

EPBC 2019/8487 Healesville-Koo Wee Rup Road Upgrade

Offset Management Plan for the Southern Brown Bandicoot *Isodon obesulus obesulus*, Timboon-Nullawarre Road, Brucknell, Victoria.



Final Report

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on behalf of Major Roads Projects Victoria**

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Document Control

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Proposed Action	To duplicate approximately 10 kilometres of the Healesville-Koo Wee Rup Road between the Princes Freeway in Pakenham and Manks Road in Koo Wee Rup.		
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Cover Photo: Potential habitat for the EPBC Act listed Southern Brown Bandicoot *Isoodon obesulus obesulus*, Timboon-Nullawarre Road, Brucknell, Victoria (photo taken by ██████████, 6/7/2020).

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Signature

Full Name

Organisation

Date

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1 Introduction

1.1 Context

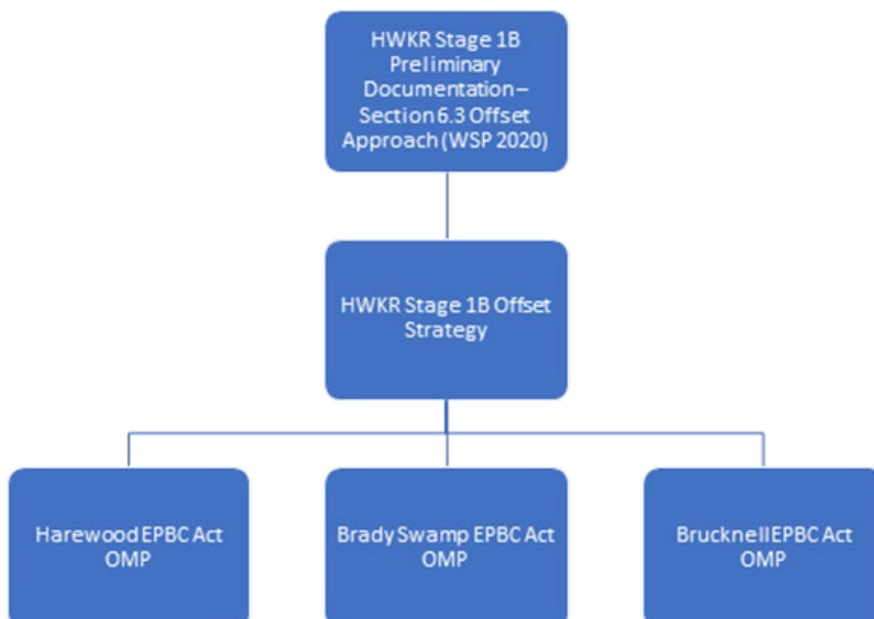
The EPBC Act Offset Management Plan (OMP) for Brucknell has been prepared to offset residual impacts of the Healesville-Koo Wee Rup Road Upgrade (Stage 1B) project (the Project) to Southern Brown Bandicoot *Isoodon obesulus obesulus*. Southern Brown Bandicoot is a listed Matter of National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Project is located approximately 55 kilometres south east of Melbourne within the Cardinia Shire Local Government Area.

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 here <https://roadprojects.vic.gov.au/projects/south-eastern-roads-upgrade/healesville-koo-wee-rup-road>.

The OMP for Brucknell forms part of the *Healesville-Koo Wee Rup Road Offset Strategy* (Arup 2020). The Offset Strategy expands on the commitments in the Preliminary Documentation and provides for a package of direct offsets for Growling Grass Frog *Litoria raniformis* and Southern Brown Bandicoot. The other two OMPs included as part of the Offset Strategy are Harewood (Growling Grass Frog and Southern Brown Bandicoot) and Brady Swamp (Growling Grass Frog offsets only).

The Offset Strategy describes how the offset requirements for the Project will be achieved across the three OMPs, how the objectives of the *EPBC Act Environmental Offsets Policy* (DSEWPaC 2012) will be achieved and includes the EPBC Act Offsets Assessment Guide calculations. The OMPs focus specifically on the management actions to be implemented at each site, and how these actions will benefit the MNES and other significant values on site.

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



1.2 Brucknell Matters of National Environmental Significance

The Brucknell offset site supports suitable habitat for the EPBC Act listed Southern Brown Bandicoot. The Southern Brown Bandicoot is described below. While the species was recorded within the vicinity of the offset site, they have not yet been detected onsite. Extensive targeted Southern Brown Bandicoot surveys will be undertaken at Brucknell during Years 1 and 2 of the 10-year offset management (see Section 3.6.1) to confirm species presence or absence at the proposed offset site. If the species is not detected during these targeted surveys, an alternative offset will be sought.

The Brucknell offset site also supports confirmed habitat for the EPBC Act listed Long-nosed Potoroo (SE Mainland) *Potorous tridactylus tridactylus*. The Long-nosed Potoroo (SE Mainland) is described below. The species was detected in the offset site during targeted surveys for the Southern Brown Bandicoot (WSP 2020). Offsets are not required for this MNES as part of the Healesville-Koo Wee Rup Road Upgrade (Stage 1B). However, as the MNES is present in the Brucknell offset site and has similar habitat requirements and threats to its population to the Southern Brown Bandicoot, this OMP has been prepared to protect and enhance breeding, foraging and dispersal habitat for both species.

1.2.1 Southern Brown Bandicoot *Isodon obesulus obesulus*

The Southern Brown Bandicoot is listed as Endangered under the EPBC Act. It is a medium-sized, ground-dwelling marsupial that inhabits dense vegetation, including the wetland fringes and heathland (Paull 2008; TSSC 2016). Bandicoots rarely venture far from cover, possibly to avoid predation (Claridge 1998). They do not create burrows, but construct nests under plants on the ground, and occasionally use the burrows of other species. The species is omnivorous, and mainly forages for food by digging in the leaf litter and soil for insects, fungi, plant root nodules and bulbs. It also eats fruit, seeds and other plant material above ground (Paull 2008). The Southern Brown Bandicoot breeds throughout the year with a peak in Spring. The species may have two to three litters per year, with up to six young per litter. Sexual maturity is reached in about 60 days and longevity in the wild is three to four (Paull 2008).

Despite its high fecundity rates, the population and range of the Southern Brown Bandicoot has declined significantly since European settlement (Zenger *et al.*, 2005; Bilney *et al.*, 2010). Its distribution is now highly fragmented across its historic range, extending from southern Hawkesbury River in New South Wales to Kangaroo Island in South Australia. In Victoria, records of the species are clustered in several bioregions, including the East Gippsland Lowlands, Gippsland Plains (Western section), Otway Plain (Anglesea section), Warrnambool Plain (Port Campbell section), Greater Grampians, Glenelg Plains and Wilsons Promontory (Coates *et al.* 2008). The Port Campbell Community Group (2015) reported a decline of more than 70% in the local population between 2007 and 2015, and is continuing to decline by more than 10% each year. The primary threats to the Southern Brown Bandicoot are predation by foxes (*Vulpes vulpes*) and cats (*Felis catus*), habitat loss and degradation, and too frequent and extensive burning (TSSC 2016).

