BEMROSE
WILDLIFE MANAGEMENT SERVICES

2023

Site: Lot 191 Ranger Road, Adare.

Date of service: 16th November. 2023

Fauna Management and Consultancy. Onsite Five Year Offset Milestone Report. Koala observational survey audit. (EPBC Act 1999). Lockyer Energy Management Pty Ltd.

Dean Bemrose.

Bemrose Wildlife Management Services.

16th November. 2023

Lockyer Energy Pty Ltd.

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1.0

SCOPE OF WORKS: Annual Environment Protection and Biodiversity Conservation (Koala) audit. November 2023. Five year Offset Milestone and Habitat Values. 2023.

Bemrose Wildlife Management Services (Queensland Government Rehabilitation Permit number WA0050118, Damage Mitigation Permit numberWA0049329) has been engaged via Lockyer Energy Management Pty Ltd to report on the ongoing site-specific Annual compliance conditions as well as the specific conditions relating to the once-off Five Year offset Milestone reporting framework.

This Milestone required a "at five years after the start of the offset, the habitat has been maintained or improved and no increase in threats have occurred.
Performance indicators:
(a) "Density and abundance of koala food trees is maintained or increased"
(b) "Threats that have been identified have not spread or increased"

The Department of Environment and Science was notified that the client had legally secured an area of 41.65 hectares of koala habitat. This covenant is displayed on the Lockyer Energy Management Pty Ltd website. This parcel of land ("the offset") is supporting a mobile koala population.

Key performance indicators and outcomes during this phase as listed indicate a strong commitment in managing the site.

All pertinent Governmental authorities have been communicated with as per the enforced stipulations. The program has been scrutinised and is categorised as within areas of the bioregion that is essential and within a core Koala area mapping zone.

This scope of works was performed on the 16th Day of November 2023. Under the prescribed conditions, the annual audit of the site in reference to the uptake of the site by CREVNT listed Koala (listed as Endangered under the Nature Conservation Act 1992 (Queensland) and listed under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth/Federal) legislative frameworks, has been successfully achieved. The audit proposed to implement and complete an onsite Koala observational and anecdotal evidence search of the greater Lockyer Energy Management Pty Ltd offset space and determine if the habitat values have been stabilised, increased, or regressed in habitat values. Mapping of transect points of significance are illustrated in plates (1 to 23).

A summary of linear, grid and meandering walkthrough transects and methodologies inclusive of S.A.T field protocols did achieve a greater than 2018 – 2023 (five year milestone)

and 2022 (Annual Koala Audit) observations - koala habitat value and anecdotal evidence (climbing indicators, scat indicators); in addition to maintaining a higher level of general Regional Ecosystem values that correlate to a broad spectrum of critical biodiversity values (shelter, habitat values, breeding places, koala home tree stabilisation, nutrient availability and potential for higher uptake of nutrients). Within this framework, which is perceived as integrated, is the significant reduction in invasive floristic species (especially *Lantana sp)*. This is a critical point to mention, as when the densities of *Lantana sp* increases, the impact to koala mobility through the offset can reduce their paths of travel, thus potentially reducing accessibility to primary koala food, shelter, and home trees.

Observations aligned with a field fauna and flora and koala site indicator survey as conducted by Ecologists with GHD.

These indicators have been achieved and the general health of the biodiversity and values within have been maintained and increased. Habitat degradation and or habitat fragmentation has not occurred in reference to koala habitat within the offset. This is evident via the trace indicators observed throughout the site. Significantly the increase in frequency of koala climbing and scat indicators reflect access and egress pathways that have been identified in (November 2023) and correlated with similar pathways as traversed by koalas in 2017 (GHD Habitat Conservation for Significant Species 14th July 2017) and the annual koala habitat offset field survey concluded in 2022.

