

# Ocean Grove Nature Reserve

Ecological Values and Conservation Needs



Report for  
The Friends of Ocean Grove Nature Reserve  
July 2020



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## 1 SUMMARY

Ocean Grove Nature Reserve (OGNR) is the largest remnant (143 ha) of non-coastal indigenous vegetation on the Bellarine Peninsula. It was purchased by a volunteer committee and is now managed by Parks Victoria with support from the Friends of Ocean Grove Nature Reserve. OGNR is bounded by farmland and residential estates which contribute to its ecological values and connectivity, but ongoing loss and degradation of indigenous vegetation outside of OGNR has reduced the ecological values within OGNR. It is dominated by Grassy Woodland, which is listed as endangered in the Corangamite catchment, and Heathy Woodland. The structure and species composition of this woodland has changed over time and especially since the 1970s as a result of fire, drought, over-grazing and plant diseases, but OGNR has remarkably few weeds compared to similar woodland remnants.

OGNR supports five species listed as globally threatened, two species listed as nationally threatened and seven species listed as threatened in Victoria. Perhaps of greater relevance is that some species now occur nowhere else in the jurisdiction of the City of Greater Geelong and/or the Bellarine region. For example, the Prickly Geebung tree (see Plate 10) might now be restricted to a single naturally occurring individual in the whole Bellarine region. The presence of species such as echidnas and wallabies, and the expanse of peaceful natural vegetation is highly valued by local residents and visitors. These values are increasingly important as the population of Ocean Grove and the Bellarine region grows.

Maintenance and enhancement of these values requires ongoing management interventions. Management actions are suggested in Table 1 for the conservation of OGNR's priority ecological values. These need to be combined with management needs for other objectives, such as visitor amenity and safety, and developed into a formal Management Plan for Parks Victoria and the Friends of OGNR.



**Plate 1.** OGNR is of global importance for Bellarine Yellow Gums. These trees also provide habitat for the critically endangered Swift Parrot and provide the open woodland landscape preferred by visitors

**Table 1:** Summary of suggested Management Actions

Conservation Value	Threatening Process	Management Actions
Grassy Woodland  and  Bellarine Yellow Gum  and  Other plants of conservation value	Lack of Fire	Initiate an experimental programme of small cool management burns, such as Indigenous burns
		Mechanical slashing for ecological objectives and fire risk management
		Clear mid-storey species immediately adjacent to individual eucalypts
		Plant new eucalypts away from competing trees and mid-storey species, protect against grazing with wire guards, and water through droughts
		Map each individual Bellarine Yellow Gum and record the size, an index of health and any management interventions
		Monitor changes to ecosystems through permanent photographic points
	Environmental Weeds	Remove every high-risk weed (e.g. Gorse; Boneseed) before it seeds
		Minimise disturbance that creates bare ground suitable for weed germination
		Extend weed eradication to the narrow inaccessible gap between the two perimeter fences
		Map all exotic planted trees and shrubs, perhaps at decadal intervals, to monitor recruitment and spread
Phytophthora Dieback	Prohibit and/or clean with disinfectant any vehicles off the main tracks within three days of rain	
	Encourage visitors to keep to marked tracks in OGNR	
Over Grazing	Install possum-exclusion collars on individual live eucalypts	
	Install additional larger wallaby exclosures	
Climate Change	Plant trees that are genetically better adapted to the predicted future climate	
Swift Parrot	Other	Monitor other threatening processes e.g. Noisy Miners and Honey Bees
Bibron's Toadlet	Wetland Loss	Maintain current hydrology to the north of OGNR
	Climate Change	Experimentally deepen some suitable depressions
Koala, Echidna and birds of conservation value	Land Clearance; Habitat Fragmentation	Prohibit and discourage any clearance of indigenous vegetation with potential connectivity to OGNR, even tiny remnants, through planning controls and incentives for private land-holders
		Incentivise planting of indigenous vegetation, especially as corridors or biolinks, across large areas with connectivity to OGNR
Other fauna species	Loss of Hollow-bearing Trees	Maintain hollow-bearing dead trees and stags
		Consider installing nest-boxes for educational purposes and specific species (e.g. kookaburra and bats)
	Predation by Cats	Advocate prohibitions on domestic cats in residential developments that neighbour OGNR
	Predation by Foxes	Destroy any fox dens within OGNR
	Disturbance by Visitors & Dogs	Maintain and enforce the prohibition of dogs in OGNR
		Light and Noise Pollution
Advocate use of 'best practice lighting design' in nearby developments		
Other plant species	Multiple Threats	Consider pollination and/or propagation of key species

# 1 INTRODUCTION

Biodiversity Solutions and Beacon Ecological were engaged by the Friends of Ocean Grove Nature Reserve (FOGNR) to develop an ecological and conservation needs assessment for the Ocean Grove Nature Reserve (OGNR). This report details the ecological and conservation values within the OGNR, the threatening processes and potential management actions to protect and enhance these values.

## 1.1 STUDY AREA

The 143 ha Ocean Grove Nature Reserve is located on the northern edge of Ocean Grove, a rapidly growing coastal town on the Bellarine Peninsula, south-east of Geelong. OGNR is bounded by farmland to the west and north, the Ocean Grove north-east growth area to the east and the Yellow Gums and Woodlands residential sub-divisions to the south. In the late 1960s, the OGNR, Woodlands and Yellow Gums estates formed a largely uncleared square mile of indigenous vegetation. These residential estates and the surrounding farmland contribute to the ecological values and connectivity of OGNR.

OGNR is located within a Public Conservation and Resource Zone (PCRZ) of the City of Greater Geelong Shire Planning Scheme and is covered by a Bushfire Management Overlay (BMO) (DELWP 2020c). The majority of the site is modelled as Location Risk 3 under DELWP location risk modelling (DELWP 2020a).

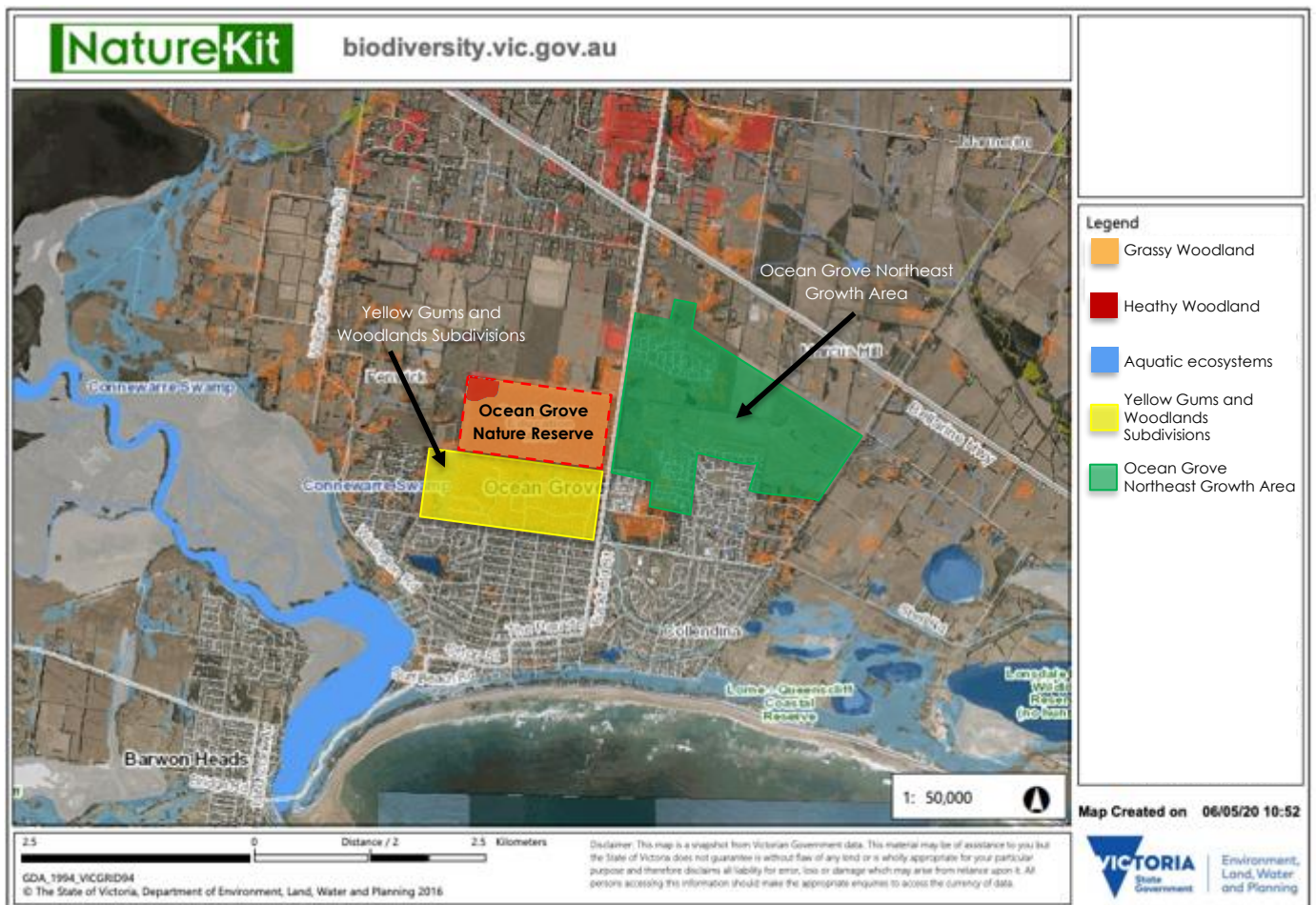


Figure 1. Location of OGNR and 2005 mapped native vegetation (DELWP 2020a)



## 1.2 ECOLOGICAL HISTORY

The Wadawurrung people lived across the Bellarine until British colonisation in the 1830s and land divisions in the 1850's. The earliest documented descriptions of the landscape describe open grassy woodlands but there are no details of fire or other land management practices. Between 1850 and 1960, the OGNR was probably used for timber and firewood, stripping the bark of Golden Wattles *Acacia pycnantha* for leather tanning and occasional sheep grazing. By the 1960s, no fires had occurred during living memory. Most nearby land was cleared. The remnant square mile of bushland was sold in the 1960s. Two blocks which now constitute the OGNR were bought in 1969 and 1973 through a community-led public appeal. (The other blocks have become the adjacent Woodlands and Yellow Gums housing subdivisions.) Approximately half of the eastern block had been cleared in strips, windrows formed and cattle introduced in anticipation of housing development (FOGNR 2017).

Following purchase and declaration of the reserve, a management committee oversaw a range of works including weed control, plantings (including non-indigenous species) and infrastructure development (including the information centre, picnic area, carpark, perimeter fence and excavation of the central wetland). A fuel reduction burn was undertaken in 1982, followed by 20 different fires in the 1990s. Non-indigenous plants were no longer planted and some were removed, to be replaced with indigenous plants. The management of the reserve was ceded to government in 1994, supported by a 'Friends' group. Subsequent restoration works included replanting Yellow Gums, constructing the 'tennis court' exclosures in 2005, using a forest mower from 2006 and ongoing weed control.

## 1.3 ECOLOGICAL SUCCESSION

The structure and species composition of trees in the OGNR has changed significantly since the 1970s, and this has caused significant changes to other flora and the fauna. There have been a series of studies investigating ecological succession (e.g. Lunt 1998a, Lunt 1998b, Withers 1978a, 1978b, 1979, Withers and Ashton 1977, Zeeman 2013), These have concluded that the following factors are determining the current and future ecosystems within the reserve:

- Fire: frequent 'cool' fires are thought to maintain an open woodland structure by suppressing mid-storey plants, while having little impact on established *Eucalyptus* trees which remain widely spaced from competition for light and water (Withers and Ashton 1977, Lunt 1998a, Lunt 1998b);
- Drought: many *Eucalyptus* trees died during the 2000-2009 drought, which was the most severe drought in last 70 years;
- Disease: *Phytophthora cinnamomi* kills many species, especially *Xanthorrhoea* and *Banksia* species but also *Eucalyptus* species, especially where dense mid-storey plants create damper ground-layers and the trees are otherwise stressed (Withers 1978b, 1979);
- Grazing of seedlings: tree seedlings are one of many plants preferentially grazed by Black Wallabies (Zeeman 2013 and observations from the exclosures); and



- Grazing of Eucalyptus canopy: leaves are sometimes selectively over-grazed by Common Brushtail Possums and perhaps Common Ringtail Possums (observations from tree-collar experiments); and insects can over-graze, especially regrowth or physiologically stressed plants (Landsberg and Wylie 2006, Marsh and Adams 1995).

