An assessment of the ecological values of Barrm Birrm, Riddells Creek

Prepared for the Macedon Ranges Shire Council

GSW

ECOLOGICAL CONSULTING

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This report and associated field surveys are the work of Geordie Scott-Walker and Karl Just. The project was commissioned by the Macedon Ranges Shire Council and its findings are intended for use by this Council and should not be applied by other parties out of context on sites other than Barrm Birrm.

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Cover image: Barrm Birrm and backdrop of Macedon Ranges, viewed from farmland to the south-east.

Acknowledgements

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Council also acknowledges local Aboriginal and/or Torres Strait Islander residents of Macedon Ranges for their ongoing contribution to the diverse culture of our community.

Agency and individual contributors

The following people made valuable contributions to this project:

- Tanya Loos, Martin Roberts, Krista Patterson-Majoor and Stephanie Grylls (Macedon Shire Council)
- Riddells Creek Landcare

Terminology

Plant names in this report follow the scientific and common names given in the VBA and the taxonomy of VicFlora (RBGBV 2023). The taxonomy and common names for fauna species is sourced from the ALA, which is based on the Australian Faunal Directory (AFD) (DCCEEW 2023), noting that many species of invertebrates do not have a formal common name in the AFD.

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1. Introduction

Barrm Birrm is the 'place of many yam roots' that forms the foothills on the western outskirts of Riddells Creek in the Macedon Ranges of central Victoria[1]. The site is 119.5 hectares of privately owned land that includes 140 properties. Macedon Ranges Shire Council commissioned the preparation of this assessment to identify the current ecological values and threats at Barrm Birrm.

In the 1970s, owners of 120 hectares ('Shone and Sholtz') used a subdivision plan from the 1890s to sell 162 lots of land at Barrm Birrm. Council at that time (Romsey Council) informed owners they would be unable to develop the land due to highly erodible soils. This policy remains in order today and explains the lack of development.

In accordance with the Macedon Ranges Biodiversity Strategy, Council is taking steps to ensure that Barrm Birrm is given appropriate long-term land protection. This report provides a rationale for protection of the land and recommends land management actions that will help to maintain and enhance biodiversity, control threats and reduce the current level of human disturbances.

Land management objectives

- Protect and enhance the ecological values and biodiversity of Barrm Birrm.
- Manage threatening processes and reduce inappropriate human disturbances; and
- Maintain the viability of indigenous plant and animal populations as well as the health and condition of native vegetation and ecological communities.

[1] The name Barrm Birrm was coined in 2005 by Riddells Creek Landcare in consultation with the Victorian Aboriginal Corporation for Languages (Riddells Creek Landcare 2022).

2. Study site

The study area includes all parts of Barrm Birrm as shown on figures 1 and 2. This includes all land east of Gap Road from the Riddells Creek Cemetery north to 359 Gap Road. The northern and western site perimeter follows the southern boundary of 359 Gap Road to the intersection with public land at Conglomerate Gully Flora Reserve (FR). The southern boundary aligns and links from the flora reserve to the Cemetery. Council-owned land is shown in Figure 2, to which the environmental works plan applies (section 7).

Prince of Wales Terrace, Prince Alfred Street and Princess Street are three public road easements running through Barrm Birrm from north to south, which are not maintained for vehicle use. Numerous informal trails, several old 4WD tracks and unpermitted motorbike trails criss-cross the site, forming a network of walking tracks (visible on Open Street Map).

Council currently owns 47 parcels that equate to 25.55 ha of land (approximately 21% of the site). Properties at Barrm Birrm are subject to the following zones and overlays under the Macedon Ranges Planning Scheme:

- Schedule 1 to Clause 35.06 Rural Conservation Zone (RCZ1)
- Schedule 1 to the Significant Landscape Overlay (SLO1)
- Schedule 7 to the Restructure Overlay (RO7) – the "Shone/Shultz" Restructure Plan
- Schedule 9 to the Vegetation Protection Overlay (VPO9)
- Bushfire Management Overlay (BMO)

2.1. Catchment and landform

Located within the Port Phillip and Westernport Regional Catchment Management Area and the custodial lands of the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation, Barrm Birrm forms the southern-most hill of the Robertson and Macedon ranges. The landscape comprises low, rolling hills of Palaeozoic geology that rise from east to west, ascending to the north-south ridge known locally as Lightwood Hill (620 m elevation). The slopes bounding Lightwood Hill form a series of gentle crests abridged by natural drainage lines. The site elevation drops to around 450 m along parts of the eastern boundary with Gap Road/Royal Parade.

Figure 2 illustrates how most of the small allotments at Barrm Birrm (c. 0.4 ha) occupy the lower and middle slopes of the eastern fall, while the upper slopes and western fall are defined by larger parcels of land (>8 ha) (Figure 2).

Local water catchments

Due to the size, landscape position and topography at Barrm Birrm the forested slopes function as headwaters to four sub-catchments to Riddells Creek (DELWP 2018a). Drainage lines on the western fall join an unnamed waterway that flows south through Conglomerate Gully Flora Reserve prior to the confluence with Riddells Creek, while the eastern slopes drain into Sandy Creek, Murnong Creek and several other sub-catchments. These waterways all converge with Riddells Creek, which flows into Jacksons Creek (Hume City Council) followed by Maribyrnong River, at Sydenham Park (Brimbank City Council) in Keilor North. The catchment terminates with flows entering Port Phillip Bay approximately 50 km to the south, with the watercourse meandering through Macedon Ranges, Hume, Brimbank, Moonee Valley, Maribyrnong and Melbourne local government areas (LGA).

Surface geology, soils, and climate

Government surface geology mapping held by DELWP (2023a) suggests Barrm Birrm comprises fluvial conglomerates and metamorphosed sediments (hornfels rock) derived from three types of underlying parent materials (see also VandenBerg 2005 and Thomas 1932). Goat Rocks conglomerate (Silurian to Devonian) is concentrated on the western fall and ridge (Lightwood Hill) and is synonymous with areas described by Baxter et al. (1994) as 'Kerrie Conglomerate' (Photo 1). Riddell Sandstone (Middle Ordovician) is recorded from upper and middle slopes of the eastern fall and Riddell Sandstone (Upper Ordovician) on the lower slopes and southern parts of Barrm Birrm's eastern fall. Goat Rocks conglomerate is a naturally restricted geological feature found on the eastern end of the Macedon Range, most recently described by VandenBerg (2009) as massive pebble to boulder conglomerate with a closed framework of sandstone, quartzite, chert and gritstone clasts derived from Ordovician rocks with minor vein quartz.

Photo 1. Conglomerate rock outcrop on the upper slopes of Barrm Birrm.

Soil types broadly comprise well-drained stony, shallow earths (DELWP 2023) but are likely to have high spatial variability and could include a range of types with seasonal waterlogging likely to predominate in some areas. The soils range from shallow, uniform profiles to texture contrast (duplex) soils with brown, red, yellow or grey horizons, often with a sandy loam or clay loam topsoil and clay subsoil (Baxter et al. 1994). Colluvial deposits of sand, silt and gravel are mapped from northern and eastern low slopes the drain into Sandy Creek (DELWP 2023a) and these are likely to be fertile with high moisture retention compared to shallow, rocky soils on exposed areas of Barrm Birrm's upper slopes. Soil types and topography are strong determinants of Barrm Birrm's plant communities.

The region has a cool climate with a mean maximum temperature of 9.2°C in July at the Kilmore Gap weather station (BOM 2023a). The historical rainfall in this area is c. >700 mm per annum, where precipitation is lower than potential evaporation from November to March (Jeffery 1981).

Aspects of the land capability and terrain of Barrm Birrm are described by Jeffrey (1981) and the site is broadly referrable to the Mt. Charlie Land System.

2.2. Historical land disturbance

Detailed information on the land use history of Barrm Birrm is difficult to access and may be poorly documented. Milne & Best (2005) suggest that most of the land was used for timber harvesting for firewood and charcoal, similar with other parts of the Macedon Ranges, but with little soil disturbance resulting from gentle silvicultural practices. The lack of old trees is evidence of the history of timber extraction from the site. Milne & Best (2005) also suggest that little or no stock grazing has occurred, and that this land use history explains the current high quality of understorey vegetation as well as the lack of hollows in forest that is estimated to be regrowth of fifty years age or more.

The spatial footprint of government fire history data held by DELWP (2022a) suggests that bushfires and prescribed burns have not happened at Barrm Birrm in the last fifty years. The footprint of the major Macedon Range bushfires of 1939, 1965 and 1983 are all within the vicinity of Barrm Birrm and it is possible that the mapped boundaries of these bushfires could be inaccurate. Residues of charcoal are present on trees at the site, demonstrating that fire events have occurred at some time in preceding decades, however the site is clearly long unburnt with a gradual accumulation of coarse woody debris evident on the forest floor in some parts of the site. It is not known what gold mining or fossicking history may have occurred at Barrm Birrm.

2.3. Community interest

Riddells Creek Landcare was formed in 2005 with the specific aim to protect Barrm Birrm. The Landcare group has put significant effort into raising local community awareness of the environmental values of the site. This was achieved initially through the production of the report *A Statement of Significance for the Riddell Ranges Estate* (Milne & Best 2005). Detailed study to identify and document the flora of Barrm Birrm led to the production of the field guide *Macedon Ranges Flora: 1. A photographic guide to the flora of Barrm Birrm, Riddells Creek* (Best and Francis 2008), and to records of flora being stored at NatureShare, an open access flora and fauna database created by Riddells Creek Landcare. The research led to the discovery and formal description of a new plant sub-species not previously known to science, the Hairy-leaf Triggerplant *Stylidium armeria* subsp. *pilosifolium* (Best et al. 2009). Hairy-leaf Triggerplant is a narrow-range endemic to the Macedon Ranges LGA that is also a threatened taxon currently listed as Critically Endangered under the Victorian *Flora and Fauna Guarantee Act 1988* (DELWP 2022b).

Riddells Creek Landcare encourage the local community to explore and enjoy Barrm Birrm and to participate in community-led field activities to learn about the site's biodiversity values and address land management issues. These activities include regular weeding working bees, rubbish removal and citizen science events.

2.1. Areas of Aboriginal Cultural Heritage Sensitivity

Parts of Barrm Birrm are a recognised area of Aboriginal Heritage Sensitivity, including the lower eastern slopes near Sandy Creek and an envelope of land buffering a waterway outside the site (Murnong Creek).

'Areas of cultural heritage sensitivity' are defined in the *Aboriginal Heritage Regulations 2018* and relate to landforms and soil types where Aboriginal places are more likely to be found. This includes land within 200 metres of named waterways. This means a cultural heritage management plan may be required before any high impact activities are undertaken, particularly close to waterways but possibly in other areas too.

The cultural significance of Barrm Birrm to Traditional Owner groups is currently not well known. However, an investigation into these values is being carried out concurrently with this ecological assessment by the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation.

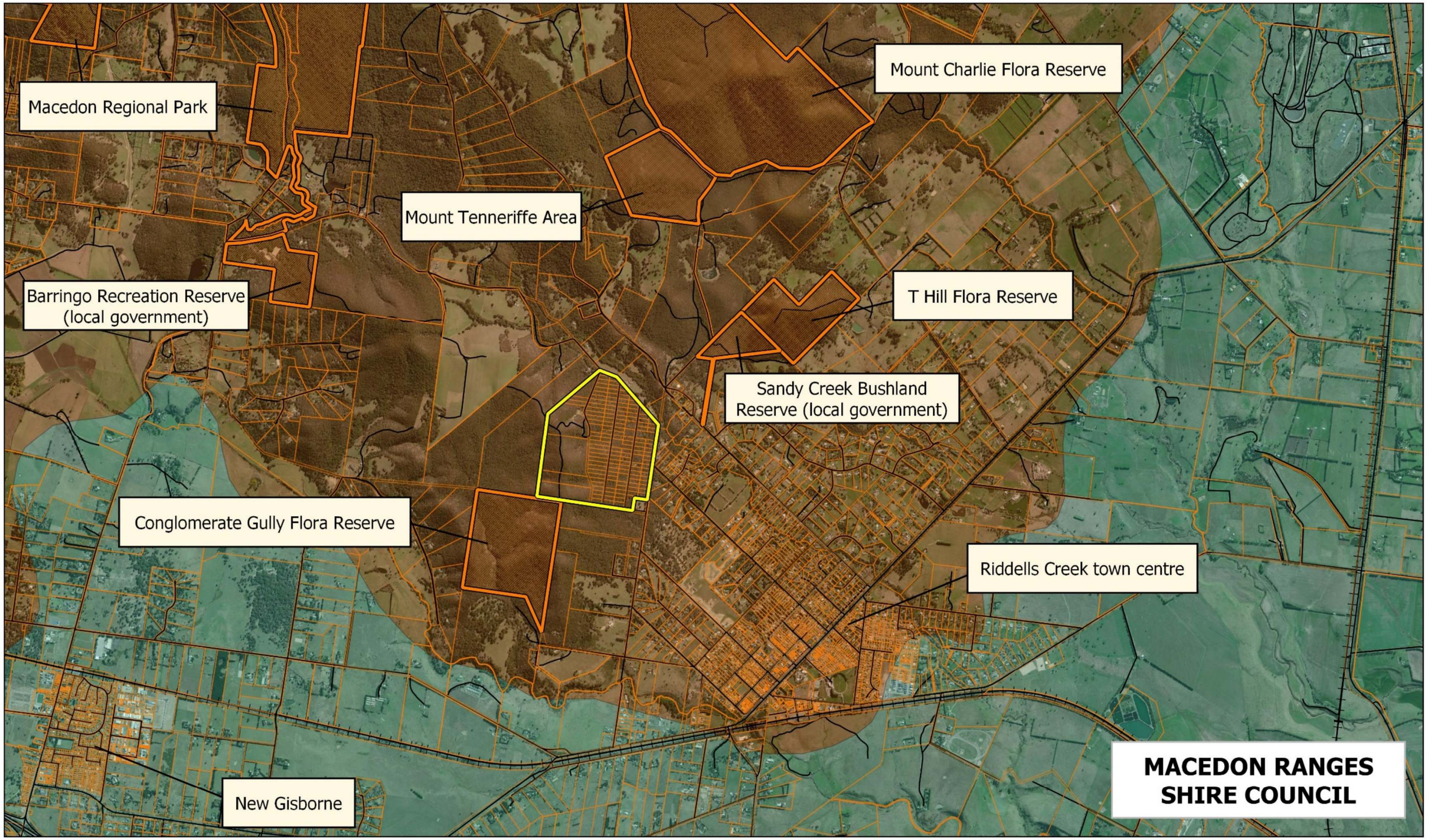


Figure 1. Landscape features surrounding Barrm Birrm.

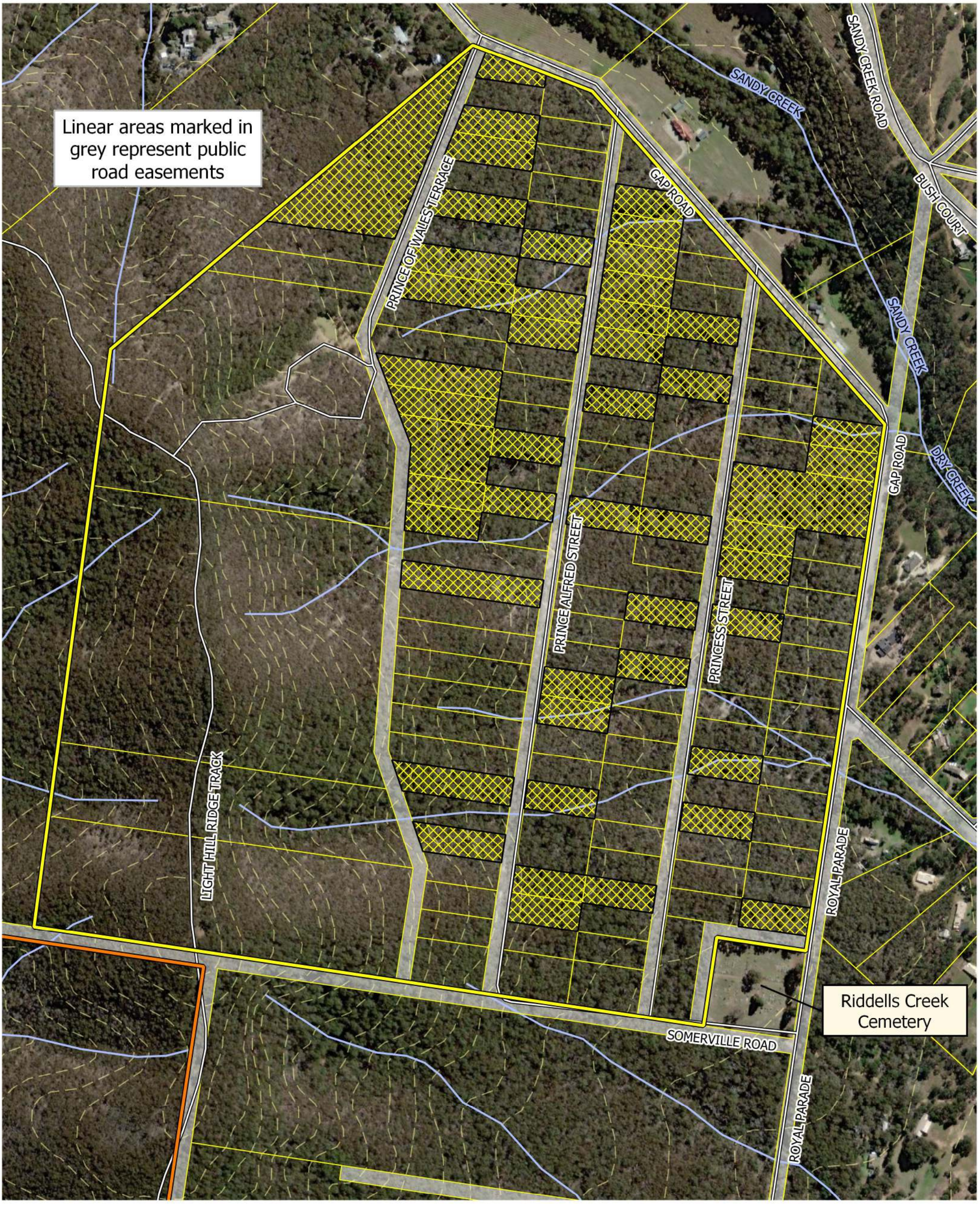


Figure 2. Land form and land ownership at Barrm Birrm, Riddells Creek.

