

In relation to the proposed Frankston Bypass running through Westerfield

PLANNING PANEL VICTORIA—Frankston Bypass Project.

Proponent Simon and Joyce Welsh

Expert Witness Statement of Nick McCaffrey in relation to flora and Malcolm Legg in relation to Fauna.

Experts retained by Simon and Joyce Welsh

1 Name and address

Malcolm Legg

Mal's Environmental and Ecological Services, PO Box 247, Shoreham, 3916.

2 Qualifications and Experience

I was qualified for Advanced Certificate in Horticulture from Victorian College of Agriculture & Horticulture Ltd (Burnley) in 1991, Alpine Ecology Course on the Bogong High Plains with the Department of Conservation & Natural Resources 1994 and Advanced Certificate in Natural Resource Management at Frankston College of TAFE in 1995.

Since then I have worked as a foreshore ranger for seven years at Shoreham Foreshore Reserve, revegetation extensive areas through out and conducting fauna research.

Since 1995 I have also conducted my own environmental and ecological consulting business both part time and more recently (2002) full-time carrying out fauna surveys at over 500 sites on the Mornington Peninsula, 20 sites within the Frankston and Cranbourne areas, urban growth areas within the south-east of Melbourne and over 20 sites across the rest of the country. I have also regenerated several sites, both public and private on the Mornington Peninsula.

At the young age of eight through to university, I have worked in the bush conducting bush land restoration, volunteering and carried out fauna surveys, mainly for the Victorian Herpetological Society.

3 Area of expertise

Since 1995 I have carried out fauna surveys at over 500 sites on the Mornington Peninsula, 20 sites within the Frankston and Cranbourne areas, urban growth areas within the south-east of Melbourne and over 20 sites across the rest of the country. I have also regenerated several sites, both public and private on the Mornington Peninsula.

I have also conducted several flora surveys across the Mornington Peninsula.

4 Expertise to make the report

I have worked on a broad range of projects relating to flora and fauna surveying

Currently

*Threatened Fauna Survey of the 3 precincts in the south east urban growth areas.

*Mapping fauna and fauna road kills across the entire Mornington Peninsula and creating the Mornington Peninsula Wildlife Atlas August, 2007 to June, 2009.

Previously

* Flora and Fauna Assessment of 'Westerfield', 86-118 Robinsons Road, Frankston South and Langwarrin South, March to December 2008.

*Fauna survey for Balcombe Creek Estuary, Mt Martha, August, 2008.

*Small Mammal Survey Point Nepean National Park, August, 2008.

*Fauna Survey for Buxton Reserve, Shoreham.

*Swamp Skink Survey of Kings Creek, Limestone Road and Drum Drum Alloc Creek Reserve, April 2008.

*Fauna Survey Cranbourne Botanical Garden in the Australian Garden Stage 2, July 2007.

*Fauna Survey for Point Nepean National Park, Portsea January 2007

*Fauna Survey for Portsea Lagoon, Portsea, May 2007.

*Fauna Survey for Sunshine Reserve, Mt Martha, May 2007.

*Fauna Survey for Mornington Coast, Mornington, October, 2007

*Fauna Survey for Warringine Reserve, Hastings, November, 2007.

*Fauna Survey and Management Prescriptions for Rosebud Foreshore, Rosebud, January, 2006 to April, 2006.

*Flora and Fauna Survey for Crib Point and Stony Point Foreshore, Crib Point, October, 2005 to October, 2006.

5 Instructions defining the scope of the report

Mal's Environmental and Ecological Services was commissioned by property owners Simon and Joyce Welsh to conduct a Flora and Fauna Survey within 'Westerfield', 86-118 Robinsons Road, Frankston South. I conducted the Fauna Survey and Nick McCaffrey was commissioned by myself to conduct the flora survey. I was subsequently commissioned by the property owners to prepare an expert witness statement in relation to the proposed bypass running through 'Westerfield'.

6 Facts, matters and assumptions upon which this report is based

As set out in the following report.

7 Documents and other materials taken into account

The reports and information I reviewed in preparing this Statement are summarized below:

Venosta, M., Schnittler, N., Bloink, C., Koehler, S. and Meredith, C. (2008) *Flora and Fauna Assessment of the proposed Frankston Bypass, Carrun to Mount Martha, Victoria. Existing Conditions and impact Assessment Report*. Report to Maunsell Australia by Biosis Research Pty Ltd, Port Melbourne, Victoria.

8 Persons carrying out tests or experiments

The fauna survey was conducted by myself, while the flora survey was conducted by local botanist Nick McCaffrey.

9 FINDINGS

9.1 SUMMARY OF OPINIONS

The flora and fauna assessment is attached to Simon and Joyce Welsh's submission for the Frankston Bypass Project and I adopt it as the basis for my expert witness statement and evidence.

9.2 METHODS

FLORA

The study area was traversed by foot during a number of field trips from June to September 2008 on the following dates 14 June 2008 (2hrs), 12 July 2008 (8hrs), 24 August 2008 (8hrs) and 21 September 2008 (8hrs).

Dedicated searches for rare flora species were also made during fieldwork. This involved traversing suitable areas making careful observations of flowers, foliage and plant habits for a variety of rare plant species. This included searches for significant flora species detected within the general area on database searches.

A flora species list for the entire study area was compiled, which was given a unique identifier for defined areas (T0615004) for inclusion in DSE's Flora Information System (FIS). This included species recorded during quadrates and incidental sightings of species outside of quadrates.

Seven quadrates were undertaken throughout the study area with the aim of sampling the floristic of a range of habitats. Each quadrat was accurately located with a handheld GPS and undertaken according to a modified version of the Braun-Blanquet system from 1951.

FAUNA

Fauna surveys were deployed using the following methods.

- Fish were sampled in bait traps which were deployed in the dam.
- Amphibians were sampled by listening to vocal calls and identifying each species.
- Reptiles were identified by sight, hand capture and were detected under tin, rubbish or logs.
- Birds were identified by sight, their calls and during spotlight walks.
- Mammals were sampled and identified by sampling hairs in hair tubes, analysing scats and diggings, conducting spotlight walks and by sight.

Taxa were identified using reference literature including Allen and Midgley (2002), Cogger (2000), Menkhorst (1996), Simpson and Day (1999) and Strahan (1998).

9.3 RESULTS

FLORA

A total of 199 vascular plant taxa were recorded in the study area during this survey, of which 143 were indigenous (72%), and 56 (28%) were introduced, planted or naturalized outside their natural range. Appendix 1 lists all flora species recorded within the study area. Table 1 summarizes plant species recorded in the study area during this survey.

Table 1. Summary of vascular plants recorded in the study area

Plant status	Numbers
Indigenous	144
Exotic	48
Native species outside of natural range	7
TOTAL	199

The study area has a rich flora relative to its size in comparison to much larger reserves in the Frankston area (Fairbridge, Legg & Williamson 2008):

- Frankston Reservoir - 208 indigenous flora species
- Langwarrin Flora and Fauna Reserve - 300 indigenous flora species
- Pines Flora and Fauna Reserve - 170 indigenous flora species

9.3.1 SIGNIFICANT FLORA SPECIES

One species of state significance, Bronze Bird-orchid *Chiloglottis X pescottiana*, was recorded in the study area in quadrat 6 on 21 Sep 2008. Identification was confirmed by Jeff Jeanes (National Herbarium of Victoria) on 26 September 2008.

No species of national significance were recorded.

Bronze Bird-orchid *C. X pescottiana* is listed as rare in DSE (2005), as it is a rare natural hybrid between Dainty Wasp-orchid *C. trapeziformis* and Common Bird-orchid *C. valida* (Backhouse and Jeanes 1995). The hybrid exhibits intermediate characteristics between the parents, which can be variable, as shown on photos in Jeanes and Backhouse (2006). The two plants recorded in the study area demonstrate variation within the hybrid form, with characteristics as such deflexed lateral sepals such as those in *C. trapeziformis* and a large ovate labellum and scattered calli for *C. valida*.

9.3.2 BIOREGIONAL SIGNIFICANT SPECIES

Approximately 71 bioregionally significant plant species were determined by utilizing frequency functions of data produced using FIS (DSE 2007). This represents 50% of the total number of indigenous species recorded in the study area. See Table 2 below.

