EPBC Offset Management Plan for Southern Brown Bandicoot: Lot 9 Beach Road, Ocean Grange 3880

August 2022

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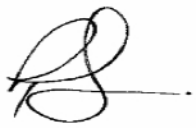
DOCUMENT CONTROL

DOCUMENT	DETAILS
Report title:	EPBC Offset Management Plan for Southern Brown Bandicoot: Lot 9 Beach Road, Ocean Grange 3880
Client:	Major Road Projects Victoria (MRPV)
Authors:	Peter Gannon
Version number:	Final report
Date:	26 August 2022

DOCUMENT DISTRIBUTION

VERSION	RECIPIENT	DATE
Draft report	Rhys Owen-Roberts (MRPV) Paul Guest (Bush Blocks Pty Ltd)	November 2021
Final report	DAWE	10 May 2022
Final report	Major Road Projects Victoria (MRPV)	22 May 2022
Final report	DCCEEW	26 August 2022

DOCUMENT HISTORY

	NAME	DATE	SIGNATURE
Draft prepared by:	Peter Gannon	November 2021	
Draft reviewed by:	Bush Blocks & MRPV	November 2021	
Final prepared by:	Peter Gannon	02 December 2021	
Review:	DAWE	10 May 2022	
Amended:	Peter Gannon & MRPV	31 May 2022	
Amended:	Peter Gannon & MRPV	22 June 2022	
Amended:	Peter Gannon & MRPV	7 July 2022	
Amended:	Peter Gannon & MRPV	26 August 2022	

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Acknowledgements

Ecocentric acknowledges the following persons, agencies and companies for their contributions to this study and report:

- Rhys Owen-Roberts (MRPV)
- Tom Wright (ARUP)
- Paul Guest (Bush Blocks Pty Ltd)

ACRONYMS

Cwlth	Commonwealth
DAWE	Federal Department of Agriculture, Water and the Environment
DCCEEW	Federal Department of Climate Change, Energy, the Environment and Water (formerly DAWE)
DBH	Diameter at Breast Height
DELWP	Victorian Department of Environment, Land, Water and Planning
DEPI (now DELWP)	Victorian Department of Environment and Primary Industries
EPBC Act 1999 (Cwlth)	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
EVC	Ecological Vegetation Class
FFG Act 1988 (Vic)	Victorian Flora and Fauna Guarantee Act 1988
GIS	Geographical Information System (mapping system)
MNES	Matters of National Environmental Significance
MRPV	Major Road Projects Victoria
SBV	Strategic Biodiversity Value
VBA	DELWP's Victorian Biodiversity Atlas

SPECIES SIGNIFICANCE

Significant Species / Threatened Species are defined as taxa listed under the EPBC Act 1999 (Cwlth) and/ or the FFG Act 1988 (Vic) and associated FFG Amendment Act 2019 (Vic).

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GLOSSARY

TERM	DEFINITION
Bioregion	Biogeographical areas that capture the patterns of ecological characteristics in the landscape or seascape, providing a natural framework for recognising and responding to biodiversity values.
Canopy tree	See 'Native Canopy Tree'.
Diameter at Breast Height (DBH)	The diameter of the trunk of a tree measured over bark at 1.3m above ground level.
Ecological Vegetation Class (EVC)	A type of native vegetation classification that is described through a combination of its floristic, life form and ecological characteristics, and through an inferred fidelity to particular environmental attributes. Each EVC includes a collection of floristic communities (i.e. lower level in the classification that is based solely on groups of the same species) that occur across a biogeographical range, and although differing in species, have similar habitat and ecological processes operating.
Habitat Hectare	A site-based measure of quality and quantity of native vegetation that is assessed in the context of the relevant native vegetation type.
High threat weed	Introduced plant species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term, assuming on going current site characteristics and disturbance regime.
Mapped wetlands	Mapped wetlands may or may not be visible on the ground and are treated as a patch of native vegetation for the purpose of Offsets unless they are covered by a hardened, man-made surface, for example, a roadway. The location and extent of mapped wetlands are available in NVIM and other DELWP GIS mapping systems.
Matters of National Environmental Significance (MNES)	There are nine MNES identified under the EPBC Act 1999 (Cwlth): World Heritage properties; National Heritage places; wetlands of international importance (listed under the Ramsar Convention); listed threatened species and ecological communities; migratory species protected under international agreements (protected under international agreements); Commonwealth marine areas, the Great Barrier Reef Marine Park; nuclear actions (including uranium mines); and water resources in relation to coal seam gas development and large coal mining development.
Native Canopy Tree	A native canopy tree is either: • a mature tree (able to flower) that is greater than three metres in height and is normally found in the upper layer of the relevant vegetation type (EVC); or • a standing dead tree (stag) if it has a trunk diameter of 40 centimetres or more at a height of 1.3 metres above the ground.
Native Vegetation	Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'.
Offset	Protection and management (including revegetation) of native vegetation at a site to generate a gain in the contribution that native vegetation makes to Victoria's biodiversity. An offset is used to compensate for the loss to Victoria's biodiversity from the removal of native vegetation. Offsets will be secured in perpetuity with an on-Title conservation covenant.

TERM	DEFINITION
Patch of native vegetation	A patch of native vegetation is either: • an area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or • any area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy; or • any mapped wetland included in the current wetlands layer available in NVIM and other DELWP systems.
Perennial Understorey	Plants that usually live for more than two years and are found in the lower layers of vegetation, like grasses and shrubs.
Plant cover	The proportion of the ground that is shaded by vegetation foliage when lit from directly above.
Protection (of a tree)	An area with twice the canopy diameter of the tree(s) fenced and protected from adverse impacts: grazing, burning and soil disturbance not permitted, fallen timber retained, weeds controlled, and other intervention and/or management if necessary, to ensure adequate natural regeneration or planting can occur.
Recruitment	The production of new generations of plants, either by allowing natural ecological processes to occur (regeneration etc.), by facilitating such processes, or by actively revegetating (replanting, reseeding). See revegetation.
Revegetation	Establishment of native vegetation to a minimum standard in formerly cleared areas, outside of a remnant patch.
Strategic Biodiversity Value (SBV)	The Strategic Biodiversity Value is a rank of a location's complementary contribution to Victoria's biodiversity, relative to other locations across the state with regard to its condition, extent, connectivity and the support function it plays for species.
Wetlands	See 'Mapped wetlands'.

1. CONTEXT

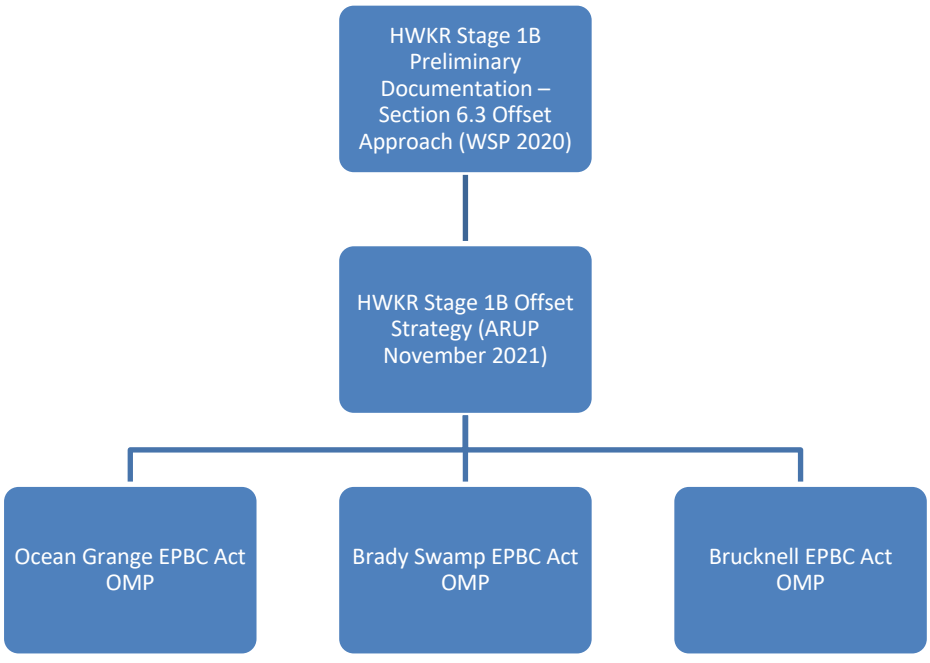
Ecocentric Environmental Consulting (hereafter referred to as Ecocentric) was engaged to develop an Offset Management Plan (OMP) in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy* (DSEWPaC 2012; hereafter the EPBC Environmental Offset Policy) for the mitigation of residual impacts of the Healesville-Koo Wee Rup Road Upgrade (Stage 1B) project (the Project) to Southern Brown Bandicoot (*Isoodon obeslus obesulus*) (SBB).

SBB impacts constitute an impact on a listed Matter of National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Referral number EPBC 2019/8487).

Further information on the impact of the Project on MNES, proposed avoidance and mitigation measures, and the overarching approach to offsets is provided in the Preliminary Documentation (WSP 2020) that is publicly available via the MRPV website (2021[1]).

This EPBC SBB Offset Management Plan forms part of the Healesville-Koo Wee Rup Road Stage 1B EPBC Act Offset Strategy (Arup 2021; hereafter the Koo Wee Rup Road Offset Strategy). The Koo Wee Rup Road Offset Strategy expands on the commitments in the Preliminary Documentation and provides for a package of direct offsets for MNES. The Koo Wee Rup Road Offset Strategy describes how the offset requirements for the Project will be achieved across three Offset Management Plans, how the objectives of the *EPBC Act Environmental Offsets Policy* will be achieved, and includes the EPBC Act Offsets Assessment Guide calculations.

The figure below illustrates the hierarchy of offset documentation submitted as part of the Project.



[1] https://roadprojects.vic.gov.au

The Koo Wee Rup Road Offset Strategy outlined above identifies three offset sites for SBB. This Offset Management Plan sets out how a direct offset will be secured at the Ocean Grange offset site for a portion of the total SBB impacts for the project (as detailed in the Koo Wee Rup Road Offset Strategy).

1.1 PURPOSE

The purpose of the Ocean Grange SBB Offset Management Plan is to:

- Identify the specific environmental outcomes to be achieved at the offset site to meet the requirements of the Environmental Offsets Policy;
- Detail how the offset will be secured, managed and monitored to meet these environmental outcomes, including:
    - Management actions, performance targets, monitoring methodology and review criteria.
    - Responsibility and timing for implementation of the actions.

