



*Hamilton Environmental Services*  
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**FLORA AND FAUNA ASSESSMENT AND NET GAIN AND LOSS REPORTING  
– BUTLERS ROAD PRECINCT, KILMORE**



**Flora and Fauna Assessment and Net Gain and Loss Reporting – Butlers Road Precinct,  
Kilmore**

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**Cover Photo:** View of the northern section of the assessed area, looking east.

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## **1. INTRODUCTION**

A residential development is proposed for a property at 40 Butlers Road Kilmore.

In July 2016, Hamilton Environmental Services (HES) was engaged by Planright Kilmore on behalf of the landholder to undertake a flora and fauna assessment of the property and prepare a Net Loss Report.

Dr. Steve Hamilton undertook a field evaluation of the site on the 25<sup>th</sup> July 2016, and this report presents the findings from these investigations.

## **2. BACKGROUND**

### **2.1 Site Location and Description**

The Butlers Road property is found 1 km west of the CBD of Kilmore (Fig. 2-1), bordered by the Kilmore-Lancefield Road to the north, Butlers Road to the east, the Kilmore Catholic Cemetery and freehold land to the west, and freehold land to the south (Vicroads 615 C5; Fig. 2-2).

It is proposed that the rectangular property of approximately 18.2 ha be re-zoned to allow for residential development; the north-south extent of the precinct is around 360 m, and east-west width is around 500 m (Fig. 2-2).

Other than a fenced housing block of 0.63 ha in the south-east corner of the property, the majority of the defined precinct has been developed as a series of grazing paddocks, and all areas are fenced around boundaries with stock-proof fencing.

The property has been cleared of all indigenous woody native vegetation.

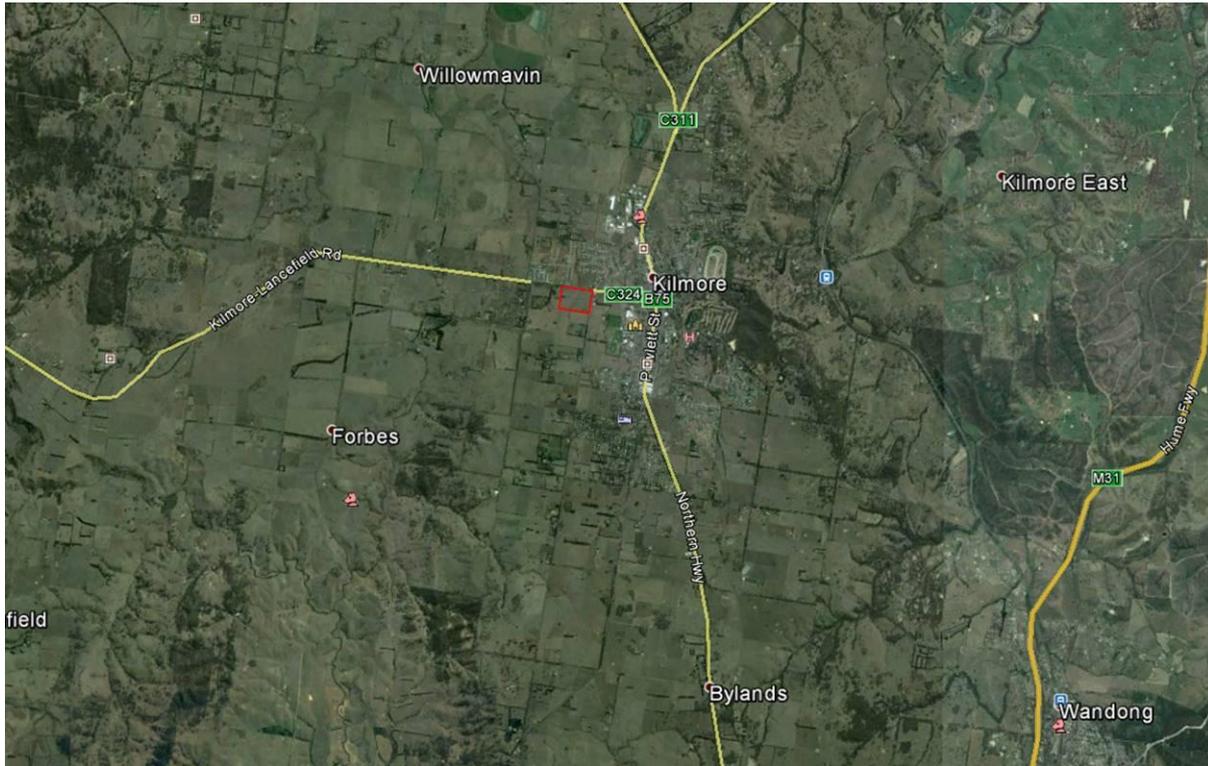
The bulk of the property is in two large paddocks, defined as the North Paddock and South Paddock Zones (these paddocks are 7.76 and 9.37 ha, respectively), and there is a plantation of non-indigenous native planted trees and shrubs on the western boundary of the property adjacent to the Cemetery (an area of 0.44 ha referred to as the Plantation Zone), there are some mature Radiata Pine found on the northern boundary, and on the eastern boundary area adjacent to the Butlers Road reserve, and the noxious weed Hawthorn has become naturalised along both the central north-south drainage line and adjacent to the northern boundary (see Fig. 2-2).

The land management across the property is uniform and is most likely long-term stock grazing, and this evidenced by the domination at ground level of opportunistic introduced pasture species. As a consequence of the past clearing and this long-term stock grazing history, there has been no recruitment of indigenous trees or shrubs, and introduced species have almost completely replaced any indigenous understorey.

#### **2.1.1 Bioregion and Ecological Vegetation Class**

The site is within the Highlands – Northern Fall Bioregion (Department of Environment, Land, Water and Planning [DELWP] 2016a).

Pre-1750 Ecological Vegetation Class (EVC) mapping suggests that prior to European settlement, the vegetation of the proposed development site would have been wholly Herb-rich Foothills Forest EVC (EVC 23; Bioregional Conservation Significance [BCS] Common)(DELWP 2016a and 2016b); given that this site has no remnant vegetation to facilitate confirmation of the presence of this EVC, it has been assumed that the whole site was this EVC.



**Figure 2-1** Aerial image of the location of the assessed site within the district, with the assessed area outlined with a solid red border (Image from Google Earth 2016).

The EVC Benchmark statement for this EVC can be found in Appendix C.

### **2.1.2 Land Tenure and Planning Scheme**

The property consists of two land parcels, Allotment 126 (PP2318) and Allotment 127 (PP2318), both Parish of Bylands, Mitchell Shire (see Fig. 2-3).

Both parcels are *Farm Zone* and are subject to the *Schedule to the Farm Zone*, and both parcels are subject to a *Salinity Management Overlay* (Department of Transport, Planning and Local Infrastructure [DTPLI] 2016).



Figure 2-2 Aerial imagery of the Butlers Road property outlined with a solid red line (Image from NearMap 2016).



**Figure 2-3** Aerial imagery of the Butlers Road property outlined with a solid red line, showing parcel Lot and Plan Numbers (from DTPLI 2016; Image from NearMap 2016).

### 3. METHOD

#### 3.1 Desktop Review

The following desktop information was gathered on the property before field evaluation:

- Aerial imagery;
- Planning information;
- Both pre-1750 and current EVC mapping;
- Relevant EVC benchmark documents;
- Threatened species sightings within a 10 km radius of the site using the Victorian Biodiversity Atlas, Biodiversity Interactive Mapper, and the EPBC Matters of National Environmental Significance search tool.