S.A.T (Spot Assessment Technique) as completed by GHD is significant as it demonstrates the maintained or greater than values of the offset in 2023 have been successful. Observations, in reference to the home, shelter or food trees, with higher levels of koala trace elements did indicate that Spotted Gum (*Corymbia citriodora* and possible *Corymbia henryi*) is heavily favoured by the endemic population surrounding this site. Ironbark species (*Eucalyptus sp*) is the dominant species within the offset area and is also described as a Non-Juvenile Koala Habitat Tree. Both species are home, shelter, and food trees for koalas. These indicators as observed can demonstrate the preferences to diet as the foliar nutritional quantity can differ substantially, even between individual trees from the same species.

Field observations along the linear transects South to North did produce evidence to suggest that the first third and the last third of the offset does contain a higher abundance of Spotted Gum, whereas the mid-section of the offset, although fringed with Spotted Gum, did not produce high anecdotal koala evidence. It is, therefore, highly likely that koala inhabit these locations regularly in search for suitable leaf for consumption. There was a notable heat difference within the mid-section of the offset, which can also correlate to the preferred areas and NJKHT species. Studies (Ellis et al 2010; Briscoe et al 2014) confirm this hypothesis with koalas potentially searching for specific thermal properties of NJKHTs

(shade or offer cooler or warmer temperatures) to assist in thermoregulation. One factor that can influence this is bark type and colour. Hand temperature reading off bark (Ironbark and Spotted Gum) did indicate differences in bark temperature, with Spotted Gum feeling cooler. This could be influential as the season of survey, and the day of the survey was hot (>37°C) at midday. To the extent of the habitat values within the offset area, the floristic composition of the open eucalypt woodland is significant as it provides a robust koala habitat. Structurally, the individual NJKHTs did predominately have interlocking canopies, providing canopy transfers by koalas. Another assumption is that the lower areas within the offset area (mid-section is generally higher peaking at a rocky outcrop and contains a greater mass of igneous rocks) do have a greater level of soil nutrient uptake and access to ground water and sub terranean water to feed the NJKHTs, therefore has a greater uptake by koalas. The section in the later third of the offset does have an ephemeral water pathway, with a general greater frequency of Spotted Gum. Koala evidence was high within this location (climbing and scat trace). SAT indicators along the forward and rear perimeter (Spotted Gum with scat levels higher than 10) within the frameworks of this site were regarded as a positive interaction. Ironbark species (although dominant) and readily inhabited throughout the site, did not present with high numbers of koala evidence. This can be explained with several reasons: Koala mobility during the survey season (breeding season), interactions between koala (male and female, sub-adult to adult), dominance, home range and territorial aspects, available nutrients. As the site is open and relatively unobstructed access and egress via site immigration to emigration can vary significantly. Population dynamics are not categorical as of the date of survey, therefore the distances of travel between areas can be vast. Home ranges depend on the dominance of the animal (male/female), and the overall health of the system. They can be as few as one hectare to several hundred hectares. Future and ongoing field studies within the general footprint are scheduled until 2047. This capacity for survey efforts will continue to provide evidence on population dynamics, health of the biodiversity and general ecology, suitable koala habitat and interactions on how koala and in what capacity can they continue to survive. Technological advances do open several pathways in investigation techniques that can be integrated into this greater koala field study campaign.

The greater the overall health score of a koala forest can influence the biodiversity that inhabits it as observed throughout the field survey effort. High levels of activity (robust anecdotal evidence) were observed, with Short-beaked Echidna, Wedge-tailed Eagle (highly active nest with feeding bout evidence), South-east Queensland Bearded Dragon, South-eastern Queensland Blue Tongue Skink, Brown Hare, Tawny Frogmouth, macropod (possible sub-adult Eastern Grey Kangaroo) and Northern Bandicoot species). This fortifies the resolution that the offset does have a healthy and robust biodiversity. Natural performance indicators (inter-specific and intra-specific competition and indicators) and possible interactions within the context of allogeneic predation are stable, specifically in reference to the project footprint (external factor) that seems to have little impacts within the offset

area as observed on the date of survey. Positive establishment of the offset also seems to have been highly effective and commended. It is critical to note, that the ongoing survivorship characteristics appear to be influenced by the interconnectivity of this site and the neighbouring properties.