1.2 OBJECTIVES

The objective of this Offset Management Plan is to address the requirements of the EPBC Act approval for EPBC 2019/8487, specifically condition 4A. The 10ha offset site at Ocean Grange is an alternative offset site for Harewood, and will offset a residual impact to SBB habitat as part of the Healesville-Koo Wee Rup Road Upgrade Project.

This objective is to be achieved by securing an area of freehold land at Ocean Grange with a Trust for Nature conservation covenant, and to improve the available SBB browsing habitat and the long-term viability of the SBB population at the offset site. Ocean Grange is a coastal holiday destination and securing and managing the property for conservation will enable the site to provide a conservation gain for the SBB.

Table 1 below summarises the current threats to the SBB population on site, and conservation opportunities that can be implemented in order to generate conservation gains for this species. Management prescriptions and implementation details are further detailed in Section 3 below.

Table 1. Summary of SBB offset gains

POTENTIAL THREAT TO SBB	POTENTIAL THREAT CONSEQUENCE	PROPOSED MITIGATION	SBB CONSERVATION GAIN
Predation by feral predators such as foxes and cats.	Reduced SBB population.	Feral predator controls	Maintenance of the extant SBB population and potential for a modest gain in site numbers.
Declining habitat values due to deer impacts such as pugging, creation of game trails and browsing of native vegetation.	Degraded habitat overall, and in particular degradation of SBB foraging habitat due to direct impacts associated with pugging and tracking, and indirect due to opening of game trails providing greater access for foxes.	Deer controls	Reduction of deer impacts resulting in improvement of SBB foraging habitat areas.

POTENTIAL THREAT TO SBB	POTENTIAL THREAT CONSEQUENCE	PROPOSED MITIGATION	SBB CONSERVATION GAIN
High threat weeds invading inter-tussock areas within SBB foraging habitat areas.	Degraded habitat overall, and in particular degradation of SBB foraging habitat through crowding of inter-tussock foraging areas.	Elimination and control of the spread of Ragwort and Spear Thistle. Monitoring for, and rapid eradication of new high threat weeds if identified on site.	Improved SBB foraging habitat values through maintenance of inter-tussock foraging opportunities.
Unauthorised pedestrian access and associated vehicle impacts.	Loss of habitat due to clearing for creation of tracks and camping sites, rubbish dumping and introduction of weeds (dumped garden waste).	Installation and maintenance of fences and locked gates. Public notifications and signage identifying conservation areas.	Improved habitat and habitat connectivity through rehabilitation of unauthorised tracks and clearings. Reduced vehicle tracks and loss of native vegetation and habitat values.

The SBB offset gains summarised above will be achieved by the landowner through implementation of this Offset Management Plan. Direct SBB conservation gains will therefore primarily be made through the following measures:

- Eradicating cats and foxes which predate on SBB from within and immediately adjacent to the offset site;
- Eradicating feral grazers such as Hog Deer (*Axis porcinus*) and Sambar Deer (*Rusa unicolor*; previously *Cervus unicolor*) which degrade SBB habitat areas through pugging impacts, creation of game trails (also utilised by foxes) and which browse native flora;
- Continuously reducing Ragwort (*Senecio jacobaea*) infestations and eliminating Spear Thistle (*Cirsium vulgare*) in the offset site as well as neighbouring areas and the pipeline easement in order to improve SBB successional foraging habitat values;
- Preventing and controlling the spread of other high threat weeds which can dominate inter-tussock spaces, degrading and limiting foraging habitat for SBB;
- Preventing unauthorised access by 4WD and quad-bikes by maintaining gates and fences and preventing illegal access along the easement, removing rubbish and controlling weeds.

The successful implementation of these measures will be monitored through general assessments of the offset site and broader property, as well as the direct monitoring of the current SBB population on site. It is expected that the foraging habitat available on site for SBB, specifically the inter-tussock areas and sandy soils where SBB are observed foraging for invertebrates (mainly insects but also earthworms and other invertebrates), plant material and fungi, can be improved through weed control and elimination of deer and associated pugging and grazing impacts. It is also expected that the extant SBB population can be protected through the elimination of feral predators, and that a modest increase in the site's SBB population may be achieved over time.

2. OFFSET SITE DETAILS

Table 2 below summarises the location, planning restrictions, and proposed security and management arrangements for the Ocean Grange (Loch Sport) offset site.

Table 2. Offset site ownership status and security details

ITEM	DETAILS
Landholder	Bush Blocks Pty Ltd
Address/ Lot details	Lot 9 Beach Road, Ocean Grange 3880 (Lot 9 LP217552)
Parcel identifier (SPI)	EPBC offset site: 9\LP217552 Property also includes: 8\LP217552, 7\LP217552 & 6\LP217552
Local Government Area	Wellington Shire
Catchment Management Authority	West Gippsland
Bioregion	Gippsland Plain
Total Area	386 hectares
EPBC Offset Area required	10 hectares
Planning Zones and Overlays	Rural Conservation Zone (RCZ1) Environmental Significance Overlay (ESO1 and ESO2) Bushfire Management Overlay (BMO) Floodway Overlay (FO) Land Subject to Inundation Overlay (LSIO)

2.1 OFFSET SITE LOCATION

The Ocean Grange estate is located south-east of the Loch Sport township and comprises over 386 hectares of remnant coastal woodland and saltmarshes on two Titles (comprising four allotments). The EPBC offset site includes 10 hectares out of a total 166.04 hectares of Coast Banksia Woodland present within the Ocean Grange estate on the north side of Beach Road, Ocean Grange, 3880. An on-title covenant will be placed on the entire property making further credits available on an ongoing basis for both Federal and State offset schemes.

The land is largely undisturbed and situated within Ocean Grange, which is a strip of land that separates Bass Strait to the south-east from Lake Reeve to the north-west. The land is accessible via Beach Road that connects to the township of Loch Sport, located on the north-western edge of Lake Reeve.

The property is located within the Wellington Shire Council, within Victoria's broader Gippsland Plain bioregion, and entirely within a Rural Conservation Zone (RCZ1). Several overlays also apply including an Environmental Significance Overlay (Schedule 1) (ESO1), Environmental Significance Overlay (Schedule 2) (ESO2), Bushfire Management Overlay (BMO), Floodway Overlay (FO) and Land Subject to Inundation Overlay (LSIO) (DELWP, 2020b). The land is also located within an area of Aboriginal cultural heritage sensitivity.

The property is currently un-encumbered and there are no conservation covenants on the property. The landowner is committed to providing offsets and is prepared to enter into an agreement secured under a Trust for Nature offset covenant.

2.2 SITE CONTEXT

The proposed offset site is located in an area of contiguous native vegetation, much of which forms known or potential habitat for SBB. The offset property, which is currently privately held land, is located between the beach and Lake Reeve, 1.5 km from the town of Loch Sport. Lake Reeve, a tidal lake forming part of the Gippsland Lakes complex, separates the site from Loch Sport. The property of which the offset is part is contiguous with the Gippsland Lakes Ramsar site and the Gippsland Lakes Coastal Park.

A local dirt road (Beach Road) and an easement for gas pipelines (connecting offshore platforms to the Longford Gas Plant) bisect the property but are not included within the EPBC offset site. The location of the gas pipeline easement and the offset site is shown in Appendix 6.2 aerial mapping.

The Strategic Biodiversity Value (SBV) of the proposed offset site ranges from 86 to 99 (out of 100), as modelled by the Victorian Department of Environment, Land, Water and Planning (DELWP). A high SBV is indicative of high biodiversity value, with the high scores for the proposed offset site rating the area very highly for general biodiversity, and also specifically for the SBB (DELWP 2021[2]).

2.3 CURRENT HABITAT VALUES AND FLORISTICS

Vegetation within the EPBC offset site is characterised as Coast Banksia (*Banksia integrifolia*) Woodland with a dense, structurally complex understorey suitable for SBB habitation. Much of the understorey retains a vegetation structure with 50-80% average foliage density in the 0.2-1 m height range – considered to be the optimal range for supporting SBB (DSEWPC 2011; Claridge & Barry 2000) – interspersed with more open areas dominated by graminoids, offering foraging opportunities within close proximity to cover.

Canopy cover within the 10ha offset site is relatively uniform, with an open canopy of Coast Banksia (*Banksia integrifolia*) (10% cover, 10m tall). Gippsland Red-gum (*Eucalyptus tereticornis* subsp. *mediana*) and Rough-barked Manna Gum (*Eucalyptus viminalis* ssp. *pryoriana*) (<1% cover, 15m tall) are also present as secondary canopy species. The canopy species mix within the EPBC offset site and across the wider property varies in response to sandy soils and (likely) historical fire regimes resulting in a mosaic of woodland canopy cover interspersed with more open areas dominated by graminoids.

Mid-storey vegetation within the EPBC offset site is variable and includes open areas where the mid-storey is sparse to absent, and higher density areas where shrub species form loose thickets (25% cover, 2m tall). This layer is dominated by Coast Tea-tree (*Leptospermum laevigatum*) and Heath Tea-tree (*L. myrsinoides*), but includes a number of other shrubs including Common Boobialla (*Myoporum insulare*), juvenile Coast Banksia (*Banksia integrifolia*), as well as a number of herbaceous climbers including Angled Lobelia (*Lobelia anceps*) and Love-creeper (*Comesperma volubile*).

Understorey vegetation comprises a species-rich, structurally complex assemblage of graminoids, herbs and shrubs. This layer is primarily characterised by a dense cover of Spiny-headed Mat-rush (*Lomandra longifolia* subsp. *longifolia*), various rushes (*Hypolaena fastigata*, *Ficinia nodosa*, *Cladium procerum*), tufted graminoids (*Rytidosperma* spp. and *Austrostipa* spp.), small shrubs including Seaberry Saltbush (*Rhagodia candolleana* subsp. *candolleana*), and Austral Bracken (*Pteridium esculentum*) (70% cover, 0.5 – 1m tall). Openings in this dense cover reveal a ground layer of grasses and prostrate forbs including Shiny Swamp-mat (*Goodenia radicans*), Weeping grass (*Microlaena stipoides*), and Kidney weed (*Dichondra repens*).

[2] https://maps2.biodiversity.vic.gov.au/Html5viewer/index.html?viewer=NatureKit

Weed cover across the EPBC 10ha offset site is relatively low (<1% cover across the site), however two high-threat weeds, Ragwort and Spear Thistle, have been recorded.

