MURRAYS ROAD
BOTANICAL ASSESSMENT

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Natural Landscape Management

Murrays Road, Kinglake Botanic Assessment October 2022

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Figure 1: Western end of Murrays Road (from McMahons Road).

SUMMARY

Murrays Road running from west to east in Kinglake contains mainly high-quality vegetation with a diversity of indigenous species from the remnants of forest vegetation communities with medium quality sections along some cleared area. The quality of indigenous vegetation, presence of Critically Endangered and rare species, relatively moderate levels of invasive weeds, and the links to the adjoining high quality and biodiverse bushland to the west and east confirms Murrays Road as having significant roadside vegetation.

AIM

The aim of this investigation is to better understand the botanical values of this roadside. This evidence should assist future management decisions and support the protection and enhancement of the natural landscape of Murrays Road, Kinglake.

INTRODUCTION/ASSESSMENT/PURPOSE

This is the first known botanical assessment of this estimated almost one hectare of Kinglake district roadside vegetation. The assessment includes vegetation structure, species composition, EVC's, locations of any significant or rare plant species, locations of high threat weed species, and quality assessment. The assessment is sponsored by the Upper Goulburn Landcare Network (UGLN) as part of the Ribbons of Remnant Roadside funding by the Victorian State Government. This program seeks to generate better ecological understanding of roadside vegetation and habitat values

BACKGROUND

Location

Figure 2: Murrays Road, Kinglake.

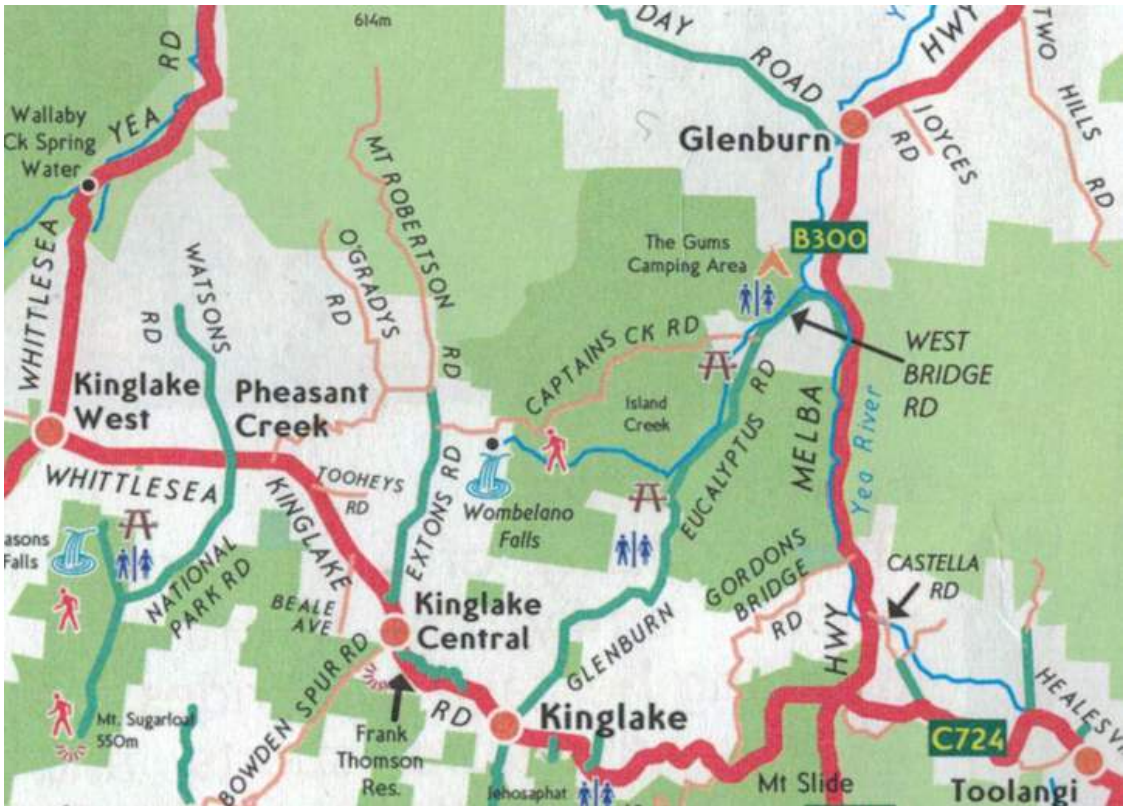


Figure 3: Kinglake district from Shire of Murrindindi "Heart of Victoria" map.

The Kinglake district is set in the southern slopes of the Great Dividing Range in Central Victoria. Murrays Road is located within Kinglake and north of the main Whittlesea-Kinglake Road and is situated at an elevation between 540 and 560 metres above sea level.

By road it is 3 km north of Kinglake township, 16km east of Kinglake West, 16km northeast of St Andrews, 18km southwest of Glenburn, 35km west of Healesville, 36 km southeast of Flowerdale, and 46km south of Yea.

Murrays Road is 680m long. From McMahons Road in the west it traverses east then southeast ending as a no through road. There is, however at the end, a further dirt road running north for approximately 300m then east for up to a kilometre which is apparently a private road or carriage easement, and which appears to have been partially revegetated along the track sides with a variety of indigenous and native shrub and tree species adding to the existing indigenous species there which includes Critically Endangered *Pomaderris vacciniifolia*.

Figure 4: Aerial view of Murrays Road, Kinglake.

History

Kinglake district is within the traditional land of the Kulin Nation with Wurundjeri people to the south and Taungurung people to the north, so Murrays Road is considered Taungurung country although there would have been interaction between the two peoples of the Kulin Nation.

Their specific habitation of this area before white settlement is still yet to be made better known or understood although the Kinglake district, as the area is known today, would have been a desirable place to visit particularly at certain times of the year possibly for trading, ceremonies, and there would have been use of much of the flora (and fauna) for food, clothing, medicine, weapons, and possibly the widely practiced traditional firestick farming. There is much conjecture on the lost opportunities to learn from Aboriginal fire management and the abrupt changes imposed by white settlement, which it is claimed, have lead to less regular but more intense fires, now being exacerbated by climate change.

To increase awareness of the cultural value and history of indigenous flora and fauna, and with respect to the longest continuous culture in the world, the author takes this opportunity to include the known Koori (Aboriginal) use of many of the plants in this area. See Appendix 4 (Koori/Aboriginal Use of Flora) for more detail.