These factors have led to a very significant decrease in the number of *Eucalyptus* trees and a great increase in the number and density of mid-storey plants, notably Sheoaks *Allocasuarina* species, Golden Wattle *Acacia pycnantha* and Hedge Wattle *Acacia paradoxa*. These mid-storey plants then appear to outcompete eucalypts by being more drought-tolerant (and hence out-competing large and seedling eucalypts for water; Close *et al.* 2009, Withers 1978b, Withers and Ashton 1977) and more shade-tolerant (and hence preventing growth of seedling *Eucalyptus*; Withers 1978a). Ultimately, this process has been predicted to result in the permanent transition away from a *Eucalyptus*-dominated system to shade-tolerant mid-storey species (Lunt 1998a). If fire is reintroduced, under current conditions of herbivory by wallabies, a more open scrubby grassland will result (Figure 2):

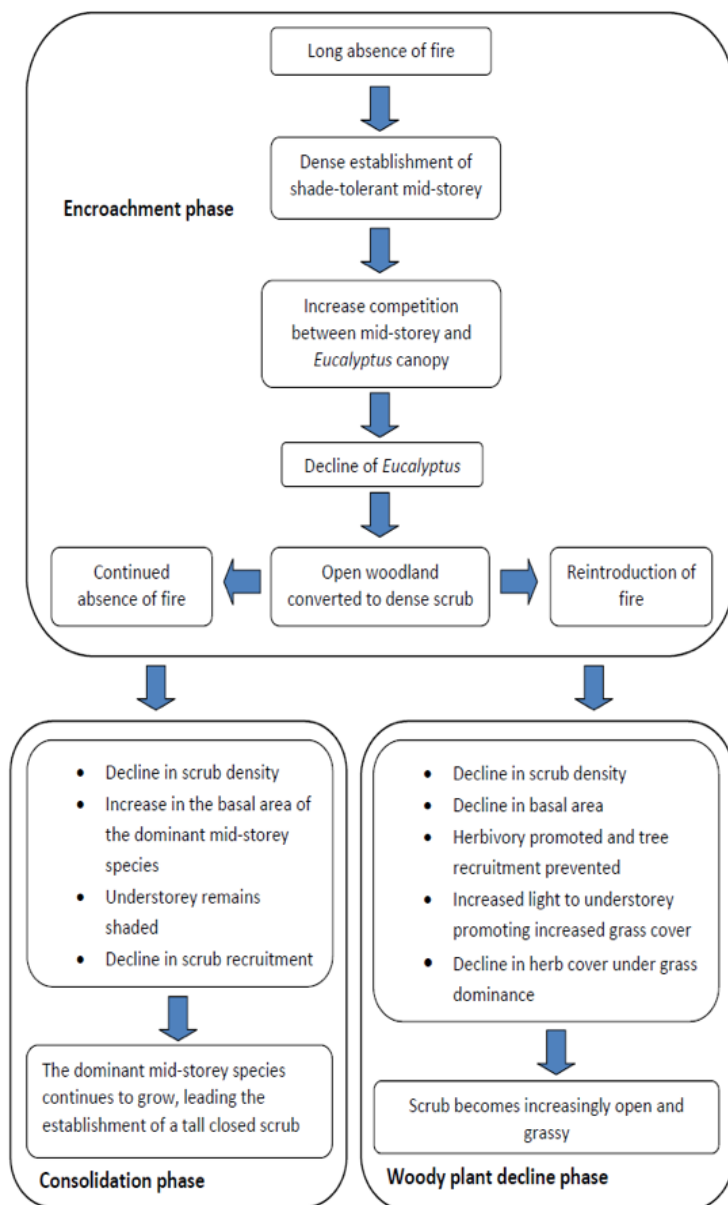


Figure 2. State in transition model proposed by Zeeman (2013)

## 2 METHODS

### 2.1 DATABASE REVIEW

The following Department of Environment, Land, Water and Planning (DELWP) and Department of Agriculture, Water and Environment (DAWE) databases were reviewed to obtain background information on the survey area:

- **Nature Kit** for pre-1750 (pre- British colonisation) and 2005 (extant) native vegetation modelling (DELWP 2020a).
- **Victorian Biodiversity Atlas** for previous records of nationally significant flora and fauna within five kilometres of the study area (DELWP 2020b)
- **Protected Matters Search Tool** for nationally significant ecological values that are predicted to occur within five kilometres of the study area (DAWE 2020).
- **VicPlan** for information regarding planning provision overlays and zones pertaining to native vegetation and ecological values within the study area (DELWP 2020c).

### 2.2 MAPPING AND OTHER LITERATURE

Relevant literature, such as Bioregional Ecological Vegetation Class (EVC) Benchmarks and national/state/local policies and legislation were also reviewed as part of the investigation (DELWP 2020d).

### 2.3 FIELD ASSESSMENT

Initial vegetation mapping was undertaken during an initial field survey on 18 December 2019 with several members from the Friends of Ocean Grove Nature Reserve (FOGNR). The reserve was traversed on foot with management issues and vegetation types observed. An additional site visit was completed on 7 May 2020 to map vegetation types, and this mapping was refined on further visits in May 2020. The general condition of vegetation present was assessed with any locations of vegetation communities documented and all dominant vascular flora species were recorded.

Flora and fauna species and general management issues were observed informally over several hundred visits since 2014, including almost weekly visits since 2016. Bird records of interest were submitted to the Geelong Bird Report and/or eBird. Mammal, reptile and amphibian records of interest were submitted to the Geelong Field Naturalists Club database for upload onto the Victorian Biodiversity Atlas. Flora records were shared informally with the FOGNR.

Species lists of vascular plants and vertebrates were compiled primarily from databases and interpreted based on the observations and experiences of the authors and FOGNR experts. Invertebrates and non-vascular plants were not considered.



## 3 ECOLOGICAL VALUES

### 3.1 FLORA SPECIES

Records provided by the FOGNR indicate that at least 284 species of plant have been recorded within the reserve (Appendix 2 and 3). The list is based on numerous surveys and databases but it is considered likely that additional species occur and other species may now longer occur in the OGNR.

### 3.2 ECOLOGICAL VEGETATION CLASSES

Department of Environment, Land, Water and Planning pre-1750 vegetation modelling and extant 2005 mapping indicates that the reserve is dominated by Grassy Woodland Ecological Vegetation Community (EVC 175) with a small area of Heathy Woodland Ecological Vegetation Community (EVC 48) in the northwest corner (DELWP 2020a).

The field assessment confirmed that the site is dominated by Grassy Woodland (EVC 175) with Heathy Woodland (EVC 48) in the northwest corner in varying condition (Figure 3). The middle-west and south-west of OGNR might originally have supported Heathy Woodland (EVC 48), as suggested by the presence of Manna Gums *Eucalyptus viminalis*, but past land-uses have obscured the original vegetation. See Figure 3 and for descriptions of these vegetation types below.

#### Heathy Woodland (EVC 48)

Heathy Woodland is described as spanning a variety of geologies but is generally associated with nutrient-poor soils including deep uniform sands (aeolian or outwash) and Tertiary sand/clay which has been altered to form quartzite gravel. Eucalypt-dominated low woodland to 10 metres tall lacking a secondary tree layer and generally supporting a diverse array of narrow or ericoid-leaved shrubs except where frequent fire has reduced this to a dense cover of bracken. Geophytes and annuals can be quite common, but the ground cover is normally fairly sparse (DELWP 2020d).

Within OGNR, Heathy Woodland is located in the northwest (Figure 3) and dominated by Manna Gum over a moderate shrub layer including Heath Tree-tree *Leptospermum myrsinoides*, Hedge Wattle *Acacia paradoxa*, Silver Banksia *Banksia marginata* and Austral Grass-tree *Xanthorrhoea australis* over a groundcover dominated by Bracken *Pteridium esculentum* typically in association with Spear Grass *Austrostipa* spp. and Thatch Saw-sedge *Gahnia radula*. Other scattered native groundcover species are present including Common Raspwort *Gonocarpus tetragynus*, Sword Sedges, *Lepidosperma* spp, Weeping Grass *Microlaena stipoides* var. *stipoides*, various Wallaby Grasses *Rytidosperma* spp, and at least 25 species of orchids. This small area of Heathy Woodland within OGNR was mostly burnt in the 1990s and some extensive areas have a heavy mid-storey of Hedge Wattle. Areas dominated by Hedge Wattle are mapped as a different ecosystem for management purposes in Figure 4.





**Plate 1.** Heathy Woodland vegetation in OGNR

### Grassy Woodland (EVC 175)

Grassy Woodland is typically a variable open eucalypt woodland to 15 metres tall or occasionally Sheoak woodland to 10 metres tall over a diverse ground layer of grasses and herbs. The shrub component is usually sparse. It occurs on sites with moderate fertility on gentle slopes or undulating hills on a range of geologies (DELWP 2020d).

Within OGNR, Grassy Woodland is predominant and was likely originally dominated by Bellarine Yellow Gum *Eucalyptus leucoxylon* subsp. *bellarinensis*, Swamp Gum *Eucalyptus ovata* and, less often, Manna Gum. However, this has been heavily modified by a history of fire (in the 1990s), fire suppression (slashing, forest mulching and limited controlled burns), drought and over-grazing (see Section 1.3). This has led to extensive die-back of *Eucalyptus* species and replacement by a canopy and midstorey of Black Sheoak *Allocasuarina littoralis* and Drooping Sheoak *Allocasuarina verticillata* with Golden Wattle *Acacia pycnantha* and Hedge Wattle. For this report, the Grassy Woodland EVC has been mapped as a number of finer-scale vegetation types for management purposes (Figure 4 and below).

#### *Dense Allocasuarina-dominated Grassy Woodland*

This vegetation type is predominant in most of OGNR (see Figure 4) and comprises a dense canopy of Black Sheoak and Drooping Sheoak with some older emergent Sheoaks, scattered emergent and mid-storey eucalypts and large dead eucalypts. Scattered wattles are also present over a dense ground cover dominated principally by Thatch Saw-sedge and Weeping Grass. Other scattered native ground cover species include Variable Sword-sedge *Lepidosperma laterale*, Stinking Penny-wort *Hydrocotyle laxiflora*, Silky Guinea-flower *Hibbertia sericea*, Cranberry Heath *Astroloma humifusum*, Wattle Mat-rush *Lomandra filiformis* and Spiny-headed Mat-rush *Lomandra longifolia*.



Plate 2. Dense *Allocasuarina*-dominated Grassy Woodland in OGNR

**FIGURE 3. ECOLOGICAL VEGETATION CLASSES IN OGNR**



**FIGURE 4. VEGETATION TYPES FOR MANAGEMENT PURPOSES IN OGNR**





### *Open Grassy Woodland*

This vegetation type is present in the east of the reserve (See Figure 4) and comprises a patchy, open, occasionally dense canopy dominated variously by Black Sheoak, Drooping Sheoak and Bellarine Yellow Gum or Swamp Gum. Scattered patches of Hedge Wattle and Golden Wattle are present, however the shrub layer is predominantly absent (but recovering in the exclosures). The ground cover is dominated by native species, particularly Thatch Saw-sedge and Weeping Grass with Thatch Saw-sedge more prevalent in the western areas, in association with other native species including Kangaroo Grass *Themeda triandra*, Silky Guinea flower, Cranberry Heath, Wattle Mat-rush, Spiny-headed Mat-rush, Black-anther Flax-lily *Dianella admixta*, Common Raspwort, Wallaby Grasses *Rytidosperma* spp., and Spear Grass.

Since 2007, areas of Grassy Woodland with a dense mid-storey of Sheoaks or wattles have been progressively opened into Open Grassy Woodland by mulching most of the mid-storey, including dead wood, with a 'forest mower'. 15 ha was mulched in 2019 and 25 ha is planned to be mulched in 2020/2021. See Figure 4 for the extent of these ecosystems at the time of survey, noting that further areas were scheduled to be mulched and converted into Open Grassy Woodland.



**Plate 3.** Open *Allocasuarina*-dominated Grassy Woodland in OGNR

See cover for an image of Open Grassy Woodland dominated by Bellarine Yellow Gum.

*Hedge Wattle thickets*

Areas of a dense mid-storey of Hedge Wattle with scattered emergent and mid-storey eucalypts and large dead eucalypts are present in the west of the reserve (see Figure4). These have become much denser and more widespread after wildfires and controlled burns that stimulated a dense germination of seedlings. Scattered Golden Wattle, Black Sheoak and Drooping Sheoak are also present. The ground layer is often absent or dominated by Thatch Saw-sedge in more open patches in association with other scattered native ground cover species including Weeping Grass, Kangaroo Grass, Black-anther Flax-lily, Silky Guinea-flower, Common Raspwort and Kidney Weed *Dichondra repens*.



**Plate 4.** Hedge Wattle thickets in OGNR

*Golden Wattle thickets*

Areas of a dense mid-storey of Golden Wattle with scattered emergent and mid-storey eucalypts and large dead eucalypts are present in the south-west of the reserve (See Figure4). These thickets generated after a wildfire in 1997. Scattered Black Sheoak and Drooping Sheoak are also present. Similar to the *Hedge Wattle thickets*, the ground layer is often absent or dominated by Thatch Saw-sedge in more open patches in association with other scattered native ground cover species including Variable Sword-sedge, Weeping Grass, Cranberry Heath, Silky Guinea-flower, Common Raspwort and Wattle Mat-rush. Similar Golden Wattle thickets that were present in the north-east of OGNR in the 1990s have died out due to old age and a lack of fire for regeneration of this species.



**Plate 5.** Golden Wattle thickets in OGNR

*Mown tracks*

A total of approximately seven hectares is regularly mown along the Centre, North, South and East Tracks, and a narrower width is mown along the other tracks. These mown areas have a few large trees but no shrubs and are dominated by native grasses, primarily spear grasses and Weeping Grass, and a wide variety of small forbs including several orchids species.



**Plate 6.** Mown track in OGNR

*Planted Non-indigenous Trees*

A significant area of the central north of OGNR was planted with an overstorey of a variety of non-indigenous Australian trees and shrubs in the 1980s. These include various non-locally indigenous gums *Eucalyptus* spp. and some exotic wattles *Acacia* spp, banksias *Banksia* spp. and hakeas *Hakea* spp. The understorey is dominated with native species similar in composition to the *Open Grassy Woodland Vegetation* within the reserve.



**Plate 7.** Planted non-indigenous trees over native vegetation in OGNR

### 3.3 INTRODUCED VEGETATION

The Commonwealth Government has identified and declared 32 weed species as Weeds of National Significance due to the threat they pose to the economy, biodiversity and other values on a national scale. Five of these Weeds of National Significance occur in small numbers in the OGNR.

