# 152-200 Bluff Road
# St Leonards

# Vegetation Assessment

*Draft*

Prepared for

St Quentin Consulting

Prepared by

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# 1 Introduction

## 1.1 Project Background

A residential sub-division is proposed for 152-200 Bluff Road, St Leonards. This report was commissioned by St Quentin Consulting to undertake a vegetation assessment for that area.

The State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the former Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website i).

This report has been prepared in accordance with the Regulations.

Refer to Section 4 for further discussion.

## 1.2 Aims

The aims of the study are to -

- Determine the extent of any indigenous vegetation and faunal habitat values that exists in the study area.
- Describe the vegetation of the study area.
- Undertake an assessment of any indigenous vegetation (patches or scattered trees).
- Determine the implications for any impacts from the proposal.

## 1.3 Study Area

The study area is all of the property at 152-200 Bluff Road St Leonards, within the City of Greater Geelong. The size of the study area is 17.6 hectares.

The study area is within the Otway Plains bioregion (DNRE 2002), which is located within in the Corangamite Catchment Management Authority area. The study area is within the designated City of Greater Geelong St Leonards Growth Area 2.

The site has a history of agricultural disturbance, however the site carries some indigenous vegetation. The vegetation of the study area can be described as:

- Partially intact remnant indigenous vegetation and/or re-colonized indigenous vegetation.
- Exotic vegetation dominated by exotic species, (the cropped, grazed and disturbed areas).

The adjacent roadside reserves were also assessed. Refer to Figure 1 for the study area location.

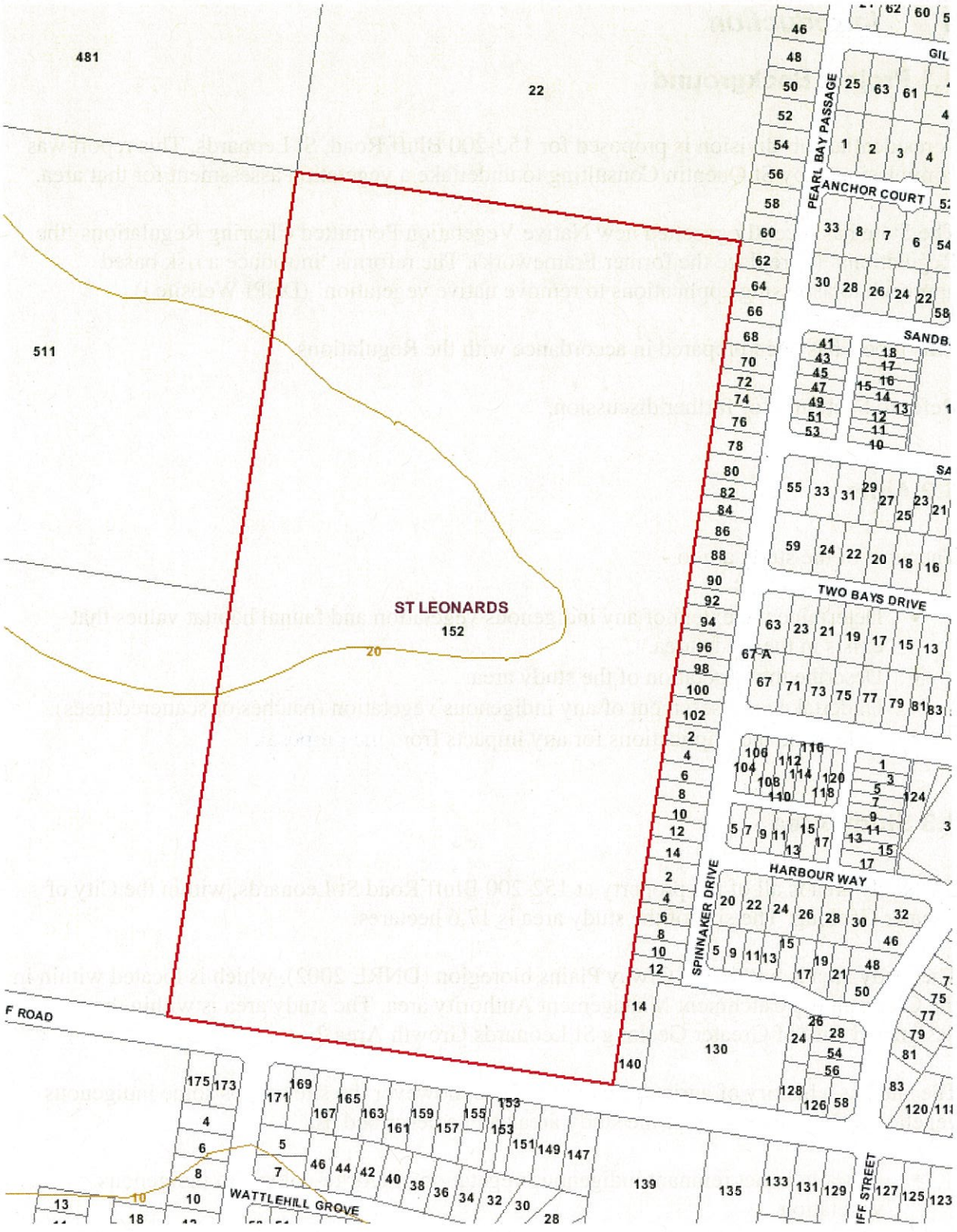


**Figure 1.** Study area location shown in red outline.

# 2 Methodology

## 2.1 Taxonomy

Scientific names for plants follow the Census of Vascular Plants of Victoria 8th ed (Walsh & Stajsic 2007). Common names for plants follow the Flora of Victoria Volumes 2-4 (Walsh and Entwisle 1994-1999).

## 2.2 Literature and Database Review

Relevant literature and databases, including data within the Flora Information System (FIS) And Victorian Wildlife Atlas of the Department of Sustainability and Environment (DSE) and the Biodiversity Interactive Map (DSE Website i), were reviewed.

## 2.3 Field Survey

The study area was inspected on foot on the 22nd of July 2014 by the report author. General observations were made on the vegetation and habitat quality of the study area. A list of all indigenous and dominant exotic vascular plant species was compiled. The location of all vegetation was mapped.

## 2.4 Limitations

The surveys were conducted in winter, a time of year suitable for the detection of most, but not all, flora species. However, due to the mostly degraded nature of the study area, the site inspection is considered to be adequate to assess the ecological values of the site. Consequently there are not considered to be any significant limitations to the study.

The survey includes only vascular flora. Non-vascular flora (mosses, lichens, fungi, etc.) was not recorded. Fauna assessments were not undertaken.

## 2.6 Defining and Assessing Native Vegetation

Under the Regulations native vegetation in Victoria has been defined by DEPI as belonging to two categories. These are:

**Remnant Patch**
Remnant patches of remnant native vegetation are composed of indigenous plant species considered part of a clearly definable EVC. Such vegetation includes understorey species of greater than 25% total understorey cover (excluding bare ground), and/or indigenous canopy trees with at least 20% projected foliage canopy cover.

**Scattered Trees**
Scattered trees comprise mature indigenous canopy trees that occur outside a remnant patch.

**Habitat Hectares**
Habitat hectare is a site-based measure that combines extent and condition of native vegetation. The current condition of native vegetation is assessed against a benchmark for its Ecological Vegetation Class (EVC). EVCs are classifications of native vegetation types. The benchmark for an EVC describes the attributes of the vegetation type in its mature natural state, which reflects the pre-settlement circumstances. The condition score of native vegetation at a site can be determined through undertaking a habitat hectare assessment. The habitat hectares of native vegetation is calculated by multiplying the current condition of the vegetation (condition score) by the extent of native vegetation.

**Determining the Tree Protection Zone (TPZ)**
The radium of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (Australian Standard AS4970-2009 *Protection of trees on development sites)*
Where DBH = trunk diameter measured at 1.4 metres above ground.
Radius is measured from the centre of the stem at ground level.
A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ. A tree is deemed to be impacted upon if greater than 10% of the TPZ area is to be disturbed (*Refer to* Appendix 2).

# 3 Results

## 3.1 Ecological Vegetation Classes (EVC)

EVCs are the primary level of classification of vegetation communities within Victoria. An EVC contains one or more plant (floristic) community, and represents a grouping of vegetation communities with broadly similar ecological attributes. Classification of EVCs in this report follows Oates and Taranto (2002).

The pre-1750 EVC mapping of the study area undertaken by DSE (DSE 2003) indicates that the study area and immediate surrounds were comprised of EVC 55 Plains Grassy Woodland.

This report finds that sections of the study area are comprised of partially intact native vegetation that accords with EVC 55 Plains Grassy Woodland.

The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered' (DSE 2004). Endangered is defined as an EVC where 'less than 10% of pre-european extent remains' (DNRE 2002). Refer to Figure 2 for the distribution of year 2005 EVCs (DSE data).


**Figure 2**. Distribution of year 2005 EVCs (DSE data).

## 3.2 Plant Species

A total of 16 indigenous vascular plant species were recorded for the study area. Refer to Table 1 for a list of all recorded indigenous vascular plant species, including conservation significance and distribution by private property or roadside reserve. A total of 13 dominant naturalized exotic plant species were recorded for the study area. Refer to Table 2 for a list of dominant exotic vascular plant species.

**Table 1 Indigenous Plant Species**

| Botanical Name | Common Name | Status | Private Property | Roadside Reserve |
|---|---|---|---|---|
| *Acacia mearnsii* | Late Black Wattle | L | * | * |
| *Acacia pycnantha* | Golden Wattle | L | | * |
| *Allocasuarina verticillata* | Drooping Sheoke | R | * | |
| *Austrodanthonia racemosa* | Slender Wallaby-grass | L | | * |
| *Dianella brevicaulis* | Coast Flax-lily | L | | * |
| *Dianella revoluta* | Black-anther Flax-lily | L | | * |
| *Eucalyptus camaldulensis* | River Red Gum | R | * | |
| *Juncus subsecundus* | Finger Rush | L | * | * |
| *Lepidosperma laterale* | Variable Sword-sedge | L | | * |
| *Leptospermum laevigatum* | Coast Tea-tree | L | * | * |
| *Leucopogon parviflorus* | Coast Beard-heath | L | | * |
| *Lomandra longifolia* | Spiny Mat-rush | L | | * |
| *Microleana stipoides* | Weeping Grass | L | | * |
| *Pteridium esculentum* | Bracken Fern | L | * | * |
| *Rhagodia candolleana* | Seaberry Saltbush | L | * | * |
| *Tetragonia implexicoma* | Bower Spinach | L | * | * |

Status: L – Local Conservation Significance
R – Regional Conservation Significance

**Table 2 Dominant Exotic Plant Species**

| Botanical Name | Common Name |
|---|---|
| *Agrostis capilaris* | Brown-top Bent |
| *Arctotheca calendula* | Cape Weed |
| *Asparagus asparagoides* | Smilax |
| *Cynodon dactylon* | Couch-grass |
| *Dactylis glomeratus* | Cock's-foot |
| *Genista linefolia* | Flax-leaf Broom |
| *Oxalis pes-caprae* | Sour Sob |
| *Pennisetum clandestinum* | Kikuyu-grass |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Romulea rosea* | Onion Grass |
| *Solanum linnaeanum* | Apple of Sodom |
| *Sporobolus indicus* | Rat's-tail Grass |
| *Ulex europeus* | Gorse |

## 3.3 Significant Plant Species

No plant species of National or State conservation significance were recorded. A total of two Regionally Significant plant species, i.e. River Red Gum and Drooping Sheoke, were recorded. The remaining 14 indigenous species are assessed to be of Local conservation significance. Refer to Table 1 for a list of significant species.

## 3.3 Condition of the Vegetation

The current survey results show that areas of 'natural' native vegetation are present. These areas of partially intact native vegetation are comprised of scattered mature indigenous canopy trees that are assessed as 'scattered trees' and areas of native vegetation with at least 25% cover of understorey foliage that are assessed as remnant 'patch' vegetation.

The areas of native vegetation are defined as follows:

- Partially intact River Red Gum, Coast Tea-tree and Drooping Sheoke dominated vegetation that occurs as separate remnant 'patches' that occur on the private property.
- Partially intact Coast Tea-tree dominated vegetation that occurs as separate remnant 'patches' that are confined to sections of the adjacent Bluff Road roadside reserve.

The areas of River Red Gum dominated vegetation consist of 7 mature trees and regeneration. This vegetation is part of a larger patch that also occurs on the adjacent property (569 Ibbotson St).

Collectively, the areas of roadside reserve vegetation provide a potentially significant wildlife corridor.

The areas of predominately exotic (non-indigenous) vegetation are defined as follows:

- Plantations of exotic and non-indigenous native trees.
- The bulk of the study area that is comprised of land that has been cropped, grazed (currently by cattle, horses and sheep) and/or subject to significant disturbance. Areas of Bracken Fern that occur within the otherwise exotic cropped and grazed areas are exempt under Clause 42.17 and are therefore not assessed.

Negligible indigenous vegetation was recorded for these areas. Habitat values are assessed to be negligible.

Refer to Figure 7 for the location of native vegetation.

# 4 State

## 4.1 Native Vegetation Permitted Clearing Regulations

Under Particular Provision (Native Vegetation Clause 52.17) the State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the Native Vegetation Management Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website I *and* DSE Website ii).

DEPI have produced a range of biodiversity information tools to assess site significance and to assess the potential impacts of any permitted vegetation clearing. The biodiversity information tools are as follows:

- Native Vegetation Extent; the 'area of land covered by native vegetation'.
- Native Vegetation Site Condition; 'comprised of three components, species diversity, structure and function'.
- Native Vegetation Location Risk' 'location risk is calculated on the basis of a set of spatial models describing the importance of suitable habitat within the current extent of native vegetation for many rare or threatened species and native vegetation modeled condition data'.
- Strategic Biodiversity Score; a ' spatially explicit view of strategic biodiversity values', it 'identifies the value of a site relative to the value of all other Victorian locations'.

Refer to Figure 3 for Native Vegetation Extent, Refer to Figure 4 for Native Vegetation Site Condition. Refer to Figure 5 for Native Vegetation Location Risk. Refer to Figure 6 for Strategic Biodiversity Score, including discussion of implications for the study area (DSE data, DSE Website i).

Implications for the current proposal are discussed as follows.