Following assessments, derived flora and fauna lists were checked against reference lists of rare and threatened species in Victoria (Department of Sustainability and Environment [DSE] 2009 and 2013, and Department of Environment and Primary Industries [DEPI] 2014).

#### 3.2 Site Assessment

On the 25<sup>th</sup> July 2016, Dr. Steve Hamilton visited the site to undertake the assessment. On the day of observation, air temperatures were between 4 and 5°C, the sky was overcast, there was light rain, and the winds were between 5-20 km/h (Bureau of Meteorology 2016).

The site was traversed, with continuous active searching for flora and fauna conducted over a total period of 1 ½ hours, with the following assessments undertaken:

- Compilation of a detailed flora species list, by zone, including the attribution of cover/abundance to each species in each zone;
- Casual sightings of fauna noted;
- Any indigenous *Scattered Trees* were defined as canopy trees > 3 m in height within an area where overall canopy cover for a group of < 3 trees is less than 20 %;
- A *Remnant Patch* was defined in-field as an area of vegetation where 25 % of the understorey cover is indigenous and/or a group of indigenous trees (i.e. three or more) where canopy cover is at least 20% (DSE 2007), and these areas were mapped;
- The individual recording of any significant indigenous trees (i.e. > 3 m in height) across all zones, including their geo-location by GPS, diameter at breast height (dbh), their health, and presence of hollows;
- A Habitat Hectare assessment was completed if any *Remnant Patch* were defined in order to determine the potential Net Loss under the revised *Native Vegetation Framework* and the *2013 revisions*;
- Degraded treeless vegetation was defined as areas containing less than 25 % indigenous vegetation and dominated by introduced species. Degraded treeless vegetation did not require a *Vegetation Quality Assessment* (DSE 2007);
- Recording and location of any specific instances related to land management, such as noxious weed or pest animal infestations, etc.;
- Digital images across the sites taken from geo-located points.

Forty seven (47) images were taken across the site during the assessment, with description of the characteristics of these images in Appendix E.

### **3.3 Taxonomy**

#### **3.3.1 Flora**

Specimens were identified using the *Flora of Victoria* (Walsh and Entwisle 1994, 1996 and 1999), and PlantNet Flora On-line (Royal Botanic Gardens Sydney 2016).

#### **3.3.2 Fauna**

A list of fauna present across the sites was compiled, with the nomenclature based variously on the compilations of Hero *et al.* (1991), Menkhorst (1995), Cogger (1996) and Simpson and Day (1998), and utilising Triggs (1996) for identification using indirect methods, such as the presence of scats or tracks.

## **4. FLORA AND FAUNA ASSESSMENT**

### **4.1 Vegetation**

The inventory of species noted across the area of evaluation is recorded in Appendix A according to designated zones (see Fig. 2-2).

The House Block Zone was not assessed.

A total of 29 vascular plant species were recorded across the assessed area; 26 of these species were introduced and 3 indigenous (Table 4-1).

All zones exhibited no or very low indigenous diversity; a reflection of the high level of modification and disturbance across the property; the introduced species tally for the Plantation Zone includes the two planted non-indigenous native species (Yellow Gum and Bracelet Honey-myrtle)(Table 4-1).

**Table 4-1 The number of indigenous and introduced species across the three assessed zones at Butlers Road Kilmore.**

| Zone             | Indigenous species | Introduced species | Total species |
|------------------|--------------------|--------------------|---------------|
| Plantation       |                    | 10                 | 10            |
| Northern Paddock | 2                  | 20                 | 22            |
| Southern Paddock | 2                  | 18                 | 20            |
| <b>Total</b>     | <b>3</b>           | <b>26</b>          | <b>29</b>     |

There were no rare or threatened species observed at the site (DEPI 2014).

Victorian Biodiversity Atlas, Biodiversity Interactive Mapper and Matters of National Environmental Significance searches revealed that there were records of nineteen threatened flora recorded or likely to occur within a 10 km radius of the property; however, likelihood analysis based on site disturbance and available habitat of the assessed area indicates that none of these species are likely to be found on-site (DELWP 2016c, Department of Environment [DoE] 2016; Appendix E). This assessment is based on the high level of disturbance across the assessed area, and the long history of stock grazing and commensurate soil disturbance across the site, and it is highly unlikely that any of these species would be found or would recruit into the site. It is also unlikely that some of these species would have ever been found in this EVC and habitat.

EPBC searching also identified as the nationally endangered *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*, and the critically endangered *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, Natural Temperate Grassland of the Victorian Volcanic Plain*, and the *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* communities could occur within a 10 km radius of the property (DoE 2015). The site is not within the Victorian Volcanic Plain Bioregion; however, there is no remnant vegetation remaining on the property.

As indicated previously, the assessed area have been fully cleared of any woody native vegetation, and has clearly been grazed by stock for a long period; the indigenous ground layer has been almost completely replaced by introduced opportunistic pasture species as a consequence of grazing impact, and there is no tree or shrub recruitment and no indigenous shrub layer as a consequence.

The Paddock Zones are dominated by a range of introduced annual and perennial species (up to 90 % cover) such as Great Brome, Capeweed, Yorkshire Fog-grass, Annual Ryegrass, Winter-grass, Phalaris, Cocksfoot, Cat's Ear, Paspalum, Sheep Sorrel and Onion-grass. Hawthorn lines the drainage line that runs north-south centrally across the property, and planted Weeping Willow, Mirror Bush and Radiata Pine are found on the eastern boundary of the property along Butlers Road. Madiera Broom is found underneath the planted specimens across the Plantation Zone. There are individual plants/clumps of the indigenous herb species Cinquefoil Geranium, Water Couch and Swamp Dock are scattered at ground level across the Paddock Zones, but these are all in very low abundance (Appendix A).

The central north-south aligned drainage line maintains the same ground layer composition as the surrounding open paddock areas, but is lined by naturalised Hawthorn, that in some sections of the drainage line is quite dense.

The Plantation Zone is dominated by a fenced dense, mature planting of two non-indigenous native species – Yellow Gum and Bracelet Honey-myrtle; given the density of plantings, there is relatively little ground level growth except along the eastern edge of the plantation, and where individuals have died and light space has been created. Madiera Broom is found at a relatively low abundance across the zone (Appendix A).



**Plate 4-1** Typical views of the Plantation Zone and Northern Paddock Zone from the northern-west property corner (top left and right, respectively), the Southern Paddock Zone from the south-western property corner (middle left), the drainage line from the west (middle right), and the House Block Zone from Butlers Road (bottom).

As indicated, there are some significant weeds found across the assessed area, with the *Regionally Controlled Weeds* Hawthorn and Madiera Broom found on the property along the drainage line and

within the Plantation, respectively, the *Regionally Controlled Weed* African Boxthorn is found along the northern boundary of the property, and the Restricted Weed Spear Thistle is also found in underneath the planted specimens across the Plantation Zone (Appendix A; Victorian Government 2010).

Other invasive species without a noxious weed status such as Cocksfoot, Phalaris, Paspalum and Plantain are also present, and will expand their abundance if left unmanaged (Appendix A).

## 4.2 Fauna

There were 10 species of fauna observed across the property, including five introduced species. Details of those species noted or inferred over the assessment period are detailed in Appendix B.

