

Healesville - Koo Wee Rup Road Upgrade - Preliminary Native Vegetation Assessment

Project: 08-78

Prepared for:

VicRoads



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1 Introduction

Ecology Australia was commissioned by VicRoads to undertake a desktop review to provide VicRoads with a preliminary estimate of the potential impacts of the Healesville – Koo Wee Rup Road project on native vegetation. This review builds on from previous work Ecology Australia has undertaken for VicRoads for the project. This work has included two desktop assessments and targeted surveys for threatened flora (River Swamp Wallaby-grass) and fauna (Southern Brown Bandicoot, Growling Grass Frog and Swamp Skink).

The initial desktop assessments were at an overview level and did not include the recent concept plans for the proposed upgrade, which now have service roads and interchange alignments. The objective of the study is to provide a broad estimate of the native vegetation expected to be impacted as a result of the upgrade and would only be used by VicRoads as a guide. In particular, VicRoads wish to know whether the estimate of loss is near 10 ha, which is a potential trigger for an Environmental Effects Statement (EES) referral. It will also assist VicRoads in the evaluation of options for a bypass of Koo Wee Rup (southern section) and a connection to the Pakenham Bypass (northern section). In addition, a summary of Net Gain and an outline of the potential Net Gain offset requirements are also presented (Section 5).

A field survey, including a Net Gain assessment, will need to be undertaken for the final road alignment.

1.1 Study Area

The Healesville – Koo Wee Rup Road upgrade extends from the Pakenham Bypass to the South Gippsland Highway (c. 13 km). In the longer term, the project will include upgrading the existing road (two lanes each way), interchanges at Greenhills, Hall, Ballarto and Manks Roads, service roads to private properties and on and off ramps to the South Gippsland Highway.

The study area is defined by the proposed road alignment (Figure 1) and areas adjoining the alignment that may be impacted during construction (Figure 2 a-d). With the exception of the interchanges, the extent of disturbance is generally confined to a width of 80 m.

The study area is within the Gippsland Plain Bioregion. It would have once formed part of the Koo Wee Rup Swamp prior to drainage and predominately supported Swamp Paperbark shrub (*Melaleuca ericifolia*), reeds and rushes (Yugovic and Mitchell 2006). North of the South Gippsland Railway Line, native vegetation is now largely confined to road reserves, creeks and drainage-lines. Considerable areas of remnant vegetation occur in the southern section of the study area along the Bunyip River Drainage-line Complex (McGregors Drain, McDonalds Drain, North West Drain, Bunyip River Drain and Southern Boundary Drain) and Moodys Inlet, which includes Cardinia, Toomuc and Deep Creeks. All these watercourses flow into the internationally important

wetland, the Western Port Ramsar Site (ANCA 1996). The lower reaches of the drains also form part of the Ramsar site (coast to the South Gippsland Highway).

2 Methods

The loss of native vegetation associated with the upgrade of the Healesville – Koo Wee Rup Road was estimated by undertaking a preliminary desktop review and utilising our knowledge gained from previous field surveys in the area.

The study area has previously been visited by Ecology Australia as part of the following studies:

- Healesville – Koo Wee Rup Road – Flora and Fauna Issues, Desktop Review (Ecology Australia 2005)
- Healesville – Koo Wee Rup Road – Southern Brown Bandicoot Survey (Ecology Australia 2006a)
- Healesville – Koo Wee Rup Road Upgrade – Growling Grass Frog Surveys (Ecology Australia 2006b)
- Healesville – Koo Wee Rup Road Upgrade – Rare Plant Survey focusing on *Amphibroumus fluitans* (Ecology Australia 2006c).
- Healesville – Koo Wee Rup Road – Pakenham Bypass, Alternate Connection. Desktop Review of Flora and Fauna Values (Ecology Australia 2007).
- Healesville – Koo Wee Rup Road Upgrade: Growling Grass Frog and Swamp Skink Survey (Ecology Australia 2008a)
- Healesville – Koo Wee Rup Road Upgrade: Southern Brown Bandicoot Surveys (Ecology Australia 2008b).

Further, the desktop assessment involved:

- reviewing the recently updated DSE extant Ecological Vegetation Class (EVC) mapping (DSE 2008);
- reviewing previous reports from the area (Ecology Australia 2005-2008 and Ecology Partners 2007).
- Analysing aerial photography; and
- Utilising Google Street View©

VicRoads provided the concept plans for the upgrade. Vegetation expected to occur within the vicinity of the proposed road alignment was mapped (Figure 1). A set vegetation width was given for areas predicted to support native vegetation. This width was estimated from aerials and our knowledge of the area (refer also Section 4). In general an 80 m wide construction corridor was applied to the proposed alignment. Vegetation within this alignment was assumed lost.