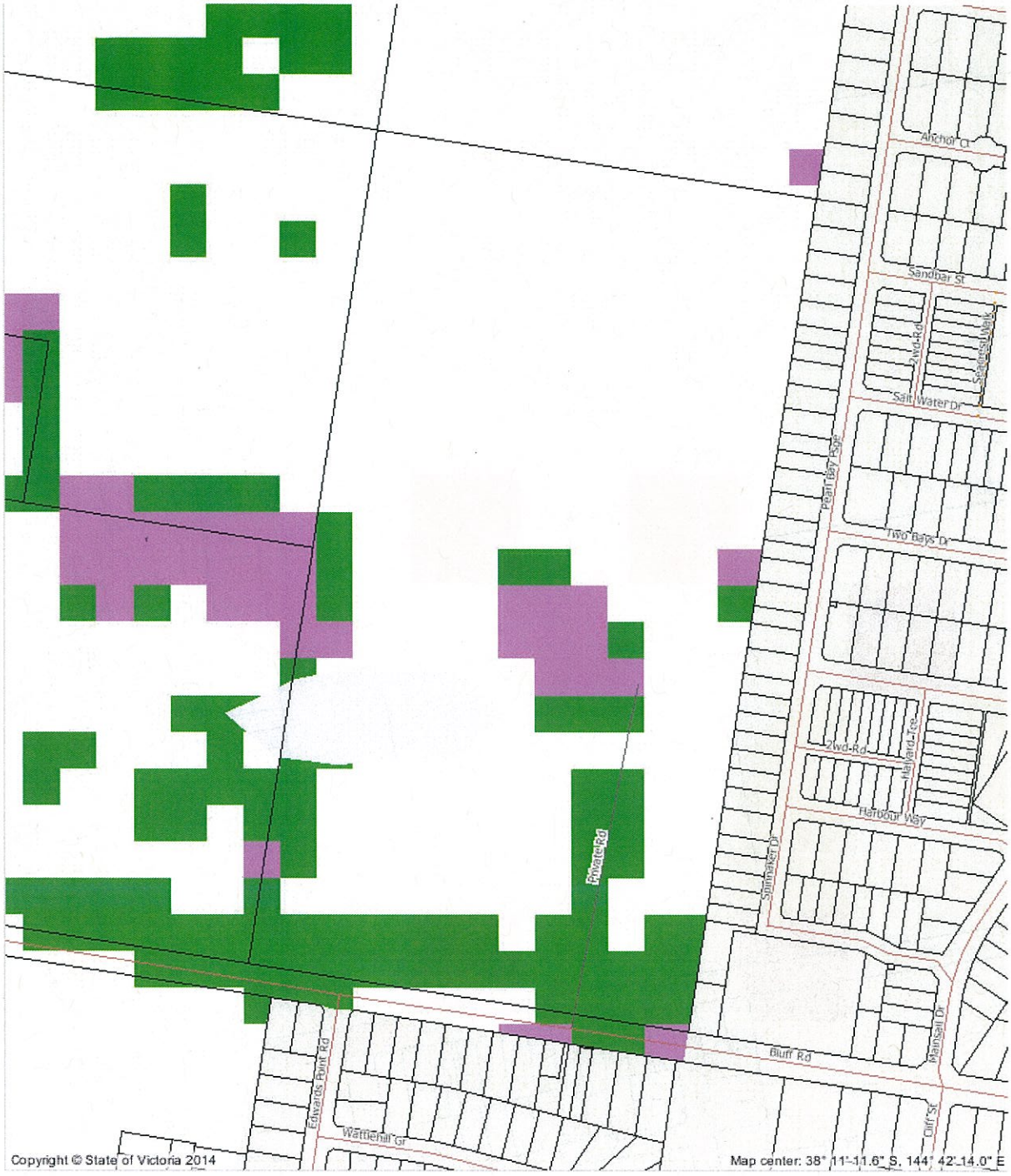


**Figure 3.** Native Vegetation Extent. Green equates to native vegetation cover, purple equates to exotic tree cover, white equates to exotic largely treeless vegetation (DSE Website i). The DEPI mapping is assessed to be in part correct in predicting the occurrence of the River Red Gum dominated vegetation and the roadside reserves dominated native vegetation. However this study finds that the areas of green in the private sector are, in the main, devoid of native vegetation.

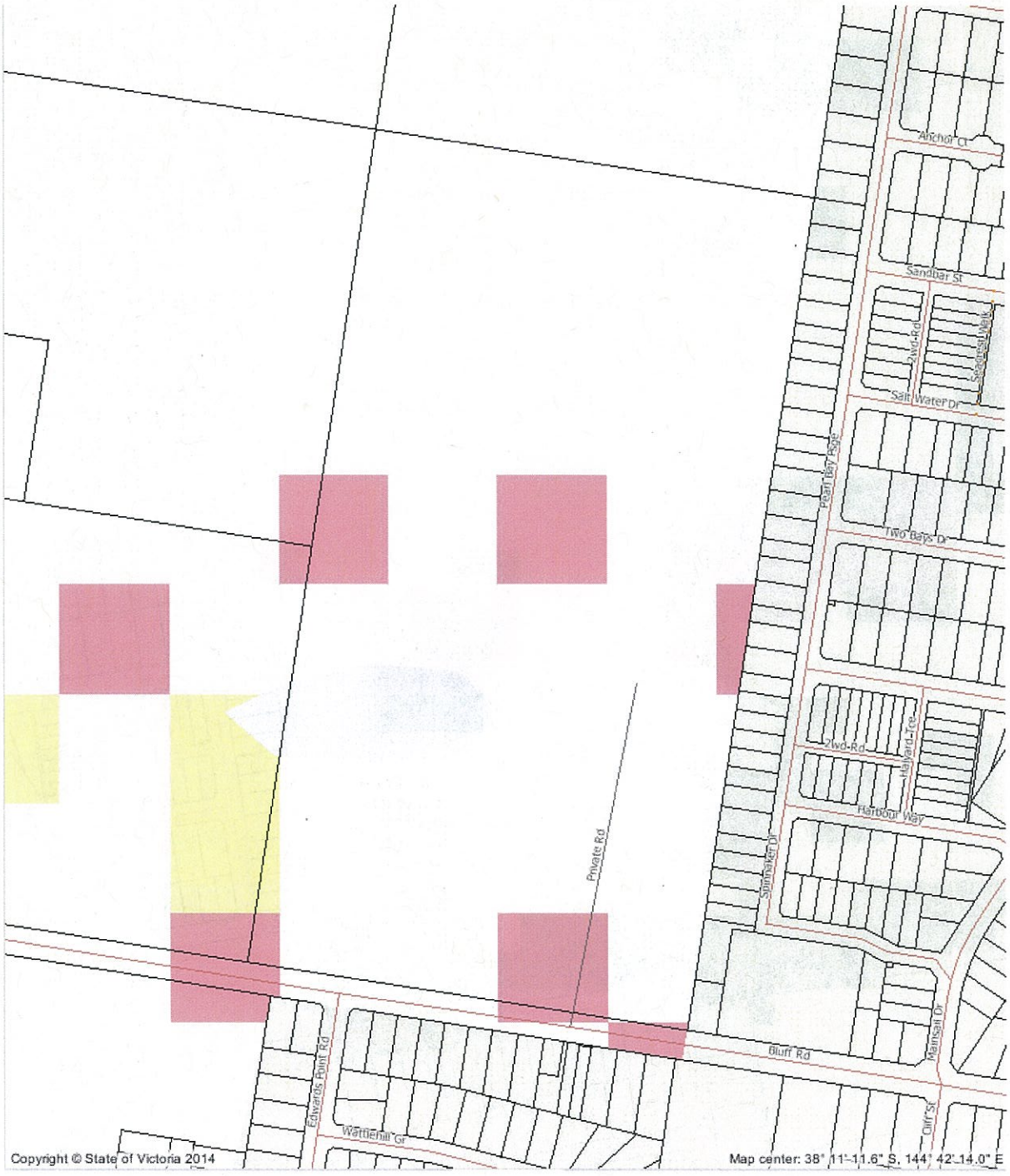


**Figure 4.** Native Vegetation Site Condition. The study area is given a site condition score of zero (no colour), 0.21-0.4 (pink) and 0.41-0.6 (yellow) (DSE Website i). The areas of pink in part correspond with the occurrence of the roadside reserves dominated native vegetation. However this study finds that the areas of pink in the private sector are devoid of native vegetation.


**Figure 5.** Distribution of vegetation according to 'Location Risk'. Blue equates to 'Location Risk A' (i.e. least risk). (DSE Website i).


**Figure 6**. Strategic Biodiversity Score. The study area is given a Strategic Biodiversity Score of 0.21-0.4 (light green), 0.41- 0.6 (dark green) (DSE Website i). The areas of highest Strategic Biodiversity Score in part correlates with areas of River Red Gum and roadside reserve vegetation.

### 4.1.1 Area of Remnant Patch Vegetation

Under the Regulations, any remnant 'patch' vegetation that is proposed to be removed is subject to protection/and or recruitment offsets, depending upon the characteristics of the site.

The current survey results show that indigenous remnant patch vegetation is comprised of the following:

- Partially intact River Red Gum, Coast Tea-tree and Drooping Sheoke dominated vegetation that occur as separate 'patches' that occur on the private property.
- Partially intact Coast Tea-tree dominated vegetation that occurs as separate 'patches' that are confined to the adjacent Bluff Rd roadside reserves.

The remainder of the study area is comprised of pre-dominantly exotic vegetation.

### 4.1.2 Trees

Under the Regulations, any scattered native canopy trees that are proposed to be removed are subject to protection/and or recruitment offsets, depending upon the characteristics of the site.

Scattered trees, that is, mature native canopy trees that exist outside of a patch, are also assessed under the Regulations. Within the Otway Plain bioregion, EVC 55 has *Eucalyptus* spp as 'canopy trees'.

For practicality, a standard extent amount (i.e. 0.071 ha per tree) has been developed for assessing applications to remove scattered trees, based on the habitat hectare assessment method.

Tree assessments have been undertaken for all the mature River Red Gum trees as they are generally located within the proposed development area. Although they are located within areas of 'patch' vegetation, this method allows for the determination of appropriate Tree Protection zones. A total of 7 mature trees were recorded for the study area.

Refer to Table 3 for tree findings. Refer to Figure 7 for the location of trees.

**Table 3 Trees, DBH, Size Class and Tree Protection Zone**

| Tree # | Botanical name | DBH[1] | TPZ[2] |
|---|---|---|---|
| 1 | *Eucalyptus camaldulensis* | 43 | 5.2 |
| 2 | *Eucalyptus camaldulensis* | 59 | 7.1 |
| 3 | *Eucalyptus camaldulensis* | 36 | 4.3 |
| 4 | *Eucalyptus camaldulensis* | 33 | 4 |
| 5 | *Eucalyptus camaldulensis* | 39 | 4.7 |
| 6 | *Eucalyptus camaldulensis* | 49 | 5.9 |
| 7 | *Eucalyptus camaldulensis* | 74 | 8.9 |

[1] - Diameter at 1.4 metres above ground, in cm.
[2] - TPZ – Tree Protection Zone in metres (*refer to* Appendix 2).

Note that Trees # 1-7 occur within areas of remnant 'patch' vegetation.

### 4.1.3 Implications

The current survey results show that areas of remnant 'patch' vegetation occur within the study area and on the adjacent Bluff Road roadside reserve.

Therefore there would be implications for the Regulations if areas of remnant 'patch' roadside vegetation were proposed to be cleared. A permit would be required for the removal of that vegetation and appropriate vegetation offsets would be required to be generated.

An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway. An application to remove greater than 1 ha of 'Location Risk A' native vegetation would be assessed as a Moderate risk-based pathway.

## 5 Conclusions

The study has a history of agricultural and residential disturbance. The vegetation of the study area can be described as follows:

- Remnant 'patch' vegetation that occurs within the study area
- Remnant 'patch' vegetation that occurs on sections of the adjacent bluff Road roadside reserves.
- Pre-dominantly exotic degraded vegetation, which dominate the study area.
- Non-indigenous native and exotic plantations.

The Remnant 'patch' vegetation accords with EVC 55 Plains Grassy Woodland. The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered'

The remainder of the study area is comprised of predominately exotic vegetation.

A total of 16 indigenous plant species were recorded for the study area.

No plant species of National or State conservation significance were recorded. A total of two Regionally Significant plant species, i.e. River Red Gum and Drooping Sheoke, were recorded. The remaining 14 indigenous species are assessed to be of Local conservation significance.

DEPI mapping designates the study area as 'Location Risk A' (i.e. least risk). An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway. An application to remove greater than 1 ha of 'Location Risk A' native vegetation would be assessed as a Moderate risk-based pathway.

Therefore there would be implications for the Regulations if areas of remnant 'patch' vegetation were proposed to be cleared. A permit would be required for the removal of that vegetation and appropriate vegetation offsets would be required to be

There are not considered to be any significant limitations to this survey.

## 6 References


Conn, B J (1993). Natural regions and vegetation of Victoria. Pp. 79-158 In Foreman, D B and Walsh, G (eds.) 'Flora of Victoria Volume 1: Introduction.' Inkata Press, Melbourne.

Corangamite Catchment Management Authority (2005). 'Corangamite Native Vegetation Plan' CCMA, Colac, Victoria.