1.2.2 Long-nosed Potoroo (SE Mainland) *Potoroo tridactylus tridactylus*

The Long-nosed Potoroo (SE Mainland) is listed as Vulnerable under the EPBC Act. It is also a medium-sized marsupial. It inhabits coastal heaths and wet and dry sclerophyll forests, and prefers dense canopy and shrub cover with a ground layer comprising low floristic diversity (Norton et al. 2010a). They do not build complex nests and are typically found sheltering in shallow squats under dense vegetation (DEPI 2013). The diet of the Long-nosed Potoroo (SE Mainland) is similar to that of the Southern Brown Bandicoot. It mainly forages by digging for fungi, roots, tubers, bulbs and insects, and also feeds on fruit, stems, flowers, leaves and seeds (Tory et al 1997). Breeding may occur throughout the year, although births (of a single young) may peak in late winter and early spring (Green & Mitchell 1997). Sexual maturity is reached after 12 months and longevity in the wild is four to five years (Martin & Temple-Smith 2012).

The population and range of the Long-nosed Potoroo (SE Mainland) has declined significantly since European settlement, and continues to decline (Martin & Temple-Smith 2012). Its current distribution is along the south-eastern coast of mainland Australia, from south-eastern Queensland to south-eastern South Australia. In Victoria, several populations exist in areas including East Gippsland (east of Lakes Entrance), Wilson's Promontory, French Island, the Otway Ranges, the lower Glenelg River area and the Grampians (DEPI 2013). The historic distribution of the Long-nosed Potoroo (SE Mainland) was likely to have been across a similar range to its current distribution, but the species would have been much more continuously distributed, wherever there was suitable habitat, rather than the patchy, fragmented distribution seen today (Martin & Temple-Smith 2012). The primary threats to the Long-nosed Potoroo (SE Mainland) are habitat loss and fragmentation, and predation by foxes (*Vulpes vulpes*) and cats (*Felis catus*). Other threats include inappropriate fire regimes, forestry activities, and habitat degradation from domestic livestock and feral herbivores, and Phytophthora and Myrtle Rust-associated dieback (TSSC 2019).

2 Offset Description

Table 2 below summarises the location, planning restrictions, and proposed security and management arrangement for the Brucknell offset site.

Table 2. Offset Site 1 Security and Management

Address	Timboon-Nullawarre Road, Brucknell VIC 3268
Allotment	Lot 1 on Title Plan 824910B
Victorian Bioregion	Warrnambool Plain
Catchment Management Authority	Corangamite
Local Government Area	Corangamite
Current Zoning	Farm Zone
Planning Overlays	Bushfire Management Overlay
Current Security	None
Proposed Security	Section 69 (<i>Conservation, Forests and Lands Act 1987</i>) Agreement.
Date of commencement of Security Agreement	Registration in progress, estimated date of commencement is 1 January 2021.
Offset Management Period	10 years (to commence following registration of Section 69 Agreement, estimated at 1 January 2021)
Offset Site Management Responsibility	Landowner
Offset Monitoring Responsibility	Landowner and Victorian Department of Environment, Land, Water and Planning (DELWP).

2.1. Location

The Brucknell offset site is located on private land at Lot 1 of Title Plan 824910B, Timboon-Nullawarre Road, Brucknell, Victoria (Figure 1). It is approximately 220 kilometres south-west of Melbourne’s CDB and 25 kilometres north of Port Campbell. It is located in the Corangamite Shire Council, Corangamite Catchment Management Authority and Warrnambool Plain bioregion, is zoned Farming – Schedule 1 (FZ1) and contains a Bushfire Management Overlay (BMO). The property is 41.72 hectares and the potential Southern Brown Bandicoot offset is 38.1065 hectares (Figure 2). The Healesville-Koo Wee Rup Road Upgrade (Stage 1B) requires 30 hectares of this offset. The property surrounded by dairy and beef cattle farms except for two easements at its northern and south-western boundaries that are contiguous with the offset and comprise similar vegetation, and where the property meets the Timboon-Nullawarre Road as its southern tip. The offset is situated opposite the Brucknell Scout Camp on Timboon-Nullawarre Road, which also comprises similar native vegetation and habitat to the offset.

2.2. Historic Land Use and Disturbance

The Landowner has owned the property since 2005 and has not undertaken any farming or commercial practices during their ownership. Previously, the property has been used for annual concerts, known as the Bush Bonanza, from 1980 to 2001 in the group of large sheds that have been excluded from the offset area

(Plate 4; Figure 2). There is potential that the site has also been used for recreational motocross bikes due to a series of mounds towards the north of the property that may be old jumps, but are now overgrown with vegetation. There are the remains of an old gravel pit adjacent to the access track towards the north of the offset site, suggesting that small-scale rock extraction once occurred at the site. This pit is filled in and native vegetation is recruiting over top. The Landowner indicated that the property may have been grazed by cattle more than 60 years ago. There is no evidence of past fertiliser use or broad acre spraying having been undertaken at the property. The landowner currently undertakes weed control each year through handpulling and spot spraying with herbicides on woody and high threat herbaceous weeds.

2.3. Vegetation and Habitat Description

A total of 52 indigenous flora species and 15 introduced flora species were recorded in the Brucknell offset site during the offset site assessment undertaken on 6 July 2020 (Appendix 1). The timing of the site assessment did not however coincide with the optimal survey period (Spring to Summer) for some native grasses and herb species, which may have limited the number of flora species recorded.

The offset comprises 38.1065 hectares of Lowland Forest (EVC 16) vegetation of the Warrnambool Plain bioregion (Plates 1-3; Figure 2). Lowland forest is an open forest to 25 metres tall with a diversity of flora species and lifeforms in each stratum (DELWP 2020a). The offset contains a continuous canopy, approximately 20 metres tall, of Messmate Stringybark *Eucalyptus obliqua*, Manna Gum *Eucalyptus viminalis* and Swamp Gum *Eucalyptus ovata*, scattered understorey trees, including Silver Wattle *Acacia dealbata* and Privet Mock-olive *Notelaea ligustrina*, a diversity of shrubs, including Wattles *Acacia* spp., Silver Banksia *Banksia marginata*, Sweet Bursaria *Bursaria spinosa*, Prickly Currant-bush *Coprosma quadrifida*, Prickly Tea-tree *Leptospermum continentale*, Tree Everlasting *Ozothamnus ferrugineus*, Hop Goodenia *Goodenia ovata* and Dusty Miller *Spyridium parvifolium*, and a dense groundcover (approximately 1m tall) heavily dominated by Sword-sedge *Lepidosperma* spp. and Austral Bracken *Pteridium esculentum* with a variety of other native graminoids, scramblers, herbs and ferns, including Red-fruit Saw-sedge *Gahnia sieberiana*, Tussock-grass *Poa* spp., Wallaby-grass *Rytidosperma* spp., Wire-grass *Tetrarrhena* spp., Weeping Grass *Microleana stipoides*, Grass-tree *Xanthorrhoea* spp., Grass Triggerplant *Stylidium parvifolium*, Downy Dodder-laurel *Cassytha pubescens*, Mountain Clematis *Clematis aristata*, Small-leaf Bramble *Rubus parvifolius*, Raspwort *Gonocarpus* spp., Fireweed *Senecio* spp., Common Woodruff *Asperula conferta*, Kidney-weed *Dichondra repens*, Ivy-leaf Violet *Viola hederacea* and Common Maidenhair *Adiantum aethiopicum* (Appendix 1).