Figure 1. Coast Banksia Woodland habitat within the offset site

Figure 2. Open graminoid understorey mosaic habitat within the offset site

The EPBC offset site (10ha) is a relatively small component of a much larger area of remnant native vegetation (386 hectares across the two Titles) that will be protected and managed with a Trust for Nature offset covenant. Table 3 provides a summary of EVCs assessed and mapped across the property, with descriptions to follow below.

Table 3. Extant Ecological Vegetation Classes at Ocean Grove

ECOLOGICAL VEGETATION CLASSES	DESCRIPTION	TOTAL AREA AVAILABLE (hectares)	AREA REQUIRED FOR OFFSET (hectares)
Coast Banksia Woodland (EVC 2)	Occupies secondary and tertiary dunes behind Coastal Dune Scrub. Dominated by a woodland overstorey of Coast Banksia *Banksia integrifolia* (up to 10m tall), with Gippsland Red-gum *Eucalyptus tereticornis* subsp. *mediana* and Rough-barked Manna Gum *Eucalyptus viminalis* ssp. *pryoriana* (up to 15m tall) present over a medium shrub layer. The understorey comprises of a number of herbs, graminoids and sedges, including scramblers.	166.04	10 hectares (additional area available if required)
Coastal Dune Scrub (EVC 160)	Closed scrub to 5m tall dominated by Coast Tea-tree (*Leptospermum laevigatum*) with occasional emergents occurring on secondary dunes along ocean and bay beaches and lake shores. Occupies siliceous and calcareous sands that are subject to high levels of salt-spray and continuous disturbance from onshore winds.	27.68	Not required
Wet Saltmarsh Herbland (*Sarcocornia quinqueflora* herbland) & Estuarine Flats Grassland (EVC 914) mosaic	Closed to open grassland (to 1.5m tall) with occasional shrubs occurring on estuarine flats, grading into *Sarcocornia* dominated saltmarsh herbland (to 0.5m tall). Occupies sand sheets that are occasionally inundated by high tides and areas on marginally higher ground inland from saltmarsh. Ecotonal with estuarine scrub.	61.74	Not required
Estuarine Scrub (EVC 953)	Closed scrub to 6m tall growing on the edge of estuarine waterbodies such as creeks, rivers and lagoons with intermediate salinity and poor drainage conditions. Dominated by Swamp Paperbark (*Melaleuca ericifolia*) with a halophytic (succulent) ground layer dominated by graminoids and herbs. Ecotonal with Coastal Dune Scrub, and found as intermittent patches within Coast Banksia Woodland.	106.60	Not required

Only a small portion (10ha) of the available 166.04ha of Coast Banksia Woodland on the property is required for this offset. It is expected that the larger area of contiguous remnant vegetation will also contribute niche habitat requirements for SBB and the region's other threatened and significant vegetation communities, flora and fauna, as well as mitigate against the impacts commonly associated with edge effects.

2.4 MNES HABITAT SUITABILITY

A number of studies indicate that bandicoots prefer structurally complex sites with a dense shrub and ground cover layer. Coarse woody debris is also a key habitat element for the SBB (Brown & Main 2010). As demonstrated in Figures 1 to 4, the offset site provides high quality habitat for the SBB with a dense mid and lower storey and ample coarse woody debris.

To date survey results have confirmed the presence of over 70 individual SBB recorded[3] across the property. Photographs provided in Figure 5 are indicative of bandicoots recorded during site surveys. SBB presence is further supported by a historical record in the Victorian Biodiversity Atlas (VBA) on the property (July 1993 observation) and two within 5km of the site (May 1997 observed on Wattle Grove, Loch Sport, and October 2017 infrared camera record within a nearby New Holland Mouse (*Pseudomys novaehollandiae*) reference site). Conical diggings, associated with SBB foraging activity within sandy soils, have been regularly observed within the proposed offset site (see Figure 5 for details).

Potential threats to the SBB at the Loch Sport offset site are predation by foxes and cats, deer, unauthorised access, and weed infestations (Figure 6). This Offset Management Plan has been prepared to address these potential threats and to improve the quality of, and extent of, available foraging habitat for the species, and to support the persistence of the SBB at the site.

Figure 3. Areas of the offset site support an open woodland of Gippsland Red Gum (*Eucalyptus tereticornis* subsp*. mediana*) with a dense understorey of Spiny-headed Mat-rush (*Lomandra longifolia* subsp. *longifolia*) and Austral Bracken (*Pteridium esculentum*)

[3] An individual SBB was recorded when there was a break of one hour or greater between a group of images and as identified by the time-stamps.

Figure 4. Open graminoid areas suitable for foraging adjacent to dense understorey cover dominated by Swamp Paperbark (*Melaleuca ericifolia*) and / or Coast Tea-tree (*Leptospermum laevigatum*) and Heath Tea-tree (*L. myrsinoides*)

Figure 5. Indicative photographs of SBB camera records, and digging activity recorded on site


2021-08-15 00:56:53 M 1/3 1°C
HF2 PRO COVERT
RECONYX


2021-07-27 19:14:12 M 3/3 12°C
HF2 PRO COVERT
RECONYX

Figure 6. Ragwort and Spear Thistle are high threat weeds within the offset site

3. OFFSET MANAGEMENT PLAN

This section outlines the EPBC offset management obligations at Ocean Grange. These obligations are detailed within sections 3.1 to section 3.10. The obligations are designed to avoid further decline in SBB habitat values and to achieve in an overall conservation gain for SBB. Table 4 below summarises how the management actions will address the critical threats to SBB and achieve a conservation gain for the species.

Table 4. Summary of SBB offset gains

POTENTIAL THREAT TO SBB	POTENTIAL THREAT CONSEQUENCE	PROPOSED MITIGATION	SBB CONSERVATION GAIN
Predation by feral predators such as foxes and cats.	Reduced SBB population.	Feral predator controls	Improvement in habitat quality with a potential for a modest gain in site numbers.
Declining habitat values due to deer impacts such as pugging, creation of game trails and browsing of native vegetation.	Degraded habitat overall, and in particular degradation of SBB foraging habitat due to direct impacts associated with pugging and tracking, and indirect due to opening of game trails providing greater access for foxes.	Deer controls	Reduction of extant deer impacts resulting in improvement of SBB foraging habitat areas.
High threat weeds invading inter-tussock areas within SBB foraging habitat areas.	Degraded habitat overall, and in particular degradation of SBB foraging habitat through crowding of inter-tussock foraging areas.	Elimination and control of the spread of Ragwort and Spear Thistle. Monitoring for, and rapid eradication of new high threat weeds if identified on site.	Improved SBB foraging habitat values through maintenance of inter-tussock foraging opportunities.
Unauthorised pedestrian access and associated vehicle impacts.	Loss of habitat due to clearing for creation of tracks and camping sites, rubbish dumping and introduction of weeds (dumped garden waste).	Installation and maintenance of fences and locked gates. Public notifications and signage identifying conservation areas.	Improved habitat and habitat connectivity through rehabilitation of unauthorised tracks and clearings. Reduced vehicle tracks and loss of native vegetation and habitat values.

3.1 IN PERPETUITY SECURITY

The property is currently un-encumbered, and there are no conservation covenants on Title. A key component of securing offsets at this site will therefore be the establishment of a Trust for Nature Deed of Covenant for the conservation of land pursuant to section 3A of the *Victorian Conservation Trust Act 1972* (Vic). The conservation covenant will enshrine this EPBC Offset Management Plan and the management and monitoring requirements set out below. Annual management and performance reports will be supplied to MRPV, which will subsequently provide those reports to the DCCEEW.

The property and the extent of the Trust for Nature conservation covenant to be placed on Title is mapped in Appendix 6.2 and shows all areas of habitat to which this plan applies. Note that the total on-ground area of the site is in excess of 380 hectares, of which only 10 hectares is required at this time for EPBC Act offsets for the Healesville-Koo Wee Rup Road upgrade project.

3.2 HABITAT CONDITION

Habitat values within the Coast Banksia Woodland are in excellent condition; this site scored 91/100 in a Vegetation Quality Assessment (VQA) (DSE 2004). The high-quality habitat is attributable to the long-term undisturbed nature of the offset site. Understorey habitat is highly varied (see Appendix 6.1 for a site flora list) and retains a mosaic of dense, shrubby thickets, interspersed with more open areas dominated by graminoids. Denser thickets provide 50-80% average foliage density in the 0.2-1 m height range, which is considered to be the optimal range to support SBB (DSEWPC 2011; Claridge & Barry 2000). SBB is known to occupy suitable sites as long-term residents, even when these occur in close proximity to residential areas (Maclagan 2016), or within proximity to roadways or slashed areas as is present within the pipe-line easement (author's personal experience).

Open areas adjacent to the understorey thickets offer excellent foraging habitat opportunities for SBB, with cover on hand nearby for protection against predators. These areas are dominated by graminoids and conical diggings, associated with SBB foraging activity within the sandy soils of these sites, and were regularly observed during the site assessments.

Table 5 below provides the Habitat Hectare assessment details for the EPBC offset site.

Table 5. EPBC Offset Site VQA values

Benchmark assessment criteria	Maximum score	EPBC offset site score	Justification
Large Old Trees	10	10	Exceeds benchmark for large trees (10 per hectare: eucalyptus spp. 70cm / banksia spp. 50cm)
Canopy cover	5	5	Exceeds benchmark canopy cover (15%)
Understorey	25	25	All lifeforms present / none modified
Lack of weeds	15	11	Low (1%) weed cover; of two high threat species
Recruitment	10	10	All woody species are recruiting well
Organic litter	5	5	Organic litter cover is at 40-60%
Logs	5	5	Large logs are abundant and well in excess of benchmark
Site condition total	75	71	
Patch size	10	8	Patch is over 20ha but disturbed by roadway and pipeline
Neighbourhood	10	8	Neighbourhood predominantly indigenous but disturbed
Distance to core area	5	4	Patch is contiguous with disturbed core area (total offset site exceeds 380 ha)
Landscape condition total	25	20	
HABITAT QUALITY SCORE	**100**	**91**	

There is an opportunity to improve the 'lack of weeds' component within the offset site, in particular through the continuous reduction of Ragwort and eradication of Spear Thistle within the SBB foraging habitat areas. These high threat weeds, if left unchecked, will 'crowd' the inter-tussock areas that are utilised by SBB whilst foraging for food sources, and will lead to degradation of natural habitat values within the surrounding cover habitat areas. Reduction and elimination measures for these species are therefore provided in section 3.5 below.