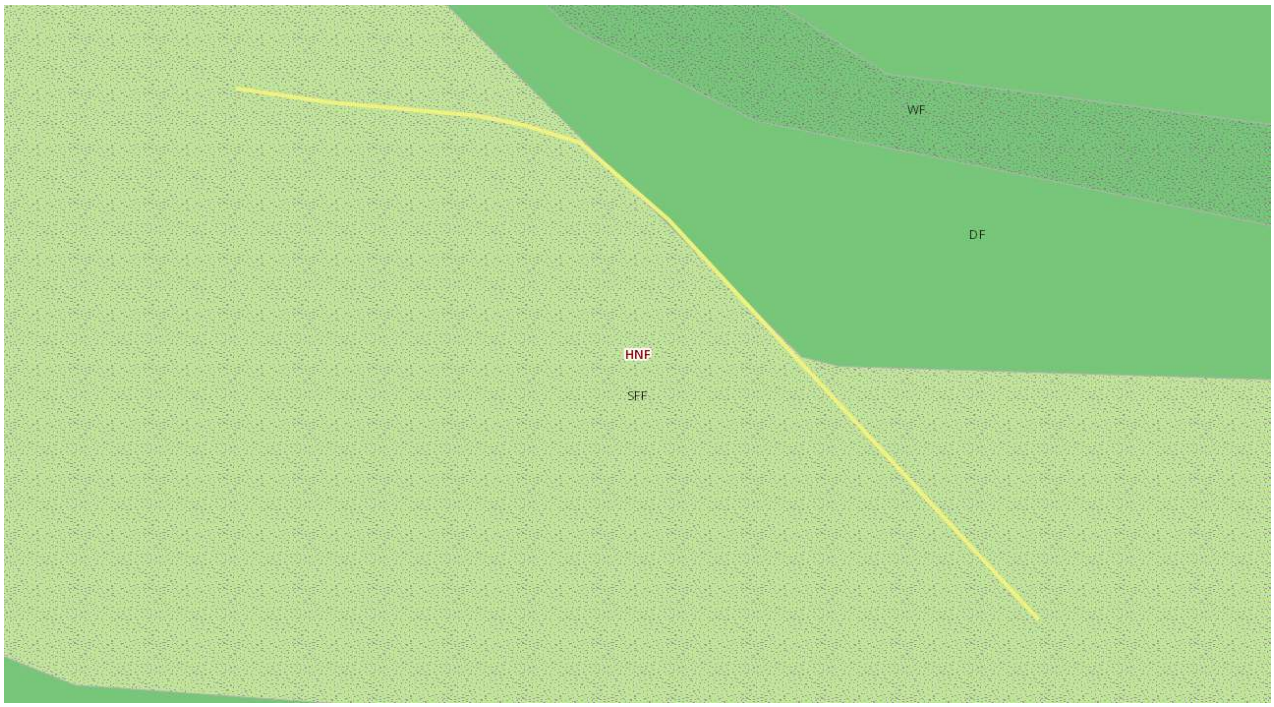


Figure 5: Pre 1750 Murrays Road Forest EVC's from NatureKit Biodiversity Index Map

The above Figure 5 shows the pre-1750 Murrays Road area as a sequence of vegetation types including Shrubby Foothill Forest (SFF) and Damp Forest (DF), with Wet Forest (WF) nearby. From the second half of the 1800's, like much of Kinglake district, the Murrays Road area was cleared and settled for agricultural and horticultural purposes, with some logging over the years for timber, construction, and probably some gold prospecting around the creeks. Subsequently, there was alteration of the vegetation mix from forest to a mix of today's remnants of original vegetation mostly along roadsides, on some private properties amongst the developed areas, and at either end in bushland.

As was common in early white rural settlement, Murrays Road was mostly larger properties, although the area has since been partially further subdivided.

Figure 6: Landcarers maintaining plantings Spring 2021.

A Landcare roadside planting of indigenous plants with volunteers was undertaken for National Tree Day in September 2019. Approximately 200 plants, mainly Blackwoods, Musk Daisy-bush, Round-leaf Pomaderris, and thirty local eucalypts were staked and guarded. It was part of a plan for a Greater Glider habitat link from the Kinglake East Bushland Reserve to Number Three Creek (see plan in Appendix 5). With local consultation, the plan suggested several clumped groups of indigenous plants including trees surrounded by a few understory shrubs mainly along the northern side of the road and incorporating existing trees and native vegetation along the roadside into the corridor. Subsequently, Landcare volunteers have made maintenance visits to the plantings and removing weeds and rubbish (see photo above). Further planting is planned.

Kinglake district has recorded many bushfires including those in recent history in 1926, 1939, 1962, 1982, 2006, and 2009. The January 2006 fire just missed this road. The even more catastrophic February 2009 fire devastated the Kinglake district.

Flora values

Kinglake district sits on the boundary of the *Highlands Southern Fall* and *Highlands Northern Fall* Bioregions which are two of the 28 Bioregions as defined by the Victorian State Government. Murrays Road is considered to be within the *Highlands Northern Fall Bioregion*.

Bioregions are a landscape-scale approach to classifying the environment using attributes such as climate, geomorphology, geology, soils and vegetation. Within these bioregions, further classifying areas into Environmental Vegetation Classes (EVC's) can assist with flora identification.

The Threatened Species Management Plan for Kinglake National Park (ABZECO 2010) detailed the State Botanical Significance of Victorian Rare and Threatened Species (VROT). Those species found here are included in the species lists appendices.

Situated at approximately 550m ASL on the slopes of the Great Dividing Range, this location influences the vegetation communities contained.

Rainfall also influences the vegetation communities and Mean Annual Rainfall figures from Bureau of Meteorology (BOM) stations Kinglake West to the west is 1041.3mm (1990-2020), east to Toolangi 1356.4mm (1953-2020), northeast to Glenburn 837.1mm (1937-2020), and southwest to Tourrourong Reservoir 785.2mm (1892-2020).

Where rainfall exceeds 900 mm *Eucalyptus* forests are commonly tall (over 30m) with a dense understory of small trees, especially in sheltered valleys.

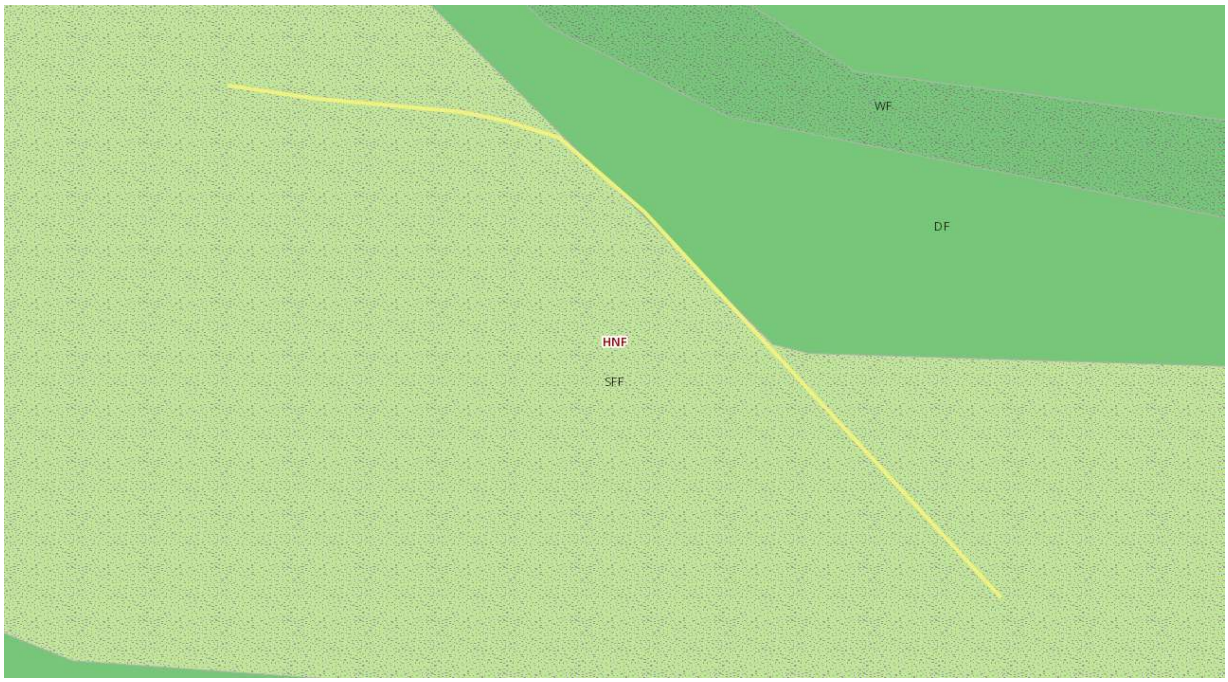


Figure 7: Pre 1750 EVC's Murrays Road area from NatureKit Biodiversity Index Map.