There were no rare or threatened species observed at the site (DSE 2008 and 2013).

The species that were noted are typically those observed in peri-urban environments, such as the indigenous Australian Magpie, Australian Raven and Magpie-lark; the ubiquitous introduced Common Blackbird, Indian Myna and European Rabbit were also found across the property (Appendix B).

This relative lack of observed species diversity is not surprising, given that:

- there was a limited survey time and the weather conditions on the day of observation were cold, wet and windy;
- all of the assessed area is highly modified, has been long-term grazed by stock and has been fully cleared, and hence there is highly simplified indigenous vegetation structure with a no effective understorey and a dominant introduced annual ground layer across all of the site, and no evidence of any remnant vegetation;
- there no scattered remnant large trees, while there was a range of planted non-indigenous native woody vegetation found in the western Plantation, and there was no fallen wood left on ground, and no standing dead trees;
- the likely presence of both a fox and feral cat population.

On this basis, there are significantly reduced opportunities for faunal occupation across most of the site, in terms of a highly simplified vegetation structure (i.e. little shrub or emerging tree layer, meaning fewer opportunities for food collection and shelter/protection), and a lack of food sources (e.g. lack of nectar producing plants and those producing fleshy fruits).

Victorian Wildlife Atlas, Biodiversity Interactive Mapper and Matters of National Environmental Significance searches revealed thirty six (36) significant fauna species (excluding aquatic species) previously recorded within 10 km of the property (DELWP 2016c, DoE 2016; Appendix D). Given the limited connectedness of the property, likelihood analysis based on known threatened species distribution and habitat preferences, it is considered that only two (2) of these species may utilise the site, although this usage is unlikely to be frequent. These species are: Cattle Egret and Eastern Great Egret. These species are all typically generalists who will utilise grazed paddocks in damp/wetter areas for foraging.

Given the long history of regional disturbance, it is highly unlikely that most of the other threatened species listed in Appendix D would now be resident or utilise the site given their known distribution and/or habitat preferences.

## 4.3 Remnant Patches

There were no *Remnant Patches* of native vegetation identified, and no Vegetation Quality Assessment (Habitat Hectares Assessment) was required.

#### 4.4 Significant Trees

There were no indigenous trees found on the property.

There are planted non-indigenous native trees within the Plantation Zone (Yellow Gum; see Fig. 2-2), and there are several mature Radiata Pine individuals on both the eastern and northern boundaries.

### 5. NET GAIN AND LOSS REPORTING

#### 5.1 Native Vegetation Clearance in Victoria

##### ***Victoria's Native Vegetation Management: A Framework for Action***

*Victoria's Native Vegetation Management – A Framework for Action* (the Framework) was released in August 2002 (Department of Natural Resources and Environment [DNRE] 2002) and the policy was incorporated into the Victorian Planning Provisions on 24<sup>th</sup> July 2003.

The Framework aims to guide vegetation management in Victoria to achieve the goal of Net Gain, which is defined as “...*the outcome for native vegetation and habitat where overall gains are greater than overall losses and where individual losses are avoided where possible*” (DNRE 2002). The three steps involved in applying the Net Gain principle are (DNRE 2002; DSE 2006a):

1. To **avoid** adverse impacts, particularly through vegetation clearance;
2. If impacts cannot be avoided, to **minimise** impacts through appropriate consideration in planning processes and expert input to project design or management;
3. Identify appropriate **offset** options.

The 2013 reforms to the *Native Vegetation Permitted Clearing Regulations* (DEPI 2013b), which took effect on the 20<sup>th</sup> December 2013, have changed the goal of vegetation management in Victoria from a Net Gain principle, to one of ‘No Net Loss’. A number of changes have been made in the assessment pathway, to Victorian Planning Provisions, Ecological Vegetation Classes are being re-mapped, and the Habitat Hectares method revised (DEPI 2013a and 2013b). These changes were to be progressively adopted over the next 6 months (DEPI 2013c).

Ecological Vegetation Class (EVC) information will still provide the basis for completing native vegetation assessments using a modified ‘Habitat Hectares approach’ as required under the Framework. An EVC benchmark outlines the expected percentage of vegetation cover in a particular vegetation type and is used to compare the existing vegetation quality against the vegetation quality which existed prior to European settlement (DELWP 2015a and 2014b).

##### ***Native Vegetation Clearance Regulations 2013***

Up until the 20<sup>th</sup> December 2013, each EVC benchmark was defined within its specific Bioregion and contains information describing the character species, expected density and structure typical of that vegetation class (DELWP 2015a). DSE had determined the Bioregional Conservation Status for each EVC in each Bioregion based on the relative amount (area) of each EVC still existing compared with that prior to European Settlement (DELWP 2015a). The Bioregional Conservation Significance (BCS) of vegetation influenced a number of decisions and offset requirements (DELWP 2015a).

However, the 2013 reforms see the concept of Bioregions replaced by Catchments in this regard. The concept of Bioregional Conservation Status and Significance will be replaced by use of a mapping-based Strategic Biodiversity Score, and current assessment pathways replaced by risk-based pathways based on an extent of vegetation and pre-determined location risk and site condition, supported by measures of strategic biodiversity value at the landscape scale which can be derived in DEPI/DELWP web-based mapping (DEPI 2013c).

## 5.2 Avoid and Minimise

There were no *Scattered Trees* or *Remnant Patches* of native vegetation on the property.

## 5.3 Quantification of Losses and Required Offsets

Development of the property would not result in the loss of any native vegetation, and so no offset would be required.

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## **6.1 Personal Communication**

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## **APPENDIX A      FLORA INVENTORY AT BUTLERS ROAD KILMORE**

Vascular flora have been recorded for presence across the assessed area, using a cover-abundance scale that is shown in the Table immediately below.

An asterisk denotes an introduced species.

Each plant species present were assessed for cover-abundance using the scale outlined below. Nomenclature and taxonomy of plants based variously on Costermans (2005), Hnatiuk (1990), and Walsh and Entwisle (1994, 1996 and 1999).

| Visual assessment of cover/abundance |   |
|--------------------------------------|---|
| Symbol                               | Description   |
| +                                    | rare, cover < 5%  |
| 1                                    | Uncommon, cover < 5 %   |
| 2                                    | Very common, cover < 5 % or cover 5-25 % with any number of individuals |
| 3                                    | Cover 25-50 % with any number of individuals                            |
| 4                                    | Cover 50-75 % with any number of individuals                            |
| 5                                    | Cover 75-100 % with any number of individuals                           |