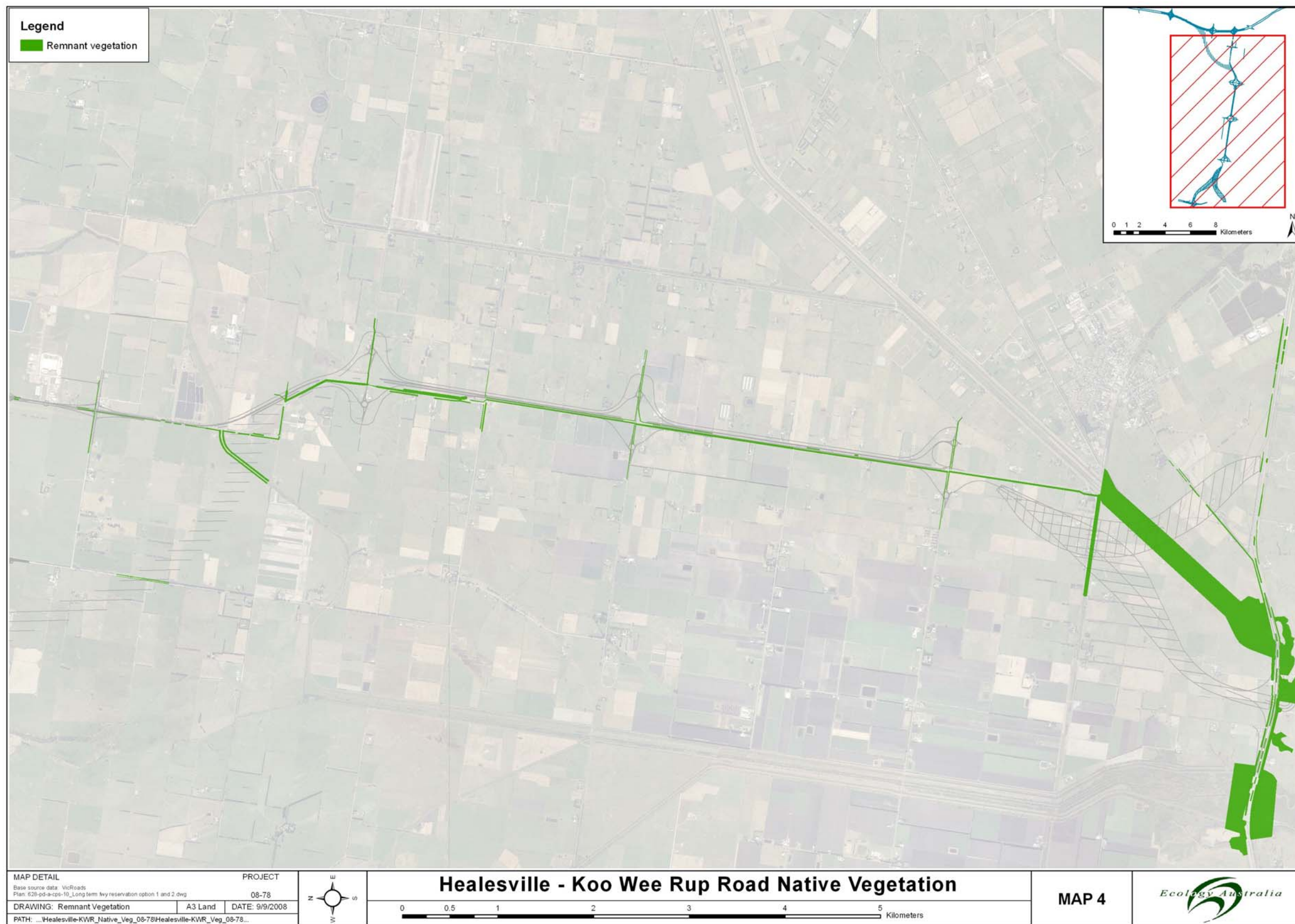


Figure 1 Healesville – Koo Wee Rup Road Upgrade – native vegetation (green) predicted to occur within, or immediately adjoining, the proposed road alignment.

3 Potential Impacts to Native Vegetation

This section estimates the potential loss of native vegetation as a result of the Healesville Koo Wee Rup Road Upgrade and includes two options for the future road alignments in the north and south of the study area, and also potential road interchanges and local service roads. The losses are preliminary estimates, and as mentioned above, they must be confirmed with a field survey.

The study area has been broken down into five sections:

- Section 1 – Pakenham Bypass to north of Watson Road, VicRoads Option 1
- Section 2 – Pakenham Bypass to north of Watson Road, VicRoads Option 2
- Section 3 – Watson Road to South Gippsland Railway Line
- Section 4 – Koo Wee Rup Bypass – VicRoads Option 1
- Section 5 – Koo Wee Rup Bypass – VicRoads Option 2

For each section, the results of this desktop assessment are presented, and include the assumptions made (e.g. width of vegetation, also see below) and additional comments/recommendations.