The closed canopy, dense groundcover and high leaf litter provide ideal refuge and foraging habitat for the EPBC Act listed Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) (see Section 1.2 above). A habitat assessment for the Southern Brown Bandicoot confirmed that 70% of the Brucknell offset site provides suitable habitat cover for the species, predominantly due to the dense cover of Sword-sedge and Austral Bracken throughout the site (Cardno 2020). The suitability of habitat for these species is discussed further in Section 2.4 below.

The offset comprises a low (<5%) cover of introduced flora species scattered throughout the site, which include a number woody and declared noxious weeds of Victoria. These are Sweet Pittosporum *Pittosporum undulatum*, Common Blackberry *Rubus anglocandicans*, Spear Thistle *Cirsium vulgare* and Ragwort *Senecio*

jacobaea. Other grassy and herbaceous weeds recorded include Couch *Cynodon dactylon*, Cocksfoot *Dactylis glomerata*, Yorkshire Fog *Holcus lanatus*, Greater Plantain *Plantago major*, Black Nightshade *Solanum nigrum* and Sow-thistle *Sonchus* spp., and are predominantly found encroaching along the boundary of the offset and adjacent to existing tracks. One New Zealand Cabbage-tree *Cordyline australis* was also recorded in the offset site (Plates 5 and 6; Appendix 1; Figure 2).

The Red Fox *Vulpes Vulpes*, feral Cats *Felis catus*, Fallow Deer *Dama dama* and the European Rabbit *Oryctolagus cuniculus* have been sighted by the landowner and are known to occur in the area. Red Fox and Fallow Deer were also recorded on site on camera traps during targeted Southern Brown Bandicoot surveys undertaken between October and December 2019 (WSP 2019). One old den was recorded in an old motocross jump in the north of the offset site that may no longer be in use (Plate 9; Figure 2). Damage from deer is evident on the trunks of some canopy trees during the offset site assessment, caused by deer rubbing their antlers against the tree.

Rubbish was also recorded throughout the site during the offset site assessment (Plate 11; Figure 2).

2.3.1 Vegetation Quality (Habitat Hectare) Assessment

A vegetation quality assessment was undertaken in the offset site on 6 July 2017 using habitat hectare methodology (Parkes et al 2003; DSE 2004). The vegetation is high quality. Table 3 below outlines the results of the habitat hectare assessment.

Table 3. Brucknell vegetation quality.

Site Number		1 / A	2 / A	3 / A	4 / A	5 / A	6 / A
Area (ha)		28.16	6.0761	0.3223	1.2296	0.5227	1.7958
EVC name		LF	LF	LF	LF	LF	LF
Bioregion		WaP	WaP	WaP	WaP	WaP	WaP
	Max Score	Score	Score	Score	Score	Score	Score
Site Condition Score	Large Old Trees	10	10	10	10	10	10
	Canopy Cover	5	5	5	5	5	5
	Understorey	25	20	20	20	20	20
	Lack of Weeds	15	13	13	13	13	13
	Recruitment	10	10	10	10	10	10
	Organic Matter	5	5	5	5	5	5
	Logs	5	5	5	5	5	5
	Total Site Condition Score	75	68	68	68	68	68
Landscape value	Patch Size	10	8	8	8	8	8
	Neighbourhood	10	3	3	3	3	3
	Distance to Core	5	3	3	3	3	3
	Total Landscape Score	25	14	14	14	14	14
Habitat points out of 100		100	82	82	82	82	82
Habitat (Quality) Score out of 10		10	8	8	8	8	8

Note: LF = Lowland Forest, WaP= Warrambool Plain.

2.4. Matters of National Environmental Significance Habitat Suitability

The continuous canopy and dense groundcover throughout the Brucknell offset site provides ideal habitat for the EPBC Act listed Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) (Plates 1-3). Cardno (2020) assessed the offset as ‘optimal’ habitat for the Southern Brown Bandicoot, relevant to the categories of habitat suitability for Southern Brown Bandicoot identified by SEWPaC (2011) and Paull et al. (2013) (Table 4). This assessment was largely due to the dense groundcover of Sword-sedge and Austral Bracken throughout the offset site.

Table 4. Habitat Descriptions for Southern Brown Bandicoot (Cardno 2020).

Optimal	>50% cover of shrubs/Sword-sedge/Austral Bracken in the 0.2 – 1 m height range
Suboptimal	<50% cover of shrubs/Sword-sedge/Austral Bracken in the 0.2 – 1 m height range and >50% cover of low trees in the < 10 m height range
Unsuitable	<50% cover of shrubs/Sword-sedge/Austral Bracken in the 0.2 – 1 m height range and <50% cover of low trees in the < 10 m height range

A Southern Brown Bandicoot was recorded in the Brucknell Scout Camp directly to the south of the offset site in 2005 in Lowland Forest vegetation of similar quality and composition to the Brucknell offset site (DELWP 2020b). Given the proximity of this record and that the property comprises optimal Southern Brown Bandicoot habitat, the Brucknell offset site is also likely to support the species (WSP 2019).

Targeted surveys for Southern Brown Bandicoot were initiated by WSP in October 2019 (WSP 2020). These surveys include the use of infrared cameras and hair-tubes baited with a non-lethal attractant at multiple locations throughout the offset site. To date, Southern Brown Bandicoot has not been detected in the offset site, however targeted surveys are ongoing. The intensity of these surveys will be increased during Years 1 and 2 of the offset management period to maximise the likelihood of detecting the species on site.

A large population of the EPBC Act listed Long-nosed Potoroo (SE Mainland) has been recorded in the offset site during targeted surveys (WSP 2019). This species inhabits similar vegetation and habitat types to the Southern Brown Bandicoot, and is at risk from similar threats, including habitat degradation, loss and fragmentation, and predation by foxes and feral cats (see Section 1.2).

Potential threats to the Southern Brown Bandicoot and the Long-nosed Potoroo (SE Mainland) at the Brucknell offset site are predation by foxes and cats, and habitat degradation from entitled land-uses (e.g. grazing, firewood collection), deer, rabbits, livestock, unauthorised access, recreational activities (e.g. motocross), weed infestations (particularly woody and high threat herbaceous weeds), rubbish, spray drift from adjacent farmland, and the potential spread of *Phytophthora* or Myrtle Rust-associated dieback to the site. This offset management plan has been prepared to address these potential threats and support the persistence of both EPBC Act listed species.



Plate 1 Lowland Forest vegetation and potential Southern Brown Bandicoot habitat, Brucknell offset site (photo taken by [REDACTED], 6/7/2020).



Plate 2 High cover of Austral Bracken and fallen tree, Brucknell offset site (photo taken by [REDACTED], 6/7/2020).



Plate 3 Groundcover dominated by Tall Sword-sedge, Brucknell offset site (photo taken by [REDACTED], 6/7/2020).