Table 2. Bioregionally significant species of plants recorded within the study area

<i>Acaena agnipila</i>	Hairy Sheep's Burr	1.94%	121
<i>Acaena echinata</i>	Sheep's Burr	2.05%	128
<i>Austrodanthonia fulva</i>	Copper-awned Wallaby-grass	0.57%	36
<i>Austrodanthonia geniculata</i>	Kneed Wallaby-grass	2.99%	187
<i>Austrostipa mollis</i>	Supple Spear-grass	3.27%	204
<i>Austrostipa rudis</i> subsp. <i>rudis</i>	Veined Spear-grass	1.18%	74
<i>Brunonia australis</i>	Blue Pincushion	2.29%	143
<i>Bulbine bulbosa</i>	Bulbine Lily	1.45%	91
<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue Stars	2.19%	137
<i>Chiloglottis trapeziformis</i>	Dainty Wasp-orchid	0.11%	7
<i>Chiloglottis valida</i>	Common Bird-orchid	0.48%	30
<i>Cotula australis</i>	Common Cotula	3.17%	198
<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea	1.76%	110
<i>Dianella admixta</i>	Black-anther Flax-lily	0.03%	2
<i>Dianella brevicaulis</i>	Small-flower Flax-lily	1.07%	67
<i>Dianella laevis</i>	Smooth Flax-lily	0.01%	1
<i>Diuris orientis</i>	Wallflower Orchid	0.91%	57
<i>Drosera peltata</i> subsp. <i>peltata</i>	Pale Sundew	2.82%	176
<i>Eleocharis sphacelata</i>	Tall Spike-sedge	2.61%	163
<i>Eucalyptus cephalocarpa</i> s.l.	Silver-leaf Stringybark	1.01%	63
<i>Euchiton involucratus</i> s.l.	Common Cudweed	1.89%	118
<i>Glossodia major</i>	Wax-lip Orchid	2.34%	146
<i>Gonocarpus humilis</i>	Shade Raspwort	2.82%	176
<i>Goodenia humilis</i>	Swamp Goodenia	2.61%	163
<i>Hakea decurrens</i> subsp. <i>physocarpa</i>	Bushy Needlewood	0.01%	1
<i>Haloragis heterophylla</i>	Varied Raspwort	1.36%	85
<i>Hardenbergia violacea</i>	Purple Coral-pea	4.68%	292
<i>Helichrysum luteoalbum</i>	Jersey Cudweed	2.11%	132
<i>Hibbertia stricta</i> s.l.	Upright Guinea-flower	2.02%	126
<i>Hydrocotyle callicarpa</i>	Small Pennywort	0.49%	31
<i>Hydrocotyle foveolata</i>	Yellow Pennywort	0.80%	50
<i>Hypnum cupressiforme</i>	Common Plait-moss	0.32%	20
<i>Hypoxis vaginata</i>	Yellow Star	0.56%	35
<i>Isolepis inundata</i>	Swamp Club-sedge	2.79%	174
<i>Lachnagrostis filiformis</i> var. <i>1</i>	Common Blown-grass	0.89%	56
<i>Lagenophora gracilis</i>	Slender Bottle-daisy	3.11%	194
<i>Lepidosperma gunnii</i>	Slender Sword-sedge	2.19%	137

<i>Lepidosperma laterale</i> var. <i>laterale</i>	Variable Sword-sedge	1.74%	109
<i>Lepidosperma laterale</i> var. <i>majus</i>	Variable Sword-sedge	2.75%	172
<i>Leptospermum scoparium</i>	Manuka	0.48%	30
<i>Lilaeopsis polyantha</i>	Australian Lilaeopsis	0.62%	39
<i>Lindsaea linearis</i>	Screw Fern	4.89%	305
<i>Lobelia pratioides</i>	Poison Lobelia	0.54%	34
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Wattle Mat-rush	2.56%	160
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Wattle Mat-rush	2.53%	158
<i>Lomandra longifolia</i> subsp. <i>longifolia</i>	Spiny-headed Mat-rush	2.99%	187
<i>Luzula meridionalis</i>	Common Woodrush	1.36%	85
<i>Luzula meridionalis</i> var. <i>meridionalis</i>	Common Woodrush	0.51%	32
<i>Muellerina eucalyptoides</i>	Creeping Mistletoe	2.13%	133
<i>Pandorea pandorana</i>	Wonga Vine	2.61%	163
<i>Persicaria decipiens</i>	Slender Knotweed	3.60%	225
<i>Poa rodwayi</i>	Velvet Tussock-grass	0.80%	50
<i>Poa tenera</i>	Slender Tussock-grass	4.13%	258
<i>Pterostylis concinna</i>	Trim Greenhood	1.02%	64
<i>Pterostylis melagramma</i>	Tall Greenhood	0.41%	26
<i>Pterostylis nutans</i>	Nodding Greenhood	4.33%	270
<i>Rumex brownii</i>	Slender Dock	2%	125
<i>Senecio hispidulus</i> s.l.	Rough Fireweed	4.07%	254
<i>Senecio minimus</i>	Shrubby Fireweed	4.45%	278
<i>Senecio quadridentatus</i>	Cotton Fireweed	4.53%	283
<i>Solanum laciniatum</i>	Large Kangaroo Apple	1.90%	119
<i>Solenogyne dominii</i>	Smooth Solenogyne	1.07%	67
<i>Thysanotus patersonii</i>	Twining Fringe-lily	2.95%	184
<i>Triglochin procera</i> s.l.	Water Ribbons	3.25%	203
<i>Triglochin striata</i>	Streaked Arrowgrass	4.39%	274
<i>Veronica calycina</i>	Hairy Speedwell	2.75%	172
<i>Veronica gracilis</i>	Slender Speedwell	2.38%	149
<i>Veronica plebeia</i>	Trailing Speedwell	3.25%	203
<i>Viminaria juncea</i>	Golden Spray	1.41%	88
<i>Wurmbea dioica</i>	Common Early Nancy	2.46%	154
<i>Xanthosia dissecta</i> s.l.	Cut-leaf Xanthosia	3.41%	213

9.4 ECOLOGICAL VEGETATION CLASSES

The type and quality of vegetation varies throughout the study area ranging from highly modified areas dominated by lawns, gardens, eucalypt plantings to patches of remnant native vegetation.

EVCs were assigned to native vegetation based upon resemblance to 1:25,000 EVC mapping (Oates and Taranto 2001). However, there were some differences between EVC mapping and site conditions due to the scale of mapping undertaken by Oates and Taranto (2001).

The study area supports four EVCs. Each EVC and its bioregional conservation status are presented in table 3 below.

Table 3. Ecological Vegetation Classes (EVCs) occurring within the study area.

EVC No.	EVC	Bioregion	Conservation Status	Current distribution within the study area
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16	Lowland Forest	Vulnerable	Dominant native vegetation across western part of study area
175	Grassy Woodland	Endangered	Dominant native vegetation across eastern part of study area
653	Aquatic Herbland	Endangered	Occurs in the dam
937	Swampy Woodland	Endangered	Occurs in and on the northern slope of the dam

^Taken from DSE (2008)

FAUNA

A total of 92 species of fauna were recorded within the study site. Of these 83 species are native and eight species are introduced.

No species of Decapod Crustaceans and one species of Fresh Water Fish was recorded within the study site.

During this survey five species of frogs were identified mainly within the dams and along drainage lines. During this survey seven species of reptiles were recorded of which one species is a tortoise, five species are lizards and one species is a snake. There appears to be a reasonable diversity of frogs and reptiles within different habitats of the property.

65 species of birds were recorded during this survey within the property. 61 of these are native species and four species are introduced. Through out the property bird species, population numbers and breeding months were recorded for each month during the duration of the survey period.

Fourteen species of mammals were recorded during this survey. Four of these species are introduced. There appears to be a medium diversity of mammals still inhabiting the property with the extinction of some species occurring in the past 20 or so years.

9.5 SIGNIFICANCE

Assessment methods or criteria used to determine the significance of flora and fauna species, plant communities, fauna habitats and sites are consistent with up-to-date government policies, legislation and publications. Below is a summary of the biological significance of each of the different components found on the FIS and VFD systems.

FLORA

- 72 bioregionally significant species present.
- One State significant species Bronze Bird-orchid *Chiloglottis X pescottiana* found during this survey.
- A total of 290 plant species present; 212 (73%) indigenous and 78 exotic (27%).
- A total of 199 vascular plant taxa were recorded; 143 (72%) and 56 (28%) were introduced, planted or naturalized outside their natural range.

