS 84	☐				
GDA 94	☐	50m Mark	Zone	Easting	Northing
Plot bearing			Recorders		

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 6 and Transect 5 - mapped RE12.9/10.17

Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	8		
Scientific Name	*Eucalyptus acmenoides*	Common Name	White Mahogany
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Eucalyptus microcorys*	Common Name	Tallowood
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name	*Allocasuarina torulosa*	Common Name	Forest Sheoak
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark
Scientific Name	*Eucalyptus propinqua*	Common Name	Grey Gum
Scientific Name	*Eucalyptus microcorys*	Common Name	Tallowood
Scientific Name	*Eucalyptus acmenoides*	Common Name	White Mahogany
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name	*Lophostemon confertus*	Common Name	Brush Box
Scientific Name	*Allocasuarina torulosa*	Common Name	Forest Sheoak

Shrub species richness:			
Total number of species	7		
Scientific Name	*Acacia elongata*	Common Name	Slender Wattle
Scientific Name	Lophostemon confertus	Common Name	Brush Box
Scientific Name	*Xanthorrhoea*	Common Name	Grass Tree
Scientific Name	*Persoonia sp.*	Common Name	Geebung
Scientific Name	*Jacksonia scoparia*	Common Name	Dogwood
Scientific Name	*Lomatia silaifolia*	Common Name	Crinkle Bush
Scientific Name	*Brachychiton sp.?*	Common Name	Spiky Leaf?
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	3		
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Imperata cylindrica*	Common Name	Blady Grass
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	10		
Scientific Name	*Hardenbergia violacea*	Common Name	Native Sarsparilla
Scientific Name	*Desmodium sp.*	Common Name	Hairy Desmodium
Scientific Name	*Lomandra longifolia*	Common Name	Mat Rush
Scientific Name	*Pteridium*	Common Name	Bracken Fern
Scientific Name	*Sida acuta*	Common Name	Small Sida
Scientific Name	*Goodenia rotundifolia*	Common Name	Star Goodenia
Scientific Name	*Lomandra multiflora*	Common Name	Many-flowered Mat Rush
Scientific Name	*Ozothamnus diosmifolius*	Common Name	Rice Flower
Scientific Name	*Desmodium sp.*	Common Name	Hairy Desmodium
Scientific Name	*Hardenbergia violacea*	Common Name	Native Sarsparilla
Scientific Name	*Hybanthus stellarioides*	Common Name	Spade Flower
Scientific Name	*Dianella careula*	Common Name	Blue Flax-lily

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	0.00%		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	918.00		
1	6.00	26	14.50
2	8.20	27	5.00
3	4.50	28	6.00
4	0.60	29	0.60
5	0.50	30	0.50
6	0.50	31	0.80
7	8.00	32	0.50
8	12.40	33	1.50
9	15.20	34	
10	1.40	35	
11	9.50	36	
12	15.20	37	
13	6.20	38	
14	7.00	39	
15	10.00	40	
16	0.50	41	
17	10.00	42	
18	3.00	43	
19	8.50	44	
20	1.00	45	
21	6.00	46	
22	5.30	47	
23	6.50	48	
24	2.00	49	
25	6.20	50	

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	42.50%	60.00%	42.50%	45.00%	22.50%	42.50%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	25.00%	17.50%	30.00%	32.50%	40.00%	29.00%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	400	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	28	Number of large non eucalypt trees:	0
Total Number Large Trees:	28		

Median Tree Canopy Height Measurements	Canopy:	21.50	Sub-canopy:	13.00	Emergent:	

Number of ecologically dominant layer species regenerating:	76

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	74.80%	Sub-canopy:	29.60%	Emergent:	
Shrub canopy cover %	9.30%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION					
SCORE					

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES ☐ **PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED**

NO ☐ **PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED**

Part K - Species Habitat Attributes

Species Habitat Attributes

No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1				Description					
				Score					
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					
7				Description					
				Score					
8				Description					
				Score					
9				Description					
				Score					
10				Description					
				Score					
				Maximum Score					

Attach Landscape Photos Here

North

South

East

West

(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here: QLD Environmental Offsets

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for:	An Impact Site ☐	An Offset Site ☐	an Advanced Offset Site ☐

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Case reference		Project Name	

Part B – Nominated Approach (FOR IMPACT SITE ONLY)

Please Select Your Nominated approach: Rapid approach ☐ Standard Approach ☑

ii) **Standard Assessment** ..... **(COMPLETE REMAINDER OF FORM)**

Part C - Site Data

Property	Burnett Creek	Date	03.06.2019

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
3		12.9-10.2	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum		0m Mark	Zone	Easting	Northing
WGS 84	☐				
GDA 94	☐	50m Mark	Zone	Easting	Northing
Plot bearing			Recorders		

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 3, 4 and 7

Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	9		
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Lophostemon confertus*	Common Name	Brush Box
Scientific Name	*Allocasuarina torulosa*	Common Name	Forest Sheoak
Scientific Name	*Corymbia trachyphloia*	Common Name	Brown Bloodwood
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name	*Angophera subvalentina*	Common Name	Broad-leaved Apple
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum
Scientific Name	*Allocasuarina torulosa*	Common Name	Forest Sheoak
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leved Ironbark
Scientific Name	*Corymbia trachyphloia*	Common Name	Brown Bloodwood
Scientific Name	*Allocasuarina torulosa*	Common Name	Forest Sheoak
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum

Shrub species richness:			
Total number of species	7		
Scientific Name	*Acacia elongata*	Common Name	Slender Wattle
Scientific Name	*Breynia oblongifolia*	Common Name	Coffee Bush
Scientific Name	*Dodonaea viscosa*	Common Name	Hop Bush
Scientific Name	*Ficus coronata*	Common Name	Sandpaper Fig
Scientific Name	*Drynaria*	Common Name	Basket Fern
Scientific Name	*Acacia elongata*	Common Name	Slender Wattle
Scientific Name	*Persoonia*	Common Name	Geebung
Scientific Name	*Jacksonia scoparia*	Common Name	Dogwood
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	7		
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Scented Top?*	Common Name	
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Scented Top?*	Common Name	
Scientific Name	*Oplismenus sp.*	Common Name	Basket Grasss
Scientific Name	*Panicum decompositum*	Common Name	Native Millet
Scientific Name	*Aristida sp.*	Common Name	
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Cymbopogon refractus*	Common Name	Barbed Wire Grass
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Panicum decompositum*	Common Name	Native Millet
Scientific Name	*Aristida sp.*	Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	9		
Scientific Name	*Glycine sp.*	Common Name	
Scientific Name	*Lobelia purpurescens*	Common Name	White Root
Scientific Name	*Vigna unguiculata*	Common Name	Cow Pea
Scientific Name	*Lepidosperma sp.*	Common Name	
Scientific Name	*Cheilanthes distans*	Common Name	Bristle Cloak Fern
Scientific Name	*Vigna unguiculata*	Common Name	Cow Pea
Scientific Name	*Lomandra longifolia*	Common Name	Mat Rush
Scientific Name	*Glycine sp.*	Common Name	
Scientific Name	*Lomandra longifolia*	Common Name	Mat Rush
Scientific Name	*Desmodium sp.*	Common Name	
Scientific Name	*Dianella caerulea*	Common Name	Blue Flax-lily
Scientific Name	*Chrysocephalum apiculatum*	Common Name	Yellow Buttons
Scientific Name	*Lepidosperma sp.*	Common Name	