3. Assessment methods

This ecological assessment was completed over spring-summer 2022-2023. A combination of desktop assessment and field surveys were completed. Desktop analysis included research into past assessments of the land such as flora and fauna surveys. Data held in the Victorian Biodiversity Atlas (VBA), Atlas of Living Australia (ALA) and iNaturalist was reviewed. The Victorian Government's publicly available spatial data was used to identify modelled Ecological Vegetation Classes (EVCs), fire history, terrain and surface geology.

Field surveys provide an up-to-date assessment of the current ecological attributes of the site that includes samples of the flora, large trees, vegetation, and biodiversity threats. Field assessments were completed over 7 visits between August 2022 and February 2023 intended to document as much of the seasonally variable flora as possible.

Maps in this report are based on georeferenced spatial data collected in the field using a GPS accurate to ±5 m in average conditions. The preparation of vegetation (EVC) maps also involved Aerial Photography Interpretation using a Geographical Information System.

Survey limitations

The survey was completed in spring-summer during the final of three relatively wet years under La Niña climatic conditions, which brought above-average rainfall to the south east of Australia (BOM 2023b). Conditions were satisfactory for the purpose of identifying and documenting many plant species, however additional surveys conducted over multiple seasons would discover more species, which may include rare or threatened species, particularly orchids. It is noted that fauna, fungi, invertebrates, non-vascular plants and some vascular plants such as orchids are more cryptic than most of the flora and have not been subject to detailed surveys, so the overall diversity of the site is currently undocumented.

4. Biodiversity values

4.1. Flora

The Atlas of Living Australia has 1434 plant records from Barrm Birrm (ALA 2023a). This collection, after being vetted to bring older plant names into alignment with the taxonomy used by the VBA and VicFlora includes a total of 226 taxa of vascular plant taxa (Appendix 1).

During the field survey a total of 247 vascular plant taxa were recorded (Appendix 2). Species include 188 native taxa (indigenous to the study area), 50 exotics, 7 Victorian native species that are non-indigenous to the study area, and two species of uncertain origin, *Cassinia sifton* (Drooping Cassinia) and *Juncus bufonius* (Toad Rush) (VicFlora 2023). At least seven weed species listed under the *Catchment and Land Protection Act 1996* are currently present at Barrm Birrm (Table 1) (Agriculture Victoria 2023).

Threatened species

Four species recorded from the field survey are threatened species listed on the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) (Table 2). Two other species, *Eucalyptus cephalocarpa* (Mealy Stringybark) and *E. aromaphloia* (Scentbark), are listed on the IUCN Red List of Endangered Plants (Fensham *et al*. 2019ab, 2020) (Table 2). Listings under the IUCN Red List of Endangered Plants have no statutory basis in Australia and are included here for information purposes.

Two other threatened species, the closely related *Pterostylis clivosa* (Mountain Midget Greenhood) and *P. rubescens* (Mountain Red-tip Greenhood) were not recorded during the field survey but have been documented in past surveys (ALA 2023a). These species are cryptic ground orchids that may necessitate a targeted autumn survey to confirm their presence at Barrm Birrm.

Regionally significant flora

The following taxa are considered to have regionally significant populations at Barrm Birrm: *Brachyscome diversifolia* (Tall Daisy), *Calochilus herbaceus* (Leafless Beard-orchid), *Chrysocephalum apiculatum* ssp. *congestum* (Plains Everlasting), *Chrysocephalum baxteri* (White Everlasting), *Chrysocephalum semipapposum* ssp. *lineare* (Clustered Everlasting), *Cryptandra amara* s.s. (Bitter Cryptandra), *Drosera macrantha* ssp. *macrantha* (Climbing Sundew), *Hypoxis hygrometrica* var. *villosisepala* (Golden Weather-glass), *Lepidosperma curtisiae* (Little Sword-sedge), *Leptoceras menziesii* (Hare Orchid), *Persoonia chmaepeuce* (Dwarf Geebung), *Sebaea ovata* (Yellow Sebaea), *Senecio odoratus* (Scented Groundsel) and *Viola cleistogamoides* (Hidden Violet).

Regionally significant species include those considered to be naturally rare or that are known or suspected to have a significantly depleted or threatened local population. The determination is made at the scale of the Macedon Ranges LGA or the broader Central Victorian Uplands bioregion and is based on an assessment of the reporting frequency of each taxon in the VBA vetted against the field survey experience of the authors.

Table 1. Declared noxious weeds recorded from Barrm Birrm.

Listing status according to the Port Phillip and Westernport Region under the *Catchment and Land Protection Act 1996*.

Species	Occurrence notes
Regionally controlled	
Genista linifolia Flax-leaf Broom	A small infestation is present at two locations along the edge of Gap Road ().
Nassella trichotoma Serrated Tussock	A small infestation occurs on a disused road easement along the north-western site boundary about 200 m south-west of Gap Road.
Rubus anglocandicans Common Blackberry	Scattered widely throughout Barrm Birrm but usually recorded from damp areas on or near drainage lines. Locally common outside of Barrm Birrm.
Ulex europaeus Gorse	Scattered throughout the site in small patches near watercourses and damp sites, usually close to Gap Road.
Watsonia meriana var. *bulbillifera* Bulbil Watsonia	Restricted to disturbed areas and damp depressions on lower slopes near to Gap Road.
Regionally restricted	
Allium triquetrum Angled Onion	Occurs on disturbed areas near the southern boundary next to the Cemetery, near Gap Road.
Cirsium vulgare Spear Thistle	Occasional in damp or disturbed areas (e.g., along Gap Road).

4.2. Plant communities

The description of vegetation types in this report is based on the Victorian Ecological Vegetation Class (EVC) topology (DELWP 2023b) which classifies native vegetation using a range of attributes such as topography, soil, climate and geomorphology.

Victorian Government EVC modelling at the 1:25,000 scale suggests that Barrm Birrm is characterised by two EVCs, Heathy Dry Forest and Grassy Dry Forest, with a minor extent of Riparian Woodland present along the far eastern boundary (DELWP 2018b). The modelling also suggests that four other EVC's are likely to be found within a kilometre, being Grassy Forest, Herb-rich Foothill Forest, Lowland Forest and Valley Grassy Forest.

The field survey identified and mapped the extent of four EVCs present at Barrm Birrm (Table 3, Figure 3, Photographs 1–4). A small dam is also present in the northern part of Barrm Birrm that is not referrable an EVC, comprising an open body of water fringed by *Leptospermum continentale* (Prickly Tea-tree) and semi-aquatic grasses and herbs.

Table 2. Threatened flora species recorded at Barrm Birrm in spring-summer 2022-23.

Species	Lifeform	Listed status[1]	Distribution, abundance, and taxonomic notes
Acacia leprosa var. *uninervia* Large-leaf Cinnamon Wattle	Upright shrub to 5 m tall	FFG: Endangered	Scattered across lower slopes on the eastern side of Lightwood Hill. The Barrm Birrm population comprises an estimated c. 50–250 mature individuals. *Acacia leprosa* var. *uninervia* is locally common in forests north-east of Melbourne and has also been recorded from north-east Victoria at Mount Buffalo and in NSW. The hills around Riddells Creek are part of the western range limit of this variant.
Acacia nanodealbata Dwarf Silver Wattle	Upright shrub to 6 m tall	FFG: Vulnerable	Scattered throughout dry to damp forests of mid- to upper east-facing slopes. The Barrm Birrm population includes an estimated c. 50–250 mature individuals. *Acacia nanodealbata* has a disjunct distribution in forests of the Otway Range, Creswick, Glenlyon, Macedon Ranges and Healesville-Warburton. Voucher records suggest it also occurs in the ACT. The population at Barrm Birrm is notable for its atypical occurrence on relatively dry, skeletal soils.
Eucalyptus aromaphloia Scentbark	Tree to 18 m tall	IUCN: Vulnerable	Common and widespread, but most abundant in dry to damp forests of lower and middle east-facing slopes. The Barrm Birrm population includes as estimated c. 250–1000 mature individuals. *Eucalyptus aromaphloia* is endemic to Victoria, recorded from a broad distributional belt through central Victoria from Gariwerd (Grampians NP), south-west to the Macedon Range with a coastal outlier in the Otway Range (e.g., at Anglesea). The hills around Riddells Creek form the eastern range limit for the species.
Eucalyptus cephalocarpa Mealy Stringybark	Tree to 20 m tall	IUCN: Vulnerable	Widespread; most abundant on infertile, rocky soils but much less abundant than other canopy species and sparse or absent from areas of Herb-rich Foothill Forest (EVC 23). The Barrm Birrm population includes an estimated c. 100–500 mature individuals. *Eucalyptus cephalocarpa* is a predominantly southern Victorian species (Mornington Peninsula east to Mallacoota, also found in far southeast NSW) but inland populations have been recorded as far north as Castlemaine (central Victoria) and Kinglake (Central Highlands). The hills around Riddells Creek are part of the north-western range limit of the species.
Senecio microbasis Slender Fireweed	Erect herb to 0.6 m tall	FFG: Vulnerable	Sparsely recorded from dry forests on shallow, rocky soils on east-facing slopes and near rock outcrops on or near Lightwood Ridge and the western slopes. This species is can easily be mistaken with the more common and widespread *Senecio phelleus* (Stony Fireweed) and its distribution at Barrm Birrm is currently poorly documented, the population size estimated at c. 50–250 mature individuals. In Victoria *Senecio microbasis* is known from dry woodlands and forests of rocky sites concentrated around parts of north-east Victoria, the Victorian Alps and East Gippsland. Records from central Victoria are disjunct and include vouchered specimens from Barrm Birrm, Mount Buangor State Park and Warrandyte State Park.
Stylidium armeria subsp. *pilosifolium* Hairy-leaf Triggerplant	Low herb with an erect flowering stem to 0.2 m tall	FFG: Critically Endangered	Recorded from drier forests where it occupies areas of shallow, rocky soils of Grassy Dry Forest and Heathy Dry Forest. At Barrm Birrm this taxon may be sympatric with the common and widespread *S. armeria* subsp. *armeria,* which typically occupies more fertile sites. Within areas of suitable habitat, the subspecies is locally abundant and the Barrm Birrm population is likely to exceed 1000 mature individuals. *Stylidium armeria* subsp. *pilosifolium* was described by Best et al. in 2009 based on a type specimen collected from Barrm Birrm. The subspecies is endemic to the Macedon Ranges LGA where it has only been vouchered from Barrm Birrm, however VBA records suggest additional populations occur on public land at Lerderderg State Park, Mount Charlie Flora Reserve, Mount Tennerrife and Conglomerate Gully Flora Reserve.

1 FFG – *Flora and Fauna Guarantee Act 1988;* **IUCN –** International Union for Conservation of Nature Red List of threatened species (note this is a non-statutory advisory list included for information purposes only).

Photo 2. Heathy Dry Forest characterised by low Eucalypt canopy with abundant grass-trees and a sparse, grassy ground layer.

Photo 3. Grassy Dry Forest characterised by a Eucalypt canopy, scattered understorey shrubs and a dense ground layer of *Rytidosperma pallidum*.

Photo 4. Herb-rich Foothill Forest characterised by relatively tall Messmate Stringybark canopy with herb-rich ground layer with abundant Bracken.

Photo 5. Grassy Forest characterised by Eucalypt canopy with scattered shrubs and herb-rich grassy ground layer.

Table 3. The distribution and characteristics of Ecological Vegetation Classes at Barrm Birrm.

BCS – Bioregional Conservation Significance in the Central Victorian Uplands bioregion (DSE 2013). LC – Least Concern, D – Depleted, VU – Vulnerable.
† – Percentage extent is calculated using the full area of Barrm Birrm (119.52 ha) noting the areas of each EVC include road easements, tracks and trails that are commonly unvegetated.

EVC	BCS	Extent †		Distribution and habitat	General description and ecological features	Canopy dominants and characteristic flora	Qualitative condition and management issues
		ha	%				
Heathy Dry Forest (EVC 20)	LC	13	11	Occupies shallow, stony earths on nutrient poor substates of middle to upper slopes, becoming prominent on steep upper slopes and more widespread on topographically exposed aspects.	A low, open eucalypt forest sometimes stunted to 5 m tall with a sparsely vegetated understorey often characterised by narrow-leaved, prickly shrubs, and tussock grasses with a low cover of herbs compared to other local EVCs. Austral Grass-tree (*Xanthorrhoea australis*) and low shrubs are distinctive features.	*Eucalyptus dives, E. cephalocarpa, E. aromaphloia Acacia gunnii, Cryptandra amara, Gompholobium huegelii, Monotoca scoparia, Podolobium procumbens, Rytidosperma pallidum, Xanthorrhoea australis.*	**Excellent condition.** Intact canopy and understory with exceptionally low weed cover. Low to moderate abundance of coarse woody debris and few large logs are present. Limited tree hollows are likely to be present, although any small hollows that are present have significant habitat value. Old cross-terrain vehicle tracks readily erode after heavy rain events, and this causes downslope vegetation disturbance.
Grassy Dry Forest (EVC 22)	D	62	52	Common and widespread across the eastern slopes including moderate to steep slopes as well as drier parts of the lower slopes where it intergrades with Grassy Forest across gently undulating terrain.	Eucalypt forest up to c. 20 m tall with an open understorey of occasional shrubs and a dense ground layer dominated by drought-tolerant grasses and herbs. The EVC is naturally species-rich and can have large populations of orchids. Several plant species are restricted to areas in or near damp gullies within this EVC, including *Allocasuarina littoralis, Brachyscome diversifolia, Chrysocephalum apiculatum, Craspedia variabilis, Grevillea alpina, Tetratheca ciliata* and *Persoonia chamaepeuce*.	*Eucalyptus obliqua, E. aromaphloia, Acrotriche serrulata, Comesperma volubile, Coronidium scorpioides, Daviesia leptophylla, Dillwynia cinerascens, Grevillea alpina, Hovea heterophylla, Leptorhynchos tenuifolius, Lomandra filiformis subsp. filiformis, Microseris walteri, Opercularia varia, Ozothamnus obcordatus, Pimelea linifolia, Rhytidosporum procumbens. Rytidosperma pallidum, Stylidium armeria* subsp. *pilosum, Senecio phelleus.*	**Excellent condition.** Intact canopy and high-quality understorey with low herbaceous weed cover. Shrub and climber weeds are sparsely scattered throughout the EVC, the most significant weed threats posed by garden plants dispersed by wildlife, including non-indigenous native shrubs. The quantity of coarse woody debris is low overall, although parts of this EVC have a high concentration of logs and debris that provide high habitat value. Limited tree hollows are likely to be present. Old cross-terrain vehicle tracks readily erode after heavy rain events, and this causes downslope vegetation disturbance. Trails and gullies on the middle to lower slopes show active gully erosion (and may also experience tunnel erosion, which is not as easy to detect).

EVC	BCS	Extent †		Distribution and habitat	General description and ecological features	Canopy dominants and characteristic flora	Qualitative condition and management issues
		ha	%				
Herb-rich Foothill Forest (EVC 23)	D	17	14	Occurs on middle to upper slopes on the eastern side of Lightwood Ridge where restricted to sheltered, relatively fertile well-drained soils on south-facing aspects and along the upper reaches of local watercourses. HRFF also envelopes part of Lightwood Ridge along a minor saddle and both upper and lower slopes on the western face.	Mature eucalypt canopy to c. 25 m tall with a small tree/large shrub layer and high cover and diversity of herbaceous ground flora including grasses, herbs and ground orchids. This EVC supports the tallest trees at Barrm Birrm owing to the sheltered landscape position.	*Eucalyptus obliqua, Acaena novae-zelandiae, Arthropodium milleflorum, Asperula scoparia, Cassinia aculeata, Chiloglottis valida, Dianella revoluta, Dichondra repens, Geranium* sp. 2, *Hydrocotyle laxiflora, Lagenophora sublyrata, Lomandra longifolia* subsp. *exilis, Olearia lirata, Poa labillardierei, Pteridium esculentum, Senecio odoratus, Senecio prenanthoides, Stellaria pungens, Veronica calycina*.	**Exceptionally good condition.** Intact canopy and understorey with a low to moderate cover of herbaceous weeds (notably *Anthoxanthum odoratum*). Coarse woody debris is well developed in many areas (associated with recent storm damage to canopy trees). Motorbike trails have caused disturbance and gully vehicle/track crossings have resulted in vegetation disturbance and affected local hydrology. Localised canopy dieback to eucalypts close to waterway crossings is inferred as a local hydrological impact.
Grassy Forest (EVC 128)	VU	28	23	Occupies the low slopes along Gap Road at around 440–470 m elevation on relatively deep, fertile colluvial soils. This EVC also continues shortly upslope from the core patches as a narrow band along drainage lines (abridged by undulating, drier slopes characterised by GDF).	Forest up to c. 20 m tall with diverse canopy species composition, and a species-rich herbaceous understorey characterised by lilies, grasses and a diversity of broadleaf herbs. Drainage lines have a high cover of understorey shrubs and some locally restricted species (e.g., *Gahnia radula)*.	*Eucalyptus obliqua, E. radiata subsp. radiata, E. aromaphloia, Acacia mearnsii, Austrostipa pubinodis, Billardiera mutabilis, Brunonia australis, Bursaria spinosa, Exocarpos cupressiformis, Gahnia radula, Microlaena stipoides, Stylidium armeria* subsp. *armeria, Thysanotus tuberosus, Wurmbea dioica*.	**Excellent condition.** A species-rich, high-quality example of Grassy Forest with a young canopy of mixed eucalypts. Ground-layer diversity is remarkably high with abundant herbaceous species. Coarse woody debris is low. Localised eucalypt dieback has allowed understorey shrubs and small trees to become abundant, including *Cassinia longifolia,* the semi-parasitic *Exocarpos cupressiformis,* and near damp sites by *Acacia mearnsii*.