FAUNA

- Three nationally significant species have been recorded from within a 5 kilometer radius of the property.
- There are up to twelve FFG-listed species and three EPBC-listed species which have been recorded in the greater area
- Twenty-eight state significant species have been recorded within the greater area; most have been recorded within the last 5-10 years.
- During this survey two species detected on the property are listed as internationally migratory under the *Environment Protection and Biodiversity Act 1999*.
- Three state significant species were recorded during this study. One of those species is listed under the *Flora and Fauna Guarantee Act 1988* as threatened.
- In addition, a further 15 species recorded are considered to be of regional significance and five species recorded are considered to be of high local significance.
- Due to large population and habitat losses on the Mornington Peninsula and within the Frankston area the remaining native fauna can be considered to be at local significance levels. High local to state significant species identified during this survey are listed in Table 4 below.

TABLE 4 SIGNIFICANT FAUNA SPECIES DETECTED ON THE PROPERTY

KEY TO DEFINING SIGNIFICANT SPECIES

Signif Significant/status of species is designated by:

N National

S State

R Regional

HL High Local

NRE Threatened Vertebrate in Victoria-2000 (NRE 2000)

FFG *Flora and Fauna Guaranteed Act 1988*

ActPI Action Plan approved by Environmental Australia

EPBC *Environment Protection and Biodiversity Conservation Act 1999*

TR International Treaties, C=China (CAMBA) and J=Japan (JAMBA).

Cen	critically endangered
End	endangered
Vul	vulnerable
LR	lower risk-near threatened
NT	Near Threatened
DD	data deficient
Ls	Listed
M	Migratory under the EPBC Act
Un	Uncommon
MC	Moderately Common
LC	Locally Common
C	Common
Lim	Limited

Significant taxa detected throughout the study site during this survey.

Common Name	Scientific Name	Signi	NRE	FFG	ActPI	EPBC	TR
Reptiles							
Eastern Three-lined Skink	<i>Bassiana duperreyi</i>	R	MC				
Delicate Skink	<i>Lampropholus delicata</i>	R	Un				
Weasel Skink	<i>Saproscincus mustelinus</i>	R	MC				
Blotched Blue-tongue	<i>Tiliqua nigrolutea</i>	R	MC				
White-lipped Snake	<i>Drysdalia coronoides</i>	R	Un				
Birds							
Hardhead	<i>Aythya australis</i>	S	Vul				
Great Egret	<i>Ardea alba</i>	S	Vul	Ls		M	CJ
Royal Spoonbill	<i>Platalea regia</i>	S	Vul				
Wedge-tail Eagle	<i>Aquila audax</i>	HL	MC				
Swamp Harrier	<i>Circus approximans</i>	HL	MC				
Common Bronzewing	<i>Phaps chalcoptera</i>	HL	C				
Southern Boobook	<i>Ninox novaehollandiae</i>	R	MC				

Common Name	Scientific Name	Signi	NRE	FFG	ActPI	EPBC	TR
Yellow-tailed Black-Cockatoo	<i>Calyptorhynchus funereus</i>	HL	MC				
White-throated Needletail	<i>Hirundapus caudacutus</i>	R	C			M	CJ
White-eared Honeyeater	<i>Lichenostomus leucotis</i>	HL	LC				
Flame Robin	<i>Petroica phoenicea</i>	R	Un				
Eastern Yellow Robin	<i>Eopsaltria australis</i>	R	Un				
Grey Currawong	<i>Strepera versicolor</i>	R	Un				
Mistletoebird	<i>Dicaeum hirundinaceum</i>	R	Un				
Mammals							
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	R	C				
Sugar Glider	<i>Petaurus breviceps</i>	R	MC				
Micro bats occurring through out.	<i>Vespadelus sps.</i>	R	C				
Swamp Rat	<i>Rattus lutreolus</i>	R	C				

PLANT COMMUNITIES

- Four Ecological Vegetation Classes present, of which three are considered endangered in the Gippsland Plains Bioregion due to their poor conservation status. The other EVC is vulnerable.

- All vegetation patches (46a, 46b, 47a & 47b) assessed in Venosta *et al.* (2008) occurring in the proposed freeway alignment are considered to have *very high* conservation significance, it is highly likely that the Lowland Forest (the patch not modified, as shown on Map 2) would be considered as *very high* conservation significance, based on the presence of some large old trees, low weed cover, high species richness, the presence of the best 50% habitat for a threatened species and the moderate levels of woody life-form recruitment.
- Due to their intact condition and conservation status the EVCs Grassy Woodland and Lowland Forest are considered to be State significant.
- Very intact herb and grass rich understorey with extraordinarily low weed cover compared with other similar types of vegetation in the Frankston area. It is also considered to be "an ecologically intact bioregional representation of Grassy Woodland within the Gippsland Plain Bioregion" (Venosta *et al.* 2008).
- The vegetation in the study area is unique and is difficult to ascribe to current EVCs.

FAUNA HABITATS

- The property is part of an important bio-link (flora and fauna habitat corridor) that extends from Seafood Wetlands to the Pines Flora and Fauna Reserve along bushland on private properties, golf courses and freeway reserves to Langwarrin Flora and Fauna Reserve and surrounding bushland. This is the only functioning bio-link within Frankston City Council and linking to the Mornington Peninsula thus allowing flora and fauna conductivity
- Forms part of a local biolink to the Langwarrin Flora and Fauna Reserve, other patches of bushland in Langwarrin.
- Forms part of the key regional biolink from the Mornington Peninsula to other habitat remnants Langwarrin-Cranbourne area.
- Supports four different vegetation types, including swampy woodlands and a dam.

The study area is noted as having regional botanical significance in Muir *et al.* (1997), listed as part of Site 14 Bayside Christian College. Muir *et al.* (1997) also stated this is part of a proposed habitat link. Due to the intact nature of the Grassy Woodland, the vegetation in the study area is considered to be state significant in Venosta *et al.* (2008).

The site is not listed as a biosite in DSE (2005), which may relate to the lack of previous detailed surveying on the site. A biosite is a physical area of land or water containing biological assets with particular attributes, such as the presence of rare or threatened flora, fauna or habitat required for their survival and/or rare or threatened vegetation communities (DSE 2005). Whilst biosites are not strictly part of any statutory regulation or legislation, they are used widely as a tool for regional planning and management. A number of Councils around Melbourne use biosites as a basis to draw their Environmental Significance Overlays (ESO). Frankston City Council used Muir *et al.* (1997) in preparation of their ESOs, which determines the ESO2 rating in the study area.

Using Version 4.0 of DSE's *Standard criteria for sites of biological significance in Victoria* (DSE 2004), the study area is assessed against the Biosite criteria:

In summary, the study area, using the biosites criteria is considered State significant.

9.6 IMPACTS

This section provides a simple evaluation of the impacts considered likely to occur as a result of the proposed freeway construction. A detailed impact evaluation and risk assessment is provided in Venosta *et al.* (2008).

FLORA

LOCALLY AND BIOREGIONALLY SIGNIFICANT SPECIES

The loss of numerous locally and bioregionally significant plant species currently conserved under voluntary conservation management.

Scale of impact: Local - bioregional

STATE SIGNIFICANCE SPECIES

Though plants of Bronze Bird-orchid *C. X pescottiana* were not located within the proposed freeway alignment, the only plants of Common Bird-orchid *C. valida* were observed in the alignment in Quadrat 5, thus potentially limiting the hybridising abilities of between the parents to produce *C. X pescottiana*. Further surveys for *C. X pescottiana* are recommended, as it considered likely that there are other populations in the study area. Other potential impacts are the loss of habitat and disturbance to the pollinator of all *Chilloglottis* species in the study area.

Scale of impact: Bioregional-state

NATIVE VEGETATION

Removal of 2.18 ha of state significant Grassy Woodland throughout proposed alignment and along Robinsons Road (Venosta *et al.* 2008). This vegetation is considered to be of *very high* conservation significance under *Victoria's Native Vegetation Framework*. The response criteria for a site considered *very high* in the Framework is "clearing not permitted unless exceptional circumstances apply" (DNRE 2002). The offset requirement for removal of Grassy Woodland is 2.92 habitat hectares. This equates to approximately 14 ha, calculated at a habitat increase of 20% of an offset site. Venosta *et al.* (2008) states that "offset like-for-like requirements are likely to be difficult to meet due to the exceptionally high quality of the patch (the offset should be 90% of the quality of the area to be lost)". In summary, the risk rating in Venosta *et al.* (2008) for the removal of the Grassy Woodland is assessed as "extreme". To reduce the risk rating in Venosta *et al.* (2008) from extreme, the vegetation removal would need to be reduced to <1 ha or greater than 50% reduction.

There are also likely offsite impacts on state significant Lowland Forest include altered hydrology, sediment/nutrient laden storm-water run-off, and fragmentation of flora species populations.