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	2.60%		
Scientific Name	*Sporobolus sp.*	Common Name	Rats Tail Grass
Scientific Name	*Bidens Pillosa*	Common Name	Cobblers Pegs
Scientific Name	*Melinis repens*	Common Name	Red Natal Grass
Scientific Name	*Sporobolus sp.*	Common Name	Rats Tail Grass
Scientific Name	*Melinis repens*	Common Name	Red Natal Grass
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	456.33		
1	0.50	26	6.80
2	0.50	27	
3	0.50	28	
4	8.00	29	
5	8.20	30	
6	8.00	31	
7	12.30	32	
8	8.60	33	
9	14.80	34	
10	0.80	35	
11	0.50	36	
12	14.00	37	
13	3.60	38	
14	8.20	39	
15	8.00	40	
16	0.50	41	
17	3.00	42	
18	4.80	43	
19	1.00	44	
20	7.50	45	
21	3.00	46	
22	2.60	47	
23	3.00	48	
24	2.20	49	
25	6.00	50	

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	50.00%	41.60%	40.00%	50.00%	58.30%	47.98%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	23.30%	28.30%	23.30%	16.60%	21.60%	22.62%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	5	Number of large non eucalypt trees:	0
Total Number Large Trees:	5		

Median Tree Canopy Height Measurements	Canopy:	22.60	Sub-canopy:	12.30	Emergent:	

Number of ecologically dominant layer species regenerating:	71

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	62.10%	Sub-canopy:	24.70%	Emergent:	
Shrub canopy cover %	33.70%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION					
SCORE					

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES ☐ PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED

NO ☐ PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED

Part K - Species Habitat Attributes

Species Habitat Attributes

No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1				Description					
				Score					
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					
7				Description					
				Score					
8				Description					
				Score					
9				Description					
				Score					
10				Description					
				Score					
				Maximum Score					

Attach Landscape Photos Here

North

South

East

West

(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here: QLD Environmental Offsets

Habitat Quality Site Assessment Template……..

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for:	An Impact Site		An Offset Site		an Advanced Offset Site	

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Job Number		Project Name	

Part B - Site Data

Property	Burnett Creek	Date	28/02/2020

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		12.8.20	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Site description and Location (including details of discrete polygons within the assessment unit)

T1 - Rock/Eucalypt Forest

Part C - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	3		
Scientific Name	*Eucalyptus dura*	**Common Name**	Smooth-branched Ironbark
Scientific Name	*Corymbia trachyphloia*	**Common Name**	Brown Bloodwood
Scientific Name	*Eucalyptus carnea*	**Common Name**	Thick-leaved Mahogony
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Shrub species richness:			
Total number of species	3		
Scientific Name	*Xanthorrhoea sp.*	**Common Name**	Grass Tree
Scientific Name	*Salonaum ellipticum*	**Common Name**	Potato Bush
Scientific Name	*Allocasuarina littoralis*	**Common Name**	Black She-oak
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Grass species richness:			
Total number of species	3		
Scientific Name	*Poaceae sp.*	**Common Name**	Tussock Grass
Scientific Name	*Aristida latifolia*	**Common Name**	Feathertop Wiregrass
Scientific Name	*Cymbopogon refractus*	**Common Name**	Barbed Wire Grass
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Forbs and others (non grass ground) species richness:			
Total number of species	7		
Scientific Name	*Dianella caerulea*	**Common Name**	Blue Flax-lily
Scientific Name	*Desmodium sp.*	**Common Name**	Hairy Desmodium
Scientific Name	*Drynaria sp.*	**Common Name**	Basket Fern
Scientific Name	*Cheilanthes distans*	**Common Name**	Bristle Cloak Fern
Scientific Name	*Lepidosperma sp.*	**Common Name**	
Scientific Name	*Hardenbergia violacea*	**Common Name**	Native Sarsparilla
Scientific Name	*Ozothamnus diosmifolius*	**Common Name**	Rice Flower

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	2.00%		
Scientific Name	*Tradescantia zebrina*	**Common Name**	Wandering Jew
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	271.00		
1	6.20	26	
2	0.60	27	
3	1.20	28	
4	5.10	29	
5	0.20	30	
6	0.50	31	
7	1.00	32	
8	0.80	33	
9	8.00	34	
10	0.50	35	
11	3.00	36	

12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	0.00%	10.00%	0.00%	0.00%	60.00%	14.00%
Native other grass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Native forbs and other species	0.00%	10.00%	15.00%	5.00%	20.00%	10.00%
Native shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non-native grass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non native forbs and shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Litter	0.00%	30.00%	10.00%	0.00%	10.00%	10.00%
Rock	80.00%	40.00%	70.00%	95.00%	10.00%	59.00%
Bare Ground	20.00%	10.00%	5.00%	0.00%	0.00%	7.00%
Cryptogram						0.00%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	490	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	0	Number of large non eucalypt trees:	0
Total Number Large Trees:	3		

Median Tree Canopy Height Measurements	Canopy:	20.00	Sub-canopy:	8.00	Emergent:	

Percentage of ecologically dominant layer species regenerating:	75

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	26.70	Sub-canopy:	6.90	Emergent:	
Shrub canopy cover %	17.60					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	1.40	8.10	6.70	T2	57.20	63.00	5.80
T1	8.80	12.10	3.30	T2	92.00	93.10	1.10
T1	28.20	37.50	9.30	T2			
T1	92.60	100.00	7.40	T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			

T1				**T2**			
T1				**T2**			
T1				**T2**			
T1				**T2**			
T1				**T2**			

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	1.70	3.10	1.40	**Shrub**	31.30	32.40	1.10
Shrub	3.70	4.80	1.10	**Shrub**	38.40	39.20	0.90
Shrub	7.30	7.90	0.60	**Shrub**	44.30	45.40	1.10
Shrub	8.90	9.60	0.70	**Shrub**	57.20	58.00	0.80
Shrub	10.40	11.90	1.50	**Shrub**	62.00	63.00	1.00
Shrub	13.40	17.40	4.00	**Shrub**	80.60	81.80	1.20
Shrub	26.30	27.30	1.00	**Shrub**	97.70	98.90	1.20

