135 O'HERNS ROAD, EPPING

VEGETATION ASSESSMENT

O'Herns Road Developments Pty Ltd

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Suite 5, 61–63 Camberwell Road, Hawthorn, VIC 3123
P.O. Box 337, Camberwell, VIC 3124
Ph. (03) 9815 2111
Fax. (03) 9815 2685

April 2016

Report No. 7145 (3.2)

CONTENTS

TABLES

FIGURES

APPENDICES

1. EXECUTIVE SUMMARY

Introduction

O'Herns Road Developments Pty engaged Brett Lane & Associates Pty. Ltd. (BL&A) to conduct a Flora and Fauna Impact Assessment for an approximately 30 hectare area of private land located at 135 O'Herns Road, Epping.

This investigation was commissioned to determine the extent and condition of native vegetation in the study area according to Victoria's *Biodiversity assessment guidelines* (DEPI 2013a) and to highlight any flora and fauna matters listed under the state *Flora and Fauna Guarantee Act 1988* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act*)*. This report provides a summary of the status of flora and fauna and associated requirements to satisfy planning requirements.

Results

BL&A conducted a Flora and Fauna Net Gain Assessment in September 2007, during which one patch of native remnant vegetation comprising 0.037 hectares of Stony Knoll Shrubland (EVC 649) was identified within the study area. The current assessment confirmed the presence of the patch (Habitat Zone C), and determined that an increase in the extent of the patch had occurred since the 2007 survey. A further thirteen patches of remnant native vegetation were also recorded during the current assessment. A breakdown of the ecological values recorded during the current assessment is provided below:

- Two native remnant patches of Stony Knoll Shrubland (EVC 53), equating to 0.26 hectares; and
- Twelve native remnant patches of Heavier Soils Plains Grassland (EVC 132_61), equating to 1.912 hectares.

No scattered trees were recorded within the study area.

No state or nationally listed flora or fauna species of conservation significance were detected during the 2007 field survey or current field survey.

In 2007 it was determined that no species of flora or vegetation communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are considered to potentially occur within the study area.

Impacts

The current development plan provided by the proponent indicates that 1.957 hectares (0.729 habitat hectares) of native remnant patch vegetation will be removed by the proposal. The current proposal is also predicted to have a proportional impact on important habitat for a threatened flora species, Matted Flax-lily (0.006%).

The Department of Environment, Land, Water and Planning (DELWP) provided a Biodiversity impact and offset requirements report that lists the offset requirements. This report is attached in Appendix 6.

Any proposed removal of this native vegetation would require a permit from the local planning authority. Approved native vegetation removal would attract an Offset obligation according to Victoria's *Biodiversity assessment guidelines* (DEPI 2013), the guidelines.

Implications

The current proposal will trigger a referral to DELWP due to the proposed removal of more than 0.5 hectares of native vegetation.

The proposal is assessed under the *high* risk-based pathway under Victoria's *Biodiversity assessment guidelines* as more than one hectare of native vegetation would be removed.

Offsets required to compensate for the proposed removal of native vegetation from the study area are listed below.

- 0.002 general biodiversity equivalence units (GBEU's) with a minimum strategic biodiversity score of 0.233 within the Port Phillip and Westernport Catchment Management Authority area OR the council of Whittlesea; and
- 1.095 specific biodiversity equivalence units for Matted Flax Lily.

A Biodiversity Impact and Offset Requirements report from DELWP is required to support applications for permits to remove native vegetation under clause 52.16 or 52.17 of planning schemes in Victoria and is attached in Appendix 7.

Under the Guidelines *all* offsets must be secured prior to the removal of native vegetation.

Offsite offsets can be identified through a native vegetation broker. However, specific offsets are proving difficult to obtain resulting in delays in obtaining planning permits.

Based on the relevant guidelines, the proposed development is unlikely to result in a significant impact on EPBC Act listed values covered by this investigation. As such, no Referral under the EPBC Act is required.

There are no implications under the FFG Act in relation to the proposed development.

2. INTRODUCTION

O'Herns Road Developments Pty engaged Brett Lane & Associates Pty. Ltd. (BL&A) to conduct a Flora and Fauna Impact Assessment for an approximately 30 hectare area of private land located at 135 O'Herns Road, Epping.

This investigation was commissioned to determine the extent and condition of native vegetation in the study area according to Victoria's *Biodiversity assessment guidelines* (DEPI 2013a) and to highlight any flora and fauna matters listed under the state *Flora and Fauna Guarantee Act 1988* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act*)*. This report provides a summary of the status of flora and fauna and associated requirements to satisfy planning requirements.

Specifically, the scope of the investigation included:

- A site survey involving:
    - Characterisation and mapping of remnant native vegetation on the site;
    - Vegetation Quality (Habitat Hectare) Assessment; and
    - Assessment of the impacts of a proposed development layout.
- Preparation of a map showing the results of the assessment.

This report is divided into the following sections:

Section 3 describes the sources of information, including the methods used for the field survey.

Section 4 provides the legislative background including details of all relevant Commonwealth, State and local legislation and policies.

Section 5 presents the assessment results, including details of the native vegetation, flora and fauna of the study area.

Section 6 discusses the proposed impacts of the project and details the implications of the findings under the relevant legislation and policy.

This investigation was undertaken by a team from BL&A, comprising Verity Fyfe (Botanist), Davide Coppolino (Senior Ecologist), Curtis Doughty (Zoologist), Bernard O'Callaghan (Senior Ecologist) and Brett Lane (Principal Consultant).

3. SOURCES OF INFORMATION

3.1. Existing information

Existing information used for this investigation is described below. Note that 'study area' refers to the parcel of private land located at 135 O'Herns Road, Epping.

3.1.1. Existing reporting and documentation

The reports, planning scheme and/or development plans below, relating to the study area were reviewed.