| Common name                     | Scientific name                | Lifeform <sup>#</sup> | Plantation | North Paddock | South Paddock |
|---------------------------------|--------------------------------|-----------------------|------------|---------------|---------------|
| Capeweed                        | <i>Arctotheca calendula</i> *  | MH                    | 2          | 2             | 3             |
| Great Brome                     | <i>Bromus diandrus</i> *       | LNG                   | 2          | 2             | 2             |
| Spear Thistle                   | <i>Cirsium vulgare</i> *       | LH                    | 2          |               |               |
| Mirror Bush                     | <i>Coprosma repens</i> *       | MS                    |            |               | 1             |
| Hawthorn                        | <i>Crataegus monogyna</i> *    | MS                    |            | 2             | 2             |
| Cocksfoot                       | <i>Dactylis glomerata</i> *    | LTG                   |            | 2             | 2             |
| Yellow Gum (planted)            | <i>Eucalyptus leucoxylon</i> * | T                     | 3          |               |               |
| Cleavers                        | <i>Galium aparine</i> *        | MH                    | 2          |               |               |
| Madeira Broom                   | <i>Genista stenopetala</i> *   | MS                    | 2          |               |               |
| Cinquefoil Cranesbill           | <i>Geranium potentilloides</i> | MH                    |            | 1             |               |
| Yorkshire Fog-grass             | <i>Holcus lanatus</i> *        | MNG                   | 2          | 2             | 2             |
| Cat's Ear                       | <i>Hypochaeris radicata</i> *  | MH                    |            | 1             | 1             |
| Wimmera Ryegrass                | <i>Lolium rigidum</i> *        | MNG                   |            | 2             | 2             |
| African Boxthorn                | <i>Lycium ferocissimum</i> *   | MS                    |            | 1             |               |
| Small-flowered Mallow           | <i>Malva parviflora</i> *      | SH                    |            | 2             | 1             |
| Bracelet Honey-myrtle (planted) | <i>Melaleuca armillaris</i> *  | MS                    | 3          |               |               |
| Soursob                         | <i>Oxalis pes-caprae</i> *     | MH                    |            | 1             | +             |
| Paspalum                        | <i>Paspalum dilitatum</i> *    | LNG                   |            | 2             |               |
| Water Couch                     | <i>Paspalum distichum</i>      | MNG                   |            |               | 2             |
| Toowoomba Canary Grass          | <i>Phalaris aquatica</i> *     | LTG                   | 1          | 2             | 2             |
| Plantain                        | <i>Plantago lanceolata</i> *   | MH                    |            | 2             |               |
| Winter-grass                    | <i>Poa annua</i> *             | STG                   |            | 3             | 2             |
| Onion-grass                     | <i>Romulea rosea</i> *         | STG                   |            | 2             | 2             |
| Swamp Dock                      | <i>Rumex brownii</i>           | LH                    |            | +             | 1             |
| Curled Dock                     | <i>Rumex crispus</i> *         | SH                    |            | 1             | 2             |

Flora and Fauna Assessment – Butlers Road, Kilmore

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| Common name         | Scientific name                 | Lifeform <sup>#</sup> | Plantation | North Paddock | South Paddock |
|---------------------|---------------------------------|-----------------------|------------|---------------|---------------|
| Weeping Willow      | <i>Salix babylonica</i> *       | T                     |            | 2             | +             |
| Milk Thistle        | <i>Sonchus oleraceus</i> *      | LH                    |            | 1             | +             |
| Subterranean Clover | <i>Trifolium subterraneum</i> * | SH                    |            | 2             | 2             |
| Small Nettle        | <i>Urtica urens</i> *           | MH                    | 1          | +             | 1             |

<sup>#</sup> abbreviations for lifeform for indigenous species are T = tree, MS = medium shrub, SS = small shrub, LH = large herb, MH = medium herb, SH = small herb, LTG = large tufted graminoid, MTG = medium tufted graminoid, STG = small tufted graminoid, MNG = medium non-tufted graminoid, SC = scrambler/climber, GF = ground fern, B/L = bryophyte/lichen, P = parasite.

**APPENDIX B      OBSERVED OR INFERRED FAUNA AT  
BUTLERS ROAD KILMORE**

Observed or inferred fauna at the site and surrounds between 9.00 am and 10.00 am  
on the 25<sup>th</sup> July 2016.

| Common name             | Scientific name                | Mode of observation <sup>#</sup> |
|-------------------------|--------------------------------|----------------------------------|
| <b>Birds</b>            |                                |                                  |
| Australian Magpie       | <i>Gymnorhina tibicen</i>      | A,V                              |
| Australian Raven        | <i>Corvus coronoides</i>       | A,V                              |
| Common Blackbird        | <i>Turdus merula</i> *         | A,V                              |
| Indian Myna             | <i>Acridotheres tristis</i> *  | A,V                              |
| Magpie-lark             | <i>Grallina cyanoleuca</i>     | A                                |
| Red Wattlebird          | <i>Anthochaera carunculata</i> | A                                |
| Yellow-rumped Thornbill | <i>Acanthiza chrysorrhoa</i>   | A,V                              |
| <b>Mammals</b>          |                                |                                  |
| Brown Hare              | <i>Lepus europaeus</i> *       | V                                |
| Cow                     | <i>Bos taurus</i>              | V                                |
| European Rabbit         | <i>Oryctolagus cuniculus</i> * | S                                |

\* denotes introduced species

<sup>#</sup> Identification method: A = audible call; V = visual; N = distinctive nest; S = scat

## **APPENDIX C      EVC BENCHMARK DESCRIPTION**



Department of  
Sustainability and  
Environment

## EVC/Bioregion Benchmark for Vegetation Quality Assessment Highlands – Northern Fall bioregion

### EVC 23: Herb-rich Foothill Forest

#### Description:

Occurs on relatively fertile, moderately well-drained soils on an extremely wide range of geological types and in areas of moderate to high rainfall. Occupies easterly and southerly aspects mainly on lower slopes and in gullies. A medium to tall open forest or woodland to 25 m tall with a small tree layer over a sparse to dense shrub layer. A high cover and diversity of herbs and grasses in the ground layer characterise this EVC.

#### Large trees:

| Species                | DBH(cm) | #/ha    |
|------------------------|---------|---------|
| <i>Eucalyptus</i> spp. | 70 cm   | 20 / ha |

#### Tree Canopy Cover:

| %cover | Character Species              | Common Name             |
|--------|--------------------------------|-------------------------|
| 40%    | <i>Eucalyptus radiata</i> s.l. | Narrow-leaf Peppermint  |
|        | <i>Eucalyptus dives</i>        | Broad-leaved Peppermint |
|        | <i>Eucalyptus obliqua</i>      | Messmate Stringybark    |

#### Understorey:

| Life form                           | #Spp | %Cover | LF code |
|-------------------------------------|------|--------|---------|
| Immature Canopy Tree                |      | 5%     | IT      |
| Understorey Tree or Large Shrub     | 2    | 10%    | T       |
| Medium Shrub                        | 7    | 15%    | MS      |
| Small Shrub                         | 3    | 5%     | SS      |
| Prostrate Shrub                     | 2    | 5%     | PS      |
| Large Herb                          | 3    | 5%     | LH      |
| Medium Herb                         | 11   | 20%    | MH      |
| Small or Prostrate Herb             | 3    | 5%     | SH      |
| Large Tufted Graminoid              | 2    | 5%     | LTG     |
| Large Non-tufted Graminoid          | 1    | 1%     | LNG     |
| Medium to Small Tufted Graminoid    | 6    | 10%    | MTG     |
| Medium to Tiny Non-tufted Graminoid | 2    | 5%     | MNG     |
| Ground Fern                         | 2    | 10%    | GF      |
| Scrambler or Climber                | 2    | 5%     | SC      |
| Bryophytes/Lichens                  | na   | 20%    | BL      |