Desktop assessment using the Department of Environment Land Water & Planning's (DELWP) *NatureKit* (*Biodiversity Interactive Maps)* online tool suggested that the pre-1750 Murrays Road area (Fig 7) was a mosaic of Shrubby Foothill Forest (EVC 45-dotted pale green), Damp Forest (EVC 29-dark green), and nearby Wet Forest (EVC 30-dotted dark green).

NatureKit for 2005 (Figs 8 & 9) similarly shows from west to east along Murrays Road as remnants of Shrubby Foothill Forest (EVC 45), Damp Forest (EVC 29), and nearby Wet Forest (EVC 30) separated by cleared/agricultural areas.

Whilst EVCs act as a useful guide, land use history and major disturbances such as logging, agriculture, mining, human habitation and intense bushfires complicate this process of classifying vegetation communities.

Figure 8: 2005 EVC Hybrid Map of Murrays Road, Kinglake.

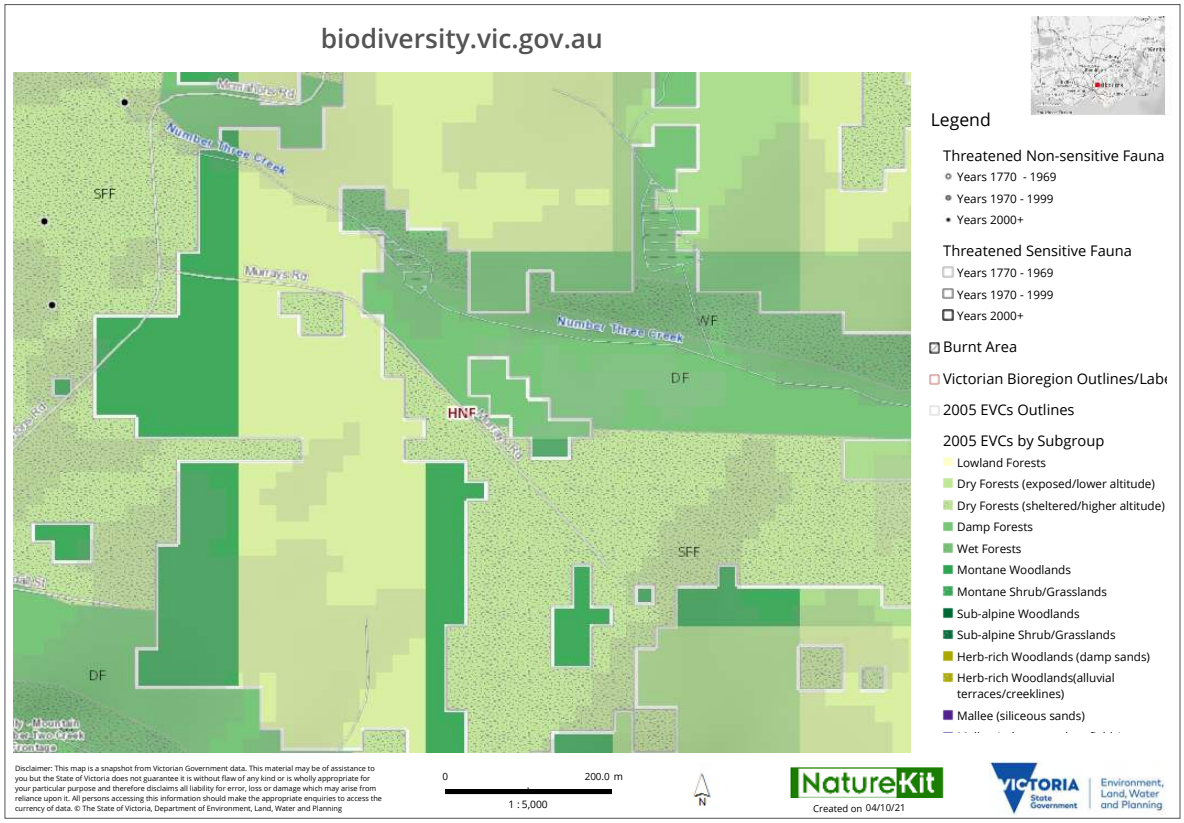


Figure 9: 2005 Murrays Rd area EVC's from NatureKit Biodiversity Map.

Murrays Road still retains sections of remnant vegetation along the roadsides of varying quality although clearing, mowing, and slashing has reduced the biodiversity in other sections of the roadside. The Critically Endangered Round-leafed Pomaderris (*Pomaderris vacciniifolia*), for example, persists in some of these sections surviving the current vegetation management by some adjacent landowners.

Figure 10: *Epacris impressa* (Common Heath)

Relevant Authorities and Strategies

Local Government

Although Kinglake district straddles five local government areas, much of the district including Murrays Road, Kinglake is within the boundaries of and thus administered by Murrindindi Shire Council (MSC). MSC have recognised Murrays Road significance by supporting this Botanic Assessment.

MSC advise of Murrundindi Planning Scheme that

"Clause 02.03 Strategic Directions includes Environmental and landscape values:

Remaining native vegetation on private land is highly fragmented and usually occurs in small or narrow linear remnants, increasing the importance of roadside and riparian vegetation. Land clearing, invasion of weeds and loss of habitat are particular threats to this vegetation….in protecting environmental and landscape values, Council supports:

Protecting environmental values, including native vegetation, roadside vegetation, and scattered paddock trees.

This is supported by the MSC Rural Roadside Management Plan (2014-18 being updated) which details the values, responsibilities, roles etc.

Water Catchment

There is no reticulated water supply system in Kinglake district, however, it straddles two catchments/authorities, Goulburn Broken Catchment Management Authority (GBCMA) and Melbourne Water's Port Philip and Westernport Catchment. Murrays Road falls within the

GBCMA being just north of the catchment divide and thus within the Goulburn Broken Regional Catchment Strategy 2012-2019 (currently being updated). In fact, Murrays Road sits within the headwaters of Numbers Two and Number Three Creeks.

Goulburn Broken Catchment Management Authority seeks partnership in waterway management with the community and all levels of government such as the Shire of Murrindindi and local residents and is ultimately responsible/accountable to the State Government.

Parks Victoria

PV is directly responsible for the management of the Kinglake National Park to the east of Murrays Road and also the Kinglake East Bushland Reserve to the west.

State Government

Indigenous vegetation is protected by State Government on public land through the Flora and Fauna Guarantee Act 1988 (FFG), with special consideration for rare or threatened species and more broadly through the Planning and Environment Act.

Clauses 12.01 and 52.17 of the Victorian Planning Provisions seek to assist the protection and conservation of Victoria's biodiversity (including native vegetation) by ensuring that clearing of vegetation and habitat which impacts on biodiversity is regulated through Native Vegetation Clearing Regulations.

Federal Government

The Environment Protection Biodiversity Conservation Act, 1999 (EPBC), contains protections for matters of national environmental significance including certain vegetation communities, flora, and fauna. This includes the Nationally Threatened/Critically Endangered *Pomaderris vacciniifolia* (Round-leaf Pomaderris) which is found on this roadside and in the district.

The newly elected federal government is expected to review the EPBC Act effectiveness.

METHODS

This report was compiled by fieldwork in late Spring 2021 through to early Spring 2022 using visual assessment, field guides research, and report writing. Additional information was gathered via personal communications with some local residents and other stakeholders. Vegetation Quality Assessments were assisted by using RRV (formerly VicRoads) Roadside Vegetation Assessment sheets.

As the roadside was the focus of the study, most adjacent private properties were not visited so off-road species listed are mainly those found in areas immediately adjacent in bushland reserves.

As is a common practice, locations of flora and fauna are not always made clear to avoid potential unlawful or destructive removal.