In Victoria, The Catchment and Land Protection Act 1994 (CaLP Act) obliges managers and owners to effect control of noxious weed species which are listed under the Act as 'Regionally Prohibited', 'Regionally Controlled' or 'State Restricted' within the relevant Catchment Management Authority region (DPI 2008). Four 'regionally controlled' weeds within the Corangamite Catchment occur in the OGNR:

- Serrated Tussock *Nassella trichotoma* (Weed of National Significance)
- Bridal Creeper *Asparagus asparagoides* (Weed of National Significance)
- African Boneseed *Chrysanthemoides monilifera* subsp. *monilifera* (Weed of National Significance)
- Gorse *Ulex europaeus* (Weed of National Significance)

Another three 'regionally restricted' species occur in the OGNR:

- Blackberry *Rubus fruticosus* agg. (Weed of National Significance; regionally restricted weed)
- Soursob *Oxalis pes-caprae* (regionally restricted weed)
- Spear Thistle *Cirsium vulgare* (regionally restricted weed)

The following introduced species are not on government lists as declared weeds but have the potential to invade indigenous ecosystems in the region, and are present in OGNR:

- Buffalo Grass *Stenotaphrum secundatum*
- Coast Tea-tree *Leptospermum laevigatum* (native on the coast but not at OGNR: Ecology Australia 2013)
- Galenia / Carpet Weed / Blanket Weed *Galenia pubescens*
- Italian Buckthorn *Rhamnus alaternus*
- Myrtle-leaf Milkwort / Bellarine Pea *Polygala myrtifolia*
- Pampas Grass *Cortaderia selloana*
- Sallow Wattle *Acacia longifolia* var. *longifolia*
- Sweet Pittosporum *Pittosporum undulatum*



Many other weed species occur in relatively small numbers in the OGNR and have less potential to invade indigenous ecosystems. Despite this long list of weeds, most occur in very small numbers and OGNR has remarkably little introduced vegetation compared to similar woodland remnants. This is in part a result of the ongoing efforts of the FOGNR, Parks Victoria and the preceding Management Committee in controlling weedy species. Most of these weeds occur as scattered occurrences, mostly around the boundaries and especially between the inner and outer boundary fences. The only listed species that occurs widely, albeit scattered in small numbers, is Spear Thistle *Cirsium vulgare*. The boundaries, especially the boundaries of the Heathy Woodland, also have a variety of introduced grasses. It is uncertain whether these weedy grasses are slowly expanding into OGNR.

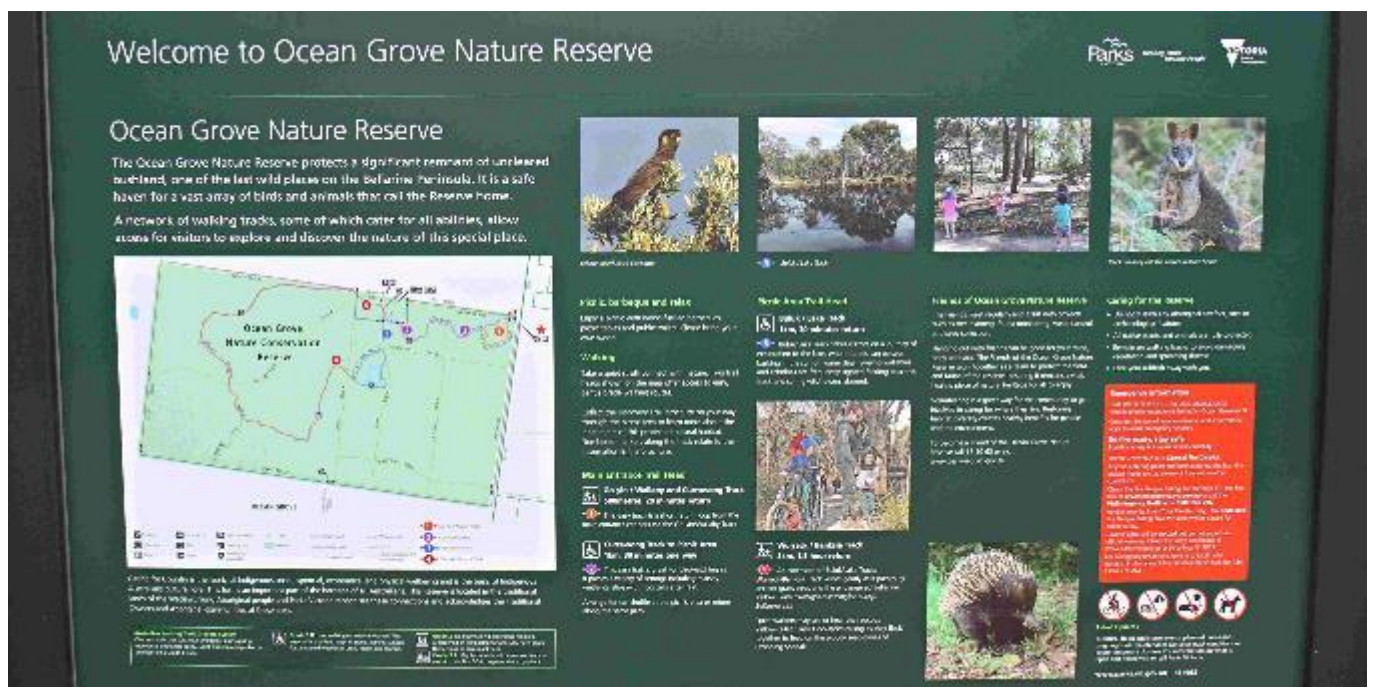


Plate 8. Information notice at main gate to OGNR

### 3.4 FAUNA

Records provided by the FOGNR, the GFNC and eBird (eBird 2020) indicate that 16 mammal species, 139 bird species, 8 reptile species, 5 amphibian species and no fish have been recorded within in recent years in the reserve (Appendix 1). Species believed no longer to occur are excluded, including any bird species not recorded since 2005. For birds recorded before 2005, see Hart *et al.* (2005). Of these, 4 mammal species and 9 bird species are exotic. It is considered likely that this is a complete list of vertebrate species for OGNR except for an ongoing slow accrual of additional species of migratory and dispersive birds.

Several mammal and bird species are considered to be ecologically undesirable. Foxes and rabbits are declared as pest animals in Victoria under the *Catchment and Land Protection Act 1994*, and all landowners have a legal duty to prevent the spread of, and as far as possible eradicate these species. Eastern Grey Kangaroos (which occur rarely inside the kangaroo-proof fence) are considered to be too damaging to small patches of indigenous vegetation to be allowed in the OGNR. Swamp Wallabies, Common Brushtail Possums and Common Ring-tailed Possums are potentially over-abundant in the absence of their natural predators which have disappeared from the Bellarine. Black Rats and House Mice are relatively common in OGNR but are not obviously over-abundant or causing detectable impacts.

Noisy Miners, a native bird which can become over-abundant and excludes other native species. are common in more open woodlands adjacent to OGNR but rarely occur in the OGNR away from the peripheral cleared tracks. Similarly, Common Mynas occasionally use the fringes of OGNR. Common Starlings nest in hollows in OGNR, especially in the heathy Woodland of the north-west. Other exotic birds in the OGNR (notably Common Blackbirds) are considered to have negligible adverse ecological impacts.



**Plate 9.** Echidna in OGNR



## 4 CONSERVATION VALUES

Ecological conservation typically aims to maintain viable populations of species and communities for utilitarian as well as ethical purposes. The primary human activities in the OGNR are recreational walking, exercise and appreciating nature, the reserve being one of the few places south and east of Geelong for appreciating and walking in a natural bushland. Visitors come for the woodland aesthetic, the network of trails and especially for the quiet natural environment. Many visitors come primarily or partially to appreciate the constituent species including wallabies, birds and flowers. Educational opportunities such as guided and self-guided interpretive walks and bush-kindergartens are well-supported.

The OGNR is the source of many locally indigenous plants propagated in local nurseries for climate-resilient native gardens. OGNR regulates the water inflows that sometimes flood in from the adjacent fields and contributes to other local and global ecosystem services such as moderating extreme temperatures and sequestering carbon.

Visitors' needs and perceptions are important: and Parks Victoria is planning to undertake a visitor survey in late 2020.

Conservation of natural ecosystems and species is prioritised to maintaining viable populations of features that could disappear without active interventions and are classified as threatened, or features which are inherently rare or very localised. These threatened ecosystems and species are listed in the next section.

### 4.1 LISTED THREATENED SPECIES

The IUCN Red List (IUCN 2020) is the definitive authority on threatened species. However, only some species have been formally assessed against the Red List criteria, including all Australian vertebrates, few invertebrates, a few vascular plants, few non-vascular plants and no ecosystems. Five species in the OGNR are listed as globally threatened (and three as globally Near Threatened) as shown in Table 2.

Under Section 178 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), Australia maintains a national statutory list of threatened species and ecological communities. Two species in the OGNR are listed as nationally threatened as shown in Table 2. Note that the EPBC Act has not assessed the status of many taxa such as the Bellarine Yellow Gum, and its assessments of frogs are out of date.

Under the Flora and Fauna Guarantee Act 1988, the State of Victoria maintains a statutory list of threatened species (DELWP 2018). These are supported by the non-statutory Victorian Threatened Species Advisory Lists which are a comprehensive record of threatened species in Victoria (DEPI 2014 and DSE 2013). Seven species in the OGNR are listed as threatened and one as rare in Victoria as shown in Table 2.



**Table 2:** Species of Priority Conservation Value in OGNR (highest priority first)

Species	IUCN Red List (global)	EPBC Act (national)	FFG Act (State)	Notes on status in OGNR
<b>Threatened species for which OGNR has global significance</b>				
<b>Swift Parrot</b>	Critically Endangered	Critically Endangered	Endangered, Listed on FFG Act	Non-breeding winter migrants sometimes feed in flowering Bellarine Yellow Gums
<b>Bellarine Yellow Gum</b>	Not assessed (Yellow Gum =Vulnerable)	Not assessed	Endangered, Listed on FFG Act	OGNR supports a significant % of the world population which extends only from Torquay to the Bellarine
<b>Bibron's Toadlet</b>	Near Threatened	'Insufficiently known... may be of concern' <sup>1</sup>	Endangered, Listed on FFG Act	A small breeding population in OGNR; the next nearest population in the You Yangs has not been seen since 1990. (See Plate 11.)
<b>Threatened species for which OGNR has limited significance</b>				
<b>Grey-headed Flying-fox</b>	Vulnerable	Vulnerable	Vulnerable, Listed on FFG Act	Sometimes feed in flowering gums, probably from the population camped in Geelong Botanic Gardens
<b>White-throated Needle-tail</b>	Vulnerable	Vulnerable	Vulnerable, not Listed on FFG Act	Non-breeding summer migrants recorded nearly annually flying (and hence probably feeding) over OGNR
<b>Flame Robin</b>	Near Threatened	Near Threatened	Not threatened or listed on FFG Act	Regular small flocks of non-breeding winter migrants
<b>Koala</b>	Vulnerable	(not listed in Victoria)	Not threatened or listed on FFG Act	Very small numbers, perhaps all introduced, and possibly extirpated from OGNR in the 2010s
<b>White-bellied Sea-Eagle</b>	Not threatened	Not threatened	Vulnerable, Listed on FFG Act	Occasional records flying over OGNR suggests possible use for foraging
<b>Grey Goshawk</b>	Not threatened	Not threatened	Vulnerable, Listed on FFG Act	Occasional records inside OGNR and regular records from surrounding residences suggest a regular visitor
<b>Swamp Gum</b>	Vulnerable	Not assessed	Not threatened or listed on FFG Act	Relatively common but declining in OGNR
<b>Manna Gum</b>	Near Threatened	Not assessed	Not threatened or listed on FFG Act	Relatively common in north-west of OGNR
<b>Snowy Mint-bush</b>	Not threatened	Not threatened	Rare, not Listed on FFG Act	Handful of bushes, perhaps planted and not locally indigenous

<sup>1</sup> Tyler (1997) *The Action Plan for Australian Frogs* cited on the EPBC Act website, but not a formal EPBC Act listing

## 4.2 REGIONALLY SIGNIFICANT ECOSYSTEMS AND SPECIES

For local residents and for planning at a regional and local scale, and given the extensive losses of natural vegetation in the Bellarine and Geelong region, it is more appropriate to look at regionally significant ecosystems and species.

The 'region' could be defined ecologically – the OGNR is in the Otway Plain bioregion – or socio-politically as the Greater Geelong and/or Bellarine region. The conservation threat status of ecosystems has been assessed at a bioregional scale. The OGNR is dominated by the Grassy Woodland EVC which is classified as 'Endangered' in the Otway Plain bioregion. This is the largest remnant of this EVC in the bioregion.

Otherwise, species and sites have not been assessed for conservation prioritisation at a regional or local level. The standard Victorian framework for identifying regionally significant sites (Amos 2004) includes the following criteria under which OGNR might be considered to be regionally significant:

- Sites with unusually high native species richness, vegetation, habitat types or communities that are exceptional when compared to sites regionally.
- Corridors or habitat components that are important at a regional scale.

Within the jurisdiction of the City of Greater Geelong and/or the Bellarine region, the OGNR would be prioritised as one of the largest of very few areas supporting various species. Some species now occur nowhere else in the region. Some examples are given in Table 2; this excludes species already detailed in Table 1.

Local residents and visitors have not been surveyed to determine which species are most highly valued, but informal ad-hoc conversations indicate a widely-held interest in the Black Wallabies as one of the most valued species. Visitors who see Echidnas value them very highly, but most people are not lucky enough to encounter one of these relatively rare and unobtrusive species. The Echidnas in OGNR are presumably dependent on connectivity into the wider landscape to sustain a viable population given that the mean annual home-range size of male Echidnas has been measured as 107 ha for males and 48 ha for females in Tasmania (Nicol et al. 2011) and between 21 ha and 93 ha in Queensland (Wilkinson et al. 1998).

Birdwatchers value the variety of bird species, especially along the north-western boundaries. They highly value the relatively frequent encounters with birds of prey, including Wedge-tailed Eagle (which used to nest in the OGNR but no longer, probably because of increased human disturbance).

Local residents and visitors highly value individual large trees. These are specifically defined and protected in Victoria as they are disproportionately valuable as wildlife habitat, including for hollow-using birds and mammals, as well as for the landscape and aesthetic values. Unfortunately, most of the large native trees have died since the fires and drought of the 1990s and 2000s.