DEPI Website i.
http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/native-vegetation/native-vegetation-permitted-clearing-regulations

DEPI Website ii.
http://nvim.depi.vic.gov.au/

DEPI Website iii.
http://www.depi.vic.gov.au/__data/assets/pdf_file/0010/198964/Meeting-the-moderate-and-high-risk-based-pathway-application-requirements.pdf

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## Figure 7 Location of Native Vegetation

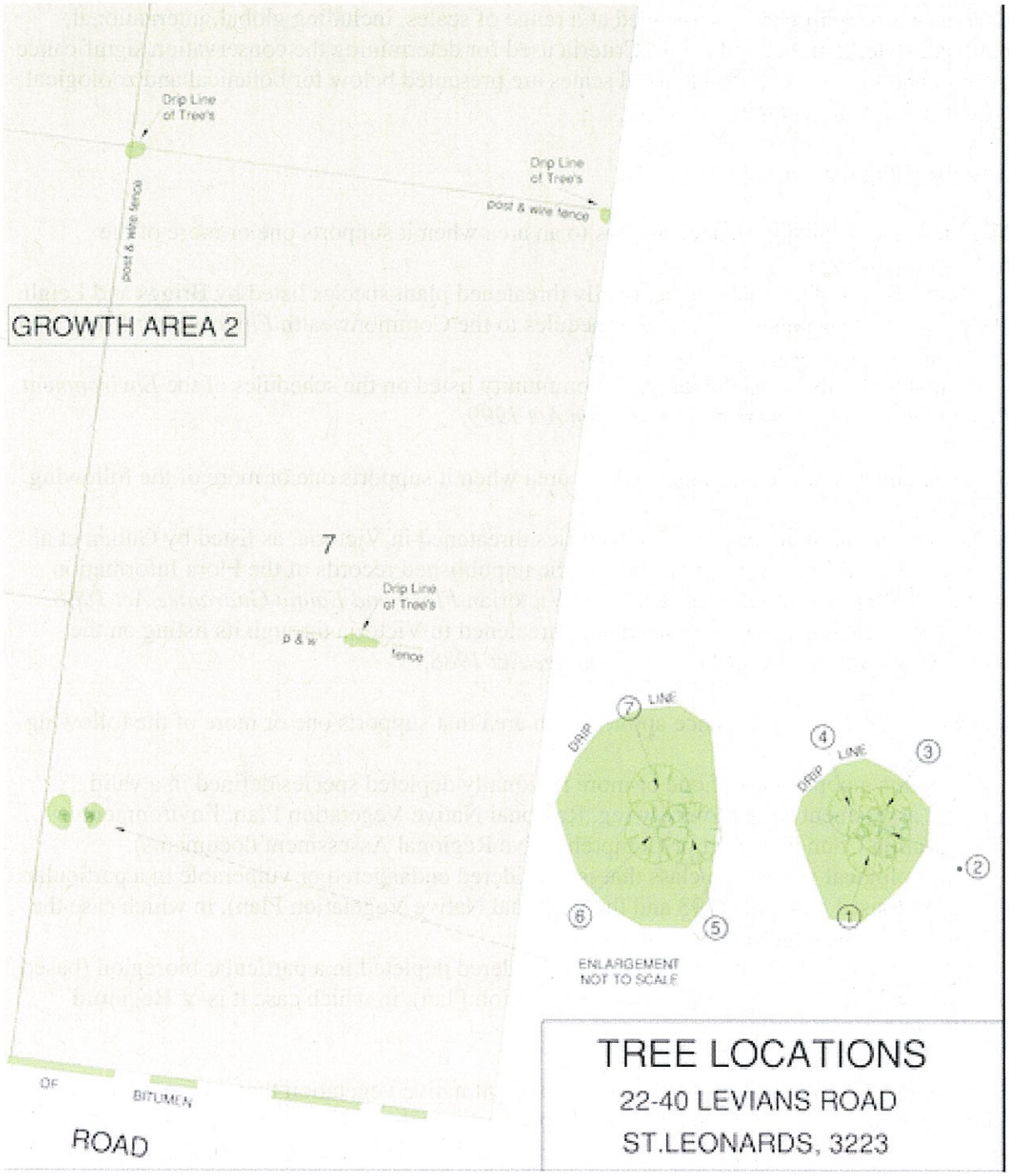



**Figure 7.** Location of remnant patch vegetation on subject land and adjacent roadside reserve, shown in green. Enlargement shows tree #1-7.

## Appendix 1 Assessing Conservation Significance

Conservation significance is assessed at a range of scales, including global, international, national, state, regional and local. Criteria used for determining the conservation significance of flora and fauna at national to local scales are presented below for botanical and zoological conservation significance.

### Botanical Significance

**National** botanical significance applies to an area when it supports one or more of the following attributes:

a population of at least one nationally threatened plant species listed by Briggs and Leigh (1996) or plant species listed on the schedules to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

A nationally threatened ecological community listed on the schedules of the *Environment Protection and Biodiversity Conservation Act 1999.*

**State** botanical significance applies to an area when it supports one or more of the following attributes:

A population of at least one plant species threatened in Victoria, as listed by Gullan et al. (1990), NRE (2000a) or more recently in the unpublished records of the Flora Information System (NRE), or on the schedules to the Victorian *Flora and Fauna Guarantee Act 1988.*

An ecological community considered threatened in Victoria through its listing on the schedules of the *Flora and Fauna Guarantee Act 1988.*

**Regional** botanical significance applies to an area that supports one or more of the following attributes:

Supports a population of one or more regionally depleted species defined in a valid regional assessment of biodiversity (eg. Regional Native Vegetation Plan, Environment Conservation Council Report or Comprehensive Regional Assessment documents).

An ecological vegetation class that is considered endangered or vulnerable in a particular bioregion (based on Conn 1993 and the Regional Native Vegetation Plan), in which case the area is of **High Regional** significance.

An ecological vegetation class that is considered depleted in a particular bioregion (based on Conn 1993 and the Regional Native Vegetation Plan), in which case it is of **Regional** significance.

**Local** botanical significance applies to all remnant native vegetation that does not meet the above criteria. In much of Victoria, and in particular in the Otway Plain bioregion, native vegetation has been so depleted by past clearing and disturbance that all remaining vegetation must be considered to be of at least local conservation significance.

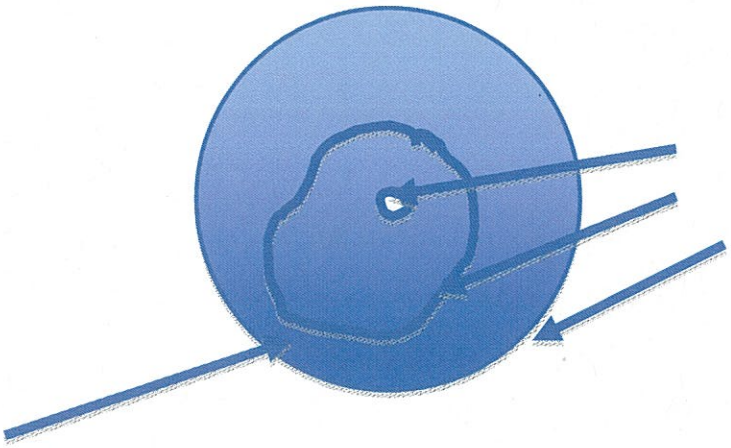
## Appendix 2 Determining the Tree Protection Zone

**Determining the Tree Protection Zone (TPZ)**
The radium of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (Australian Standard AS4970-2009 *Protection of trees on development sites)*
Where
DBH = trunk diameter measured at 1.4 metres above ground Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ.

A tree is deemed to be impacted upon if greater than 10% of the TPZ area is to be disturbed.

**Indicative Size of Tree Protection Zone**



Tree Trunk
Tree Canopy
Edge of Tree Protection Zone

Outer edge of Tree Protection Zone x metres (DBH x 12) from centre of tree

# 22-40 Leviens Road St Leonards
# Roadside Reserve

# Vegetation Assessment

Prepared for

St. Leonards Property Holdings P/L

Prepared by

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# 1 Introduction

## 1.1 Project Background

A residential sub-division is proposed for 22-40 Leviens Road, St Leonards. This report was commissioned by St Leonards Property Holdings P/L to undertake a vegetation assessment for the adjacent Leviens Road roadside reserve (southern verge).

The State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the former Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website i).

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The aims of the study are to -

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- Describe the vegetation of the study area.
- Undertake an assessment of any indigenous vegetation (patches or scattered trees).
- Determine the implications for any impacts from the proposal.

## 1.3 Study Area

The study area is all of the Leviens Road roadside reserve (southern verge) adjacent to 22-40 Leviens Road St Leonards, within the City of Greater Geelong. The study area is approximately 300 metres long.

The study area is within the Otway Plains bioregion (DNRE 2002), which is located within the Corangamite Catchment Management Authority area.

The roadside reserve carries areas of relatively intact indigenous vegetation. The vegetation of the study area can be described as:

- Areas of partially intact remnant indigenous vegetation and/or re-colonized indigenous vegetation.
- Areas of predominately exotic vegetation.

Refer to Figure 1 for the study area location.

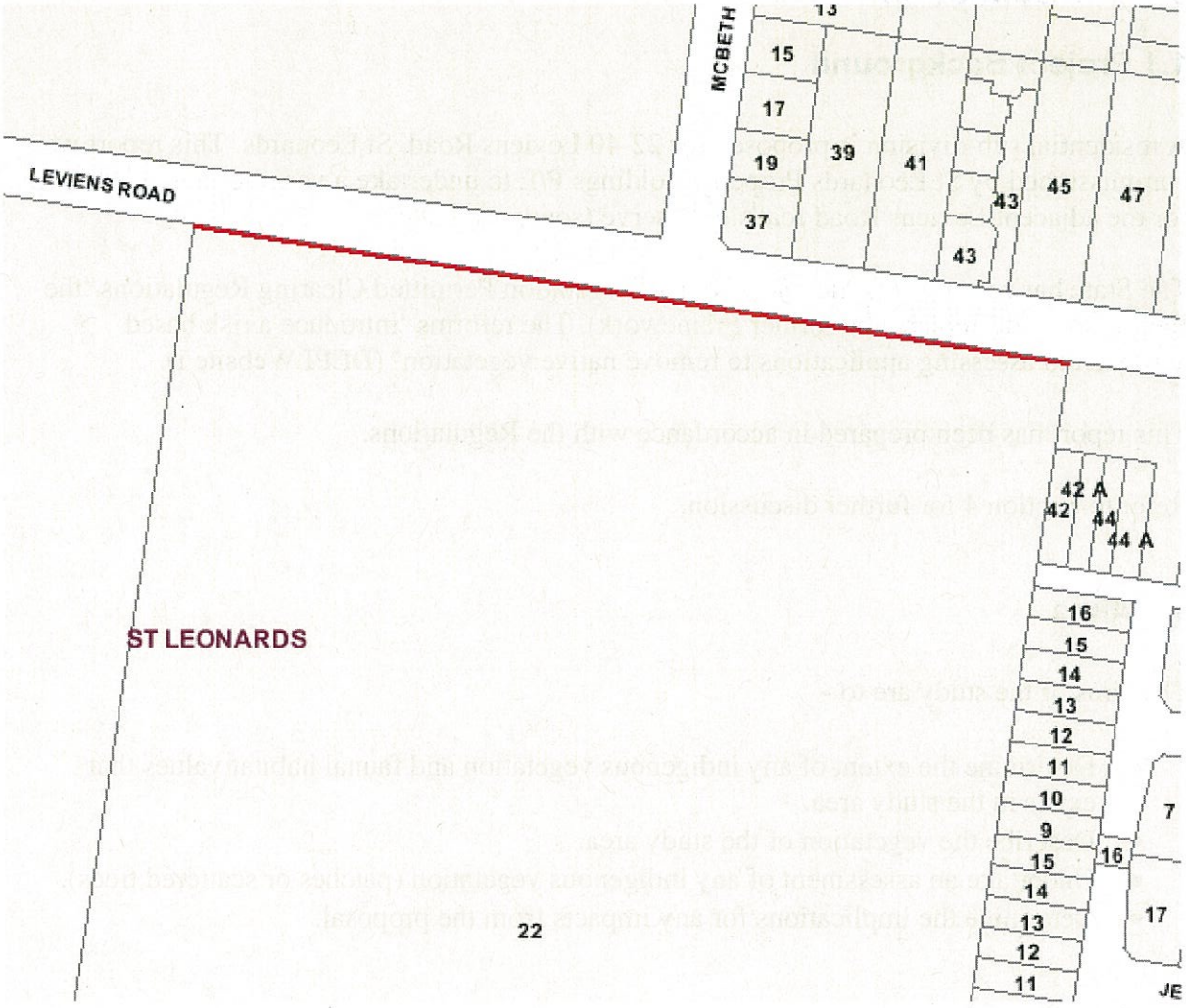


**Figure 1.** Study area location shown in red line.

# 2 Methodology

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## 2.4 Limitations

The surveys were conducted in winter, a time of year suitable for the detection of most, but not all, flora species. However, due to the mostly degraded nature of the study area, the site inspection is considered to be adequate to assess the ecological values of the site. Consequently there are not considered to be any significant limitations to the study.

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The pre-1750 EVC mapping of the study area undertaken by DSE (DSE website i) indicates that the study area and immediate surrounds were comprised of EVC 55 Plains Grassy Woodland.

This report finds that parts of the study area are comprised of partially intact native vegetation that accords with EVC 55 Plains Grassy Woodland.

The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered' (DSE 2004). Endangered is defined as an EVC where 'less than 10% of pre-european extent remains' (DNRE 2002). Refer to Figure 2 for the distribution of year 2005 EVCs (DSE data).


**Figure 2**. Distribution of year 2005 EVCs (DSE data).

## 3.2 Plant Species

A total of 12 indigenous vascular plant species were recorded for the study area. Refer to Table 1 for a list of all recorded indigenous vascular plant species, including conservation significance. A total of 13 dominant naturalized exotic plant species were recorded for the study area. Refer to Table 2 for a list of dominant exotic vascular plant species. Refer to Figure 7 for the location of native vegetation.

**Table 1 Indigenous Plant Species**

| Botanical Name | Common Name | Status |
|---|---|---|
| *Acacia mearnsii* | Late Black Wattle | L |
| *Acacia pycnantha* | Golden Wattle | L |
| *Allocasuarina verticillata* | Drooping Sheoke | R |
| *Austrodanthonia racemosa* | Slender Wallaby-grass | L |
| *Dianella revoluta* | Black-anther Flax-lily | L |
| *Lepidosperma laterale* | Variable Sword-sedge | L |
| *Lomandra longifolia* | Spiny Mat-rush | L |
| *Microleana stipoides* | Weeping Grass | L |
| *Pteridium esculentum* | Bracken Fern | L |
| *Rhagodia candolleana* | Seaberry Saltbush | L |
| *Tetragonia implexicoma* | Bower Spinach | L |
| *Themeda triandra* | Kangaroo Grass | L |

Status: L – Local Conservation Significance
R – Regional Conservation Significance

**Table 2 Exotic Plant Species**

| Botanical Name | Common Name |
|---|---|
| *Agrostis capilaris* | Brown-top Bent |
| *Arctotheca calendula* | Cape Weed |
| *Asparagus asparagoides* | Smilax |
| *Cynodon dactylon* | Couch-grass |
| *Dactylis glomeratus* | Cock's-foot |
| *Genista linefolia* | Flax-leaf Broom |
| *Oxalis pes-caprae* | Sour Sob |
| *Pinus radiata* | Radiata Pine |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Romulea rosea* | Onion Grass |
| *Solanum linnaeanum* | Apple of Sodom |
| *Sporobolus indicus* | Rat's-tail Grass |
| *Ulex europeus* | Gorse |

## 3.3 Significant Plant Species

No plant species of National or State conservation significance were recorded. One Regionally Significant plant species, i.e. Drooping Sheoke, was recorded. The remaining 11 indigenous species are assessed to be of Local conservation significance. Refer to Table 1 for a list of significant species.

## 3.3 Condition of the Vegetation

The current survey results show that areas of relatively intact native vegetation are present and are consistent in terms of vegetation quality and vegetation type. These areas of native vegetation are comprised of remnant indigenous vegetation with at least 25% understory cover value, and are therefore assessed to be remnant 'patch' vegetation.

The areas of native vegetation are defined as follows:

- Partially intact Drooping Sheoke dominated EVC 55 vegetation occurs as separate 'patches' that are confined to the Levians Rd roadside reserves.