Scale of impact: State

FAUNA

LOCALLY AND BIOREGIONALLY SIGNIFICANT SPECIES

The loss of numerous locally and bioregionally significant fauna species currently conserved under voluntary conservation management.

Scale of impact: Local - bioregional

STATE SIGNIFICANCE SPECIES

The three state significant fauna species were all observed in the dam feeding within the water or resting. They appear to utilize the large scale fish and invertebrate food source during winter to gain weight before breeding. They all appear to breed elsewhere.

Scale of impact: Bioregional–state

FAUNA HABITATS

Removal of 2.18 ha of state significant Grassy Woodland throughout proposed alignment and along Robinsons Road (Venosta *et al.* 2008). This vegetation is considered to be of *very high* conservation significance under *Victoria's Native Vegetation Framework*. It also is important habitat for several fauna species and the proposed freeway will dissect the property and cause several road kills to all that remain thus greatly reducing fauna populations and diversity.

The freeway should be designed to allow fauna movement without causing death or injury via vehicle impact.

Scale of impact: State

9.7 RECOMMENDATIONS

1. The proposed freeway needs to adequately address the three-step process of avoid, minimize, and offset in DSE's *Victoria's Native Vegetation Framework* (DNRE 2002).
2. Demonstrate avoidance under *Victoria's Native Vegetation Framework* by:
 - fully exploring other freeway options, including upgrading existing roads
 - exploring options for a tunnel under the properties (as suggested in Venosta et al. 2008)
 - explore options for the flyover Robyns Road to extend over the study area.
3. Further surveys for Bronze Bird-orchid *C. X pescottiana* are recommended.
4. The property is about to be registered under Heritage Victoria. What are the implications?
5. The property is a historic property and should be kept as one.

If the project goes ahead then the following recommendations are essential:

6. All significant flora and all fauna should be relocated to the nearest suitable site during the construction of the freeway. A qualified botanist and zoologist must be present during such construction.
 7. A new dam must be constructed on the property prior to destruction of the old dam and all fauna and aquatic plants must be relocated into the new dam. A qualified botanist and zoologist must be present during such construction.
 8. Fauna underpasses and overpasses through the property and other bushland sights need to be designed and constructed during construction of the Bypass.
 9. Fauna nesting boxes and hollow limbs (of different shapes and sizes) need to be erected in the remaining trees along the Bypass to adequately accommodate the faunal requirements.
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APPENDIX 1: Vascular Plant Taxa Recorded within the Study Area

Flora survey undertaken by Nic McCaffrey between June and September 2008.

Codes for status within Victoria:

*	introduced species
#	ecologically out-of-balance or non-indigenous native species
r	rare in Victoria in Victoria in DSE (2005)
(r)	listed as rare in Victoria in DSE (2005), however taxa has been introduced to the site

MOSSES

Hypnaceae	<i>Hypnum cupressiforme</i>	Common Plait-moss
Thuidiaceae	<i>Thuidiopsis sparsa</i>	Weft Moss
	<i>Thuidiopsis spp.</i>	Weft Moss

FERNS AND ALLIES

Dennstaedtiaceae	<i>Pteridium esculentum</i>	Austral Bracken
Lindsaeaceae	<i>Lindsaea linearis</i>	Screw Fern

CONIFERS

Pinaceae	* <i>Pinus radiata</i>	Radiata Pine
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MONOCOTYLEDONS

Alliaceae	* <i>Agapanthus praecox subsp. orientalis</i>	Agapanthus
Anthericaceae	<i>Arthropodium strictum s.l.</i>	Chocolate Lily
	<i>Chamaescilla corymbosa var. corymbosa</i>	Blue Stars
	<i>Thysanotus patersonii</i>	Twining Fringe-lily
Araceae	* <i>Zantedeschia aethiopica</i>	White Arum-lily
Asphodelaceae	<i>Bulbine bulbosa</i>	Bulbine Lily
Colchicaceae	<i>Burchardia umbellata</i>	Milkmaids
	<i>Wurmbea dioica</i>	Common Early Nancy
Cyperaceae	<i>Carex breviculmis</i>	Common Grass-sedge
	<i>Eleocharis sphacelata</i>	Tall Spike-sedge
	<i>Gahnia radula</i>	Thatch Saw-sedge
	<i>Isolepis inundata</i>	Swamp Club-sedge
	<i>Lepidosperma gunnii</i>	Slender Sword-sedge
	<i>Lepidosperma laterale var. laterale</i>	Variable Sword-sedge
	<i>Lepidosperma laterale var. majus</i>	Variable Sword-sedge
	<i>Schoenus apogon</i>	Common Bog-sedge
Hemerocallidaceae	<i>Dianella admixta</i>	Black-anther Flax-lily
	<i>Dianella brevicaulis</i>	Small-flower Flax-lily
	<i>Dianella laevis</i>	Smooth Flax-lily
	<i>Tricoryne elatior</i>	Yellow Rush-lily
Hypoxidaceae	<i>Hypoxis vaginata</i>	Yellow Star
Iridaceae	* <i>Freesia alba x Freesia leichtlinii</i>	Freesia
	* <i>Freesia spp.</i>	Freesia
	* <i>Gladiolus spp.</i>	Gladiolus

	* <i>Gladiolus undulatus</i>	Wild Gladiolus
	* <i>Romulea rosea</i>	Onion Grass
Juncaceae	<i>Juncus amabilis</i>	Hollow Rush
	* <i>Juncus bulbosus</i>	Bulbous Rush
	<i>Juncus flavidus</i>	Gold Rush
	<i>Juncus gregiflorus</i>	Green Rush
	<i>Juncus ingens</i>	Giant Rush
	<i>Juncus planifolius</i>	Broad-leaf Rush
	<i>Luzula meridionalis</i>	Common Woodrush
	<i>Luzula meridionalis var. meridionalis</i>	Common Woodrush
Juncaginaceae	<i>Triglochin procera s.l.</i>	Water Ribbons
	<i>Triglochin striata</i>	Streaked Arrowgrass
Orchidaceae	<i>Acianthus caudatus</i>	Mayfly Orchid
	<i>Chiloglottis trapeziformis</i>	Dainty Wasp-orchid
	<i>Chiloglottis valida</i>	Common Bird-orchid
r	<i>Chiloglottis X pescottiana</i>	Bronze Bird-orchid
	<i>Diuris orientis</i>	Wallflower Orchid
	<i>Glossodia major</i>	Wax-lip Orchid
	<i>Microtis spp.</i>	Onion Orchid
	<i>Pterostylis concinna</i>	Trim Greenhood
	<i>Pterostylis melagramma</i>	Tall Greenhood
	<i>Pterostylis nutans</i>	Nodding Greenhood
	<i>Thelymitra spp.</i>	Sun Orchid
Poaceae	* <i>Agrostis capillaris</i>	Brown-top Bent
	* <i>Agrostis stolonifera</i>	Creeping Bent
	* <i>Aira elegantissima</i>	Delicate Hair-grass
	* <i>Aira spp.</i>	Hair Grass
	* <i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
	<i>Austrodanthonia fulva</i>	Copper-awned Wallaby-grass
	<i>Austrodanthonia geniculata</i>	Knead Wallaby-grass
	<i>Austrodanthonia racemosa var. racemosa</i>	Slender Wallaby-grass
	<i>Austrostipa mollis</i>	Supple Spear-grass
	<i>Austrostipa rudis subsp. rudis</i>	Veined Spear-grass
	* <i>Briza maxima</i>	Large Quaking-grass
	* <i>Cynodon dactylon var. dactylon</i>	Couch
	<i>Deyeuxia quadriseta</i>	Reed Bent-grass
	* <i>Ehrharta erecta var. erecta</i>	Panic Veldt-grass
	* <i>Ehrharta longiflora</i>	Annual Veldt-grass
	* <i>Holcus lanatus</i>	Yorkshire Fog
	<i>Lachnagrostis filiformis var. 1</i>	Common Blown-grass
	* <i>Lolium perenne</i>	Perennial Rye-grass
	<i>Microlaena stipoides var. stipoides</i>	Weeping Grass
	* <i>Paspalum dilatatum</i>	Paspalum
	* <i>Poa annua</i>	Annual Meadow-grass
	<i>Poa morrisii</i>	Soft Tussock-grass
	<i>Poa rodwayi</i>	Velvet Tussock-grass
	<i>Poa tenera</i>	Slender Tussock-grass
	* <i>Stenotaphrum secundatum</i>	Buffalo Grass
	<i>Themeda triandra</i>	Kangaroo Grass
	* <i>Vulpia bromoides</i>	Squirrel-tail Fescue
	* <i>Vulpia spp.</i>	Fescue
Xanthorrhoeaceae	<i>Lomandra filiformis subsp. coriacea</i>	Wattle Mat-rush
	<i>Lomandra filiformis subsp. filiformis</i>	Wattle Mat-rush