Plate 4 Sheds area, excluded from Brucknell offset site (photo taken by [REDACTED], 6/7/2020)



Plate 5 Sweet Pittosporum, Brucknell offset site (photo taken by [REDACTED], 6/7/2020)



Plate 6 New Zealand Cabbage-tree, Brucknell offset site (photo taken by [redacted], 6/7/2020)



Plate 7 Car access track, Brucknell offset site (photo taken by [redacted], 6/7/2020)



Plate 8 Quadbrike access track, Brucknell offset site (photo taken by [redacted], 6/7/2020)



Plate 9 Fox den, Brucknell offset site (photo taken by [redacted], 6/7/2020)



Plate 10 Boundary fence, Brucknell offset site (photo taken by [redacted], 6/7/2020)



Plate 11 Rubbish, Brucknell offset site (photo taken by [redacted], 6/7/2020)

3 Offset Management

The Landowner(s) of the Brucknell offset site will be responsible for the implementation of the offset for Southern Brown Bandicoot, including the delivery of the 10-year offset management plan and its in perpetuity protection. The Landowner(s) are Dairy farmers and experienced land managers, and possess suitable qualifications to implement the offset management and monitoring requirements effectively, including:

1. Diploma in Conservation and Land Management;
2. Agricultural Chemical Users Permit; and,
3. Gun License.

The proposed in perpetuity site security, and the 10-year management actions, performance targets and schedule of works are outlined below.

3.1 In Perpetuity Security

The entire Brucknell offset site will be permanently secured under a Section 69 (*Conservation, Forest and Lands Act 1987*) Agreement. This security mechanism meets the requirements under the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (DSEWPaC 2012). The Section 69 Agreement will be executed between the Secretary of the Victorian Department of Environment, Land, Water and Planning (DELWP) and the Landowner, and registered on the land title. It will permanently restrict the allowable land uses to conservation activities only, and oblige the landowner to protect and improve native vegetation, and Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) habitat in accordance with the agreed management plan in perpetuity. DELWP is the responsible agency that will oversee the implementation of the offset and compliance by the Landowner with the *Landowner Agreement* to be registered on-title.

3.2 Habitat Condition

The Brucknell offset site currently supports confirmed habitat for the Long-nosed Potoroo (SE Mainland) and potential habitat for the Southern Brown Bandicoot. Currently, the site supports 'optimal' habitat for the Southern Brown Bandicoot due to the dense groundcover of Sword-sedge and Austral Bracken, with a variety of native shrubs, and provides 70% habitat cover for the species (Cardno 2020). At a minimum this habitat quality and extent will be maintained in perpetuity, and improved, where possible, during the 10-year management plan through the eradication (<1% cover) of woody and high threat herbaceous weeds (see Section 3.5 below).

3.3 Fencing

The property is currently fenced (approximately 3.16 kilometres in total) with either a 4 or 5-line barb wire and post fence (Plate 10). The fence is preventing livestock access from adjacent farmland, however it does not meet DELWP's minimum fencing standard (DELWP 2019). To meet DELWP's fencing standard and avoid injuring native wildlife, all barb wire will be removed and a new fence installed in Year 1 in accordance with

the standard. The new fence will comprise three plain wires and two electrified strands. Regular monitoring of the boundary fence will be undertaken to remove fallen trees and maintain the electric fence.

The current stockproof fencing alignment extends around the two vegetated easements at the northern and south-western boundaries which also comprise Lowland Forest vegetation and potential habitat for the Southern Brown Bandicoot. The fence will be reinstalled along the same alignment to avoid unnecessary native vegetation clearance that would be required to create a new fence alignment along the northern and south-western title boundaries, as well as to ensure that the vegetation in these easements can continue to be managed by the Landowner. If the use of these easements changes in the future and the fence is required to be moved, the Landowner will immediately erect a new fence along the northern and south-western title boundaries that meets DELWP's minimum fencing standard. A six metre buffer along the entire land title boundary has been excluded from the offset area to allow for fencing installation and maintenance works without detriment to the offset (Figure 2).

3.4 Access and Signage

Access to the offset site via vehicle gates will be maintained at the southern property entrance off Timboon-Nullawarre Road, and at the north-west corner of the property at the end of Bennetts Road. These gates will remain locked to avoid unauthorised access to the property and offset site. One car access track (2.5 metres wide) to the sheds area and six quadbike tracks (2 metres wide) will also be maintained to assist with maintenance of the offset (Plates 7 and 8; Figure 2). These tracks have been excluded from the offset area. Signs will be installed at property access gates and along the boundary fence in Year 1 to alert neighbouring properties, roadside managers and the public to the presence of the offset site and prohibited activities, including unauthorised access, littering and spray drift.

3.5 Weed Control

The Brucknell offset site comprises a low (<5%) cover of introduced flora species scattered throughout the site, which include a number woody and declared noxious weeds of Victoria. Table 5 below lists all weeds observed during the offset site assessment, their threat status (based on their invasiveness in the Brucknell offset site and their status under the *Catchment and Land Protection Act 1994*), and the method and timing for their control. Weed control methods include herbicide application, chipping (ie. with hoe) or handpulling. The application of herbicides is an effective and efficient control method for a range of woody, herbaceous and grass weeds. Off-target impacts to surrounding native flora must be avoided through the correct use and careful application of herbicides. All herbicides must be used in accordance with the manufacturer's specifications and occupational health and safety policies. Application methods may include spot spraying with a knapsack, dabbing of weeds with a foam tipped application device (ie. weed wand), dabbing/painting of cut stumps and injection of woody weeds.

All woody and high threat herbaceous weeds will be eradicated (<1% cover) during the 10-year offset management period, and the cover of other herbaceous weeds will be reduced. Monitoring for new and re-emerging woody and herbaceous weeds will be conducted throughout the year, and any new and emerging weeds eliminated.

Table 5. Weeds recorded in the Offset Site, control method and timing.

Weed group/ Common Name	Species Scientific Name	Threat Status	% Cover	Method	Timing	Target Cover
Spear Thistle	<i>Cirsium vulgare</i> .	High	1%	Herbicide application, chip or handpull	Winter and Spring	Eradicate (<1%)
New Zealand Cabbage-tree	<i>Cordyline australis</i>	High	<1%	Cut and paste with herbicide	All year	Eradicate (0%)
Perennial grasses	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Cynodon dactylon</i> var. <i>dactylon</i> , <i>Dactylis glomeratum</i> , <i>Holcus lanatus</i>	Low	3%	Herbicide application, chip or handpull	All year	2%
Herbaceous weeds	<i>Centaurium erythraea</i> , <i>Lysimachia arvensis</i>	Low	<1%	Herbicide application, chip or handpull	All year	<1%
Sweet Pittosporum	<i>Pittosporum undulatum</i>	High	1%	Cut and paste with herbicide	All year	Eradicate (<1%)
Flatweeds	<i>Plantago</i> spp., <i>Sonchus</i> spp.	Low	<1%	Herbicide application, chip or handpull	Spring	<1%
Common Blackberry	<i>Rubus anglocandicans</i>	High	1%	Herbicide application, chip or handpull	Spring and Summer	Eradicate (<1%)
Ragwort	<i>Senecio jacobaea</i>	High	1%	Herbicide application, chip or handpull	Spring	Eradicate (<1%)
Black Nightshade	<i>Solanum nigrum</i>	Moderate	<1%	Herbicide application, chip or handpull	Spring	<1%

3.6 Pest Control

The *Catchment and Land Protection Act 1994* lists rabbits, foxes and feral cats as established pest animals and requires that all landowners take reasonable steps to prevent the spread of, and as far as possible eradicate, established pest animals on their land. Deer is also a pest animal recorded at the Brucknell offset site. Rabbits, foxes, feral cats and deer are a threat to native fauna, including the Southern Brown Bandicoot and the Long-nosed Potoroo (SE Mainland), through competition and predation. Rabbits and deer also degrade native vegetation and habitat through over-browsing, erosion, trampling and ring-barking trees.