The size of the remnant 'patch' vegetation is assessed to be 0.176 ha.

The areas of exotic (non-indigenous) vegetation are defined as follows:

- Pre-dominantly exotic vegetation that has been subject to significant disturbance.

Refer to Figure 7 for the location of native vegetation.

# 4 State

## 4.1 Native Vegetation Permitted Clearing Regulations

Under Particular Provision (Native Vegetation Clause 52.17) the State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the Native Vegetation Management Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website I *and* DSE Website ii).

DEPI have produced a range of biodiversity information tools to assess site significance and to assess the potential impacts of any permitted vegetation clearing. The biodiversity information tools are as follows:

- Native Vegetation Extent; the 'area of land covered by native vegetation'.
- Native Vegetation Site Condition; 'comprised of three components, species diversity, structure and function'.
- Native Vegetation Location Risk' 'location risk is calculated on the basis of a set of spatial models describing the importance of suitable habitat within the current extent of native vegetation for many rare or threatened species and native vegetation modeled condition data'.
- Strategic Biodiversity Score; a ' spatially explicit view of strategic biodiversity values', it 'identifies the value of a site relative to the value of all other Victorian locations'.

Refer to Figure 3 for Native Vegetation Extent, Refer to Figure 4 for Native Vegetation Site Condition. Refer to Figure 5 for Native Vegetation Location Risk. Refer to Figure 6 for Strategic Biodiversity Score, including discussion of implications for the study area (DSE data, DSE Website i).

Implications for the current proposal are discussed as follows.


**Figure 3.** Native Vegetation Extent. Green equates to native vegetation cover, purple equates to exotic tree cover, white equates to exotic largely treeless vegetation (DSE Website i). The DEPI mapping is assessed to be in part correct in predicting the occurrence of the roadside reserves dominated native vegetation.

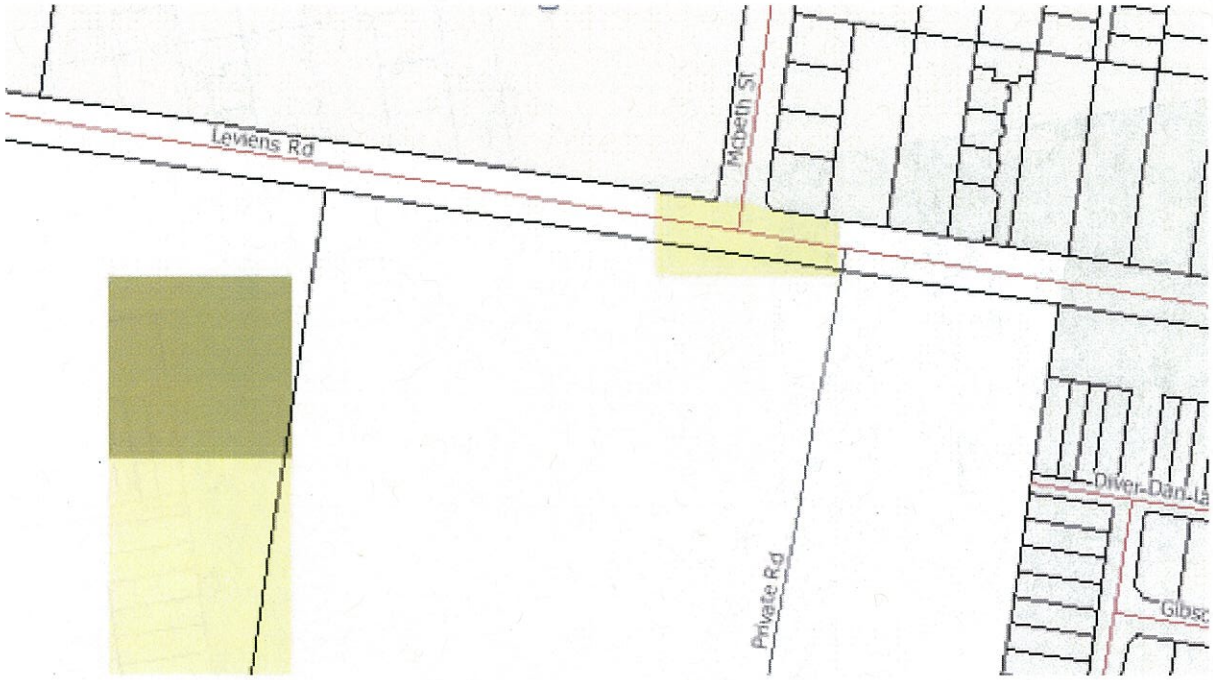


**Figure 4.** Native Vegetation Site Condition. The study area is given a site condition score of predominately 0 (no colour) and 0.41-0.6 (yellow) (DSE Website i). The areas of yellow in part correspond with the occurrence of the roadside reserves dominated native vegetation.

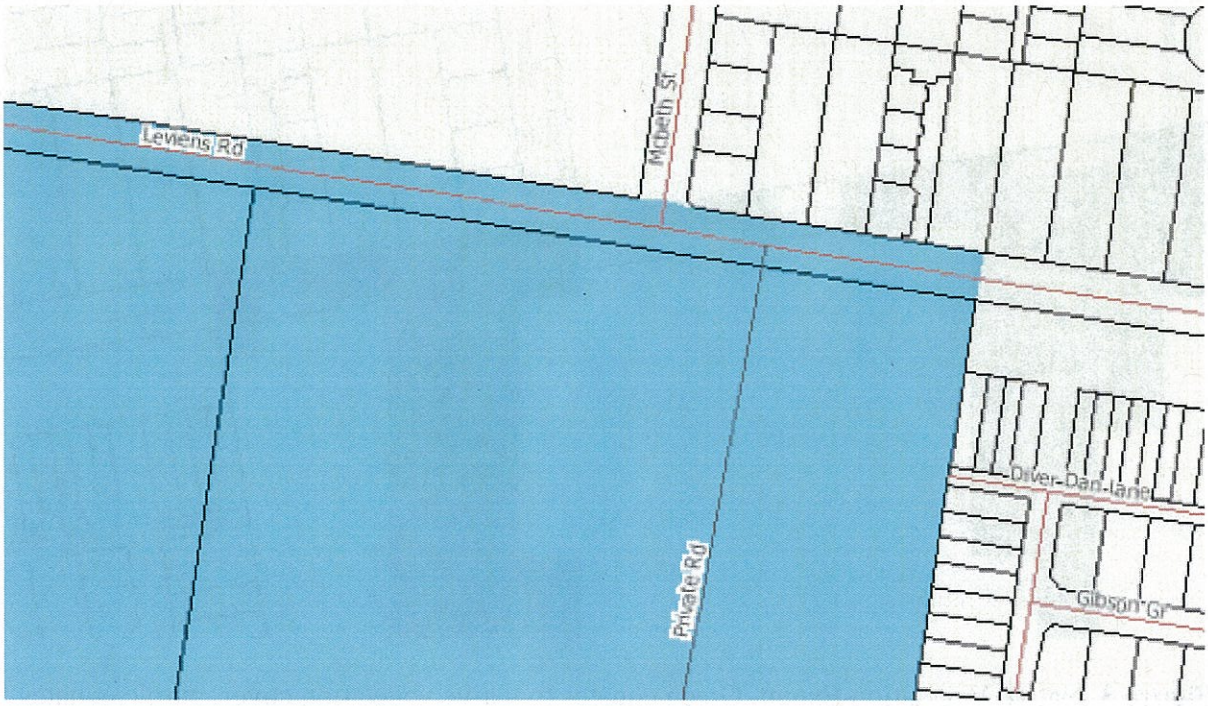


**Figure 5.** Distribution of vegetation according to 'Location Risk'. Blue equates to 'Location Risk A' (i.e. least risk). (DSE Website i).


**Figure 6**. Strategic Biodiversity Score. The study area is given a Strategic Biodiversity Score of 0.21-0.4 (light green) and 0.41- 0.6 (dark green) (DSE Website i). The Strategic Biodiversity Score correlates (in part) with areas of roadside vegetation.

### 4.1.1 Area of Remnant Patch Vegetation

The current survey results show that sections of indigenous remnant patch vegetation is located within areas of roadside vegetation.

The size of the remnant 'patch' vegetation is assessed to be 0.176 ha. This vegetation occurs as 5 separate patches that are alike in terms of vegetation quality and type, and consequently are assessed as a single habitat zone. Utilizing the DEPI standardized Site Condition Score (DSE Website i) of 0.4 (40/100), the habitat hectare score for this vegetation is 0.07.

The remainder of the study area is comprised of predominately exotic vegetation (Figure 7).

### 4.1.2 Trees

Under the Regulations, any scattered native canopy trees that are proposed to be removed are subject to protection/and or recruitment offsets, depending upon the characteristics of the site.

Scattered trees, that is, mature native canopy trees that exist outside of a patch, are also assessed under the Regulations. Within the Otway Plain bioregion, EVC 55 has *Eucalyptus* spp as 'canopy trees'.

For practicality, a standard extent amount (i.e. 0.071 ha) has been developed for scattered trees, based on the habitat hectare assessment method.

The current survey results show that no scattered trees were recorded for the study area. Therefore no scattered trees are proposed to be impacted upon.

### 4.1.3 Implications

The current survey results show that 0.176 ha of remnant 'patch' vegetation occur on the Leviens Rd roadside reserve.

Therefore there would be implications for the Regulations if areas of remnant 'patch' roadside vegetation were proposed to be cleared. A permit would be required for the removal of that vegetation and appropriate vegetation offsets would be required to be generated.

An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway.

## 5 Conclusions

The vegetation of the study area can be described as follows:

- Partially intact areas of remnant indigenous vegetation and/or re-colonized indigenous vegetation (the Drooping Sheoke dominated vegetation).
- Degraded vegetation dominated by exotic species.

The Drooping Sheoke dominated native vegetation that accords with EVC 55 Plains Grassy Woodland. The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered'

A total of 12 indigenous plant species were recorded for the study area.

No plant species of National or State conservation significance were recorded. A total of one Regionally Significant plant species, i.e. Drooping Sheoke, was recorded. The remaining 11 indigenous species are considered to be of Local conservation significance.

No scattered trees were recorded for the study area.

0.176 ha of remnant 'patch' vegetation occur on the Leviens Rd roadside reserve.

DEPI mapping designates the study area as 'Location Risk A' (i.e. least risk). An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway.

Therefore there would be implications for the Regulations if areas of remnant 'patch' roadside vegetation were proposed to be cleared. A permit would be required for the removal of that vegetation and appropriate vegetation offsets would be required to be generated.

There are not considered to be any significant limitations to this survey.

## 6 References


Conn, B J (1993). Natural regions and vegetation of Victoria. Pp. 79-158 In Foreman, D B and Walsh, G (eds.) 'Flora of Victoria Volume 1: Introduction.' Inkata Press, Melbourne.

Corangamite Catchment Management Authority (2005). 'Corangamite Native Vegetation Plan' CCMA, Colac, Victoria.

DEPI Website i.
http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/native-vegetation/native-vegetation-permitted-clearing-regulations

DEPI Website ii.
http://nvim.depi.vic.gov.au/

DEPI Website iii.
http://www.depi.vic.gov.au/__data/assets/pdf_file/0010/198964/Meeting-the-moderate-and-high-risk-based-pathway-application-requirements.pdf

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http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim

DNRE (2000). 'Rare or Threatened Vascular Plants in Victoria 2000.' Department of Natural Resources and Environment, Victoria, East Melbourne, Victoria.

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Gullan, P K; Cheal, D C and Walsh, N G (1990). 'Rare or Threatened Plants in Victoria.' Department of Conservation and Environment, Victoria.

Oates, A. & Taranto, M. (2001). 'Vegetation Mapping of the Port Phillip &Westernport region' Arthur Rylah Institute for Environmental Research, DNRE, Victoria.

Parkes, D., Newell, G. & Cheal, D. (2003). 'Assessing the Quality of Indigenous Vegetation: The Habitat Hectares Approach' Parks, Flora & Fauna Division, DNRE, Victoria.

Walsh, N G & Stajsic, V. (2007). 'A Census of the Vascular Plants of Victoria- Eighth Edition' Royal Botanic Gardens, Melbourne.

Walsh, N G & Entwisle, T (1994-1999). 'Flora of Victoria Vol 2-4' Inkata Press, Melbourne.

## Figure 7 Location of Native Vegetation

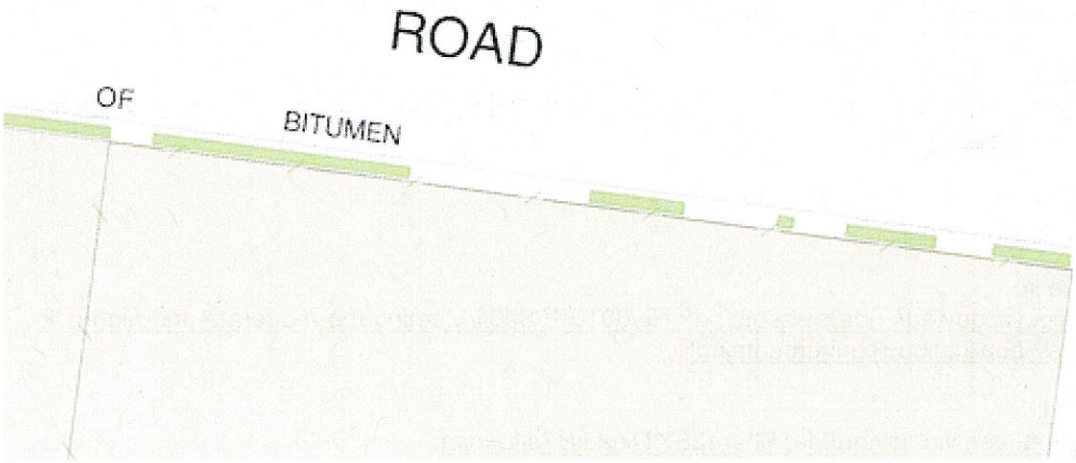


**Figure 7.** Location of native vegetation shown in green.

## Plate 1-2 Photographs existing conditions.

**Plate 1.** Photograph of study area roadside reserve Drooping Sheoke dominated vegetation, existing conditions.


**Plate 2.** Photograph of study area roadside reserve, exotic vegetation, typical conditions.

## Appendix 1 - ASSESSING CONSERVATION SIGNIFICANCE

Conservation significance is assessed at a range of scales, including global, international, national, state, regional and local. Criteria used for determining the conservation significance of flora and fauna at national to local scales are presented below for botanical and zoological conservation significance.