	<i>Lomandra longifolia</i> subsp. <i>longifolia</i>	Spiny-headed Mat-rush
	<i>Xanthorrhoea minor</i> subsp. <i>lutea</i>	Small Grass-tree
DICOTYLEDONS		
Apiaceae		
	<i>Centella cordifolia</i>	Centella
	<i>Hydrocotyle callicarpa</i>	Small Pennywort
	<i>Hydrocotyle foveolata</i>	Yellow Pennywort
	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort
	<i>Lilaeopsis polyantha</i>	Australian Lilaeopsis
	<i>Xanthosia dissecta</i> s.l.	Cut-leaf Xanthosia
Aquifoliaceae		
	* <i>Ilex aquifolium</i>	English Holly
Asteraceae		
	* <i>Arctotheca calendula</i>	Cape Weed
	* <i>Aster subulatus</i>	Aster-weed
	<i>Cassinia aculeata</i>	Common Cassinia
	* <i>Conyza bonariensis</i>	Flaxleaf Fleabane
	<i>Cotula australis</i>	Common Cotula
	<i>Euchiton involucratus</i> s.l.	Common Cudweed
	<i>Helichrysum luteoalbum</i>	Jersey Cudweed
	<i>Helichrysum scorpioides</i>	Button Everlasting
	* <i>Hypochoeris radicata</i>	Flatweed
	<i>Lagenophora gracilis</i>	Slender Bottle-daisy
	<i>Lagenophora stipitata</i>	Common Bottle-daisy
	<i>Leontodon taraxacoides</i> subsp.	
	* <i>taraxacoides</i>	Hairy Hawkbit
	<i>Olearia lirata</i>	Snowy Daisy-bush
	<i>Ozothamnus ferrugineus</i>	Tree Everlasting
	<i>Senecio glomeratus</i>	Annual Fireweed
	<i>Senecio hispidulus</i> s.l.	Rough Fireweed
	<i>Senecio minimus</i>	Shrubby Fireweed
	<i>Senecio quadridentatus</i>	Cotton Fireweed
	<i>Solenogyne dominii</i>	Smooth Solenogyne
	* <i>Sonchus asper</i> s.l.	Rough Sow-thistle
	* <i>Sonchus oleraceus</i>	Common Sow-thistle
Bignoniaceae		
	<i>Pandorea pandorana</i>	Wonga Vine
Brassicaceae		
	* <i>Brassica fruticulosa</i>	Twiggy Turnip
	* <i>Cardamine hirsuta</i> s.l.	Common Bitter-cress
Brunoniaceae		
	<i>Brunonia australis</i>	Blue Pincushion
Campanulaceae		
	<i>Lobelia anceps</i>	Angled Lobelia
	<i>Lobelia pratioides</i>	Poison Lobelia
Caryophyllaceae		
	* <i>Cerastium glomeratum</i> s.l.	Common Mouse-ear
	* <i>Stellaria media</i>	Chickweed
Casuarinaceae		
	<i>Allocasuarina littoralis</i>	Black Sheoak
	<i>Allocasuarina paludosa</i>	Scrub Sheoak
Convolvulaceae		
	<i>Dichondra repens</i>	Kidney-weed
Crassulaceae		
	<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula
	<i>Crassula sieberiana</i>	Sieber Crassula
Dilleniaceae		
	<i>Hibbertia stricta</i> s.l.	Upright Guinea-flower

Droseraceae	<i>Drosera peltata</i> subsp. <i>auriculata</i>	Tall Sundew
	<i>Drosera peltata</i> subsp. <i>peltata</i>	Pale Sundew
	<i>Drosera whittakeri</i> subsp. <i>aberrans</i>	Scented Sundew
Epacridaceae	<i>Acrotriche serrulata</i>	Honey-pots
	<i>Astroloma humifusum</i>	Cranberry Heath
	<i>Leucopogon virgatus</i>	Common Beard-heath
Euphorbiaceae	<i>Poranthera microphylla</i> s.l.	Small Poranthera
Fabaceae	<i>Bossiaea prostrata</i>	Creeping Bossiaea
	<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea
	<i>Dillwynia cinerascens</i> s.l.	Grey Parrot-pea
	<i>Hardenbergia violacea</i>	Purple Coral-pea
	<i>Kennedia prostrata</i>	Running Postman
	<i>Platylobium obtusangulum</i>	Common Flat-pea
	* <i>Ulex europaeus</i>	Gorse
	<i>Viminaria juncea</i>	Golden Spray
Goodeniaceae	<i>Goodenia humilis</i>	Swamp Goodenia
Haloragaceae	<i>Gonocarpus humilis</i>	Shade Raspwort
	<i>Gonocarpus tetragynus</i>	Common Raspwort
	<i>Haloragis heterophylla</i>	Varied Raspwort
	<i>Myriophyllum</i> spp.	Water-milfoil
Loranthaceae	<i>Amyema pendula</i>	Drooping Mistletoe
	<i>Muellerina eucalyptoides</i>	Creeping Mistletoe
Lythraceae	<i>Lythrum hyssopifolia</i>	Small Loosestrife
Mimosaceae	* <i>Acacia decurrens</i>	Early Black-wattle
	* <i>Acacia elata</i>	Cedar Wattle
	# <i>Acacia floribunda</i>	White Sallow-wattle
(r)	# <i>Acacia howittii</i>	Sticky Wattle
	# <i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sallow Wattle
	# <i>Acacia longifolia</i> subsp. <i>sophorae</i>	Coast Wattle
	<i>Acacia mearnsii</i>	Black Wattle
	<i>Acacia melanoxylon</i>	Blackwood
	<i>Acacia paradoxa</i>	Hedge Wattle
	* <i>Acacia prominens</i>	Gosford Wattle
	<i>Acacia pycnantha</i>	Golden Wattle
	# <i>Acacia retinodes</i> s.l.	Wirilda
	<i>Acacia verticillata</i>	Prickly Moses
Myrtaceae	<i>Eucalyptus cephalocarpa</i> s.l.	Silver-leaf Stringybark
	<i>Eucalyptus ovata</i>	Swamp Gum
	<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint
	<i>Kunzea ericoides</i> spp. agg. (shrubby form)	Burgan
	<i>Leptospermum continentale</i>	Prickly Tea-tree
	# <i>Leptospermum laevigatum</i>	Coast Tea-tree
	<i>Leptospermum scoparium</i>	Manuka
	<i>Melaleuca ericifolia</i>	Swamp Paperbark
Oxalidaceae	* <i>Oxalis corniculata</i> s.s.	Creeping Wood-sorrel
	<i>Oxalis perennans</i>	Grassland Wood-sorrel
	* <i>Oxalis pes-caprae</i>	Soursob

Pittosporaceae	* <i>Billardiera heterophylla</i>	Bluebell Creeper
	<i>Billardiera mutabilis</i>	Common Apple-berry
	<i>Bursaria spinosa subsp. spinosa</i>	Sweet Bursaria
	# <i>Pittosporum undulatum</i>	Sweet Pittosporum
Polygalaceae	<i>Comesperma volubile</i>	Love Creeper
Polygonaceae	<i>Persicaria decipiens</i>	Slender Knotweed
	<i>Rumex brownii</i>	Slender Dock
Proteaceae	<i>Hakea decurrens subsp. physocarpa</i>	Bushy Needlewood
	* <i>Hakea salicifolia subsp. salicifolia</i>	Willow-leaf Hakea
Ranunculaceae	<i>Clematis aristata</i>	Mountain Clematis
	<i>Clematis microphylla s.l.</i>	Small-leaved Clematis
Rosaceae	<i>Acaena agnipila</i>	Hairy Sheep's Burr
	<i>Acaena echinata</i>	Sheep's Burr
	* <i>Aphanes arvensis</i>	Parsley Piert
	* <i>Rubus anglocandicans</i>	Blackberry
Rubiaceae	<i>Opercularia varia</i>	Variable Stinkweed
Rutaceae	<i>Correa reflexa</i>	Common Correa
Santalaceae	<i>Exocarpos cupressiformis</i>	Cherry Ballart
Solanaceae	<i>Solanum laciniatum</i>	Large Kangaroo Apple
Thymelaeaceae	<i>Pimelea humilis</i>	Common Rice-flower
Veronicaceae	* <i>Plantago lanceolata</i>	Ribwort
	<i>Veronica calycina</i>	Hairy Speedwell
	<i>Veronica gracilis</i>	Slender Speedwell
	<i>Veronica plebeia</i>	Trailing Speedwell
Violaceae	<i>Viola hederacea sensu Willis (1972)</i>	Ivy-leaf Violet

Appendix 2:

Fauna Species Detected During This Survey

Fauna taxa detected throughout study site during the survey by Malcolm Legg of Mal's Environmental and Ecological Services.