Pest animal populations and activity will be monitored and controlled as required throughout the year in accordance with Table 6 below. Monitoring will be undertaken through regular site visitations and the use of infrared cameras during Southern Brown Bandicoot surveys (see sections 3.7.1 and 3.7.2), and a detailed record of sightings and pest activity will be maintained. Control methods that may be implemented include fumigation, hand collapsing of burrows/dens, trapping, shooting and baiting if required and in accordance with the correct licenses.

One fox den was recorded in the Brucknell offset site that is not currently in use (Figure 2). This den will be monitored. If activity is detected the den will be fumigated and collapsed. Shooting of all pest animals will be undertaken in accordance with suitable licenses. Cage traps will be used to catch feral cats and euthanise humanely. Cage traps must be checked daily when in use, and any non-target fauna released immediately. Any baited carcasses must be removed to prevent poisoning of native predators. Rubbish and artificial piles of logs

and rocks may be used as harbour by pest animals, and will be removed or dispersed as appropriate. Indigenous plants, fallen logs or rocks will not be removed from the site.

The effectiveness of pest control methods largely depends on regional pest animal populations and pest control undertaken by surrounding landowners. Where possible, an integrated approach should be undertaken with surrounding landowners to maximise the effectiveness of pest control at the Brucknell offset site. At a minimum, no active burrows, dens or harbours for pest animals will be present in the Brucknell offset site, and the pest animal populations and activity will be maintained or reduced.

Monitoring for new and emerging pest animals will also be undertaken throughout the year, and control undertaken as required.

Table 6. Pest animals control method and timing.

Common name	Method	Timing	Performance Target
Rabbits & Foxes	Fumigation and hand collapse of rabbit burrows and fox dens, if required	Ongoing	No active burrows or dens
Rabbits & Foxes	Baiting (optional method)	September to January if required	Pest animal populations and activity maintained or reduced
Rabbits & Foxes	When baiting, collect and dispose of carcasses to prevent poisoning of native predators.	September to January if required	
Rabbits, Foxes, Feral Cats & Deer	Shooting	All year	
Feral Cats	Cage trapping and euthanise	All year	
Rabbits, Foxes & Feral Cats	Remove rubbish and/or disperse surface harbour	Ongoing	No harbours for pest animals
Rabbits, Foxes, Feral Cats & Deer	Where possible, undertake integrated pest control with surrounding landowners	All year	Pest animal populations and activity maintained or reduced
Rabbits, Foxes, Feral Cats & Deer	Monitor and control	Ongoing	
New & Emerging pest animals	Monitor and control	Ongoing	

3.7 Monitoring and Reporting

Extensive targeted surveys for the Southern Brown Bandicoot will be undertaken throughout the Brucknell offset site during Years 1 and 2 of the offset management period to confirm the species presence or absence, and the subsequent suitability of the site for a Southern Brown Bandicoot offset. If the Southern Brown Bandicoot is detected during this period, MRPV will purchase the offset to meet requirements for the Healesville-Koo Wee Rup Road Upgrade (Stage 1B), and targeted surveys will no longer continue. Annual population monitoring for the Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) will however be undertaken over the remainder of the offset management period once the suitability of the site has been confirmed during Years 1 and 2.

If the Southern Brown Bandicoot is not detected during targeted surveys in Years 1 and 2, MRPV may not purchase the offset and seek an alternative offset on the approval by DAWE. In this instance, ongoing population monitoring for the Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) for the remainder of the offset management period will not be required.

Offset site monitoring will also be undertaken by the Landowner throughout the duration of the 10-year offset management plan and in perpetuity, in accordance with the Section 69 Landowner Agreement.

3.7.1 Targeted surveys for Southern Brown Bandicoot

The *Environment Protection and Biodiversity Conservation Act 1999 draft referral guidelines for the endangered southern brown bandicoot (eastern), Isoodon obesulus obesulus* (DSEWPaC 2011) recommends the use of hair tube traps, infrared cameras, and other secondary survey methodologies to detect the Southern Brown Bandicoot. However, as the quality and accessibility of infrared cameras has significantly improved over the last 10 years, and they remain the least invasive survey methodology to native fauna, the use of infrared cameras will be used as the primary survey method for targeted Southern Brown Bandicoot surveys at the Brucknell offset site.

The Landowner has been assisting with the Southern Brown Bandicoot surveys at the Brucknell offset site through installing his own infrared cameras, checking and sharing camera footage with MRPV's consultant ecologists regularly, and rebaiting camera stations. As the landowner has qualifications and experience in conservation and land management, he will continue to undertake targeted surveys for Southern Brown Bandicoot in accordance with the offset management plan, with the ongoing assistance of MRPV's consultant ecologist.

To maximise the opportunity of detecting the species on site during Years 1 and 2, the Landowner will increase the intensity and frequency of surveys. The following targeted survey methodology for the Southern Brown Bandicoot will be undertaken by the Landowner during Years 1 and 2, or until the species is detected:

- 20 infrared cameras will be installed at multiple locations throughout the 38.1065 hectare offset site, and moved monthly to capture different areas of the site;
- The 20 camera stations will be rebaited weekly with a non-lethal attractant;
- Camera memory cards will be reviewed fortnightly;
- If the landowner reviews footage of a potential Southern Brown Bandicoot, Long-nosed Potoroo (SE Mainland) or similar mammal, he will send these to MRPV's consultant ecologist for species verification; and,
- MRPV consultant ecologist to report to DAWE on the findings of the Brucknell targeted Southern Brown Bandicoot surveys.

3.7.2 Annual monitoring for Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland)

If the Southern Brown Bandicoot is detected during the targeted surveys, ongoing monitoring for the species and the Long-nosed Potoroo (SE Mainland) will be undertaken annually during their optimal survey period in Autumn when the recruitment of juveniles into populations is at its peak. Annual population monitoring for the Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) will be undertaken according to the following methodology:

- 20 infrared cameras will be installed at multiple locations throughout the 38.1065 hectare offset site in early Autumn;
- The 20 camera stations will be rebaited weekly with a non-lethal attractant;

- Camera memory cards will be reviewed fortnightly for at least a 1-month period;
- If the landowner reviews footage of a potential Southern Brown Bandicoot, Long-nosed Potoroo (SE Mainland) or similar mammal, he will send these to MRPV's consultant ecologist for species verification; and,
- MRPV consultant ecologist to report to DAWE on the findings of each annual population monitoring for the Southern Brown Bandicoot.