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus dura	35
Corymbia trachyphloia	14
Eucalyptus carnea	2
Allocasuarina littoralis	1

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Assessment Unit - Regional Ecosystem	Assessment Unit 1 Remnant - 12.8.20												
Site Reference	Benchmark	Transect 1			Transect 2			Transect 2020 1					Benchmark
	RE12.8.20	Transect Data	% Benchmark	Score	Transect Data	% Benchmark	Score	Transect Data	% Benchmark	Score	Average % benchmark	Assessment Unit Average	RE12.9-10.2
Recruitment of woody perennial species in EDL	**100**	40	40.00	**3**	71	71.00	**3**	100	100.00	**5**	55.50	3.67	**100**
Native plant species richness - trees	**7**	5	71.43	**2.5**	7	100.00	**5**	3	42.86	**2.5**	85.71	3.33	**6**
Native plant species richness - shrubs	**10**	3	30.00	**2.5**	7	70.00	**2.5**	3	30.00	**2.5**	50.00	2.50	**7**
Native plant species richness - grasses	**4**	2	50.00	**2.5**	2	50.00	**2.5**	3	75.00	**2.5**	50.00	2.50	**7**
Native plant species richness - forbes	**15**	6	40.00	**2.5**	6	40.00	**2.5**	7	46.67	**2.5**	40.00	2.50	**13**
Tree canopy height (Canopy)	**21**	16	76.19	5	21	100.00	5	20	95.24	5	88.10	NA	**21**
Tree canopy height (Sub-canopy)	**7**	7	100.00	5	8	114.29	5	8	114.29	5	107.14	NA	**12**
Tree Canopy Height Average	**NA**	NA	NA	**5**	NA	NA	**5**	NA	NA	**5**	NA	5.00	**NA**
Tree canopy cover (Canopy)	**44**	47.8	108.64	5	65	147.73	5	26.7	60.68	5	128.18	NA	**64**
Tree canopy cover (Sub-canopy)	**16**	17.3	108.13	5	6.5	40.63	2	6.9	43.13	2	74.38	NA	**20**
Tree Canopy Cover Average	**NA**	NA	NA	**5**	NA	NA	**3.5**	NA	NA	**3.5**	NA	4.00	**NA**
Shrub canopy cover	**29**	20.4	70.34	**5**	19.5	67.24	**5**	17.6	60.69	**5**	68.79	5.00	**6**
Native grass cover	**20**	67	335.00	**5**	37	185.00	**5**	14	70.00	**3**	260.00	4.33	**21**
Organic litter	**40**	16	40.00	**3**	17	42.50	**3**	10	25.00	**3**	41.25	3.00	**48**
Large trees (euc plus non-euc) (per ha)	**20**	1	5.00	**5**	6	30.00	**5**	0	0.00	**0**	17.50	3.33	**38**
Coarse woody debris (per ha)	**811**	289	35.64	**2**	380	46.86	**2**	271	33.42	**2**	41.25	2.00	**506**
Non-native plant cover	**0**	0	0.00	**10**	5	5.00	**5**	2	2.00	**10**	2.50	8.33	**0**
Quality and availability of food and foraging habitat	**NA**	10	NA	**10**	**10**	NA	**10**	**10**	NA	**10**	NA	10.00	**NA**
Quality and availability of shelter	**NA**	10	NA	**10**	**10**	NA	**10**	**10**	NA	**10**	NA	10.00	**NA**
											Average of Transect scores		
Site Condition Score				73			69			66.5	71	70	
MAX Site Condition Score				*100*			*100*			*100*		*100*	
Site Condition Score - out of 3												**2.09**	
Site Context													
Size of patch				10			10			10		10	
Connectedness				5			5			5		5	
Context				5			5			5		5	
Ecological Corridors				6			6			6		6	
Role of site location to species overall population in the state				5			5			5		5	
Threats to the species				7			7			7		7	
Species mobility capacity				10			10			10		10	
Site Context Score				48			48					48	
MAX Site Context Score				*56*			*56*					*56*	
Site Context Score - out of 3												**2.57**	

Species Stocking Rate (SSR)

Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0		5		10		10	SAT surveys detected koalas are present on
		No		Yes - adjacent		Yes - on site			
Species usage of the site (habitat type & evidenced usage)	Score	0	5	10		15		10	Presence of scats over site indicates koalas
		Not habitat	Dispersal	Foraging		Breeding			
Approximate density (per ha)	Score	0	10	20		30		10	SAT surveys showed low presence using the
		0%							
Role/importance of species population on site*	Score (*Total from supplementary table below*)	0	5		10		15	5	See below
		0	5 - 15		20 - 35		40 - 45		
Total SRR score (out of 70)		35							
SRR Score (out of 4)		**2.00**							

***SSR Supplementary Table**					
*Key source population for breeding	Score	0	10	0	Given the low usage and lack of evidence of breeding occurring on site it is not considered to be a key populaiton for bre
		No	Yes/ Possibly		
*Key source population for dispersal	Score	0	5	5	Unknown but using the cautionary principle it is considered possible.
		No	Yes/ Possibly		
*Necessary for maintaining genetic diversity	Score	0	15	0	The site is highly unlikely to necessary for maintaining genetic diversity given the low density
		No	Yes/ Possibly		
*Near the limit of the species range	Score	0	15	0	The site is not near the limit of koalas range
		No	Yes		

Final habitat quality score (weighted)	**AU1**	**AU2**	**AU3**	**Average/ Final**	
Site Condition score (out of 3)	2.09	2.15	2.06	2.10	
Site Context Score (out of 3)	2.57	2.57	2.57	2.57	
Species Stocking Rate Score (out of 4)	2	2	2	2.00	6.67
Habitat Quality score (out of 10)	*6.66*	*6.72*	*6.63*	6.670595238	
Assessment Unit area (ha)	59.9953	70.4186	20.8854	151.2993	
Total offset area (ha) for this MNES	151.2993	151.2993	151.2993		
Size Weighting	0.40	0.47	0.14	***1.00***	
Weighted Habitat Quality Score	***2.64***	***3.13***	***0.92***	***6.68***	
Rounded weighted Habitat Quality Score				**7**	