Codes for status within RBGC and Victoria:

*	introduced species
VU	Vulnerable in Victoria (DSE 2003b)
EN	Endangered in Victoria (DSE 2003b) or Australia (EPBC Act)
NT	Near threatened in Victoria (DSE 2003b)
L	listed as threatened under FFG Act 1988
I	Invalid or ineligible under FFG Act 1988

KEY-Significance/status of species:

N	National
S	State
R	Regional
HL	High Local
L	Local
*	Introduced

Type of record:

h	Heard
s	Seen
l	Incidental (scats, feathers etc.)
t	Trapped/handheld
B	Breeding residential bird
A	Anabat 2 Bat Detector

FISH RECORDED WITHIN THE STUDY SITE, DECEMBER, 2008.

Scientific Name	Common Name	Conservation status on property	Type of record
<i>Nannoperca australis</i>	Southern Pigmy-perch	Uncommon	Rt

AMPHIBIANS RECORDED WITHIN THE STUDY SITE, DECEMBER, 2008.

Scientific Name	Common Name	Conservation status on property	Type of record
<i>Crinia signifera</i>	Common Froglet	Common	Lhs
<i>Limnodynastes dumerilii</i>	Southern Bullfrog	Uncommon	Lhs
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	Uncommon	Lhs
<i>Litoria ewingii</i>	Southern Brown Tree Frog	Common	Lhs
<i>Litoria verreauxii</i>	Verreaux's Tree Frog	Common	Lhs

REPTILES RECORDED WITHIN THE STUDY SITE, DECEMBER, 2008.

Scientific Name	Common Name	Conservation status on property	Type of record
TORTOISE			
Common Long-necked Tortoise	<i>Chelodina longicollis</i>	Uncommon	Ls
LIZARDS			
<i>Bassiana duperreyi</i>	Eastern Three-lined Skink	Uncommon	Rs
<i>Lampropholis delicata</i>	Delicate Skink	Uncommon	Rt
<i>Lampropholis guichenoti</i>	Garden Skink	Common	Lst
<i>Saproscincus mustelinus</i>	Weasel Skink	Uncommon	Rst

<i>Tiliqua nigrolutea</i>	Blotched Blue-tongue Lizard	Common	Rst
SNAKES			
<i>Drysdalia coronoides</i>	White-lipped Snake	Uncommon	Rst

COASTAL AND WETLAND BIRDS RECORDED WITHIN THE STUDY SITE, DECEMBER, 2008.

Scientific Name	Common Name	Conservation status on property	Type of record
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	Common at times	Ls
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	Uncommon	Ls
<i>Anas supercilliosa</i>	Pacific Black Duck	Uncommon	Lhs
<i>Anas castanea</i>	Chestnut Teal	Uncommon	Lhs
<i>Aythya australis</i>	Hardhead	Rare	Ss
<i>Chenonetta jubata</i>	Australian Wood Duck	Uncommon	Lhs
<i>Gallinula tenebrosa</i>	Dusky Moorhen	Common	Lhs
<i>Porphyrio porphyrio</i>	Purple Swamphen	Uncommon	Lhs
<i>Fulica atra</i>	Eurasian Coot	Uncommon	Lhs
<i>Egretta novaehollandiae</i>	White-faced Heron	Uncommon	Ls
<i>Ardea alba</i>	Great Egret	Rare	Ss
<i>Threskiornis molucca</i>	Australian White Ibis	Common	Lhs
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Common	Lhs
<i>Platalea regia</i>	Royal Spoonbill	Rare	Ss
<i>Vanellus miles</i>	Masked Lapwing	Uncommon	Lhs

WOODLAND BIRDS RECORDED WITHIN THE STUDY SITE, DECEMBER, 2008.

Scientific Name	Common Name	Conservation status on property	Type of record
<i>Aquila audax</i>	Wedge-tail Eagle	Rare	HLs
<i>Accipiter fasciatus</i>	Brown Goshawk	Uncommon	Lhs
<i>Circus approximans</i>	Swamp Harrier	Rare	Rs
* <i>Streptopelia chinensis</i>	Spotted Turtle-Dove	Common	hs
<i>Phaps chalcoptera</i>	Common Bronzewing	Uncommon	HLhs
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo	Uncommon	HLs
<i>Eolophus roseicapillus</i>	Galah	Uncommon	Lhs
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Common	Lhs
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Common	Lhs
<i>Trichoglossus chorolepidotus</i>	Scaly-breasted Lorikeet	Uncommon	Lhs
<i>Platycercus elegans</i>	Crimson Rosella	Uncommon	Ls
<i>Platycercus eximius</i>	Eastern Rosella	Common	Lhs
<i>Cacomantis flabelliformis</i>	Fantail Cuckoo	Uncommon	Lhs
<i>Chalcites basalus</i>	Horsfield's Bronze-Cuckoo	Rare	Lhs
<i>Ninox novaehollandiae</i>	Southern Boobook	Rare	Rh

<i>Podargus strigoides</i>	Tawny Frogmouth	Uncommon	Lhs
<i>Hirundapus caudactus</i> race	White-throated Needletail	Common at times	HLs
<i>Dacelo novaehollandiae</i>	Laughing Kookaburra	Common	Lhs
<i>Malurus cyaneus</i>	Superb Fairy-wren	Common	Lhs
<i>Pardalotus punctatus</i>	Spotted Pardalote	Common	Lhs
<i>Sericornis frontalis</i>	White-browed Scrubwren	Common	Lhs
<i>Acanthiza pusilla</i>	Brown Thornbill	Common	Lhs
<i>Anthochaera carunculata</i>	Red Wattlebird	Common	Lhs
<i>Manorina melanocephala</i>	Noisy Miner	Common	Lhs
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater	Common	Lhs
<i>Lichenostomus leucotis</i>	White-eared Honeyeater	Uncommon	HLhs
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Common	Lhs
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	Uncommon	Lhs
<i>Petroica phoenicea</i>	Flame Robin	Rare	Rhs
<i>Eopsaltria australis</i>	Eastern Yellow Robin	Uncommon	Rhs
<i>Colluricincla harmonica</i>	Grey Shrike Thrush	Common	Lhs
<i>Pachycephala pectoralis</i>	Golden Whistler	Uncommon	Lhs
<i>Pachycephala rufiventris</i>	Rufous Whistler	Uncommon	Lhs
<i>Rhipidura fuliginosa</i>	Grey Fantail	Common at times	Lhs
<i>Rhipidura leucophrys</i>	Willy Wagtail	Uncommon	Lhs
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Uncommon	Lhs
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Uncommon	Lhs
<i>Grallina cyanoleura</i>	Magpie-lark	Common	Lhs

Scientific Name	Common Name	Conservation status	Type of record
<i>Cracticus torquatus</i>	Grey Butcherbird	Common	Lhs
<i>Gymnorhina tibicen</i>	Australian Magpie	Common	Lhs
<i>Strepera versicolor</i>	Grey Currawong	Rare	Rhs
<i>Corvus coronoides</i>	Australian Raven	Common	Lhs
<i>Corvus mellori</i>	Little Raven	Common	Lhs
<i>Hirundo neoxena</i>	Welcome Swallow	Common	Lhs
<i>Neochmia temporalis</i>	Red-browed Finch	Uncommon	Lhs
<i>Dicaeum hirundinaceum</i>	Mistletoebird	Rare	Rhs
<i>Zosterops lateralis</i>	Silveryeye	Common	Lhs
* <i>Turdus merula</i>	Common Blackbird	Common	hs
* <i>Sturnus vulgaris</i>	Common Starling	Common	hs
* <i>Acridotheres tristis</i>	Common Myna	Common	hs

*Denotes introduced species

MAMMALS RECORDED WITHIN THE STUDY SITE, DECEMBER, 2008.