**Table 3:** Species of potential Local Conservation Significance in OGNR

Species	Status and distribution in Greater Geelong region	Status in OGNR
<b>Mammals</b>		
Echidna	Widespread but rare along coasts; very rare inland in Bellarine	Small population. Possibly the last viable population in Bellarine
Black Wallaby	Populations along south-western coasts, Otways, Brisbane Ranges, You Yangs	Probably a few tens of resident individuals
Small bats	Poorly-known	Poorly-known but might be significant
<b>Birds</b>		
Brown Goshawk	Scattered low-density breeding resident	Pair regularly breeds in OGNR
Birds of prey e.g. eagles, kites, hawks, falcons	Scattered low-density breeding residents	Regularly feed over OGNR, especially along north boundary
Grey Currawong	Nearest resident populations in Otways and Brisbane Ranges	Small resident population. Probably the source of scattered records in the Bellarine
Eastern Yellow Robin	Resident populations along coasts, Otways, Brisbane Ranges, You Yangs	Small resident population. Probably the last population in inland Bellarine.
Woodland birds e.g. whistlers, thornbills, honeyeaters	Scattered low-density breeding residents across the Bellarine with significant numbers in all remnant bushland	The largest populations in the Bellarine of many species
<b>Reptiles</b>		
White's Skink	Scattered along ocean coasts, and in Otways and Brisbane Ranges	Individuals and small groups recorded across much of OGNR
<b>Plants – examples given; other plants likely to have similarly local conservation significance</b>		
Pale Turpentine Bush <i>Beyeria lechenaultii</i>	One record western Geelong; west of Brisbane Ranges; Mornington Peninsula	Small but recruiting population
Horny Cone-bush <i>Isopogon ceratophyllus</i>	Two other records in the Bellarine (still surviving?); Otways to Jan Juc	Small but seemingly widespread population in Heathy Woodland
Pink Bells <i>Tetradlea ciliata</i>	Three other records in the Bellarine (still surviving?); widespread in Brisbane Ranges and Otways	Scattered but widespread
Prickly Geebung <i>Persoonia juniperina</i>	Only known record on the Bellarine Peninsula (see Plate 9)	A single mature shrub (and two propagated plants)
Parsons Bands <i>Eriochilus cucullatus</i>	Brisbane Ranges, You Yangs and Otways to Anglesea	Small but seemingly widespread population in Heathy Woodland
Brown-tipped Greenhood <i>Pterostylis clivosa</i>	Otways to Anglesea	Small but seemingly widespread population in Heathy Woodland
Tall Greenhood <i>Pterostylis melagramma</i>	Brisbane Ranges and Otways to Anglesea	Only one recent record
Pepper-top Sun Orchid <i>Thelymitra brevifolia</i>	Brisbane Ranges and Otways to Anglesea	Small population in Heathy Woodland
Large Spotted Sun Orchid <i>Thelymitra juncifolia</i>	Brisbane Ranges and Otways to Anglesea	Small but seemingly widespread population in Heathy Woodland
Plain Sun Orchid <i>Thelymitra nuda</i>	Brisbane Ranges, Bannockburn and Otways to Anglesea	Small population in Heathy Woodland
Trim Sun Orchid <i>Thelymitra peniculata</i>	Two recent records west of Geelong and Brisbane Ranges	Small but seemingly widespread population in Heathy Woodland



**Plate 10.** Prickly Geebung *Persoonia juniperina* in OGNR – this is possibly the last individual on the Bellarine



**Plate 11.** Bibron's Toadlet in OGNR – the nearest populations are in the You Yangs or further distant

## 5 THREATENING PROCESSES

The following threatening processes are considered to be potentially significant to the ecological values of the OGNR. Some threatening processes have been formally assessed and listed under national (EPBC Act) or State (FFG Act) legislation. Other threatening processes have been demonstrated in the scientific literature but have not been legally listed. Management actions specific to OGNR are offered below for each of these threatening processes.

### 5.1 LOSS OF CLIMATIC HABITAT CAUSED BY ANTHROPOGENIC EMISSIONS OF GREENHOUSE GASES

A key threatening process under the national EPBC Act and, using different words, under the Victorian FFG Act.

The primary impacts of climate change on the ecological values of the OGNR are reduced rainfall, changed rainfall patterns (e.g. more heavy summer storms and less winter rain) and increased temperatures. This will create a climate that is unsuitable for some species and will increase the risk of fire. It is likely that the Millennium Drought of 2001-2009 contributed to the death of many Eucalypts in the OGNR including Bellarine Yellow Gums. It is predicted that some species dependent on wet winters or intolerant of hot summers will disappear from the OGNR. For example:

- Bibron's Toadlet requires heavy autumn and early winter rainfall to flood the shallow pools where it breeds.
- Grey-headed Flying-fox suffers lethal hyperthermia in ambient temperatures  $\geq 42$  °C (Welbergen et al. 2008) and 4500 died in three days in a heatwave in December 2019 in Melbourne.

Climate change is perhaps the most significant long-term threat to many of the ecological values in OGNR. Mitigation options are limited but include planting trees better adapted to the predicted future climate.

### 5.2 LAND CLEARANCE

A key threatening process under the national EPBC Act.

Although OGNR is not itself at risk from clearance, clearance of any vegetation surrounding the OGNR reduces habitat for mobile species in the wider landscape and reduces the population connectivity between individuals in OGNR and in other remnant vegetation patches. This includes clearance of isolated paddock trees, including dead trees, and clearance of exotic vegetation such as windbreaks. It also includes ploughing or conversion of patches of degraded native grasslands.

For some species of lower conservation concern, such as Rainbow Lorikeets, clearance of agricultural land for residential development (e.g. the Yellow Gums and Woodlands estates) increases their habitat and population connectivity. The suite of species to benefit from residential development depends largely on how many indigenous trees are retained, the amount of public open space, any construction of artificial wetlands and the types of plantings in open space, roadsides and private gardens. These species are

generally species which are benefiting from similar development elsewhere in Ocean Grove, the wider region and globally, and are hence of limited concern or interest for conservation or of wider public value.

For other species, clearance of agricultural land for residential development reduces their habitat and population connectivity. Many species that occur in the OGNR, use agricultural land for habitat and connectivity, and are of local conservation priority. These include bats, various birds of prey (e.g. Wedge-tailed Eagle) and Flame Robin.

Land clearance on private land surrounding OGNR is perhaps the most significant short-term threat to a subset of the ecological values in OGNR (as well as to aesthetic and recreational values). Clearance, even of tiny remnants of native vegetation, should be prohibited through planning controls and discouraged through incentives and other options for private land-holders. Past clearance should be remediated by incentivising planting of indigenous vegetation across large areas adjoining OGNR.

### **5.3 HABITAT FRAGMENTATION AS A THREATENING PROCESS FOR FAUNA IN VICTORIA**

A potentially threatening process listed under the Victorian FFG Act.

Although OGNR is not itself at risk from habitat fragmentation, clearance of any vegetation within kilometres of OGNR reduces the ecological connectivity of OGNR, leading to fragmentation of both habitat and species populations. This includes clearance of isolated paddock trees, including dead trees, and clearance of exotic vegetation such as windbreaks. It also includes ploughing or conversion of patches of degraded native grasslands.

Clearance of ecologically significant areas of native vegetation within kilometres of OGNR should be prohibited through planning controls and discouraged through incentives and other options for private land-holders. Past fragmentation should be remediated by incentivising planting corridors or biolinks of indigenous vegetation between the OGNR and neighbouring habitat remnants.

### **5.4 INAPPROPRIATE FIRE REGIMES CAUSING DISRUPTION TO SUSTAINABLE ECOSYSTEM PROCESSES AND RESULTANT LOSS OF BIODIVERSITY**

A potentially threatening process listed under the Victorian FFG Act.

The lack of (managed) fire in the Ocean Grove Nature Reserve is causing an ecological succession from the Open Grassy Woodland of high conservation value to thickets of Sheoaks and wattles, of lower conservation value. Wildfire is also a risk to many ecological values as well as being a major risk to buildings and other assets directly south of OGNR. Inappropriate fire management, together with habitat fragmentation, are probably the primary causes of the recent historical loss of various bird species from OGNR (e.g. Pescott 1981, Hart *et al.* 2005) and the likely loss of the Koala population.

The ecological values of OGNR would benefit greatly from an experimental programme of small cool management burns, such as Indigenous burns. These should be prioritised areas suffering from dense regrowth of sheoaks. In the absence of any managed fires, the succession to dense sheoaks could be mitigated by mechanical slashing. However, mechanical slashing lacks the other ecological functions of fire such as creating germination niches for many plants.



## **5.5 WETLAND LOSS AND DEGRADATION AS A RESULT OF CHANGE IN WATER REGIME, DREDGING, DRAINING, FILLING AND GRAZING**

A potentially threatening process listed under the Victorian FFG Act.

OGNR is fed by direct rainfall plus sheet-flow and drainage lines from the agricultural land to the north and east. Heavy rainfall is required to saturate the soil and allow these drainage lines to flow through and above the ground to OGNR. Changes in hydrology uphill of OGNR would impact the ecological values of the wetlands in OGNR. This is clearly evident in the extensive flooding of the north-east of OGNR in 2020 as a result of engineering works associated with Grubb Road and the north-east growth area. Bibron's Toadlet, one of the most threatened key ecological values in OGNR with a population of only seven calling males recorded in 2020, is at risk to changed hydrology caused by land-use changes to the north of OGNR. It requires wetlands which are dry over summer but fill and maintain open water over winter at least once every 10-20 years and is presumed to require relatively unpolluted water.

The key management action is to maintain current land-use and hydrology to the north of OGNR or to increase the volume and quality of autumn and winter (but not summer) run-off.

## **5.6 INVASION OF NATIVE VEGETATION BY 'ENVIRONMENTAL WEEDS'**

A potential threatening process under the Victorian FFG Act and, using different words, under the national EPBC Act. This section also includes the following potential threatening process under the Victorian FFG Act: *Spread of Pittosporum undulatum in areas outside its natural distribution and Loss of biodiversity as a result of the spread of Coast Wattle (Acacia longifolia subsp. sophorae) and Sallow Wattle (Acacia longifolia subsp. longifolia) into areas outside its natural range.*

See Section 3.3. for a review of introduced vegetation. OGNR is remarkably free of environmental weeds thanks to decades of weed-control work, and the current weed burden is unlikely to have a significant adverse effect on environmental values. However, if these weeds are allowed to spread without control, they could eventually dominate the understorey and mid-storey as seen at Buckley Park Foreshore Reserve and other coastal reserves in Ocean Grove (dominated by Myrtle-leaf Milkwort and Coast Tea-Tree) or the You Yangs (dominated by Boneseed). Some management actions such as fire and the use of heavy equipment can create open ground which favours weed germination.

It is unclear whether the various species of exotic planted trees and bushes are having adverse ecological impacts or recruiting and expanding their spatial area. Many ecologists would prefer that these exotics are removed but many provide nectar and other natural resources, and some are of aesthetic value to visitors.

The key management action is to monitor the whole reserve for high-risk weeds (e.g. Boneseed, Coast Tea-tree, Gorse, Myrtle-leaf Milkwort, Sallow Wattle, Sweet Pittosporum) and to remove every individual weed plant before it seeds. A second management action is to minimise disturbance to the ground that creates bare ground suitable for weed germination. A supporting management action that has been neglected for many years is to extend the weed eradication to the narrow and inaccessible zone between the two perimeter fences. Another supporting management action is to map all exotic planted trees and bushes, perhaps at decadal intervals, to monitor any recruitment and spread.





## 5.7 LOSS OF HOLLOW-BEARING TREES FROM VICTORIAN NATIVE FORESTS

A potential threatening process under the Victorian FFG Act.

Many bird species including all parrots, bat species, Common Brushtail Possum and Common Ringtail Possum use natural tree hollows for nesting and/or roosting. In OGNR, nearly all hollows occur in large eucalypts. Large eucalypts have greatly declined across OGNR and the number of hollows is probably limiting the populations of hollow-dependent birds and mammals in OGNR. The reasons for eucalypt loss are multi-factorial and not fully understood but probably include drought, hot wildfires, perennial fire suppression, over-dominance by dense mid-storey competitors, infection by root-rot fungus, over-grazing of seedlings by wallabies and over-grazing of leaves by possums and insects (see Section 1.3).

The key immediate management action is to conserve individual live eucalypts by clearing immediately adjacent mid-storey species and installing possum-exclusion collars. These actions should be undertaken as a monitored experiment to investigate their impact. The key longer-term management action is to plant and nurture new eucalypts by planting away from competing trees and mid-storey species, protecting against wallabies with wire guards and watering through droughts. A second management action is to maintain hollow-bearing dead trees and stags. The installation of nest-boxes might be warranted for educational purposes and specific species (e.g. Laughing Kookaburra and small bats) but is not a sustainable solution to the loss of natural hollows.

## 5.8 DIEBACK CAUSED BY THE ROOT-ROT FUNGUS (PHYTOPHTHORA CINNAMOMI)

A key threatening process under the national EPBC Act and, using different words, under the Victorian FFG Act.

*Phytophthora cinnamomi* is a disease of plant roots that spreads through the movement of soil and mud, especially by vehicles and footwear, as well as through water and root-to-root contact between plants. It is generally considered that *P. cinnamomi* is probably present if susceptible species (e.g. Austral Grass-tree, Silver Banksia, Cranberry Heath, guinea flower and Pink Bells) show symptoms of disease and resistant species (e.g. wattles, sheoaks, Cherry Ballart, *Lomandra* species, *Lepidosperma* species and Thatch Saw-sedge) remain healthy. From the early 2000s there has been some die-back of Austral Grass-tree on the Centre Track, which tested positive for two different species of *Phytophthora*, and in the north-west near Banksia Track, which tested negative but are believed to be infected. It is possible that dieback of Silver Banksia could be more widespread within OGNR (based on multiple dead and dying individuals seen in 2020; Plate 12).