The EPBC offset site is also a part of a much larger area of contiguous habitat with connectivity to a broad range of habitat typologies including woodlands, saltmarsh and coastal sand-dune scrubs. Connectivity to a range of habitat types, as well as connectivity to a regional population of SBB, is recognised as key aspects for the support of a meta-population for this species (Coates, T., Nicholls, D. & Willig, R. 2008).

Habitat connectivity will be maintained by implementing this plan for the whole property, and the establishment of an 'in perpetuity' offset covenant on Title. Monitoring of the SBB population within the offset site and surrounding habitat areas is also proposed to monitor the success of weed control measures and the gain associated with an improvement of SBB foraging habitat areas.

3.3 FENCING

There is little to no risk of stock inadvertently entering the property from the open beach foreshore or from across the Lake Reeve inlets. There is a fence at the southern end between the offset site and the neighbouring property, however, there is little to no evidence of grazing at this location and the chances of stock entering from this point is deemed to be very low; the existing fence at this location can be upgraded at a later date if required to manage stock.

There is no fence at the northern end of the property, however, the neighbouring property at this point is heavily vegetated (providing contiguous Coast Banksia Woodland habitat for SBB) and it is unlikely that a fence would be required at this location in the future. A 6m buffer has been applied to all shared property boundaries in order to accommodate fencing if required. The gas pipeline easement, which transects the property, has recently installed fences, locked gates and signage to prohibit vehicle (and stock) access; it is deemed to be unlikely that additional fencing will be required.

The public roadway, which also transects the property, is also unfenced and there is evidence of unauthorised vehicular access to parts of the easement and to the beach. These access points are now fenced and gated to prohibit access to the property and to prohibit illegal rubbish dumping. We note however that there is little to no chance of unauthorised access to the EPBC offset site area, attributable to the dense vegetation cover at this site, the presence of numerous, large ground logs (up to 1m DBH), and the absence of beach access through this location (it being north of the roadway). Monitoring for unauthorised access is a commitment of the conservation covenant to be placed on Title.

Figure 7. Recently installed fencing and locked gates to control access

3.4 ACCESS AND SIGNAGE

As noted above there is evidence of illegal access to the property, however, the EPBC offset site area remains generally undisturbed and is considered unlikely to be disturbed in the near future. Signage identifying this as private property has been erected and will be maintained by the landowner as a requirement of this plan. Illegal activity and trespass on the property will be reported by the landowner to the Victorian Police Force.

3.5 WEED CONTROL

Weed control within the offset site will focus on the management of two high threat weeds, Ragwort (*Senecio jacobaea*) and Spear Thistle (*Cirsium vulgare*), which were recorded invading the offset site from the pipeline easement. Whilst the cover of these species is currently low (generally at or below 1%), there are areas where their cover is at a higher rate, with up to 2% cover at some locations. Whilst these species are likely to be scattered throughout the property, areas where these species are observed to be taking a hold within SBB foraging habitat are identified in Appendix 6.2 mapping. These areas will be targeted for control and eradication programs since, if left unchecked, these species are considered likely to increase in density and infiltrate further areas within the offset site. It is also considered likely that the easement is a source of seed for both species; control works are therefore to be implemented across the easement in conjunction with the offset site works.

Ragwort in particular is observed invading the inter-tussock areas around the graminoids which are important foraging habitat for SBB. This invasive weed is therefore to be targeted in a control program aimed at treating all individuals and continuously reducing ragwort cover and spread so as to eradicate this weed species from the offset site. Ragwort rosettes will be controlled primarily by hand (plants are easily pulled out of the sandy soils) and/or spot-sprayed in spring, with follow-up hand-removal, spot-spraying and removal of flower-heads in summer; spot-spraying is to use Grazon Extra applied from a knapsack.

Spear Thistle will be systematically and continuously controlled and eradicated from the offset site over time using a similarly applied spring and summer spot-spraying program using a suitable herbicide applied from a knapsack.

Please note that all chemical herbicide use is to be in accordance with labelled application rates, and that extreme care is to be taken to avoid off-target impacts associated with spray-drift. The weed control works are to be conducted by the landowner or a contractor who is licenced (with an ACUP) and experienced with working in high quality habitat environments (and who is also familiar with flora species found within the Coast Banksia Woodland EVC).

No woody weeds were recorded within the offset site, however, it is expected that Blackberry (*Rubus fruticosus* spp. agg.), which was observed within roadside reserves nearby (outer bounds of Loch Sport), may be encountered as germinant plants. Monitoring for woody weeds, with rapid control actions to ensure that they do not establish, will therefore be implemented at the offset site.

High threat weed management commitments therefore include (at minimum):

- Continuously reduce the cover and spread of Ragwort (*Senecio jacobaea*) through comprehensive treatment of infestations annually within the offset area and across the easement;
- Eliminate Spear Thistle (*Cirsium vulgare*) within the offset area and across the easement within 10 years;
- Monitor sites where high threat weeds have been treated to ensure re-emergence is detected and controlled, and re-treated to reduce coverage and spread of these species;
- Monitor for and ensure that woody weeds are not introduced to the offset site;
- Control herbaceous and grassy weeds and ensure that weed cover is reduced across the offset site area; and
- Monitor for, prevent, and control new and emerging woody and herbaceous weeds.

All weed control works are expected to be followed by natural recruitment and successional establishment of indigenous flora and EVC appropriate canopy structures. Emphasis is to be

placed on ensuring that Ragwort and Spear Thistle cover and distribution is reduced and eliminated, and that herbaceous weed cover is reduced across the offset site. Ragwort and Spear Thistle will be treated at rosette formation (spring) with follow-up treatment before flowers emerge and germinate (summer); control methods and monitoring requirements are set out below.

Table 6. High threat weeds, control methods and timing

COMMON NAME	SCIENTIFIC NAME	THREAT STATUS	% COVER	METHOD	TIMING	TARGET
Sweet Vernal-grass	**Anthoxanthum odoratum*	low	<1%	Spot-spray patches and monitor for recruitment of EVC appropriate flora	Active growing season in spring to summer	<1%; reduce cover where practicable to do so
Spear Thistle	**Cirsium vulgare*	high	1%	Hand-pull small plants (taking care to remove tap-roots); spot-spray with Grazon Extra	Active growing season twice-yearly in spring and summer	Eradicate spear thistle within the offset site and easement
Cocksfoot	**Dactylis glomerata*	low	<1%	Spot-spray patches and monitor for recruitment of EVC appropriate flora	Active growing season in spring to summer	<1%; reduce cover where practicable to do so
Blackberry	**Rubus fruticosus* spp. agg.	high	<<1%	Control small plants by hand; spot-spray large patches	Active growing season in spring to summer	Prevent introduction to site
Ragwort	**Senecio jacobaea*	high	1%	Hand-pull small plants (taking care to remove tap-roots); spot-spray with Grazon Extra, physically remove flowerheads	Active growing season twice-yearly in spring and summer	Reduce cover and spread within the offset site and easement
Apple of Sodom	**Solanum linnaeanum*	low	<<1%	Hand-pull small plants (taking care to remove tap-roots); spot-spray with Grazon Extra	Active growing season in spring to summer	<<1%; reduce cover where practicable to do so

3.5.1 WEED CONTROL MONITORING

Weed control works will be monitored by the landowner and the effectiveness of actions assessed. Successful implementation of the weed control program will be demonstrated by:

- Steady decline in the coverage and distribution of Ragwort, the eradication of Spear Thistle, and subsequent improvements in SBB foraging habitat areas;
- Steady decline in herbicide usage and/or volume of flower-head being removed from the property;
- Reduced control works as tracked using a hand-held GPS during the works program;
- Photo monitoring at control sites.

Given that Ragwort and Spear Thistle coverage rates are considered to be currently low on site, it is expected that twice-yearly knapsack spot-spraying, hand-pulling and removal of flowerheads will be an effective control methodology. In the event however that it cannot be

demonstrated that Ragwort is declining, or that Spear Thistle is persisting, then additional weed control works will be triggered. These additional works will include (as a minimum):

- Transect surveys of the SBB foraging habitat areas in order to determine the location(s) of weed infestations on site;
- Treatment using control methods as set out above;
- GPS tracking of the treatment works program with details of treatment locations, Ragwort and Spear Thistle coverage and distribution rates;
- Follow-up monitoring at the treatment sites with increased works to be conducted as required to reduce and eliminate high threat weeds (including Ragwort and Spear Thistle) over time.

The results of the monitoring will inform the requirement for, or the success of, corrective actions and/or responsive and adaptive management controls. These monitoring requirements are further detailed in Section 4.1: Management Plan.

3.6 FERAL / PEST ANIMAL CONTROL

The intent of feral animal control programs is to reduce ecological pressures associated with grazing and degradation of habitat areas, and the predation of SBB by introduced predators. This is the primary strategy for increasing the SBB population and viability at the offset site.

Control measures for feral animals, including grazers – Sambar and Hog Deer – and predators – fox and feral cat – will be promptly implemented within the EPBC offset site and wider property should feral species be identified during the monitoring programs. The intent is to eradicate pest animals within and adjacent to the offset site.

The success of pest animal control programs is to be benchmarked against the current SBB and deer population in order to monitor achievements and maintenance of the plan's objectives, and to inform implementation of the control methods. Details for the estimation of the extant SBB and deer population is provided below in Section 3.7.2 and Table 7.

Details of the extant fox and cat population is also provided, however, given the current low number of these species it could be difficult to measure any population decline over the duration of this plan. Rather, any record of these feral predators is to trigger immediate implementation of control / eradication programs in order to ensure that SBB predation is minimised.

An integrated approach to pest animal management is outlined in Table 7 below. All care will be taken to avoid off-target impacts or inadvertent harm to native fauna. Regardless of the control option(s) used, these must be the most effective, safe and humane methods available.

Table 7. Pest animal control methods and timing

SPECIES	CONTROL METHODS	TIMING	OUTCOME
Foxes	Remove dens or disperse surface harbour taking care to ensure no impacts to SBB. Engage qualified and licenced trapper / shooter; ensure SBB are not impacted. Investigate use of Canid Pest-ejectors on the property.	Ongoing	Fox eradication onsite and immediately adjacent.
Cats	Engage qualified and licenced trapper / shooter; ensure SBB are not impacted.	Ongoing	Cat eradication onsite and immediately adjacent.