Disclaimer

Plant identification particularly by flowers was mainly during late Spring, Summer, Autumn, and early Winter which covered most species. Follow up is usually suggested all year round for completeness. Also, some tree species can be more difficult to identify due to height, lack of flowers and fruit, burnt bark from recent fires, and the ever present possibility of hybrids.

RESULTS

This botanic assessment identified 52 indigenous and 28 exotic flora species from trees through shrubs, ground flora, grasses, and ferns including rare and Critically Endangered species. This is in a structure along and beside this roadside fitting many of the elements of the EVC's of Shrubby Foothill Forest, Damp Forest, and Wet Forest.

Figure 11: Flowering *Pomaderris vacciniifolia*.(Round'leafed Pomaderris)

A complete list of recorded flora is provided alphabetically by species name (including common names), and also within botanical families alphabetically in Appendix 1.

Vegetation Quality Assessment

Assisted by using RRV Roadside Vegetation Assessment sheets (see Appendix 4), scoring indicates that the roadside is almost all high quality due to factors such as structure,

threatened species and vegetation communities, and relatively low level of weeds. One medium quality section on the westernmost 200m on the southside of the roadside is due to very narrow width and mainly exotic (non-indigenous) vegetation.

Connectivity

Connectivity of the roadside to the adjacent rural and semirural properties and to the bushland reserves adds to the habitat and biodiversity value as can be seen by the aerial photo. Continuous multi storey vegetation cover is extensive for most of the roadside and the latest plantings will assist. It also correlates with the vegetation quality.

Connectivity tends to reduce some of the deleterious fragmentation and edge effects including increased risk of losing sensitive flora (and fauna), reductions in genetic diversity of those sensitive species, increased predation, and competition from species favoured by disturbance.

Biodiversity

As can be seen from the attached lists/appendices of approximately 50 observed indigenous species, this relatively short road is deservedly considered an area of medium/high biodiversity with remnants of the original vegetation believed to have existed before white settlement less than 200 years ago.

Structure

There is significant tree cover along most of the roadside especially on the south and east with small gaps on the northwest end where trees are being planted (as Figure 12 below), and around property entrances. Most of the vegetation is on the roadsides of the fence lines, with the private properties, particularly at the western end, cleared of trees and shrubs.

Figure 12: Western end of Murrays Road.

Figure 13: Eastern end of Murrays Road.

Some sections of the road are either regularly slashed, mowed or otherwise disturbed which appears to have reduced shrub coverage and minimised groundcovers in those sections and leaving mainly exotic grasses. Multi-layered structures provide more diverse habitat and opportunities for use by a larger number of fauna species.

Ecological Vegetation Classes (EVC's)

The Department of Environment Land Water and Planning (DELWP) NatureKit Maps indicate there are three EVC's represented along the roadside. See Figures 2 and 3 for more details.

Figure 14: Pre 1750 EVC's Murrays Road area from NatureKit Biodiversity Index Map.

Desktop assessment using the Department of Environment Land Water & Planning's (DELWP) NatureKit online tool suggested that the pre-1750 Murrays Road area (Fig 14) was a mosaic of forest types including Shrubby Foothill Forest (EVC 45) and Damp Forest (EVC 29), with Wet Forest (EVC 30) nearby.

Figure 15: 2005 EVC Hybrid Map of Murrays Rd, Kinglake.

NatureKit for 2005 (Fig 15) similarly shows from west to east along Murrays Road as initially cleared then variously Shrubby Foothill Forest (EVC 45) and Damp Forest (EVC 29), with Wet Forest (EVC 30) nearby. GBCMA estimate that these EVC's in the Northern Fall Bioregion have retained upwards

of 50% of pre 1750 cover. The cleared first 200m on the northside is now being successfully replanted and Orchids have been rediscovered in that section.

Whilst EVCs act as a useful guide, land use history and major disturbances such as logging, agriculture, mining, human habitation and intense bushfires complicate this process of classifying vegetation communities.

Trees

Significant indigenous tree cover (including planted) along most of the road including *Eucalyptus blakelyi* (Blakelys Red Gum) planted nearby, *Eucalyptus cypellocarpa* (Mountain Grey Gum), *Eucalyptus dives* (Broad-leafed Peppermint), *Eucalyptus obliqua* (Messmate), *Eucalyptus radiata* (Narrow-leafed Peppermint), *Acacia dealbata* (larger Silver Wattles), and *Acacia melanoxylon* (larger Blackwoods), abundant *Acacia obliquinervia* (Mountain Hickory Wattle), and *Acacia verticillata* ssp *cephalatha* (Prickly Moses).

Figure 16: Abundant *Acacia quinquinervia* Mountain Hickory Wattle

Shrubs

ty Miller)

Figure 18: Fruiting *Polyscias sambucifolia* (Elderberry Panax)

Wattle shrubs such as *Acacia dealbata* (Silver Wattle), *Acacia melanoxylon* (Blackwood), abundant *Acacia obliquinervia (Mountain* Hickory Wattle), *Acacia verticillata* ssp *verticillata* (Prickly Moses), *Cassinia aculeata* (Dogwood/Common Cassinia), *Coprosma quadrifida* (Prickly Currant-bush), rare *Goodia pubescens* (Silky Clovertree), *Goodenia ovata* (Hop Goodenia), abundant *Kunzea* sp (Upright Form) (Forest Burgan), *Leptospermum continentale*? (Prickly Tea-tree), *Olearia* spp (Daisy-bushes), *Pimelea axiflora* (Bootlace Bush), *Pittosporum bicolor* (Banyalla), *Polyscias sambuccifolia* (Elderberry Panax), *Pomaderris aspera* (Hazel Pomaderris), abundant Critically Endangered *Pomaderris vacciniifolia* (Round-leaf Pomaderris), *Prostanthera lasianthos* (Coranderrk/Victorian Christmas Bush), *Pultenaea gunnii* (Golden Bush-pea), *Pultenaea muelleri* var *muelleri* (Mueller's Bush-pea), *Pultenaea scabra* (Rough Bush-pea), and *Spyridium parvifolium* (Dusty Miller).

Groundflora (including Lilies and Orchids)

Figure 19: *Pimelea axiflora* (Bootlace Bush)

Figure 20: *Pultenaea muelleri* (Muellers Bush-pea)

Diversity includes Orchids *Microtis* spp (Onion Orchids), *Thelymitra* spp (Sun-orchids), also *Acaena novae-zelandiae* (Bidgee-Widgee), *Dianella spp* (Flax-lilies), *Dichondra repens* (Kidney-weed), *Epacris impressa* (Common/Pink Heath), *Geranium* spp (Cranes-bill), abundant *Gonocarpus* spp (Raspworts), *Helichrysum luteoalbum* (Jersey Cudweed), *Hydrocotyle* sp (Pennyworts), *Lomandra longifolia* var *longifolia* (Spiny-headed Mat-rush), *Pimelea* spp (Rice-flowers), *Senecio* spp (Fireweeds), *Stellaria flaccida* (Forest Starwort), and *Viola* spp (Violets).

Figure 21: *Goodenia ovata* (Hop Goodenia)

Figure 22: *Tetratheca ciliata* (Pink Bells)

Figure 23: *Thelymitra* sp (Sun-orchid)

Fi nion-orchid)

Grasses and Grass-like Forms

Microlaena stipoides (Weeping Grass), *Poa ensiformis* (Purple-sheathed Tussock Grass), *Tetrarrhena junceus* (Forest Wire-grass), and *Lepidosperma laterale* (Variable Sword-sedge).

Ferns

Pteridium esculentum Bracken Fern is widespread, other ferns found nearby included Cyathea australis Rough Tree-fern (pooeet) and Calochlaena dubia Rainbow Fern/False Bracken.