*P. cinnamomi* cannot be eradicated from infested sites and autonomous spread is difficult to control, so the only practical management objectives are to minimise the spread to areas that are uninfested, and mitigate impacts where infestations occur (O'Gara et al. 2015). Management actions include prohibiting vehicles (including bikes), other than on the main vehicle tracks, during damp conditions (e.g. within three days of rain) and/or cleaning with disinfectant (e.g. Phytoclean). Vehicles operating off the main tracks should be considered to be infested and cleaned. Isolation and cleaning is particularly important for vehicles along the Centre Track and Banksia Track. Any earthworks along the north-west boundary tracks should maintain the current on-track waterflow to the west and then to the West Dam, avoiding run-off



into the uninfested Heathy Woodland. Other actions of lower priority or feasibility, including chemical control with phosphite, are offered in the national best practice guidelines for the Management of *Phytophthora cinnamomi* for Biodiversity Conservation in Australia (O'Gara et al. 2015).



Plate 12. Dying and unhealthy Silver Banksia in OGNR

## 5.9 OVER-GRAZING BY NATIVE MAMMALS

As noted in Section 1.3 Ecological Succession, Black Wallabies over-graze tree seedlings, and Common Brushtail Possums and perhaps Common Ringtail Possums sometimes over-grazed Eucalypt canopy leaves. The importance of wallaby browsing on a range of plant species is very evident from the exclosures and can be inferred to be a major reason for the lack of recruitment of eucalypts and the relative sparsity of many herbs and forbs. This grazing is likely to act in synergy with other threatening processes such as drought and *Phytophthora cinnamomi*. Wallabies and possums are presumed to be over-abundant in OGNR because of the lack of any native predators or human control. As an example of the current abundance, 35 Common Ringtail Possums, 12 Black Wallabies and 7 Brush-tailed Possums were seen in a 5 km night-time walk over 1.5 hours on 26 March 2020 (G. Dutson in Geelong Naturalist).

The most effective management action, to control wallaby and possum populations, is unlikely to be acceptable to other users of OGNR. Wallaby numbers might be reduced if sections of the fence were opened to allow egress from OGNR. Possum-excluding collars should be installed on individual eucalypts showing signs of over-grazing. Additional larger wallaby exclosures should be considered, partly as experiments to demonstrate the impact of wallabies.

## 5.10 PREDATION OF NATIVE WILDLIFE BY THE CAT, FELIS CATUS

A potential threatening process under the Victorian FFG Act and, using different words, under the national EPBC Act.

It is estimated that pet cats kill 53 million reptiles and 61 million birds each year in Australia (Woinarski et al. 2017, Woinarski et al. 2018). One of OGNR's priority conservation values, White's Skink, is in the size range of reptiles vulnerable to depredation by cats. Fortunately, there are few, if any, records of cats in OGNR. However, areas peripheral to residential development, including reserves, set-asides, buffers and adjacent

undeveloped land, have an increased occupancy by domestic cats. It is modelled that buffer zones around nature reserves or protected sites in order to prevent incursions by cats need to be from 360m to 2.4km, noting that cats in areas of lower housing density roam much further (Hall *et al.* 2016).

The key mitigation action is to place legally enforceable prohibitions on keeping domestic cats in residential developments that neighbour OGNR.

### **5.11 PREDATION BY EUROPEAN RED FOX**

A key threatening process under the national EPBC Act and, using different words, under the Victorian FFG Act. In Victoria, Red Foxes *Vulpes vulpes* are declared as established pest animals under the Catchment and Land Protection Act 1994 and land owners have a responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, foxes from their land.

Foxes eat a wider variety of foods than cats, including a range of fruit and invertebrates, but are significant predators of small and medium sized native animals including birds and reptiles. The impact of foxes on the current fauna of OGNR is poorly-known but likely to be of moderate to minor significance. It is noted that the current tall boundary fence around OGNR is porous to foxes (and rabbits and wallabies through dug holes) and serves little ecological purpose. It largely excludes kangaroos and livestock (when gates are left closed) but it is perceived to have an animal welfare function in reducing the number of wallabies straying onto roads and into areas with dogs.

The key management action is to destroy any dens within OGNR.

### **5.12 DISTURBANCE BY HUMANS AND DOGS**

There is solid scientific evidence for negative impacts of human disturbance on some species. For example, Wedge-tailed Eagles used to nest in OGNR but no longer, probably partly the result of human disturbance. The Tasmanian government conservation advice for the Wedge-tailed Eagle includes avoiding "people or loud machinery too near the nest during the breeding season ('too near' can be many hundreds of metres if in direct line of sight of the nest) or residential development near nesting habitat". Human disturbance resulting from increased population density in the greater Ocean Grove area is likely to impact some ecological values of OGNR.

Human disturbance to many animals is much greater when people are accompanied by dogs (Weston and Stankowich 2014), for example dog walking in woodland in one study lead to a 35% reduction in bird diversity and 41% reduction in abundance (Banks and Bryant 2007).

There has been limited research into the disturbance caused by people on bicycles (e.g. Pickering *et al.* 2010). Concerns include the transmission of *Phytophthora cinnamomi*, creation of new trails (and especially any jumps or other technical features) and rutting and widening of trails especially around wet areas. (There are other reasons beyond ecological conservation to regulate the use of bicycles, and Parks Victoria is planning new regulations.)

The key management action is to maintain and enforce the prohibition of dogs in OGNR. A supporting management action is to encourage human visitors to keep to the marked tracks in OGNR. Stronger



constraints would need to be well articulated and justified in order not to adversely affect visitors' support of OGNR management.

### **5.13 ARTIFICIAL LIGHT AND NOISE POLLUTION**

Artificial light and noise pollution has adverse impacts on some ecological values including moths (which are attracted to lights) and birds (which communicate by song). Artificial light and noise pollution will have increasing adverse impacts on OGNR, especially along the eastern boundary bordering Grubb Road and the Ocean Grove north-east growth area.

Management actions include encouraging a dense buffer of indigenous vegetation along the eastern boundary and installing street lights using 'best practice lighting design' (Commonwealth of Australia 2019) in nearby developments including Grubb Road and the Ocean Grove north-east growth area.

### **5.14 COMPETITION AND LAND DEGRADATION BY RABBITS**

A key threatening process under the national EPBC Act and, using different words, under the Victorian FFG Act. In Victoria, Rabbits *Oryctolagus cuniculus* are declared as established pest animals under the Catchment and Land Protection Act 1994 and land owners have a responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, foxes from their land.

There are relatively few rabbits in OGNR, mostly along the north track where they access adjacent farmland. The authors consider that the current population of Rabbits in OGNR is having a minor threat compared to the preceding threats in this Section. The key management action is for informal monitoring.

### **5.15 OTHER LOWER RISK THREATENING PROCESSES**

The following threatening processes listed under the EPBC Act and/or the FFG Act are considered to be relatively low-risk in OGNR and in need of monitoring but not action:

- Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*).
- Threats to native flora and fauna arising from the use by the feral honeybee *Apis mellifera* of nesting hollows and floral resources.

## 6 MANAGEMENT ACTIONS

It is generally accepted to be impractical to return peri-urban and isolated small sites to their pre-European state. FOGNR and Parks Victoria should consult with stakeholders to develop a vision for the ecological future of OGNR based in part on the conservation values and threatening processes detailed in this report. The future ecological state of OGNR needs to be a pragmatic compromise between the following factors:

- Ecological values – ecological values to be conserved should be defined and prioritised, with consideration given to the practicality of maintaining long-term viability. In this report, the following ecological values are prioritised:
  - Key tree species and vegetational structure of the Grassy Woodland and Heathy Woodland EVCs
  - Bellarine Yellow Gum (and Swift Parrot and Grey-headed Flying-fox)
  - Bibron's Toadlet
  - Koala, Echidna and other birds of conservation value
  - Other plants of conservation value
- Ecological feasibility – some actions such as regenerating *Eucalyptus* trees might be risky or unsuccessful in a drying climate
- Recreational values – the vision should clearly define what recreational activities are supported, noting the predicted increase in visitor pressure arising from increased residential development to the east of OGNR
- Managing risk to human safety – risks to visitors and neighbours, notably from wildfire, need to be managed
- Resourcing – ecological futures that require significant ongoing investment risk being stalled or abandoned, and the outcomes of under-investment should be considered.

It is suggested that the vision includes a patchwork of areas with different indigenous vegetation structures, different dominant species and different key species of conservation significance to maximise the variety of biodiversity and aesthetics.

Depending on the agreed vision, the following management actions should be considered for each ecological value. Developing agreed management recommendations is a dynamic task of balancing conservation needs with other stakeholder opinions and resource availability. Management recommendations also need to be adaptive based on monitoring and evaluation of previous and ongoing actions. The following suggested management actions need to be developed, discussed and agreed into a formal management plan:



## 6.1 GRASSY WOODLAND AND HEATHY WOODLAND

The objective for the Grassy Woodland and Heathy Woodland EVCs could be to:

- Restore most of OGNR to open woodland with an open canopy dominated by indigenous eucalypts, a (very) limited mid-storey of sheoaks and wattles, and a varied ground-layer of small shrubs, herbs and grasses.

This report considered this to be the highest-priority ecological objective for OGNR. To be practical, the management plan should have staged objectives for different areas.

The threats to the Grassy Woodland EVC are (in descending order of significance):

- Fire can kill eucalypts when too hot/intense, but occasional fire can enable recruitment and a lack of fire favours over-dominance by mid-storey plants (Withers and Ashton 1977, Lunt 1998a, 1998b).
- Drought can kill eucalypts (especially Swamp Gum and Bellarine Yellow Gum), especially where over-dominant mid-storey plants compete for water.
- Over-grazing by wallabies of saplings and by possums and insects of trees, especially physiologically stressed trees (Landsberg and Wylie 2006, Marsh and Adams 1995, Zeeman 2013).
- *Phytophthora cinnamomi* can kill eucalyptus and other plants, especially where over-dominant mid-storey plants create a damp substrate (and hence over-dominant mid-storey bushes and trees are a threat; Withers 1978b, 1979).

This report suggests the following actions:

- Undertake controlled cool patch-burns where feasible (noting that fire usually stimulates a quicker regeneration of more species, both desired and undesired species, than mechanical mulching).
  - Engage with Indigenous land-managers to trial 'indigenous burns'.
  - Initially burn small areas with few Eucalyptus and with a dense species-poor ground-storey until the methods, outcomes and risks are better-known.
  - Monitoring to include follow-up weed control.
- Clear or thin the mid-storey from most of the woodland.
  - Preferentially clear (e.g. mechanical mulching with a forest mower) the dominant sheoak, Golden Wattle and Hedge Wattle, leaving the less common species such as Silver Banksia, Sweet Bursaria *Bursaria spinosa*, Heath Tea-tree and Coast Pomaderris *Pomaderris paniculosa*.
  - Preferentially clear species-poor thickets of sheoak and Golden Wattle and, to a lesser extent because it is more important for birds, Hedge Wattle.



- Preferentially clear around live eucalypts (of any size).
- Preferentially clear around the south and east boundaries to reduce fire risk to neighbours.
- Maintain some patches (perhaps 10-20%) with dense mid-storey for ecological and aesthetic variety, especially any thickets of indigenous species.
- Control regeneration of mid-storey by burning (preferred), ongoing mechanical clearance or spraying.
- Monitor the spread and cover of mid-storey species (and other measures of ecosystem change) using permanent or GPS-located photographic points.
- Regenerate indigenous eucalypts
  - Plant indigenous eucalyptus saplings, preferentially Bellarine Yellow Gums, using robust fencing to protect from grazing wallabies.
    - Monitor the outcomes to determine what factors (e.g. geographical areas, soil dampness, seasonal conditions) affect success.
  - Consider planting genetic stock or species indigenous to drier climates (in order to improve climate resilience).
  - Identify existing indigenous eucalyptus saplings and protect using robust fencing to protect from grazing wallabies.
  - Preferentially clear mid-storey from around individual eucalyptus trees including saplings.
  - Install possum exclusion collars over trunks of individual eucalypts showing signs of over-grazing of canopy leaves.
    - Monitor the outcomes to determine what factors (e.g. species, size, leaf appearance, number of leaves, canopy touching adjacent canopies) affect regeneration in response to collars.



**Plate 13.** Successfully planted Bellarine Yellow Gum in wallaby exclusion fencing at OGNR

- Control *Phytophthora cinnamomi*
  - Authorised vehicles allowed on the internal tracks are to remain on the main vehicle tracks. Prohibit all vehicles on internal tracks during damp conditions (e.g. within three days of rain). Prior to entering the internal tracks, wash down or clean with disinfectant (e.g. *PhytoClean*) any vehicles or machinery that may have previously travelled in a known *Phytophthora* infected region.
  - Any earthworks along the north-west boundary tracks should maintain the current on-track waterflow, avoiding run-off into the uninfested Heathy Woodland.
  - Consider other actions, including chemical control with phosphite, as in the national best practice guidelines for the management of *Phytophthora* (O'Gara et al. 2015).

## 6.2 BELLARINE YELLOW GUM

The objective for Bellarine Yellow Gum could be to:

- Conserve and regenerate Bellarine Yellow Gums across much of OGNR.

It is noted that Parks Victoria has a legal obligation to conserve Bellarine Yellow Gums under the FFG Act. This might be considered to be a very high priority ecological objective for OGNR, and should be undertaken in conjunction with conserving Grassy Woodland because most of the management actions are similar. To be practical, this should have staged objectives for mapped areas under different stages of management.