Estimated losses have been broken down into indicative impacts associated with upgrading, or building a new road, the installation of the interchanges, and where impacts are likely to be combined, the upgrade and interchanges together.

In general, widths of vegetation that are predicted to occur within the road reserves or drainage lines/creeks are as follows:

- Healesville – Koo Wee Rup Road (eastern side)
 - Drains supporting native vegetation - 3 m or 5 m
 - Larger patches of Swamp Scrub (around Hall Road) – 20 m or 30 m
- Healesville – Koo Wee Rup Road (western side)
 - Narrow patches of native vegetation (may include drains) in the northern section – 5 m
 - Native vegetation within the larger drains and/or shrubs within the southern section (south of Soliders Road) – 10 m or 15 m
- Side roads (including McGregors Road)
 - Drains supporting native vegetation – 3 m narrower drains – 5 m wider drains (may also include scattered scrubs).
 - Patches of native shrubs and vegetation within the drains – 10 m
- Deep Creek (terrestrial vegetation only) – 15 m northern bank and 10 m southern bank

-
- South Gippsland Highway road reserve (east of Koo Wee Rup Swamp)
 - Native vegetation within drains – 3 m
 - Patches of native shrubs – 5 m, 10 m or 15 m
 - South Gippsland Highway road reserve (west of Koo Wee Rup Swamp)
 - Patches of native vegetation – mostly 10 m or 15 m; 30 m adjoining Moodys Inlet (south side).
 - Bunyip River Drainage Line Complex, Moodys Inlet and Koo Wee Rup Swamp – contiguous patches of native vegetation. Loss is generally defined by the width of the construction corridor.

3.1 Section 1: Pakenham Bypass – north of Watson Road, Option 1

Location:	Located between the Pakenham Bypass and just north of Watson Road. This option involves upgrading the existing road alignment and includes an interchange at Greenhills Road.	
Figure/s	Map 1	
Estimated Native Vegetation Impacted	Upgrading Healesville - Koo Wee Rup Road:	0.33 ha
	Installation of the interchange:	0.72 ha
	Estimated total:	1.05 ha
Assumptions:	<ul style="list-style-type: none"> • The area of possible disturbance is 40 - 80 m wide centred on the proposed road alignments (excluding interchange). • Width of native vegetation within the Healesville- Koo Wee Rup Road reserve includes: 3 m for vegetation within the drains, 5 m for drains and adjoining scattered indigenous shrubs, and 10 m for larger patches of shrubs (may also include associated drains). • Width of native vegetation within Greenhills Road reserve is 3 m for the narrow drain west of Koo Wee Rup Road and 5 m for the wider drain (east side). • Instream vegetation of Deep Creek will not be impacted and therefore has not contributed to the estimated loss. 	
Comments:	<ul style="list-style-type: none"> • Some native vegetation mapped in the earlier desktop review (Ecology Australia 2005) has been removed as part of the Pakenham Bypass project. 	

3.2 Section 2: Pakenham Bypass – north of Watson Road, Option 2

Location:	Located between the Pakenham Bypass and north of Watson Road. This option involves a new road linking the Pakenham Bypass (just east of Toomuc Creek) to the Healesville – Koo Wee Rup Road, joining south of Deep Creek. The road would cross McGregor Road and Deep Creek.	
Figure/s	Map 1	
Estimated Native Vegetation Impacted	Installation of a new linking road:	0.9 ha
	Estimated total:	0.9 ha
Assumptions:	<ul style="list-style-type: none"> • The area of possible disturbance is 80 m wide. An indicative road alignment is shown and is within the ‘band of interest’ for this option. • Instream vegetation of Deep Creek will not be impacted and therefore has not contributed to the estimated loss. • Plains Grassland and Plains Grassy Woodland would have been dominant EVCs within the northern section of this road alignment. Small patches have been recently modelled for the area by the recently updated interactive mapping DSE (2008). None of these remnants have been mapped in Ecology Partners (2007). The distribution of these EVCs, particularly Plains Grassland, within the road alignment can only be determined by field survey and can not be estimated for the current project. 	
Comments:	<ul style="list-style-type: none"> • While the loss of vegetation is estimated to be small, in terms of potential impacts to flora and fauna, the Growling Grass Frog is the most important factor to be considered for this option (refer also Ecology Australia 2007 and 2008a). 	