Figure 25: *Calochlaena dubia* (False Bracken/Rainbow Fern)

Figure 26: Fungi

Fungi, lichens, mosses, and mistletoes

These life forms are often cryptic to identify and not always found or easily identified on roadsides. Deserves further exploration at a more appropriate time of the year such as around May for fungi. Photo below believed to be *Cortinarius* sp? from the roadside in late March.

Habitat

Figure 27: Habitat hollow

Figure 28: Habitat hollow

The remaining sections of habitat along this roadside are sufficient to allow for a diversity of wildlife particularly with connectivity to bushland on adjacent private property areas and to conservation reserves containing significant hollows. There are also a few trees and large logs along the roadside that contain ground level hollows (see above photos) with some appearing to be used by wildlife. Above ground hollow bearing trees were harder to observe.

Wildlife observed is listed in Appendix 2.

Indigenous Fauna

Figure 29: *Perameles nasuta* (Long-nosed Bandicoot)

Flora as habitat is very important so fauna sightings are included in this assessment. Assisted by cameras set up by Landcare and local residents, a wide variety of animals have been recorded.

Abundant birdlife as recorded in the Fauna List in Appendix 2, including Olive Whistler,

Painted Button-quail, Agile Antechinus, Australian Bush Rat, Eastern Grey Kangaroo, Echidna, Long-nosed Bandicoot, Copperhead Snake, Ringtail Possum, Swamp Wallaby, Wombat and Mountain Brush-tailed Possum (Bobuck).

DISCUSSION

Rare or Threatened Species

Many of the 52 indigenous species along this road are listed as Protected Flora in Victoria under the FFG Act, including *Acacia obliquinervia, Acacia verticillata*, *Cassinia aculeata*, *Epacris impressa*, *Pomaderris vacciniifolia*, *Senecio* spp, all Orchids, all *Epacridaceae* (Heaths), all *Prostantheras* (Mint-bushes), and all ferns other than *Pteridium esculentum* (Bracken). This limited protection only applies to public land except for *Pomaderris vacciniifolia* which is State FFG listed, and also Critically Endangered protected by the federal EPBC Act with significant penalties. *P.vacciniifolia* is naturally occurring particularly on the southern roadside (and also in plantings along the roadsides and the adjacent eastern road/carriageway).

Also, *Goodia pubescens* is listed as rare. Tolsma et al on "Recovery from 2009 Bushfires" reported in 2012 that *Goodia pubescens* needed to be protected from fire until viable seed store is re-established which is occurring with several *Goodia pubescens* planted by Landcare.

Land use Threats and Opportunities

The significant fragmentation of bushland since white settlement, consequent disturbances such as weed invasions, probable changed fire regimes leading to more severe bushfires as in 2009 have all contributed to the changes to the vegetation community of the area. However, the evolutionarily developed characters of indigenous vegetation appear to have assisted survival of these processes and contributed to the roadside biodiversity as have previous carefully regulated and monitored roadside burns (see photos?)

Figure 30: Ecological burning of roadside, Kinglake West

apparently achieved their objectives of reduced fire risk and regeneration of indigenous flora. Regeneration from pre-fire reports of as few as 150 known plants of Critically Endangered *Pomaderris vacciniifolia* to at least some thousands has been widely observed since the 2009 bushfires in the Kinglake district (personal observation and pers. comm. Kinglake Landcare Group members).

Ecological burning has been successfully attempted in recent years along selected local roadsides with good results in fire protection and regeneration of indigenous groundflora (see photo below), but, with due regard to re-establishment of rare species such as *Goodia pubescens.*

Climate change is making the fire threat increasingly more severe as the southeast of Australia will continue to get hotter and drier and with more extremes of temperature, rainfall, and winds, even if strong remedial action is belatedly taken.

Pest Plants

High threat weed species for this district include Broom and Blackberry which have been found scattered along this road. Increased attention by the Upper Goulburn Landcare Network using Conservation Volunteers Australia, Kinglake Landcare members, other volunteers, and MSC specialist contractors in recent years have drastically reduced these high threat weed species on the roadsides.

Scattered/occasional small emergent Blackberry and Broom plants that were observed along the roadside could be followed up by specialist contractors to prevent re-establishment of these invasive pest plants amongst this biodiverse landscape.

Figure 32: *Disa bracteata* (South African Weed Orchid)

Lower threat abundant weed species along the road mentioned in the Appendix include the

Figure 31: *Rubus fruticosus agg* (Blackberry)

grasses *Dactylis glomerata* (Cocksfoot) *Anthoxanthum odoratum* (Sweet Vernal Grass), *Allium triquetrum* (Angled Onion), and *Acer pseudoplatanus* (Sycamore Maple).

More invasive weeds, although mostly contained, include *Disa bracteata* (South African Orchid), Blackberry, Holly, and Broom.

Pest Animals

Rabbits, Foxes and Deer have all been recorded in the area.

Dumping

Roadside dumping appears to be relatively limited. However, green waste and soil dumping is often the cause of weed infestations including from succulents and garden escapees which can become quite invasive. Soil disturbance including soil excavation from road works can similarly cause weed infestation and smother indigenous vegetation.

RECOMMENDATIONS

Community/Residents

The level of awareness of their vegetation community by local residents/landowners in the district is varied and as local community groups are the closest organisations to the people by their very nature, so workshops on "your local environment" with advice to residents re value of their roadsides should be considered.

It is suggested that State and local government give continuing support to community groups such as Landcare that currently help to protect and enhance the ecology of the area including continuing the Greater Glider Habitat Link (see Appendix).

Local Government

In recent years, it is considered that MSC has had a greater awareness and made progress with weed control through specialist contractors with working knowledge of indigenous and weedy species.

Scattered/occasional small emergent Blackberry and Broom plants that were observed along the roadside should be followed up by specialist contractors to prevent re-establishment of these invasive pest plants amongst this biodiverse landscape.

Local government is the closest level of government to the people and the managing authority of local roads such as Murrays Road, so there appears to be a need for further cooperative advice to residents through workshops, and sponsoring community initiatives

such as Landcare flora and fauna walks, workshops, and botanical tours to raise the level of awareness of local residents. MSC could actively promote the welcome recent expansion of the green waste delivery at the Kinglake Transfer Station from peak bushfire periods to an all year round free service to further reduce illegal dumping and also reduce resident burn offs. Finally, carefully regulated and monitored ecological/bushfire prevention burns of roadside should be considered as previous examples have apparently achieved their objectives of reduced fire risk and regeneration of indigenous flora.

Importantly, to ensure that any road widening or drainage works does not degrade remnant roadside vegetation especially species such as Critically Endangered *Pomaderris vacciniifolia.*

State Government

Over the years, changes to legislation in Victoria transferred the responsibility for noxious weeds on roadside to Local Government from a former State responsibility. However, this transfer of responsibilities has not apparently been accompanied by sufficient resources to enable that to effectively happen, especially for rural shires with large areas of responsibility and limited growth areas compared to many urban local governments with either established facilities or growth areas with complementary significant developer funding.

Parks Victoria manages the nearby Kinglake National Park and patches of bushland and a scarcity of resources for community education, weed control, pest control, etc. can have a limiting effect on their ability to more effectively protect and enhance the flora and fauna of the district, and thus indirectly connectivity with Murrays Road.

There have been some recent successes with fox control programs in the district in cooperation with Upper Goulburn Landcare Group, DELWP, Parks Victoria, and interested landowners, managers, and residents.

Most other State agencies such as DELWP are administered from outside the Kinglake District which, combined with funding restraints, can limit their local activities and enforcement of the FFG Act etc.