- Planning Property Report (DELWP)
- Whittlesea Planning Scheme
- Development Plan (Goodison & Associates)
- Flora and Fauna Net Gain Assessment Report 7145 (2.2) (BL&A 2008)

3.1.2. Location and extent risk

The likely risk-based pathway for assessment of any proposed vegetation removal relies on the 'location risk' and 'extent risk' determined with the assistance of the online Native Vegetation Information Management system (NVIM) administered by the Department of Environment, Land Water and Planning (DELWP 2014a).

NVIM online mapping was viewed to determine the mapped location risk of the study area and to gain a preliminary indication of the extent risk, described in Section 4.1.2.

3.1.3. Native vegetation

Pre-1750 (pre-European settlement) vegetation mapping administered by DELWP was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Victorian Volcanic Plain bioregion[1] (DELWP 2014b); and
- Biodiversity Interactive Maps (DELWP 2014c).

3.1.4. Listed matters

Existing flora and fauna species records and information about the potential occurrence of listed matters was obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the approximate centre point of the study area (coordinates: latitude 37˚ 38' 23" S and longitude 145˚ 00' 31" E).

The online *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (Department of the Environment 2016) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

[1] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

3.2. Field methodology

Field assessments for the current investigation were conducted on the 8th, 11th and 15th of March 2015. During this assessment, the study area was surveyed on foot. The initial survey was conducted with the intention of re-assessing the patch of Stony Knoll Shrubland (EVC 649) recorded during 2007. Upon comparing the previous and current extent of this patch, further assessments were deemed necessary to determine the presence of native vegetation within the study area.

Sites in the study area found to support native vegetation or the potential to support listed matters were mapped. Mapping was undertaken through a combination of aerial photograph interpretation and ground-truthing using a hand held GPS (accurate to approximately five metres).

3.2.1. Native vegetation

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. The *Biodiversity assessment guidelines* define native vegetation as belonging to two categories (DEPI 2013):

- Remnant patch; or
- Scattered trees.

The definitions of these categories are provided below, along with the prescribed DELWP methods to assess them.

Remnant patch

A remnant patch of native vegetation is either:

- An area of native vegetation where at least 25 per cent of the total perennial understorey plant cover is native; and/or
- Any area with three or more native canopy trees[2] where the canopy foliage cover[3] is at least 20 per cent of the area.

Remnant patch condition is assessed using the habitat hectare method (Parkes *et al*. 2003; DSE 2004) whereby components of native vegetation (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The NVIM system (DELWP 2014a) provides modelled condition scores for native vegetation to be used in certain circumstances (Section 4.1.2). All wetlands mapped on DELWP's native vegetation layer are treated as a remnant patch.

The condition score assists in defining the biodiversity equivalence score (described in Section 4.1.2) of the native vegetation and the offset targets if removal of native vegetation is approved.

[2] A canopy tree is a reproductively mature tree that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.
[3] Foliage cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above.

Scattered trees

The *Biodiversity assessment guidelines* define scattered trees as a native canopy tree[2] that does not form part of a remnant patch of native vegetation.

Scattered trees are counted, the species identified and their DBH (diameter at breast height or 1.3 metres above ground) measured or estimated.

3.2.2. Flora species and habitats

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation, described above. Specimens requiring identification using laboratory techniques were collected.

The potential for habitats to support listed flora species was assessed based on the criteria outlined below:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and
- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

3.2.3. Fauna species and habitats

During the 2007 assessment, a list of the fauna of the area was obtained from the Viridans Atlas of Victorian Wildlife (AVW), a public database held by the Department of Sustainability and Environment, also known as the Victorian Fauna Database (VFD). The list includes all vertebrate fauna species, including rare and threatened species, found in a search area within a radius of ten kilometres of the study area with approximate centre point coordinates: latitude 37˚ 38' 23" S and longitude 145˚ 00' 31" E.

Information on the likelihood of suitable habitat on the site for nationally threatened fauna species and ecological communities was obtained through the *Environment Protection and Biodiversity Conservation Act 1999* Protected Matters Search Tool (DEWR 2007 and DELWP 2016). An area within a 10 kilometre radius of the site was searched using the abovementioned search region.

Fauna taxonomy used throughout this report follows the VFD standards.

3.2.4. Threatened ecological communities

The study area was assessed against identification criteria and condition thresholds for relevant listed ecological communities found to potentially occur in the study area.

3.3. Limitations of field assessment

Whilst this assessment was not designed to provide an exhaustive inventory of flora and fauna species in the study area, all efforts were made to schedule the site assessment at a time of year when the majority of native vegetation life forms and habitat niches are likely to be present. Nevertheless, site assessments may fail to record all life-forms because of the seasonal absence of some species and sampling nature of surveys.

The current site assessments were carried out in early autumn, when some annual and/or seasonally-emergent plant species may have been absent or in the senescent or pre-flowering stage of their life-cycle. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and condition of native vegetation and fauna habitats.

Wherever appropriate, a precautionary approach was adopted in the discussion of implications for matters listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Victorian *Flora and Fauna Guarantee Act 1988*. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat. The implications under legislation and policy are considered accordingly.

4. LEGISLATIVE BACKGROUND

4.1. Planning and Environment Act 1987

Victoria's planning schemes are constituted under the *Planning and Environment Act 1987*. This section discusses planning provisions in the local planning scheme applicable to flora and fauna.

4.1.1. Local provisions

Local Planning Policy Frameworks

No local planning policy frameworks are relevant to this investigation.

Overlays

No overlays relevant to this investigation cover the study area. Surrounding land mainly supports farming, industrial, transport and residential land uses.

4.1.2. State provisions

Destruction, lopping or removal of native vegetation on land which, together with all contiguous land in one ownership, has an area of 0.4 hectares or more requires a planning permit under Clause 52.17 of all Victorian Planning Schemes. This includes the removal of dead trees with a DBH (diameter at breast height or 1.3 metres) of 40 centimetres or more and any individual scattered native plants.