3.3 Section 3: Watson Road to South Gippsland Railway Line

Location:	This option involves upgrading the existing road alignment and includes an interchanges at Hall, Ballarto and Manks Roads	
Figure/s	Maps 1-3	
Estimated Native Vegetation Impacted	Upgrading Healesville - Koo Wee Rup Road:	0.90 ha
	Installation of interchanges and service roads:	5.14 ha
	Upgrading road and interchanges/service roads:	2.96 ha
	Estimated total:	9.0 ha
Assumptions:	<ul style="list-style-type: none"> • The area of possible disturbance for the road upgrade is 80 m wide between Watson Road and Ellett Road. This band of disturbance is centred on the proposed road alignment where the new alignment is within adjoining paddocks. Where the existing road is being used, the band of disturbance is 60 m from the current western road verge (i.e. avoids vegetation within the western road reserve where there is no interchange). • Service roads include an additional 20 m construction corridor on top of the upgrade construction corridor, or where they are not adjoining the Healesville – Koo Wee Rup Road. • Interchanges have an additional 10 m construction corridor added to the outer road alignment. It is assumed that areas within the centre of the interchange will be disturbed. • Width of native vegetation within the western side of the Healesville-Koo Wee Rup Road Reserve is 10 m wide to Soldiers Road and 15 m wide to the railway line. • Width of native vegetation on the eastern side of the road reserve is 20 m or 30 m to Soliders (includes larger patches of Swamp Scrub and drains) and 5 m in the remaining mapped areas. • Width of native vegetation on side roads – 10 m for larger patches of vegetation (may also include drains) and 3 – 5 m for native vegetation associated with the drains. 	
Comments:	<ul style="list-style-type: none"> • The largest areas of vegetation that could potentially be impacted are associated with the interchanges, particularly at Hall Road. There could be some potential to minimise vegetation loss in these areas, which would also be beneficial for the Growling Grass Frog and Southern Brown Bandicoot. 	

	<ul style="list-style-type: none">• There may also be further potential to avoid native vegetation within the construction corridor associated with the upgrade of Healesville – Koo Wee Rup Road.
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3.4 Section 4: Koo Wee Rup Bypass – Option 1

Location:	Located between the South Gippsland Railway and the South Gippsland Highway. This option involves a new road that will bypass Koo Wee Rup. It will involve crossing the Bunyip River Drainage Line Complex, interchanges on Rossiter Road, on and off ramps at the South Gippsland Highway, and a service road south of the South Gippsland Highway for access to private properties.	
Figure/s	Maps 4	
Estimated Native Vegetation Impacted	Construction of the new road including the service road and on and off ramps at the South Gippsland Highway:	2.7 ha
	Interchanges on Rossiter Road:	0.88 ha
	Estimated total:	3.6 ha
Assumptions:	<ul style="list-style-type: none"> • The area of possible disturbance for the bypass includes an 80 m wide corridor within the ‘band of interest’. • A 20 m disturbance zone has been added on to either side of the round-a-bouts, service roads, and on and off ramps. • Areas between on and off ramps and main carriageways will potentially be disturbed during construction. • It is estimated that 40% of the 2 ha of native vegetation within the Bunyip River Drainage Line complex will not be impacted. This equates to 0.82 ha. This estimate will need to be confirmed at the detailed design phase. • Native vegetation associated with the railway reserve will be avoided. • Native vegetation within Rossiter Road reserve has a width of either 5 m or 10 m (more intact patches). • Width of native vegetation within the South Gippsland Highway Road Reserve varies from 3 m (drains) to 15 m (larger patches). • Scattered trees are not included in the assessment 	
Comments:	<ul style="list-style-type: none"> • There could be further potential to reduce vegetation losses associated with the interchanges and service roads. 	

3.5 Section 5: Koo Wee Rup Bypass – Option 2

Location:	Located between the South Gippsland Railway and the South Gippsland Highway. This option also involves a new road to be built to bypass Koo Wee Rup. It will cross the railway line and connect to the Gippsland Highway between the Koo Wee Rup Swamp and Moodys Inlet. The South Gippsland Highway will need to be widened, which will also include the bridges crossing the waterways associated with the Inlet. A major interchange is proposed to be constructed south of the highway, as well as service roads to the private properties in this area and Prestons Road.	
Figure/s	Maps 4	
Estimated Native Vegetation Impacted	Widening of Highway (including bridges) and installation of on and off ramps and service roads	14.9 ha
	Estimated total:	14.9 ha
Assumptions:	<ul style="list-style-type: none"> • The area of potential disturbance for the bypass includes an 80 m wide corridor within the ‘band of interest’ and for the South Gippsland Highway. • A 20 m disturbance zone has been added on to either side of the South Gippsland Highway for service roads. • Areas between on and off ramps and main carriageways will potentially be disturbed. • Native vegetation is essentially continuous within the Bunyip River Drainage Line Complex and Moodys Inlet. The width of vegetation potentially impacted is determined by the assumed corridor widths. • Native vegetation associated with the railway reserve will be avoided. • Width of native vegetation within the South Gippsland Highway Road Reserve (including the median strip), outside of the larger continuous remnants, varies from 3 m (drains) to 30 m (larger patches). The majority of the patches are assumed to be either 10 m or 15 m wide. • Scattered trees are not included in the assessment. 	
Comments:	<ul style="list-style-type: none"> • Loss of native vegetation associated with this option is likely to be substantial. Moody’s Inlet supports a very significant and large remnant, and measures to avoid this vegetation should also be investigated. • Interpretation of aerial photography indicates that remnant vegetation (possibly part of a Saltmarsh Complex) may persist south of the South 	