Scientific Name	Common Name	Conservation status	Type of record
MONOTREMES			
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	Common	Rsl
MARSUPIALS			
<i>Phascolarctos cinereus</i>	Koala	Rare	Rhs
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Uncommon	Lhs
<i>Petaurus breviceps</i>	Sugar Glider	Uncommon	Rhs
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	Common	Lhsf
PLACENTAL MAMMALS			
MICROBATS			

<i>Tadarida australis</i>	White-striped Freetail Bat	Uncommon	Rh
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	Common	Rh
<i>Vespadelus darlingtoni</i>	Large Forest Bat	Uncommon	Rh
<i>Vespadelus vulturnus</i>	Little Forest Bat	Common	Rh
RODENTS			
<i>Rattus lutreolus ssp. Lutreolus</i>	Swamp Rat	Common	Rtl
INTRODUCED MAMMALS			
* <i>Mus musculus</i>	House Mouse	Common	s
* <i>Rattus rattus</i>	Black Rat	Common	t
* <i>Vulpes vulpes</i>	Red Fox	Common	sl
* <i>Felis catus</i>	Feral Cat	Common	t

*Denotes introduced species

10 Declaration

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Tribunal.



Malcolm Legg

04/02/09

APPENDIX 3: CURRICULUM VITAE OF MALCOLM LEGG

1.0 Qualifications

Award	Institute	Years
Adv Cert in Horticulture	Victorian College of Agriculture & Horticulture Ltd-Burnley.	1989-1991
Adv Cert in Natural Resource Management	Frankston College of TAFE	1993-1995
Alpine Ecology Course- Bogong High Plains	Department of Conservation & Natural Resources.	1994
Shoreline Response Course	Marine Board of Victoria Port of Hastings	Oct, 1999
Fire fighting Certificates- Personal Protection 1 Wildfire Suppression 1 Wildfire Behavior 1	NRE-Transfield Depot, Mornington.	Mar, 2000
The Farm Chemicals Users Course	Chisholm Institute, Rosebud Campus	2000
Freshwater Ecology Course	NRE-Main Creek, Mornington Peninsula	2000

2.0 Membership of Professional Associations

Current

WPPC (Westernport and Peninsula Protection Council Inc.)
BERG (Balcombe Estuary Rehabilitation Group)

Previous

SFRCM (Shoreham Foreshore Reserve Committee of Management)
SEPPRA (South Eastern Peninsula Residents Association)
Emu Plains Committee of Management
Buxton Bush land Reserve Committee of Management
Friends of the Pines Flora and Fauna Reserve
Friends of the Helmeted Honeyeater
Victorian Herpetological Society

3.0 Employment History

3.1 August, 2002-2006. Casual lecturer at Chisholm Institute (Rosebud Campus)
Contact Peter Beddows Applied Science & Horticulture section.

3.2 1995-Current Self-employed-Full time Consultant and Contractor.

Business Name–Mal’s Environmental & Ecological Services

Contact Bill Mallinson for reference (Conservation Officer MPSC)–(03) 59 860 259

3.2.1 Reports

Client

Current

Mapping fauna and fauna road kills across the entire Mornington Peninsula and creating a wildlife atlas

MPS

Fauna survey for Balcombe Creek Estuary

MPS &

BERG

Fauna Survey for Buxton Reserve

MPS

Previous

Swamp Skink Survey of Kings Creek, Limestone Road and Drum Drum Alloc Creek Reserve, April 2998.

MPS

Fauna Survey Cranbourne Botanical Garden in the Australian Garden Stage 2, July 2007.

RBGM&C

Fauna Survey for Point Nepean National Park, Portsea January 2007

Parks Vic

Fauna Survey for Portsea Lagoon, Portsea, May 2007.

MPS

Fauna Survey for Sunshine Reserve, Mt Martha, May 2007.

MPS

Fauna Survey for Mornington Coast, Mornington, October, 2007

MPS

Fauna Survey for Warringine Reserve, Hastings, November, 2007.

MPS

Fauna Survey and Management Prescriptions for Rosebud Foreshore, Rosebud, January, 2006 to April, 2006.

MPS

Flora and Fauna Survey for Crib Point and Stony Point Foreshore, Crib Point, October, 2005 to October, 2006.

CPF

Com. of Man.

Fauna Survey and Management Prescriptions for Tootgarook Swamp, Boneo, July, 2005 to January, 2006.

MPS

Flora and Fauna Assessment at Lots A and 1 on LP215407 Henry Road Pakenham, Feb. 2006.

Practical

Ecology

Fauna Survey and Management Prescriptions for Sanctuary Park Bush land Reserve, Rosebud West, June, 2005 to January, 2006.

MPS

Fauna Survey and Management Prescriptions for Police Point Shire Park, Portsea, June, 2005 to January, 2006.

MPS

Fauna Survey and Management Prescriptions for Olivers Creek Bush land Reserve, Tyabb, June, 2004 to January, 2006.

MPS

Flora and Fauna Assessment of 92 Elizabeth Avenue, Rosebud West, January, 2006.	Practical Ecology
Flora and Fauna Assessment of Potential Pipe Alignments for SPS651 Ultimate Pressure Main, Mernda – Doreen. Dec. 2005	Practical Ecology
Fauna and Fauna Survey of Punty Lane, Shoreham, November, 2005.	Leo Kuter
Fauna Survey and Management Prescriptions for 4211 Frankston– Flinders Road, Shoreham, June, 2004 to July 2005.	Kelvin Boyd
Fauna Survey for Royal Park Childrens Hospital Redevelopment, Sept. 2005.	Practical Ecology
Fauna Survey and Management Prescriptions for lot 1/2018 Boneo Road, Flinders, May, 2004 to May, 2005.	Peninsula Bushworks
Fauna Survey and Management Prescriptions for 60 Shergolds Lane, Dromana, May, 2004 to April 2005.	George Flowers
Fauna Survey and Management Prescriptions for 61 Bulldog Creek Road, Merricks North, May, 2004 to April 2005.	Leo Kuter
Fauna Survey and for 42 Blake Street, Shoreham, April, 2005.	Eric McClean
Fauna Survey and Habitat Assessment for 45 River Red Gums on, Worsley Road Carrum Downs, 30 March, 2005.	Bunurong Land Council
Fauna Survey and Management Prescriptions for Sorrento Golf Club Lake, MPS Sorrento, November, 2004 to February, 2005.	
Micro bat Survey at Shoreham Foreshore Reserve, Shoreham 12.02.05	SFR Com. of Man. Inc
Stage 2 Fauna Survey and Management Prescriptions for Ambrosia Ridge, Red Hill South, October, 2003 to December 2004.	Judith Kefford
Fauna Survey and Management Prescriptions for Xanthorrhoea Gardens, Main Ridge, Sept., 2003 to Sept. 2004.	Rob Nigro
Assessment of Coast Banksia Trees at Point Leo Camping Grounds, Point Leo 10/08/04.	Point Leo Foreshore Com. of Man.
Assessment of 50 Pinus radiata Trees at 54 Western Parade, Point Leo 01/06/04.	Robert Molch
Fauna Survey and Management Prescriptions for 321 Arthurs Seat Road, Red Hill, April, 2004 to May 31 st , 2004.	Environmental Restoration
Fauna Survey and Management Prescriptions for Tootgarook Swamp, Boneo, May, 2003 to May 2004.	Rob McNaught
Fauna Survey and Management Prescriptions for Ambrosia Ridge Reserve, Boneo, November, 2003.	Judith Kefford
Fauna Survey and Management Prescriptions for 21–25 Cliff Road, Shoreham, April 30 th , 2004.	Practical Ecology

Fauna Survey and Management Prescriptions for Lorna's Triangle, Crib Point, March, 2003 to March, 2004.	MPS
Fauna Survey and Management Prescriptions for Peninsula Gardens Bush land Reserve, Rosebud South, September, 2003 to March, 2004.	MPS
Fauna Survey and Habitat Assessment for 231 Nepean Highway, Dromana, 19 March, 2004.	Port Phillip Conservation Council
Micro bat Survey at Two Sites on Mt Bullet, 12/12/04.	Aaron Harvey
Fauna Survey and Management Prescriptions for 51 Kingston Road Langwarrin, November, 2003.	Terry Vinton
Fauna Survey and Management Prescriptions for Flinders Coast, Flinders, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Hanns Creek Bush land Reserve, Balnarring, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Coastal Bittern Wetlands, Bittern, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Port Estate Reserve, Crib Point, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Coastal Hastings, Hastings, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Carpenters Lane Bush land Reserve, Hastings, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Boe's Road Bush land Reserve, Hastings, November, 2003.	MPS
Fauna Survey and Management Prescriptions for RM Hooper Bush land Reserve, Hastings West, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Olivers Creek Bush land Reserve, Tyabb, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Gordon Rolfe Reserve, Somerville, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Blacks Camp Bush land Reserve, Somerville, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Portsea Coast Portsea, November, 2003.	MPS,
Fauna Survey and Management Prescriptions for Tyrone Bush land Reserve, Rye, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Mathis Avenue Bush land Reserve, Tootgarook, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Tootgarook Wetlands And tern Avenue Bush land Reserve, Rosebud West, November, 2003.	MPS