Before issuing a planning permit, Responsible Authorities are obligated to refer to Clause 12.01 (Biodiversity) in the Planning Scheme. This refers in turn to the incorporated document *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI 2013).

Guidelines objective

As set out in *Permitted clearing of native vegetation – Biodiversity assessment guidelines* ('the Guidelines') the objective for permitted clearing of native vegetation in Victoria is 'No net loss in the contribution made by native vegetation to Victoria's biodiversity'. The key strategies for ensuring this outcome when considering an application to remove native vegetation are:

- Avoiding the removal of native vegetation that makes a significant contribution to Victoria's biodiversity;
- Minimising impacts on Victoria's biodiversity from the removal of native vegetation; and
- Where native vegetation is permitted to be removed, ensuring it is offset in a manner that makes an equivalent contribution to Victoria's biodiversity made by the native vegetation to be removed.

If native vegetation does not meet the definition of either a remnant patch or scattered trees, the requirements of the Guidelines do not apply.

Risk-based assessment pathways

The first step in determining the type of assessment required for any site in Victoria is to determine the risk to biodiversity associated with the proposed native vegetation removal

and therefore the risk-based assessment pathway for the proposed native vegetation removal. There are three risk-based pathways for assessing an application to remove native vegetation, below.

- Low risk
- Moderate risk
- High risk

This risk-based assessment pathway is determined by two factors, outlined below.

Extent risk – the area in hectares proposed to be removed *or* the number of scattered trees. *Note:* extent risk also includes any native vegetation clearing for which permission has been granted in the last five years.

Location risk – the likelihood that removing native vegetation in a location will have an impact on the persistence of a rare or threatened species classified into three categories: Location A, Location B and Location C.

The risk-based pathway for assessing an application to remove native vegetation is determined by the following matrices for remnant patches and scattered trees:

Extent (remnant patches)	Location A	Location B	Location C
< 0.5 hectares	Low	Low	High
≥ 0.5 hectares and < 1 hectare	Low	Moderate	High
≥ 1 hectare	Moderate	High	High
Extent (scattered trees)	**Location A**	**Location B**	**Location C**
< 15 scattered trees	Low	Moderate	High
≥ 15 scattered trees	Moderate	High	High

All native vegetation within any subdivision plot of less than 0.4 hectares is deemed to be lost; For applications with combined removal of both remnant patch and scattered trees, the extent of the scattered trees is converted to an area by assigning a standard area of 0.071 hectares per tree – the total extent is then used to determine the risk-based pathway.

The presence of any Location B or Location C risk categories within an area of proposed native vegetation removal means this whole area of removal is considered to belong to that category for the purpose of determining the risk-based assessment pathway.

The assessment process, decision guidelines and offset requirements for approved native vegetation removal are summarised in Appendix 1.

DELWP referral criteria

Clause 66.02 of the planning scheme determines the role of DELWP in the assessment of native vegetation removal permit applications. If an application is referred, DELWP may make certain recommendations to the responsible authority in relation to the permit application. An application to remove native vegetation must be referred to DELWP in the following circumstances:

- Applications where the native vegetation to be removed is 0.5 hectares or more (this does not apply to removal of scattered trees only);
- All applications in the high risk-based pathway;

- Applications where a property vegetation plan applies to the site; and
- Applications on Crown land which is occupied or managed by the responsible authority.

Summary of the assessment process

The assessment process, decision guidelines and offset requirements for approved native vegetation removal are outlined in Appendix 1.

4.2. EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species or communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a 'controlled action' under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

4.3. FFG Act

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) lists threatened and protected species and ecological communities (DELWP 2013, DELWP 2014d). Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Protected Flora Permit under the Act, obtained from DELWP.

The FFG Act only applies to private land in relation to the commercial collection of grasstrees, tree-ferns and sphagnum moss.

4.4. EE Act

The "Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978"* (DSE 2006), identifies the following criteria related to flora and fauna which assist in determining whether a Referral to the State Minister for Planning is required:

- Potential clearing of ten hectares or more of native vegetation from an area that is of an EVC identified as endangered by the Department of Environment, Land, Water and Planning (DELWP 2014b);
- Potential long-term loss of a significant proportion (1 to 5% depending upon conservation status of species concerned) of known remaining habitat or population of a threatened species in Victoria;
- Potential long-term change to a wetland's ecological character, where that wetland is Ramsar listed, or listed in 'A Directory of Important Wetlands in Australia';
- Potential major effects upon the biodiversity of aquatic ecosystems over the long term;
- Potential significant effects on matters listed under the *Flora and Fauna Guarantee Act 1988*.

One or a combination of these criteria may trigger a requirement for a Referral to the Victorian Minister for Planning who will determine if an EES is required.

5. ASSESSMENT RESULTS

5.1. Site assessment

5.1.1. Site description

The study area for this investigation was approximately 30 hectares of private land located at 135 O'Herns Road, Epping, in Melbourne's outer north. It is bordered by O'Herns Road to the north and farmland (accessed via O'Herns Road and Cooper Street) to the south, east and west.

The study area was composed of heavy basaltic clay soils with frequent stony outcrops on a flat landscape. One stony knoll was observed near the study areas eastern boundary midpoint (see Figure 1).

The northern extremity of the study area included remains of a dwelling and introduced gardens. Planted trees such as Sugar Gum, Peppercorn and Radiata Pine were scattered around the dwelling. Understorey vegetation was comprised exclusively of common pastoral weeds in this portion of the study area. Dry-stone walls that bordered and partitioned the study area supported a few exotic shrubs such as African Boxthorn, Montpellier Broom and Briar Rose. The majority of the study area was dominated by the following exotic species: Paterson's Curse, Indian Mustard, Ribwort, Artichoke Thistle, Blackberry, Canary-grass and Chilean Needle-grass. Isolated native plants such as Wiry Dock, Wattle Mat-rush and Common Woodruff were also observed.