	<p>Gippsland Highway where the proposed interchange is located. The presence of this vegetation has not been confirmed by any previous site visit.</p>
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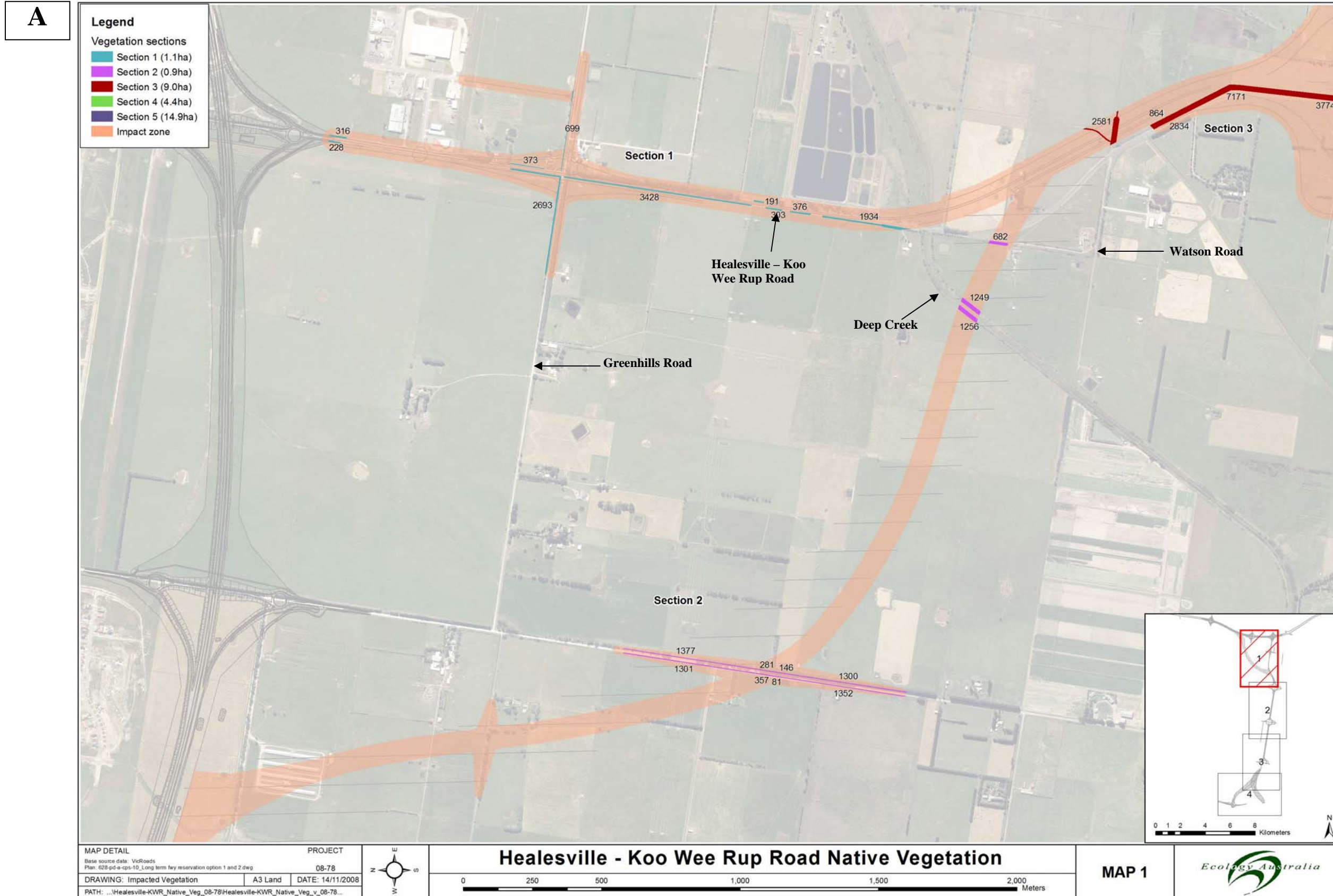
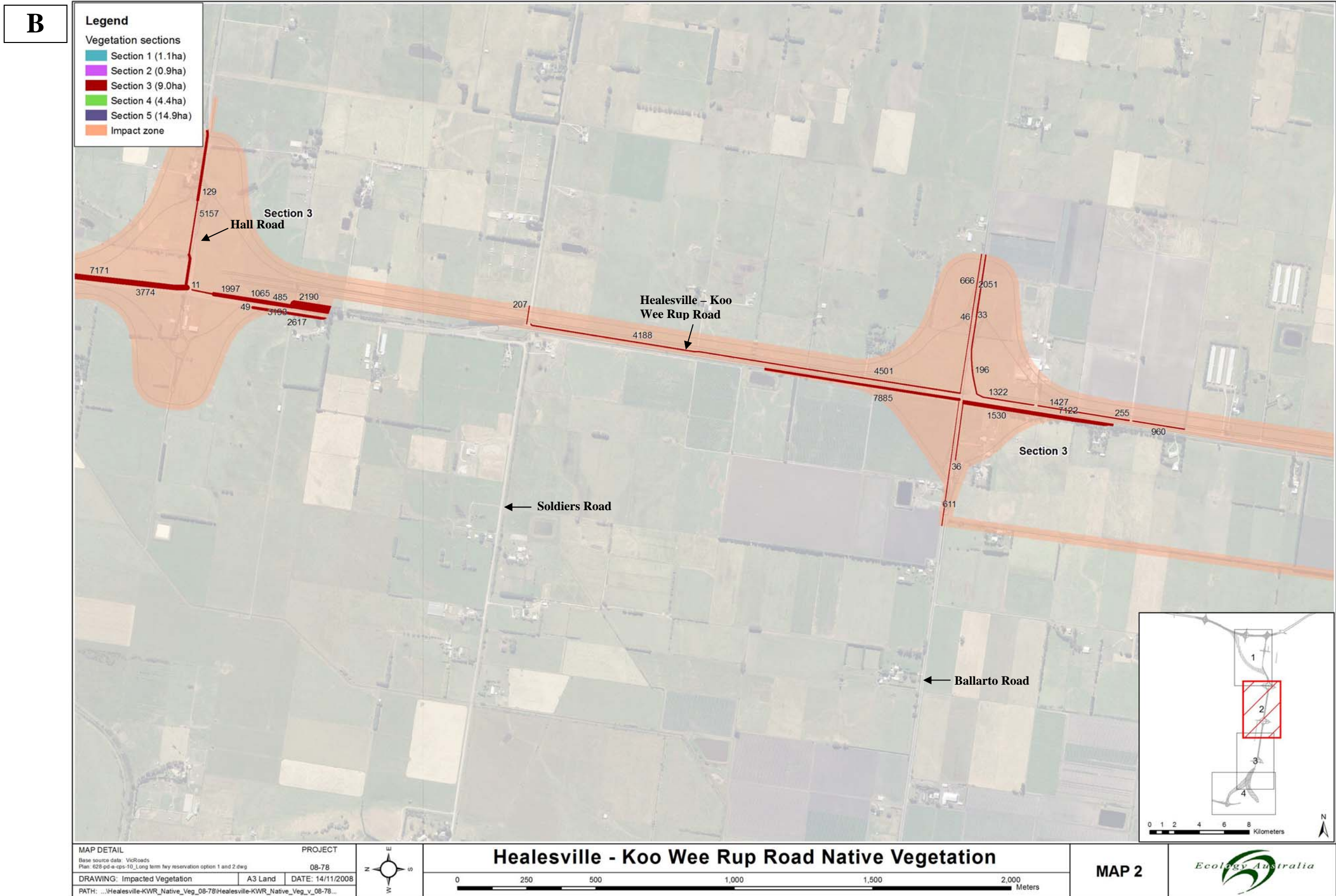
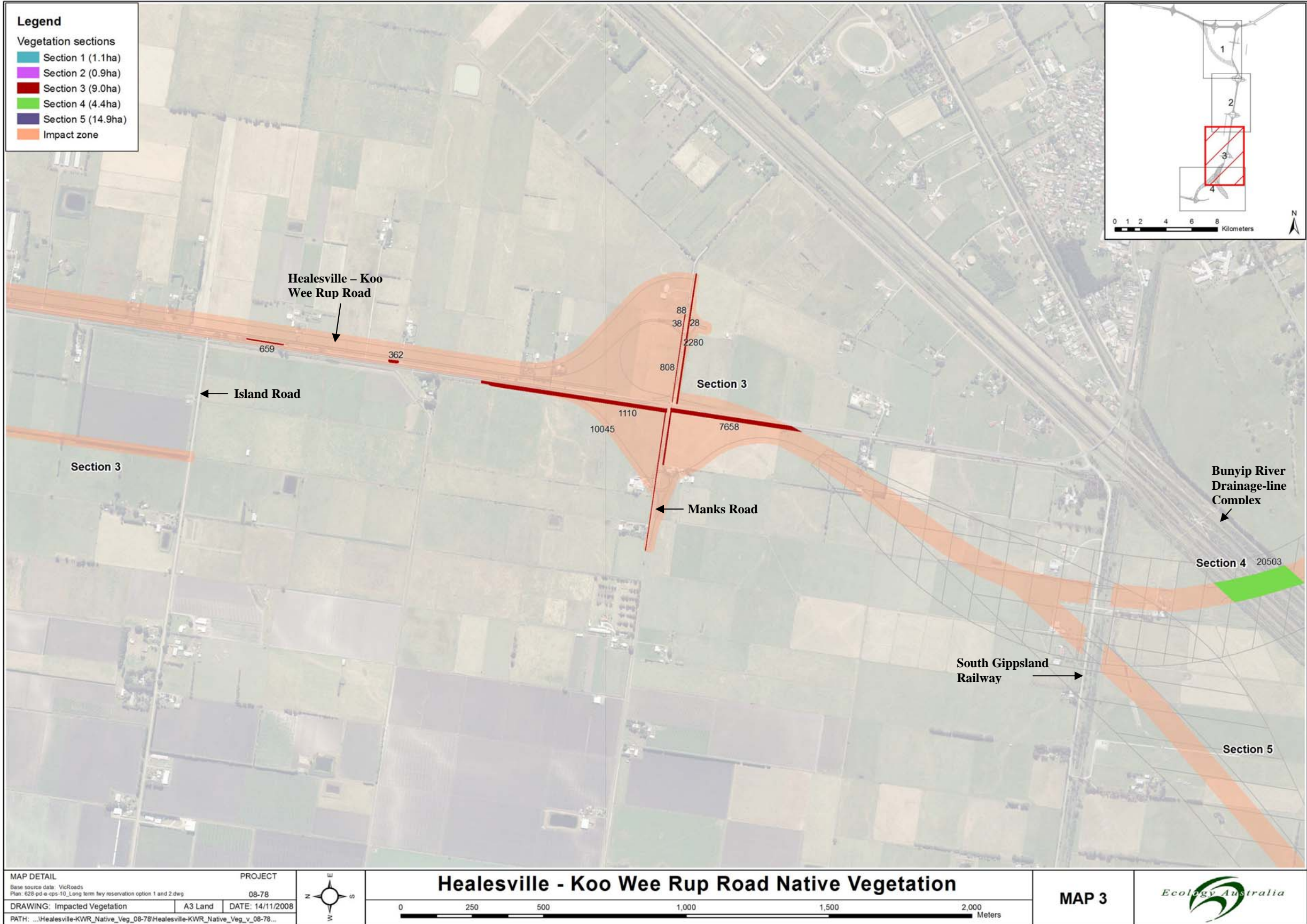