2.0

KOALA ASSESSMENT TECHNIQUES

Koala observational transects generally aligned in an East to West the West to East format. When applicable, the searches encompassed several trees in a 360°pattern to optimise the potential in observing and discovering further evidence of koala inhabitation.

At this time of year, Koala/s are known to be dispersing and travelling significant distances in search of breeding partners. The greater region is known to have robust remnant Koala populations extending to historical records decades old. There is a divergence of secondary Koala food and home trees within the greater area.

At no time of the fauna management inspection program were Koalas observed onsite or transitioning through the site. It is noted that critically, there is a high connectivity of highly suitable refugia for Koalas within adjacent regional ecosystems.

Robust and frequent anecdotal Koala evidence was observed during the immediate inspections and onsite management of the site. The habitat that was present on the site does conform with accessible Koala habitat or connectivity corridors. As a precautionary principle, relevant and con-current observational management techniques actioned were 360°Basal to Canopy (inclusive of Canopy over-lapping). Koala focused searches, with the aim of locating Koala, Koala scat and or evidence of climbing scratches did occur during this survey effort. Grid and randomized transect search techniques were additionally utilized inclusive of Dique et al Koala search methodologies and S.P.O.T mechanisms. Principals in koala survey efforts, when scat and or when strong anecdotal evidence suggest that koala are potentially within the general area, dictates that a interlocking Non-Juvenile Koala Habitat tree search is conducted entailing a star shaped linear transect line extending up to fifty (50 meters) meters in several directions at roughly 30 degree angles to the location of anecdotal evidence. This technique is aimed at maximising the potential for direct observations of koala.

3.0

KOALA SPOTTER SCOPE OF WORKS

A Non-Juvenile Koala Habitat Tree is an individual tree that is greater than 300mm diameter at 1.3 meters above ground level and 4 meters above ground level. This has been activated regardless of if the tree is singular or bifurcated. Minor continuous over-lapping potential NJKHT canopy cover was located within a grid transect.

Koala Doe's and Bucks during the month of the scope of works (November 2023) if observed should be forming semi-independence. This is highly variant due to seasonal variation and population dynamics. Should any trace of Chlamydia or Koala retro virus be observed immediate Koala management capture and Veterinarian support be activated. Indicators of koala distress or immobilising pathogen threat or gross inappetence that leads to a koala being located on the terrestrial base does enact a very serious response as the risk of a catastrophic health event can be imminent and Veterinarian assistance is required immediately.

It is a fundamental role of the Koala Spotter to maintain and traverse linear transects where vegetation removal is scheduled and to stay onsite until vegetation checks had been completed by an accredited Fauna/Koala Spotter. These actions are to determine and enact fauna mitigation strategies to maximise fauna survivorship whilst minimizing potential myopathy concerns. Habitat retention and assessment is a component of this program to maximise potential fauna habitat.

The role of the Fauna/Koala manager (Spotter) for this site, requires onsite management, controlled under the general EPBC Act 1999 and the NC Act 1994. Fauna management actions are comprehensively scheduled in direct correlation to fauna species observed and habitat anecdotal evidence acquired.

4.0

GENERAL SITE OBSERVATIONS – FAUNA AND HABITAT OBSERVATIONS WITHIN THE OFFSET AREA.

The principal component for this fauna management project is terrestrial and arboreal fauna management controls. There are no ephemeral or permanent water bodies, or pathways that are in flow at present. Therefore, no special least concern Platypus controls are in effect.

No fauna load reduction campaign has been activated on the pretext that low levels of fauna interactions is anticipated. With an open site as this, it can also encourage fauna assets offsite to enter the site.

No special least concern short-beaked echidna or common habitat values were identified. Comprehensive site fauna management will be fulfilled during onsite vegetation management works.

No flowering, seed, or fruit in high densities was observed. Termitarium (terrestrial/arboreal) was observed to have been excavated throughout the site by Short-beaked Echidna. It was evident that the excavations varied in depths and access/egress points in the terrestrial termitarium. This enables several terrestrial species to inhabit the mounds and utilise them as breeding places, forage sites, dens, and shelter places.

Extensive Northern Bandicoot terrestrial foraging sites were located throughout the southern to northern fauna field observational transect lines.