All other native vegetation was restricted to the recorded patches of native remnant vegetation. Stony Knoll vegetation was characterised by Hedge Wattle, Kangaroo-grass, Weeping Grass, Wattle Mat-rush, Common Rice-flower, Curved Rice-flower and Yellow Rush-lily. No native trees or shrubs were recorded in areas outside of the stony knoll. The majority of native vegetation occurring as grassland was located in the southwest of the study area. This native vegetation was dominated by a mixture of native grasses such as Spear-grass, Common Wheat-grass, Kangaroo Grass and Weeping Grass. Less common indigenous species included Rushes (*Juncus* spp.), Wattle Mat-rush, Common Tussock-grass, Grassland Wood-sorrel and Common Grass-sedge.

At the time of the initial survey in 2007, most of the study area was being grazed by livestock and the northern extremity included an occupied dwelling with associated sheds and introduced gardens.

The study area falls under the jurisdiction of the Port Philip and Westernport Catchment Management Authority (PPWP CMA) and lies within the Victorian Volcanic Plain bioregion. It is currently zoned Comprehensive Development Zone – Schedule 2 (CDZ2) and is part of the Cooper Street Employment Area. No overlays relevant to this investigation cover the study area. Surrounding land mainly supports farming, industrial, transport and residential land uses.

5.1.2. Remnant patches

Pre–European EVC mapping (DELWP 2014c) indicated that the study area and surrounds would have supported Heavier Soils Plains Grassland (EVC 132_61), Creekline Grassy Woodland (EVC 68) and Plains Grassy Woodland (EVC 55) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition, soil characteristics and topography suggested that Stony Knoll Shrubland (EVC 649) and Heavier Soils Plains Grassland (132_61) were present within the central and south-western sections of the study area (Figure 1).

No native trees (scattered or within habitat zones) were recorded during the current survey.

Stony Knoll Shrubland (EVC 649) is described in the published benchmark as "shrubland to 3 m tall or low non-eucalypt woodland to 8 m tall with a grassy understorey. It occurs on low stony rises on basalt flows. The soils are fertile and well drained but shallow with out cropping rock, causing severe summer dryness." (Appendix 5).

Heavier Soils Plains Grassland (EVC 132_61) is described in the published benchmark as "treeless vegetation mostly less than 1 m tall dominated by largely graminoid and herb life forms. Occupies fertile cracking basalt soils prone to seasonal waterlogging in areas receiving at least 500 mm annual rainfall." (Appendix 5).

Thirteen remnant patches (referred to herein as habitat zones) comprising the abovementioned EVCs were identified in the study area (Table 1).

Table 1: Description of habitat zones in the study area

Habitat Zone	EVC	Description
A, B	Heavier Soils Plains Grassland (EVC 132_61)	Heavily modified and degraded patches dominated by native Rush (*Juncus* spp.), with Spear-grass occurring on edges. Very poor native species diversity. Weed cover 10%, comprising 50% high threat species. Bare ground 20%, due to soil disturbance and lack of recruitment by native species.
C (comprising two patches)	Stony Knoll Shrubland (EVC 649)	Sparse shrubby layer dominated by Hedge Wattle. Patchy native understorey of Kangaroo Grass, Weeping Grass and Common Wheat-grass. Other indigenous elements included Wattle Mat-rush, Common Rice-flower, Curved Rice-flower and Yellow Rush-lily. Weed cover moderate-high, comprising 50% high threat species. Bare ground approximately 25%.
D	Heavier Soils Plains Grassland (EVC 132_61)	Similar to habitat zones A and B, though slightly better native species diversity due to presence of Wallaby-grass and Common Tussock-grass.

Habitat Zone	EVC	Description
E, F	Heavier Soils Plains Grassland (EVC 132_61)	Similar to habitat zones A and B, though with 40% bare ground cover.
G	Heavier Soils Plains Grassland (EVC 132_61)	Similar to habitat zones A and B, though with 30% bare ground cover.
H	Heavier Soils Plains Grassland (EVC 132_61)	Dominated by Spear-grass, followed by native Rush (*Juncus* spp.) and scattered Common Grass-sedge. Weed cover 10%, comprising up to 50% high threat species. Bare ground cover 30%.
I	Heavier Soils Plains Grassland (EVC 132_61)	A thin linear patch dominated by Spear-grass. Common Wheat-grass thinly scattered. Native Rush and Common Grass-sedge present in low abundance. Weed cover and bare ground cover 10%.
J	Heavier Soils Plains Grassland (EVC 132_61)	Dominated by Spear-grass followed by Kangaroo Grass and Common Wheat-grass. Common grass-sedge and Common Wood-sorrel also present in moderate abundance. Weed cover 10%, comprising up to 50% high threat species. Bare ground cover 10%.
K	Heavier Soils Plains Grassland (EVC 132_61)	Similar to habitat zone J though less native grass cover and a higher weed cover of 15%.
L	Heavier Soils Plains Grassland (EVC 132_61)	Dominated by Spear-grass, followed by Kangaroo Grass and Common Wheat-grass. Weed cover 10%, comprising <50% high threat species. Bare ground cover 35%.
M	Heavier Soils Plains Grassland (EVC 132_61)	A thin linear patch dominated by Spear-grass. Common Tussock-grass and Common Grass-sedge present in low abundance. Weed cover and bare ground 10%.

The habitat hectare assessment results for these habitat zones are provided in Table 2. More detailed habitat scoring results are presented in Appendix 2.