### Botanical Significance

**National** botanical significance applies to an area when it supports one or more of the following attributes:

a population of at least one nationally threatened plant species listed by Briggs and Leigh (1996) or plant species listed on the schedules to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

A nationally threatened ecological community listed on the schedules of the *Environment Protection and Biodiversity Conservation Act 1999.*

**State** botanical significance applies to an area when it supports one or more of the following attributes:

A population of at least one plant species threatened in Victoria, as listed by Gullan et al. (1990), NRE (2000a) or more recently in the unpublished records of the Flora Information System (NRE), or on the schedules to the Victorian *Flora and Fauna Guarantee Act 1988.*

An ecological community considered threatened in Victoria through its listing on the schedules of the *Flora and Fauna Guarantee Act 1988.*

**Regional** botanical significance applies to an area that supports one or more of the following attributes:

Supports a population of one or more regionally depleted species defined in a valid regional assessment of biodiversity (eg. Regional Native Vegetation Plan, Environment Conservation Council Report or Comprehensive Regional Assessment documents).

An ecological vegetation class that is considered endangered or vulnerable in a particular bioregion (based on Conn 1993 and the Regional Native Vegetation Plan), in which case the area is of **High Regional** significance.

An ecological vegetation class that is considered depleted in a particular bioregion (based on Conn 1993 and the Regional Native Vegetation Plan), in which case it is of **Regional** significance.

**Local** botanical significance applies to all remnant native vegetation that does not meet the above criteria. In much of Victoria, and in particular in the Otway Plain bioregion, native vegetation has been so depleted by past clearing and disturbance that all remaining vegetation must be considered to be of at least local conservation significance.

# 22-40 Leviens Road
# St Leonards

# Vegetation Assessment

Prepared for

St. Leonards Property Holdings P/L

Prepared by

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August 2014

# CONTENTS




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# 1 Introduction

## 1.1 Project Background

A residential sub-division is proposed for 22-40 Leviens Road, St Leonards. This report was commissioned by St Leonards Property Holdings P/L to undertake a vegetation assessment for that area.

The State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the former Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website i).

This report has been prepared in accordance with the Regulations.

Refer to Section 4 for further discussion.

## 1.2 Aims

The aims of the study are to -

- Determine the extent of any indigenous vegetation and faunal habitat values that exists in the study area.
- Describe the vegetation of the study area.
- Undertake an assessment of any indigenous vegetation (patches or scattered trees).
- Determine the implications for any impacts from the proposal.

## 1.3 Study Area

The study area is all of the property at 22-40 Leviens Road St Leonards, within the City of Greater Geelong. The size of the study area is 20 hectares.

The study area is within the Otway Plains bioregion (DNRE 2002), which is located within in the Corangamite Catchment Management Authority area.

The study area has a history of agricultural disturbance and carries no indigenous vegetation.

The vegetation of the study area can be described as:

- Exotic vegetation dominated by exotic species, (the cropped, grazed and disturbed areas, the subject land).

Refer to Figure 1 for the study area location.

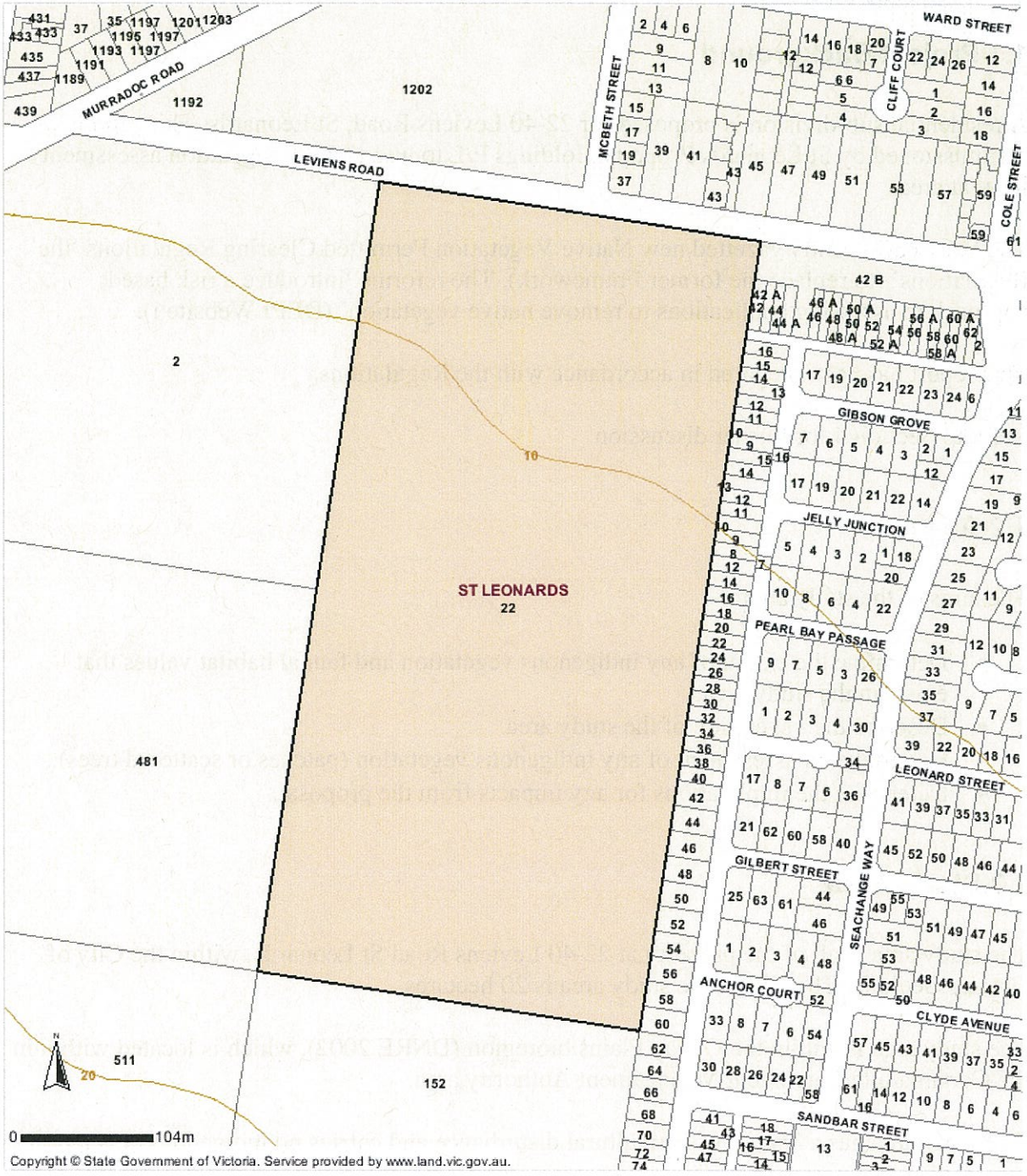


**Figure 1.** Study area location.

# 2 Methodology

## 2.1 Taxonomy

Scientific names for plants follow the Census of Vascular Plants of Victoria 8th ed (Walsh & Stajsic 2007). Common names for plants follow the Flora of Victoria Volumes 2-4 (Walsh and Entwisle 1994-1999).

## 2.2 Literature and Database Review

Relevant literature and databases, including data within the Flora Information System (FIS) And Victorian Wildlife Atlas of the Department of Sustainability and Environment (DSE) and the Biodiversity Interactive Map (DSE Website ii), were reviewed.

## 2.3 Field Survey

The study area was inspected on foot on the 22nd of July 2014 by the report author. General observations were made on the vegetation and habitat quality of the study area. A list of dominant exotic vascular plant species was compiled. The location of all dominant vegetation was mapped.

## 2.4 Limitations

The surveys were conducted in winter, a time of year suitable for the detection of most, but not all, flora species. However, due to the mostly degraded nature of the study area, the site inspection is considered to be adequate to assess the ecological values of the site. Consequently there are not considered to be any significant limitations to the study.

The survey includes only vascular flora. Non-vascular flora (mosses, lichens, fungi, etc) was not recorded. Fauna assessments were not undertaken.

## 2.6 Defining and Assessing Native Vegetation

Native vegetation in Victoria has been defined by DEPI as belonging to three categories. These are:

**Remnant Patch**
Remnant patches of remnant native vegetation are composed of indigenous plant species considered part of a clearly definable EVC. Such vegetation includes understorey species of greater than 25% total understorey cover (excluding bare ground), and/or indigenous canopy trees with at least 20% projected foliage canopy cover.

**Scattered Trees**
Scattered trees comprise mature indigenous canopy trees that occur outside a remnant patch.

**Degraded Treeless Vegetation**
Degraded treeless vegetation comprises all other vegetation.

**Habitat Hectares**
Habitat hectare is a site-based measure that combines extent and condition of native vegetation. The current condition of native vegetation is assessed against a benchmark for its Ecological Vegetation Class (EVC). EVCs are classifications of native vegetation types. The benchmark for an EVC describes the attributes of the vegetation type in its mature natural state, which reflects the pre-settlement circumstances. The condition score of native vegetation at a site can be determined through undertaking a habitat hectare assessment. The habitat hectares of native vegetation is calculated by multiplying the current condition of the vegetation (condition score) by the extent of native vegetation.

**Determining the Tree Protection Zone (TPZ)**
The radium of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (Australian Standard AS4970-2009 *Protection of trees on development sites)*
Where DBH = trunk diameter measured at 1.4 metres above ground.
Radius is measured from the centre of the stem at ground level.
A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). A tree is deemed to be impacted upon if greater than 10% of the TPZ area is to be disturbed.

# 3 Results

## 3.1 Ecological Vegetation Classes (EVC)

EVCs are the primary level of classification of vegetation communities within Victoria. An EVC contains one or more plant (floristic) community, and represents a grouping of vegetation communities with broadly similar ecological attributes. Classification of EVCs in this report follows Oates and Taranto (2002).

The pre-1750 EVC mapping of the study area undertaken by DSE (DSE 2003) indicates that the study area and immediate surrounds were comprised of EVC 55 Plains Grassy Woodland.

The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered' (DSE 2004). Endangered is defined as an EVC where 'less than 10% of pre-european extent remains' (DNRE 2002). Refer to Figure 2 for the distribution of year 2005 EVCs (DSE data).

No EVC 55 Plains Grassy Woodland grassland vegetation was recorded. The identified presence in Figure 2 is comprised exotic trees.

**Figure 2**. Distribution of year 2005 EVCs (DSE data).

## 3.2 Plant Species

No indigenous vascular plant species were recorded for the study area. A total of 11 dominant naturalized exotic plant species were recorded for the study area. Refer to Table 1 for a list of dominant exotic vascular plant species. Refer to Figure 7 for the location of dominant vegetation.

**Table 1 Indigenous Plant Species**

**Table 2 Exotic Plant Species**

| Botanical Name | Common Name |
|---|---|
| *Agrostis capilaris* | Brown-top Bent |
| *Arctotheca calendula* | Cape Weed |
| *Asparagus asparagoides* | Smilax |
| *Cynodon dactylon* | Couch-grass |
| *Dactylis glomeratus* | Cock's-foot |
| *Oxalis pes-caprae* | Sour Sob |
| *Pinus radiata* | Radiata Pine |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Romulea rosea* | Onion Grass |
| *Sporobolus indicus* | Rat's-tail Grass |
| *Ulex europeus* | Gorse |

## 3.3 Significant Plant Species

No plant species of National or State conservation significance were recorded.

## 3.3 Condition of the Vegetation

The areas of exotic (non-indigenous) vegetation are defined as follows:

- Plantations of non-indigenous native Sugar Gum (*Eucalyptus cladocalyx*) trees.
- The bulk of the study area, which is comprised of land that has been heavily cropped and/or subject to significant disturbance.

No indigenous vegetation was recorded. Habitat values are assessed to be negligible.

# 4 State

## 4.1 Native Vegetation Permitted Clearing Regulations

Under Particular Provision (Native Vegetation Clause 52.17) the State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the Native Vegetation Management Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website I *and* DSE Website ii).

DEPI have produced a range of biodiversity information tools to assess site significance and to assess the potential impacts of any permitted vegetation clearing. The biodiversity information tools are as follows:

- Native Vegetation Extent; the 'area of land covered by native vegetation'.
- Native Vegetation Site Condition; 'comprised of three components, species diversity, structure and function'.
- Native Vegetation Location Risk' 'location risk is calculated on the basis of a set of spatial models describing the importance of suitable habitat within the current extent of native vegetation for many rare or threatened species and native vegetation modeled condition data'.
- Strategic Biodiversity Score; a ' spatially explicit view of strategic biodiversity values', it 'identifies the value of a site relative to the value of all other Victorian locations'.

Refer to Figure 3 for Native Vegetation Extent, Refer to Figure 4 for Native Vegetation Site Condition. Refer to Figure 5 for Native Vegetation Location Risk. Refer to Figure 6 for Strategic Biodiversity Score, including discussion of implications for the study area (DSE data, DSE Website i).

Implications for the current proposal are discussed as follows.


**Figure 3.** Native Vegetation Extent. Green equates to native vegetation cover, purple equates to exotic tree cover, white equates to exotic largely treeless vegetation (DSE Website i). This study finds that the area of green in the study area is devoid of native vegetation.

Areas of exotic treed vegetation (Mature Pines) have been recently removed from the study area.


**Figure 4.** Native Vegetation Site Condition. The study area is given a site condition score of predominately 0 (no colour) and 0.41-0.6 (yellow) (DSE Website i). The areas of yellow in part correspond with the occurrence of the roadside reserves dominated native vegetation. However this study finds that the areas of yellow in the study area are devoid of native vegetation.


**Figure 5.** Distribution of vegetation according to 'Location Risk' . Blue equates to 'Location Risk A' (i.e. least risk). (DSE Website i).


**Figure 6**. Strategic Biodiversity Score. The study area is given a Strategic Biodiversity Score of 0.21-0.4 (light green) and 0.41- 0.6 (dark green) (DSE Website i). The areas of highest Strategic Biodiversity Score appear to correlate (in part) with areas of roadside vegetation.

### 4.1.1 Area of Remnant Patch Vegetation

The study area is comprised of exotic vegetation that is assessed to be 'degraded treeless' vegetation.

### 4.1.2 Trees

Under the Regulations, any scattered native canopy trees that are proposed to be removed are subject to protection/and or recruitment offsets, depending upon the characteristics of the site.

Scattered trees, that is, mature native canopy trees that exist outside of a patch, are also assessed under the Regulations. Within the Otway Plain bioregion, EVC 55 has *Eucalyptus* spp as 'canopy trees'.

For practicality, a standard extent amount (i.e. 0.071 ha) has been developed for scattered trees, based on the habitat hectare assessment method.

The current survey results show that no scattered trees were recorded for the study area.

### 4.1.3 Implications

An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway.

As there is no native vegetation proposed to be removed there are no implications for the Regulations.