3.7.3 Annual Reporting

The landowner will prepare and submit a report annually to DELWP at the end of each management year over the 10-year management period. The annual report will include a record of all management actions implemented in accordance with the Landowner Agreement registered on-title, site observations and photos. Photos will be taken from permanent photopoints established in throughout the offset in Year 1 as well as other of observations. Annual Reports will include enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of, or progress against, the performance targets for each management activity.

3.8 Performance Targets

Table 7 below outlines the 10-year performance targets for the offset management actions summarised above and in which year each target will be achieved.

Table 7. 10-year Performance Targets

Management Action	Responsibility		Performance Targets	Year to be Achieved
Security Agreement	Landowner, MRPV, DELWP	1.1	Section 69 Agreement secured on-title	Commencement of Year 1
Habitat Condition	Landowner	2.1	Maintain 'optimal' habitat and a minimum of 70% habitat cover for the Southern Brown Bandicoot	Annually
Fencing	Landowner	3.1	Offset site is stockproof	Within 3 months of commence of Year 1
Access and Signage	Landowner	4.1	Vehicle access is restricted, and signs erected at access gates and along offset boundary fence	Within 3 months of commence of Year 1
Weed Control	Landowner	5.1	Woody weeds eradicated (<1% cover)	Year 1
		5.2	All high threat herbaceous weeds <1% cover	End Year 5
		5.3	All introduced grasses and herbaceous weeds <5% cover	End Year 5
Pest Control	Landowner	6.1	Pest animals monitored and controlled as required	Annually
		6.2	No active burrows, dens or harbours for pest animals	Annually
		6.3	Pest animal populations and activity will be maintained or reduced	Year 10
Monitoring and Reporting	Landowner, MRPV, DELWP, DAWE	7.1	Site Monitoring	Every 3 months
		7.2	Targeted surveys for Southern Brown Bandicoot	Years 1 and 2
		7.3	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Years 3-10
		7.4	Current quality of Southern Brown Bandicoot habitat improved to 6/10 and maintained	Year 5, ongoing
		7.5	Annual report submitted to DELWP	End each Year

3.9 10-Year Management Plan

Table 8 below summarises the management actions, responsible personnel and timing of each action to be implemented over the 10-year management period.

Table 7. 10-year management actions, responsibility and timing.

Year	Action No.	Management Action	Description	Responsible Authority/ personnel	Timing of action	Performance Target (Table 6)
1	1.1	Security Agreement	Offset site secured on-title under a Section 69 Agreement	DELWP, Landowner	Commencement of OMP	1.1
1	1.2	Monitoring and Reporting	Install a minimum of 5 x photopoints.	Landowner	Commencement of OMP	7.1
1	1.3	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
1	1.4	Fencing	Reinstall stockproof fence in accordance with DELWP's minimum fencing standard (approx 3.16km)	Landowner, qualified personnel	Within 3 months of commence of OMP	3.1
1	1.5	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
1	1.6	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
1	1.7	Signage	Erect signs at offset site access gates and along the offset boundary fence to alert neighbouring properties, roadside managers and the public to the presence of the offset site and prohibited activities.	Landowner, qualified personnel	Within 3 months of commence of OMP	4.1
1	1.8	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
1	1.9	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
1	1.10	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
1	1.11	Monitoring and Reporting	Undertake Targeted Surveys for the Southern Brown Bandicoot to confirm species presence or absence	Landowner, MRPV consultant ecologist, DAWE	All year	7.2, 7.4
1	1.12	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 1	7.5
2	2.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
2	2.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
2	2.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
2	2.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
2	2.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3

Year	Action No.	Management Action	Description	Responsible Authority/ personnel	Timing of action	Performance Target (Table 6)
2	2.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
2	2.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
2	2.8	Monitoring and Reporting	Undertake Targeted Surveys for the Southern Brown Bandicoot to confirm species presence or absence	Landowner, MRPV consultant ecologist, DAWE	All year	7.2, 7.4
2	2.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

3	3.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
3	3.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
3	3.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
3	3.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
3	3.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
3	3.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
3	3.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
3	3.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
3	3.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

4	4.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
4	4.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
4	4.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
4	4.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
4	4.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
4	4.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3

Year	Action No.	Management Action	Description	Responsible Authority/ personnel	Timing of action	Performance Target (Table 6)
4	4.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
4	4.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
4	4.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

5	5.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
5	5.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
5	5.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
5	5.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
5	5.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
5	5.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
5	5.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
5	5.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
5	5.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

6	6.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
6	6.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
6	6.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
6	6.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
6	6.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
6	6.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
6	6.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1

Year	Action No.	Management Action	Description	Responsible Authority/ personnel	Timing of action	Performance Target (Table 6)
6	6.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
6	6.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

7	7.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
7	7.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
7	7.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
7	7.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
7	7.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
7	7.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
7	7.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
7	7.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
7	7.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

8	8.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
8	8.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
8	8.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
8	8.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
8	8.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
8	8.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
8	8.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
8	8.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
8	8.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

Year	Action No.	Management Action	Description	Responsible Authority/ personnel	Timing of action	Performance Target (Table 6)
9	9.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
9	9.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
9	9.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
9	9.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
9	9.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
9	9.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
9	9.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
9	9.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
9	9.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5
10	10.1	Habitat Condition	Maintain habitat quality and extent for the Southern Brown Bandicoot	Landowner	All year	2.1
10	10.2	Fencing	Maintain/repair perimeter fencing (approx 3.16km) as required.	Landowner, qualified personnel	All year	3.1
10	10.3	Signage	Maintain signage along the offset boundary fence and at offset site access gate(s)	Landowner, qualified personnel	All year	4.1
10	10.4	Access	Vehicle access gates to remain locked	Landowner	All year	4.1
10	10.5	Weed Control	Undertake weed control (see Table 5 for control methods and timing).	Landowner, qualified personnel	See Table 5	5.1, 5.2, 5.3
10	10.6	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 6 for control methods and timing).	Landowner, qualified personnel	See Table 6	6.1, 6.2, 6.3
10	10.7	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Every 3 months	7.1
10	10.8	Monitoring and Reporting	Annual monitoring of Southern Brown Bandicoot and Long-nosed Potoroo (SE Mainland) populations	Landowner, MRPV consultant ecologist, DAWE	Autumn	7.2, 7.4
10	10.9	Monitoring and Reporting	Prepare and submit annual report	Landowner, DELWP	End of Year 2	7.5

3.10 In Perpetuity Management

The OMP outlines management actions and targets to be implemented at the offset site to improve the quality and condition of potential habitat for the Southern Brown Bandicoot over the 10-year management period. At the completion of the 10-year management period, the landowner is required to continue to undertake management to maintain the current population, and quality and extent of habitat, for the Southern Brown Bandicoot at the Brucknell offset site. Table 9 below outlines the in perpetuity performance targets for the offset site.