Road maintenance, and particularly limited funding and sometimes inappropriate nature of vegetation maintenance of the nearby RRV roads (Melba Highway, Kinglake-Healesville Road, and Kinglake-Glenburn Road) can also affect local roads such as Murrays Road including its habitat connectivity.

APPENDIX I FLORA SPECIES (alphabetical by species and also by family)

Figure 33: *Thelymitra* sp (Sun Orchids)

Indigenous Flora

Acacia dealbata	**Silver Wattle**
Acacia melanoxylon	**Blackwood**
Acacia obliquinervia (A)	**Mountain Hickory Wattle**
Acacia verticillata	**Prickly Moses**
Acaena novae-zelandiae	**Bidgee-widgee**
Calochlaena dubia	**Rainbow Fern/False Bracken**
Cassinia aculeata (A)	**Dogwood/Common Cassinia**
Clematis aristata	**Austral/Mountain Clematis**
Coprosma quadrifida	**Prickly Currant-bush**
Cyathea australis	**Rough Tree-fern (pooeet)**
Dianella tasmanica	**Tasman Flax-lily**
Dichondra repens	**Kidney-weed**
Epacris impressa	**Common Heath**
Eucalyptus blakelyi	**Blakely's Red Gum**

Eucalyptus cypellocarpa	**Mountain Grey Gum**
Eucalyptus dives	**Broad-leafed Peppermint**
Eucalyptus obliqua	**Messmate Stringybark (daagonj)**
Eucalyptus radiata	**Narrow-leafed Peppermint**
Geranium potentilloides	**Soft Crane's-bill**
***Geranium* sp**	**Crane's-bill**
Gonocarpus tetragynus (A)	**Common Raspwort**
Goodenia ovata	**Hop Goodenia**
***Goodia pubescens* (Rare in Vic)**	**Silky Clovertree**
Helichrysum luteoalbum	**Jersey Cudweed**
***Hydrocotyle* sp**	**Pennywort**
***Kunzea* sp (Upright form)**	**Forest Burgan**
Lepidosperma laterale	**Variable Sword-sedge**
Lomandra longifolia	**Spiny-headed Mat-rush**
Microlaena stipoides	**Weeping Grass**
***Microtis* spp**	**Onion Orchid**
Olearia argophylla	**Musk Daisy-bush**
Olearia lirata	**Snowy Daisy-bush**
Pimelea axiflora	**Bootlace Bush**
Pittosporum bicolor	**Banyalla**
Poa ensiformis (A)	**Purple-sheathed Tussock Grass (bu-iy/bowat)**
Polyscias sambucifolia	**Elderberry Panax**
Pomaderris aspera	**Hazel Pomaderris**
Pomaderris vacciniifolia (A)	**Round-leaf Pomaderris (Critically Endangered)**
Prostanthera lasianthos	**Coranderrk/Victorian Xmas Bush (geringda)**
Pteridium esculentum (A)	**Austral Bracken**
Pultenaea gunnii	**Golden Bush-pea**
Pultenaea muelleri	**Muellers Bush-pea**
Pultenaea scabra	**Rough Bush-pea**
Rubus parvifolius	**Small-leaf Bramble/Native Raspberry**

Senecio linearifolius	Fireweed Groundsel
Senecio sp	Fireweeds
Spyridium parvifolium	Dusty Miller
Stellaria flaccida	Forest Starwort
Tetratheca ciliata	Pink Bells
Tetrarrhena juncea	Forest Wiregrass
Thelymitra sp	Sun Orchid
Viola hederacea	Ivy-leaf Violet
Wahlenbergia gracilis	Sprawling Bluebell

Exotic Flora

Acer pseudoplanatus (A)	Sycamore Maple
Acetosella vulgaris	Sheep Sorrel
Allium triquetrum (A)	Angled Onion
Anagallis arvensis	Scarlet Pimpernel
Anthoxanthum odoratum (A)	Sweet Vernal Grass
Arctotheca calendula	Capeweed
Brassica sp	Mustard
Centaurium sp	Centaury
Cytisus scoparius	English Broom
Dactylis glomerata (A)	Cocksfoot
Disa bracteata	South African Orchid
Galium aparine	Cleavers
Genista monspessulana	Montpellier Broom/Cape Broom
Hyacinthoides hispanica	Spanish Bluebells
Hypochaeris radicata	Cats-ears
Ilex aquifolium	Holly
Myosotis sylvatica	Wood Forget-me-not
Oxalis incarnata	Pale Wood-sorrel
Paspalum dilatatum	Caterpillar Grass
Pinus radiata	Monterey Pine

Plantago spp	Plantain
Prunus laurocerasus	Cherry Laurel
Raphanus sp	Wild Radish
Romulea rosea var *australis*	Onion Grass
Rubus fruticosus spp agg	European Blackberry spp
Sonchus spp	Sow-thistle
Taraxacum officinale	Dandelion
Trifolium campestre (A)	Hop Clover

ALL FLORA BY FAMILY

FERNS AND ALLIES

Cyatheaceae

Cyathea australis	Rough Tree-fern

Dennstaedtiaceae

Pteridium esculentum	Austral Bracken

Dicksoniaceae

Calochlaena dubia	Rainbow Fern/False Bracken

CONIFERS

Pinaceae

**Pinus radiata*	Monterey Pine

MONOCOTYLEDONS

Asparagaceae

Lomandra longifolia var *longifolia*	Spiny-headed Mat-rush

Cyperaceae

Lepidosperma laterale	Variable Sword-sedge

Liliaceae

**Allium triquetrum* (A)	Angled Onion

Hyacinthoides hispanica	**Spanish Bluebells**
Gentianaceae	
***Centaurium sp**	**Centaury**
Hemerocallidaceae	
Dianella tasmanica	**Tasman Flax-lily**
Iridaceae	
Romulea rosea* var *australis	**Onion Grass**
Orchidaceae	
Disa bracteata	**South African Orchid**
***Microtis* spp**	**Onion Orchid**
***Thelymitra* sp (50-100 incl Blue)**	**Sun Orchid**
Poaceae	
*** *Anthoxanthum odoratum* (A)**	**Sweet Vernal-grass**
*** *Dactylis glomerata (A)***	**Cocksfoot**
Microlaena stipoides	**Weeping Grass**
Paspalum dilatatum	**Caterpillar Grass**
***Poa ensiformis* (A)**	**Purple-sheathed Tussock-grass**
Tetrarrhena juncea	**Forest Wiregrass**
DICOTYLEDONS	
Aceraceae	
***Acer pseudoplanatus (A)**	**Sycamore Maple**
Apiaceae	
***Hydrocotyle* sp**	**Pennywort**
Aquifoliaceae	
***Ilex aquifolium**	**Holly**
Araliaceae	
Polyscias sambucifolia	**Elderberry Panax**

Asteraceae	
***Arctotheca calendula**	**Capeweed**
Cassinia aculeata (A)	**Dogwood/Common Cassinia**
Helichrysum luteoalbum	**Jersey Cudweed**
***Hypochaeris radicata**	**Cat's-ears/Flatweed**
Olearia argophylla (P)	**Musk Daisy-bush**
Olearia lirata	**Snowy Daisy-bush**
***Senecio* spp**	**Fireweeds**
Senecio linearifolius	**Fireweed Groundsel**
***Sonchus* spp.**	**Sow-thistle**
***Taraxacum officinale**	**Dandelion**
Boraginaceae	
***Myosotis sylvatica**	**Wood Forget-me-not**
Brassicaceae	
***Brassica* sp**	**Mustard**
***Raphanus* sp**	**Wild Turnip**
Campanulaceae	
Wahlenbergia gracilis	**Sprawling Bluebell**
Caryophyllaceae	
Stellaria flaccida	**Forest Starwort**
Convolvulaceae	
Dichondra repens	**Kidney Weed**
Droseraceae	
Elaeocarpaceae	
Tetratheca ciliata	**Pink Bells**
Ericaceae	
Epacris impressa	**Common/Pink Heath**