Table 2: Summary of habitat hectare assessment results

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)
A	Heavier Soils Plains Grassland (132_61)	0.020	33
B	Heavier Soils Plains Grassland (132_61)	0.051	33
C	Stony Knoll Shrubland (649)	0.26	28
D	Heavier Soils Plains Grassland (132_61)	0.174	33
E	Heavier Soils Plains Grassland (132_61)	0.014	37
F	Heavier Soils Plains Grassland (132_61)	0.013	37
G	Heavier Soils Plains Grassland (132_61)	0.016	34
H	Heavier Soils Plains Grassland (132_61)	0.013	37
I	Heavier Soils Plains Grassland (132_61)	0.024	33
J	Heavier Soils Plains Grassland (132_61)	0.410	33
K	Heavier Soils Plains Grassland (132_61)	0.858	40
L	Heavier Soils Plains Grassland (132_61)	0.239	44
M	Heavier Soils Plains Grassland (132_61)	0.080	33
Total		2.172	

Legend

- Study area
- Native vegetation to be removed

Native Vegetation

EVC

- Heavier Soils Plains Grassland - 132_61
- Stony Knoll Shrubland - 649

Metres

0 50 100 200

Figure 1: Study area and native vegetation to be removed

Project: O'Herns Subdivision

Client: O'Herns Road Developments Pty

Project No.: 7145.2	Date: 24/03/2016	Created By: N. May / V. Fyfe

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road
Hawthorn East ,VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

5.1.3. Scattered trees

Scattered trees recorded in the study area would have once comprised the canopy component of Creekline Grassy Woodland (EVC 68) and Plains Grassy Woodland (EVC 55). No scattered trees were recorded in the study area.

5.1.4. Flora species

During the habitat hectare assessments 26 plant species were recorded. Of these, 16 (61%) were indigenous and 10 (39%) were introduced or non-indigenous native in origin (Appendix 4).

In 2007 Flora Information System records and the EPBC Protected Matters Search Tool indicated that within the 10 kilometre search region there are records of, or there occurs potential habitat for, 42 flora species listed as having national or state conservation significance. A current EPBC Protected Matters Search Tool search did not result in the listing of any additional species. No nationally and/or state listed flora species of conservation significance were detected during the 2007 or current field survey.

The likelihood of occurrence in the study area of species listed under the FFG Act or EPBC Act is addressed in the Flora, Fauna and Net Gain Assessment Report (BL&A 2007). No species were considered likely to occur. The species covered are either known to occur in the broader search region or suitable habitat has been identified in the broader search region by the Protected Matters Search Tool (DEWR 2007 and DELWP 2016).

5.1.5. Fauna habitats

Three main habitat types were recorded during the current investigation at the study area, they include:

- Stony Knoll Shrubland;
- Exotic Pasture/Native Grassland; and
- Scattered non-indigenous trees.

Stony Knoll Shrubland

The majority of the study area appears to have been cultivated as part of past management practices and is now dominated by exotic pasture grasses. However, there was one area of rocky outcrop that had not been cultivated due to the difficulty in cultivating such terrain. This rocky outcrop area contained remnant native vegetation throughout.

The scattered surface and embedded rocks would provide shelter for small mammals, reptiles and frogs. Horses have heavily grazed this area and further degraded the land. The Stony Knoll Shrubland was small in size and was not connected to other native vegetation patches in the region. Overall the rocky native pasture habitat type is considered to be low habitat quality.

Exotic pasture/Native Grassland

The majority of the study area had been cleared of its original vegetative condition and was dominated by exotic pasture grasses. Trees, shrubs and rocks had been removed from these areas possibly to encourage higher grass yields or for cropping. Removing trees, shrubs and rocks also removes habitat for native fauna.

The exotic pasture provided habitat for common occurring farmland fauna. Overall this habitat type is considered to be low quality for fauna. Native grassland provided moderate quality habitat for fauna, due to the availability of tussock grasses.

Scattered non-indigenous trees

Sugar Gums and cypress trees had been planted around the homestead and other non-indigenous trees and shrubs were scattered about the property. These trees provided habitat for birds and small mammals. Due to the isolated state of this habitat, it is considered to be low quality for fauna.

5.1.6. Fauna species

Based on the field assessment and the review of existing information conducted in 2007, the study area is known or likely to support 106 species of vertebrate fauna, including 13 species of mammal (seven introduced), 73 species of bird (10 introduced), 13 species of reptile and eight species of frog. These species are addressed in the Flora, Fauna and Net Gain Assessment Report (BL&A 2007).

The Victorian Fauna Database (VFD) and the EPBC Act Protected Matters Search Tool contained a total of 24 species listed under the EPBC Act, an additional 26 listed under the FFG Act, and a further 25 listed by DSE as threatened (DSE 2003). The EPBC Act listed species include four species of mammal, 16 species of bird (including species

listed as migratory and marine), one species of frog, two species of reptile and one species of invertebrate.

The majority of these threatened species are unlikely to occur on the study area due to a lack of suitable or extensive habitat to support any significant populations.

These species are addressed in the Flora, Fauna and Net Gain Assessment Report (BL&A 2008, see Appendix 7).

6. IMPACTS AND REGULATORY IMPLICATIONS

6.1. Proposed development

The proposed development will involve subdivision of the subject land for commercial and industrial development.

The extent of the area of impact for the current proposal was determined using a GIS analysis and included the outer-most boundaries of the Development Plan provided by Goodison & Associates.

6.2. Impacts of proposed development

Impacts have been identified for the proposed development. These impacts on ecological values are outlined below and shown in Figure 1.

- The removal of 1.957 hectares of native remnant patch vegetation from thirteen habitat zones; and
- A proportional impact of 0.006% on Matted Flax-lily.

6.3. Implications for the proposed development

6.3.1. Local Provisions

Planning Policy Frameworks

There are no planning policy frameworks that are relevant to this investigation.

Overlays

There are no overlays that are relevant to this investigation.

State provisions

A planning permit under Clause 52.17 of the Whittlesea Planning Scheme is required for the removal of native vegetation.

The current proposal would trigger a referral to DELWP as it meets the criteria specified in Section 4.1.2.