4.3. Fauna

The Atlas of Living Australia has 293 fauna records from Barrm Birrm (ALA 2023b). This collection, after being vetted to bring taxon names into alignment with the current taxonomy used by the VBA, includes a total of 94 species including two amphibians, 32 birds, 51 invertebrates, 7 mammals, 1 mollusc and 1 reptile (Appendix 3). In addition, Council recorded thirty-nine bird species on 23 September 2022 (lodged in Birdata).

Historic and recent observations indicate that Barrm Birrm supports habitat for many species of iconic Australian fauna. Examples of such species include Australian Magpie (*Gymnorhina tibicen*), Eastern Banjo Frog (*Limnodynastes dumerilii*), Eastern Grey Kangaroo (*Macropus giganteus*), Koala (*Phascolarctos cinereus*), Kookaburra (*Dacelo novaeguineae*), Red Wattlebird (*Anthochaera carunculata*), Short-beaked Echidna (*Tachyglossus aculeatus*), Southern Blue-tongue (*Tiliqua nigrolutea*), Krefft's Glider (*Petaurus notatus*), Sulphur-crested Cockatoo (*Cacatua galerita*), Swamp Wallaby (*Wallabia bicolor*) and Wedge-tailed Eagle (*Aquila audax*) (ALA 2023b).

Threatened species that are known or likely to occur at Barrm Birrm are listed in Table 4. Further to this list, the Brown-headed Honeyeater (*Melithreptus brevirostris*) was recorded on site in the September assessment, which is a component species of the FFG Act-listed *Victorian temperate-woodland bird community*, noting that dry forests are excluded from the definition of the threatened community (SAC 2000).

Table 4. Threatened fauna species with potential to occur at Barrm Birrm.

Species	Listed status	Occupancy notes
Callocephalon fimbriatum Gang-gang Cockatoo	EPBC: Vulnerable	Recorded foraging in eucalypt canopy at Barrm Birrm on 23 September 2022 (observations lodged with Birdata). See text below for more detail on this taxon.
Ninox strenua Powerful Owl	FFG: Vulnerable	Historically recorded on site in the ALA. Known from forested sites throughout the Macedon Range. Powerful owl are likely to hunt suitable prey at Barrm Birrm and may roost in tall trees in sheltered sites but requires hollows for nesting.
Phascogale tapoatafa Brush-tailed Phascogale	FFG: Vulnerable	Wide-ranging species known from dry forests and woodlands throughout central Victoria. Requires large patches of forest to sustain viable populations.
Pseudophryne bibronii Bibron's Toadlet/Brown Toadlet	FFG: Endangered	Known from a wide range of habitats including dry forests, where individuals occupy damp sites under leaf litter and logs.

Gang-gang Cockatoo (Callocephalon fimbriatum)

Recently listed as Endangered on the Commonwealth *Environmental Protection and Biodiversity Act 1999* (EPBC Act) in March 2022, the Gang-gang Cockatoo is endemic to south-east Australia. The species' range includes parts of New South Wales and Australian Capital Territory (ACT), Victoria and South Australia and is the faunal emblem of the ACT (DAWE 2022a). Gang-gang Cockatoos are best adapted to cool climates where they occupy temperate eucalypt forests and woodlands and are most common at higher elevations and more southern latitudes. These cockatoos predominantly feed in eucalypt canopies, often in groups of up to 25 individuals, and form monogamous breeding pairs that prefer old growth forests and woodlands for nesting, loafing and roosting.

The Conservation Advice for Gang-gang Cockatoo identifies a range of habitats and associated features that represent habitat critical to the survival of Gang-gang Cockatoos (DAWE 2022a). Critical habitat includes all foraging habitat during the breeding and non-breeding season, which includes the open forests of Barrm Birrm where winter canopy foraging is now known to occur. Stands of suitable hollow-bearing trees with known or potential Gang-gang Cockatoo hollow chambers (20 cm in floor diameter, 50.5 cm deep and around 7.5 m above the ground) (Davey & Mulvaney 2020, Davey *et al.* 2021) are also part of this definition, including stands that are likely to become hollow-bearing in future years if they are within or adjacent to known breeding areas (DAWE 2022a).

Further assessment is required to ascertain the quality of potential Gang-gang Cockatoo breeding habitat at Barrm Birrm.

4.4. Habitat and landscape values

Barrm Birrm is part of an extensive, contiguous and relatively intact forested landscape that spans the foothills and more elevated slopes of the Macedon Range and provides a regional link between habitats of the plains to upland areas of the Macedon and Lerderderg ranges. Key public land reserves in this matrix include Conglomerate Gully FR, Mount Charlie FR, T Hill FR and Mount Teneriffe, which are linked to the Macedon Regional Park and Lerderderg State Park via forested areas of private land.

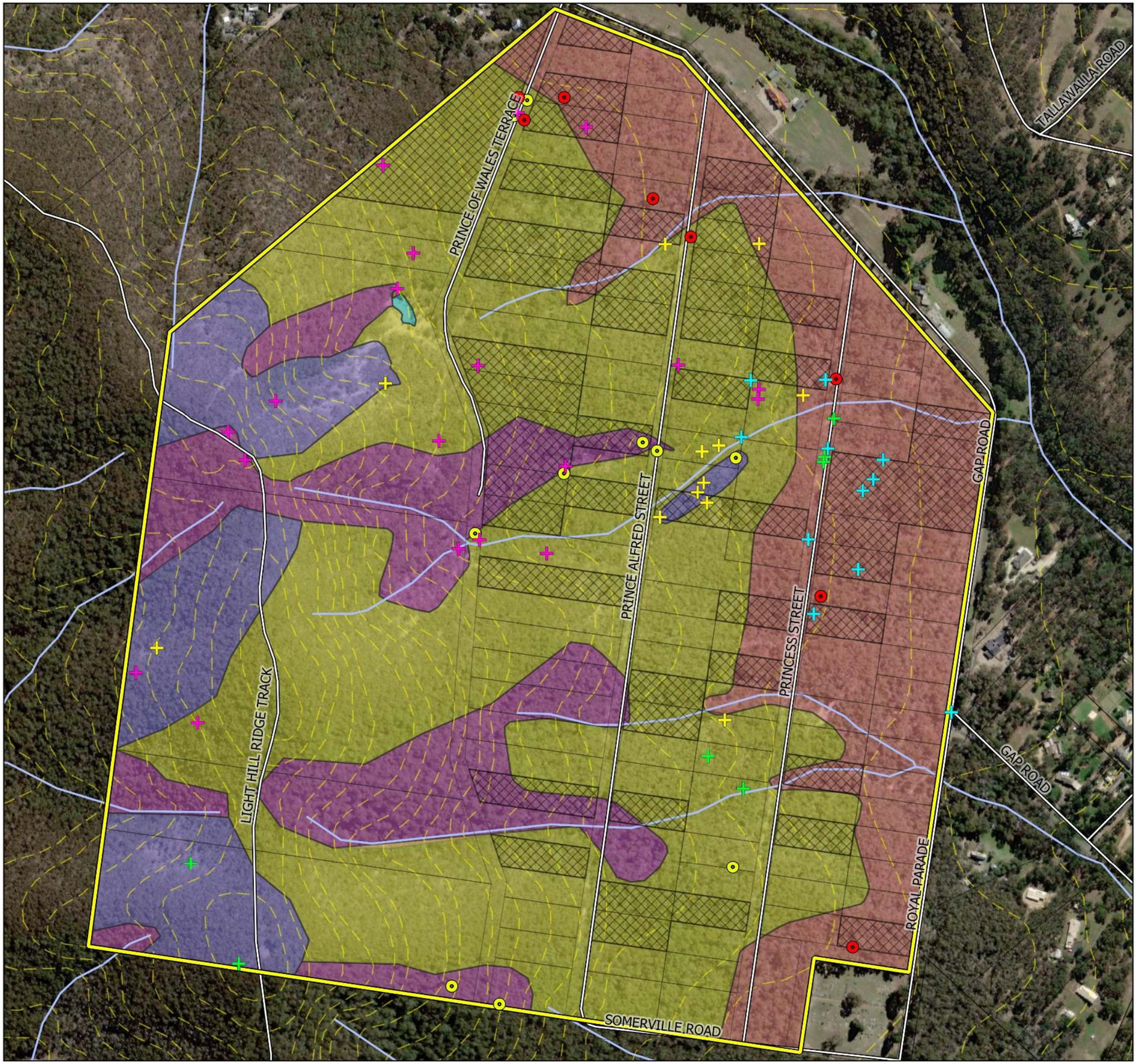
The varied terrain and surface geology of Barrm Birrm gives rise to a diversity of habitats and provides an example of the natural ecological transitions to be found across foothills of the southern Macedon Range. Habitat diversity is exemplified by the presence of four EVCs and associated intra-EVC habitats found in dry sclerophyll forests within riparian sites, on areas of rocky outcrops and on embankments and road cuttings that support locally unique plant assemblages, including flora species uniquely adapted to survive on the soils and climate of this site and a rich assemblage of terrestrial orchid species.

The diversity and exceptional quality of vegetation at Barrm Birrm supports suitable habitat for many plant species including significant habitat for four Victorian FFG Act listed taxa and two species listed on the advisory IUCN Red List. The EPBC-listed Gang-gang Cockatoo also uses the site although the extent and overall value of the habitat requires further investigation. Barrm Birrm provides critical habitat for a large population of the Critically Endangered Hairy-leaf Triggerplant.

Mesic gullies in dry forest landscapes are important habitat resources for mammals and avifauna, during and outside of drought periods to enable survival and breeding. These important habitat qualities are associated with the productive conditions supported by riparian habitats (Mac Nally *et al*. 2000, Soderquist and Mac Nally 2000). Barrm Birrm supports numerous riparian corridors that may function as potential faunal refuges during drought and following bushfires.

Upper catchment values

Lightwood Hill is bounded by steep, rocky crests that may be important sites for groundwater recharge (Baxter et al. 1994). These slopes form the upper watershed for a series of drainage lines that feed into Riddells Creek, Jacksons Creek and Maribyrnong River and play an important role in catchment processes including water and soil filtration. The upper catchment condition plays a significant role in regulating hydrological processes that affect downstream communities and water users, highlighting the importance of protecting the forested upper catchment in an undisturbed state.



GSW
ECOLOGICAL CONSULTING

- Barrm Birrm
- Local Roads
- Council-owned land
- Cadastre
- Watercourse
- 10 m contour

Ecological Vegetation Class

- EVC 20 - Heathy Dry Forest
- EVC 22: Grassy Dry Forest
- EVC 23: Herb-rich Foothill Forest
- EVC 128: Grassy Forest
- Waterbody/dam

Habitat Trees

- Hollow-bearing
- Large specimens

Threatened flora species

- Acacia leprosa var. uninervia
- Acacia nanodealbata
- Senecio microbasis
- Stylidium armeria ssp. pilosifolium

Scale 1:5000 (print to A3)
Coordinate System: GDA 1994 MGA Zone 55

N

0 100 200 300 400 m

Figure 3. Ecological features of Barrm Birrm, Riddells Creek.

5. Biodiversity threats and land disturbances

The majority of Barrm Birrm is unfenced privately owned properties and its land tenure insecure and future land uses uncertain. Any land development proposals that require vegetation removal are likely to have significant negative impacts on biodiversity.

Land use entitlements

Timber removal, rubbish dumping, and bush camping are considered illegal when they are conducted without the written consent by the land owners on whose property/ies they occur. Private landholders therefore have legal entitlements to undertake various activities including native vegetation removal to obtain reasonable amounts of wood for personal use on individual properties, in accordance with the exemptions outlined in Section 52.17 of the Macedon Ranges Planning Scheme. However, in most cases where vegetation disturbance or clearing occurs, for example to establish a camping area, or other activities causing soil compaction, vegetation removal and formation of new tracks, these activities almost always trigger the requirement for a planning permit and individual landholders are encouraged to contact Council to discuss proposals for vegetation removal on privately owned allotments at Barrm Birrm.

5.1. Timber removal and dumping of rubbish

Timber removal diminishes an important habitat resource for wildlife, and often happens during firewood collection or when land managers try to 'tidy up.' Logs and fallen woody debris have immense ecological value as food and shelter for many species of invertebrates, amphibians, reptiles, birds and mammals (Lindenmayer *et al*. 2002). Historical firewood harvesting and tree clearing at Barrm Birrm is likely to have been the most significant post-colonial land use disturbance due to the impacts of removing coarse woody debris, large old trees and tree hollows, the latter being critical for arboreal fauna.

Illegal rubbish dumping and any clearing associated with bush camping causes soil and vegetation disturbance, soil compaction and has the potential to introduce new pests and diseases (see sections 5.3 to 5.5 below).

5.2. Track construction, erosion and altered hydrology

Historical road construction for private land access, recreational 4WD track construction, motorbike and mountain biking trail disturbances cause significant soil and vegetation loss and promote erosion. Walking trails and motorbike tracks that run up and down the slopes of Barrm Birrm have the effect of concentrating water flows over bare ground that become channelised and this leads to soil erosion causing downslope sedimentation. Altered hydrology along several of the Barrm Birrm watercourses may be part of the reason that canopy dieback has occurred on eucalypts near roads that cross these sites, because of excessive waterlogging.

Photo 6. Soil slumping clear along the bank of a gully.

Photo 7. Gully erosion and bank slumping that runs along a walking trail.

Photo 8. Rocks and soil deposited from an old 4WD track running upslope of the road in view in this image.

Photo 9. Downslope view of the location in photo 8, showing rocks and soil burying native vegetation.

Photo 10. An example of timber removal for firewood, resulting in a loss of coarse woody debris.

Photo 11. A bushland motorbike trail that has resulted in vegetation disturbance and erosion.

5.3. Weeds

Exotic and non-indigenous native species present at Barrm Birrm comprises species that are naturalised in Victorian ecosystems, and function as environmental weeds that displace native species and alter wildlife habitats. The potential negative effects of weeds to biodiversity varies by weed species, but at Barrm Birrm perennial species pose the greater threat compared to annual (short-lived) weeds. Of the range of weeds recorded on site, the most invasive group of plants is woody weeds that include non-indigenous Australian shrub species. If Barrm Birrm is affected at any time by a bushfire, weed management issues are likely to worsen because of fire-mediated weed invasion processes.

Specific environmental weed management priorities for Barrm Birrm are listed in Appendix 4.

5.4. Pest animals

Pest animals are likely to be common and widespread in the local landscape around Barrm Birrm and local pest species will be present at Barrm Birrm at times. Observations of pest activity were limited in the field survey to occasional deer activity and exotic birds, noting that the presence of pest species may not be obvious or easy to detect without a targeted survey. Specific pest animal impacts vary by species and local context, and the following list indicates pests that pose a considerable risk to the environmental values present at Barrm Birrm through a range of competitive effects.

Mammals: Black Rat (*Rattus rattus*), Cat (*Felis catus*), House Mouse (*Mus musculus*), Fox (*Vulpes vulpes*), Sambar (*Cervus unicolor*).

Birds: Common Starling (*Sturnus vulgaris*), Eurasian Blackbird (*Turdus merula*).

Invertebrates: Black Portuguese Millipede (*Ommatoiulus moreleti*), European Honey Bee (*Apis mellifera*), European Wasp (*Vespula germanica*), Redlegged Earth Mite (*Halotydeus destructor*).

5.5. Phytophthora dieback

Phytophthora cinnamomi is an introduced soil-borne pathogen that causes decline in susceptible native plant species. 'Dieback caused by the root-rot fungus *Phytophthora cinnamomi*' is listed as a key threatening process under the Commonwealth EPBC Act (DoEE 2018) and the disease is present in some of Council's bushland reserves (MRSC 2008). The interaction of *P. cinnamomi* with other plant stressors including fires, drought and waterlogging can worsen disease impacts (DoEE 2018).

Distinctive spotting characteristics of *P. cinnamomi* presence were observed from several areas of Barrm Birrm during the field survey. Chlorotic foliage of *Xanthorrhoea australis* (Austral Grass-tree), a highly susceptible species, and high densities of decayed materials of this plant species were found spread throughout a small patch of Heathy Dry Forest east of Prince Alfred Street (Figure 4). To confirm the presence of the disease at Barrm Birrm the disease must be isolated in soil samples collected from the site.