Fabaceae	
***Cytisus scoparius**	**English Broom**
***Genista monspessulana**	**Montpellier Broom/Cape Broom**
***Goodia pubescens* (P) Rare in Vic**	**Silky Clovertree**
Pultenaea gunnii	**Golden Bush-pea**
***Pultenaea muelleri* var *mueller*i**	**Muellers Bush-pea**
Pultenaea scabra	**Rough Bush-pea**
***Trifolium campestre (A)**	**Hop Clover**
Geraniaceae	
Geranium potentilloides	**Soft Crane's Bill**
***Geranium* sp**	**Crane's Bill**
Goodeniaceae	
Goodenia ovata	**Hop Goodenia**
Haloragaceae	
Gonocarpus tetragynus (A)	**Common Raspwort**
Lamiaceae	
Prostanthera lasianthos	**Victorian Christmas-bush/Coranderrk**
Mimosaceae	
Acacia dealbata	**Silver Wattle**
Acacia melanoxylon	**Blackwood**
***Acacia obliquinerva* (A)**	**Mountain Hickory Wattle**
Acacia verticillata* ssp *verticillata	**Prickly Moses**
Myrtaceae	
***Eucalyptus blakelyi* (P)**	**Blakely's Red Gum**
Eucalyptus cypellocarpa	**Mountain Grey-gum**
Eucalyptus dives	**Broad-leafed Peppermint**
Eucalyptus obliqua	**Messmate Stringybark**
Eucalyptus radiata	**Narrow-leafed Peppermint**
***Kunzea* sp (Upright form)**	**Forest Burgan**

Oxalidaceae	
***Oxalis incarnata**	**Pale Wood-sorrel**
Pittosporaceae	
Pittosporum bicolor	**Banyalla**
Plantaginaceae	
***Plantago spp**	**Plantain**
Polygonaceae	
***Acetosella vulgaris**	**Sheep Sorrel**
Primulaceae	
***Anagallis arvensis**	**Scarlet Pimpernel**
Ranunculaceae	
Clematis aristata	**Austral/Mountain Clematis**
Rhamnaceae	
Pomaderris aspera	**Hazel Pomaderris**
Pomaderris vacciniifolia (A)	**Critically Endangered Round-leaf Pomaderris**
Spyridium parvifolium	**Dusty Miller**
Rosaceae	
Acaena novae-zelandae	**Bidgee-widgee**
***Prunus laurocerasus**	**Cherry Laurel**
***Rubus fruticosus** agg	**European Blackberry Species**
Rubus parvifolius	**Small-leaf Bramble**
Rubiaceae	
Coprosma quadrifida	**Prickly Currant-bush**
***Galium aparine**	**Cleavers**
Thymeleaceae	
Pimelea axiflora	**Bootlace Bush**
Violaceae	
Viola hederacea	**Ivy-leaf Violet**

Notation

A – abundant

P - planted

*** - Exotic Flora**

? – not confirmed/previously recorded in the area but not observed during this assessment

APPENDIX 2 – FAUNA SPECIES OBSERVED OR RECORDED

Mammals:

Agile Antechinus

Australian Bush Rat

Eastern Grey Kangaroo

Echidna

Figure 34: Agile Antechinus

Feral Cat

Long-nosed Bandicoot

Mountain Brush-tailed Possum

Platypus (nearby in Number Three Creek)

Rabbit

Red Fox

Figure 35: Long-nosed bandicoot with young

Ringtail Possum

Sambar Deer

Swamp Wallaby

White-tailed Water Rat – Rakali (nearby in Number Three Creek)

Wombat

Reptiles and Amphibians:

Blotched Blue-tongued Lizard

Copperhead Snake

Red-bellied Black Snake

Tiger Snake

Figure 36: Long-nosed Bandicoot

Birds:

Australian Magpie

Australian Raven
Australian Wood Duck
Bassian Thrush
Brown Thornbill
Brown-headed Honeyeater
Common Myna
Crimson Rosella
Eastern Rosella
Eastern Yellow Robin
Eastern Whipbird
Fan-tailed Cuckoo
Golden Whistler
Grey Fantail
Grey Shrike Thrush
Kookaburra
Leaden Flycatcher
Magpie-Lark
Olive Whistler
Painted Button-quail
Pied Currawong
Red Wattlebird
Spotted Pardalote
Sulphur-crested Cockatoo
Superb Blue Wren
Superb Lyrebird (calling nearby)
White-browed Scrub-wren
White-throated Treecreeper
Yellow-faced Honeyeater

Figure 37: Olive Whistler

Figure 38: Wombat

Figure 39: Australian Bush Rat

Figure 40: Young Swamp Wallaby

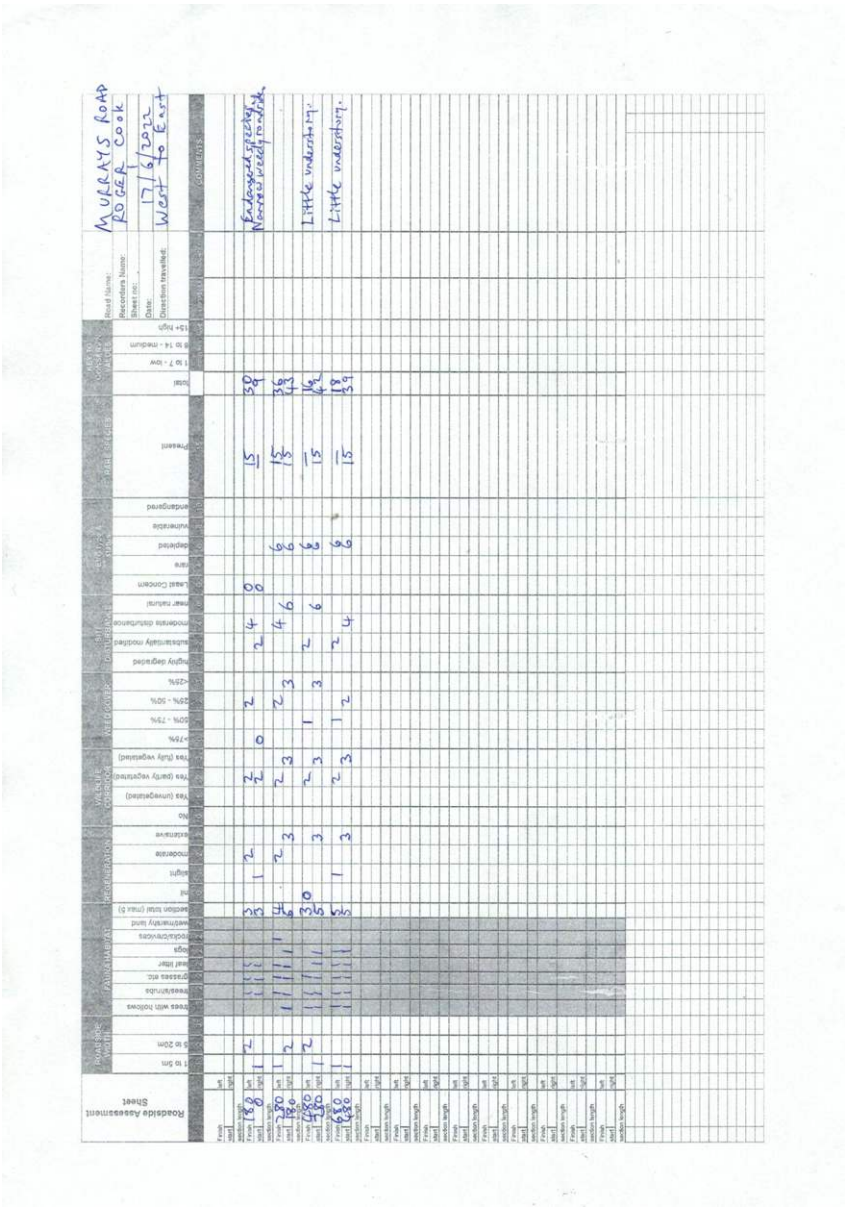
Figure 41: Echidna

Fig 48: Rabbit

Fig 49: Red Fox

APPENDIX 3 – RRV (VICROADS) ROADSIDE VEGETATION ASSESSMENT SHEET

Roadsides were assessed and rated high (15+), medium (8-14), and low (1-7) quality roadside vegetation, reflecting the various characters shown on the attached sheet including diversity of indigenous flora species (also see Vegetation Quality Fig 12)