Risk–based assessment pathway

Location risk

The study area contained mapped areas of the following *location risk* category:

- Location Risk B – covering the entire study area.

Extent risk

Early indications provided by the proponent are that at least 1.957 hectares of native vegetation will be impacted by the proposal. It is understood that no native vegetation has been approved for removal on the property within the last five years.

Risk-based assessment pathway

Based on the criteria outlined in Section 4.1.2 the Guidelines stipulate that the proposal will be assessed under the high risk assessment pathway and that both general and specific offsets apply to any approved native vegetation removal.

The current proposal would trigger a referral to DELWP as it meets the criteria specified in Section 4.1.2.

Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from habitat zones have been determined using site-based habitat hectare scores and the EnSym Tool via DELWP (Appendix 6). These are presented below.

- 0.002 *general* biodiversity equivalence units
- 1.095 *specific* biodiversity equivalence units for Matted Flax-lily

Offsets must be located within the Port Phillip and Westernport Catchment Management Authority area or the Whittlesea Council area and must have a minimum strategic biodiversity score of 0.233. Under the Guidelines *all* offsets must be secured prior to the removal of native vegetation.

Offsets cannot occur within 150 metres of any dwellings and associated buildings on the subject land or adjoining properties covered by a BMO or within 50 metres of these structures on all other land.

The offset targets for the current proposal cannot be achieved within the study area given the above requirements.

6.3.2. EPBC Act

Based on the relevant guidelines, and the 2007 surveys the proposed development is unlikely to result in a significant impact on EPBC Act listed values presented in the Fauna and Net Gain Assessment Report (BL&A 2007).

6.3.3. FFG Act

No FFG Act values listed as threatened or protected are susceptible to impacts from the proposed development, as the study area occurs on private land.

6.3.4. EE Act

A Referral to the state Minister for Planning is unlikely to be required under the EE Act for the aspects covered by the current investigation.

6.4. Recommendations for mitigation

Best-practice development and construction recommendations are provided in Appendix 4. These should be considered to ensure impacts are minimised to flora and/or fauna, and native vegetation.

7. REFERENCES

Brett Lane and Associates (BL&A), Flora and Fauna Net Gain Assessment Report 7145 (2.2) (BL&A 2008)

Department of Environment, Land, Water and Planning 2014a, *Native Vegetation Information Management system*, Department of Environment, Land, Water and Planning (then DEPI), East Melbourne, Victoria, viewed 11th March 2016, <http://www.depi.vic.gov.au>

Department of Environment, Land, Water and Planning 2014b, *Ecological Vegetation Class (EVC) Benchmarks by Bioregion*, Department of Environment, Land, Water and Planning (then DSE), East Melbourne, Victoria, viewed 2nd March 2016, <http://www.depi.vic.gov.au>.

Department of Environment, Land, Water and Planning 2014c, *Biodiversity Interactive Map 2.0*. Department of Environment, Land, Water and Planning (then DSE), East Melbourne, Victoria, viewed 2nd March 2016, <http://www.depi.vic.gov.au>.

Department of Environment and Primary Industries 2013, *Permitted clearing of native vegetation: Biodiversity assessment guidelines* (dated September 2013), Department of Environment and Primary Industries, East Melbourne, Victoria.

Department of Environment and Primary Industries 2014, *Permitted Clearing of Native Vegetation, Biodiversity Assessment Handbook, Version 0.2*, Department of Environment and Primary Industries, East Melbourne, Victoria.

Department of Sustainability and Environment 2004, *Native Vegetation: sustaining a living landscape, Vegetation Quality Assessment Manual – guidelines for applying the Habitat Hectare scoring method (Version 1.3)*. Department of Sustainability and Environment, East Melbourne, Victoria.

Department of Sustainability and Environment 2006, *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978,* Department of Sustainability and Environment, East Melbourne, Victoria.

Department of Sustainability and Environment 2010, *Native Vegetation – Technical information sheet: Degraded treeless vegetation, Best and remaining habitat determinations, Tree protection/retention requirements*, Department of Sustainability and Environment, East Melbourne, Victoria.

Department of the Environment 2014, *EPBC Act Protected Matters Search Tool*. Department of the Environment, Canberra, viewed 23rd March 2016, <http://www.environment.gov.au >

Environment Protection Authority Victoria 1991, *Construction Techniques for Sediment Pollution Control*, Environment Protection Agency Victoria, Carlton.

Parkes, D, Newell, G, & Cheal, D 2003, 'Assessing the Quality of Native Vegetation: The 'habitat hectares' approach'. *Ecological Management and Restoration*, vol. 4, supplement, pp. 29-38.

Appendix 1: Summary of the assessment and offset requirements under the Guidelines