Two large avian stick nests were located. They have been constructed at height and located in the upper stratum (canopy) of Ironbark species. The height advantage avails suitable and accessible landing platforms for the Wedge-tailed Eagle. The nest are greater than one (1) meter in diameter. The first nest (as observed in 2022) is slowly deconstructing with age, subsequently a second (newly constructed) by the significant evidence on the terrestrial base of large sticks splayed around the diameter of the NJKHT (5 -10 meters diameter). The depth of the nest is over 50cm. Two adult Wedge-tailed Eagles were observed throughout the survey effort soaring on the updrafts. Several bones (macropod, large lizard, Brown Hare, Tawny Frogmouth, Northern Bandicoot) and several pellets (regurgitated indigestible feathers and fur). It is possible that koala is predated upon by Wedge-tailed Eagles. This is a natural occurrence in the inter-specific prey cycle. Having a breeding pair of Wedge-tailed Eagles is critically significant to the site and the habitat values exhibited. It symbolises a robust ecosystem and the ecological values and responses within an open system. This

greater footprint encapsulates a regional footprint, that once was heavily fragmented and did not support the biodiversity values integrated within this habitat footprint.
No Ring-tailed Possum Dreys, active or inactive was observed.

No large Psittaciformes (Cockatoo, Galah species) that are listed as common and known to be an urban species were observed. Smaller Lorikeet species are forming or have reunited pair bonds to engage in breeding activities. These species are hollow dependent, as such hollows are a critical habitat value.

It is essential that fauna friendly corridors are maintained to enable Wren/Finch/pardalote species access to habitat dynamics within short distances as distance between habitat values for these Aves is essential for survivorship and fecundity levels to be sustainable.

No microbat species were observed.

No CREVNT amphibian species were detected or audible. Least concern (NCA92') amphibian check and clear searches will be a continuous mechanism activated on this scope or works site.

Adaptation of fauna individuals or assemblages established within the greater envelope of the site should be maintained and progress positively.

Macro and micro habitats were assessed for vagile fauna that may be encountered during the fauna management program.

Australasian Bee-eaters were not audible (not observed to be active around embankments to indicate breeding chambers).

Hollows generally form when a suitable tree reaches an age of 60 -80 – 350 years. This is highly dependent on the species of tree. Ironbark species, utilising field experience and knowledge do not develop hollow bearing natural assets as frequently, however, can harbour undetectable hollows and fissures, not observable from ground level, this is due to the greater density of the Ironbark wood, however, can contain degraded inner core areas of the tree forming chambers and or vertical chimney hollows – typically due to health degradation or termitaria influx.

Scribbly Gum species however, phyto-morphologically do develop hollows sooner from within the main trunk system to leading limbs. With job sites that do have Scribbly Gums, or alternate NJKHTs hollows greater than 10 cm diameter, habitat box installations are essential to assist in negating hollow habitat losses, in conjunction with Habitat Box Management Plans.

It is known via research models and infield experience morphologically Ironbark species have deep furrows (trench like vertical indentations of the bark) that enable termite species to mobiles relatively low impacts to survivorship as the furrows provide direct cover from predation with minimal sunlight penetration. Excavations to arboreal termitaria via Greater Kingfisher species (Kookaburra) is frequently observed. These excavations can be inhabited by Brush-tail Possum and or Lace Monitors.

Uninhibited line of sight potentials from the basal areas of scheduled trees to the upper canopy stratum levels was common throughout the site. Techniques that were utilised during this phase involved standard Bemrose Wildlife protocols for observing arboreal fauna. Basal searches of the selective areas were carried out to determine Koala presence in conjunction with 360° basal to upper canopy Koala searches. No physical observations of Koala occurred at any stage of the program. Dique et al, contemporary research methodologies and S.P.O.T/SAT fauna management mechanisms were adopted for this project.

No RAMSAR wetland sites or any alternate trigger documents or places of significance was detected or observed throughout the scope of works site. No Special Least Concern fauna reliant on wetlands were observed, or audible call indicators recorded. Under this legislative document all pertinent clients were advised of the obligations under this scope of works.