APPENDIX 4 – FIRST NATIONS (ABORIGINAL) USE OF FLORA

Many plants found in and around Murrays Road area of Kinglake are species used by Aboriginal people across Victoria.

From Beth Gott including from *Use of Victorian Plants by Koories,* in the *Flora of Victoria Volume 1*, and *Taungurung* compiled by Mrs Leah Healy, detailed below are uses of these local species and indigenous names applied where known:

Fibre, adhesives, and implements; *Acacia* spp bark for buckets*; Acacia dealbata* (moy-yan) resin for adhesives, inner bark for string, bark for buckets, and wood for axe handles; *Acacia melanoxylon* (burnnalook) inner bark for string, wood for woomeras, shields, and throwing sticks, and bark infusion for rheumatic joints; *Acacia verticillata* bark for string fishing lines; *Banksia* spp. cones for strainers and fire carriers; *Exocarpos cupressiformis* (ballee) wood used for spear throwers and bullroarers*; Dianella* spp (murmbal) for basketmaking; *Eucalyptus* spp. incl gums and stringybarks) inner bark for string, bags, and nets, and suitable species for heavy spears, canoes, digging tools; *Hedycarya angustifolia* (djelwuck) wood for firedrills and spear ends; *Juncus* spp stems for baskets and string; *Kunzea sp* Upright Type (burgan) wood for spears, clubs, and boomerangs; *Lepidosperma* spp. leaves for baskets; *Lomandra longifolia* (kurawan) leaves for baskets, net bags, mats, and eel-traps; *Melaleuca* spp. paperbark for swaddling; *Pimelea axiflora* bark as string for fine nets and bootlaces; *Poa ensiformis* (bowat) leaves and stems for string and baskets; *Pomaderris aspera* wood for pegs stretching animal skins; *Prostanthera lasianthos* (coranderrk/geringda) stems for fire drill; and *Xanthorrhea* spp (bagap/baggup/mymurrung/toolemerin) resin from leaf for adhesives, stems as a base for fire-drills Spears, and leaves for cutting meat, and for food, medicine, and fish-poisons from all parts of plants including seeds, flowers, roots, and leaves - *Acacia dealbata* (moy-yan) gum for food and also applied to sores and wounds, and bark infusion for indigestion; *Acrotriche* spp small drupes eaten or soaked in water or sucked for nectar; *Arthropodium* spp tubers probably eaten; *Banksia* spp flowers steeped in water for nectar; *Billardiera scandens* (garawang) berries eaten raw; *Bulbine bulbosa* (pike) bulb eaten; *Burchardia umbellata* tubers eaten; *Cassytha* spp edible fruit, probably eaten; *Coprosma quadrifida* (morr) berries eaten raw; *Cyathea australis* (pooeet) and *Dicksonia antarctica* (kombadik/gumbadik) heart of the stems, and *Cyathea* stalks of young leaves as a tonic; *Eucalyptus* spp. flowers for nectar, sugary lerps on some spp, seed soaked and ground, and gum for toothache; *Exocarpos* spp succulent fruiting pedicel eaten raw; *Exocarpos cupressiformis* (ballee) sap as cure for snakebite (Tasmania?); *Geranium* spp.(terrat) tubers for food; *Helichrysum luteoalbum* (in Qld) leaf infusion for general sickness; *Kunzea sp* Upright Type (burgan) leaves burned to repel insects; *Lomandra* spp. flowers for nectar; *Orchidaceae* tubers of most species for food; *Mentha* spp used as lining for earth ovens; *Polyscias sambucifolia* fleshy fruit edible, probably used; *Pteridium esculentum* rhizomes cooked and beaten for food (and in Qld young stem for insect bites); *Rubus* spp. fleshy fruits; *Sambucus* spp. whitish drupes eaten raw; *Solanum* spp. ripe berries eaten, but, some *Solanum* species are highly toxic; *Thysanotus* spp tubers; *Typha spp* (cumbung, boort-deet) rhizomes eaten; *Urtica incisa* leaves and young stems cooked (in SA), poultices of leaves and stems for sprains (and in NSW as a poultice for rheumatism), and *Xanthorrhea* spp (bagap/baggup/mymurrung/toolemerin) tubers of young plants and leaf bases, eaten; flowers for nectar.

APPENDIX 5 – Greater Glider Habitat Link

Greater Glider Habitat Link

Fauna surveys in recent years by Landcare and NMIT Conservation & Land Management students at the Kinglake East Bushland Reserve have shown a concerning drop in numbers of the endangered greater gliders.

We feel that the population might be too isolated and inbreeding might be affecting their natural reproduction.

Kinglake Landcare Group members recently met with local residents to discuss possible sites for a habitat link to assist Greater Gliders to move to and from the Kinglake East Bushland Reserve.

"Restore connectivity to fragmented populations" is one of the threat mitigation actions recommended by the federal government's action plan for protecting declining greater glider populations
We came up with an idea of planting scattered trees along a short section of roadside on Murrays Rd.
As you can see on the map below this would create a great link connecting the Kinglake East Bushland Reserve with Number Three Creek.

The plan is to do several clumped groups of indigenous plants which would include a tree surrounded by a couple of understorey shrubs.
These will be mainly scattered along the northern side of the road and once established will create a canopy link connecting the two areas of native habitat.
We will incorporate existing trees and native vegetation along the roadside into the corridor.

The Murrindindi Shire is supportive of the project and we are planning to hold a community planting day in September.

With all the discussion and concerns recently about logging and its effect on greater gliders.
We are lucky to have greater gliders actually persisting in this reserve in the township of Kinglake and that this is something positive that we can do that may help protect this local population.

Regards, Chris Cobern.
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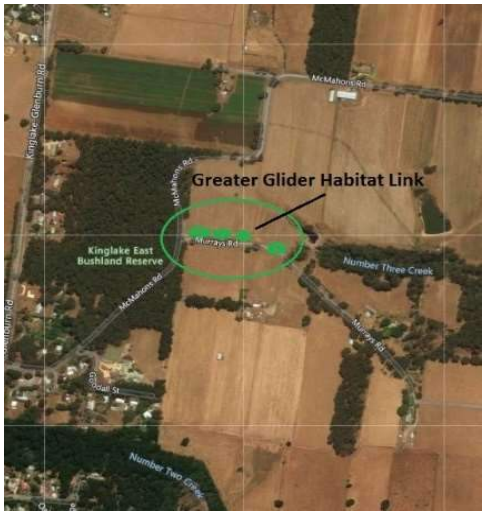

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Figure 42: Pomaderris vacciniifolia Round-leafed Pomaderris

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Figure 43: Acacia obliquinervia Mountain Hickory Wattle

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Figure 44: The revegetated western end of Murrays Road 2022

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