Assessment Unit 2 - Remnant 12.9-10.2											Assessment Unit 3 - Remnant RE12.11.3						
Transect 3			Transect 4			Transect 7					Benchmark	Transect 5			Transect 6		
Transect Data	% Benchmark	Score	Transect Data	% Benchmark	Score	Transect Data	% Benchmark	Score	Average % benchmark	Assessment Unit Average	RE12.11.3	Transect Data	% Benchmark	Score	Transect Data	% Benchmark	Score
57	57	**3**	75	75	**3**	0	0	**0**	44	**2.00**	**100**	0	0	**0**	0	0	**0**
7	117	**5**	4	67	**2.5**	5	83	**2.5**	89	**3.33**	**6**	5	83	**2.5**	7	117	**5**
5	71	**2.5**	1	14	**0**	2	29	**2.5**	38	**1.67**	**12**	2	17	**0**	5	42	**2.5**
2	29	**2.5**	7	100	**5**	3	43	**2.5**	57	**3.33**	**4**	1	25	**2.5**	3	75	**2.5**
4	31	**2.5**	2	15	**2.5**	5	38	**2.5**	28	**2.50**	**21**	9	43	**2.5**	3	14	**0**
21	100	5	26	124	5	21	100	5	108	**NA**	**25**	22	88	5	2	8	5
12	100	5	14	117	5	11	92	5	103	**NA**	**10**	15	150	5	11	110	5
NA	NA	**5**	NA	NA	**5**	NA	NA	**5**	NA	**5.00**	**NA**	NA	NA	**5**	NA	NA	**5**
6.2	10	0	61.4	96	5	56.5	88	5	65	**NA**	**72**	79.8	111	5	80.7	112	5
26.1	131	5	20.5	103	5	27.5	138	5	124	**NA**	**17**	38	224	3	20.6	121	5
NA	NA	**2.5**	NA	NA	**5**	NA	NA	**5**	NA	**4.17**	**NA**	NA	NA	**4**	NA	NA	**5**
8.4	140	**5**	7.1	118	**5**	23.7	395	**3**	218	**4.33**	**21**	9.9	47	**3**	9.3	44	**3**
54	257	**5**	6	29	**1**	48	229	**5**	171	**3.67**	**16**	63	394	**5**	34	213	**5**
8	17	**3**	82	171	**5**	39	81	**5**	90	**4.33**	**76**	26	34	**3**	32	42	**3**
2	5	**5**	4	11	**5**	8	21	**5**	12	**5.00**	**63**	39	62	**10**	17	27	**5**
177	35	**2**	708	140	**5**	484	96	**5**	90	**4.00**	**370**	954	258	**2**	882	238	**2**
5	NA	**5**	2	NA	**10**	1	1	**10**	1	**8.33**	**0**	0	0	**10**	0	0	**10**
10	NA	**10**	**10**	NA	**10**	**10**	NA	**10**	NA	**10.00**	**NA**	**10**	NA	**10**	**10**	NA	**10**
10	NA	**10**	**10**	NA	**10**	**10**	NA	**10**	NA	**10.00**	**NA**	**10**	NA	**10**	**10**	NA	**10**
									Average of Transect scores								
		68			74				71	72				69.5			68
		100			*100*					*100*				*100*			*100*
										2.15							
		10			10			10		10				10			10
		5			5			5		5				5			5
		5			5			5		5				5			5
		6			6			6		6				6			6
		5			5			5		5				5			5
		7			7			7		7				7			7
		40			10			10		10				10			10
		78			48					48				48			48
		56			*56*					*56*				*56*			*56*
										2.57							

site

are foraging on site

e east coast (med-high) category

eding

Average % benchmark	Assessment Unit Average
0.00	**0.00**
100.00	**3.75**
29.17	**1.25**
50.00	**2.50**
28.57	**1.25**
48.00	**NA**
130.00	**NA**
NA	**5.00**
111.46	**NA**
172.35	**NA**
NA	**4.50**
45.71	**3.00**
303.13	**5.00**
38.16	**3.00**
44.44	**7.50**
248.11	**2.00**
0.00	**10.00**
NA	**10.00**
NA	**10.00**

Average of Transect scores	
68.75	68.75
	100
	2.06

	10
	5
	5
	6
	5
	7
	10
	48
	56
	2.57

Appendix C

Grey-headed Flying-fox Foraging Habitat Assessment Data

All of this new editing

Assessment Unit - Regional Ecosystem	AU 1 - REMNANT - 12.8.20								AU 2 - REMNANT - 12.9-10.2								AU 3 - REMNANT - 12.11.3					
Site Reference	OUT OF	Transect 1		Transect 2		Transect 2020 T1		Mean Score	OUT	Transect 3		Transect 4		Transect 7		Mean Score	OUT OF	Transect 5		Transect 6		Mean Score
	(X/X)	comment	Score	comment	Score	comment	Score		OF	comment	Score	comment	Score	comment	Score		(X/X)	comment	Score	comment	Score	
Vegetation Condition	**20**	cat B	20	cat B	20	cat B	20	20	**20**	cat B	20	cat B	20	cat B	20	20	**20**	cat B	20	cat B	20	20
Species Richness	**20**	5	10	7	20	3	5	11.66667	**20**	7	20	4	10	5	10	13.33333	**20**	5	10	7	20	15
Flower Score	**10**	0.344286	5	0.482	5	0.503333	8	6	**10**	0.5186	8	0.4875	5	0.48	5	6	**10**	0.492	5	0.494286	5	5
Timing of Biological Shortages	**10**	all	10	all	10	all	10	10	**10**	all	10	all	10	all	10	10	**10**	No food short	7.5	all	10	8.75
Quality of Foraging Habitat	**20**	1	5	1	5	0	0	3.333333	**20**	3	5	3	5	3	5	5	**20**	2	5	3	5	5
Non-native Plant Cover	**20**	0.00%	20	5.00%	10	2.00%	20	16.66667	**20**	5.00%	10	2.00%	20	1.00%	20	16.66667	**20**	0.00%	20	0.00%	20	20
Site Condition Score			70		70		63	67.66667			73		70		70	71			67.5		80	73.75
MAX Site Condition Score	***X***	*X*	*100*	*X*	*100*	*X*	*100*	*100*	***X***	*X*	*100*	*X*	*100*	*X*	*100*	*100*	***X***	*X*	*100*	*X*	*100*	*100*
Site Condition Score - out of 4	**X**	**X**	**2.80**	**X**	**2.80**	**X**	**2.52**	**2.71**	**X**	**X**	**2.92**	**X**	**2.80**	**X**	**2.80**	**2.84**	**X**	**X**	**2.70**	**X**	**3.20**	**2.95**
Size of patch	**10**		10		10		10	10	**10**		10		10		10	10	**10**		10		10	10
Connectedness	**10**	0 active car	0		0		0	0	**10**		0		0		0	0	**10**		0	0	0	0
Context	**10**	56%	6		6		6	6	**10**		6		6		6	6	**10**		6		6	6
Ecological Corridors	**10**		10		10		10	10	**10**		10		10		10	10	**10**		10		10	10
Role of site location to species overall population in the sta	**10**	0 ≥ 3 level ca	0		0		0	0	**10**		0		0		0	0	**10**		0		0	0
Threats to the species	**10**	moderate	5		5		5	5	**5**		5		5		5	5	**5**		5		5	5
Site Context Score			31		31		31	31			31		31		31	31			31		31	31
MAX Site Context Score	***X***	*X*	*60*	*X*	*60*	*X*	*60*	*60*	***X***	*X*	*60*	*X*	*60*	*X*	*60*	*60*	***X***	*X*	*60*	*X*	*60*	*60*
Site Context Score - out of 3	**X**	**X**	**1.55**	**X**	**1.55**	**X**	**1.55**	**1.55**	**X**	**X**	**1.55**	**X**	**1.55**	**X**	**1.55**	**1.55**	**X**	**X**	**1.55**	**X**	**1.55**	**1.55**
Presence of large trees	**10**	5	2	30	4	0	0	2	**10**	5	2	11	2	21	2	2	**10**	62	6	27	4	5
Species Stocking Rate Score			2		4		0	2			2		2		2	2			6		4	5
MAX Species Stocking Rate Score	***X***	*X*	*10*	*X*	*10*	*X*	*10*	*10*	***X***	*X*	*10*	*X*	*10*	*X*	*10*	*10*	***X***	*X*	*10*	*X*	*10*	*10*
Species Stocking Rate Score - out of 3	**X**		**0.60**		**1.20**		**0.00**	**0.60**	**X**		**0.60**		**0.60**		**0.60**	**0.60**	**X**		**1.80**		**1.20**	**1.50**
Total			**4.95**		**5.55**		**4.07**	**4.86**			**5.07**		**4.95**		**4.95**	**4.99**			**6.05**		**5.95**	**6.00**