No terrestrial based Masked-Lapwing (Avian species) was identified during the pre-clearance phase to have nesting terrestrial structures. If a nest is to be located mitigation translocation into the green zone would be a probable outcome in maintaining the incubation and survivorship of the eggs. No alternate ground nesting Avian species – Quail – were observed.

The proposed clearance methodology does allow maximum line of sight to successfully manage the objective. No Antechinus hides or alternate endemic or native small mammal hides, or nests were observed.

It is determined that the bulk of the vegetation was at an age whereby phyto-morphologically, the potential for suitable hollow bearing natural assets was correspondingly a low volume. This assumption was proven during the pre-clearance program. Inhabitation by Glider, Phascogale, Possum, Micro-bat, Herpeto-fauna and or Psittaciformes (Parrot species) is possible, however observations did not occur. Several large NJKHTs are existent within the offset area to support species listed. Wildnet searches indicate a broad spectrum of fauna individuals and or assemblages of fauna can inhabit this site successfully.

Under the Queensland state legislative pieces inclusive of the *Animal Care and Protection Act 2001 (ACP Act), Nature Conservation Act (NC Act) and subordinate legislation, Biosecurity Act 2014, Environmental Protection Act 1994 (EP Act), Planning Act 2016 (Koala Conservation) and the Vegetation Management Act 1999 (VM Act) (essential habitat)* has been assessed as per protocols and in addition to pertinent data that has been forwarded to assess. The Code of Practice – Care of Sick, Injured or Orphaned Protected Animals in Queensland is acknowledged via the Department of Environment and Heritage Protection 2013a.

Fauna aggregation of risk and distribution should not significantly affect; within the greater system/s post vegetation removal. Allogenic succession is a potential within the scope of works general civil program, however, the potential affects have been significantly reduced via the retention of habitat values.

No Varanid species was observed at any location of the site (Goannas can and do utilise arboreal fauna as breeding and resting locations.

Comprehensive toolbox meetings have been activated for this project to ensure complete transparency and continuity.

Ephemeral water bodies can pool and run-off attributing to potential assemblages of small to medium amphibians within the classed EVNT ranges and scheduled classes of abundance. No acid frogs, Wallum frogs or tusked frog species were observed via visual searches nor was audible resonance heard. It is not anticipated that EVNT amphibians will be impacted by this phase of operations.

Maximum precautionary human safety was observed on-site as the potential for observing potentially venomous snakes is evident. Specifically, Eastern Brown, Red-Bellied Black, Yellow-faced Whip and was possible. During the broader program inclusive of the inspection, any potential ground hollow and sedge/tussock grass clumping was checked and cleared. Extreme caution and precautionary fauna management principles were also enacted to maximise human and animal safety. All areas were subsequently probed utilizing specialized PPE.

All precautionary principles of fauna/EVNT management were observed and enforced during this phase.

5.0

LEGISLATIVE FRAMEWORK

This report acknowledges the principles and values regarding the Koala-sensitive Design Guideline. A guide to Koala-sensitive design measures for planning and development activities prepared by: Koala Conservation Unit, Department of Environment and Heritage Protection © State of Queensland (Department of Environment and Heritage Protection) 2012. All Koala based guidelines and Policy frameworks were adhered to, inclusive of counts pertaining to Non-Juvenile Koala Habitat Trees that were required to be removed.

Acknowledgement is accepted, pertaining to the Queensland Animal Care and Protection Act 2001 which provides legislative protection to animals generally, and the relevant Legislature: Queensland Nature Conservation Act 1992, the Queensland Vegetation Management Act 1999, and the Federal Environmental Protection and Biodiversity Conservation Act 1999, inclusive of the legislature piece: Nature Conservation (Koala) Conservation Plan 2017 were referred to.