## EVC 23: Herb-rich Foothill Forest Highlands – Northern Fall bioregion

| LF Code | Species typical of at least part of EVC range | Common Name           |
|---------|---|-----------------------|
| T       | <i>Acacia dealbata</i>                        | Silver Wattle         |
| MS      | <i>Cassinia aculeata</i>                      | Common Cassinia       |
| MS      | <i>Coprosma quadrifida</i>                    | Prickly Currant-bush  |
| MS      | <i>Coprosma hirtella</i>                      | Rough Coprosma        |
| MS      | <i>Epacris impressa</i>                       | Common Heath          |
| SS      | <i>Tetradlea ciliata</i>                      | Pink-bells            |
| SS      | <i>Olearia erubescens</i>                     | Moth Daisy-bush       |
| SS      | <i>Hibbertia obtusifolia</i>                  | Grey Guinea-flower    |
| SS      | <i>Hovea heterophylla</i>                     | Common Hovea          |
| PS      | <i>Platylobium formosum</i>                   | Handsome Flat-pea     |
| PS      | <i>Acrotriche serrulata</i>                   | Honey-pots            |
| PS      | <i>Acrotriche prostrata</i>                   | Trailing Ground-berry |
| LH      | <i>Senecio tenuiflorus</i>                    | Slender Fireweed      |
| MH      | <i>Viola hederacea sensu Willis (1972)</i>    | Ivy-leaf Violet       |
| MH      | <i>Gonocarpus tetragynus</i>                  | Common Raspwort       |
| MH      | <i>Lagenophora stipitata</i>                  | Common Bottle-daisy   |
| SH      | <i>Hydrocotyle laxiflora</i>                  | Stinking Pennywort    |
| SH      | <i>Dichondra repens</i>                       | Kidney-weed           |
| LTG     | <i>Lomandra longifolia</i>                    | Spiny-headed Mat-rush |
| LNG     | <i>Tetrarrhena juncea</i>                     | Forest Wire-grass     |
| MTG     | <i>Stylidium graminifolium s.l.</i>           | Grass Trigger-plant   |
| MTG     | <i>Poa sieberiana</i>                         | Grey Tussock-grass    |
| MTG     | <i>Dianella tasmanica</i>                     | Tasman Flax-lily      |
| MTG     | <i>Luzula meridionalis var. flaccida</i>      | Common Woodrush       |
| MNG     | <i>Microlaena stipoides var. stipoides</i>    | Weeping Grass         |
| GF      | <i>Pteridium esculentum</i>                   | Austral Bracken       |
| GF      | <i>Polystichum proliferum</i>                 | Mother Shield-fern    |
| SC      | <i>Clematis aristata</i>                      | Mountain Clematis     |
| SC      | <i>Glycine clandestina</i>                    | Twining Glycine       |
| SC      | <i>Hardenbergia violacea</i>                  | Purple Coral-pea      |

**Recruitment:**  
Continuous

**Organic Litter:**  
40 % cover

**Logs:**  
20 m/0.1 ha.

| <b>Weediness:</b> |                             |                 |          |        |
|-------------------|-----------------------------|-----------------|----------|--------|
| LF Code           | Typical Weed Species        | Common Name     | Invasive | Impact |
| LH                | <i>Cirsium vulgare</i>      | Spear Thistle   | high     | high   |
| MH                | <i>Hypochoeris radicata</i> | Cat's Ear       | high     | low    |
| MH                | <i>Centaureum erythraea</i> | Common Centaury | high     | low    |

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**APPENDIX D      EPBC AND VICTORIAN THREATENED  
SPECIES AND LIKELIHOOD OF  
OCCURRENCE**

**List of threatened flora species recorded by the Victorian Biodiversity Atlas in a 10 km radius around the property, and by Matters of National Environmental Significance searching of the district, their status, and their likelihood of occurrence on the sites (DELWP 2016c; DoE 2016).**

| Scientific name             | Common Name               | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|-----------------------------|---------------------------|--|---|--|
| <i>Acacia ausfeldii</i>     | Ausfeld's Wattle          | v                                      |   | This species of grassy woodlands has been found once close to Broadford in 1980. While the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification, and is disconnected to former/known locations. <b>Likelihood: Unlikely to be present</b>   |
| <i>Acacia nano-dealbata</i> | Dwarf Silver Wattle       | r                                      |   | This species grows mostly on poor soils in highland forests, and has been recorded once on a high point 5 km east of the proposed site. Site is not suitable habitat. <b>Likelihood: Unlikely to be present</b>  |
| <i>Amphibromus fluitans</i> | River Swamp Wallaby-grass |  | V                                       | Wetland/riparian plant. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. No records within 20 km. <b>Likelihood: Highly unlikely to be present</b>  |
| <i>Caladenia tensa</i>      | Rigid Spider-orchid       | v                                      | E                                       | This species grows mostly in light soils on sand-hills and sand plains. Site is not suitable habitat. No records of the species within 20 km of the site. <b>Likelihood: Highly unlikely to be present</b>   |
| <i>Caladenia versicolor</i> | Candy Spider-orchid       | e,L                                    | V                                       | This very rare species in Victoria would once have been found in habitats such as this site, but this species is now confined in Victoria to Lake Fyans and the Stawell region. <b>Likelihood: Highly unlikely to be present</b>   |
| <i>Cardamine tenuifolia</i> | Slender Bitter-cress      | k                                      |   | A plant of semi-shade in moist swampy soils and along creek edges. While the waterway and floodplain across the site and adjacent area may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. Found within 5 km of the site to the east in 1988 and 2003. <b>Likelihood: Unlikely to be present</b> |

| Scientific name                | Common Name      | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|--------------------------------|------------------|--|---|--|
| <i>Carex tasmanica</i>         | Curly Sedge      | v,L                                    | V                                       | The Curly Sedge is a small, perennial, clumping sedge growing in seasonally damp sites on heavy basaltic soils in grassland or grassy woodland. The species is currently known from about 60 sites and perhaps 500,000 or more plants. However, most plants occur in just two populations (near Craigieburn and in SW Victoria), with the remainder generally small and isolated. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. No records of the species within 20 km of the site. <b>Likelihood: Highly unlikely to be present</b> |
| <i>Comesperma polygaloides</i> | Small Milkwort   | v,L                                    |   | This species is an erect perennial forb found in native grasslands on basaltic soils from near Melbourne to the Western District. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. Species recorded once within 10 km – north of Kilmore in 2011. <b>Likelihood: Highly unlikely to be present</b>  |
| <i>Dianella amoena</i>         | Matted Flax-lily | e,L                                    | E                                       | The Matted Flax-lily is known from 120 sites in Victoria, although there are thought to be only 50 populations producing seed. This species was thought to be confined to well-drained grasslands and grassy woodland sites in the Victorian Volcanic Plains, South East Coastal Plain, South Eastern Highlands and Victorian Midlands bioregions. While some sections of the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. Species recorded once within 5 km of the site – at Bylands in 2005. <b>Likelihood: Unlikely to be present</b>   |
| <i>Diuris behrii</i>           | Golden Cowslips  | v                                      |   | A plant of moist soils and along creek edges; now confined to the east and south-west of Melbourne and near the Grampians. While the waterway and floodplain across the site and adjacent area may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. Recorded 10 km west of the site over 40 years ago. <b>Likelihood: Highly unlikely to be present</b>   |
| <i>Glycine latrobeana</i>      | Clover Glycine   | v,L                                    | V                                       | A twining Grassy Woodland species typically found on elevated habitats immediately above the floodplain. No sightings within 10 km, and the site is not suitable habitat. <b>Likelihood: Unlikely to be present</b>  |