Human activities have the potential to spread *P. cinnamomi*. Some of the main ways the disease can be spread include construction and maintenance of roads, trails and firebreaks, management of drainage, movement of machinery, equipment and vehicles between sites and along roads and tracks for management of pest animals and plants, recreational land uses including bush walking, bike, motorbike and horse riding, 4WD use, camping, planting out propagated materials, and emergency service works such as fire management (DSE 2008).

Photo 12. Dead *Xanthorrhoea australis* among living specimens, indicative of *Phytophthora cinnamomi* effects.

Photo 13. Chlorosis of *Xanthorrhoea australis* in the foreground is symptomatic of the presence of *Phytophthora cinnamomi*.

5.6. Fire regimes that cause declines in biodiversity

Fire regimes that cause declines in biodiversity is a listed key threatening process (KTP) under the Commonwealth EPBC Act. The fire KTP includes the full range of fire-related ecological processes that directly or indirectly cause persistent declines in the distribution, abundance, genetic diversity or function of a species or ecological community (DAWE 2022b). What constitutes a suitable fire regime at Barrm Birrm and within the surrounding forested landscape is not known and requires detailed analysis to determine. Such a regime will depend on the ecological requirements and fire-sensitivity of resident species as well as the specific goals of land and biodiversity management. With a projected increase in the number of fire danger days and fire weather for south-east Australia, the threat of fire-related declines in biodiversity will increase. For threatened flora and fauna, fire threats are likely to intensify due to threat interactions, for example bushfires that are preceded with or followed by droughts and the effects of increased post-fire herbivory, predation and disease spread (DAWE 2022b).

Barrm Birrm currently supports exceptional quality vegetation in a long-unburnt state. Many of the resident flora species are long-lived and can persist and successfully recruit in the absence of fire. This feature is evidenced by the diverse composition of the site in the absence of fire for many decades, making Barrm Birrm an unburnt refuge for flora and fauna. Most of the site has a low fuel hazard risk due to the intact grassy ground layer, sparse shrub cover across most of the site and patchily distributed coarse woody debris, and this condition will be stable in the absence of major disturbances such as bushfires, planned burns, timber extraction or other vegetation clearing. For example, the principal areas where fuel loads are highest follow the edge of Gap Road, where the greatest edge effects occur, and recent canopy disturbances/dieback have promoted shrubby understories characterised by *Cassinia longifolia* (Shiny Cassinia) and non-indigenous woody weeds (predominantly *Acacia* species).

Planned burns in forested landscapes stimulates the growth of understorey shrubs that attain high fuel loads within several years of fire. Such disturbances promote rather than reduce elevated fuels in forested landscapes, increasing the risk of high severity bushfire effects and maintaining the need for regular fuel reduction burns. For example, Dixon et al. (2018) demonstrated that probabilities of high, very high or extreme fuel hazards was highest 0.5 to 12 years post-fire and lowest in long unburnt forests in their study of 81 eucalypt forest and woodland sites in Namadgi National Park. Spatial modelling of the 2019-20 bushfire severity for eastern Australia can be used to identify many sites where recent pre-fire disturbances such as logging are associated with high fire severity, which is likely due to the combined effects of extreme fire weather and elevated post-logging forest fuels, which are not dissimilar to shrubby regrowth following planned burns. Fuel reduction burns also increase the risk of weed invasion, disease spread, tree dieback and require fire breaks.

Planned burns will only be appropriate at Barrm Birrm when conducted under strict guidance for ecological and cultural heritage reasons and such activities must be supported by detailed pre- and post-fire monitoring to ensure the effects of individual fires and cumulative fire effects over time are documented and evaluated. The restricted shrubby patches can be reduced through manual thinning combined with re-establishment of a healthy eucalypt canopy.

5.7. Climate change

Victoria has undergone a temperature increase of 1.2°C since 1910, a decrease in average rainfall and a significant increase in fire danger in spring (DELWP 2019). Under high emissions, it is projected that Victoria will undergo an increase in the average annual temperature by up to 2.4°C, a decline in cool season rainfall, experience more intense downpours, double the number of hot days and experience longer fire seasons with up to double the number of high fire danger days (DELWP 2019). Climate change is likely to cause changes to regional flora and fauna species distributions, increase risk exposure to individual populations from climate-induced disturbances, and may cause population declines through the effects of reduced habitat suitability. At Barrm Birrm, declines in habitat quality and habitat suitability may be important for locally rare or threatened species, and climate disturbances may lead to increased erosion caused by heavy rain events and an increase in disease spread.

6. Land protection

6.1. Statement of significance

Barrm Birrm is a natural bushland area of approximately 119 hectares that has significant scientific, social and catchment values. Set in the foothills of the Macedon Ranges, Barrm Birrm supports at least four species of Victorian-listed threatened flora, habitat for the EPBC-listed, threatened Gang-Gang Cockatoo, supports extensive areas of four foothill forest communities, including approximately 27 hectares of a high quality remnant of the Victorian vulnerable EVC Grassy Forest (EVC 128) and extensive areas of relatively intact species-rich forest communities.

The size of Barrm Birrm, its degree of intactness, connectivity with other areas of forested public and private land and its importance to regional climate adaptation provide a strong basis for its acquisition by Council to establish a permanently protected nature conservation reserve.

Hosting a significant, large population of the Critically Endangered Macedon Ranges endemic, Hairy-leaf Triggerplant and the type locality for the taxon, Barrm Birrm is one of few areas that provides very high-quality habitat for the species and an opportunity to provide long-term population management to ensure in situ conservation. The diversity of orchid species and likely exceptionally large orchid populations contributes to the scientific, social and antiquity values of Barrm Birrm.

The Riddells Creek community puts significant value on Barrm Birrm for its social and environmental aesthetic and its ecological values. This is demonstrated by the Riddells Creek Landcare group, the formation of which was due to an interest by community members in the protection of Barrm Birrm from inappropriate development. The site therefore has rich social connections for local community members. The site may also have high cultural value to traditional custodians of the land, the Wurundjeri people, however this is to be investigated further through engagement of the Wurundjeri Woi Wurrung Aboriginal Corporation to undertake cultural heritage assessments of the land.

6.2. Recommended management actions

The actions outlined in Table 5 are applicable to all areas of Barrm Birrm except where these are only relevant to Council owned land. As new allotments come into Council ownership the parcels should be assessed to identify any specific management needs based on the site condition at the time of acquisition. In the absence of active management of the privately owned allotments some land management issues, such as weed invasion may worsen over time. Wherever possible, private landholders are encouraged to adopt any actions outlined in this section that may serve to improve the condition of their native vegetation and biodiversity.

Planned burns

Planned burning is inappropriate at Barrm Birrm and no recommendations are made for burning any part of the site for the life of this management plan (see section 5.6). The only exceptions may be small-scale ecological burns which may be beneficial for the purpose of weed management or as cultural burns conducted under guidance from Traditional Custodians.

If ecological burning is undertaken now or in to the future, as part of this action the allocation of budget to control pest weeds and animals post burn is critical.

Table 5. Recommended site protection and land management actions at Barrm Birrm.

Priority levels are: High – begin action within 1-2 years, Medium – 2-5 years, Low – 5-10 years.

Item	Action	Priority level
Permanent land and biodiversity protection		
A1	Investigate planning controls on private land to protect the ecological values of the site.	Medium
A2	Covenant to protect all amalgamated allotments through on-title security, such as a Section 173 agreement under the *Planning and Environment Act 1987* or an agreement with Trust for Nature to register a covenant under the *Nature Trust Conservation Act 1972*, or enter an agreement with the Secretary to the Victorian Department of Energy, Environment and Climate Action (DEECA) under section 69 of the *Conservation, Forests and Lands Act 1987*.	Low
A3	Develop a management plan for consolidated allotments that considers the range of land management issues, land uses and biodiversity values at the time. The plan should consider the full range of threats to biodiversity and fire management for biodiversity conservation.	Low
Pest plant and animal and disease management		
B1	Plan for and secure multi-year funding for a staged weed control program across all Council owned properties at Barrm Birrm. Note the need to source additional funds to manage new properties that come into Council ownership over time.	High
B2	Implement weed control on Council owned land and on public road easements as set out in the environmental works plan (section 7) and with reference to the priority weeds listed in Appendix 4. Where feasible, undertake a survey of the current Council owned land boundaries so land management actions can be undertaken by contractors on Council properties. Commence this action on larger blocks.	High
B3	Encourage private land holders to conduct weed control to prevent weed spread, based on the target weeds listed in Appendix 4. Council should supply practical advice to landholders about suitable methods for weed control.	Medium
B4	Investigate the suspected occurrence of *Phytophthora cinnamomi* (PC) by commissioning soil core testing by a suitably qualified and experienced research laboratory. Wherever possible include private land holdings in any assessments. If PC is detected, then investigate disease management options and develop a disease management strategy for the site that ensures hygiene and containment are priority actions.	High
B5	Undertake a literature review to investigate the risk posed by *Phytophthora cinnamomi* to locally indigenous plants and vegetation communities; identify any knowledge gaps to overcome through research.	Medium
B6	Raise awareness about the weed threat posed by non-indigenous native species with local community and nurseries, for example through the production of an information pamphlet and articles in local media.	Medium
B7	Follow any land disturbances, investigate the need for targeted revegetation on Council properties. The aim of revegetation is to restore the original Ecological Vegetation Class in the area. Refer to Appendix 5 for basic revegetation guidelines.	Low
B8	Document the occurrence of pest animals through targeted surveys and investigate the level of threat posed. This action should be conducted in collaboration with interested members of the community, ideally through the auspices of Riddells Creek Landcare.	Medium

Item	Action	Priority level
B9	Minimise the introduction of new pests and diseases by setting up appropriate hygiene procedures for Council and contractors. Raise awareness of pest and disease issues by sharing educational materials such as the 'Arrive Clean, Leave Clean' guidelines (DoE 2015).	Medium
Access controls and prohibited land uses		
C1	Maintain all Council gates, barrier structures and signage to prevent 4WD access and consult with neighbouring land holders to identify additional access and investigate management options to better control these points.	High
C2	Investigate surveillance options to monitor and restrict illegal motorbike use Birrm. This may require a range of actions such as raising awareness in the local community about this issue, increase signage at access points as well as taking more direct action where appropriate.	High
C3	Investigate safe options for local community members to report on illegal activities taking place, for example to document and report any illegal fires, dumping of rubbish, unpermitted camping and timber removal.	High
C4	Consult with Parks Victoria, State Government, and other relevant organisations with experience in managing illegal land use to investigate available options.	Medium
Erosion management		
D1	Monitor all known erosion sites recorded from track margins and along gullies, including any new detections of gully erosion. Photopoints can be installed at all major gully sites and the extent of erosion, and any associated impacts mapped in the field.	Medium
D2	Investigate erosion control options for high-risk sites where negative impacts to biodiversity are likely to result. Suitable erosion control measures are likely to include actions to stabilise upslope source areas to limit soil loss, actions that increase rainwater infiltration and capture suspended sediments. To reduce any downslope erosion impacts, it may be necessary to install sediment traps and coir bunding.	Medium
D3	Consult with Melbourne Water to develop strategies for erosion control in upper catchment areas.	Medium
D4	Prevent the construction of new pedestrian or vehicle tracks. Retain any trees and logs that fall over existing trails except where clearance is required for safety or egress, or if trail blockages will lead to further vegetation disturbance from people or vehicles creating new paths around these barriers.	Ongoing / as needed
Threatened species and habitat management		
E1	Develop a threatened species management program for Gang-gang Cockatoo that includes monitoring methods and actions to increase habitat suitability for the species, for example by installing specially designed nest boxes. Design and implementation should be based on guiding actions set out in the Conservation Advice for the species (DAWE 2022a). Engage the local community on this work by using citizen science activities.	Medium
E2	Develop survey guidelines and a monitoring procedure for threatened flora known that includes structured survey methods and ensures the data is compatible with IUCN Red List assessments used by Victorian and Commonwealth governments. Key information to record include the number of mature individuals, the species' ecology and disturbance response, and identification of threats and threat-abatement measures. Priority species include *Stylidium armeria subsp. pilosifolium* (Hairy-leaf Trigger-plant), *Senecio microbasis* (Slender Fireweed), *Acacia nanodealbata* (Dwarf Silver Wattle) and any threatened orchid species found to be present.	Medium
E3	As new properties come into Council ownership over coming decades and as more disturbances affect the condition of native vegetation, develop targeted land management guidelines for all threatened species that aim to maintain and enhance local populations so that these are viable in the long-term. In the short to medium term, it is unlikely that the known threatened plant populations will decline rapidly given that the land is not used for commercial extractive purposes and in principle cannot be developed.	Low
E4	Investigate options for increasing the density of tree hollows. Preliminary options include strategic tree thinning to reduce inter-tree competition in regrowth stands of dry forests, or the use of novel hollow-creation methods such as HollowHog.	Low
E5	Retain fallen trees, logs, and branches to increase the amount of coarse woody debris habitat. If any ecological thinning is conducted, ensure that thinned materials are kept on site to enhance habitat values for common fauna species that will benefit from this resource. For any fallen woody material that is to be removed from tracks or trails, relocate this material into nearby bushland taking care to locate it in an area that minimises disturbance to understorey vegetation.	Ongoing

Item	Action	Priority level
Fire management		
F1	Collaborate with Traditional Custodians; identify and assess the appropriateness of cultural burns that promote traditional fire-stick practices and that supported by Wurundjeri Woi Wurrung Elders and the local community.	Low
F2	Avoid the use of planned burns unless a clear and strong ecological benefit will result, which is unlikely to have negative effects on the known flora and fauna species and ecological communities. Planned burning may be appropriate for strategic weed control in select cases where the aim is to promote a mass-recruitment of hard-seeded leguminous weeds (e.g., non-indigenous *Acacia* species) to deplete the weed seed-bank, noting there are risks associated with doing this if adequate resources are not available for follow-up weed control. Conversely, a high severity wildfire at Barrm Birrm would promote a significant flush of weeds that would be difficult to manage at a large scale.	Ongoing
F3	Following any wildfire/s that impact Barrm Birrm, undertake post-fire assessments of fire severity and identify post-fire risks to biodiversity. Concentrate effort on wildlife rescue, threatened species protection (e.g., fencing sensitive plants to protect from post-fire grazing threat), weed and pest animal control, and disease spread.	N/A
Ecological monitoring and research		
G1	Assess fixed photopoints at least every two years to document visual changes to the site. Install photopoints at new sites where visual records can enhance site management and reporting.	High
G2	Monitor the effects of major climatic events, including but not limited to droughts, floods or high rainfall events and storms, and identify the risk of biodiversity decline from with these events and any threat abatement actions.	As required
G3	Undertake targeted fauna surveys for reptiles, amphibians, birds, mammals and invertebrates using a variety of permitted survey techniques such as spotlighting, camera trapping, paver and tile surveys and anabat detection. Document all findings in relevant government databases and project reports. Such surveys provide suitable opportunities for small numbers of volunteer participation (e.g., through Council's existing biodiversity monitoring program). Consult with private land holders to find opportunities to conduct fauna surveys on private land.	High
G4	If Barrm Birrm is subject to wildfire or planned burns ensure that post-burn orchid surveys are completed for several years over multiple seasons, to identify a suite of species that are fire-stimulated or fire-dependent and estimate the population size and reproductive success of these populations using structured survey methods. This will present an important opportunity to search for new species at the site and to better understand the population ecology of resident species.	As required
Community engagement		
H1	Offer local community members opportunities to be involved in flora and fauna monitoring, for example through Council's biodiversity monitoring program (see action G3). The Birds in Schools program and other BirdLife Australia bushfire recovery initiatives may have resources available to support the development of a monitoring program for threatened bird species.	High
H2	Increase community knowledge and awareness of Barrm Birrm's biodiversity and environmental values through field excursions and presentations, preferably through the auspices of Riddells Creek Landcare.	High
H3	Support the work of Riddells Creek Landcare in their effort to protect Barrm Birrm. Support can be provided through financial assistance to maintain or improve existing works programs (e.g., weed control), develop promotional materials about the site, assistance in educating Riddells Creek residents about the issues associated with rubbish dumping and motorbike activity, or support through in-kind field-based project collaboration.	High

7. Environmental works plan for Council land

Barrm Birrm has been divided into six management zones, the first five of which have Council-owned properties and are subject to the management recommendations provided in this section (Figure 4). The proposed works for the next ten years include weed control, photopoint monitoring at four locations, and soil testing for the presence of *Phytophthora cinnamomi* (Table 7). Additional works may be required under Council's management of the land, and management should be responsive to changing site conditions.

The objective of this works plan is focussed primarily on reducing the threat of woody and herbaceous weeds based on staged works across five management zones. Each management zone is given treatments over the ten-year period, noting that the sixth zone is entirely privately owned and has some environmental weed infestations that require control.

Photopoints

The locations of four photopoints are given in Table 6. Each point includes multiple photos to capture a variety of features; Council holds baseline photos.

Table 6. Four photopoints established at Barrm Birrm in February 2023.

Coordinate Reference System: GDA 1994 MGA Zone 55.