Fauna Survey and Management Prescriptions for Tootgarook Bush land Reserve, Boneo, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Old Cape Schanck Road Bush land Reserve, Rosebud, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Sylvan Drive Bush land Reserve, Rosebud, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Waterfall Gully Bush land Reserve, Rosebud sth, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Mt Martha Coast, Mt Martha, November, 2003.	MPS
Fauna Survey and Management Prescriptions for B:asser Avenue Bush land Reserve, Dromana, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Dromana Bush land Reserve, Dromana, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Boundary Road Bush land Reserve, Dromana, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Jackson Way Bush land Reserve, Dromana, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Dorothea Bush land Reserve, Dromana, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Bracken Ridge Bush land Reserve, Dromana, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Mornington Coast, Mornington, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Hearn Creek Bush land Reserve, Mt Martha, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Hopetoun–Norfolk Flora and Fauna Reserves and Greenfield Way Reserve, Mt Martha, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Craigie Road Bush land Reserve, Osborne, November, 2003.	MPS (Mornington Peninsula Shire)
Fauna Survey and Management Prescriptions for Balcombe Creek Bush land Reserve, Osborne, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Gunyong Creek Bush land Reserve, Mt Eliza, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Kirton Bush land Reserve, Mornington, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Somerville Bush land Reserve, Somerville, November, 2003.	MPS
Fauna Survey and Management Prescriptions for Mt Eliza Coast,	MPS

Mt Eliza, November, 2003.		
Fauna Survey and Management Prescriptions for Millbank Bush land Reserve, Mt Eliza, November, 2003.	MPS	
Fauna Survey and Management Prescriptions for Erang Drive Bush land Reserve, Mt Eliza, November, 2003.	MPS	
Fauna Survey and Management Prescriptions for Lorikeet Bush land Reserve, Mt Eliza, November, 2003.	MPS	
Fauna Survey and Management Prescriptions for Mann Road Bush land Reserve, Mt Eliza, November, 2003.	MPS	
Fauna Survey and Habitat Assessment for Road side Reserve adjoining, 69 Tyabb-Tooradin Road, Tyabb, July, 2003.	MPS	
Fauna Survey and Management Prescriptions for 2 Oceanview Avenue, Red Hill South, Feb. 2003 to June, 2003.	MPS	
Fauna Survey and Management Prescriptions for Main Ridge Equestrian Ground, May, 2002 to May 2003.	MPS	
Management Plan for the proposed Flora & Fauna Corridor at Dromana, April, 2003.		Dromana Dromana Secondary College, Secondary College
In-stream Fauna Survey and Management Prescriptions for Merricks Creek Catchment, June, 2001 to March, 2003.	MPS	
Fauna Survey and Management Prescriptions for Merricks-Red Hill Trail Red Hill, September, 2001 to February 2003.	MPS	
Fauna Survey for Daryl Manley's Property, 170 Boundary Road Dromana, November, 2002 to February, 2003.		Daryl, Manley
Fauna Survey and Management Prescriptions for Earimil Creek, Mt Eliza August, 2001 to January, 2003.	MPS	
Fauna Survey and Management Prescriptions for Betty Clift Conservation Reserve, September, 2001 to November, 2002.	MPS	
Fauna Survey and Management Prescriptions for Moorooduc Quarry Flora and Fauna Reserve, August, 2001 to October, 2002.	MPS	
Fauna Survey and Management Prescriptions for the Somers Koala Reserve, Somers, September, 2001 to September, 2002.	MPS	
Fauna Survey and Management Prescriptions for Dimmicks Bush land Reserve, Blairgowrie, July, 2001 to August 2002.	MPS	
Fauna Survey and Management Prescriptions for Goolgowie Bush land Reserve, Rosebud South, July, 2001 to August 2002.	MPS	
Weed Strategy for 7 Rahona Road, Red Hill South, July, 2002		Gerard Dunlop & Eben Ventier
Fauna Survey and Management Prescriptions for Peninsula Gardens	MPS	

Bush land Reserve, Rosebud South, June, 2001 to June, 2002.

Fauna Survey and Management Prescriptions for Coolart Reserve,
Somers, May, 2001 to May, 2002 Friends of
Coolart Inc

.Fauna Survey and Management Prescriptions for Chinamans Creek and
Drum Drum Alloc Creek, Rosebud, December, 2001 to February, 2002. MPS

Fauna Survey and Management Prescriptions for Tanti Creek,
Mornington, January, 2002. MPS

Fauna Survey and Management Prescriptions for Woods Reserve,
Moorooduc South, April, 2000 to May, 2001. MPS

Fauna Survey and Management Prescriptions for Latrobe Reserve,
Dromana, September, 2000 to April, 2001. MPS

Weed Strategy for East Creek Study Area, Point Leo February, 2001. Point Leo
Coast Action Group.

3.2.2 Contracts (Bush land works) Client

Latrobe Reserve, Dromana- woody weed removal eg. Sweet Pittosporum, Dromana
Cotoneaster, Boneseed and Polygala etc. June 2006 to July 2006. Foreshore
Com. of Man.

Dunns Creek Estate, Red Hill- Pittosporum and pine removal at the
head waters of Dunns Creek. February, 2006. Owners

4211 Frankston-Flinders Road, Shoreham- Coastal Cliff Restoration,
total restoration. May, 2004 to June, 2006 Kelvin Boyd

Pine Avenue, Red Hill South- Fern Gully Restoration Removal of
Blackberries, Karamu, pittosporum etc, April, 2005 to June, 2006 Vanessa
Bird

36 Burns Road Shoreham- Wetland and bush land establishment,
Digging out wetlands, weed control and intense planting. June, 2005
to July, 2006. Cos

Dromana Secondary College, Dromana, Restoration of bush land
disturbed by pipeline, Dec, 2004 to Dec, 2006. Education
Department

Sylvan Bush land Reserve-hand weeding Asparagus Fern and Panic Veldt
Grass Sept, 2002 to June, 2003. MPS

Flinders Coast (Western Port) - removal of woody weeds and spraying
of some perennials along the coastal cliffs at 'the farm' and 'Cove Lane'.
Dec, 2001 to June, 2003. MPS

Coryule Foreshore-Removal of woody weeds, perennials and annuals
along the foreshore. Sep, 2001 to June, 2003. MPS

Merricks Foreshore- Removal of woody weeds, perennials and annuals
foreshore at various points. June, 2001 to June, 2003. MBFCM (Merricks along the
Beach and Foreshores
Committee of Man. Inc)

3.3 October, 1995 to March, 2002 Ranger-Manager of the Shoreham Foreshore Reserve and Camping Grounds

APPENDIX 4: CURRICULUM VITAE OF Nic McCaffrey

Name: Nic McCaffrey

Position: Botanist for Mal's Environmental and Ecological Services

Address: 31 Millbank Drive, Mt Eliza 3930

Qualifications:

Bachelor of Applied Science (Natural Resource Management), Deakin University, Rusden, 1997

Professional Memberships:

- Field Naturalists Club of Victoria – member
- Friends of Snow gums (Mornington) – member
- Invasive Species Council – member
- Friends of Terrick Terrick National Park – member
- Victorian Indigenous Nurseries Co-operative – member
- Australian Native Orchid Society – member

Relevant Experience:

- Over 6 years experience in ecological consulting at Practical Ecology
- Worked extensively as a field ecologist and bush regenerator, prior to Practical Ecology, for several organizations including Greening Australia Victoria, Frankston City Council, Biosis Research, National Trust and Peninsula Bushworks.
- Undertaken botanical field studies in Ecuador and have worked in Eastern Canada undertaking forestry inventories.
- I have over 15 years experience with numerous volunteer environmental organisations including Friends of Moorooduc Quarry Flora & Fauna Reserve and the Friends of the Snow gum Woodlands.
- Flora and fauna database manager; Practical Ecology

Areas of Expertise:

In summary, my expertise is lies with undertaking botanical surveys and coordinating and preparing ecological assessment reports in context of the management of native vegetation and planning law and objectives. Over time I have taken extensive knowledge of vegetation and ecology and combined it with knowledge and experience of the planning system gained through experience.

I have undertaken numerous ecological assessments in the Frankston area, as well as working extensively in bush regeneration on the Mornington Peninsula over the last ten years.