SPECIES	CONTROL METHODS	TIMING	OUTCOME
Sambar and Hog Deer	Engage qualified and licenced trapper / shooter; ensure SBB are not impacted.	Ongoing	Deer eradication onsite and immediately adjacent.
Foxes & cats	Monitor and control as necessary.	Ongoing	Accurate data on population dynamics; clear indication of control action success (or otherwise).
Deer	Monitor and control as necessary.	Ongoing	Accurate data on population dynamics; clear indication of control action success (or otherwise).
New & emerging pest animals	Monitor and control as necessary.	Ongoing	No new pest animals established within the offset site.

3.7 MONITORING AND REPORTING

The landowner will submit a report to Trust for Nature annually for each year of the years of this plan (see also Section 4.1) and thereafter at the reasonable request of MRPV. The monitoring report is to be provided annually and is to include details of the monitoring and management works conducted within the offset site. Monitoring results and management actions that will be included in the monitoring report are provided below.

Annual monitoring will include walking the offset site and undertaking visual inspections for weeds, pest animals, fences and any evidence of illegal property access. Monitoring of SBB and pest animal populations, and SBB habitat condition will be conducted formally at years 1, 2, 3, 5, 10, 15, 17 following plan approval and 2040 by collecting quantitative data for these parameters as described in the following sub-sections. The monitoring program will be reviewed at Year 10 if the intended conservation gains have not been achieved.

3.7.1 POPULATION MONITORING

This Plan will provide a conservation gain for the SBB by improving the quality and extent of SBB foraging habitat availability within the offset site. Monitoring of the SBB population is a requirement of this Plan, and is designed to demonstrate that there has been, over the initial ten year monitoring period, an improvement in the foraging habitat quality by reducing feral grazers and predators and cover of herbaceous weeds. This is expected to result in an increase in SBB populations over the 10 year period.

Baseline data of the existing SBB and feral grazer and predator populations is therefore provided in the Tables below, based on the results of infrared camera monitoring that has been conducted on site to date. For the balance of the period of the plan, monitoring reports will be written to demonstrate whether or not the habitat quality has improved through a decrease in predators and weeds and that the SBB population has been maintained or increased.

The results of the monitoring will also be used to assess the efficacy of other actions conducted on site, and will inform responsive, adaptive management actions if required (see Section 3.10). The monitoring will also be conducted against the baseline SBB population currently present on site and as detailed above.

The specific monitoring programs will be in general accord with EPBC survey guidelines for SBB and as set out in Section 3.7.3 below. Monitoring methods are based on the survey guidelines in the *EPBC Act draft referral guidelines for the endangered southern brown bandicoot (eastern), Isoodon obesulus obesulus* (DSEWPaC 2011), and includes the use of infra-red remote cameras.

3.7.2 BASELINE MONITORING DATA

A monitoring program to ascertain the current SBB and feral animal populations within the offset site was conducted by the landowner over two survey periods; spring 2021 and autumn 2022. These surveys included the use of infrared cameras at monitoring stations across the property (within the proposed offset site and the existing 5 ha site adjoining), as shown in the mapping in Appendix 6.2. The camera stations were baited to attract SBB (in accordance with prescriptions set out below in Section 3.7.3). Deer and feral predator records (fox and cat) are also recorded incidentally.

Tables 8 and 9 below provide the results of the baseline monitoring programs. This data pertains to areas within the property that extend beyond the offset site and is provided as an indication of the extant SBB population on site and to provide a baseline for monitoring of the population dynamics once this OMP is implemented.

Table 8. Spring 2021 monitoring data

IR CAMERA POINT	SOUTHERN BROWN BANDICOOT	DEER	FOX	CAT
BB007	0	0	2	0
BBM001	10	5	3	0
BBM002	4	0	0	0
BBS005	4	0	2	0
BBS006	1	0	1	0
BBS008	2	11	3	0
ECO004R	1	0	1	0
ECO005R	19	5	0	1
PEX001	7	0	1	0
PEX002	0	2	0	1
TOTALS (records per day)	**0.07**	**0.03**	**0.02**	**0.003**

Survey period: 26 May – 22 September, 2021
Number of cameras: 10
Total camera survey days: 682

Table 9. Autumn 2022 monitoring data

IR CAMERA POINT	SOUTHERN BROWN BANDICOOT	DEER	FOX	CAT
GLU01	4	3	0	0
GLU02	7	2	0	0
GLU03	0	0	0	0
GLU04	13	2	0	0
GLU05	2	3	0	0
MRPV01	4	1	0	0
MRPV02	3	2	0	3

IR CAMERA POINT	SOUTHERN BROWN BANDICOOT	DEER	FOX	CAT
MRPV03	3	2	0	0
MRPV04	0	3	0	0
MRPV05	8	4	0	1
TOTALS (records per day)	**0.09**	**0.04**	**0.00**	**0.01**

Survey period: 4 April – 25 May, 2022
Number of cameras: 10
Total camera survey days: 496

The baseline data provided above identifies an average count of the SBB population of between 0.07 to 0.09 individuals identified per (infrared camera) survey day. It is expected that SBB numbers will vary between seasons, and we note that this data is collected from across the property (not exclusively from within the offset site). Long-term monitoring against this baseline population data will however enable assessment of SBB population trends and the effectiveness of management actions to improve the viability of this species.

Infrared cameras will therefore be deployed within the offset site in accordance with set up and baiting protocols set out in Section 3.7.3 below, and the results benchmarked against the number of records per survey day provided above. Future surveys are also to be conducted in a fashion that is easily and efficiently repeatable in order to facilitate direct comparison against the baseline data (see also Appendix 6.2 aerial mapping for camera station locations). Monitoring reports will provide the results of all surveys in order to facilitate long-term population trends over the period of the OMP.

It will be necessary for the landowner to respond to the results of the monitoring program. A decline of the SBB population of greater than 20% against the baseline data, or an increase of the deer population of greater than 40% against the benchmark, will trigger a contingency response to determine whether there is an issue, what it might be and what options are available to correct the situation. A decline of the SBB population of greater than 40% against the baseline data, or an increase of the deer population of greater than 40% against the benchmark, will trigger a review of the management actions being implemented within the offset site and surrounding habitat areas will trigger implementation of corrective management actions in accordance with adaptive management prescriptions. Details of corrective actions and responsive / adaptive management processes are provided below in Sections 3.8 and 3.10 respectively.

The survey data will be presented to DCCEEW in a format that can be easily used to identify trends in the SBB population dynamics, such as (for example) in a graph format of SBB records per infrared camera survey day. Similarly, deer, fox and cat numbers will be presented in the same format in order to facilitate an efficient reading of feral animal population trends.

3.7.3 SOUTHERN BROWN BANDICOOT MONITORING PROGRAM

Targeted survey monitoring for SBB is to be conducted during autumn (and in response to rainfall patterns and seasonal conditions) at intervals of years 1, 2 ,3, 5,10, 15, 17 and in the Year 2040, and is to be conducted by a suitably qualified and experienced ecologist. A minimum of five cameras within the offset site and five cameras within surrounding habitat areas on the property will be deployed for each of the surveys.

The cameras will be maintained in the field for a period of a minimum of 30 days in autumn, with cameras installed at the predetermined monitoring locations as identified in Appendix 6.2

mapping. The monitoring program is to be conducted at years 1, 2, 3, 5,10, 15, 17 and Year 2040 from inception of this Offset Management Plan.

At each site, an infra-red remote camera baited with peanut butter, oats, golden syrup and truffle oil will be placed for the duration of the survey. The camera location will be mapped, permanently marked (if practicable), the bearing of the camera direction recorded (south-facing recommended), and photographs taken such that the precise setup can be replicated in future monitoring events. Monitoring locations will be selected based on habitat suitability, presence of active diggings, and with consideration for camera security.

Remote cameras will be installed at each of the survey points for a minimum of 30 days; cameras will be checked at one month and the sites re-baited if required. The cameras will be retrieved and photographs downloaded for each site for analysis of SBB and feral animal records per camera survey day (see Section 2.7.2 for data analysis protocols).

Setup and camera settings will be as follows:

- Cameras to be baited with 5:1:2 mixture of rolled oats, golden syrup and peanut butter, plus approx. 20 ml/kg of truffle oil, secured in an inaccessible bait holder.
- Camera to be approx. 50 cm above ground level.
- Bait to be set up 1-3 m in front of each camera. Trim vegetation between the camera and bait, and around bait, if required.
- Sensitivity: high.
- Quiet period: 15 seconds.
- 5 photographs per trigger.

Daily presence/absence and the cumulative number of nights that SBB are detected will be recorded for each site and the results included in the annual monitoring reports. Deer, fox and cat activity detected on cameras will be similarly recorded. This will also inform actions conducted around pest animal controls set out in Section 3.6.

3.7.4 SOUTHERN BROWN BANDICOOT HABITAT ASSESSMENT

The quality of the SBB habitat will also be assessed once per monitoring season (autumn), using a consistent proforma, and with photographs taken. Where relevant, any additional works required to improve habitat quality (particularly within areas identified for weed control) will be identified.

The habitat assessment proforma will include scoring of:

- Ground layer density (vegetation at the 0.2-1m height range).
- Shelter availability (i.e. presence of low shrubs, scrub piles, logs etc).
- Plant species and structural canopy diversity.
- Patch size (size of patch of habitat of similar quality).
- Connectivity.
- Presence of native vegetation (given a low weighting as the species is known to utilise suitable exotic vegetation, however this is worth scoring as habitat improvement will aim to use native species).

The above habitat assessment features are based on published habitat preferences of the species (as summarised in the species' DCCEEW profile) and local studies (Maclagan, Coates & Ritchie 2018; Masters, Taylor & Maclagan 2019; Maclagan 2019). The habitat monitoring points will be identified by a short wooden stake, located near each of the five camera bait locations within the offset site. Habitat characteristics and quality will be scored for a 5 m radius of the point and a photograph of the stake taken facing south.

The results of the SBB monitoring will be used to inform variation / adaptation of the monitoring program in the event that implementing the plan does not achieve the plan's objectives for SBB. Under such circumstances, additional monitoring sites will be established, with regard for processes set out in the responsive / adaptive management procedures in Section 3.10 below.