Assessment unit	AU1	AU2	AU3	Total
Toatal quality score	4.86	4.99	6.00	
Assessment unit area	59.995	70.4186	20.8854	151.2993
Toatal offset area	151.3	151.2993	151.299	
Size Weighting	0.40	0.47	0.14	***1.00***
Area weighted score	1.9258	2.322475	0.82824	***5.08***
Rounded Modified Quality Habitat Assessment Score				**5**

	AU1	Transect 1	Wt p*r	**Flower scores working**	**Timing of biological shortages**					Qulity of foraging habitat (1 = Wt p*r ≥0.65)
					Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-Mar	Migration paths All year	Fruit industries Aug-Mar	
ᵖ mean of all Eucalyptus	*Eucalyptus acmenoides*		0.43			x	x	**x**	x	x	
† Value of 0.65 given as species listed as important winter f	*Angophera leiocarpa*		0.35								
* Assinged based on related species	*Eucalyptus dura* ᵖ		0.53								
	Corymbia citriodora		0.65	x		x			x	x	1
	Allocasuarina torulosa		0								
	Brachychiton sp.		0								

Corymbia trachyphloia	0.45			x	**x**	x	x	
	0.3442857	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**1**
AU1 Transect 2								
Corymbia citriodora	0.65	x						1
Euccalyptus dura	0.53							
Eucalyptus acmenoides	0.43		x	x	**x**	x	x	
Angophera leiocarpa	0.35							
Corymbia trachyphloia	0.45			x	**x**	x	x	
	0.482	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**1**
AU1 Transect 2020 T1								
Eucalyptus dura	0.53	x	x			x	x	
Corymbia trachyphloia	0.45			x	**x**	x	x	
Eucalyptus carnea ‡	0.53		x	x		x	x	
	0.5033333	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**0**
AU2 Transect 3								
Eucalyptus crebra †	0.65	x				x		1
Corymbia citriodora	0.65	x	x			x	x	1
Lophostemon confertus	0.64		x	x	x	x	x	1
Allocasuarina torulosa	0							
Corymbia trachyphloia	0.45			x	**x**	x	x	
Corymbia intermedia	0.86			x	x	x	x	
*Angophera subvalentina**	0.38							
	0.5185714	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**3**
AU2 Transect 4								
Corymbia citriodora	0.65	x	x			x	x	1
Eucalyptus crebra	0.65	x				x		1
Eucalyptus tereticornis	0.65	x	x	x	x	x	x	1
Allocasuarina torulosa	0							
	0.4875	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**3**
AU2 Transect 7								
Corymbia citriodora	0.65	x	x			x	x	1
Eucalyptus crebra	0.65	x				x		1
Corymbia trachyphloia	0.45			x	**x**	x	x	
Allocasuarina torulosa	0							
Eucalyptus tereticornis	0.65	x	x	x	x	x	x	1
	0.48	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**3**
AU3 Transect 5								
Eucalyptus microcorys ‡	0.53		x	x	x	x	x	
Eucalyptus acmenoides	0.43		x	x	**x**	x	x	
Corymbia intermedia	0.86			x	x	x	x	1
Lophostemon confertus	0.64		x	x	x	x	x	1
Allocasuarina torulosa	0							
	0.492	No	**yes**	**yes**	**yes**	**yes**	**yes**	**2**
AU3 Transect 6								
Eucalyptus acmenoides	0.43		x	x	**x**	x	x	
Corymbia citriodora	0.65	x	x			x	x	1
Eucalyptus microcorys	0.53		x	x	x	x	x	
Corymbia intermedia	0.86			x	x	x	x	1
Allocasuarina torulosa	0							
Eucalyptus crebra	0.65	x				x		1
Eucalyptus propinqua	0.34			x	x	x	x	
	0.4942857	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**3**

Appendix D

Weed Transect Data

Burnett Creek - Ground Layer Transect (100M) 1				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	10.0	*Themeda triandra*	Kangaroo Grass	10.00
10.0	20.0	*Heteropogon contortus*	Black Spear Grass	10.00
20.0	**20.2**	***Senecio madagascariensis***	**Fireweed**	**0.20**
20.2	75.0	*Themeda triandra*	Kangaroo Grass	54.80
75.0	100.0	*Heteropogon contortus*	Black Spear Grass	25.00
			Native/bare cover	**99.8%**
			Total Exotic/weed cover	**0.2%**
			Weeds of National Significance cover	**0.2%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 2				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	100.0	*Themeda triandra*	Kangaroo Grass	100.00
		Heteropogon contortus	Black Spear Grass	
		Xanthorrhoea johnsonii	Forest Grass Tree	
		Bare Rock	Bare Rock	
			Native/bare cover	**100.0%**
			Total Exotic/weed cover	**0.0%**
			Weeds of National Significance cover	**0.0%**