The threats and actions for the Bellarine Yellow Gums are the same as those to the Grassy Woodland EVC (listed in 6.1 above). It is unclear how much of OGNR would historically have supported Bellarine Yellow Gums and how much has suitable soils and hydrology for Bellarine Yellow Gums. New plantings could be undertaken experimentally to determine which areas are best-suited to this species. An additional management action could be to:

- Map each Bellarine Yellow Gum using a precise GPS, and record at regular intervals the size (diameter breast height), an index of health and any management interventions.

## 6.3 SWIFT PARROT (AND GREY-HEADED FLYING-FOX)

Swift Parrots and Grey-headed Flying-foxes in the OGNR and Ocean Grove are largely using Bellarine Yellow Gums and secondarily using exotic eucalyptus species. They preferentially feed in large mature trees as these produce more nectar. It is suggested that the management objectives and actions for Swift Parrot and Grey-headed Flying-fox in OGNR are identical to those for Bellarine Yellow Gums (listed in 6.2 above).

An additional threat to Swift Parrots observed in Ocean Grove is being aggressively ejected from feeding trees by Noisy Miners. Noisy Miners prefer open woodlands with little mid-storey and healthy populations of





lerps (psyllid insects); Noisy Miners 'farm' psyllids, harvesting their sugary secretions, while Swift Parrots feed on both the secretions and psyllids themselves. An additional monitoring action could be to:

- Monitor numbers of Noisy Miners in the OGNR, noting all encounters away from boundaries.

#### **6.4 BIBRON'S TOADLET**

Bibron's Toadlet lays eggs in autumn beside depressions which sometimes flood following autumn or winter rains and remain inundated long enough for the tadpoles to develop into toadlets. The toadlets need leaf litter and organic ground material but not dense grasses or marsh vegetation. Their primary requirement is for adequate water to fill the depressions for several months over winter. The key threat to Bibron's Toadlet is inadequate rainfall and water-flow. A potential threat is disturbance (such as excavation from burrows) by photographers (N. Clemann *in litt.* 2020). This report suggests the following actions:

- Maintain sub-surface water-flow by ensuring no hydrological changes in upstream catchment.
- Experimentally deepen some depressions.
- Limit communication of the presence and exact location of Bibron's Toadlets in OGNR.

#### **6.5 KOALA, ECHIDNA AND OTHER BIRDS OF CONSERVATION VALUE**

Koala, Echidna and the bird species listed as being of conservation value (other than Swift Parrot which is discussed above) are generally threatened by degradation of habitat inside and outside of OGNR, especially loss of large eucalypts. Other threats include:

- Koala is specifically threatened by the loss of large Manna Gums.
- Loss or degradation of surrounding habitat outside OGNR which acts as a corridor (e.g. Koala, Echidna, honeyeaters) or part of the foraging territory (e.g. Echidna, Flame Robin and birds of prey).
- Some species, notably Eastern Yellow Robin, would be threatened by total clearance of thickets of Hedge Wattle.

These species would benefit from the management actions suggested previously for Grassy and Heathy Woodland. This report also suggests the following actions:

- Advocate against loss or degradation of surrounding habitat outside OGNR, including isolated trees and shelter belts, through planning controls and incentives and other options for private land-holders.
- Advocate for enhancement, restoration and revegetation of surrounding habitat outside OGNR, notably corridors or biolinks through incentives and other options for private land-holders.
- Preferentially clear or thin sheoaks and Golden Wattle. Partially clear some Hedge Wattle but maintain some significant thickets of this species.



## 6.6 OTHER PLANT SPECIES OF CONSERVATION VALUE

Other plants of conservation value including shrubs, herbs and forbs are generally threatened by degradation of habitat inside OGNR, especially the succession of open grassy woodland to thickets of mid-storey plants. Other threats include:

- Preferential over-grazing by Black Wallabies
- Shading and competition by dominant ground plants
- Lack of recruitment niches as offered by fire and other disturbances

These species would benefit from the management actions suggested previously for Grassy and Heathy Woodland. This report suggests the following actions:

- Install more larger areas of wallaby exclosures
- Initiate small management fires and monitor outcomes
- Consider pollination and/or propagation of key species

## 6.7 SUMMARY OF MANAGEMENT ACTIONS

Table 4 summarises the main suggested management actions given in the preceding Sections on Threatening Processes and Management Actions. These are listed in approximately descending order of importance. It is noted that these management actions are for the conservation of OGNR's ecological values and need to be co-developed with actions for other values such as visitor safety and experience.



**Table 4: Summary of suggested Management Actions**

Conservation Value	Threatening Process	Management Actions
Grassy Woodland  and  Bellarine Yellow Gum  and  Other plants of conservation value	Lack of Fire	Initiate an experimental programme of small cool management burns, such as Indigenous burns
		Mechanical slashing for ecological objectives and fire risk management
		Clear mid-storey species immediately adjacent to individual live eucalypts
		Plant new eucalypts away from competing trees and mid-storey species, protect against grazing with wire guards, and water through droughts
		Map each individual Bellarine Yellow Gum and record the size, an index of health and any management interventions
		Monitor changes to ecosystems through permanent photographic points
Other plants of conservation value	Environmental Weeds	Remove every high-risk weed (e.g. Gorse; Boneseed) before it seeds
		Minimise disturbance that creates bare ground suitable for weed germination
		Extend weed eradication to the narrow inaccessible gap between the two perimeter fences
		Map all exotic planted trees and shrubs, perhaps at decadal intervals, to monitor recruitment and spread
	<i>Phytophthora</i> Dieback	Prohibit and/or clean with disinfectant any vehicles off the main tracks within three days of rain
		Encourage visitors to keep to marked tracks in OGNR
	Over Grazing	Install possum-exclusion collars on individual live eucalypts
		Install additional larger wallaby exclosures
Climate Change	Plant trees that are genetically better adapted to the predicted future climate	
Swift Parrot	Other	Monitor other threatening processes e.g. Noisy Miners and Honey Bees
Bibron's Toadlet	Wetland Loss	Maintain current hydrology to the north of OGNR
	Climate Change	Experimentally deepen some suitable depressions
Koala, Echidna and birds of conservation value	Land Clearance; Habitat Fragmentation	Prohibit and discourage any clearance of indigenous vegetation with potential connectivity to OGNR, even tiny remnants, through planning controls and incentives for private land-holders
		Incentivise planting of indigenous vegetation, especially as corridors or biolinks, across large areas with connectivity to OGNR
Other fauna species	Loss of Hollow-bearing Trees	Maintain hollow-bearing dead trees and stags
		Consider installing nest-boxes for educational purposes and specific species (e.g. kookaburra and bats)
	Predation by Cats	Advocate prohibitions on domestic cats in residential developments that neighbour OGNR
	Predation by Foxes	Destroy any fox dens within OGNR
	Disturbance by Visitors & Dogs	Maintain and enforce the prohibition of dogs in OGNR
		Light and Noise Pollution
Other plant species	Multiple Threats	Consider pollination and/or propagation of key species

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# APPENDICES

## APPENDIX 1. FAUNA SPECIES RECORDED WITHIN OGNR

Note that these lists are considered to be fully accurate to July 2020.

\* Indicates introduced species

Common name	Scientific name	Status in OGNR
<b>Mammals (excluding historically extinct species)</b>		
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	Resident in small numbers
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	Rare incursions into the fenced area; a few resident and transient in surrounding paddocks
Black (Swamp) Wallaby	<i>Wallabia bicolor</i>	Resident introduced population of tens of individuals; regularly crosses the boundary fence
Koala	<i>Phascolarctos cinereus</i>	Few recent records; possibly extirpated; possibly all introduced rehabilitated individuals
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	Common resident throughout OGNR
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	Common resident throughout OGNR
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Occasional visitors from Geelong feed in flowering gums
White-striped Free-tailed Bat	<i>Tadarida australis</i>	Occasionally heard overhead; status poorly-known
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Occasionally trapped for research (e.g. 1 in 2016); status poorly-known
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Occasionally trapped for research (e.g. 1 in 2016); status poorly-known
Little Forest Bat	<i>Vespadelus vulturnus</i>	Occasionally trapped for research (e.g. 19 in 2019); status poorly-known
other small bats	<i>Microchiroptera</i>	Likely to occur but no thorough surveys
*House Mouse	<i>Mus musculus</i>	Resident and probably common
*Black Rat	<i>Rattus rattus</i>	Resident and probably common
*Red Fox	<i>Vulpes vulpes</i>	Resident in small numbers; easily crosses the boundary fence; possibly breeds in OGNR
*Brown Hare	<i>Lepus europaeus</i>	Occasional records suggest transient in OGNR
*European Rabbit	<i>Oryctolagus cuniculus</i>	Resident in small numbers especially along northern boundary; easily crosses the boundary fence
<b>Birds (excluding species not recorded since 2005; for previous records, see Hart et al. 2005)</b>		
Black Swan	<i>Cygnus atratus</i>	Probably only flying overhead
Australian Shelduck	<i>Tadorna tadornoides</i>	Uncommon visitor; possibly breeds
Australian Wood Duck	<i>Chenonetta jubata</i>	Probably breeds
Pacific Black Duck	<i>Anas superciliosa</i>	Probably breeds
Grey Teal	<i>Anas gracilis</i>	Uncommon visitor; possibly breeds
Chestnut Teal	<i>Anas castanea</i>	Probably breeds
Stubble Quail	<i>Coturnix pectoralis</i>	Probably only in fields outside OGNR
Brown Quail	<i>Coturnix ypsilophora</i>	Rare visitor
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	Uncommon visitor; possibly breeds

Hoary-headed Grebe	<i>Poliiocephalus poliocephalus</i>	Probably only in dams outside OGNR
*Rock Dove	<i>Columba livia</i>	Probably only flying overhead
White-headed Pigeon	<i>Columba leucomela</i>	Rare visitor
*Spotted Dove	<i>Streptopelia chinensis</i>	Uncommon visitor; possibly breeds
Common Bronzewing	<i>Phaps chalcoptera</i>	Common breeding resident
Brush Bronzewing	<i>Phaps elegans</i>	Rare visitor
Crested Pigeon	<i>Ocyphaps lophotes</i>	Uncommon visitor; possibly breeds
Peaceful Dove	<i>Geopelia striata</i>	Rare visitor
Horsfield's Bronze-Cuckoo	<i>Chrysococcyx basalis</i>	Fairly common breeding visitor
Black-eared Cuckoo	<i>Chrysococcyx osculans</i>	Rare visitor
Shining Bronze-Cuckoo	<i>Chrysococcyx lucidus</i>	Fairly common breeding visitor
Pallid Cuckoo	<i>Cuculus pallidus</i>	Uncommon visitor; possibly breeds
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	Fairly common breeding resident
Tawny Frogmouth	<i>Podargus strigoides</i>	Fairly common breeding resident
White-throated Needletail	<i>Hirundapus caudacutus</i>	Rare visitor
Pacific Swift	<i>Apus pacificus</i>	Rare visitor
Eurasian Coot	<i>Fulica atra</i>	Rare visitor
Masked Lapwing	<i>Vanellus miles</i>	Probably only in fields outside OGNR
Latham's Snipe	<i>Gallinago hardwickii</i>	Rare visitor
Painted Buttonquail	<i>Turnix varia</i>	Rare visitor
Silver Gull	<i>Larus novaehollandiae</i>	Probably only flying overhead
Caspian Tern	<i>Hydroprogne caspia</i>	Probably only flying overhead
Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>	Uncommon visitor; breeds nearby
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	Probably only flying overhead
Australian Pelican	<i>Pelecanus conspicillatus</i>	Probably only flying overhead
White-necked Heron	<i>Ardea pacifica</i>	Probably only flying overhead
White-faced Heron	<i>Egretta novaehollandiae</i>	Uncommon visitor; breeds nearby
Cattle Egret	<i>Bubulcus ibis</i>	Probably only flying overhead
Australian White Ibis	<i>Threskiornis molucca</i>	Probably only flying overhead
Straw-necked Ibis	<i>Threskiornis spinicollis</i>	Probably only flying overhead
Royal Spoonbill	<i>Platalea regia</i>	Probably only flying overhead
Yellow-billed Spoonbill	<i>Platalea flavipes</i>	Probably only flying overhead
Black-shouldered Kite	<i>Elanus axillaris</i>	Uncommon visitor; breeds nearby
Little Eagle	<i>Hieraaetus morphnoides</i>	Uncommon visitor; breeds nearby
Wedge-tailed Eagle	<i>Aquila audax</i>	Uncommon visitor; breeds nearby
Swamp Harrier	<i>Circus approximans</i>	Common visitor
Spotted Harrier	<i>Circus assimilis</i>	Probably only in fields outside OGNR
Grey Goshawk	<i>Accipiter novaehollandiae</i>	Uncommon visitor
Brown Goshawk	<i>Accipiter fasciatus</i>	Fairly common resident; breeds
Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>	Fairly common resident; breeds nearby