6.0

CONCLUSIONS

Information pertaining to the site and the pro-active influence of the site owners and project managers, and governing authorities has activated for the greater conservation and protection of fauna that inhabits the general scope of works footprint. Entailed within the information was the commitment to habitat preservation and protection where feasible as demonstrated by the offset for the site that sustained the habitat values and increased the habitat values essential for Australian Terrestrial Vertebrates within the variants of ecosystems and ecological functions exhibited during the onsite EPBC Act 1999 endangered species survey (Koala). The supporting ecosystem values extend through the trophic levels. As the site and the survey effort is to be continued until 2047, it is expected that because the offset area is not to be impacted by future construction or operational works, population dynamics and positive inhabitancy by numerous fauna species and assemblages will continue. Breeding places are extensive for terrestrial and arboreal fauna. Interconnectivity to adjacent properties is critical to the core of koala populations in this area. Continued survey efforts can optimise the space for several years, cataloguing koala populations and movements. Advances in technologies, as of now, present exciting opportunities to navigate the complex life cycles of wild koala. Thermal technology, Drone technology and vocalisation call back systems are supportive instruments, mechanisms and methodologies that can be incorporated with great effect. DNA analysis of scat and hair trace is an effective tool in disseminating population variances. General terrestrial and arboreal field surveys, such as spotlighting surveys are proven direct observation techniques. To establish baseline generalist fauna populations, trapping survey efforts could be incorporated.

One of the core elements of significance for this project was the general site increase in frequency of observations in koala anecdotal activity. This emulates a continued positive uptake to the offset by koalas. Thus, a very positive outcome to this annual event and a positive future for the endemic koala population. It is also evident that several koalas inhabit this site as demonstrated by the variances of climbing spoor size.

Positive communication has been achieved with great success during the initial inception of the concept to the infield observations. This has availed a highly positive team with demonstrated positive KPI's and milestone achievements.

Strong observational techniques were activated to ensure the health and behavioural parameters of fauna management were adhered to.

Kind regards,

Dean Bemrose.

Diplomawildernessreservesandwildlifemanagement. UQ. AWMS. QSN. PSN. FSCI.

Senior Koala Spotter and Fauna Management Consultant.

Rehabilitation Permit. WA0021286. D.E.S. QPWS. QLD Govt.

Damage Mitigation Permit. WA0049329. D.E.S. QPWS. QLD Govt.

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DISCLAIMER

This report has been prepared by Dean Bemrose Trading as Bemrose Wildlife Management Services in accordance with the terms and conditions as detailed in the quotation and agreed to by both parties upon offer and acceptance of an order for services as per that quotation.

The survey results are accurate at the time that the onsite compliance scope of works was completed. However, no responsibility or liability is taken for any actions or works occurring at the site post the completion of the on-site compliance survey or fauna consultancy scope of works. The information as detailed in the report is for the sole use of the contracted parties and not for reproduction, reliance, or supply to any other party without express consent of Bemrose Wildlife Management Services.

To the extent that it can be shown that the survey results and report was not accurate at the time of the on-site survey, this company's liability shall be strictly restricted to re-performance of the on-site survey and supply of an update report. Should you have any queries regarding this report or require additional copies please contact Dean Bemrose at Bemrose Wildlife Management Services.