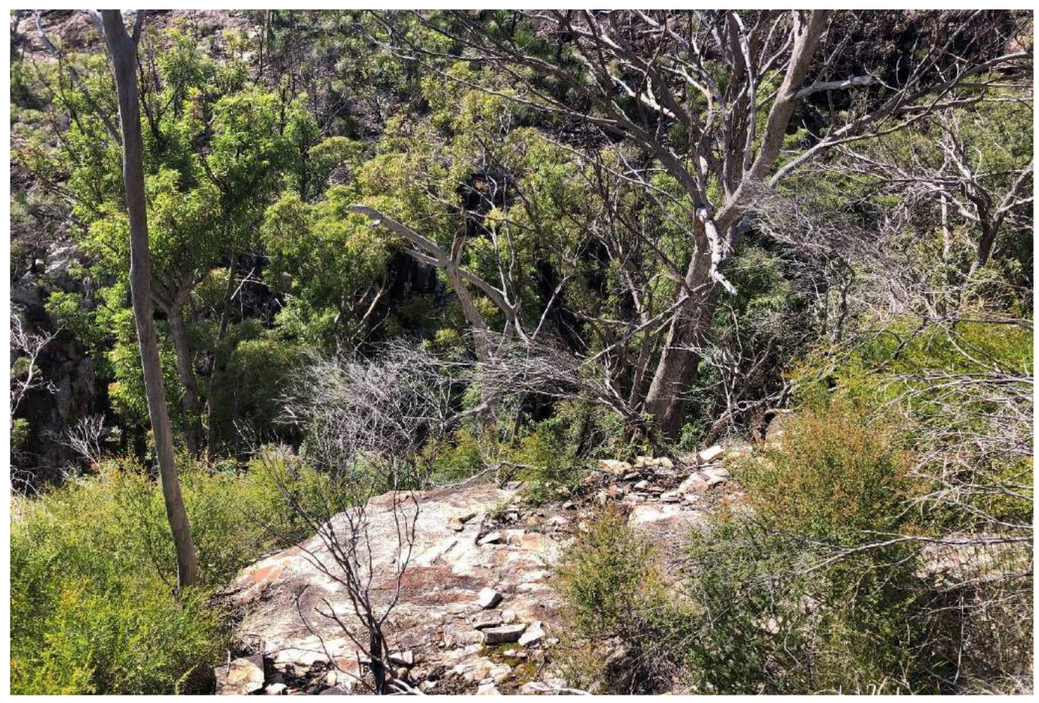
50m

North

East

South

West



Burnett Creek - Ground Layer Transect (100M) 3				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	**3.0**	***Melinis repens***	**Red Natal Grass**	**3.00**
3.0	5.0	*Themeda triandra*	Kangaroo Grass	2.00
		Heteropogon contortus	Black Spear Grass	
		Xanthorrhoea johnsonii	Forest Grass Tree	
		Bare Rock	Bare Rock	
5.0	**6.5**	***Lantana camara***	**Lantana**	**1.50**
6.5	24.0	*Themeda triandra*	Kangaroo Grass	17.50
		Heteropogon contortus	Black Spear Grass	
		Xanthorrhoea johnsonii	Forest Grass Tree	
		Bare Rock	Bare Rock	
24.0	**24.2**	***Senecio madagascariensis***	**Fireweed**	**0.20**
24.2	40.0	*Themeda triandra*	Kangaroo Grass	15.80
		Heteropogon contortus	Black Spear Grass	
		Xanthorrhoea johnsonii	Forest Grass Tree	
		Bare Rock	Bare Rock	
40.0	**40.2**	***Senecio madagascariensis***	**Fireweed**	**0.20**
40.2	80.0	*Themeda triandra*	Kangaroo Grass	39.80
		Heteropogon contortus	Black Spear Grass	
		Xanthorrhoea johnsonii	Forest Grass Tree	
		Bare Rock	Bare Rock	
80.0	**80.2**	***Senecio madagascariensis***	**Fireweed**	**0.20**
80.2	100.0	*Themeda triandra*	Kangaroo Grass	19.80
		Heteropogon contortus	Black Spear Grass	
		Xanthorrhoea johnsonii	Forest Grass Tree	
		Bare Rock	Bare Rock	
			Native/bare cover	**94.9%**
			Total Exotic/weed cover	**5.1%**
			Weeds of National Significance cover	**2.1%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 4				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	2.0	*Themeda triandra*	Kangaroo Grass	2.00
2.0	**2.5**	***Bidens pilosa***	**Cobbler's Pegs**	**0.50**
2.5	4.0	*Themeda triandra*	Kangaroo Grass	1.50
4.0	**4.2**	***Bidens pilosa***	**Cobbler's Pegs**	**0.20**
4.2	40.0	*Themeda triandra*	Kangaroo Grass	35.80
40.0	**40.2**	***Bidens pilosa***	**Cobbler's Pegs**	**0.20**
40.2	52.0	*Themeda triandra*	Kangaroo Grass	11.80
52.0	**52.3**	***Crassocephalum crepidioides***	**Thickhead**	**0.30**
52.3	55.0	*Themeda triandra*	Kangaroo Grass	2.70
55.0	**55.1**	***Bidens pilosa***	**Cobbler's Pegs**	**0.10**
55.1	95.0	*Themeda triandra*	Kangaroo Grass	39.90
95.0	**95.1**	***Bidens pilosa***	**Cobbler's Pegs**	**0.10**
95.1	100.0	*Themeda triandra*	Kangaroo Grass	4.90
			Native/bare cover	**98.6%**
			Total Exotic/weed cover	**1.4%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 5				
Start (m)	**Finish (m)**	**Species**	**Common Name**	**Coverage**
0	60	*Themeda triandra*	Kangaroo Grass	60
60	**61.5**	***Bidens pilosa***	**Cobbler's Pegs**	**1.5**
61.5	100	*Themeda triandra*	Kangaroo Grass	38.5
			Native/bare cover	**98.5%**
			Total Exotic/weed cover	**1.5%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 6				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	50.0	*Themeda triandra*	Kangaroo Grass	50.00
50.0	**50.3**	***Melinis repens***	**Red Natal Grass**	**0.30**
50.3	80.0	*Themeda triandra*	Kangaroo Grass	29.70
80.0	**80.1**	***Senecio madagascariensis***	**Fireweed**	**0.10**
80.1	85.0	*Themeda triandra*	Kangaroo Grass	4.90
85.0	**85.2**	***Senecio madagascariensis***	**Fireweed**	**0.20**
85.2	90.0	*Themeda triandra*	Kangaroo Grass	4.80
90.0	**90.5**	***Bidens pilosa***	**Cobbler's Pegs**	**0.50**
90.5	93.0	*Themeda triandra*	Kangaroo Grass	2.50
93.0	**93.3**	***Bidens pilosa***	**Cobbler's Pegs**	**0.30**
93.3	100.0	*Themeda triandra*	Kangaroo Grass	6.70
			Native/bare cover	**98.6%**
			Total Exotic/weed cover	**1.4%**
			Weeds of National Significance cover	**0.3%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 7				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	5.0	*Themeda triandra*	Kangaroo Grass	5.00
5.0	**5.4**	***Crassocephalum crepidioides***	**Thickhead**	**0.40**
5.4	7.0	*Themeda triandra*	Kangaroo Grass	1.60
7.0	**7.1**	***Crassocephalum crepidioides***	**Thickhead**	**0.10**
7.1	15.0	*Themeda triandra*	Kangaroo Grass	7.90
15.0	**15.2**	***Crotalaria lanceolata***	**Rattlepod**	**0.20**
15.2	20.0	*Themeda triandra*	Kangaroo Grass	4.80
20.0	**20.1**	***Crassocephalum crepidioides***	**Thickhead**	**0.10**
20.1	50.0	*Themeda triandra*	Kangaroo Grass	29.90
50.0	**50.2**	***Crassocephalum crepidioides***	**Thickhead**	**0.20**
50.2	100.0	*Themeda triandra*	Kangaroo Grass	49.80