| Scientific name                                    | Common Name        | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|--|--------------------|--|---|--|
| <i>Grevillea rosmarinifolia</i>                    | Rosemary Grevillea | k                                      |   | The species grows in woodland on tablelands near streams and on moist slopes, and in mallee and shrubland on the plains and slopes on sandy soils. Some sections of the areas assessed would once have been suitable habitat; however, disturbance would preclude its existence on the site. One sighting within 10 km on record - 2 km NE of Kilmore East in 1999. <b>Likelihood: Highly unlikely to be present</b>   |
| <i>Leucochrysum albicans</i> var. <i>tricolor</i>  | Hoary Sunray       | e,L                                    | E                                       | The Hoary Sunray is a small, perennial paper daisy endemic to south-eastern Australia, where it occurs in New South Wales, the Australian Capital Territory, Victoria and Tasmania, in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. In Victoria, Hoary Sunray occurs in the south-west, between Colac, Inverleigh, Ballarat, Ararat and Hamilton, in the Victorian Volcanic Plain bioregion. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. No records of the species within 20 km of the site. <b>Likelihood: Highly unlikely to be present</b> |
| <i>Melaleuca armillaris</i> ssp. <i>armillaris</i> | Giant Honey-myrtle | r                                      |   | Spreading shrub or small tree, mainly confined to near-coastal sandy heaths, scrubs slightly raised above saltmarsh, riparian scrubs, rocky coastlines and foothill outcrops eastwards from about Marlo. Occurrences to the west, such as around Kilmore East 5 km from the site and another within 1 km, are likely naturalized occurrences from cultivated stock. <b>Likelihood: Unlikely to be present</b>  |
| <i>Pimelea spinescens</i> ssp. <i>spinescens</i>   | Spiny Rice-flower  | e,L                                    | CE                                      | This plant now largely occurs on basalt-derived soils west of Melbourne, across the central Victorian volcanic plains, and on alluvial soils across north west Victoria. Recent records are now confined to the east and south-west of Melbourne and near Terrick Terrick NP near Echuca. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. No records of the species within 20 km of the site. <b>Likelihood: Highly unlikely to be present</b>   |

| Scientific name               | Common Name                  | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|-------------------------------|------------------------------|--|---|--|
| <i>Prasophyllum frenchii</i>  | Maroon Leek-orchid           | e,L                                    | E                                       | The Maroon Leek-orchid occurs in grassland and grassy woodland habitats, on sandy to black clay loams that are generally damp but well drained, although some sites are seasonally waterlogged. It is currently known only from seven populations containing about 1,000 plants (South and West Gippsland and SW Victoria), with one population occurring in South Australia. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. No records of the species within 20 km of the site. <b>Likelihood: Highly unlikely to be present</b> |
| <i>Rytidosperma monticola</i> | Small-flowered Wallaby-grass | r                                      |   | A densely tufted species of dry montane and sub-alpine woodlands that is known from the Grampians, around Melbourne and the Mornington Peninsula, Maryborough and Beechworth. The site is not suitable habitat. Three sightings of the species south of Bylands in 2005. <b>Likelihood: Highly unlikely to be present</b>  |
| <i>Sporobolus creber</i>      | Western Rat-tail Grass       | v                                      |   | A woodland species now known from only 4 localities: around Broadford, Walwa in the north-east, Rochester and East Gippsland. While the waterway and floodplain across the site may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. One record within 20 km of the site – 1 km south of Broadford in 1972. <b>Likelihood: Highly unlikely to be present</b>  |
| <i>Thelymitra luteocilium</i> | Fringed Sun-orchid           | r                                      |   | A plant of moist depressions and along creek edges; now thought to be confined to several locations in the Victoria Midlands and the Wimmera. While the waterway and floodplain across the site and adjacent area may have once been suitable habitat, it is unlikely the species would be found because of the extent of modification. Recorded 1 km SW of Kilmore East in 1995. <b>Likelihood: Highly unlikely to be present</b>   |

1. e = endangered in Victoria; v = vulnerable in Victoria; r = rare in Victoria; k = insufficiently known in Victoria; L = listed under the *Flora and Fauna Guarantee Act* (from DEPI 2014).
2. E = endangered nationally; V = vulnerable nationally (DoE 2016);
3. Habitat descriptions for species obtained from the *Flora of Victoria* (Walsh and Entwisle 1994, 1996 and 1999), DoE (2014) and PlantNet Flora On-line (Royal Botanic Gardens Sydney 2016).

**List of threatened fauna species recorded by the Victorian Biodiversity Atlas in a 20 km radius around the property, and by Matters of National Environmental Significance searching of the district, their status, and their likelihood of occurrence on the subject land (DELWP 2016c; DoE 2016).**

| Common Name              | Scientific name               | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>   |
|--------------------------|-------------------------------|--|---|---|
| Australasian Bittern     | <i>Botaurus poiciloptilus</i> | e,L                                    | E                                       | Australasian Bitterns specialise in living in dense beds of reeds and rushes, where they are surprisingly difficult to see, as they are particularly well camouflaged among reeds. Added to this, when alarmed, they stand still with neck stretched upwards and bill pointing skywards. The assessed area will have once contained some suitable habitat, however there is limited connectivity to known locations, and the site has been heavily disturbed by grazing and clearing. <b>Likelihood: Unlikely to be present</b> |
| Australasian Shoveler    | <i>Anas rhynchos</i>          | v                                      |   | Often associating with other species of ducks, the Australasian Shoveler is often seen in flocks with Pink-eared Ducks. They inhabit a wide variety of wetlands, ranging from terrestrial swamps and lakes to estuaries and even sheltered inshore waters. They prefer wetlands with areas of open water fringed by abundant aquatic vegetation, where they feed in small groups by dabbling in the mud or at the water's surface. Site does not contain suitable habitat. <b>Likelihood: Highly unlikely to be present</b>     |
| Australian Painted Snipe | <i>Rostratula australis</i>   | ce,L                                   | E                                       | The Australian Painted Snipe inhabits many different types of shallow, brackish or freshwater terrestrial wetlands, especially temporary ones which have muddy margins and small, low-lying islands. Suitable wetlands usually support a mosaic of low, patchy vegetation, as well as lignum and Canegrass. No suitable habitat occurs on site. <b>Likelihood: Highly unlikely to be present</b>  |
| Black-faced Monarch      | <i>Monarcha melanopsis</i>    |  | Migratory Terrestrial Species           | The Black-faced Monarch is found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating. Site does not contain suitable habitat, and there is a lack of connectivity to known locations. No records of the species within 20 km. <b>Likelihood: Unlikely to be present</b>  |
| Black Falcon             | <i>Falco subniger</i>         | v,L                                    |   | The Black Falcon inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. The species is usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts. Assessed area may contain some suitable habitat; however there is limited connectivity to known locations. Recorded at Wandong in 2005. <b>Likelihood: Unlikely to be present</b>             |