Habitat assessments will focus on monitoring of vegetation cover and density within the 0.2 – 1 m range to ensure that suitable habitat is available for SBB. The plan objective is to maintain 50-80% average understorey foliage cover in areas where medium shrubs are currently present, and to maintain weed-free sites where the groundstorey is more open and dominated by graminoids. These ecotonal habitat types will meet the ecological requirements for SBB breeding, foraging and movement.

Habitat assessments and monitoring efforts will also focus on areas where weed management, natural regeneration, and revegetation have occurred to determine if supplementary planting is required. If there is no natural succession of EVC-appropriate flora, then selective planting, using tube-stock propagated from local provenance indigenous seed sources, will be implemented as part of the responsive / adaptive management program (see Section 3.10 for details).

Baseline monitoring of SBB habitat conditions will need to be completed prior to the formal commencement of the offset management plan. Habitat condition will then be monitored at Years 1, 2, 3, 5, 10, 15, 17 and the Year 2040.

3.7.5 PHOTOPOINTS

A minimum of five (5) permanent photo-points will be established at locations that are representative of the management area of habitat for SBB; where appropriate these photo-points can be co-located at the infrared camera survey stations to facilitate the monitoring program. Photographs taken from these points will be representative of the annual habitat conditions and will provide a visual and temporal assessment of the effectiveness of meeting objectives set out in this EPBC Offset Management Plan.

Photographs are therefore to be taken from each photo-point annually and will use as many of the same general direction, trajectory and camera settings as is practicable. The location of photo-points is to be permanently marked on site using painted star-pickets (or equivalent), and recorded on an aerial map of the offset site.

Photographs and annual monitoring reports will be submitted at least two months prior to the anniversary date of the execution of the covenant to allow time for compliance to be assessed before the anniversary date.

3.8 MANAGEMENT AND CORRECTIVE ACTIONS

This OMP outlines management actions to improve the quality of SBB habitat at the offset site, thereby delivering a conservation gain for this species. The monitoring program will identify any instances where the management actions are failing, or where the SBB population is not improving or is in decline. Any failings in the implementation or delivery of these management actions will be addressed promptly in order to achieve the plan's ecological goals, and potential for SBB population decline.

Failings would include the following events or circumstances:

- Significant increase in high threat environmental weed cover;
- Significant damage to, and loss of, SBB habitat associated with unauthorised pedestrian access to the offset site;
- Failure to maintain the SBB population and viability on site; and/or
- Significant increase in the feral predator (fox or cat) or grazer (deer, goat or rabbit) populations on site.

The following management and corrective actions are therefore to be initiated by MRPV and delivered on-ground by the landowner in the event that there are failings identified in the implementation of this OMP or the effectiveness of the management actions.

Table 10. Corrective management actions

OMP MANAGEMENT ACTIONS	MONITORING FREQUENCY	TRIGGER	CORRECTIVE ACTION
Unauthorised pedestrian access	During site walk-overs (quarterly)	Fences or gates damaged	Repair fences and gates; increase signage.
		New tracks / clearings	Fence off access and revegetate disturbed areas; monitor for re-opening and treat promptly.
		Rubbish dumping	Remove rubbish promptly from site; monitor for re-offending and treat promptly; report dumping to Victoria Police.
		Firewood cutting	Fence off access points; monitor for re-offending and report trespassing to Victoria Police.
Ragwort invading SBB foraging habitat areas	During site walk-overs (quarterly)	Ragwort cover is not continuously decreasing	Increase the weed control program; ensure Ragwort cover and density is continuously reduced. Implement a transect weed control program using a GPS to track coverage across the offset site with follow-up controls at all treatment sites.
Spear Thistle invading SBB foraging habitat areas	During site walk-overs (quarterly)	Spear Thistle cover is not continuously decreasing, or eradicated	Increase the weed control program; ensure Spear Thistle is eradicated. Implement a transect weed control program using a GPS to track coverage across the offset site with follow-up controls at all treatment sites.
High threat weeds	During site walk-overs (quarterly)	High threat weeds, other than Ragwort and Spear Thistle, are detected	Increase the weed control program; ensure that no new species establish, reduce cover and spread of Ragwort, and eradicate Spear Thistle.

OMP MANAGEMENT ACTIONS	MONITORING FREQUENCY	TRIGGER	CORRECTIVE ACTION
Deer control	Infrared camera data analysis (Year 1, 2, 3, 5, 10, 15, 17 from approval of this plan and the Year 2040))	20% increase in deer population compared to baseline numbers	Report findings to DCCEEW. Investigate cause of increase, identify plausible corrective actions and report to DCCEEW.
		40% increase in deer population compared to baseline numbers	Report findings to DCCEEW. Engage professional shooters; ensure the deer population is eradicated.
Fox control		20% increase in fox population compared to baseline numbers	Report findings to DCCEEW. Investigate cause of increase.
		40% increase in fox population to baseline numbers	Report findings to DCCEEW. Engage professional shooters; initiate baiting program; ensure the fox population is eradicated onsite and immediately adjacent.
Cat control		20% increase in cat population compared to baseline numbers	Report findings to DCCEEW. Investigate cause of increase.
		40% increase in cat population compared to baseline numbers	Report findings to DCCEEW. Engage professional shooters; initiate trapping program; ensure the cat population is eradicated onsite and immediately adjacent.
SBB population	Infrared camera data analysis (Year 1, 2, 3, 5, 10, 15, 17 from approval of this plan and the Year 2040))	20% decrease in SBB population compared to baseline population	Report findings to DCCEEW. Identify likely causes of population decline; engage with local expert ecologists.
		40% decrease in SBB population compared to baseline population	Report findings to DCCEEW. Initiate responsive / adaptive management actions as required to reverse population declines (see also Section 3.10 for details); ensure the SBB population is improved.
SBB habitat	Year 1, 2, 3, 5, 10, 15, 17 from approval of this plan and the Year 2040	Project foliage cover <50% in 1-2 m height range	Report findings to DCCEEW. Identify likely causes of habitat condition decline, engage with local expert ecologists. Prepare a habitat restoration plan to achieve greater than 50% cover a 1-2 m height range.

Whilst it is not possible to foresee all eventualities, it is expected that the monitoring program will identify significant ecological benefits within the offset site, and the infrared camera surveys will identify SBB and feral animal population trends. Any significant decline in ecological values or the SBB population will be reported promptly to DCCEEW, and, if necessary, responsive / adaptive management actions will be initiated to improve habitat quality and/or the long-term viability of SBB on site.

3.9 ANNUAL REPORTING

The annual monitoring reports will detail progress made against the commitments set out in this plan. Annual monitoring reports will therefore provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of/progress against the management commitments for each management action and plan objectives, targets and triggers.

Details of the monitoring reports will include (but not be limited to):

- Photographs from photopoints and the results of monitoring conducted on site of fencing, weed control programs and pest/feral animal control actions;
- Management works completed within the EPBC offset site including the results of weed control programs and successional recruitment of Coast Banksia Woodland flora, and the maintenance of 50-80% average understorey foliage cover in areas where medium shrubs are currently present, and to maintain weed-free sites where the groundstorey is more open and dominated by graminoids;
- Results of the SBB population monitoring programs (for Years 1, 2, 3, 5, 10, 15, 17 from approval of this plan, and the year 2040) including any findings on population dynamics based on annual trends and comparisons with baseline conditions;
- Details of any events or impacts that have affected the offset site such as water pollution events, changes to natural hydrology and water flow regimes, illegal access by pedestrians and any associated impacts, or any events that have had a material impact on the SBB populations and their long-term viability on site.
- Clear indication, using the viability metrics detailed in this plan, of whether or not the offset management actions are resulting in an increase in the size and viability of SBB population at the offset site.

The monitoring reports will include data on the results of the infrared camera surveys, including the number of SBB, deer, fox and cat records per camera day. This data will be presented in a graph format showing the baseline survey results against all of the annual surveys. Trends in population dynamics, increasing or decreasing, will be highlighted in the graph in order that decisions on whether or not to take responsive actions can be clearly identified.

The results of the monitoring programs will be reported to DCCEEW, Trust for Nature and MRPV. Any major breaches of the management programs and/or impacts on the target species will be reported immediately to Trust for Nature and MRPV by the landowner and/or their appointed contractors.

The monitoring report is also to be published annually on the VicRoads *EPBC commitments website*:

https://www.vicroads.vic.gov.au/planning-and-projects/environment/epbc-commitments

3.10 RESPONSIVE / ADAPTIVE MANAGEMENT

The monitoring program is required to identify any significant failings in the implementation or outcomes of the EPBC Offset Management Plan, and any new or emerging threats that require an immediate and adaptive response. The development of an appropriate and responsive addition or variation of the EPBC Offset Management Plan will be developed in consultation with the landowner, Trust for Nature and MRPV, and, if required under the EPBC Act conditions of approval, approved by the Minister for the Environment.

Examples of significant failings in the implementation or outcomes of the EPBC Offset Management Plan would include bushfire, habitat and/or water contamination due to chemical spills, significant population decline of the SBB, major fence failures and/or stock impacts within habitat areas, or events that are considered to be significant enough to warrant an adaptive management approach within the offset areas.

In the event of failure to achieve the plan's objectives, the landowner will:

- Promptly notify Trust for Nature and MRPV (who must in turn notify DCCEEW), and, in consultation with these parties;
- Based on this plan, develop and implement corrective actions to address impacts; and,
- Update the EPBC Offset Management Plan and/or review implementation period (i.e. extend if required to address impacts).

The intent of a responsive, adaptive management action provision in this EPBC Offset Management Plan is to provide a mechanism for the landowner and MRPV that facilitates considered and scientifically-based variations to management of the EPBC offset site area. This flexible approach can be beneficial in that it enables a 'change of plan' if the SBB population is decreasing, and/or habitat quality for the species is not improving on site, as required under the plan. Variations of this nature however must be undertaken in consultation with ecologists and MRPV, and where appropriate, other government Agencies with expertise in the management of threatened species and habitat. If required to meet the EPBC Act conditions of approval, MRPV may also need to submit a revised plan to DCCEEW for review and approval by the Minister for the Environment.

4. PERFORMANCE TARGETS

Table 11 outlines the performance targets for the actions identified within this Offset Management Plan and the year(s) that they will be achieved.

The first ten years will be an intensive management period to achieve the plan's habitat quality and SBB population criteria, before moving into a care and maintenance phase.