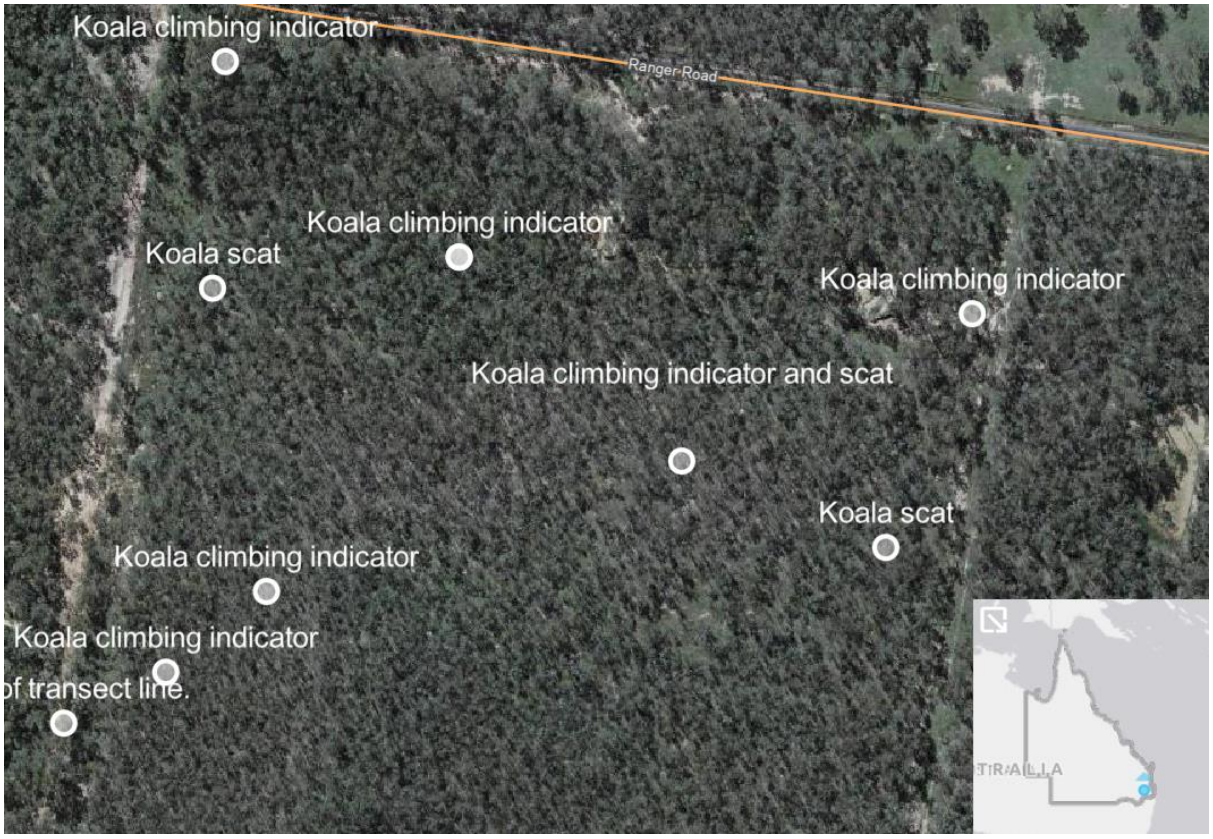

Plate 1: Northern section of the Environment Protection and Biodiversity Conservation Act 1999 endangered species (Koala)audit. 16th November. 2023. Map indicates koala anecdotal evidence. Higher levels of activity presented post 2022.

Plate 2: Southern section of the Environment Protection and Biodiversity Act 1999 endangered species (Koala)audit. 16th November. 2023. Map indicates koala anecdotal evidence. Higher levels of activity presented post 2022.

Plate 3: Koala scat located in the southern area of the offset. Located at the base of Spotted Gum.


Plate 4 and 5: Koala climbing anecdotal evidence. Several variances in thumb extensions and grip were observed indicating different animals traverse the site.


Plate: 6 and 7. Koala climbing anecdotal evidence.


Plate 8 and 9: Koala climbing anecdotal evidence.


Plate 10 and 11: Koala climbing anecdotal evidence.


Plate 12 and 13: Koala climbing anecdotal evidence.

Plate 14: Brush-tailed Possum scat (left). Koala scat (right).

Plate 15: General transect view within the offset.

Plate: 16: Short-beaked Echidna forage site. Terrestrial termitarium.

Plate: 17: Short-beaked Echidna forage site. Terrestrial termitarium.

Plate 18: Excavated Short-beaked Echidna forage site. It is now being utilised by another faunal species. No animal observed inside mound via torchlight.

Plate 19: Secondary and highly active Wedge-tailed Eagle nest. Two adult birds were observed soaring on the thermal updrafts over the site.

Plate 20: Wedge-tailed Eagle nest. Base of nest indicating a high abundance of scat.

Plate 21: Trace of Wedge-tailed Eagle prey. Species: Brown Hare.

Plate 22: An assortment of prey species and pellet of a Wedge-tailed Eagle.

Plate 23: Relatively fresh prey located within the nest area of a Wedge-tailed Eagle.