			Native/bare cover	**99.0%**
			Total Exotic/weed cover	**1.0%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 8				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	40.0	*Themeda triandra*	Kangaroo Grass	40.0
40.0	**42.0**	***Melinis repens***	**Red Natal Grass**	**2.0**
42.0	50.0	*Bare rock*	Bare rock	8.0
50.0	**75.0**	*Leptospermum petersonii*	Lemon-scented Tea-tree	25.0
75.0	**85.0**	***Melinis repens***	**Red Natal Grass**	**10.0**
85.0	90.0	*Bare Rock*	Bare Rock	5.0
90.0	100.0	*Themeda triandra*	Kangaroo Grass	10.0
			Native/bare cover	**88.0%**
			Total Exotic/weed cover	**12.0%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 9				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	100.0	*Themeda triandra*	Kangaroo Grass	100.0
		Leaf Litter	Leaf Litter	
			Native/bare cover	**100.0%**
			Total Exotic/weed cover	**0.0%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 10				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	80.0	*Themeda triandra*	Kangaroo Grass	80.0
80.0	**82.0**	***Melinis repens***	**Red Natal Grass**	**2.0**
82.0	100.0	*Themeda triandra*	Kangaroo Grass	18.0
			Native/bare cover	**98.0%**
			Total Exotic/weed cover	**2.0%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 11				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	100.0	*Themeda triandra*	Kangaroo Grass	100.0
		Heteropogon contortus	Black Spear Grass	
			Native/bare cover	**100.0%**
			Total Exotic/weed cover	**0.0%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 12				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	**10.0**	***Lantana camara***	**Lantana**	**10.0**
		Passiflora suberosa	**Corky Passion Vine**	
10.0	12.0	*Themeda triandra*	Kangaroo Grass	2.0
12.0	**14.0**	***Lantana camara***	**Lantana**	**2.0**
		Heliotropium amplexicaule	**Blue Heliotrope**	
14.0	18.0	*Themeda triandra*	Kangaroo Grass	4.0
18.0	**20.0**	***Lantana camara***	**Lantana**	**2.0**
20.0	25.0	*Themeda triandra*	Kangaroo Grass	5.0
		Leaf Litter	Leaf Litter	
25.0	**27.0**	***Lantana camara***	**Lantana**	**2.0**
		Bidens pilosa	**Cobbler's Pegs**	
		Desmodium uncinatum	**Silver-leaf Desmodium**	
27.0	52.0	*Themeda triandra*	Kangaroo Grass	25.0
		Leaf Litter	Leaf Litter	
52.0	**55.0**	***Lantana camara***	**Lantana**	**3.0**
55.0	65.0	*Themeda triandra*	Kangaroo Grass	10.0
		Leaf Litter	Leaf Litter	
65.0	**70.0**	***Lantana camara***	**Lantana**	**5.0**
70.0	80.0	*Themeda triandra*	Kangaroo Grass	10.0
		Leaf Litter	Leaf Litter	
80.0	**82.0**	***Lantana camara***	**Lantana**	**2.0**
82.0	84.0	*Themeda triandra*	Kangaroo Grass	2.0
		Leaf Litter	Leaf Litter	
84.0	**90.0**	***Lantana camara***	**Lantana**	**6.0**
90.0	97.0	*Themeda triandra*	Kangaroo Grass	7.0
		Leaf Litter	Leaf Litter	
97.0	**100.0**	***Lantana camara***	**Lantana**	**3.0**
			Native/bare cover	**65.0%**
			Total Exotic/weed cover	**35.0%**
			Weeds of National Significance cover	**27.5%**

50m

North

South

East

West

Burnett Creek - Ground Layer Transect (100M) 13				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	2.0	*Themeda triandra*	Kangaroo Grass	2.0
		Leaf Litter	Leaf Litter	
2.0	**2.3**	***Bidens pilosa***	**Cobbler's Pegs**	**0.3**
2.3	**10.0**	*Themeda triandra*	Kangaroo Grass	7.7
		Leaf Litter	Leaf Litter	
10.0	**10.2**	***Senecio madagascariensis***	**Fireweed**	**0.2**
10.2	**10.4**	***Melinis repens***	**Red Natal Grass**	**0.2**
10.4	12.0	*Themeda triandra*	Kangaroo Grass	1.6
		Leaf Litter	Leaf Litter	
12.0	**14.0**	***Lantana camara***	**Lantana**	**2.0**
14.0	55.0	*Themeda triandra*	Kangaroo Grass	41.0
		Leaf Litter	Leaf Litter	
55.0	**56.0**	***Desmodium uncinatum***	**Silver-leaf Desmodium**	**1.0**
56.0	**80.0**	*Themeda triandra*	Kangaroo Grass	24.0
		Leaf Litter	Leaf Litter	
80.0	83.0	***Desmodium uncinatum***	**Silver-leaf Desmodium**	**3.0**
		Bidens pilosa	**Cobbler's Pegs**	
		Solanum nigrum	**Blackberry Nightsahde**	
83.0	98.0	*Themeda triandra*	Kangaroo Grass	15.0
		Leaf Litter	Leaf Litter	
98.0	**100.0**	***Desmodium uncinatum***	**Silver-leaf Desmodium**	**2.0**
		Bidens pilosa	**Cobbler's Pegs**	
		Solanum nigrum	**Blackberry Nightsahde**	
			Native/bare cover	**91.3%**
			Total Exotic/weed cover	**8.7%**
			Weeds of National Significance cover	**2.0%**