Photopoint	Easting	Northing	Focal points
A	292819	5853910	Initial stages of gully erosion developing along the margins of a walking/bike trail; Herb-rich Foothill Forest and Grassy Dry Forest EVCs (EVC edge/transition).
B	293037	5853780	Potential *Phytophthora cinnamomi* infected site; Heathy Dry Forest and Grassy Dry Forest EVCs (EVC edge/transition).
C	293359	5853776	Effects of canopy dieback (over-abundant understorey shrubs including *Cassinia* longifolia and *Exocarpos cupressiformis)*, Grassy Forest EVC (grassy); diverse ground flora; small thicket of *Pomaderris racemosa*.
D	293314	5853184	Disturbed area with abundant *Cassinia longifolia* (adjacent roadside); walking trail corridor; contrast with neighbouring property (cemetery); Grassy Forest EVC (shrubby).

Guidelines for other works

If at any time Council identifies a need to conduct pest animal control, fencing, revegetation or protect trees from planned disturbances, the *Management standards for native vegetation offset sites* (DELWP 2021) provide a point of reference for basic information on these activities. For any future revegetation work, planting densities can be adopted using the *Native vegetation gain scoring manual* (DELWP 2017) based on the relevant EVC for the planting site to calculate the planting densities.

There is no current need for revegetation on Council allotments at Barrm Birrm. If revegetation is required later Appendix 5 provides an advisory list of suitable species to use, noting the need to do a thorough assessment of any planting site to identify its capacity for natural regeneration and the risks associated with soil disturbance caused by planting, such as potential weed and disease spread.

If revegetation becomes necessary and requires planting nursery-grown stock, all tube stock plantings should be staked and guarded to provide frost and grazing protection. This will also make plantings more visible and improve maintenance efficiency while guards are in place. Guards can be removed as soon as plants are established.

All plantings should be watered-in twice at planting and then regularly for at least six months unless there is sufficient rainfall. Spring plantings require summer watering to combat the added risk of plant failure associated with the shorter onset of summer drought compared to autumn plantings. Take precautions to ensure that soils are not moved into or out of the site via planting equipment due to the risk of disease spread.

Mulch is not required around plantings but could be used in certain situations where weed growth is likely to be high in planted areas, or to provide added soil-water conservation prior to summer drought. High density planting of ground layer species will not be appropriate to mulch because of the planting density but mulch can be applied to widely spaced woody tree and shrub plantings.

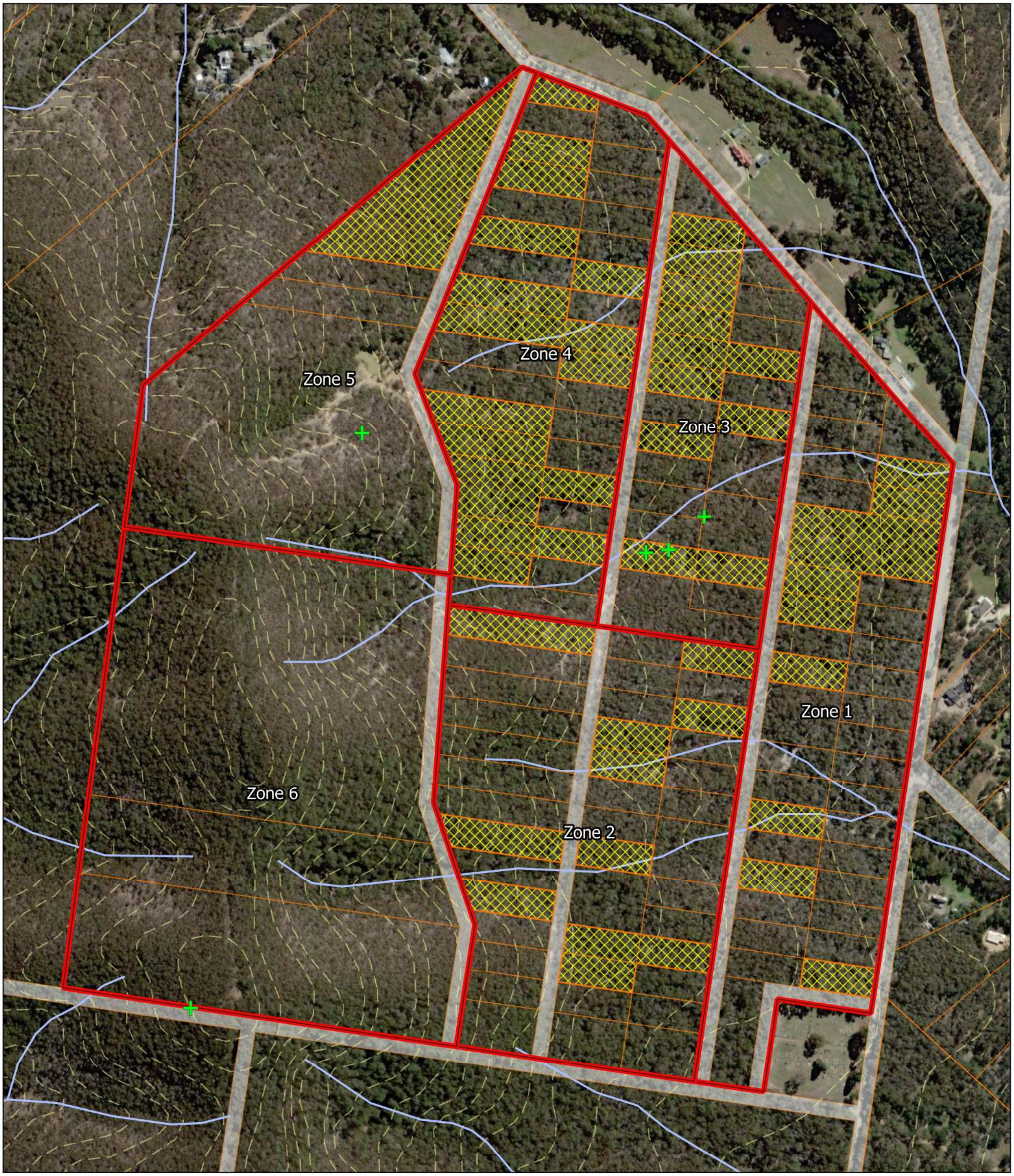


Figure 4. Management zones, photopoints and potential Phytophthora locations at Barrm Birrm. Riddells Creek.

Table 7. Ten year works plan for Barrm Birrm.

Management action	Tasks	Target standard
Year 1		
1.1	**Seasonal works planning:** report all target areas where weed control is required and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes proper contingencies for medium to high-risk scenarios.
1.2	**Weed control in Zone 1:** survey and control all high priority target weeds on Council owner properties and treat low priority target weeds if resources allow. Priority weeds are listed in Appendix 4. Treatments should start from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Record GPS locations of the main weed control sites and targeted species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are met, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
Year 2		
2.1	**Seasonal works planning:** report all target areas where weed control is needed and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes proper contingencies for medium to high-risk scenarios.

Management action	Tasks	Target standard
2.2	**Weed control in Zone 2:** survey and control all high priority target weeds on Council owner properties and treat low priority target weeds if resources allow. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Record GPS locations of the main weed control sites and targeted species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
2.3	**Phytophthora soil/root sampling:** collect soil and plant roots from potential *Phytophthora cinnamomi* disease sites and have these tested in a laboratory by an appropriate service provider. Sample from all suspected disease sites if possible.	Sampling protocol and field collection methods to be advised by the service provider. Disease presence/absence determined for each test site. If test results are inconclusive, then re-test using new samples at a suitable time.
2.4	**Photopoint monitoring:** revisit all established photopoints and record new photographs by replicating the framing and depth of field of the original photos as closely as possible.	Assessor/s collect high quality photographs at each site, having copies of original photographs and photo specifications with them in the field to accurately replicate the original photos. All photos are collated and backed up on Council systems and compiled into a comparative report or slideshow.
Year 3		
3.1	**Seasonal works planning:** report all target areas where weed control is required and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors, and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.

Management action	Tasks	Target standard
3.2	**Weed control in Zone 3:** survey and control all high priority target weeds on Council owner properties and treat low priority target weeds if resources allow. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Record GPS locations of the main weed control sites and targeted species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
Year 4		
4.1	**Seasonal works planning:** report all target areas where weed control is required and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.
4.2	**Weed control in Zone 4:** survey and control all high priority target weeds on Council owner properties and treat low priority target weeds if resources allow. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Record GPS locations of the main weed control sites and targeted species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.

Management action	Tasks	Target standard
4.3	**Photopoint monitoring:** revisit all established photopoints and record new photographs by replicating the framing and depth of field of the original photos as closely as possible.	Assessor/s collect high quality photographs at each site, having copies of original photographs and photo specifications with them in the field to accurately replicate the original photos. All photos are collated and backed up on Council systems and compiled into a comparative report or slideshow.
Year 5		
5.1	**Seasonal works planning:** report all target areas where weed control is required and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.
5.2	**Weed control in Zone 5:** survey and control all high priority target weeds on Council owner properties and treat low priority target weeds if resources allow. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Record GPS locations of the main weed control sites and targeted species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
Year 6		
6.1	**Seasonal works planning:** report all target areas where weed control is required and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes proper contingencies for medium to high-risk scenarios.

Management action	Tasks	Target standard
6.2	**Weed control in Zone 1 (second round of treatment):** use GPS data from the first round of treatment to locate and inspect all previous weed control sites. Undertake further weed control where necessary. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Update GPS data with any new locations where weed control is completed, including target species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
6.3	**Photopoint monitoring:** revisit all established photopoints and record new photographs by replicating the framing and depth of field of the original photos as closely as possible.	Assessor/s collect high quality photographs at each site, having copies of original photographs and photo specifications with them in the field to accurately replicate the original photos. All photos are collated and backed up on Council systems and compiled into a comparative report or slideshow.
Year 7		
7.1	**Seasonal works planning:** report all target areas where weed control is needed and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.

Management action	Tasks	Target standard
7.2	**Weed control in Zone 2 (second round of treatment):** use GPS data from the first round of treatment to locate and inspect all previous weed control sites. Undertake further weed control where necessary. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Update GPS data with any new locations where weed control is completed, including target species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
Year 8		
8.1	**Seasonal works planning:** report all target areas where weed control is needed and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.
8.2	**Weed control in Zone 3 (second round of treatment):** use GPS data from the first round of treatment to find and inspect all earlier weed control sites. Undertake further weed control where necessary. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Update GPS data with any new locations where weed control is completed, including target species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.

Management action	Tasks	Target standard
8.3	**Photopoint monitoring:** revisit all established photopoints and record new photographs by replicating the framing and depth of field of the original photos as closely as possible.	Assessor/s collect high quality photographs at each site, having copies of original photographs and photo specifications with them in the field to accurately replicate the original photos. All photos are collated and backed up on Council systems and compiled into a comparative report or slideshow.
Year 9		
9.1	**Seasonal works planning:** report all target areas where weed control is needed and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.
9.2	**Weed control in Zone 4 (second round of treatment):** use GPS data from the first round of treatment to find and inspect all earlier weed control sites. Undertake further weed control where necessary. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Update GPS data with any new locations where weed control is completed, including target species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
Year 10		
10.1	**Seasonal works planning:** report all target areas where weed control is required and define weed control timing, treatment methods and weed disposal procedures. Where revegetation or other works are needed, conduct necessary preparations during the project planning phase where possible.	Yearly tasks clearly defined in a project report that can be referred to by land management staff, managers, contractors and project stakeholders. Project plan is agreed between parties and includes appropriate contingencies for medium to high-risk scenarios.

Management action	Tasks	Target standard
10.2	**Weed control in Zone 5 (second round of treatment):** use GPS data from the first round of treatment to find and inspect all earlier weed control sites. Undertake further weed control where necessary. Priority weeds are listed in Appendix 4. Treatments should commence from July to August to improve the detection and accurate identification of *Acacia* spp. (many species flower in from mid-winter through to early spring and can be confused with locally indigenous species). Update GPS data with any new locations where weed control is completed, including target species (for efficient resurvey in later years and to develop a weed distribution map). Cut and paint or ring-bark mature woody weeds and leave small plants to develop in size for treatment in later years (unless trace infestations are encountered, then cut-paint, spot spray or hand weed plants). Herbaceous weeds can be manually removed where practical, or spot sprayed if necessary, taking care to avoid off-target herbicide damage.	Complete control/removal of all large woody and herbaceous weeds. GPS documentation of all target weeds, including any plants that were not treated. Document all works in a daily works record and compile an end of project report with photographs.
10.3	**Photopoint monitoring:** revisit all established photopoints and record new photographs by replicating the framing and depth of field of the original photos as closely as possible.	Assessor/s collect high quality photographs at each site, having copies of original photographs and photo specifications with them in the field to accurately replicate the original photos. All photos are collated and backed up on Council systems and compiled into a comparative report or slideshow.
10.4	**Project evaluation and reporting:** collate all project reports and any other documentation from the past ten years. Summarise the completed works, project outcomes and major successes and challenges. Distribute this within Council and to relevant stakeholders.	Historic works accurately depicted in a summary report that clearly demonstrates the activities completed and results of the work. Reporting disseminated to relevant parties and given an opportunity to provide report feedback.
10.5	**Works plan revision/update:** using the report prepared for item 10.4 and in consultation with relevant stakeholders and knowledge holders, complete a new project plan for Council owned parcels at Barrm Birrm that considers latest information, and a better understanding of biodiversity and threats present at the site. The scope of this report can be based on conditions at the time, and may vary from short (3 year) to long-term (>10 year) project planning, noting the possibility that a new, detailed ecological assessment of the land may be a valuable companion to the works plan to verify that past land management works and future proposed works are appropriate for the site.	A new work plan is prepared and endorsed by Council and relevant stakeholders, with opportunities for feedback from and, where relevant, active consultation with key stakeholders.

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Appendix 1. A compilation of databased plant species records from Barrm Birrm.

This species list includes all taxa in the ALA recorded from Barrm Birrm at species level or intraspecific rank, as of 14 February 2023 (ALA 2023a). The source of these records include NatureShare, iNaturalist Australia, Victorian Biodiversity Atlas (VBA), Australia's Virtual Herbarium, Western Australian Herbarium (PERTH) AVH data, Western Australia, Department of Biodiversity, Conservation and Attractions, and the Western Australian Herbarium. The species names have been updated to reflect the taxonomy used by the VBA (DELWP 2023) and VicFlora (2023), unless otherwise specified. The list does not include flora species recorded during field surveys completed as part of this assessment, which are given in Appendix 2.

Origin:

#	Non-indigenous Victorian taxa
*****	Exotic or non-indigenous Australian taxa
ø	Uncertain origin (assigned by VicFlora 2023)
†	*Thelymitra pallidifructus* is not currently recognised by VicFlora or the VBA but has been included here for information purposes (see Bates 2010 for a formal species description).

Conservation status:

IUCN	International Union for Conservation of Nature
FFG	*Flora and Fauna Guarantee Act 1988*
CR	Critically Endangered
EN	Endangered
VU	Vulnerable

Origin	Taxon name	Common name	VBA taxon number	Conservation Status
*	*Acacia baileyana*	Cootamundra Wattle	500014	
	Acacia dealbata subsp. *dealbata*	Silver Wattle	505875	
*	*Acacia elata*	Cedar Wattle	500031	
#	*Acacia floribunda*	White Sallow-wattle	500036	
	Acacia genistifolia	Spreading Wattle	500038	
	Acacia gunnii	Ploughshare Wattle	500041	
#	*Acacia howittii*	Sticky Wattle	500044	
	Acacia implexa	Lightwood	500045	
*	*Acacia iteaphylla*	Flinders Range Wattle	505015	
	Acacia leprosa var. *uninervia*	Large-leaf Cinnamon-wattle	505141	EN (FFG)
#	*Acacia longifolia*	Sallow Wattle	505128	
	Acacia mearnsii	Black Wattle	500056	
	Acacia melanoxylon	Blackwood	500057	
	Acacia nanodealbata	Dwarf Silver Wattle	500064	VU (FFG)
	Acacia paradoxa	Hedge Wattle	500072	
#	*Acacia pravissima*	Ovens Wattle	500077	
*	*Acacia prominens*	Gosford Wattle	503649	
	Acacia provincialis	Wirilda	504209	
	Acacia pycnantha	Golden Wattle	500078	
	Acacia stricta	Hop Wattle	500091	
	Acacia ulicifolia	Juniper Wattle	500098	
	Acacia verniciflua s.l.	Varnish Wattle	500099	
	Acacia verticillata subsp. *verticillata*	Prickly Moses	504213	
	Acaena novae-zelandiae	Bidgee-widgee	500105	
	Acrotriche prostrata	Trailing Ground-berry	500122	
	Acrotriche serrulata	Honey-pots	500123	
*	*Agapanthus praecox* subsp. *orientalis*	Agapanthus	503638	
*	*Aira caryophyllea* subsp. *caryophyllea*	Silvery Hair-grass	500164	
*	*Allium triquetrum*	Angled Onion	500179	
	Allocasuarina littoralis	Black Sheoak	500677	