Risk-based pathway	Assessment quantum inputs	Decision guidelines	Offset requirements
Low	▪ Habitat hectares* (NVIM) ▪ Strategic biodiversity score (NVIM) ▪ General biodiversity equivalence score	An application for removal cannot be refused on biodiversity grounds (unless it is not in accordance with any property vegetation plan that applies to the site). *Note: this guideline also applies to native vegetation that does not meet the definition of either a remnant patch or scattered trees.*	General offset applies: ▪ General offset = general biodiversity equivalence score (clearing site) x 1.5 ▪ Offset must be located in the same CMA^ or Local Government Area as the removal ▪ Offset must have a strategic biodiversity score at least 80% of the native vegetation removed ▪ Offset must be secured before the removal of native vegetation
Moderate	▪ Habitat hectares* (site assessment) ▪ Strategic biodiversity score (NVIM) ▪ Habitat importance scores for each Victorian rare and threatened species ▪ Specific biodiversity equivalence score for each rare and threatened species *OR* ▪ *General* biodiversity equivalence score if no habitat importance scores apply	The responsible authority will consider: ▪ The strategic biodiversity score and habitat importance score of the native vegetation proposed to be removed ▪ Any property vegetation plan that applies to the site ▪ Whether reasonable steps have been taken to ensure that impacts of the proposed removal of native vegetation on biodiversity have been minimised with regard to the contribution to biodiversity made by the native vegetation to be removed and the native vegetation to be retained ▪ Whether an offset has been identified that meets the requirements ▪ The need to remove native vegetation to create defendable space to reduce the risk of bushfire	If the specific biodiversity equivalence scores for any rare and threatened species fails the specific-general offset test, then a general offset applies (as above) Otherwise, a specific offset applies for <u>each</u> rare and threatened species: ▪ Specific offset = specific biodiversity equivalence score (clearing site) x 2 ▪ Offset must be located in the same species habitat anywhere in Victoria as determined by DELWP habitat importance mapping ▪ When a specific offset is required for multiple species, the offset site must satisfy the specific offset requirements for all of these species or multiple offset sites may be used ▪ Offset must be secured before the removal of native vegetation
High		In addition to the considerations for the moderate pathway (above) the responsible authority will determine whether the native vegetation to be removed makes a significant contribution to Victoria's biodiversity. This includes considering: ▪ Impacts on important habitat for rare or threatened species, particularly highly localised habitat ▪ Proportional impacts on remaining habitat for rare or threatened species ▪ If the removal of the native vegetation will contribute to a cumulative impact that is a significant threat to the persistence of a rare or threatened species ▪ The availability of, and potential for, gain from offsets	

*** Habitat hectares = condition score (out of 1) x extent (hectares)**

^ Catchment Management Authority

Note: All applications must provide information about the vegetation to be removed such as location and address of the property, description of the vegetation, maps and recent dated photographs

Appendix 2: Detailed habitat hectare assessment results

Habitat Zone			A	B	C	D	E	F	G	H	I	J	K	L	M
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			132_61	132_61	649	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61
Total area of Habitat Zone (ha)			0.020	0.051	0.260	0.174	0.014	0.013	0.016	0.013	0.024	0.410	0.858	0.239	0.080
Site Condition	Large Old Trees	/10	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tree Canopy Cover	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lack of Weeds	/15	9	9	-	9	9	9	9	9	9	9	9	9	9
	Understorey	/25	5	5	-	5	5	5	5	5	5	5	10	10	5
	Recruitment	/10	3	3	-	3	6	6	6	6	3	3	3	6	3
	Organic Matter	/5	5	5	-	5	5	5	3	5	5	5	5	5	5
	Logs	/5	0	0	-	0	0	0	0	0	0	0	0	0	0
	Site condition standardising multiplier*		1.36	1.36	-	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*30*	*30*	-	*30*	*34*	*34*	*31*	*34*	*30*	*30*	*37*	*41*	*30*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	1	1	1	1	1	1	1	1	1	1	1	1	1
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**33**	**33**	**28**	**33**	**37**	**37**	**34**	**37**	**33**	**33**	**40**	**44**	**33**
Condition score out of 1			0.33	0.33	0.28	0.33	0.37	0.37	0.34	0.37	0.33	0.33	0.40	0.44	0.33
Habitat Hectares in Habitat Zone#			**0.007**	**0.017**	**0.073**	**0.057**	**0.005**	**0.005**	**0.005**	**0.005**	**0.008**	**0.135**	**0.343**	**0.105**	**0.026**
Area of Habitat Zone to be removed (ha)			0.021	0.051	0.040	0.175	0.014	0.014	0.017	0.014	0.024	0.411	0.859	0.239	0.080
Habitat Hectares to be removed#			**0.007**	**0.017**	**0.011**	**0.058**	**0.005**	**0.005**	**0.006**	**0.005**	**0.008**	**0.136**	**0.344**	**0.105**	**0.026**

Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Appendix 3: Photographs of native vegetation proposed for removal

Stony Knoll Shrubland- HZ C

Modified Plains Grassland- HZ B

Plains Grassland- HZ K (co-dominated by Spear-grass and Kangaroo Grass)

Plains Grassland- HZ J (this section is dominated by Spear-grass)

Plains Grassland- HZ J
(this section comprises Kangaroo Grass, Spear-grass and Common Grass-sedge)

Appendix 4: General development recommendations

Consideration should be given to including the measures described below in a construction and operational environmental management plan for the project.

- In accordance with the *Catchment and Land Protection Act 1994*, the noxious weed species listed below, which were recorded in the study area, must be controlled using precision methods that minimise off-target kills (e.g. spot spraying). This method of control will be implemented throughout the project.
  - Blackberry;
  - Sweet Briar;
  - African Boxthorn;
  - Montpellier Broom;
  - Prickly Pear:
  - Artichoke Thistle;
  - Spear Thistle;
  - Patterson's Curse;
  - Chilean Needle-grass; and
  - Serrated Tussock.
- Where feasible, development should be sited at least thirty metres away from rivers, creeks and significant drainage lines.
- The proposed development should be designed in a way that does not alter the site's hydrology in areas that support native vegetation or act as tributaries to rivers, creeks and significant drainage lines.
- Construction contractors should be inducted into an environmental management program for construction works.
- All environmental controls should be checked for compliance on a regular basis.

<u>Construction phase:</u>

- Environmentally sensitive areas including retained native vegetation should be securely fenced at two metres from the perimeter and appropriately signed. All machinery and earthworks are to be excluded from these areas.
- Any stockpiling should occur outside of environmentally sensitive areas.
- All machinery should enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread.
- All machinery brought on site should be weed and pathogen free. This is important for environmental and agricultural protection. Soil borne pathogens such as Cinnamon Fungus and livestock diseases can be easily transported by machinery.
- All machinery wash down, lay down and personnel rest areas should be defined (fenced) and located in disturbed areas.
- All works must be undertaken in a manner that will minimise soil erosion and adhere to Construction Techniques for Sediment Pollution Control (EPAV 1991).