Table 11. Ten year performance targets

MANAGEMENT ACTION	RESPONSIBILITY	NO.	PERFORMANCE TARGET	YEAR TO BE ACHIEVED
Security Agreement	Landowner & broker / Trust for Nature	Once	Trust for Nature conservation covenant placed on Title	Immediately after endorsement by DCCEEW
Habitat condition monitoring	Landowner	Year 1, 2, 3, 5, 10, 15, 17 from approval of this plan, and the year 2040.	Annual report to Trust for Nature & MRPV; with copies sent to DCCEEW if a Permit condition	Within 3mth annually of placement of covenant on Title
Fencing	Landowner	Responsive	Fencing upgraded promptly in response to stock accessing the offset site	Promptly; if/as required
Access management and signage	Landowner	Responsive	Gates, fencing and/or signage installed to prohibit / manage access	Promptly; if/as required
Ragwort & Spear Thistle	Landowner	Twice annually	All Ragwort is treated and continuously targeted to progressively reduce cover and spread, Spear Thistle is eradicated	On-going
Weed control	Landowner	Annual	No establishment of new herbaceous or woody weed infestations.	First year; on-going
Pest control	Landowner	Annual	Feral animal (predators and grazer) population is reduced	On-going
SBB targeted surveys	MRPV or contractor	Years 1, 2, 3, 5, 10, 15, 17 from approval of this plan and the year 2040	The SBB population is maintained or increased	On-going
SBB monitoring	MRPV or contractor	Years 1, 2, 3, 5, 10, 15, 17 from approval of this plan, and the year 2040.	Monitoring is conducted in accordance with this plan.	On-going until 2040 (or as required in consultation with DCCEEW)
Reporting to DCCEEW	MRPV	Annual	Annual reports address commitments in this plan and requirements of EPBC Act approval	All years

4.1 MANAGEMENT PLAN

Table 12 (overleaf) provides a summary of the management action, responsible personnel and timing of each action to be implemented over the period of effective approval.

Table 12. Management actions, responsibility and timing for first ten year period (intensive management period).

ACTION	MANAGEMENT ACTION	DESCRIPTION	RESPONSIBLE AUTHORITY	TIMING OF ACTION	PERFORMANCE TARGET
Security agreement	Offset covenant lodged on Title	Ensure offset secured via Trust for Nature conservation covenant and that agreement is signed by Landowner and lodged on Title.	Landowner / Trust for Nature	At commencement of agreement	Ensure Trust for Nature offset covenant secured on Title.
Fencing	Fencing upgrades	Stock exclusion from offset area.	Landowner / contractor	Within 3 months of commencement of the agreement	No stock within the offset area.
Monitoring of fences	Fencing installation	No threats to the offset site currently exist, if a new or emerging threat arises erect a fence immediately to ensure that the new threats are controlled.	Landowner / contractor	Immediately on identification of new or emerging threat	Construct and/or upgrade fencing as required to control new and/or emerging stock grazing threats.
SBB Habitat Assessment	Baseline monitoring	Undertake baseline monitoring for SBB habitat assessment	Ecological consultant	Prior to formal commencement of offset management	Baseline habitat assessment conditions determined.
Access and signage	Installation of gates, fences and signage as required to prohibit illegal access	Ensure there is no illegal trespassing by the public.	Landowner / contractor	Within first year and as required in response to incursions	No illegal access; no 4WD impacts within offset area.
Weed control	Control of Ragwort and Spear Thistle	Conduct annual control of Ragwort and Spear Thistle during the spring period. Monitor for any re-sprouting or seedlings and eradicate (either spot spray or hand pull).	Landowner / contractor	Ongoing	Continuously reduce the extent and density of Ragwort and eradicate Spear Thistle within the offset area; ensure there is no further spread of either species. Map treatment areas using a GPS and monitor for re-emergence; re-treat promptly as required. Minimise off-target damage; avoid impacts to remnant vegetation and habitat.
Weed control	Monitoring	Monitor for and control all woody weeds and herbaceous weeds.	Landowner / contractor	Ongoing	No increase in cover of herbaceous weeds beyond current levels. Minimise off-target damage; avoid impacts to remnant vegetation and habitat. No establishment of new woody or herbaceous weed species.

ACTION	MANAGEMENT ACTION	DESCRIPTION	RESPONSIBLE AUTHORITY	TIMING OF ACTION	PERFORMANCE TARGET
Pest control	Fox and cat control	Monitor for and reduce the fox and cat numbers on site. Refer to Section 3.6 for a list of control methods and timing of actions.	Landowner / contractor	Ongoing	Fox and Cat are eradicated onsite and immediately adjacent.
Pest control	Deer control	Monitor for and reduce the deer numbers on site. Refer to Section 3.6 for a list of control methods and timing of actions.	Landowner / contractor	Ongoing	Deer are eradicated onsite and immediately adjacent.
Pest control	New pest control	Monitor for and control all new and emerging pest animals.	Landowner / contractor	Ongoing	Control numbers of any new & emerging pest animals.
Monitoring and reporting	Targeted SBB and pest animal monitoring, and SBB habitat assessments.	Conduct seasonal monitoring of SBB in accordance with Section 3.7.	Ecological consultant & MRPV	Years 1, 2 ,3, 5 and 10.	Monitoring of SBB population with clear indication and evaluation of fecundity and population dynamics. SBB population is maintained or increased. Reports will be submitted to Trust for Nature, MRPV and DCCEEW as outlined below.
Reporting	Annual landowner reporting	Prepare and submit an annual report.	Landowner / Trust for Nature, MRPV & DCCEEW	Submit at least two months prior to agreement anniversary date	Annual report is signed, dated and submitted to Trust for Nature, MRPV and DCCEEW by the landowner at least two months prior to the anniversary date of the agreement. Report provides enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of / progress against the commitments for the EPBC offset site area. Obligations of the landowner have been met and the obligations form is read, signed, dated and submitted with the annual report. Progress and actions, as well as failings or any new and emerging threats, are submitted to Trust for Nature and MRPV, and reported to DCCEEW.

4.2 IN PERPETUITY MANAGEMENT

This Offset Management Plan outlines the management actions and targets to be achieved at the offset site to improve the quality of potential habitat for the SBB over the 10 year time period, and to be maintained for the balance of the EPBC Act approval.

After Year 10, the landowner is required to continue to undertake management actions to retain the population of the SBB and the quality and extent of habitat attained for the species at the Ocean Grange offset site, in perpetuity. This period is considered a care and maintenance phase. Table 13 identifies the in-perpetuity performance targets for the Ocean Grange offset site.

Table 13. Offset site performance target to be maintained in perpetuity

MANAGEMENT ACTION	RESPONSIBILITY	PERFORMANCE TARGET
Security agreement	Landowner and Trust for Nature	Offset covenant remains on Title
Habitat condition	Landowner	Maintained at improved condition/quality
SBB population	Landowner	Maintenance, or modest improvement, of SBB population
SBB foraging habitat	Landowner	Maintained at improved condition/quality of SBB foraging habitat
Fencing	Landowner	Installed or upgraded if required
Access and signage	Landowner	Illegal access prohibited
Weed control	Landowner	Woody and herbaceous weeds controlled. Spear Thistle is eradicated. Ragwort extent and density continues to decline
Pest control	Landowner	Pest populations at less than baseline
Final reporting	MRPV	Provide report to DCCEEW at end of EPBC Act approval period
Monitoring (SBB population, pest animal population, SBB habitat)	MRPV	Monitoring at Year 15, 17 and the Year 2040

4.3 MANAGEMENT PLAN COSTS

The following table outlines the expected cost of implementation of this OMP. Please note that these costings are based on current market rates for materials and contract work, with annual costs increasing at 3% per annum.

Table 14. OMP costings

MANAGEMENT ACTION	RESPONSIBILITY	COSTING
Security agreement and stewardship (single payment)	Landowner and Trust for Nature	$40,000
OMP	Landowner	$400,000
SBB monitoring	MRPV	$150,000

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6. APPENDICES

6.1 FLORA RECORDED ON SITE

* = exotic species
# = native species occurring outside of its natural range

Lifeforms (LF): CT – Canopy Tree, T – Tree,
MS – Medium Shrub, SS - Small Shrub,
PS – Prostrate Shrub, LH – Large Herb, MH - Medium Herb,
SH – Small Herb, LTG – Large Tufted Graminoid,
MTG – Medium Tufted Graminoid,
LNG – Large Non-tufted Graminoid, TF – Tree fern,
GF – Ground Fern, SC – Scrambler/Climber,
W – environmental weed.