Origin	Taxon name	Common name	VBA taxon number	Conservation Status
	Amyema pendula subsp. *pendula* (s.s.)	Drooping Mistletoe	505169	
*	*Anthoxanthum odoratum*	Sweet Vernal-grass	500236	
*	*Arctotheca calendula*	Cape weed	500255	
	Arthropodium strictum s.s.	Chocolate Lily	505126	
	Asperula scoparia subsp. *scoparia*	Prickly Woodruff	500284	
	Austrostipa rudis	Veined Spear-grass	503289	
	Austrostipa semibarbata	Fibrous Spear-grass	503291	
*	*Billardiera fusiformis*	Bluebell Creeper	503202	
	Billardiera mutabilis	Common Apple-berry	504291	
	Bossiaea prostrata	Creeping Bossiaea	500440	
	Brachyloma ciliatum	Fringed Brachyloma	500482	
	Brachyscome diversifolia	Tall Daisy	500456	
*	*Briza maxima*	Large Quaking-grass	500495	
	Brunonia australis	Blue Pincushion	500508	
	Burchardia umbellata	Milkmaids	500512	
	Bursaria spinosa subsp. *spinosa*	Sweet Bursaria	500515	
	Caesia parviflora	Pale Grass-lily	500518	
	Caladenia carnea s.s.	Pink Fingers	503680	
	Caladenia clavigera	Plain-lip Spider-orchid	500528	
	Caladenia moschata	Musk Hood-orchid	500535	
	Caladenia praecox	Early Hood-orchid	500543	
	Calochilus robertsonii s.l.	Purple Beard-orchid	500589	
	Calochilus therophilus	Slender Beard-orchid	500505	
	Calochlaena dubia	Common Ground-fern	500887	
	Cassinia aculeata	Common Cassinia	500666	
	Cassinia longifolia	Shiny Cassinia	500668	
Ø	*Cassinia sifton*	Drooping Cassinia	500667	
	Cassytha glabella f. *dispar*	Slender Dodder-laurel	504681	
	Cassytha pubescens s.s.	Downy Dodder-laurel	500674	
*	*Centaurium tenuiflorum*	Slender Centaury	500705	
	Cheilanthes sieberi subsp. *sieberi*	Narrow Rock-fern	500733	
	Chiloglottis valida	Common Bird-orchid	504888	
*	*Cirsium vulgare*	Spear Thistle	500782	
	Clematis aristata	Mountain Clematis	500788	
	Clematis microphylla s.s.	Small-leaved Clematis	507386	
	Comesperma volubile	Love Creeper	500801	
	Coronidium scorpioides s.s.	Button Everlasting	501626	
	Correa reflexa var. *reflexa*	Common Correa	504370	
	Corunastylis morrisii	Bearded Midge-orchid	502715	
	Craspedia variabilis	Variable Billy-buttons	504650	
	Cryptandra amara s.s.	Bitter Cryptandra	504317	
	Cymbonotus preissianus	Austral Bear's-ear	500903	
*	*Cynara cardunculus* subsp. *flavescens*	Artichoke Thistle	500906	
*	*Cytisus scoparius*	English Broom	500947	
	Daviesia leptophylla	Narrow-leaf Bitter-pea	501000	
	Deyeuxia quadriseta	Reed Bent-grass	501023	
	Dianella revoluta var. *revoluta* s.l.	Black-anther Flax-lily	504413	
	Dichelachne sciurea spp. agg.	Short-hair Plume-grass	501034	
	Dichondra repens	Kidney-weed	501036	
	Dillwynia cinerascens s.s.	Grey Parrot-pea	505931	
	Dillwynia sericea	Showy Parrot-pea	501058	
	Dipodium roseum s.s.	Rosy Hyacinth-orchid	504889	
*	*Disa bracteata*	South African Orchid	505483	
	Diuris chryseopsis	Golden Moths	505423	
	Diuris orientis	Wallflower Orchid	501079	
	Diuris pardina	Leopard Orchid	501080	

Origin	Taxon name	Common name	VBA taxon number	Conservation Status
	Diuris sulphurea	Tiger Orchid	501085	
	Dodonaea viscosa	Sticky Hop-bush	501095	
*	*Dodonaea viscosa* 'Purpurea'	Purple Hop-bush	505413	
	Drosera auriculata	Tall Sundew	501102	
	Drosera macrantha subsp. *macrantha*	Climbing Sundew	501106	
	Drosera peltata s.s.	Pale Sundew	528434	
	Epacris impressa var. *impressa*	Common Heath	504478	
	Epilobium hirtigerum	Hairy Willow-herb	501179	
*	*Erica lusitanica*	Spanish Heath	501210	
	Eriochilus cucullatus s.s.	Parson's Bands	528694	
	Eucalyptus aromaphloia	Scentbark	501248	VU (IUCN)
	Eucalyptus cephalocarpa s.s.	Mealy Stringybark	503733	
	Eucalyptus dives	Broad-leaf Peppermint	501272	
	Eucalyptus obliqua	Messmate Stringybark	501304	
	Eucalyptus radiata s.l.	Narrow-leaf Peppermint	501313	
	Eucalyptus viminalis	Manna Gum	501323	
	Euchiton japonicus s.s.	Creeping Cudweed	501466	
	Euchiton sphaericus	Annual Cudweed	501471	
	Exocarpos cupressiformis	Cherry Ballart	501350	
	Gahnia radula	Thatch Saw-sedge	501394	
	Galium gaudichaudii	Rough Bedstraw	501409	
	Genista linifolia	Flax-leaf Broom	501421	
	Geranium sp. 2	Variable Crane's-bill	505343	
	Glossodia major	Wax-lip Orchid	501445	
	Gompholobium huegelii	Common Wedge-pea	501481	
	Gonocarpus tetragynus	Common Raspwort	501489	
	Goodenia ovata	Hop Goodenia	501507	
	Grevillea alpina	Cat's Claw Grevillea	501526	
	Grevillea rosmarinifolia	Rosemary Grevillea	501550	
#	*Grevillea rosmarinifolia* hybrids	Rosemary Grevillea hybrids	507475	
	Hakea decurrens subsp. *physocarpa*	Bushy Needlewood	505071	
*	*Hakea laurina*	Pincushion Hakea	505747	
	Hardenbergia violacea	Purple Coral-pea	501596	
*	*Holcus lanatus*	Yorkshire Fog	501692	
	Hovea heterophylla	Common Hovea	501705	
	Hydrocotyle laxiflora	Stinking Pennywort	501723	
	Hypericum gramineum spp. agg.	Small St John's Wort	501741	
*	*Hypochaeris radicata*	Flatweed	501748	
	Indigofera australis	Austral Indigo	501761	
*	*Ipheion uniflorum*	Spring Star-flower	503783	
	Isotoma fluviatilis subsp. *australis*	Swamp Isotome	501793	
*	*Juncus capitatus*	Capitate Rush	501813	
	Juncus gregiflorus	Green Rush	501820	
	Juncus holoschoenus	Joint-leaf Rush	501821	
	Juncus pallidus	Pale Rush	501830	
	Juncus planifolius	Broad-leaf Rush	501833	
	Juncus subsecundus	Finger Rush	501843	
	Kennedia prostrata	Running Postman	501847	
	Lachnagrostis filiformis s.l.	Common Blown-grass	500151	
	Lagenophora stipitata	Common Bottle-daisy	501863	
	Lepidosperma laterale	Variable Sword-sedge	501923	
	Leptoceras menziesii	Hare Orchid	500540	
	Leptorhynchos tenuifolius	Wiry Buttons	501947	
	Leptospermum continentale	Prickly Tea-tree	501956	
	Leucopogon virgatus var. *virgatus*	Common Beard-heath	504391	
	Lobelia pedunculata s.s.	Matted Pratia	505038	

Origin	Taxon name	Common name	VBA taxon number	Conservation Status
	Lomandra filiformis subsp. *coriacea*	Wattle Mat-rush	504709	
	Lomandra longifolia	Spiny-headed Mat-rush	502046	
	Luzula meridionalis var. *flaccida*	Common Woodrush	502070	
	Lythrum hyssopifolia	Small Loosestrife	502092	
*	*Medicago sativa* subsp. *sativa*	Lucerne	502141	
	Microseris walteri	Yam Daisy	503887	
	Microtis parviflora	Slender Onion-orchid	502187	
	Monotoca scoparia	Prickly Broom-heath	502220	
*	*Narcissus spp.*	Narcisssus	508798	
*	*Nassella trichotoma*	Serrated Tussock	502263	
	Olearia argophylla	Musk Daisy-bush	502299	
	Olearia lirata	Snowy Daisy-bush	502312	
	Olearia myrsinoides	Silky Daisy-bush	502316	
	Opercularia ovata	Broad-leaf Stinkweed	502341	
	Opercularia varia	Variable Stinkweed	502344	
	Oxalis exilis	Shady Wood-sorrel	502381	
	Oxalis perennans	Grassland Wood-sorrel	502386	
*	*Oxalis pes-caprae*	Soursob	502387	
	Oxalis spp.	Wood Sorrel	508835	
	Ozothamnus obcordatus	Grey Everlasting	501620	
	Pauridia vaginata	Yellow Star	503778	
	Persoonia chamaepeuce	Dwarf Geebung	502470	
	Pimelea curviflora s.s.	Curved Rice-flower	504832	
	Pimelea humilis	Common Rice-flower	502523	
	Pimelea linifolia subsp. *linifolia*	Slender Rice-flower	504819	
	Plantago varia	Variable Plantain	502566	
	Platylobium montanum subsp. *prostratum*	Mountain Flat-pea	528674	
	Poa sieberiana	Grey Tussock-grass	502608	
	Podolobium procumbens	Trailing Podolobium	502396	
	Pomaderris racemosa	Cluster Pomaderris	502671	
	Poranthera microphylla s.s.	Small Poranthera	507704	
	Prasophyllum brevilabre	Short-lip Leek-orchid	502703	
	Pteridium esculentum	Austral Bracken	502777	
	Pterostylis alpina s.s.	Mountain Greenhood	504873	
	Pterostylis clivicola	Mountain Midget Greenhood	507804	EN (FFG)
	Pterostylis concinna	Trim Greenhood	502789	
	Pterostylis decurva	Summer Greenhood	502793	
	Pterostylis melagramma	Tall Greenhood	504131	
	Pterostylis nutans	Nodding Greenhood	502806	
	Pterostylis parviflora s.s.	Tiny Greenhood	504033	
	Pterostylis rubescens	Mountain Red-tip Greenhood	528690	EN (FFG)
	Pultenaea daphnoides	Large-leaf Bush-pea	502844	
	Rhytidosporum procumbens	White Marianth	500402	
*	*Romulea rosea* var. *australis* s.s.	Common Onion-grass	504113	
*	*Rosa rubiginosa*	Sweet Briar	502950	
*	*Rubus fruticosus* spp. agg.	Blackberry	502952	
	Rytidosperma caespitosum	Common Wallaby-grass	500961	
	Rytidosperma geniculatum	Kneed Wallaby-grass	500965	
	Rytidosperma pallidum	Silvertop Wallaby-grass	500973	
	Rytidosperma penicillatum	Weeping Wallaby-grass	500974	
	Senecio glomeratus subsp. *glomeratus*	Annual Fireweed	507141	
	Senecio hispidulus s.s.	Rough Fireweed	504959	
	Senecio linearifolius var. *linearifolius*	Fireweed Groundsel (type variant)	505520	
	Senecio microbasis	Slender Fireweed	507171	VU (FFG)
	Senecio odoratus	Scented Groundsel	503120	
	Senecio phelleus	Stony Fireweed	507176	

Origin	Taxon name	Common name	VBA taxon number	Conservation Status
	Senecio picridioides	Hawkbit Fireweed	504961	
	Senecio prenanthoides	Beaked Fireweed	503126	
	Senecio quadridentatus	Cotton Fireweed	503124	
	Solanum laciniatum	Large Kangaroo Apple	503179	
	Stackhousia monogyna s.s.	Creamy Candles	528493	
	Stylidium armeria subsp. *armeria*	Common Triggerplant	528632	
	Stylidium armeria subsp. *pilosifolium*	Hairy-leaf Triggerplant	528495	CR (FFG)
	Stylidium graminifolium s.l.	Grass Triggerplant	503303	
	Styphelia humifusa	Cranberry Heath	500304	
	Tetratheca ciliata	Pink-bells	503351	
	Thelymitra aristata	Great Sun-orchid	503362	
	Thelymitra ixioides s.s.	Spotted Sun-orchid	505005	
	Thelymitra juncifolia	Rush-leaf Sun-orchid	504016	
	Thelymitra pallidifructus †	N/A	N/A	
	Themeda triandra	Kangaroo Grass	503387	
	Thysanotus patersonii	Twining Fringe-lily	503399	
	Thysanotus tuberosus subsp. *tuberosus*	Common Fringe-lily	504998	
	Tricoryne elatior	Yellow Rush-lily	503421	
*	*Ulex europaeus*	Gorse	503471	
*	*Vellereophyton dealbatum*	White Cudweed	503491	
	Veronica calycina	Hairy Speedwell	503503	
	Veronica gracilis	Slender Speedwell	503506	
	Viola betonicifolia	Showy Violet	503526	
	Viola hederacea sensu Thiele & Prober	Ivy-leaf Violet	505794	
*	*Vulpia bromoides*	Squirrel-tail Fescue	503544	
	Wahlenbergia multicaulis	Branching Bluebell	503560	
	Wahlenbergia stricta subsp. *stricta*	Tall Bluebell	503559	
	Wurmbea dioica subsp. *dioica*	Common Early Nancy	504082	
	Xanthorrhoea australis	Austral Grass-tree	503587	
	Xerochrysum viscosum	Shiny Everlasting	501633	

Appendix 2. Plant species recorded from Barrm Birrm in spring-summer 2022-23.

Flora records from this assessment have been entered into the VBA under project 7015.

Key to origin: # – Non-indigenous Victorian taxa; * – Exotic or non-indigenous Australian taxa; ⌀ – Uncertain origin

Origin	Taxon name	Common name	VBA taxon number
*	*Acacia baileyana* x *dealbata* subsp. *dealbata*	Cootamundra Wattle x Silver Wattle hybrid	505414
*	*Acacia baileyana*	Cootamundra Wattle	500014
	Acacia dealbata subsp. *dealbata*	Silver Wattle	505875
*	*Acacia decurrens*	Early Black-wattle	500028
#	*Acacia floribunda*	White Sallow-wattle	500036
	Acacia genistifolia	Spreading Wattle	500038
	Acacia gunnii	Ploughshare Wattle	500041
#	*Acacia howittii*	Sticky Wattle	500044
	Acacia leprosa var. *uninervia*	Large-leaf Cinnamon-wattle	505141
#	*Acacia longifolia* subsp. *longifolia*	Sallow Wattle	500053
	Acacia mearnsii	Black Wattle	500056
	Acacia melanoxylon	Blackwood	500057
	Acacia nanodealbata	Dwarf Silver Wattle	500064
	Acacia paradoxa	Hedge Wattle	500072
#	*Acacia pravissima*	Ovens Wattle	500077
*	*Acacia prominens*	Gosford Wattle	503649
	Acacia provincialis	Wirilda	504209
	Acacia pycnantha	Golden Wattle	500078
#	*Acacia salicina*	Willow Wattle	500083
	Acacia stricta	Hop Wattle	500091
	Acacia verniciflua s.l.	Varnish Wattle	500099
	Acacia verticillata subsp. *verticillata*	Prickly Moses	504213
	Acaena agnipila	Hairy Sheep's Burr	500104
	Acaena novae-zelandiae	Bidgee-widgee	500105
*	*Acetosella vulgaris*	Sheep Sorrel	502966
	Acrotriche serrulata	Honey-pots	500123
	Adiantum aethiopicum	Common Maidenhair	500129
*	*Agapanthus praecox* subsp. *orientalis*	Agapanthus	503638
*	*Agrostis capillaris* var. *capillaris*	Brown-top Bent	504225
*	*Aira elegantissima*	Delicate Hair-grass	500166
*	*Allium triquetrum*	Angled Onion	500179
	Allocasuarina littoralis	Black Sheoak	500677
	Amyema pendula subsp. *pendula* (s.s.)	Drooping Mistletoe	505169
	Anthosachne scabra (glabrous form)	Common Wheat-grass	507102
*	*Anthoxanthum odoratum*	Sweet Vernal-grass	500236
*	*Aphanes arvensis*	Parsley Piert	500239
	Aphelia pumilio	Dwarf Aphelia	500243
*	*Arbutus unedo*	Irish Strawberry Tree	500253
	Arthropodium milleflorum s.s.	Pale Vanilla-lily	505125
	Arthropodium strictum s.s.	Chocolate Lily	505126
	Asplenium flabellifolium	Necklace Fern	500288
	Austrostipa pubinodis	Tall Spear-grass	503288
	Austrostipa rudis subsp. *rudis*	Veined Spear-grass	504942
*	*Billardiera fusiformis*	Bluebell Creeper	503202
	Billardiera mutabilis	Common Apple-berry	504291