Black Kite	<i>Milvus migrans</i>	Fairly common visitor; breeds nearby
Whistling Kite	<i>Haliastur sphenurus</i>	Fairly common visitor; breeds nearby
Southern Boobook	<i>Ninox boobook</i>	Uncommon visitor
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	Uncommon visitor; breeds nearby
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>	Rare visitor
Sacred Kingfisher	<i>Todiramphus sanctus</i>	Uncommon visitor
Rainbow Bee-eater	<i>Merops ornatus</i>	Rare visitor
Nankeen Kestrel	<i>Falco cenchroides</i>	Uncommon resident; breeds nearby
Australian Hobby	<i>Falco longipennis</i>	Fairly common resident; breeds nearby
Brown Falcon	<i>Falco berigora</i>	Fairly common resident; breeds nearby
Peregrine Falcon	<i>Falco peregrinus</i>	Uncommon visitor
Yellow-tailed Black-Cockatoo	<i>Calyptorhynchus funereus</i>	Common visitor
Galah	<i>Cacatua roseicapilla</i>	Common breeding resident
Long-billed Corella	<i>Cacatua tenuirostris</i>	Probably only in fields outside OGNR
Little Corella	<i>Cacatua sanguinea</i>	Probably only in fields outside OGNR
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	Common visitor
Blue-winged Parrot	<i>Neophema chrysostoma</i>	Uncommon visitor
Swift Parrot	<i>Lathamus discolor</i>	Rare visitor
Crimson Rosella	<i>Platycercus elegans</i>	Fairly common visitor
Eastern Rosella	<i>Platycercus eximius</i>	Common breeding resident
Red-rumped Parrot	<i>Psephotus haematonotus</i>	Common breeding resident
Musk Lorikeet	<i>Glossopsitta concinna</i>	Uncommon visitor
Little Lorikeet	<i>Glossopsitta pusilla</i>	Rare visitor
Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>	Rare visitor
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	Common breeding resident
hybrid Scaly-breasted Lorikeet	<i>X Trichoglossus chlorolepidotus</i>	Common breeding resident
Superb Fairywren	<i>Malurus cyaneus</i>	Common breeding resident
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	Uncommon visitor
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	Common visitor
Noisy Miner	<i>Manorina melanocephala</i>	Common visitor from nearby
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	Common visitor
Little Wattlebird	<i>Anthochaera chrysoptera</i>	Rare visitor
Red Wattlebird	<i>Anthochaera carunculata</i>	Common breeding resident
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>	Common breeding resident
White-fronted Chat	<i>Epthianura albifrons</i>	Rare visitor from nearby fields
Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>	Rare visitor

Crescent Honeyeater	<i>Phylidonyris pyrrhopterus</i>	Rare visitor
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	Common breeding resident
White-eared Honeyeater	<i>Lichenostomus leucotis</i>	Rare visitor
White-naped Honeyeater	<i>Melithreptus lunatus</i>	Common visitor
Spotted Pardalote	<i>Pardalotus punctatus</i>	Common breeding resident
Striated Pardalote	<i>Pardalotus striatus</i>	
White-browed Scrubwren	<i>Sericornis frontalis</i>	Common breeding resident
Brown Thornbill	<i>Acanthiza pusilla</i>	Common breeding resident
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	Fairly common breeding resident
Yellow Thornbill	<i>Acanthiza nana</i>	Common breeding resident
Striated Thornbill	<i>Acanthiza lineata</i>	Rare visitor
Weebill	<i>Smicronis brevirostris</i>	Rare visitor
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>	Fairly common breeding resident
White-winged Triller	<i>Lalage tricolor</i>	Rare visitor
Crested Shrike-tit	<i>Falcunculus frontatus</i>	Rare visitor
Grey Shrikethrush	<i>Colluricincla harmonica</i>	Common breeding resident
Golden Whistler	<i>Pachycephala pectoralis</i>	Common non-breeding visitor
Rufous Whistler	<i>Pachycephala rufiventris</i>	Common breeding visitor
Olive-backed Oriole	<i>Oriolus sagittatus</i>	Uncommon visitor
Masked Woodswallow	<i>Artamus personatus</i>	Rare visitor
White-browed Woodswallow	<i>Artamus superciliosus</i>	Rare visitor
Dusky Woodswallow	<i>Artamus cyanopterus</i>	Uncommon visitor; possibly breeds
Grey Butcherbird	<i>Cracticus torquatus</i>	Fairly common breeding resident
Australian Magpie	<i>Gymnorhina tibicen</i>	Common breeding resident
Pied Currawong	<i>Strepera graculina</i>	Common visitor; possibly breeds
Grey Currawong	<i>Strepera versicolor</i>	Common breeding resident
Willie Wagtail	<i>Rhipidura leucophrys</i>	Common visitor from nearby fields
Rufous Fantail	<i>Rhipidura rufifrons</i>	Uncommon visitor
Grey Fantail	<i>Rhipidura fuliginosa</i>	Common breeding resident
Magpie-lark	<i>Grallina cyanoleuca</i>	Common visitor from nearby fields
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	Rare visitor
Little Raven	<i>Corvus mellori</i>	Common visitor; possibly breeds
Jacky Winter	<i>Microeca fascinans</i>	Rare visitor
Flame Robin	<i>Petroica phoenicea</i>	Fairly common winter visitor
Rose Robin	<i>Petroica rosea</i>	Rare visitor
Pink Robin	<i>Petroica rodinogaster</i>	Uncommon visitor
Eastern Yellow Robin	<i>Eopsaltria australis</i>	Fairly common breeding resident
Australasian Bushlark	<i>Mirafra javanica</i>	Probably only in fields outside OGNR
*Eurasian Skylark	<i>Alauda arvensis</i>	Probably only in fields outside OGNR

Golden-headed Cisticola	<i>Cisticola exilis</i>	Probably only in fields outside OGNR
Australian Reed Warbler	<i>Acrocephalus australis</i>	Probably only in fields outside OGNR
Welcome Swallow	<i>Hirundo neoxena</i>	Common visitor from nearby fields
Tree Martin	<i>Hirundo nigricans</i>	Uncommon visitor
Silveryeye	<i>Zosterops lateralis</i>	Common breeding resident & visitor
*Common Starling	<i>Sturnus vulgaris</i>	Common breeding resident
*Common Myna	<i>Acridotheres tristis</i>	Common visitor from nearby fields
Bassian Thrush	<i>Zoothera lunulata</i>	Rare visitor
*Common Blackbird	<i>Turdus merula</i>	Common breeding resident
Mistletoebird	<i>Dicaeum hirundinaceum</i>	Fairly common visitor
Red-browed Finch	<i>Neochmia temporalis</i>	Common breeding resident
*House Sparrow	<i>Passer domesticus</i>	Rare visitor
Australasian Pipit	<i>Anthus novaeseelandiae</i>	Probably only in fields outside OGNR
*European Greenfinch	<i>Chloris chloris</i>	Uncommon visitor
*European Goldfinch	<i>Carduelis carduelis</i>	Uncommon visitor
<b>Reptiles</b>		
Eastern Long-necked Turtle	<i>Chelodina longicollis</i>	Rare; either an occasional visitor or resident
Eastern Three-lined Skink	<i>Acritoscincus duperreyi</i>	Fairly common and widespread
Garden Skink (Pale-flecked Sunskink)	<i>Lampropholis guichenoti</i>	Abundant and widespread
White's Skink	<i>Liopholis whitii</i>	Small numbers widespread
Blotched Blue-tongued Lizard	<i>Tiliqua nigrolutea</i>	Uncommon or rare
Eastern Blue-tongued Lizard	<i>Tiliqua scincoides</i>	Uncommon or rare
Jacky Lizard	<i>Amphibolurus muricatus</i>	Common and widespread
Lowland Copperhead	<i>Austrelaps superbis</i>	Uncommon or rare
<b>Amphibians</b>		
Eastern Banjo Frog (Pobblebonk Frog)	<i>Limnodynastes dumerilii</i>	Breeds in most deeper dams
Spotted Marsh Frog	<i>Limnodynastes tasmaniensis</i>	Breeds in most deep dams and shallow wetlands
Bibron's Toadlet	<i>Pseudophryne bibronii</i>	Rare; 7 calling males in 2020; show some integrate features with Southern Toadlet <i>P. semimarmorata</i>
Common Eastern Froglets	<i>Crinia signifera</i>	Breeds in shallow wetlands including wheel ruts and dam edges
Brown Tree Frog	<i>Litoria ewingii</i>	Breeds in most deeper dams and call from drier habitats

## APPENDIX 2. ORCHID SPECIES RECORDED WITHIN OGNR

Note that this list is considered to be fully accurate to July 2020.

Observed since 2015	SCIENTIFIC NAME	COMMON NAME
	<i>Acianthus caudatus</i>	Mayfly Orchid
Y	<i>Acianthus pusilla</i>	Mosquito Orchid
Y	<i>Caladenia carnea</i>	Pink Fingers
Y	<i>Caladenia pusilla</i>	Tiny Caladenia
Y	<i>Caladenia tentaculata</i>	Mantis Orchid
Y	<i>Caladenia transitoria</i>	Eastern Bronze Caladenia
Y	<i>Chiloglottis curviclavia</i>	Autumn Bird Orchid
Y	<i>Corunastylis ciliata</i>	Fringed Midge Orchid
Y	<i>Corybas diemenicus</i>	Veined Helmet Orchid
Y	<i>Corybas incurvus</i>	Slaty Helmet Orchid
Y	<i>Cyanicula caerulea</i>	Blue Fingers
Y	<i>Cyrtostylis reniformis</i>	(Small) Gnat Orchid
	<i>Diuris chryseopsis</i>	Golden Moths
Y	<i>Diuris orientis</i>	Donkey Orchid
Y	<i>Diuris sulphurea</i>	Tiger Orchid
Y	<i>Eriochilus cucullatus</i>	Parson's Band
Y	<i>Glossodia major</i>	Waxlip Orchid
Y	<i>Leptoceras menziesii</i>	Hare Orchid
	<i>Microtis arenaria</i>	Notched Onion Orchid
	<i>Microtis parviflora</i>	Slender Onion Orchid
Y	<i>Microtis unifolia</i>	Common Onion Orchid
	<i>Prasophyllum sp.</i>	Leek Orchid
Y	<i>Pterostylis clivosa</i>	Brown-tipped Greenhood
Y	<i>Pterostylis concinna</i>	Trim Greenhood
Y	<i>Pterostylis melagramma</i>	Tall Greenhood
Y	<i>Pterostylis nana</i>	Dwarf Greenhood
Y	<i>Pterostylis nutans</i>	Nodding Greenhood
Y	<i>Pterostylis parviflora</i>	Tiny Greenhood
Y	<i>Pyrorchis nigricans</i>	Red Beaks
Y	<i>Thelymitra antennifera</i>	Rabbit Ears
	<i>Thelymitra aristata</i>	Great Sun Orchid
Y	<i>Thelymitra brevifolia</i>	Peppertop Sun Orchid
Y	<i>Thelymitra ixioides</i>	Spotted Sun Orchid
Y	<i>Thelymitra juncifolia</i>	Rush-leaf Sun Orchid
Y	<i>Thelymitra nuda</i>	Pale Sun Orchid
Y	<i>Thelymitra pauciflora</i>	Slender Sun Orchid
Y	<i>Thelymitra peniculata</i>	Trim Sun Orchid
Y	<i>Thelymitra rubra</i>	Salmon Sun Orchid



### APPENDIX 3. NON-ORCHID FLORA SPECIES RECORDED WITHIN OGNR

Note that this list is considered to be reasonably accurate to July 2020 but some species, especially introduced species, might have been overlooked.

\* Indicates introduced species

Observed since 2015	SCIENTIFIC NAME	COMMON NAME
Y	<i>Acacia implexa</i>	Lightwood
Y	<i>Acacia iteaphylla</i>	Flinders Ranges Wattle
Y	<i>Acacia longifolia</i>	Coast Wattle
Y	<i>Acacia longifolia ssp. longifolia</i>	Sydney Wattle
Y	<i>Acacia mearnsii</i>	Black Wattle
Y	<i>Acacia melanoxylon</i>	Blackwood
Y	<i>Acacia paradoxa</i>	Hedge Wattle
Y	<i>Acacia pycnantha</i>	Golden Wattle
	<i>Acacia suaveolens</i>	Sweet Wattle
	<i>Acacia verniciflua (Common variant)</i>	Varnish Wattle
	<i>Acaena echinata</i>	Sheep's Burr
	<i>Acaena novae-zelandiae</i>	Bidgee-widgee
	<i>Acaena sp.</i>	Sheep's Burr
Y	<i>Acrotriche serrulata</i>	Honey-pots
Y	<i>Aira sp.</i>	Silvery Grass
Y	<i>Allocasuarina littoralis</i>	Black Sheoak
	<i>Allocasuarina misera</i>	Small Sheoak
Y	<i>Allocasuarina verticillata</i>	Drooping Sheoak
	<i>Amphipogon strictus</i>	Grey-beard Grass
Y	<i>Amyema pendula ssp. pendula</i>	Drooping Mistletoe
	<i>Aphelia gracilis</i>	Slender Aphelia
	<i>Aphelia pumilo</i>	Dwarf Aphelia
Y	<i>Apium prostratum</i>	Shore Celery
Y	<i>Arctotheca calendula</i> *	Cape Weed
	<i>Argentipallium obtusifolium</i>	Blunt Everlasting
Y	<i>Arthropodium strictum</i>	Chocolate Lily
Y	<i>Asparagus asparagoides</i> *	Bridal Creeper
Y	<i>Astroloma humifusum</i>	Cranberry Heath
	<i>Austrostipa densiflora</i>	Foxtail Spear-grass
	<i>Austrostipa flavescens</i>	Coast Spear-grass