| Common Name                            | Scientific name                       | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|--|---------------------------------------|--|---|--|
| Brown Toadlet                          | <i>Pseudophryne bibronii</i>          | e,L                                    |   | A once widespread species now known only around Melbourne and SW Victoria. The Toadlet is recorded on numerous occasions to the west, north, south and east of Kilmore in forested areas, where it hides under fallen timber, rocks etc. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing.<br><b>Likelihood: Unlikely to be present</b>   |
| Brown Treecreeper (south-eastern ssp.) | <i>Climacteris picumnus victoriae</i> | nt                                     |   | Occurs in intact woodlands, and adjacent agricultural land. Some sections of the assessed area and probably the roadside may still be suitable habitat; however, there is limited connectivity to known locations. There have been numerous sightings of the species around Broadford and Wandong, although none of these are after 1999. <b>Likelihood: Unlikely to be present</b>  |
| Cattle Egret                           | <i>Ardea ibis</i>                     |  | Migratory Wetland Species               | The Cattle Egret is found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor. Will also forage at garbage dumps, and is often seen with cattle and other stock. There is suitable habitat across the assessed areas; however, there are no recorded sightings within 10 km. <b>Likelihood: May be present</b>  |
| Diamond Firetail                       | <i>Stagonopleura guttata</i>          | nt,L                                   |   | Occurs in woodlands, and adjacent agricultural land. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and there is limited connectivity to known locations; two sightings within 3 km south-east of the site in 1976.<br><b>Likelihood: Unlikely to be present</b>   |
| Eastern Great Egret                    | <i>Ardea modesta</i>                  | v,L                                    |   | Wetland/riparian species which is found in grasslands, woodlands and wetlands. It also uses pastures and croplands, especially where drainage is poor. Some of the site and adjacent is suitable habitat, and there are two sightings at Willowmavin, both of which are pre-2001. <b>Likelihood: May be present</b>  |
| Emu                                    | <i>Dromaius novaehollandiae</i>       | nt                                     |   | The Emu is found in a wide variety of habitats, except thickly forested regions. They are opportunistic browsers who eat a wide variety of leaves, grasses, fruits, native plants and insects. This site would have once been very suitable habitat; however, it is now unlikely to be present given the lack of connectivity of habitat and the level of site modification. The species has been observed at Willowmavin in 2000. <b>Likelihood: Unlikely to be present</b> |

| Common Name            | Scientific name               | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|------------------------|-------------------------------|--|---|--|
| Fork-tailed Swift      | <i>Apus pacificus</i>         |  | Migratory Marine Species                | This non-breeding migrant visitor to Australia mostly occurs over inland plains, but sometimes above foothills or in coastal areas. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and there is a lack of connectivity to known locations. Not recorded within a 20 km radius of the site. <b>Likelihood: Unlikely to be present</b>   |
| Golden Sun Moth        | <i>Synemon plana</i>          | e, L                                   | CE                                      | Occurs in grassy woodlands dominated by indigenous grasses. Some of site may have once been suitable habitat; however, the level of ground disturbance and species replacement is likely to have eliminated the species. The species has been recorded locally at Broadford, Glenaroua and north of Kilmore in recent times at known populations. <b>Likelihood: Unlikely to be present</b>  |
| Great Egret            | <i>Ardea alba</i>             | v,L                                    | Migratory Wetland Species               | Widespread in Australia occurring in all states/territories of mainland Australia and in Tasmania. In Australia, the largest breeding colonies, and greatest concentrations of breeding colonies, are located in near-coastal regions of the Northern Territory. The Channel Country of south-western Queensland and north-eastern South Australia have at least 12 breeding colonies, and colonies are also known in the Darling Riverine Plains region of NSW and the Riverina region of NSW and Victoria. Has been reported in a wide range of wetland habitats. No suitable habitat occurs on site, and no sightings within 20 km. <b>Likelihood: Unlikely to be present</b> |
| Grey-headed Flying-fox | <i>Pteropus poliocephalus</i> | v,L                                    | V                                       | Australia's only endemic flying-fox and occurs in a coastal belt from south-eastern Queensland to Melbourne, Victoria. It is a canopy-feeding frugivore and nectivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. Site is not suitable habitat. <b>Likelihood: Unlikely to be present</b>   |
| Growling Grass Frog    | <i>Litoria raniformis</i>     | e,L                                    | V                                       | A once widespread species now known only from around Melbourne and SW Victoria. While the some of the site and adjacent area may once have been suitable habitat, the site has been heavily disturbed, and it is unlikely the species is now found locally. Records within 10 km are over 30 years old. <b>Likelihood: Highly unlikely to be present</b>   |
| Hardhead               | <i>Aythya australis</i>       | v                                      |   | Found in freshwater swamps and wetlands and occasionally in sheltered estuaries. They are rarely seen on land and tend to roost on low branches and stumps near the water. They prefer deep, fresh open water and densely vegetated wetlands for breeding. No such habitat occurs on-site. The numerous sightings within 10 km of the assessed area are at Sewerage Plants, reservoirs and known wetlands. <b>Likelihood: Unlikely to be present</b>   |

| Common Name    | Scientific name                        | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|----------------|--|--|---|--|
| Hooded Robin   | <i>Melanodryas cucullata cucullata</i> | nt,L                                   |   | Occurs in intact woodlands, and adjacent agricultural land. They occupy a wide range of Eucalypt woodlands, Acacia shrublands and open forests. In temperate woodlands, the species favours open areas adjoining large woodland blocks, with areas of dead timber and sparse shrub cover. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and there is limited connectivity to known locations. Sightings within 10 km of the assessed area are near Broadford and Willowmavin prior to 2000. <b>Likelihood: Unlikely to be present</b>   |
| Latham's Snipe | <i>Gallinago hardwickii</i>            | nt                                     | Migratory Wetland Species               | A non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture. The assessed area will have once contained some suitable habitat; however there is limited connectivity to known locations, and the site has been heavily disturbed by grazing and clearing, and the creek channelised. No records within 20 km. <b>Likelihood: Unlikely to be present</b> |
| Musk Duck      | <i>Biziura lobata</i>                  | v                                      |   | Musk Ducks are found only in Australia. They range from north-west Western Australia, through the south and east to southern Queensland, and can be found several hundred kilometres inland in some areas. Musk Ducks tend to be found in deep freshwater lagoons, with dense reed beds. The assessed area will have once contained some suitable habitat; however there is limited connectivity to known locations, and the site has been heavily disturbed by grazing and clearing. The one sighting within 10 km of the assessed area was at Willowmavin in 1998. <b>Likelihood: Unlikely to be present</b>   |
| Osprey         | <i>Pandion haliaetus</i>               |  | Listed Marine Species                   | Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers. No suitable habitat occurs on the site. No sightings within 20 km of the site. <b>Likelihood: Highly unlikely to be present</b>  |