Origin	Taxon name	Common name	VBA taxon number
	Bossiaea prostrata	Creeping Bossiaea	500440
	Brachyscome diversifolia	Tall Daisy	500456
*	*Briza maxima*	Large Quaking-grass	500495
	Brunonia australis	Blue Pincushion	500508
	Burchardia umbellata	Milkmaids	500512
	Bursaria spinosa subsp. *spinosa*	Sweet Bursaria	500515
	Caladenia carnea s.s.	Pink Fingers	503680
	Caladenia praecox	Early Hood-orchid	500543
	Calochilus herbaceus	Leafless Beard-orchid	505420
	Calochilus robertsonii s.l.	Purple Beard-orchid	500589
	Calochilus therophilus	Slender Beard-orchid	500505
	Cassinia aculeata	Common Cassinia	500666
	Cassinia longifolia	Shiny Cassinia	500668
ø	*Cassinia sifton*	Drooping Cassinia	500667
	Cassytha glabella	Slender Dodder-laurel	500671
*	*Centaurium erythraea*	Common Centaury	500702
	Centrolepis strigosa subsp. *strigosa*	Hairy Centrolepis	500716
*	*Cerastium glomeratum* s.l.	Common Mouse-ear Chickweed	500719
	Cheilanthes sieberi subsp. *sieberi*	Narrow Rock-fern	500733
	Chiloglottis valida	Common Bird-orchid	504888
*	*Chlorophytum comosum*	Spider Plant	505405
	Chrysocephalum apiculatum subsp. *congestum*	Plains Everlasting	504281
	Chrysocephalum baxteri	White Everlasting	501608
	Chrysocephalum semipapposum subsp. *lineare*	Clustered Everlasting	903682
*	*Cicendia filiformis*	Slender Cicendia	500776
*	*Cirsium vulgare*	Spear Thistle	500782
	Comesperma volubile	Love Creeper	500801
	Coronidium scorpioides s.s.	Button Everlasting	501626
	Correa reflexa var. *reflexa*	Common Correa	504370
*	*Cortaderia selloana*	Pampas Grass	500825
	Cotula australis	Common Cotula	500846
	Craspedia variabilis	Variable Billy-buttons	504650
	Crassula decumbens var. *decumbens*	Spreading Crassula	500860
	Crassula sieberiana s.s.	Sieber Crassula	504378
	Cryptandra amara s.s.	Bitter Cryptandra	504317
	Cymbonotus preissianus	Austral Bear's-ear	500903
	Daucus glochidiatus	Australian Carrot	500989
	Daviesia leptophylla	Narrow-leaf Bitter-pea	501000
	Deyeuxia quadriseta	Reed Bent-grass	501023
	Dianella revoluta var. *revoluta* s.l.	Black-anther Flax-lily	504413
	Dichelachne rara	Common Plume-grass	503792
	Dichelachne sieberiana	Rough Plume-grass	503791
	Dichondra repens	Kidney-weed	501036
	Dillwynia cinerascens s.s.	Grey Parrot-pea	505931
	Dillwynia sericea	Showy Parrot-pea	501058
	Dipodium roseum s.s.	Rosy Hyacinth-orchid	504889
*	*Disa bracteata*	South African Orchid	505483
	Diuris pardina	Leopard Orchid	501080
	Diuris sulphurea	Tiger Orchid	501085
	Drosera auriculata	Tall Sundew	501102
	Drosera macrantha subsp. *macrantha*	Climbing Sundew	501106
*	*Ehrharta erecta* var. *erecta*	Panic Veldt-grass	501128
	Epacris impressa var. *impressa*	Common Heath	504478
	Epilobium billardierianum subsp. *cinereum*	Grey Willow-herb	504445
*	*Erica lusitanica*	Spanish Heath	501210

Origin	Taxon name	Common name	VBA taxon number
	Eucalyptus aromaphloia	Scentbark	501248
	Eucalyptus cephalocarpa s.s.	Mealy Stringybark	503733
	Eucalyptus dives	Broad-leaf Peppermint	501272
	Eucalyptus obliqua	Messmate Stringybark	501304
	Eucalyptus radiata subsp. *radiata*	Narrow-leaf Peppermint	503828
	Eucalyptus viminalis subsp. *viminalis*	Manna Gum	504463
	Euchiton japonicus s.s.	Creeping Cudweed	501466
	Exocarpos cupressiformis	Cherry Ballart	501350
*	*Freesia* spp.	Freesia	508446
	Gahnia radula	Thatch Saw-sedge	501394
	Galium gaudichaudii subsp. *gaudichaudii*	Rough Bedstraw	528457
*	*Gamochaeta purpurea* s.s.	Spiked Cudweed	504336
*	*Genista linifolia*	Flax-leaf Broom	501421
	Geranium potentilloides var. *potentilloides*	Soft Crane's-bill	505340
	Geranium sp. 2	Variable Crane's-bill	505343
	Geranium sp. 5	Naked Crane's-bill	505346
	Glossodia major	Wax-lip Orchid	501445
	Glycine clandestina	Twining Glycine	501455
	Gompholobium huegelii	Common Wedge-pea	501481
	Gonocarpus tetragynus	Common Raspwort	501489
	Goodenia ovata	Hop Goodenia	501507
	Grevillea alpina	Cat's Claw Grevillea	501526
#	*Grevillea rosmarinifolia*	Rosemary Grevillea	501550
	Hakea decurrens subsp. *physocarpa*	Bushy Needlewood	505071
	Hardenbergia violacea	Purple Coral-pea	501596
*	*Holcus lanatus*	Yorkshire Fog	501692
	Hovea heterophylla	Common Hovea	501705
	Hyalosperma demissum	Moss Sunray	501643
	Hydrocotyle callicarpa	Small Pennywort	501718
	Hydrocotyle foveolata	Yellow Pennywort	501720
	Hydrocotyle laxiflora	Stinking Pennywort	501723
	Hypericum gramineum spp. agg.	Small St John's Wort	501741
*	*Hypochaeris glabra*	Smooth Cat's-ear	501747
*	*Hypochaeris radicata*	Flatweed	501748
	Hypoxis hygrometrica var. *villosisepala*	Golden Weather-glass	504591
	Indigofera australis	Austral Indigo	501761
*	*Iris germanica*	German Iris	501763
*	*Isolepis levynsiana*	Tiny Flat-sedge	500936
	Isotoma fluviatilis subsp. *australis*	Swamp Isotome	501793
	Juncus amabilis	Hollow Rush	501803
*	*Juncus articulatus* subsp. *articulatus*	Jointed Rush	501806
⌀	*Juncus bufonius*	Toad Rush	501810
*	*Juncus bulbosus*	Bulbous Rush	501811
*	*Juncus capitatus*	Capitate Rush	501813
	Juncus holoschoenus	Joint-leaf Rush	501821
	Juncus pallidus	Pale Rush	501830
	Juncus pauciflorus	Loose-flower Rush	501831
	Juncus planifolius	Broad-leaf Rush	501833
	Kennedia prostrata	Running Postman	501847
	Lagenophora stipitata	Common Bottle-daisy	501863
	Lagenophora sublyrata	Slender Bottle-daisy	501861
*	*Leontodon saxatilis* subsp. *saxatilis*	Hairy Hawkbit	501895
	Lepidosperma curtisiae	Little Sword-sedge	501925
	Lepidosperma laterale var. *laterale*	Variable Sword-sedge	504700
	Leptoceras menziesii	Hare Orchid	500540

Origin	Taxon name	Common name	VBA taxon number
	Leptorhynchos squamatus subsp. *squamatus*	Scaly Buttons	505610
	Leptorhynchos tenuifolius	Wiry Buttons	501947
	Leptospermum continentale	Prickly Tea-tree	501956
	Leucopogon virgatus var. *virgatus*	Common Beard-heath	504391
	Lobelia pedunculata s.s.	Matted Pratia	505038
	Lomandra filiformis subsp. *coriacea*	Wattle Mat-rush	504709
	Lomandra filiformis subsp. *filiformis*	Wattle Mat-rush	504710
	Lomandra longifolia subsp. *longifolia*	Spiny-headed Mat-rush	504714
	Lomandra longifolia subsp. *exilis*	Cluster-headed Mat-rush	504713
	Luzula meridionalis var. *densiflora*	Common Woodrush	502069
	Luzula meridionalis var. *flaccida*	Common Woodrush	502070
*	*Lycium ferocissimum*	African Box-thorn	502078
*	*Lysimachia arvensis*	Pimpernel	500223
	Microlaena stipoides var. *stipoides*	Weeping Grass	502179
	Microseris walteri	Yam Daisy	503887
	Microtis spp.	Onion Orchid	508739
	Millotia tenuifolia var. *tenuifolia*	Soft Millotia	502192
	Monotoca scoparia	Prickly Broom-heath	502220
#	*Myoporum insulare*	Common Boobialla	502239
*	*Narcissus* spp.	Narcissus	508798
*	*Nassella trichotoma*	Serrated Tussock	502263
	Olearia argophylla	Musk Daisy-bush	502299
	Olearia lirata	Snowy Daisy-bush	502312
	Olearia myrsinoides	Silky Daisy-bush	502316
	Opercularia varia	Variable Stinkweed	502344
	Oxalis perennans	Grassland Wood-sorrel	502386
*	*Oxalis purpurea*	Large-flower Wood-sorrel	502388
	Ozothamnus obcordatus	Grey Everlasting	501620
	Persoonia chamaepeuce	Dwarf Geebung	502470
	Pimelea curviflora subsp. *sericea*	Curved Rice-flower	504145
	Pimelea humilis	Common Rice-flower	502523
	Pimelea linifolia subsp. *linifolia*	Slender Rice-flower	504819
*	*Pinus radiata* var. *radiata*	Radiata Pine	505190
#	*Pittosporum undulatum*	Sweet Pittosporum	502543
*	*Plantago lanceolata*	Ribwort	502561
	Plantago varia	Variable Plantain	502566
	Poa ensiformis	Sword Tussock-grass	502590
	Poa labillardierei var. *labillardierei*	Common Tussock-grass	504694
	Poa sieberiana var. *sieberiana*	Grey Tussock-grass	504835
	Podolepis decipiens	Common Podolepis	903502
	Podolobium procumbens	Trailing Podolobium	502396
	Pomaderris racemosa	Cluster Pomaderris	502671
	Poranthera microphylla s.s.	Small Poranthera	507704
	Pteridium esculentum	Austral Bracken	502777
	Pterostylis melagramma	Tall Greenhood	504131
	Pterostylis nutans	Nodding Greenhood	502806
	Pterostylis parviflora s.s.	Tiny Greenhood	504033
*	*Quercus robur*	English Oak	502884
	Rhytidosporum procumbens	White Marianth	500402
*	*Rubus anglocandicans*	Common Blackberry	502959
	Rytidosperma geniculatum	Kneed Wallaby-grass	500965
	Rytidosperma pallidum	Silvertop Wallaby-grass	500973
	Rytidosperma spp.	Wallaby Grass	508414
	Schoenus apogon	Common Bog-sedge	503039
	Sebaea ovata	Yellow Sebaea	503092

Origin	Taxon name	Common name	VBA taxon number
	Senecio glomeratus subsp. *glomeratus*	Annual Fireweed	507141
	Senecio hispidulus s.s.	Rough Fireweed	504959
	Senecio linearifolius var. *linearifolius*	Fireweed Groundsel (type variant)	505520
	Senecio microbasis	Slender Fireweed	507171
	Senecio odoratus	Scented Groundsel	503120
	Senecio phelleus	Stony Fireweed	507176
	Senecio prenanthoides	Beaked Fireweed	503126
*	*Sherardia arvensis*	Field Madder	503138
	Siloxerus multiflorus	Small Wrinklewort	502983
	Solenogyne dominii	Smooth Solenogyne	503195
*	*Sonchus asper* s.s.	Rough Sow-thistle	505712
*	*Sonchus oleraceus*	Common Sow-thistle	503204
	Stackhousia monogyna s.s.	Creamy Candles	528493
	Stellaria pungens	Prickly Starwort	503255
	Stuartina muelleri	Spoon Cudweed	503300
	Stylidium armeria subsp. *armeria*	Common Triggerplant	528632
	Stylidium armeria subsp. *pilosifolium*	Hairy-leaf Triggerplant	528495
	Stylidium graminifolium s.s.	Grass Triggerplant	504971
	Styphelia humifusa	Cranberry Heath	500304
	Tetratheca ciliata	Pink-bells	503351
	Thelymitra spp.	Sun Orchid	509134
	Themeda triandra	Kangaroo Grass	503387
	Thysanotus patersonii	Twining Fringe-lily	503399
	Thysanotus tuberosus subsp. *tuberosus*	Common Fringe-lily	504998
*	*Trifolium dubium*	Suckling Clover	503427
	Triptilodiscus pygmaeus	Common Sunray	501640
*	*Ulex europaeus*	Gorse	503471
	Veronica calycina	Hairy Speedwell	503503
	Viola cleistogamoides	Hidden Violet	505056
	Viola hederacea sensu Thiele & Prober	Ivy-leaf Violet	505794
	Vittadinia gracilis	Woolly New Holland Daisy	503539
	Wahlenbergia capillaris s.s.	Tufted Bluebell	504123
	Wahlenbergia gracilenta s.s.	Hairy Annual-bluebell	504124
	Wahlenbergia stricta subsp. *stricta*	Tall Bluebell	503559
*	*Watsonia meriana* var. *bulbillifera*	Bulbil Watsonia	503562
#	*Westringia glabra*	Violet Westringia	503570
	Wurmbea dioica	Common Early Nancy	503581
	Xanthorrhoea australis	Austral Grass-tree	503587
	Xerochrysum viscosum	Shiny Everlasting	501633

Appendix 3. Fauna species recorded from Barrm Birrm.

The species list includes all taxa recorded in the ALA from Barrm Birrm as of 15 February 2023 (ALA 2023b), bird species collected by Council on 23 September 2022 (recorded on BirdData), and incidental fauna species recorded during field surveys. The source of ALA records includes NatureShare, iNaturalist Australia, Victorian Biodiversity Atlas (VBA), BioCollect, Echidna-CSI, BowerBird, Commonwealth Scientific and Industrial Research Organisation, and the Australian National Insect Collection. The nomenclature reflects the taxonomy in use by the ALA except where a more up-to-date taxon or common name is in use in Victoria. Many invertebrates do not currently have a formal common name adopted by the ALA.

Key to status: EN – Endangered; VU – Vulnerable; MTS – Migratory Terrestrial Species; EPBC – *Environment Protection and Biodiversity Conservation Act 1999*; FFG – *Flora and Fauna Guarantee Act 1988*

Taxon name	Common name	Status
Amphibians		
Crinia signifera	Common Froglet	
Limnodynastes dumerilii	Eastern Banjo Frog	
Mammals		
Macropus giganteus	Eastern Grey Kangaroo	
Petaurus notatus	Krefft's Glider	
Phascolarctos cinereus	Koala	
Pseudocheirus peregrinus	Common Ringtail Possum	
Tachyglossus aculeatus	Short-beaked Echidna	
Vespadelus vulturnus	Little Forest Bat	
Wallabia bicolor	Swamp Wallaby	
Molluscs		
Limax maximus	Leopard Slug	
Reptiles		
Tiliqua nigrolutea	Southern Blue-tongue	
Birds		
Acanthiza lineata	Striated Thornbill	
Acanthiza nana	Yellow Thornbill	
Acanthiza pusilla	Brown Thornbill	
Acanthiza reguloides	Buff-rumped Thornbill	
Acanthorhynchus tenuirostris	Eastern Spinebill	
Anthochaera carunculata	Red Wattlebird	
Aquila audax	Wedge-tailed Eagle	
Ardea pacifica	White-necked Heron	
Cacatua galerita	Sulphur-crested Cockatoo	
Cacatua tenuirostris	Long-billed Corella	
Cacomantis flabelliformis	Fan-tailed Cuckoo	
Caligavis chrysops	Yellow-faced Honeyeater	
Callocephalun fimbriatum	Gang-gang Cockatoo	VU (EPBC)
Chalcites lucidus	Shining Bronze-Cuckoo	
Chenonetta jubata	Australian Wood Duck	
Colluricincla harmonica	Grey Shrike-thrush	
Coracina novaehollandiae	Black-faced Cuckoo-shrike	
Corcorax melanorhamphos	White-winged Chough	
Cormobates leucophaea	White-throated Treecreeper	
Corvus mellori	Little Raven	
Dacelo novaeguineae	Laughing Kookaburra	
Dicaeum hirundinaceum	Mistletoebird	
Gerygone fusca	Western Gerygone	
Gymnorhina tibicen	Australian Magpie	
Heteroscenes pallidus	Pallid Cuckoo	
Malurus cyaneus	Superb Fairy-wren	

Taxon name	Common name	Status
Birds (continued)		
Melithreptus brevirostris	Brown-headed Honeyeater	
Myiagra cyanoleuca	Satin Flycatcher	MTS
Myiagra rubecula	Leaden Flycatcher	
Ninox strenua	Powerful Owl	VU (FFG)
Oriolus sagittatus	Olive-backed Oriole	
Pachyceph pectoralis	Golden Whistler	
Pachyceph rufiventris	Rufous Whistler	
Pardalotus punctatus	Spotted Pardalote	
Pardalotus striatus	Striated Pardalote	
Passer domesticus	House Sparrow	
Petroica boodang	Scarlet Robin	
Phaps chalcoptera	Common Bronzewing	
Phylidonyris novaehollandiae	New Holland Honeyeater	
Platycercus elegans	Crimson Rosella	
Podargus strigoides	Tawny Frogmouth	
Rhipidura fuliginosa	Grey Fantail	
Rhipidura leucophyrs	Willie Wagtail	
Sericornis frontalis	White-fronted Scrubwren	
Strepera graculina	Pied Currawong	
Strepera versicolor	Grey Currawong	
Todiramphus sanctus	Sacred Kingfisher	
Turdus merula	Common Blackbird	
Zanda funereus	Yellow-tailed Black-Cockatoo	
Zosterops lateralis	Silvereye	
Invertebrates		
Adversaeschna brevistyla		
Aedes alboannulatus		
Anax papuensis	Australian Emperor	
Araneus talipedatus		
Australomisidia pilula		
Austrogomphus guerini		
Austrolestes analis		
Belenois java	Caper White	
Certonotus nitidulus		
Chrysolarentia vicissata		
Commius elegans		
Cryptobothrus chrysophorus	Golden Band-wing	
Delias aganippe	Wood White	
Diplacodes bipunctata		
Epidesmia hypenaria		
Erina hyacinthina	Common Dusky Blue	
Eriophora pustulosa		
Geitoneura acantha	Eastern Ringed Xenica	
Geitoneura klugii	Klug's Xenica	
Goniaea australsiae	Gumleaf Grasshopper	
Invertebrates (continued)		
Harmonia conformis		
Hemicordulia tau		
Heteronympha merope	Common Brown	
Heteronympha penelope		
Junonia villida		
Leptomyrmex erythrocephalus		
Leptotarsus costalis		
Leptotarsus luteisubcostatus		
Myrmecia gulosa		
Myrmecia pilosula		
Nephila edulis	Australian Golden Orb-weaving Spider	
Ogyris olane	Olane Azure	

Taxon name	Common name	Status
Invertebrates (continued)		
Orthetrum caledonicum		
Peltoschema orphana		
Phaulacridium vittatum	Wingless Grasshopper	
Phelotis cognata		
Pollanisus viridipulverulenta		
Praxis edwardsii		
Pseudalmenus chlorinda		
Rhitz modesta	Upland Heath Grasshopper	
Rhytidoponera metallica		
Stenoptilia zophodactylus		
Syllitus rectus		
Taxeotis intextata		
Trapezites phigalioides	Phigalioides Skipper	
Tryonocryptus gigas		
Turneromyia bassiana		
Uresiphita ornithopteralis		
Vanessa kershawi	Australian Painted Lady	
Wingia aurata		
Zizina Otis	Common Grass-blue	

Appendix 4. Priority weed species at Barrm Birrm.