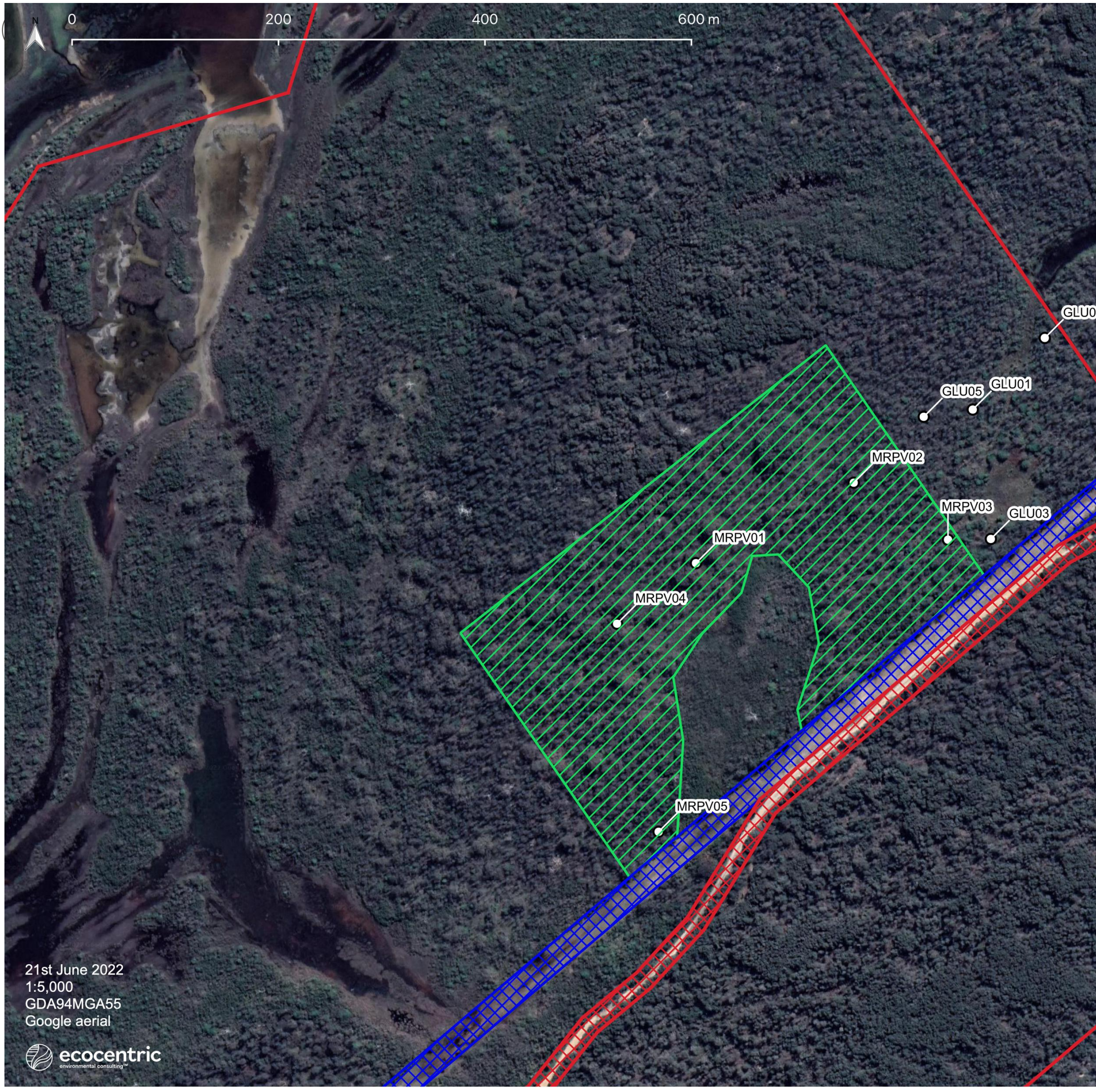
SCIENTIFIC NAME	COMMON NAME	LIFEFORMS
Acacia longifolia	Sallow Wattle	T / MS
Acacia longifolia subsp. *longifolia*	Sallow Wattle	T / MS
Acacia mearnsii	Black Wattle	T / MS
Acacia melanoxylon	Blackwood	T / MS
Acacia paradoxa	Hedge Wattle	MS
Acaena echinata	Sheep's Burr	SH
Acaena novae-zelandiae	Bidgee-widgee	MH / SH
Ammophila arenaria	Marram Grass	*
Austrostipa spp.	Spear Grass	MTG
Banksia integrifolia subsp. *integrifolia*	Coast Banksia	T / MS
Banksia serrata	Saw Banksia	T / MS
Billardiera scandens s.l.	Common Apple-berry	SC
Bursaria spinosa subsp. *spinosa*	Sweet Bursaria	MS / SS
Caladenia parva	Brown-clubbed Spider-orchid	MH
Cassinia aculeata subsp. *aculeata*	Common Cassinia	MS / SS
Cirsium vulgare	Spear Thistle	*
Cladium procerum	Leafy Twig-rush	MNG
Comesperma volubile	Love Creeper	SC
Coprosma quadrifida	Prickly Coprosma	MS / SS
Corybas incurvus	Slaty Helmet-orchid	MH / SH
Dianella longifolia s.l.	Pale Flax-lily	MTG
Dichondra repens	Kidney-weed	MH / SH
Distichlis distichophylla	Australian Salt-grass	MNG
Drosera spp.	Sundew	MH / SH
Eucalyptus tereticornis subsp. *mediana*	Gippsland Red-gum	IT
Eucalyptus viminalis subsp. *pryoriana*	Coast Manna-gum	IT
Ficinia nodosa	Knobby Club-sedge	MNG
Gahnia radula	Thatch Saw-sedge	MTG
Gahnia sieberiana	Red-fruit Saw-sedge	LTG / MTG
Goodenia radicans	Shiny Swamp-mat	MH / SH
Hypolaena fastigiata	Tassel Rope-rush	SC
Juncus spp.	Rush	MNG
Lemna disperma	Common Duckweed	SH

SCIENTIFIC NAME	COMMON NAME	LIFEFORMS
Lepidosperma laterale	Variable Sword-sedge	MTG
Lepidosperma spp.	Sword Sedge	MTG
Leptospermum continentale	Prickly Tea-tree	MS / SS
Leptospermum laevigatum	Coast Tea-tree	T / MS / SS
Leptospermum myrsinoides	Heath Tea-tree	T / MS / SS
Leucopogon parviflorus	Coast Beard-heath	MS / SS
Lobelia anceps	Angled Lobelia	SC
Lomandra longifolia	Spiny-headed Mat-rush	LTG / MTG
Melaleuca ericifolia	Swamp Paperbark	MS / SS
Microlaena stipoides var. *stipoides*	Weeping Grass	MNG
Myoporum insulare	Common Boobialla	MS / SS
Olearia lirata	Snowy Daisy-bush	MS / SS
Opuntia ficus-indica	Indian Fig	*
Oxalis perennans	Grassland Wood-sorrel	SH
Phragmites australis	Common Reed	MNG
Pimelea humilis	Common Rice-flower	MS / SS
Poa labillardierei var. *labillardierei*	Common Tussock-grass	MTG
Poa poiformis	Coast Tussock-grass	MTG
Pomaderris aspera	Hazel Pomaderris	MS
Pteridium esculentum subsp. *esculentum*	Austral Bracken	GF
Pterostylis spp.	Greenhood	MH / SH
Reseda luteola L.	Weld	*
Rhagodia candolleana subsp. candolleana	Seaberry Saltbush	MS / SS
Rytidosperma spp.	Wallaby Grass	MTG
Samolus repens var. *repens*	Creeping Brookweed	MH / SH
Sarcocornia quinqueflora	Beaded Glasswort	MH / SH
Senecio jacobaea	Ragwort	*
Senecio quadridentatus	Cotton Fireweed	LH / MH
Senecio spp.	Groundsel	LH / MH
Tetragonia spp.	Native Spinach	MS
Tetragonia tetragonioides	New Zealand Spinach	MS
Wahlenbergia gracilis	Sprawling Bluebell	MH / SH
Wahlenbergia stricta subsp. *stricta*	Tall Bluebell	MH / SH

6.2 MAPPING

The following Maps were produced using Quantum GIS (QGIS 3.10) and were developed from various datasets including:

- Aerial photography available through Nearmap and Google Maps,
- VicMap layers (Parcel, Roads, Waterways and Contours),
- GPS based data collected in the field.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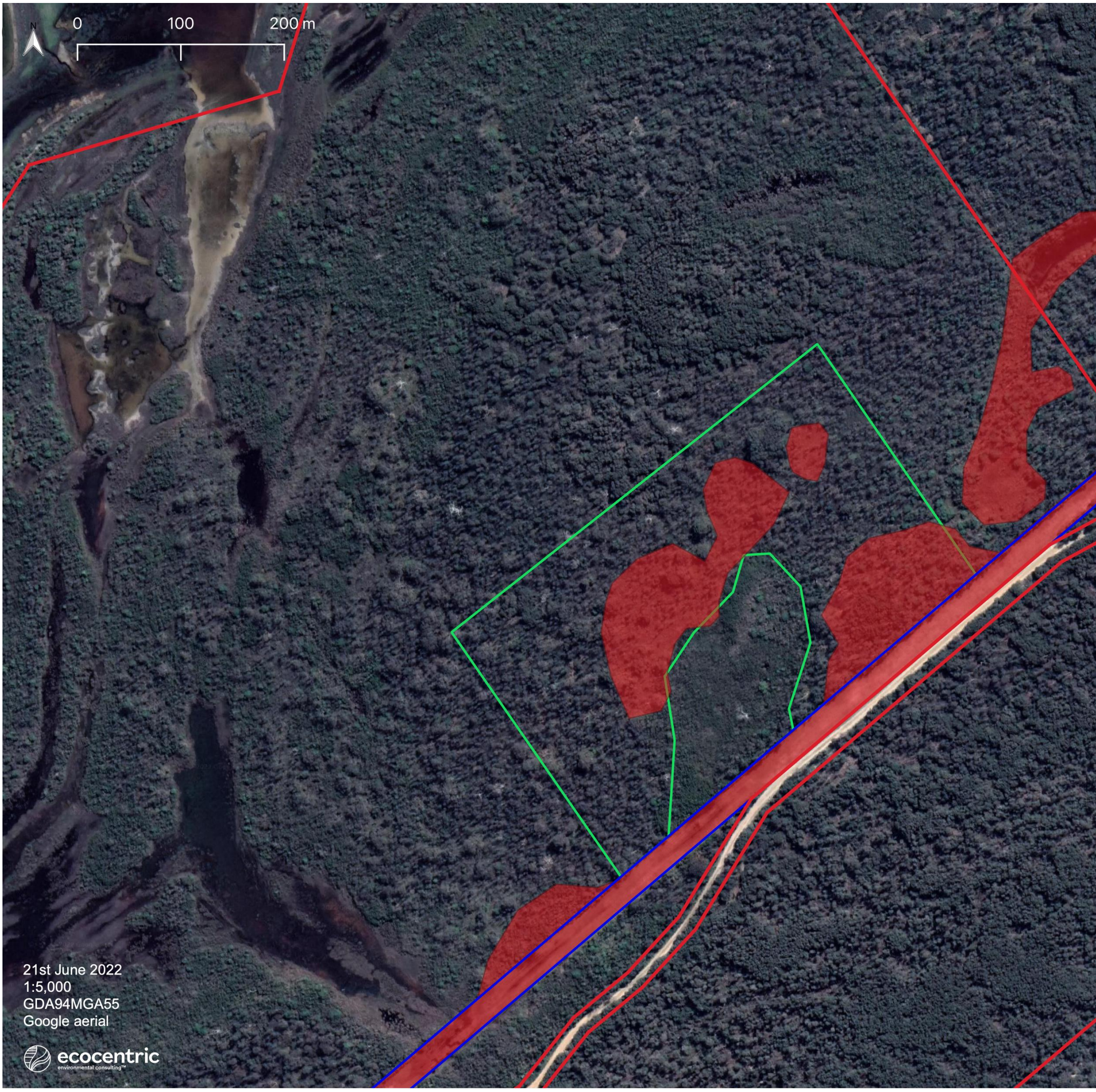
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