## 5 Conclusions

The study has a history of agricultural disturbance. The vegetation of the study area can be described as follows:

- Degraded vegetation dominated by exotic species, which dominate the study area.

The study area is comprised of exotic vegetation that is assessed to be 'degraded treeless' vegetation. No indigenous plant species were recorded.

DEPI mapping designates the study area (and the adjacent roadside) as 'Location Risk A' (i.e. least risk). As there is no native vegetation proposed to be removed there are no implications for the Regulations.

There are not considered to be any significant limitations to this survey.

## 6 References


Conn, B J (1993). Natural regions and vegetation of Victoria. Pp. 79-158 In Foreman, D B and Walsh, G (eds.) 'Flora of Victoria Volume 1: Introduction.' Inkata Press, Melbourne.

Corangamite Catchment Management Authority (2005). 'Corangamite Native Vegetation Plan' CCMA, Colac, Victoria.

DEPI Website i.
http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/native-vegetation/native-vegetation-permitted-clearing-regulations

DEPI Website ii.
http://nvim.depi.vic.gov.au/

DEPI Website iii.
http://www.depi.vic.gov.au/__data/assets/pdf_file/0010/198964/Meeting-the-moderate-and-high-risk-based-pathway-application-requirements.pdf

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DNRE (1994). 'Catchment and Land Protection Act' DNRE, Melbourne.

DSE Website i.
http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim

Gullan, P K; Cheal, D C and Walsh, N G (1990). 'Rare or Threatened Plants in Victoria.' Department of Conservation and Environment, Victoria.

Oates, A. & Taranto, M. (2001). 'Vegetation Mapping of the Port Phillip &Westernport region' Arthur Rylah Institute for Environmental Research, DNRE, Victoria.

Parkes, D., Newell, G. & Cheal, D. (2003). 'Assessing the Quality of Indigenous Vegetation: The Habitat Hectares Approach' Parks, Flora & Fauna Division, DNRE, Victoria.

Walsh, N G & Stajsic, V. (2007). ' A Census of the Vascular Plants of Victoria- Eighth Edition' Royal Botanic Gardens, Melbourne.

Walsh, N G & Entwisle, T (1994-1999). 'Flora of Victoria Vol 2-4' Inkata Press, Melbourne.

## Figure 7 Location of Vegetation

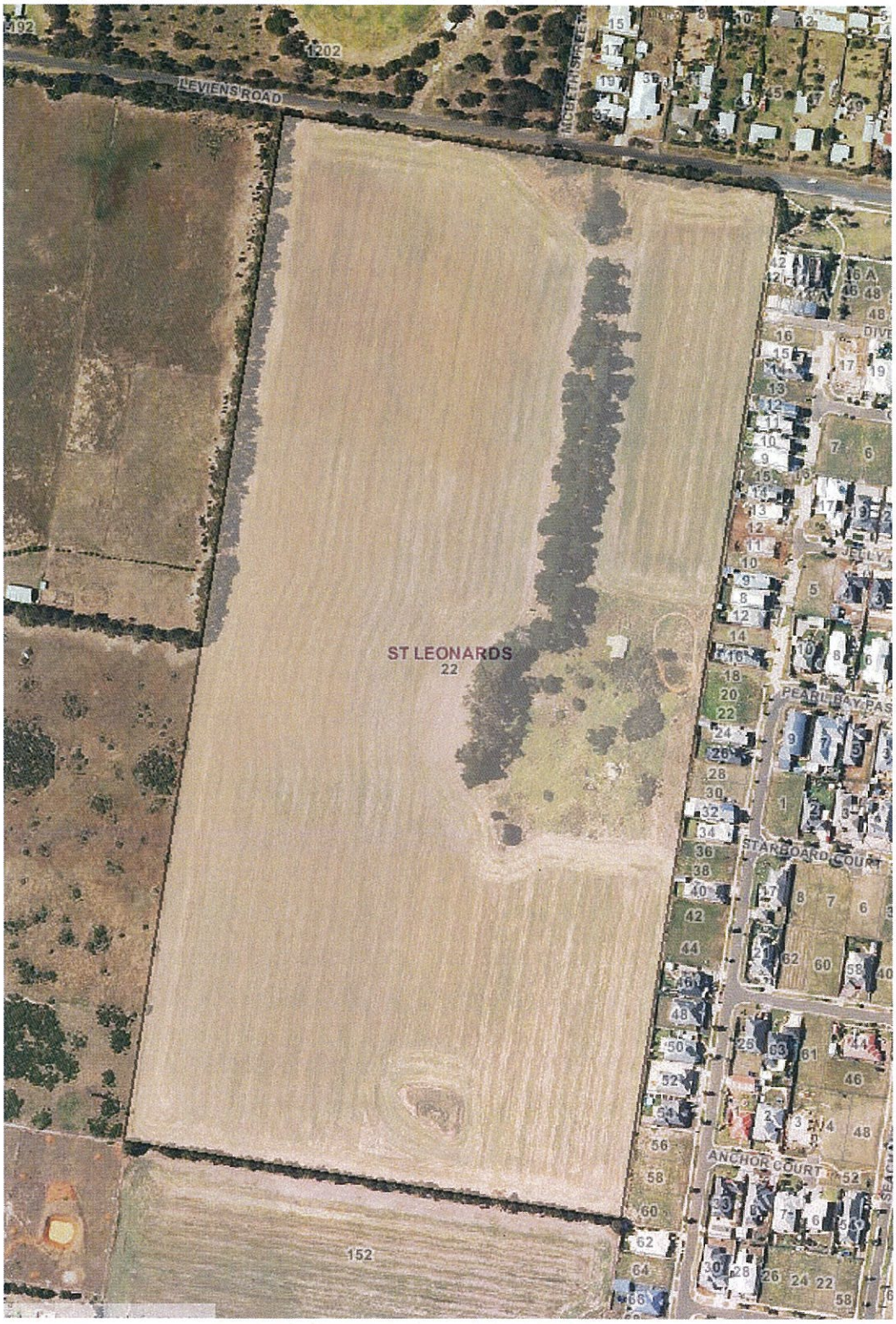


**Figure 7.** Location of Vegetation. Photograph taken prior to recent clearing of exotic trees (Pines) located in the north-central sector. Sugar Gum plantation remains in the central sector, otherwise the entire study area is cropped and entirely exotic. Roadside vegetation and perimeter plantings are located beyond the study area.

# 2-20 Leviens Road and 481-569 Ibbotson Street St Leonards

# Vegetation Assessment

Prepared for

ABC Project Management P/L

Prepared by

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September 2014

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# 1 *Introduction*

## 1.1 Project Background

A residential sub-division is proposed for 2-20 Leviens Road and 481-569 Ibbotson Street, St Leonards. This report was commissioned by ABC Project Management P/L to undertake a vegetation assessment for that area.

The State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the former Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website i).

This report has been prepared in accordance with the Regulations.

Refer to Section 4 for further discussion.

## 1.2 Aims

The aims of the study are to -

- Determine the extent of any indigenous vegetation and faunal habitat values that exists in the study area.
- Describe the vegetation of the study area.
- Undertake an assessment of any indigenous vegetation (patches or scattered trees).
- Determine the implications for any impacts from the proposal.

## 1.3 Study Area

The study area is all of the property at 2-20 Leviens Road and 481-569 Ibbotson Street St Leonards, within the City of Greater Geelong. The size of the study area is 36.3 hectares and is currently comprised of five separate properties (i.e. 2-20 Leviens Road, 481-505 Ibbotson Street, 511-529 Ibbotson Street, 531-539 Ibbotson Street and 541-569 Ibbotson Street).

The study area is within the Otway Plains bioregion (DNRE 2002), which is located within in the Corangamite Catchment Management Authority area. The study area is within the designated City of Greater Geelong St Leonards Growth Area 2.

The site has a history of agricultural disturbance, however the site carries some indigenous vegetation. The vegetation of the study area can be described as:

- Partially intact remnant indigenous vegetation and/or re-colonized indigenous vegetation.
- Exotic vegetation dominated by exotic species, (the cropped, grazed and disturbed areas).

The adjacent roadside reserves were also assessed. Refer to Figure 1 for the study area location.

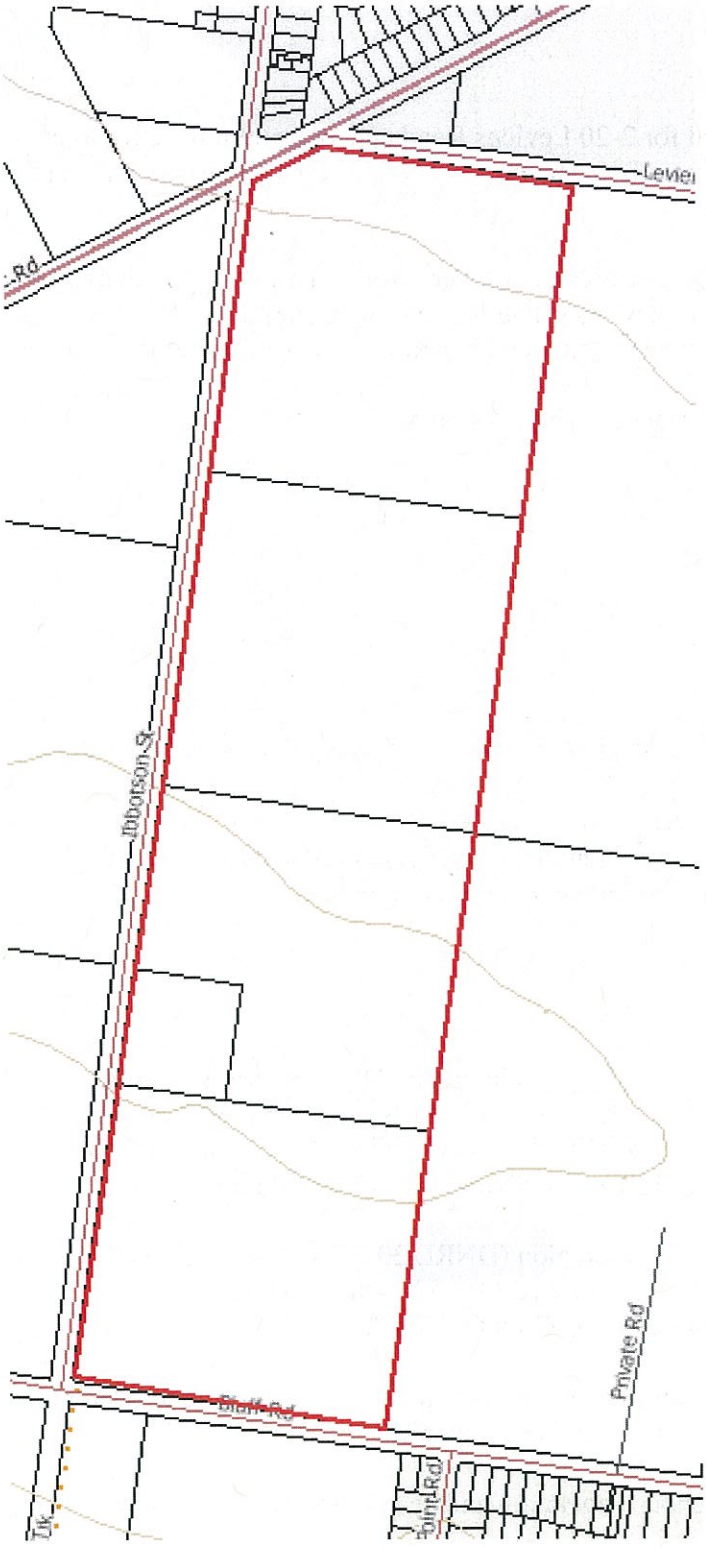


**Figure 1.** Study area location shown in red outline.

# 2 *Methodology*

## 2.1 Taxonomy

Scientific names for plants follow the Census of Vascular Plants of Victoria 8th ed (Walsh & Stajsic 2007). Common names for plants follow the Flora of Victoria Volumes 2-4 (Walsh and Entwisle 1994-1999).

## 2.2 Literature and Database Review

Relevant literature and databases, including data within the Flora Information System (FIS) And Victorian Wildlife Atlas of the Department of Sustainability and Environment (DSE) and the Biodiversity Interactive Map (DSE Website i), were reviewed.

## 2.3 Field Survey

The study area was inspected on foot on the 22nd of July 2014 by the report author. General observations were made on the vegetation and habitat quality of the study area. A list of all indigenous and dominant exotic vascular plant species was compiled. The location of all vegetation was mapped.

## 2.4 Limitations

The surveys were conducted in winter, a time of year suitable for the detection of most, but not all, flora species. However, due to the mostly degraded nature of the study area, the site inspection is considered to be adequate to assess the ecological values of the site. Consequently there are not considered to be any significant limitations to the study.

The survey includes only vascular flora. Non-vascular flora (mosses, lichens, fungi, etc) was not recorded. Fauna assessments were not undertaken.

## 2.6 Defining and Assessing Native Vegetation

Under the Regulations native vegetation in Victoria has been defined by DEPI as belonging to two categories. These are:

**Remnant Patch**
Remnant patches of remnant native vegetation are composed of indigenous plant species considered part of a clearly definable EVC. Such vegetation includes understorey species of greater than 25% total understorey cover (excluding bare ground), and/or indigenous canopy trees with at least 20% projected foliage canopy cover.

**Scattered Trees**
Scattered trees comprise mature indigenous canopy trees that occur outside a remnant patch.

**Habitat Hectares**
Habitat hectare is a site-based measure that combines extent and condition of native vegetation. The current condition of native vegetation is assessed against a benchmark for its Ecological Vegetation Class (EVC). EVCs are classifications of native vegetation types. The benchmark for an EVC describes the attributes of the vegetation type in its mature natural state, which reflects the pre-settlement circumstances. The condition score of native vegetation at a site can be determined through undertaking a habitat hectare assessment. The habitat hectares of native vegetation is calculated by multiplying the current condition of the vegetation (condition score) by the extent of native vegetation.

**Determining the Tree Protection Zone (TPZ)**
The radium of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (Australian Standard AS4970-2009 *Protection of trees on development sites)*
Where DBH = trunk diameter measured at 1.4 metres above ground.
Radius is measured from the centre of the stem at ground level.
A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ. A tree is deemed to be impacted upon if greater than 10% of the TPZ area is to be disturbed (*Refer to* Appendix 2).

# 3 Results

## 3.1 Ecological Vegetation Classes (EVC)

EVCs are the primary level of classification of vegetation communities within Victoria. An EVC contains one or more plant (floristic) community, and represents a grouping of vegetation communities with broadly similar ecological attributes. Classification of EVCs in this report follows Oates and Taranto (2002).

The pre-1750 EVC mapping of the study area undertaken by DSE (DSE 2003) indicates that the study area and immediate surrounds were comprised of EVC 55 Plains Grassy Woodland.