50m

North

South

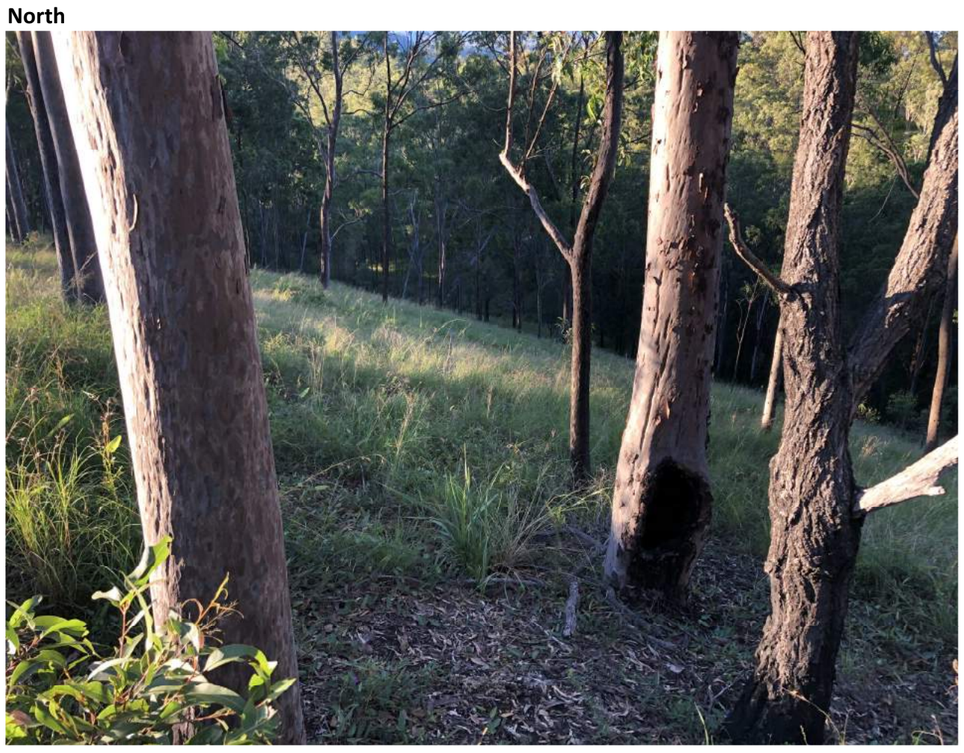
East

West

Burnett Creek - Ground Layer Transect (100M) 14				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	10.0	*Themeda triandra*	Kangaroo Grass	10.00
		Leaf Litter	Leaf Litter	
10.0	**10.2**	***Melinis repens***	**Red Natal Grass**	**0.20**
10.2	20.0	*Themeda triandra*	Kangaroo Grass	9.80
		Leaf Litter	Leaf Litter	
20.0	**21.0**	***Lantana montevidensis***	**Creeping Lantana**	**1.00**
		Desmodium uncinatum	**Silver-leaf Desmodium**	
21.0	25.0	*Themeda triandra*	Kangaroo Grass	4.00
		Leaf Litter	Leaf Litter	
25.0	**25.5**	***Lantana montevidensis***	**Creeping Lantana**	**0.50**
		Desmodium uncinatum	**Silver-leaf Desmodium**	
25.5	40.0	*Themeda triandra*	Kangaroo Grass	14.50
		Leaf Litter	Leaf Litter	
40.0	**41.0**	***Lantana montevidensis***	**Creeping Lantana**	**1.00**
		Desmodium uncinatum	**Silver-leaf Desmodium**	
41.0	52.0	*Themeda triandra*	Kangaroo Grass	11.00
		Leaf Litter	Leaf Litter	
52.0	**52.5**	***Heliotropium amplexicaule***	**Blue Heliotrope**	**0.50**
52.5	75.0	*Themeda triandra*	Kangaroo Grass	22.50
		Leaf Litter	Leaf Litter	
75.0	**75.2**	***Desmodium uncinatum***	**Silver-leaf Desmodium**	**0.20**
75.2	90.0	*Themeda triandra*	Kangaroo Grass	14.80
		Leaf Litter	Leaf Litter	
90.0	**91.0**	***Lantana montevidensis***	**Creeping Lantana**	**1.00**
		Desmodium uncinatum	**Silver-leaf Desmodium**	
			Native/bare cover	**86.6%**
			Total Exotic/weed cover	**4.4%**
			Weeds of National Significance cover	**0.0%**

50m

North



South

East

West

Burnett Creek - Ground Layer Transect (100M) 15				
Start (m)	**Finish (m)**	***Species***	**Common Name**	**Coverage**
0.0	40.0	*Themeda triandra*	Kangaroo Grass	40.00
40.0	**43.0**	***Melinis repens***	**Red Natal Grass**	**3.00**
43.0	87.0	*Themeda triandra*	Kangaroo Grass	44.00
87.0	**89.0**	***Melinis repens***	**Red Natal Grass**	**2.00**
89.0	100.0	*Themeda triandra*	Kangaroo Grass	11.00
			Native/bare cover	**95.0%**
			Total Exotic/weed cover	**5.0%**
			Weeds of National Significance cover	**0.0%**

50m

North

South

East

West

Appendix E

Non-native Koala Predator Data

Burnett Creek - Camera Trap Data

Camera	Set up	Collection	Common name	Species	Occurrence	Native/Non native
1	8/04/2021	6/05/2021	Pretty face wallaby	*Macropus parryi*	1	Native
2	9/04/2021	7/05/2021	Grey Shrike Thrush	*Colluricincla harmonica*	1	Native
			Brush-tailed Rock wallaby	*Petrogale penicillata*	1	Native
			Brush-tailed possum	*Trichosurus vulpecula*	1	Native
3	8/04/2021	6/05/2021	Northern brown bandicoot	*Isoodon macrourus*	1	Native
			Brush-tailed Rock wallaby	*Petrogale penicillata*	1	Native
			Australian Magpie	*Macropus rufogriseus*	1	Native
4	8/04/2021	6/05/2021	Pretty face wallaby	*Macropus parryi*	1	Native
5	9/04/2021	7/05/2021	Northern brown bandicoot	*Isoodon macrourus*	1	Native
6	9/04/2021	13/05/2021	Cat	*Felis catus*	1	Non-Native
			Pretty face Wallaby	*Macropus parryi*	1	Native
			Cow	*Bos taurus*	1	Non-Native

Burnett Creek - Camera 1

Burnett Creek - Camera 2

Burnett Creek - Camera 3

Burnett Creek - Camera 4

Burnett Creek - Camera 5

Burnett Creek - Camera 6