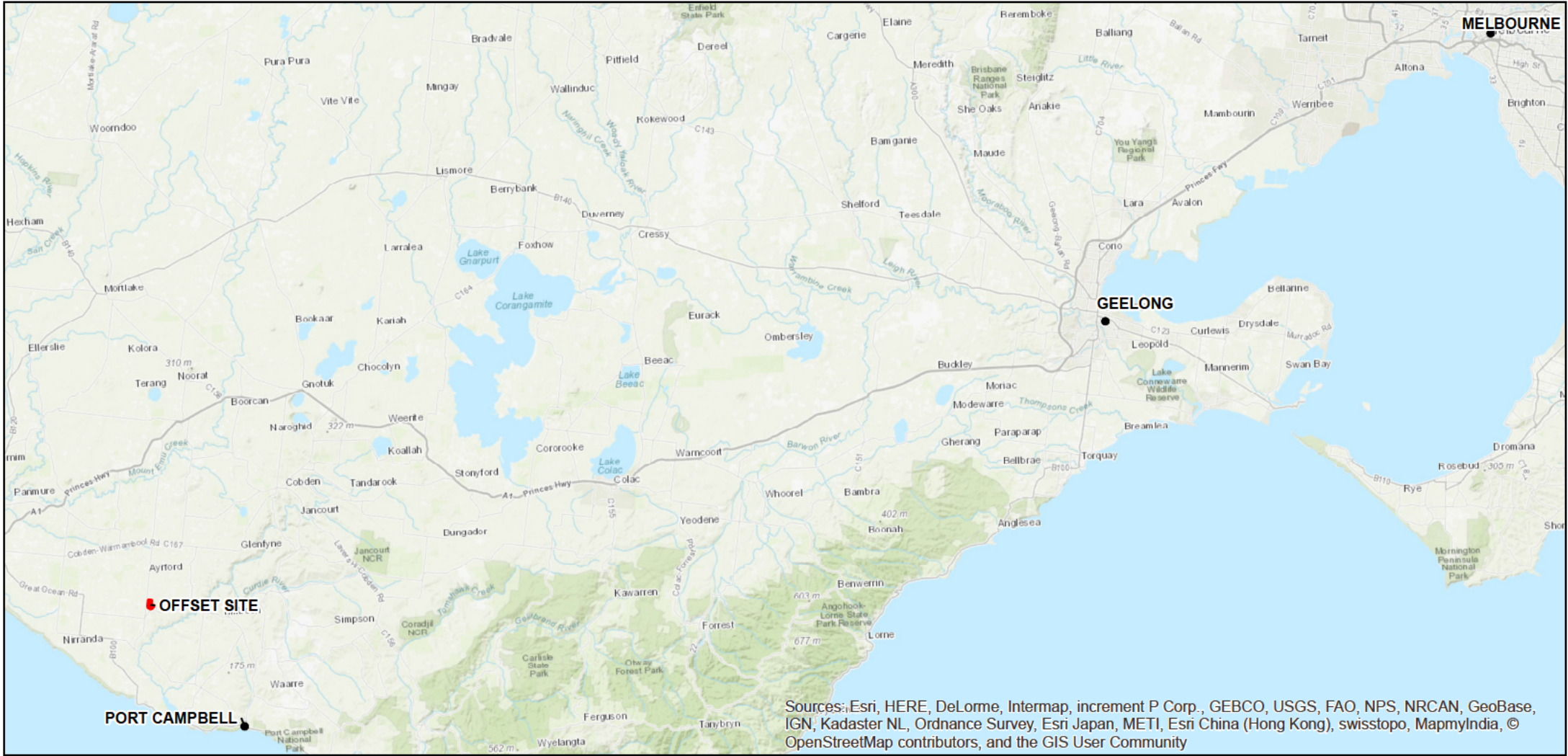
Table 9. Offset site performance targets to be maintained in perpetuity

Management Action	Responsibility	Performance Targets
Security Agreement	Landowner, DELWP	Section 69 (Landowner) Agreement to remain on-title
Habitat Condition	Landowner	Maintain 'optimal' habitat and a minimum of 70% habitat cover for the Southern Brown Bandicoot
Fencing	Landowner	Offset site is stockproof
Access and Signage	Landowner	Vehicle access is restricted and signs erected at access gates and along offset boundary fence
Weed Control	Landowner	Woody weeds eradicated (<1% cover)
		High threat herbaceous weeds <1% cover
		All introduced grasses and herbaceous weeds <5% cover
Pest Control	Landowner	Pest animals monitored and controlled as required
		No active burrows, dens or habours for pest animals
		Pest animal populations and activity will be maintained or reduced
Monitoring	Landowner, DELWP	Site is monitored and managed to maintain in perpetuity performance targets
		Southern Brown Bandicoot habitat extent and quality maintained at a minimum of 6/10
		Southern Brown Bandicoot distribution and population maintained

Figures

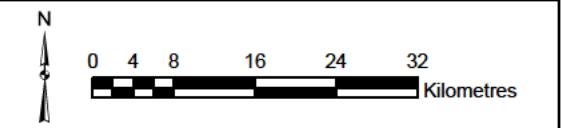
FIGURE 1 - LOCATION OF OFFSET SITE

Timboon-Nullawarre Road, Brucknell



Sources: Esri, HERE, DeLorme, Intermat, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