This report finds that parts of the study area are comprised of partially intact native vegetation that accords with EVC 55 Plains Grassy Woodland.

The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered' (DSE 2004). Endangered is defined as an EVC where 'less than 10% of pre-european extent remains' (DNRE 2002). Refer to Figure 2 for the distribution of year 2005 EVCs (DSE data).


**Figure 2**. Distribution of year 2005 EVCs (DSE data).

## 3.2 Plant Species

A total of 18 indigenous vascular plant species were recorded for the study area. Refer to Table 1 for a list of all recorded indigenous vascular plant species, including conservation significance and distribution by private property or roadside reserve. A total of 13 dominant naturalized exotic plant species were recorded for the study area. Refer to Table 2 for a list of dominant exotic vascular plant species.

**Table 1 Indigenous Plant Species**

| Botanical Name | Common Name | Status | Private Property | Roadside Reserve |
|---|---|---|---|---|
| *Acacia mearnsii* | Late Black Wattle | L | * | * |
| *Acacia pycnantha* | Golden Wattle | L | * | * |
| *Allocasuarina verticillata* | Drooping Sheoke | R | * | * |
| *Austrodanthonia racemosa* | Slender Wallaby-grass | L | * | * |
| *Dianella brevicaulis* | Coast Flax-lily | L | | * |
| *Dianella revoluta* | Black-anther Flax-lily | L | | * |
| *Eucalyptus camaldulensis* | River Red Gum | R | * | * |
| *Eucalyptus viminalis* ssp. *prioriana* | Manna Gum | L | * | |
| *Juncus subsecundus* | Finger Rush | L | * | * |
| *Lepidosperma laterale* | Variable Sword-sedge | L | | * |
| *Leptospermum laevigatum* | Coast Tea-tree | L | * | * |
| *Leucopogon parviflorus* | Coast Beard-heath | L | | * |
| *Lomandra longifolia* | Spiny Mat-rush | L | | * |
| *Microleana stipoides* | Weeping Grass | L | | * |
| *Pteridium esculentum* | Bracken Fern | L | * | |
| *Rhagodia candolleana* | Seaberry Saltbush | L | * | * |
| *Tetragonia implexicoma* | Bower Spinach | L | * | * |
| *Themeda triandra* | Kangaroo Grass | L | | * |

Status: L – Local Conservation Significance
R – Regional Conservation Significance

**Table 2 Dominant Exotic Plant Species**

| Botanical Name | Common Name |
|---|---|
| *Agrostis capilaris* | Brown-top Bent |
| *Arctotheca calendula* | Cape Weed |
| *Asparagus asparagoides* | Smilax |
| *Cynodon dactylon* | Couch-grass |
| *Dactylis glomeratus* | Cock's-foot |
| *Genista linefolia* | Flax-leaf Broom |
| *Oxalis pes-caprae* | Sour Sob |
| *Pennisetum clandestinum* | Kikuyu-grass |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Romulea rosea* | Onion Grass |
| *Solanum linnaeanum* | Apple of Sodom |
| *Sporobolus indicus* | Rat's-tail Grass |
| *Ulex europeus* | Gorse |

### 3.3 Significant Plant Species

No plant species of National or State conservation significance were recorded. A total of two Regionally Significant plant species, i.e. River Red Gum and Drooping Sheoke, were recorded. The remaining 16 indigenous species are assessed to be of Local conservation significance. Refer to Table 1 for a list of significant species.

### 3.3 Condition of the Vegetation

The current survey results show that areas of 'natural' native vegetation are present. These areas of partially intact native vegetation are comprised of scattered mature indigenous canopy trees that are assessed as 'scattered trees' and areas of native vegetation with at least 25% cover of understorey foliage that are assessed as remnant 'patch' vegetation.

The areas of native vegetation are defined as follows:

- Scattered trees, consisting of River Red Gum and Manna Gum and Drooping Sheoke occurring as isolated specimens on the private property.
- Partially intact River Red Gum, Coast Tea-tree and Wattle dominated vegetation that occurs as separate 'patches' that occur on the private property.
- Partially intact, Drooping Sheoke and Coast Tea-tree dominated vegetation that occurs as separate 'patches' that are confined to sections of the private property adjacent to the Levians Rd and Ibbotson St roadside reserves. These patches are regeneration from the roadside vegetation and are less than 10 years old. Although they are 'patch' vegetation they are exempt under Clause 52.17.
- Partially intact River Red Gum, Drooping Sheoke and Coast Tea-tree dominated vegetation that occurs as separate 'patches' that are confined to the Levians Rd and Ibbotson St roadside reserves.

The areas of River Red Gum dominated vegetation consist one mature tree and regeneration. This vegetation is part of a larger patch that also occurs on the adjacent property (152-200 Bluff Rd).

Collectively the areas of roadside reserve vegetation provide a potentially significant wildlife corridor.

The areas of predominately exotic (non-indigenous) vegetation are defined as follows:

- Plantations of exotic and non-indigenous native trees
- The bulk of the study area which is comprised of land that has been cropped, grazed (currently by cattle, horses and sheep) and/or subject to significant disturbance.

Negligible indigenous vegetation was recorded for these areas. Habitat values are assessed to be negligible.

Refer to Figures 7a and 7b for the location of native vegetation.

# 4 State

## 4.1 Native Vegetation Permitted Clearing Regulations

Under Particular Provision (Native Vegetation Clause 52.17) the State has recently gazetted new Native Vegetation Permitted Clearing Regulations 'the Regulations' (to replace the Native Vegetation Management Framework). The reforms 'introduce a risk based approach to assessing applications to remove native vegetation' (DEPI Website I *and* DSE Website ii).

DEPI have produced a range of biodiversity information tools to assess site significance and to assess the potential impacts of any permitted vegetation clearing. The biodiversity information tools are as follows:

- Native Vegetation Extent; the 'area of land covered by native vegetation'.
- Native Vegetation Site Condition; 'comprised of three components, species diversity, structure and function'.
- Native Vegetation Location Risk' 'location risk is calculated on the basis of a set of spatial models describing the importance of suitable habitat within the current extent of native vegetation for many rare or threatened species and native vegetation modeled condition data'.
- Strategic Biodiversity Score; a ' spatially explicit view of strategic biodiversity values', it 'identifies the value of a site relative to the value of all other Victorian locations'.

Refer to Figure 3 for Native Vegetation Extent, Refer to Figure 4 for Native Vegetation Site Condition. Refer to Figure 5 for Native Vegetation Location Risk. Refer to Figure 6 for Strategic Biodiversity Score, including discussion of implications for the study area (DSE data).

Implications for the current proposal are discussed as follows.

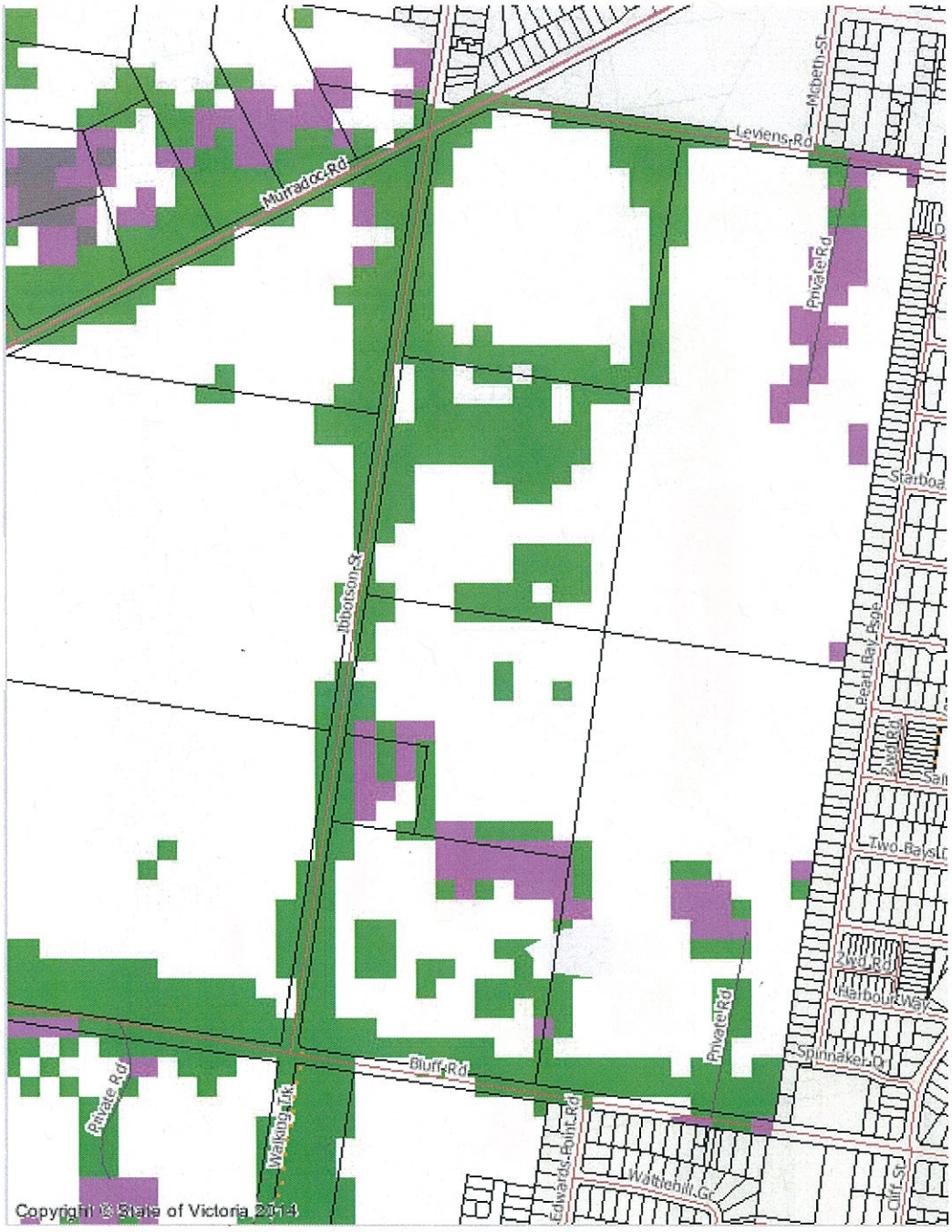


**Figure 3.** Native Vegetation Extent. Green equates to native vegetation cover, purple equates to exotic tree cover, white equates to exotic largely treeless vegetation (DSE Website i). The DEPI mapping is assessed to be in part correct in predicting the occurrence of the roadside reserves dominated native vegetation. However this study finds that the areas of green in the private sector of the study area are, in the main, devoid of native vegetation.


**Figure 4.** Native Vegetation Site Condition. The study area is given a site condition score of 0.21-0.4 (pink), 0.41-0.6 (yellow) and 0.61-0.8 (khaki) (DSE Website i). The areas of pink, yellow and khaki in part correspond with the occurrence of the roadside reserves dominated native vegetation. However this study finds that the area of pink, yellow and khaki in the private sector of the study area are, in the main, devoid of native vegetation.

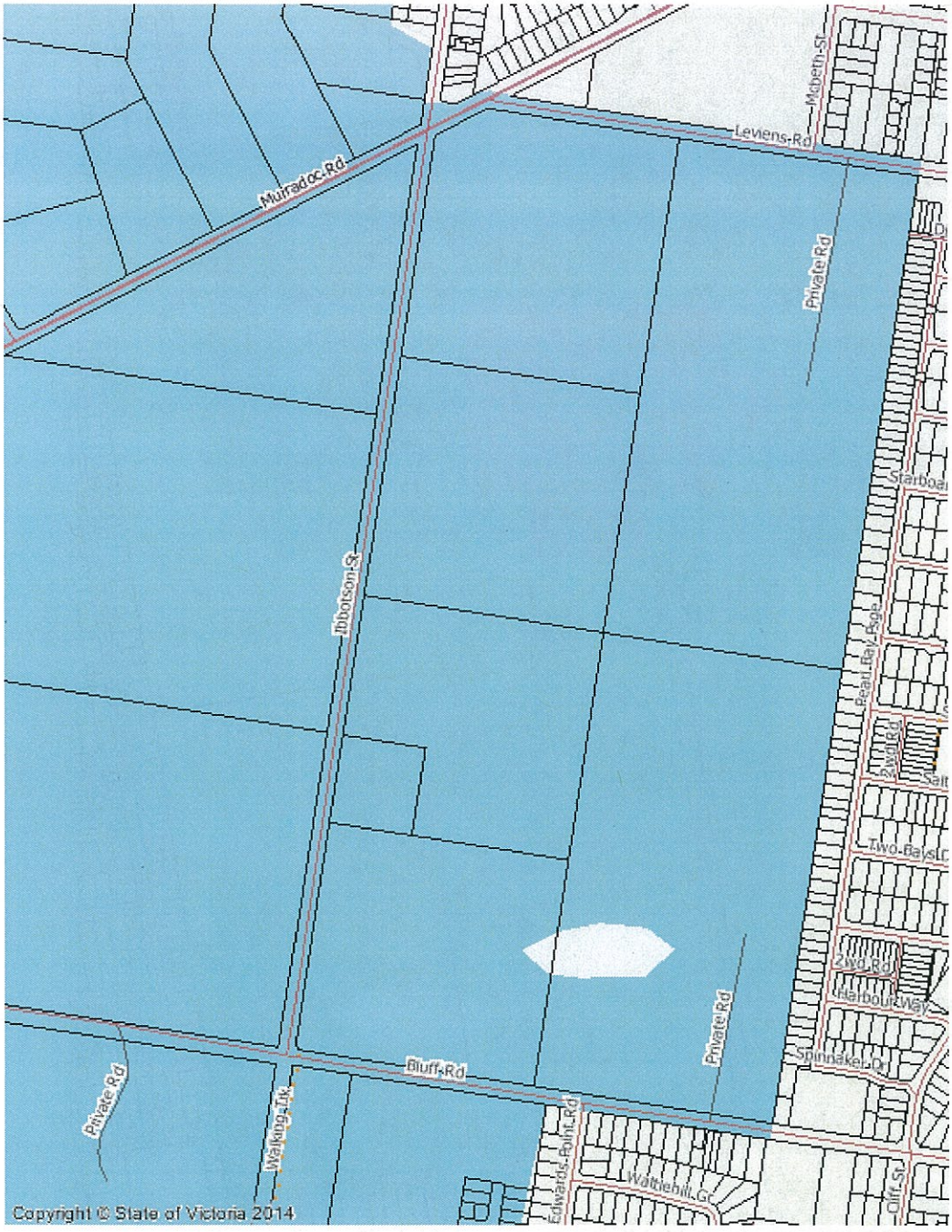


**Figure 5.** Distribution of vegetation according to 'Location Risk'. Blue equates to 'Location Risk A' (i.e. least risk). (DSE Website i).