Post-construction phase:

- Weed control, by an experienced bush regenerator, is to be carried out along disturbed areas after construction to control any weed outbreaks in bushland or wetland areas.
- A thirty metre buffer area along rivers, creeks and significant drainage lines should be revegetated with appropriate indigenous plants of local genetic provenance. This measure is aimed at minimising any potential long-term adverse impacts that the proposed development may have on the health and functionality of watercourses.
- The use of local indigenous plant species, of local genetic provenance, should be considered in the landscaping of any development on the site. Locally indigenous species generally have low water-use requirements, high survival rates and provide habitat to local fauna species. The site provides a reservoir for seed collection within native grassland and shrubland areas.

Appendix 5: EVC benchmarks

Stony Knoll Shrubland (EVC 649) –Victorian Volcanic Plains bioregion

Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 649: Stony Knoll Shrubland

Description:
Stony Knoll Shrubland is a shrubland to 3 m tall or low non-eucalypt woodland to 8 m tall with a grassy understorey. It occurs on low stony rises on basalt flows. The soils are fertile and well drained but shallow with out cropping rock, causing severe summer dryness.

[+] woodland only components (ignore when assessing treeless areas and standardise final score as appropriate)

Canopy Cover[+]:

%cover	Character Species	Common Name
15%	*Allocasuarina verticillata*	Drooping Sheoak
	Bursaria spinosa	Sweet Bursaria

Understorey:

Life form	#Spp	%Cover	LF code
Medium Shrub	3	10%	MS
Prostrate Shrub	1	1%	PS
Large Herb	2	1%	LH
Medium Herb	11	10%	MH
Small or Prostrate Herb	4	5%	SH
Medium to Small Tufted Graminoid	10	25%	MTG
Tiny Tufted Graminoid	2	5%	TTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Ground Fern	2	5%	GF
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C
Total understorey projective foliage cover		**85%**	

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Hymenanthera dentata* s.l.	Tree Violet
MS	*Acacia paradoxa*	Hedge Wattle
PS	*Kennedia prostrata*	Running Postman
LH	*Senecio quadridentatus*	Cotton Fireweed
LH	*Senecio glomeratus*	Annual Fireweed
MH	*Oxalis perennans*	Grassland Wood-sorrel
MH	*Rumex brownii*	Slender Dock
MH	*Hypericum gramineum*	Small St John's Wort
MH	*Acaena ovina*	Australian Sheep's Burr
SH	*Dichondra repens*	Kidneyweed
SH	*Hydrocotyle laxiflora*	Stinking Pennywort
SH	*Crassula sieberiana*	Sieber Crassula
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Poa sieberiana*	Grey Tussock-grass
MTG	*Austrodanthonia caespitosa*	Common Wallaby-grass
MTG	*Austrodanthonia setacea*	Bristly Wallaby-grass
TTG	*Carex breviculmis*	Short-stem Sedge
MNG	*Microlaena stipoides* var. *stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken
GF	*Adiantum aethiopicum*	Common Maidenhair
SC	*Convolvulus erubescens* spp. agg.	Pink Bindweed

Recruitment:
Continuous

Organic Litter:
20 % cover

Victoria The Place To Be

Logs[+]:

5 m/0.1 ha. (note: large log class does not apply)

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
T	*Schinus molle*	Pepper Tree	high	high
MS	*Lycium ferocissimum*	African Box-thorn	high	high
MS	*Genista monspessulana*	Montpellier Broom	high	high
SS	*Marrubium vulgare*	Horehound	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Helminthotheca echioides*	Ox-tongue	high	low
LH	*Lactuca serriola*	Prickly Lettuce	high	low
LH	*Sisymbrium officinale*	Hedge Mustard	high	low
LH	*Sonchus asper* s.l.	Rough Sow-thistle	high	low
LH	*Verbascum thapsus* ssp. *thapsus*	Great Mullein	high	high
LH	*Echium plantagineum*	Paterson's Curse	high	high
LH	*Centaurium tenuiflorum*	Slender Centaury	high	low
LH	*Foeniculum vulgare*	Fennel	high	high
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Trifolium arvense* var. *arvense*	Hare's-foot Clover	high	low
MH	*Trifolium subterraneum*	Subterranean Clover	high	low
MH	*Trifolium campestre* var. *campestre*	Hop Clover	high	low
MH	*Trifolium angustifolium* var. *angustifolium*	Narrow-leaf Clover	high	low
MH	*Lotus suaveolens*	Hairy Bird's-foot Trefoil	high	low
MH	*Cerastium glomeratum* s.l.	Common Mouse-ear Chickweed	high	low
SH	*Medicago polymorpha*	Burr Medic	high	low
SH	*Trifolium glomeratum*	Cluster Clover	high	low
SH	*Modiola caroliniana*	Red-flower Mallow	high	low
SH	*Aptenia cordifolia*	Heart-leaf Ice-plant	high	high
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
LNG	*Avena fatua*	Wild Oat	high	low
MTG	*Nassella trichotoma*	Serrated Tussock	high	high
MTG	*Ehrharta longiflora*	Annual Veldt-grass	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low
MTG	*Bromus hordeaceus* ssp. *hordeaceus*	Soft Brome	high	low
MTG	*Sporobolus africanus*	Rat-tail Grass	high	high
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Pentaschistis airoides* ssp. *airoides*	False Hair-grass	high	low
MTG	*Lolium perenne*	Perennial Rye-grass	high	low
MTG	*Dactylis glomerata*	Cocksfoot	high	high
MTG	*Vulpia myuros*	Rat's-tail Fescue	high	low
MTG	*Bromus rubens*	Red Brome	high	low
MTG	*Avena barbata*	Bearded Oat	high	low
MTG	*Aira caryophyllea*	Silvery Hair-grass	high	low
SC	*Vicia sativa* ssp. *sativa*	Common Vetch	low	low

Published by the Victorian Government Department of Sustainability and Environment May 2004