Priority weeds classes selected species listed in Appendices 1 and 2 by lifeform. The list includes woody weeds (trees, shrubs and woody climbers) and perennial herbs and grasses including all geophytes except for *Romulea rosea* (Onion Grass); annual herbs and grasses are excluded and should be managed on a case-by-case basis where they are deemed to be persistently over-abundant or a threat to individual restoration projects, where resources permit. Two species of short-lived perennial grasses, *Anthoxanthum odoratum* (Sweet Vernal-grass) and *Holcus lanatus* (Yorkshire Fog) often increase in abundance during productive, winter-wet years and decrease during dry years and drought and can appear to pose a high threat to biodiversity during these productive years, noting that Sweet Vernal-grass is common in Herb-rich Foothill Forest and disturbed areas of other EVCs while Yorkshire Fog is likely to only occur in particularly damp sites. These two species have been excluded from the list below as their management requirements are consistent with the approach outlined for annual grasses and herbs.

For further information on the risk rating of individual weed species and for appropriate methods for control and eradication, consult the latest version of the *Advisory List of Environmental Weeds in Victoria* (White *et al*. 2022) and the Victorian Government's *Weeds at the Early Stages of Invasion* project resources, including the *Early Invader Manual* (Blood et al. 2019).

In the table below all species suffixed with a '1' were not detected during the field survey (Appendix 2) but may be present and should be considered priority weeds if found.

Taxon Name	Common Name	Priority Level
Woody weeds (trees, shrubs and woody climbers)		
Acacia baileyana	Cootamundra Wattle	High
Acacia baileyana x *dealbata* subsp. *dealbata*	Cootamundra Wattle x Silver Wattle hybrid	High
Acacia decurrens [1]	Early Black-wattle	High
Acacia elata [1]	Cedar Wattle	High
Acacia floribunda	White Sallow-wattle	High
Acacia howittii	Sticky Wattle	High
Acacia iteaphylla [1]	Flinders Range Wattle	High
Acacia longifolia subsp. *longifolia*	Sallow Wattle	High
Acacia pravissima	Ovens Wattle	High
Acacia prominens	Gosford Wattle	High
Acacia salicina	Willow Wattle	High
Arbutus unedo	Irish Strawberry Tree	High
Cytisus scoparius [1]	English Broom	High
Dodonaea viscosa 'Purpurea' [1]	Purple Hop-bush	High
Erica lusitanica	Spanish Heath	High
Genista linifolia	Flax-leaf Broom	High
Grevillea rosmarinifolia hybrids [1]	Rosemary Grevillea hybrids	High
Hakea laurina	Pincushion Hakea	High
Lycium ferocissimum	African Box-thorn	High
Myoporum insulare	Common Boobialla	High
Pinus radiata var. *radiata*	Radiata Pine	High
Pittosporum undulatum	Sweet Pittosporum	High
Rosa rubiginosa	Sweet Briar	High
Quercus robur	English Oak	High
Rubus anglocandicans	Common Blackberry	High
Ulex europaeus	Gorse	High
Westringia glabra	Violet Westringia	High
Billardiera fusiformis	Bluebell Creeper	High
Geophytes		
Allium triquetrum	Angled Onion	Low
Chlorophytum comosum	Spider Plant	High

Taxon Name	Common Name	Priority Level
Geophytes (continued)		
Disa bracteata	South African Orchid	High
Freesia spp.	Freesia	High
Ipheion uniflorum [1]	Spring Star-flower	Low
Narcissus spp.	Narcissus	High
Oxalis pes-caprae [1]	Soursob	High
Oxalis purpurea	Large-flower Wood-sorrel	Low
Watsonia meriana var. *bulbillifera*	Bulbil Watsonia	High
Perennial grasses		
Agrostis capillaris var. *capillaris*	Brown-top Bent	Low
Ehrharta erecta var. *erecta*	Panic Veldt-grass	Low
Nassella trichotoma	Serrated Tussock	High
Perennial herbs		
Acetosella vulgaris	Sheep Sorrel	Low
Agapanthus praecox subsp. *orientalis*	Agapanthus	High
Cortaderia selloana	Pampas Grass	High
Cynara cardunculus subsp. *flavescens*	Artichoke Thistle	High
Hypochaeris radicata	Flatweed	Low
Iris germanica	German Iris	High
Juncus articulatus subsp. *articulatus*	Jointed Rush	Low
Juncus bulbosus	Bulbous Rush	Low
Leontodon saxatilis subsp. *saxatilis*	Hairy Hawkbit	Low
Medicago sativa subsp. *sativa* [1]	Lucerne	Low
Plantago lanceolata	Ribwort	Low

Appendix 5. Plant species recommended for use in ecological restoration projects at Barrm Birrm.

The list below excludes species that are likely to be exceedingly difficult to use in revegetation and require specialist knowledge to propagate, for example terrestrial orchids and small annual herbs. However, the list still includes some locally occurring species that are not widely available from commercial nurseries and may be difficult to acquire but are common features of the native vegetation at Barrm Birrm. At species that are not available from nurseries can still be considered a part of revegetation where they re-establish at the site through other means (i.e., natural regeneration on restoration sites).

Taxon Name	Common Name	Suitable habitat and planting considerations
Trees (Eucalyptus only)		
Eucalyptus aromaphloia	Scentbark	GF, GDF, HDF
Eucalyptus cephalocarpa	Mealy Stringybark	GF, GDF, HDF
Eucalyptus dives	Broad-leaf Peppermint	GF, GDF, HDF
Eucalyptus obliqua	Messmate Stringybark	GF, GDF, HDF, HRFF
Eucalyptus radiata subsp. *radiata*	Narrow-leaf Peppermint	GF
Eucalyptus viminalis subsp. *viminalis*	Manna Gum	GF, GDF
Upright shrubs (excluding Acacia)		
Bursaria spinosa subsp. spinosa	Sweet Bursaria	GF, GDF, HDF, HRFF
Daviesia leptophylla	Narrow-leaf Bitter-pea	GF, GDF, HDF, HRFF
Dillwynia cinerascens	Grey Parrot-pea	GF, GDF, HRFF
Dillwynia sericea	Showy Parrot-pea	GF, GDF, HDF
Goodenia ovata	Hop Goodenia	GF, HRFF, along drainage lines or on sheltered slopes
Grevillea alpina	Cat's Claw Grevillea	GF, GDF
Hakea decurrens subsp. *physocarpa*	Bushy Needlewood	GDF
Indigofera australis	Austral Indigo	GF, GDF, HRFF
Leptospermum continentale	Prickly Tea-tree	GF, riparian sites
Monotoca scoparia	Prickly Broom-heath	GDF, HDF
Olearia argophylla	Musk Daisy-bush	HRFF, riparian and sheltered sites
Olearia lirata	Snowy Daisy-bush	HRFF
Ozothamnus obcordatus	Grey Everlasting	GF, GDF, HDF, HRFF
Pimelea linifolia subsp. *linifolia*	Slender Rice-flower	GDF, HDF
Pomaderris racemosa	Cluster Pomaderris	GF, GDF, HRFF on riparian sites or sheltered slopes
Pultenaea daphnoides	Large-leaf Bush-pea	GF, GDF, HDF, HRFF
Low shrubs		
Acrotriche prostrata	Trailing Ground-berry	GF, GDF, HDF, HRFF
Acrotriche serrulata	Honey-pots	GF, GDF, HDF
Brachyloma ciliatum	Fringed Brachyloma	HDF
Cryptandra amara	Bitter Cryptandra	HDF
Gompholobium huegelii	Common Wedge-pea	GDF, HDF
Hovea heterophylla	Common Hovea	GF, GDF, HDF
Kennedia prostrata	Running Postman	GF, GDF, HDF
Leucopogon virgatus var. *virgatus*	Common Beard-heath	GF, GDF, HDF
Olearia myrsinoides	Silky Daisy-bush	GF, GDF
Persoonia chamaepeuce	Dwarf Geebung	GDF, HDF
Pimelea curviflora subsp. *sericea*	Curved Rice-flower	GF
Pimelea humilis	Common Rice-flower	GF, GDF, HDF, HRFF
Platylobium montanum subsp. *prostratum*	Mountain Flat-pea	GF, GDF, HRFF
Podolobium procumbens	Trailing Podolobium	GDF, HDF
Styphelia humifusa	Cranberry Heath	GF, GDF

Taxon Name	Common Name	Suitable habitat and planting considerations
Low shrubs (continued)		
Tetratheca ciliata	Pink-bells	GF, GDF
Ferns		
Calochlaena dubia	Common Ground-fern	HRFF
Pteridium esculentum	Austral Bracken	HRFF
Scramblers and climbers		
Billardiera mutabilis	Common Apple-berry	GF, GDF
Clematis aristata	Mountain Clematis	GF, GDF, HRFF
Clematis microphylla s.s.	Small-leaved Clematis	GF, GDF, HRFF
Comesperma volubile	Love Creeper	GF, GDF, HRFF
Glycine clandestina	Twining Glycine	GF, GDF, HRFF
Hardenbergia violacea	Purple Coral-pea	GF, GDF, HDF, HRFF
Graminoids (excluding grasses)		
Dianella revoluta var. *revoluta*	Black-anther Flax-lily	GF, GDF, HDF, HRFF
Gahnia radula	Thatch Saw-sedge	GF along drainage lines in sodden areas
Juncus amabilis	Hollow Rush	Riparian sites
Juncus gregiflorus	Green Rush	Riparian sites
Juncus holoschoenus	Joint-leaf Rush	Riparian sites
Juncus pallidus	Pale Rush	Riparian sites
Juncus pauciflorus	Loose-flower Rush	Riparian sites
Lepidosperma curtisiae	Little Sword-sedge	HDF
Lepidosperma laterale var. *laterale*	Variable Sword-sedge	GF, GDF, HDF, HRFF
Lomandra filiformis subsp. *coriacea*	Wattle Mat-rush	GF, GDF, HDF, HRFF
Lomandra filiformis subsp. *filiformis*	Wattle Mat-rush	GF, GDF, HRFF
Lomandra longifolia subsp. *exilis*	Cluster-headed Mat-rush	GDF, HDF
Lomandra longifolia subsp. *longifolia*	Spiny-headed Mat-rush	HRFF
Grasses		
Anthosachne scabra	Common Wheat-grass	GF
Austrostipa pubinodis	Tall Spear-grass	GF, GDF
Austrostipa rudis subsp. *rudis*	Veined Spear-grass	GF, GDF
Austrostipa semibarbata	Fibrous Spear-grass	GF, GDF
Deyeuxia quadriseta	Reed Bent-grass	GF, GDF, HRFF
Dichelachne rara	Common Plume-grass	GF, GDF, HRFF
Dichelachne sieberiana	Rough Plume-grass	GF, GDF, HRFF
Microlaena stipoides var. *stipoides*	Weeping Grass	GF, HRFF
Poa ensiformis	Sword Tussock-grass	Riparian sites
Poa labillardierei var. *labillardierei*	Common Tussock-grass	GF, HRFF on riparian sites or sheltered slopes
Poa sieberiana var. *sieberiana*	Grey Tussock-grass	GF, GDF, HDF, HRFF
Rytidosperma caespitosum	Common Wallaby-grass	GF
Rytidosperma geniculatum	Kneed Wallaby-grass	GF, GDF, HDF, HRFF
Rytidosperma pallidum	Silvertop Wallaby-grass	GDF, HDF
Rytidosperma penicillatum	Weeping Wallaby-grass	GF, GDF, HDF, HRFF
Themeda triandra	Kangaroo Grass	GF
Herbs		
Acaena agnipila	Hairy Sheep's Burr	GF
Acaena novae-zelandiae	Bidgee-widgee	HRFF, or in GF and GDF in riparian sites
Arthropodium milleflorum	Pale Vanilla-lily	GF, GDF, HDF, HRFF
Arthropodium strictum	Chocolate Lily	GF, GDF, HDF, HRFF
Asperula scoparia subsp. *scoparia*	Prickly Woodruff	GF, GDF, HDF, HRFF
Bossiaea prostrata	Creeping Bossiaea	GF, GDF, HRFF
Brachyscome diversifolia	Tall Daisy	GF, GDF, HRFF
Brunonia australis	Blue Pincushion	GF, GDF, HRFF
Burchardia umbellata	Milkmaids	GF, GDF, HRFF
Caesia parviflora	Pale Grass-lily	GF, GDF, HRFF

Taxon Name	Common Name	Suitable habitat and planting considerations
Herbs (continued)		
Chrysocephalum apiculatum subsp. *congestum*	Plains Everlasting	GF
Chrysocephalum baxteri	White Everlasting	HDF
Chrysocephalum semipapposum	Clustered Everlasting	GF, GDF, HDF, HRFF
Coronidium scorpioides	Button Everlasting	GF, GDF, HRFF
Craspedia variabilis	Variable Billy-buttons	GF, GDF, HRFF
Cymbonotus preissianus	Austral Bear's-ear	GF, GDF, HRFF
Dichondra repens	Kidney-weed	GF, GDF, HRFF
Geranium potentilloides var. *potentilloides*	Soft Crane's-bill	HRFF
Geranium sp. 2	Variable Crane's-bill	GF, GDF, HDF, HRFF
Gonocarpus tetragynus	Common Raspwort	GF, GDF, HDF, HRFF
Isotoma fluviatilis subsp. *australis*	Swamp Isotome	Riparian sites
Lagenophora stipitata	Common Bottle-daisy	HRFF
Lagenophora sublyrata	Slender Bottle-daisy	HRFF
Leptorhynchos tenuifolius	Wiry Buttons	GF, GDF, HDF
Lobelia pedunculata	Matted Pratia	HRFF
Microseris walteri	Yam Daisy	GF, GDF, HDF
Opercularia ovata	Broad-leaf Stinkweed	GF, GDF
Opercularia varia	Variable Stinkweed	GF, GDF, HDF, HRFF
Oxalis exilis	Shady Wood-sorrel	GF, HRFF
Oxalis perennans	Grassland Wood-sorrel	GF, GDF, HRFF
Plantago varia	Variable Plantain	GF, GDF, HDF, HRFF
Podolepis decipiens	Common Podolepis	GF, GDF
Rhytidosporum procumbens	White Marianth	GF, GDF, HDF, HRFF
Senecio glomeratus subsp. *glomeratus*	Annual Fireweed	GF, GDF, HDF, HRFF
Senecio hispidulus	Rough Fireweed	GF, GDF, HDF, HRFF
Senecio linearifolius var. *linearifolius*	Fireweed Groundsel	HRFF
Senecio microbasis	Slender Fireweed	GDF, HDF
Senecio odoratus	Scented Groundsel	GF, HRFF
Senecio phelleus	Stony Fireweed	GF, GDF, HDF, HRFF
Senecio prenanthoides	Beaked Fireweed	GF, HRFF
Senecio quadridentatus	Cotton Fireweed	GF
Solenogyne dominii	Smooth Solenogyne	GF, GDF, HDF, HRFF
Stackhousia monogyna	Creamy Candles	GF, GDF, HRFF
Stellaria pungens	Prickly Starwort	HRFF
Stylidium armeria subsp. *armeria*	Common Triggerplant	GF
Stylidium armeria subsp. *pilosifolium*	Hairy-leaf Triggerplant	GDF, HDF
Thysanotus patersonii	Twining Fringe-lily	GF, GDF
Thysanotus tuberosus subsp. *tuberosus*	Common Fringe-lily	GF, GDF, HDF
Tricoryne elatior	Yellow Rush-lily	GF
Veronica calycina	Hairy Speedwell	GF, GDF, HRFF
Veronica gracilis	Slender Speedwell	GF
Viola cleistogamoides	Hidden Violet	GF, GDF
Viola hederacea	Ivy-leaf Violet	GF, GDF, HRFF
Vittadinia gracilis	Woolly New Holland Daisy	GF, GDF
Wahlenbergia capillaris	Tufted Bluebell	GF, GDF
Wahlenbergia stricta subsp. *stricta*	Tall Bluebell	GF, GDF, HDF, HRFF
Wurmbea dioica subsp. *dioica*	Common Early Nancy	GF, GDF, HDF, HRFF
Xerochrysum viscosum	Shiny Everlasting	GF, GDF, HDF