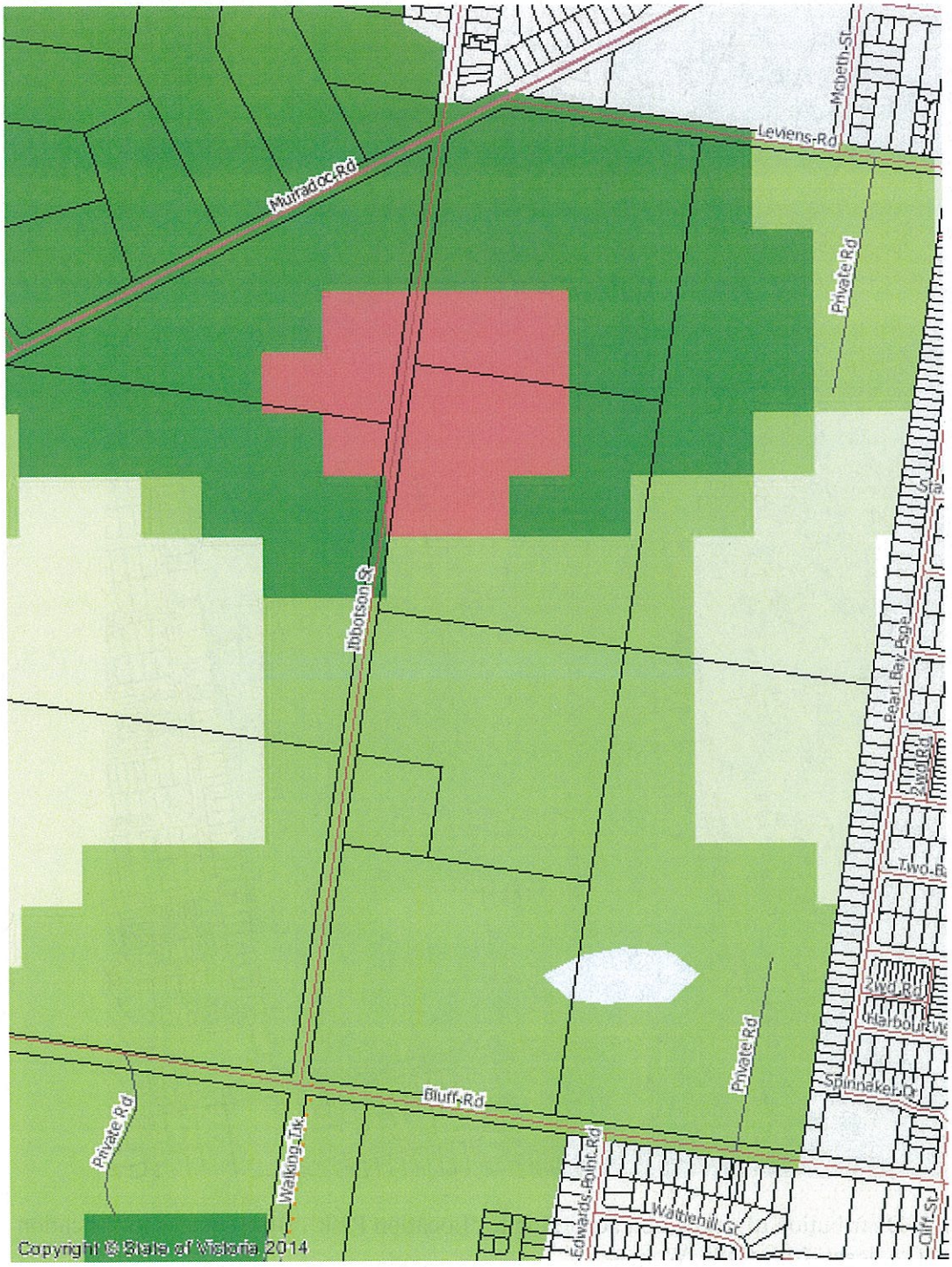


**Figure 6**. Strategic Biodiversity Score. The study area is given a Strategic Biodiversity Score of 0.21-0.4 (light green), 0.41- 0.6 (dark green) and 0.61-0.8 (pink) (DSE Website i). The areas of highest Strategic Biodiversity Score (pink) appear to correlate with areas of exotic Gorse vegetation.

### 4.1.1 Area of Remnant Patch Vegetation

Under the Regulations, any remnant 'patch' vegetation that is proposed to be removed is subject to protection/and or recruitment offsets, depending upon the characteristics of the site.

The current survey results show that indigenous remnant patch vegetation is comprised of the following:

- Partially intact River Red Gum, Coast Tea-tree and Wattle dominated vegetation that occur as separate 'patches' that occur on the private property.
- Partially intact, Drooping Sheoke and Coast Tea-tree dominated vegetation that occurs as separate 'patches' that are confined to sections of the private property adjacent to the Levians Rd and Ibbotson St roadside reserves. These patches are regeneration from the roadside vegetation and are less than 10 years old. Although they are 'patch' vegetation it exempt under Clause 52.17 (DPCD Website i).
- Partially intact River Red Gum, Drooping Sheoke and Coast Tea-tree dominated vegetation that occurs as separate 'patches' that are confined to the adjacent Levians Rd and Ibbotson St roadside reserves.

The remainder of the study area is comprised of pre-dominantly exotic vegetation.

### 4.1.2 Trees

Under the Regulations, any scattered native canopy trees that are proposed to be removed are subject to protection/and or recruitment offsets, depending upon the characteristics of the site.

Scattered trees, that is, mature native canopy trees that exist outside of a patch, are also assessed under the Regulations. Within the Otway Plain bioregion, EVC 55 has *Eucalyptus* spp as 'canopy trees'.

For practicality, a standard extent amount (i.e. 0.071 ha per tree) has been developed for assessing applications to remove scattered trees, based on the habitat hectare assessment method.

Tree assessments have been undertaken for all the scattered trees as they are generally located within the proposed development area. A total of 6 scattered trees were recorded for the study area.

Refer to Table 3 for scattered tree findings. Refer to Figures 7a and 7b for the location of scattered tree and remnant patch vegetation.

**Table 3 Scattered Trees, DBH, Size Class and Tree Protection Zone**

| Tree # | Botanical name | DBH[1] | TPZ[2] |
|---|---|---|---|
| 1 | *Eucalyptus viminalis* ssp. *prioriana* | 58 | 7 |
| 2* | *Eucalyptus camaldulensis* | 71 | 8.5 |
| 3 | *Eucalyptus camaldulensis* | 150 | 18 |
| 4 | *Eucalyptus camaldulensis* | 120 | 14.4 |
| 5 | *Eucalyptus camaldulensis* | 145 | 17.4 |
| 6 | *Allocasuarina verticillata* | 52 | 6.2 |

[1] - Diameter at 1.3 metres above ground, in cm.
[2] - TPZ – Tree Protection Zone in metres (*refer to* Appendix 2).

* Note that Tree # 2 occurs within an area of remnant 'patch' vegetation.

### 4.1.3 Implications

The current survey results show that areas of remnant 'patch' and 'scattered tree' vegetation occur within the study area and on the adjacent on the Leviens Rd and Ibbotson St roadside reserves.

Therefore there would be implications for the Regulations if areas of remnant 'patch' roadside vegetation were proposed to be cleared. A permit would be required for the removal of that vegetation and appropriate vegetation offsets would be required to be generated.

An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway. An application to remove greater than 1 ha of 'Location Risk A' native vegetation would be assessed as a Moderate risk-based pathway.

## 5 Conclusions

The study has a history of agricultural and residential disturbance. The vegetation of the study area can be described as follows:

- Remnant 'patch' and 'scattered tree' vegetation that occurs within the study area.
- Remnant 'patch' vegetation that occurs on sections of the adjacent Leviens Rd and Ibbotson St roadside reserves.
- Pre-dominantly exotic degraded vegetation, which dominate the study area.
- Non indigenous native and exotic plantations.

The Remnant 'patch' and 'scattered tree' vegetation accords with EVC 55 Plains Grassy Woodland. The bioregional conservation status of EVC 55 Plains Grassy Woodland is 'Endangered'

The remainder of the study area is comprised of predominately exotic vegetation.

A total of 18 indigenous plant species were recorded for the study area.

No plant species of National or State conservation significance were recorded. A total of two Regionally Significant plant species, i.e. River Red Gum and Drooping Sheoke, were recorded. The remaining 16 indigenous species are considered to be of Local conservation significance.

DEPI mapping designates the study area as 'Location Risk A' (i.e. least risk). An application to remove less than 1 ha of 'Location Risk A' native vegetation would be assessed as a Low risk-based pathway. An application to remove greater than 1 ha of 'Location Risk A' native vegetation would be assessed as a Moderate risk-based pathway.

Therefore there would be implications for the Regulations if areas of remnant 'patch' roadside vegetation were proposed to be cleared. A permit would be required for the removal of that vegetation and appropriate vegetation offsets would be required to be

There are not considered to be any significant limitations to this survey.

## 6 References


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DEPI Website ii.
http://nvim.depi.vic.gov.au/

DEPI Website iii.
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## Figure 7a Location of Native Vegetation Subject Property


**Figure 7a.** Location of remnant patch and scattered tree vegetation on subject land.

## Figure 7b Location of Native Vegetation adjacent Roadside Reserve

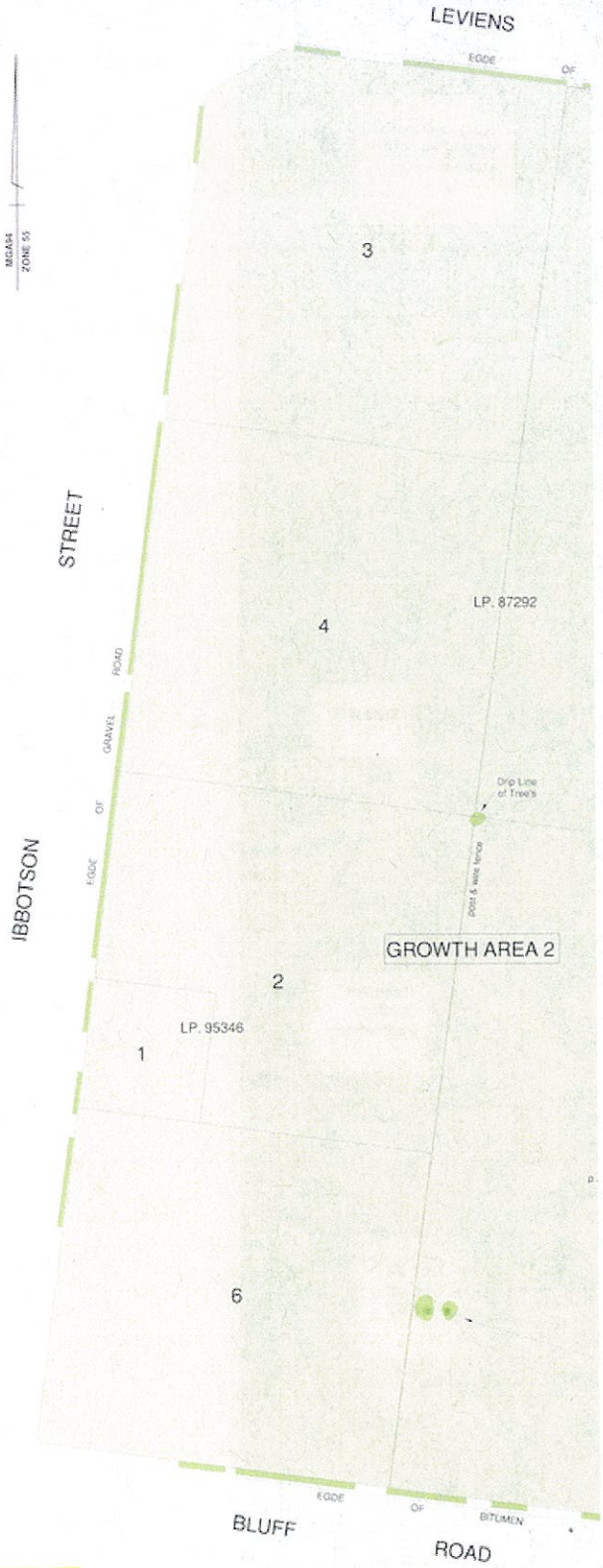


**Figure 7b.** Location of remnant patch vegetation on adjacent roadside reserves shown in green.

## Appendix 1 Assessing Conservation Significance

Conservation significance is assessed at a range of scales, including global, international, national, state, regional and local. Criteria used for determining the conservation significance of flora and fauna at national to local scales are presented below for botanical and zoological conservation significance.

**Botanical Significance**

**National** botanical significance applies to an area when it supports one or more of the following attributes:

a population of at least one nationally threatened plant species listed by Briggs and Leigh (1996) or plant species listed on the schedules to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

A nationally threatened ecological community listed on the schedules of the *Environment Protection and Biodiversity Conservation Act 1999*.

**State** botanical significance applies to an area when it supports one or more of the following attributes:

A population of at least one plant species threatened in Victoria, as listed by Gullan et al. (1990), NRE (2000a) or more recently in the unpublished records of the Flora Information System (NRE), or on the schedules to the Victorian *Flora and Fauna Guarantee Act 1988*.

An ecological community considered threatened in Victoria through its listing on the schedules of the *Flora and Fauna Guarantee Act 1988*.

**Regional** botanical significance applies to an area that supports one or more of the following attributes:

Supports a population of one or more regionally depleted species defined in a valid regional assessment of biodiversity (eg. Regional Native Vegetation Plan, Environment Conservation Council Report or Comprehensive Regional Assessment documents).

An ecological vegetation class that is considered endangered or vulnerable in a particular bioregion (based on Conn 1993 and the Regional Native Vegetation Plan), in which case the area is of **High Regional** significance.

An ecological vegetation class that is considered depleted in a particular bioregion (based on Conn 1993 and the Regional Native Vegetation Plan), in which case it is of **Regional** significance.

**Local** botanical significance applies to all remnant native vegetation that does not meet the above criteria. In much of Victoria, and in particular in the Otway Plain bioregion, native vegetation has been so depleted by past clearing and disturbance that all remaining vegetation must be considered to be of at least local conservation significance.

## Appendix 2 Determining the Tree Protection Zone

**Determining the Tree Protection Zone (TPZ)**
The radium of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (Australian Standard AS4970-2009 *Protection of trees on development sites)*
Where
DBH = trunk diameter measured at 1.4 metres above ground Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ.

A tree is deemed to be impacted upon if greater than 10% of the TPZ area is to be disturbed.

**Indicative Size of Tree Protection Zone**