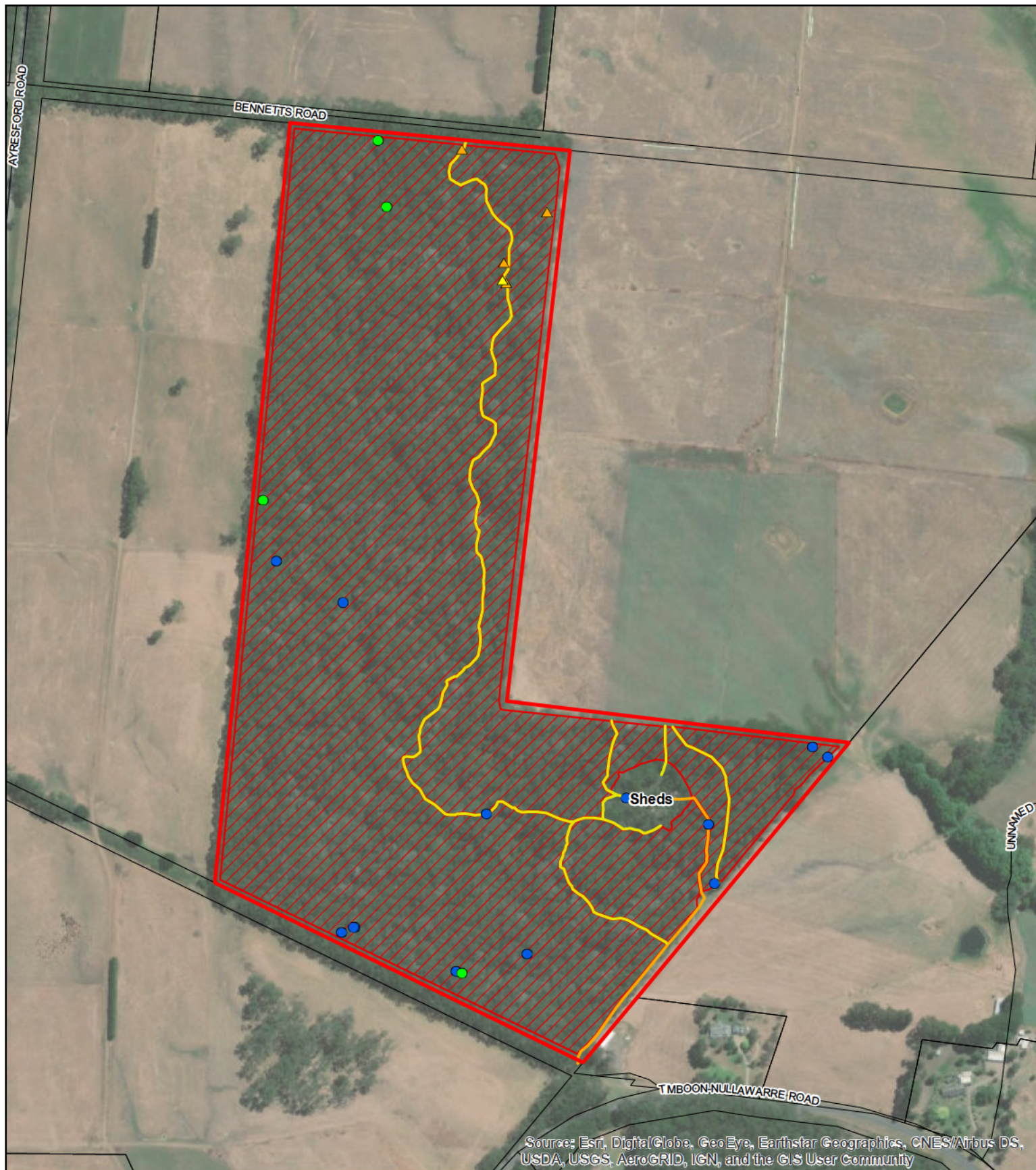
Legend
Offset Site



Prepared by GeoEccentric on behalf of Biodiversity Offsets Victoria 25/08/2020









FIGURE 2 - OFFSET SITE

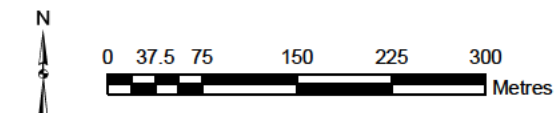
Timboon-Nullawarre Road, Brucknell



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

Legend

- | | |
|--|--|
|  Property Boundary |  Fox Den |
|  Offset Site |  Motocross Mounds |
|  Car Access Track |  Rubbish |
|  Quad Bike Track |  Woody or High Threat Herbaceous Weed |



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Appendices

Appendix 1. Flora Species Recorded

* – Victorian Native Species outside natural range

– Declared Noxious Weed of Victoria

^w – Weed of National Significance

Scientific Name	Common Name
Indigenous Species	
<i>Acacia dealbata</i>	Silver Wattle
<i>Acacia myrtifolia</i>	Myrtle Wattle
<i>Acacia stricta</i>	Hop Wattle
<i>Acacia verticillata</i> subsp. <i>verticillata</i>	Prickly Moses
<i>Acaena novae-zelandiae</i>	Bidgee-widgee
<i>Adiantum aethiopicum</i>	Common Maidenhair
<i>Apium annuum</i>	Annual Celery
<i>Asperula conferta</i>	Common Woodruff
<i>Banksia marginata</i>	Silver Banksia
<i>Burchardia umbellata</i>	Milkmaids
<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Sweet Bursaria
<i>Cassytha pubescens</i> s.s.	Downy Dodder-laurel
<i>Clematis aristata</i>	Mountain Clematis
<i>Coprosma quadrifida</i>	Prickly Currant-bush
<i>Dichondra repens</i>	Kidney-weed
<i>Eucalyptus obliqua</i>	Messmate Stringybark
<i>Eucalyptus ovata</i> subsp. <i>ovata</i>	Swamp Gum
<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum
<i>Gahnia sieberiana</i>	Red-fruit Saw-sedge
<i>Geranium potentilloides</i>	Soft Crane's-bill
<i>Gonocarpus humilis</i>	Shade Raspwort
<i>Gonocarpus tetragynus</i>	Common Raspwort
<i>Goodenia ovata</i>	Hop Goodenia
<i>Hackelia latifolia</i>	Forest Hound's-tongue
<i>Hookerchloa hookeriana</i>	Hooker Fescue
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort
<i>Lepidosperma elatius</i>	Tall Sword-sedge
<i>Lepidosperma laterale</i>	Variable Sword-sedge
<i>Lindsaea linearis</i>	Screw Fern
<i>Leptospermum continentale</i>	Prickly Tea-tree
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush
<i>Mentha laxiflora</i>	Forest Mint
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass

<i>Notelaea ligustrina</i>	Privet Mock-olive
<i>Oxalis exilis</i>	Shade Wood-sorrel
<i>Ozothamnus ferrugineus</i>	Tree Everlasting
<i>Poa labillardierei</i>	Common Tussock-grass
<i>Poa tenera</i>	Slender Tussock-grass
<i>Poranthera microphylla</i> s.l.	Small Poranthera
<i>Pteridium esculentum</i> subsp. <i>esculentum</i>	Austral Bracken
<i>Rubus parvifolius</i>	Small-leaf Bramble
<i>Rytidosperma</i> spp.	Wallaby Grass
<i>Senecio linearifolius</i>	Fireweed Groundsel
<i>Senecio minimus</i>	Shrubby Fireweed
<i>Solanum aviculare</i>	Kangaroo Apple
<i>Spyridium parvifolium</i>	Dusty Miller
<i>Stylidium graminifolium</i> s.l.	Grass Triggerplant
<i>Tetrarrhena distichophylla</i>	Hairy Rice-grass
<i>Tetrarrhena juncea</i>	Forest Wire-grass
<i>Viola hederacea</i>	Ivy-leaf Violet
<i>Wahlenbergia gracilis</i>	Sprawling Bluebell
<i>Xanthorrhoea</i> spp.	Grass-tree
Introduced Species	
<i>Agrostis capillaris</i>	Brown-top bent
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
<i>Centaureum erythraea</i>	Common Centaury
# <i>Cirsium vulgare</i>	Spear Thistle
<i>Cordyline australis</i>	New Zealand Cabbage-tree
<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch
<i>Dactylis glomerata</i>	Cocksfoot
<i>Holcus lanatus</i>	Yorkshire Fog
<i>Lysimachia arvensis</i>	Pimpernel
* <i>Pittosporum undulatum</i>	Sweet Pittosporum
<i>Plantago major</i>	Greater Plantain
# ^w <i>Rubus anglocandicans</i>	Common Blackberry
# <i>Senecio jacobaea</i>	Ragwort
<i>Solanum nigrum</i> s.l.	Black Nightshade
<i>Sonchus oleraceus</i>	Common Sow-thistle