| Common Name             | Scientific name              | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|-------------------------|------------------------------|--|---|--|
| Pied Cormorant          | <i>Phalacrocorax varius</i>  | nt                                     |   | Found throughout mainland Australia. It is more common in the south and along the coast of south-western Australia and is not found in the driest parts of the interior. Found in marine habitats (almost exclusively so in Western Australia), including estuaries, harbors and bays. It is also found in mangroves and on large inland wetlands in eastern Australia. No suitable habitat occurs on the site. Two sightings within 10 km of the site, at Willowmavin in 1976 and 1978. <b>Likelihood: Unlikely to be present</b> |
| Pink-tailed Worm-lizard | <i>Aprasia parapulchella</i> | v                                      | V                                       | Occurs in intact high quality and undisturbed grassy woodlands and grasslands. No such habitat occurs on or near the subject site, and no recording of the species within 20 km. <b>Likelihood: Highly unlikely to be present</b>  |
| Plains-wanderer         | <i>Pedionomus torquatus</i>  | ce,L                                   | V                                       | Occurs in extensive quality riparian grasslands and plains woodlands, and adjacent agricultural land. Site is not suitable habitat, and not known within the region, and there are no records within 20 km. <b>Likelihood: Highly unlikely to be present</b>   |
| Powerful Owl            | <i>Ninox strenua</i>         | v, L                                   |   | Occurs in extensive and contiguous forests and woodlands. No such habitat occurs on or near the subject land. Two sightings at Willowmavin in 1979 and 2006. <b>Likelihood: Highly unlikely to be present</b>  |
| Rainbow Bee-eater       | <i>Merops ornatus</i>        |  | Migratory Terrestrial Species           | The Rainbow Bee-eater is most often found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels. Site is suitable habitat, but not recorded within 20 km. <b>Likelihood: Unlikely to be present</b>  |
| Regent Honeyeater       | <i>Anthochaera phrygia</i>   | e                                      | E                                       | Occurs in woodlands, and adjacent agricultural land. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and a significant disconnection to current known locations up to 120 km north. One sighting within 20 km; at Wandong in 1971. <b>Likelihood: Highly unlikely to be present</b>   |
| Rufous Fantail          | <i>Rhipidura rufifrons</i>   |  | Migratory Terrestrial Species           | The Rufous Fantail is found in rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade, and is often seen close to the ground. During migration, it may be found in more open habitats or urban areas. Site does not contain suitable habitat, there is a lack of connectivity to known locations, and there are no sightings within 20 km. <b>Likelihood: Unlikely to be present</b>  |

| Common Name      | Scientific name                   | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|------------------|-----------------------------------|--|---|--|
| Satin Flycatcher | <i>Myiagra cyanoleuca</i>         |  | Migratory Terrestrial Species           | The Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. It is not a commonly seen species, especially in the far south of its range, where it is a summer breeding migrant. The species is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. Site is not suitable habitat. <b>Likelihood: Highly unlikely to be present</b>  |
| Smoky Mouse      | <i>Pseudomys fumeus</i>           | e, L                                   | E                                       | The Smoky Mouse occurs in a variety of vegetation communities, ranging from coastal heath to dry ridgeline forest, sub-alpine heath and, occasionally, wetter gullies. Except for the wetter sites, a consistent feature of Smoky Mouse habitats is the diversity of heath and bush-pea species present, combined with potential shelter sites in the form of woody debris or rocks. Records for Victoria are in the Central Highlands, the Alps, and coastal SW and eastern Victoria. Site is not suitable habitat. No records within 20 km. <b>Likelihood: Not present</b>   |
| Southern Toadlet | <i>Pseudophryne semimarmorata</i> | v                                      |   | The Southern Toadlet is a small, short limbed species, and occurs mainly to the north, east and south-east of Melbourne. It is found in forested areas, where it hides under fallen timber, rocks, etc. in moist soaks and depressions. The assessed area may have once contained some suitable habitat; however there is limited connectivity to known locations, and the site has been heavily disturbed by grazing and clearing, and the creek channelised. There are several recordings of the species, all south east of the site between Wandong and Whittlesea, all prior to 1969. <b>Likelihood: Highly unlikely to be present</b> |
| Speckled Warbler | <i>Chthonicola sagittatus</i>     | v, L                                   |   | Patchy distribution on and inland of the Great Dividing Range, from level with Mackay in Queensland, to the Grampians National Park in Victoria. Lives in dry sclerophyll forests and woodlands dominated by eucalypts. It is mostly seen on the grassy ground layer, when it is foraging. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and there is limited connectivity to known locations. Four sightings within 10 km of the assessed areas, at Broadford or Willowmavin prior to 2000. <b>Likelihood: Unlikely to be present</b>                      |

| Common Name                | Scientific name               | Conservation Status (Vic) <sup>1</sup> | Conservation Status (Comm) <sup>2</sup> | Likelihood of Occurrence <sup>3</sup>  |
|----------------------------|-------------------------------|--|---|--|
| Square-tailed Kite         | <i>Lophoictinia isura</i>     | v, L                                   |   | The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. Found in a variety of timbered habitats including dry woodlands and open forests, and shows a particular preference for timbered watercourses. The site does contain some suitable habitat; however, there is limited connectivity to known locations. One sighting within 10 km; Broadford Golf Course in 2007. <b>Likelihood: Unlikely to be present</b>                                |
| Swift Parrot               | <i>Lathamus discolor</i>      | e, L                                   | E                                       | Occurs in extensive riparian forests and woodlands, and adjacent agricultural land. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and there is limited connectivity to known locations. No sightings within 20 km. <b>Likelihood: Unlikely to be present</b>  |
| White-bellied Sea-Eagle    | <i>Haliaeetus leucogaster</i> | v,L                                    | Migratory Terrestrial Species           | Occurs in extensive quality wetlands and riparian woodlands, and adjacent agricultural land. The site is not suitable habitat. No sightings within 20 km of the assessed. <b>Likelihood: Highly unlikely to be present</b>   |
| White-throated Needle-tail | <i>Hirundapus caudacutus</i>  | v,L                                    | Migratory Terrestrial Species           | Often occur in large numbers over eastern and northern Australia. Aerial birds and for a time it was commonly believed that they did not land while in Australia. Feeds on flying insects, such as termites, ants, beetles and flies, often over water. While sections of the site may have once been suitable habitat, the site has been heavily disturbed by grazing and clearing, and poor connectivity to known locations. One record of the species 10 km west of the site in 2006. <b>Likelihood: Unlikely to be present</b> |

1. X = extinct in Victoria; ce = critically endangered in Victoria; e = endangered in Victoria; v = vulnerable in Victoria; r = rare in Victoria; e = endangered in Victoria; n = near threatened in Victoria; L = listed under the FFG Act in Victoria (from DSE 2009 and 2013).
2. X = extinct nationally; E = endangered nationally; V = vulnerable nationally (DoE 2016);
3. Habitat descriptions for species obtained from DoE (2016), Hero *et al.* (1991), Menkhorst (1995), Cogger (1996) and Simpson and Day (1998).

## **APPENDIX E      MISCELLANEOUS IMAGE LIBRARY**

| Image number | Image Location <sup>1</sup> |                 | Image Direction | Comments           |
|--------------|-----------------------------|-----------------|-----------------|--------------------|
|              | <i>Easting</i>              | <i>Northing</i> |                 |                    |
| 657-659      | 316931                      | 5870312         | E/SE/S          | South Paddock Zone |
| 660-664      | 317045                      | 5870313         | E/SE/S/SW/W     | South Paddock Zone |
| 665-669      | 317037                      | 5870314         | W/NW/N/NE/E     | North Paddock Zone |
| 670-673      | 316871                      | 5870131         | N/NE/E/SE       | South Paddock Zone |
| 674-677      | 316884                      | 5870207         | N/NE/SE/S       | South Paddock Zone |
| 678-680      | 316908                      | 5870344         | N/NE/E/SE       | North Paddock Zone |
| 681-683      | 316933                      | 5870486         | E/SE/S          | North Paddock Zone |
| 684-688      | 317194                      | 5870460         | E/SE/S/SW/W     | North Paddock Zone |
| 689-691      | 317414                      | 5870436         | S/SW/W          | North Paddock Zone |
| 695-698      | 317400                      | 5870302         | S/SW/W/N        | South Paddock Zone |
| 699-702      | 317383                      | 5870158         | S/SW/W/NW       | South Paddock Zone |
| 703          | 317383                      | 5870086         | W               | House Paddock Zone |

1. Images are found on the CD on the inside rear cover according to image number.