	<i>Austrostipa hemipogon</i> (??mollis??)	Spear-grass
	<i>Austrostipa semibarbata</i>	Fibrous Spear-grass
Y	<i>Banksia marginata</i>	Silver Banksia
Y	<i>Beyeria lechenaultii</i>	Pale Turpentine-bush
Y	<i>Billardiera fusiformis</i> *	Australian Bluebell (creeper)
Y	<i>Bossiaea prostrata</i>	Creeping Bossiaea
	<i>Brachycome</i> sp	
	<i>Brachyloma ciliatum</i>	Fringed Brachyloma
Y	<i>Briza maxima</i> *	Large Quaking Grass
Y	<i>Briza minor</i> *	Lesser Quaking Grass
Y	<i>Brunonia australis</i>	Blue Pincushion
Y	<i>Burchardia umbellata</i>	Milkmaids
Y	<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria
Y	<i>Caesia calliantha</i>	Blue Grass-lily
Y	<i>Caesia parviflora</i>	Pale Grass-lily
	<i>Cassinia aculeata</i> ssp. <i>aculeata</i>	Common Cassinia
	<i>Cassinia arcuata</i>	
	<i>Cassinia longifolia</i>	Shiny Cassinia
Y	<i>Cassytha glabella</i>	Slender Dodder-laurel
Y	<i>Centarium</i> sp	Star centaury
Y	<i>Centella cordifolia</i>	Centella
	<i>Centrolepis aristata</i>	Pointed Centrolepis
Y	<i>Centrolepis strigosa</i> ssp. <i>strigosa</i>	Hairy Centrolepis
Y	<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue Squill or Blue Stars
Y	<i>Cheilanthes austrotenuifolia</i>	Rock-fern
?	<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Narrow Rock-fern
Y	<i>Chorizandra enodis</i>	Black Bristle-rush
Y	<i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i> *	African Boneseed
	<i>Chrysocephalum apiculatum</i>	Common Everlasting
Y	<i>Cicendia filiformis</i>	Slender Cicendia
Y	<i>Cirsium vulgare</i> *	Spear thistle
Y	<i>Clematis microphylla</i>	Small-leaved Clematis
Y	<i>Comesperma volubile</i>	Love Creeper
Y	<i>Convolvulus angustissimus</i> ssp. <i>angustissimus</i>	Pink Bindweed
	<i>Coronidium scorpioides</i>	Button Everlasting
Y	<i>Cortaderia selloana</i> *	Pampass Grass
Y	<i>Corymbia maculata</i>	Spotted Gum



Y	<i>Cotula australis</i>	Common Cotula
	<i>Crassula closiana</i>	Stalked Crassula
Y	<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula
Y	<i>Cynodon dactylon</i>	Cooch
Y	<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue
Y	<i>Daviesia latifolia</i>	Hop Bitter-pea
Y	<i>Deyeuxia quadriseta</i>	Reed Bent-grass
Y	<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily
Y	<i>Dichelachne crinita</i>	Long-hair Plume-grass
Y	<i>Dichondra repens</i>	Kidney-weed
Y	<i>Dillwynia cinerascens</i>	Grey Parrot-pea
Y	<i>Dillwynia glaberrima</i>	Smooth Parrot-pea
	<i>Dillwynia sericea</i>	Showy Parrot-pea
Y	<i>Dodonaea viscosa</i>	Sticky Hopbush
Y	<i>Drosera aberrans</i>	Scented Sundew
Y	<i>Drosera auriculata</i>	Tall Sundew
Y	<i>Drosera glanduligera</i>	Scarlet Sundew
Y	<i>Drosera gunniana</i>	
?	<i>Drosera hookeri</i>	Pale Sundew
Y	<i>Drosera planchonii</i>	Climbing Sundew
	<i>Drosera pygmaea</i>	Tiny Sundew
Y	<i>Einardia nutans</i>	Nodding Saltbush
	<i>Elatine gratioloides</i>	Waterwort
	<i>Eleocharis sphacelata</i>	Tall Spike-rush
	<i>Epilobium billardierianum</i> ssp. <i>cinereum</i>	Variable Willow-herb
Y	<i>Eragrostis brownii</i>	Common Love-grass
Y	<i>Ehrharta erecta</i> *	Panic Veldt Grass
Y	<i>Eucalyptus lehmannii</i>	Bushy Yate
Y	<i>Eucalyptus leucoxylon</i> ssp. <i>bellarinensis</i>	Bellarine Yellow Gum
Y	<i>Eucalyptus ovata</i> ssp. <i>ovata</i>	Swamp Gum
Y	<i>Eucalyptus viminalis</i> ssp. <i>pyroriana</i>	Coast Manna Gum
Y	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum
Y	<i>Euchiton involucratus</i>	Common Cudweed
?	<i>Euchiton japonicus</i>	Creeping Cudweed
Y	<i>Exocarpos cupressiformis</i>	Cherry Ballart
Y	<i>Ficinia nodosa</i>	Knobby Club Rush
Y	<i>Gahnia radula</i>	Thatch Saw-sedge



Y	<i>Genista linifolia</i> *	Flaxleaf Broom
	<i>Gompholobium huegelii</i>	Common Wedge-pea
Y	<i>Gonocarpus tetragynus</i>	Common Raspwort
Y	<i>Goodenia geniculata</i>	Bent Goodenia
Y	<i>Hakea decurrens</i>	Bushy Needlewood
Y	<i>Hakea drupacea</i>	Sweet -scented Hakea
Y	<i>Hakea salicifolia</i>	Willow leaf Hakea
	<i>Hibbertia riparia</i>	Erect Guinea-flower
Y	<i>Hibbertia sericea</i> var. <i>sericea</i>	Silky Guinea-flower
	<i>Hyalosperma demissum</i>	Tiny Sunray
	<i>Hydrocotyle capillaris</i>	Slender Pennywort
	<i>Hydrocotyle foveolata</i>	Yellow Pennywort
Y	<i>Hydrocotyle hirta</i>	Hairy Pennywort
Y	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort
Y	<i>Hydrocotyle sibthorpioides</i>	Sibthorp's Pennywort
Y	<i>Hypericum gramineum</i>	Small St John's Wort
Y	<i>Hypochaeris radicata</i> *	Cat's-ear
Y	<i>Hypoxis hygrometrica</i> var. <i>hygrometrica</i>	Golden weather-grass
	<i>Isolepis hystrix</i> *	Awned Club-rush
Y	<i>Isolepis levynsiana</i> *	Tiny Flat-sedge
	<i>Isolepis platycarpa</i>	Broad-fruit Club-sedge
	<i>Isopogon ceratophyllus</i>	Horny Cone-bush
Y	<i>Juncus bufonius</i>	Toad Rush
	<i>Juncus capitatus</i> *	Dwarf Rush
	<i>Juncus microcephalus</i> *	Small-flower Rush
Y	<i>Juncus pallidus</i>	Pale Rush
	<i>Juncus planifolius</i>	Broad-leaf Rush
Y	<i>Kennedia prostrata</i>	Running Postman
Y	<i>Lachnagrostis filiformis</i>	Common Blown grass
Y	<i>Lagenophora gracilis</i>	Slender Bottle-daisy
Y	<i>Lagenophora stipitata</i>	Blue Bottle-daisy
Y	<i>Laphangium luteoalbum</i>	Jersey Cudweed
Y	<i>Lepidosperma curtisiae</i>	Little Sword-sedge
Y	<i>Lepidosperma gladiatum</i>	Coast Sword-sedge
Y	<i>Lepidosperma laterale</i>	Variable Sword-sedge
	<i>Lepidosperma semiteres</i>	Wire Rapier-sedge
	<i>Leptorhynchus squamatus</i> ssp. <i>squamatus</i>	Scaly Buttons





	<i>Leptospermum continentale</i>	Prickly Teatree
Y	<i>Leptospermum laevigatum</i>	Coast Teatree
Y	<i>Leptospermum myrsinoides</i>	Silky or Heath Teatree
Y	<i>Leucopogon parviflorus</i>	Coast Beard-heath
	<i>Leucopogon virgatus</i> var. <i>virgatus</i>	Common Beard-heath
Y	<i>Lindsaea linearis</i>	Screw Fern
Y	<i>Linum marginale</i>	Native Flax
Y	<i>Lobelia anceps</i>	Angled lobelia
	<i>Lobelia gibbosa</i>	Tall Lobelia
	<i>Lobelia pedunculata</i>	Matted Pratia
Y	<i>lobelia pratiodes</i>	Poison Lobelia
?	<i>Lomandra collina</i>	Pale Mat-rush
Y	<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Wattle Mat-rush
Y	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Wattle Mat-rush
Y	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush
Y	<i>Lomandra micrantha</i>	Small-flowered Mat-rush
Y	<i>Lomandra multiflora</i>	Many-flowered Mat-rush
Y	<i>Lomandra nana</i>	Dwarf Mat-rush
Y	<i>Luzula meridionalis</i>	Common Wood-rush
Y	<i>Lythrum hyssopifolia</i>	Lesser Loosestrife
	<i>Machaerina acuta</i>	Bare Twig-sedge
Y	<i>Melaleuca lanceolata</i>	Moonah
Y	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
Y	<i>Montia australasica</i>	White purslane
Y	<i>Muehlenbeckia adpressa</i>	Climbing Lignum
	<i>Muellerina eucalyptoides</i>	Creeping Mistletoe
Y	<i>Myoporum insulare</i>	Common Boobialla
	<i>Myriophyllum crispatum</i>	Water-milfoil
Y	<i>Nassella trichotoma</i> *	Serrated tussock
Y	<i>Olea europaea</i> *	Olive
	<i>Olearia lirata</i>	Snowy Daisy-bush
Y	<i>Opercularia varia</i>	Variable Stinkweed
Y	<i>Ornduffia reniformis</i>	Running Marsh-flower
	<i>Ottelia ovalifolia</i> ssp. <i>ovalifolia</i>	Swamp Lily
Y	<i>Oxalis pes caprae</i> *	Soursob
Y	<i>Oxalis corniculata</i> *	Creeping Wood-sorrel
Y	<i>Oxalis purpurea</i> *	Large-flower Wood-sorrel



Y	<i>Ozothamnus ferrugineus</i>	Tree Everlasting
	<i>Pauridia glabella</i> var. <i>glabella</i>	Tiny Star
Y	<i>Pauridia vaginata</i>	Yellow Star
	<i>Pentapogon quadrifidus</i>	Five-awned Spear-grass
Y	<i>Persoonia juniperina</i>	Prickly Geebung
Y	<i>Phytolacca octandra</i> *	Red-ink Weed
Y	<i>Pimelea humilis</i>	Common Rice-flower
	<i>Pimelea octophylla</i>	Woolly Rice-flower
Y	<i>Pittosporum undulatum</i>	Sweet Pittosporum
Y	<i>Plantago coronopus</i> *	Buck's-horn Plantain
Y	<i>Platylobium obtusangulum</i>	Common Flat-pea
	<i>Poa clelandii</i>	Matted Tussock-grass
	<i>Poa rodwayi</i>	Velvet Tussock-grass
?	<i>Poa sieberiana</i> x <i>labillardieri</i>	
Y	<i>Polygala myrtifolia</i> *	Myrtle-leaf Milkwort/Bellarine Pea
Y	<i>Pomaderris paniculosa</i> ssp. <i>paralia</i>	Coast Pomaderris
Y	<i>Poranthera microphylla</i>	Small Poranthera
Y	<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush
Y	<i>Pteridium esculentum</i> ssp. <i>esculentum</i>	Bracken
Y	<i>Ranunculus sessiliflorus</i>	Annual buttercup
Y	<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Seaberry Saltbush
Y	<i>Rhamnus alaternus</i> *	Italian Buckthorn
Y	<i>Rubus fruticosus</i> species aggregate *	Blackberry
	<i>Rytidosperma caespitosum</i>	Common Wallaby-grass
Y	<i>Rytidosperma geniculatum</i>	Knead Wallaby-grass
	<i>Rytidosperma pallidum</i>	Silvertop Wallaby-grass
	<i>Rytidosperma pilosum</i>	Velvet Wallaby-grass
Y	<i>Rytidosperma setaceum</i>	Bristly Wallaby-grass
Y	<i>Samolus repens</i>	Creeping Brookweed
Y	<i>Scaevola albida</i>	Small-fruit Fan-flower
Y	<i>Schoenus apogon</i>	Common Bog-rush
Y	<i>Senecio glomeratus</i>	Fireweed
Y	<i>Senecio hispidulus</i>	Rough Fireweed
Y	<i>Senecio linearifolius</i>	Fireweed groundsel
	<i>Senecio minimus</i>	Shrubby Fireweed
Y	<i>Senecio picridioides</i>	Purple-leaf Groundsel
Y	<i>Senecio pinnatifolius</i> var. <i>lanceolatus</i>	Coastal Groundsel



Y	<i>Senecio quadridentatus</i>	Cottony Fireweed
Y	<i>Siloxerus multiflorus</i>	Small Wrinklewort
	<i>Solanum vescum</i>	Kangaroo Apple (Gunyang)
Y	<i>Solenogyne dominii</i>	Smooth Solenogyne
Y	<i>Sonchus oleraceus</i> *	Milk Thistle/ Sow thistle
	<i>Sphaerolobium vimineum</i>	Leafless Globe-pea
	<i>Stackhousia monogyna</i>	Creamy Candles
Y	<i>Stenotaphrum secundatum</i> *	Buffalo Grass
	<i>Stylidium despectum</i>	Small Triggerplant
Y	<i>Stylidium graminifolium</i>	Grass Triggerplant
	<i>Stylidium perpusillum</i>	Slender Triggerplant
Y	<i>Tetragonia implexicoma</i>	Bower Spinach
	<i>Tetrarrhena juncea</i>	Forest Wire-grass
Y	<i>Tetradlea ciliata</i>	Pink-bells or Black-eyed Susan
Y	<i>Themeda triandra</i>	Kangaroo Grass
Y	<i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Thysanotus tuberosus</i> ssp. <i>tuberosus</i>	Common Fringe Lily
Y	<i>Tricoryne elatior</i>	Yellow Rush Lily
	<i>Trithuria submersa</i>	Trithuria
Y	<i>Typha</i> sp	Bullrush
Y	<i>Ulex europaeus</i> *	Gorse
Y	<i>Veronica gracilis</i>	Slender Speedwell
Y	<i>Viola cleistogamoides</i>	Hidden Violet
Y	<i>Viola hederacea</i>	Ivy-leaved Violet
?	<i>Viola sieberiana</i>	
	<i>Wahlenbergia gracilentata</i>	Hairy Annual-bluebell
Y	<i>Wahlenbergia gracilis</i>	Sprawling Bluebell
Y	<i>Wahlenbergia stricta</i> ssp. <i>stricta</i>	Tall Bluebell
Y	<i>Westringia fruticosa</i>	Coastal Rosemary
Y	<i>Wurmbea dioica</i> ssp. <i>dioica</i>	Early Nancy
Y	<i>Xanthorrhoea australis</i>	Austral Grass-tree