Figure 2 (A-D) Healesville – Koo Wee Rup Road Upgrade – native vegetation estimated to be impacted by the upgrade

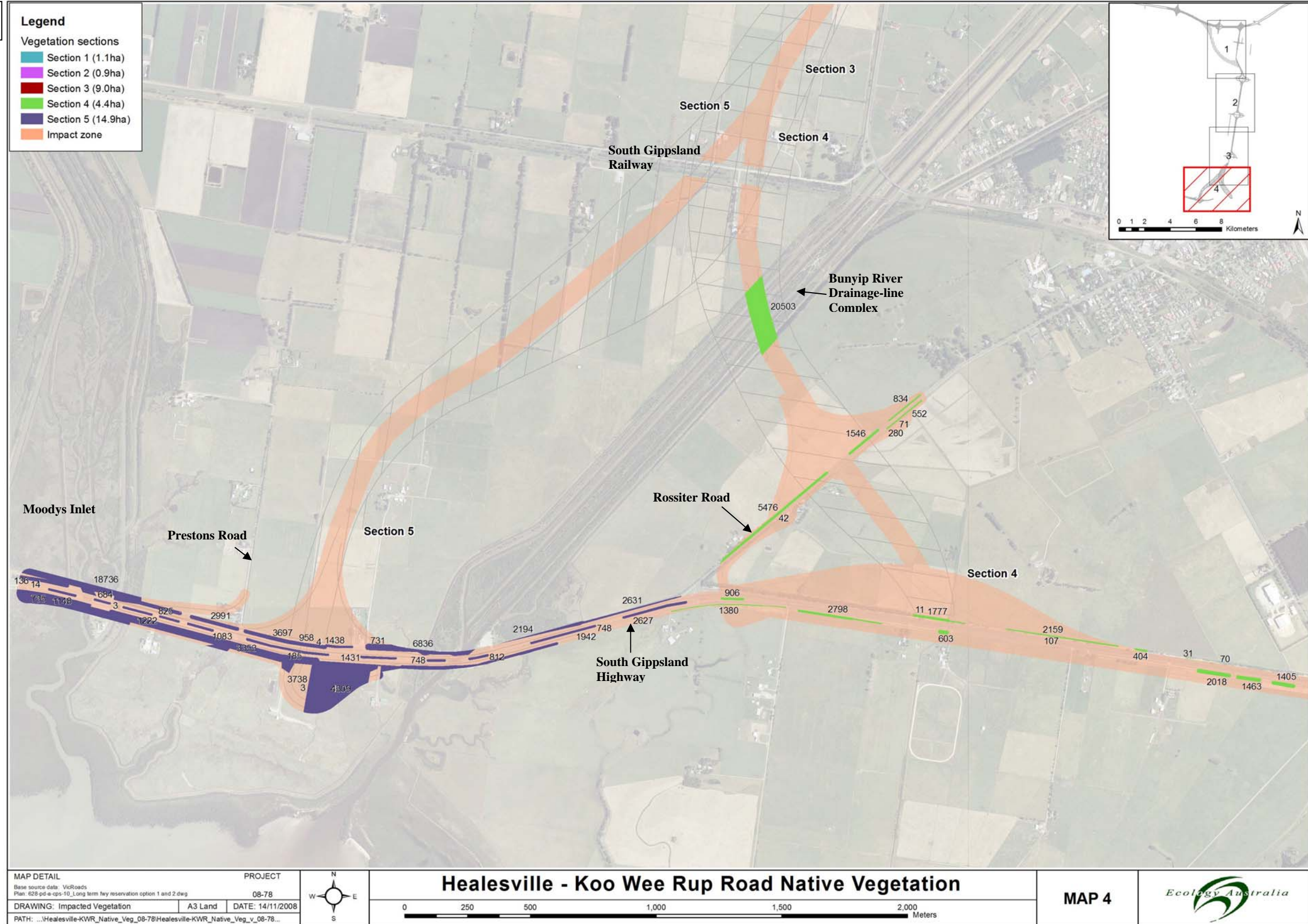




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4 Discussion of results

This desktop analysis suggests that the loss of an Endangered EVC as a result of the Healesville – Koo Wee Rup Road Upgrade is likely to exceed 10 ha. The impact on native vegetation within the main section of the proposed upgrade (Section 3) is estimated to be in the order of 9.5 ha and the southern options 4.8 ha and 15.6 ha. In addition, two EPBC-listed species (Southern Brown Bandicoot and Growling Grass Frog) are associated with the native vegetation mapped in sections of the proposed upgrade (refer Ecology Australia 2006 a, b and 2008 a, b).

With the exception of the Bunyip River Drainage-line Complex and Moodys Inlet, native vegetation within the study area is largely confined to the road reserves. Drains adjoin all roads (including side roads) and the majority of these drains are expected to support native vegetation. The loss of vegetation quickly accumulates at road intersections, where interchanges are proposed, and where all roads reserves are likely to be impacted. Within Section 3 for example, the greatest loss of native vegetation is associated with the interchanges.

It should be noted that this preliminary assessment of the potential impact on native vegetation is based on a desktop analysis only. This had included assumptions about the extent of native vegetation and the final design of the road upgrade.

The presence and/or absence of native vegetation and the size of patches will need to be confirmed by a field survey. This would form part of a Net Gain assessment, which would also determine the quality of the vegetation and the required Net Gain offsets (refer below). There may also be further potential to reduce impacts on native vegetation through design and/or reducing the construction width. Avoiding and minimising losses will need to be addressed as part of the planning permit application process and also any EPBC and EES referral. Reducing the extent of native vegetation being removed will also be beneficial for threatened species, particularly the Southern Brown Bandicoot (e.g. Swamp Scrub) and Growling Grass Frog (e.g. native vegetation within the drains).

5 Native Vegetation - Planning and Environment Act and Net Gain

In relation to the protection of flora and fauna, the Planning and Environment Act 1987 requires the relevant local government to consider such matters under the Victorian Planning Provisions (clause 52.17 Native Vegetation Protection and clause 15.09 Conservation of Native Flora and Fauna).

Victoria's policy on native vegetation, Victoria's Native Vegetation Management – A Framework for Action (the Framework) (DSE 2002) was incorporated into the Victorian Planning Provisions in 2003. The Framework's main goal is to achieve a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a Net Gain. For the clearing of vegetation, clause 52.17 requires the proposals to demonstrate the three-staged process of Net Gain:

1. **Avoid** removal of native vegetation;
2. If impacts cannot be avoided, **minimise** impacts through appropriate planning and design;
3. If clearing must occur, the loss of native vegetation must be appropriately **offset**.

The proposed Healesville – Koo Wee Rup Road upgrade will need to address the first two steps – avoidance and minimisation. Further, once the alignment has been finalised, a Net Gain assessment will be required to confirm the extent and quality of native vegetation that will be impacted.

All native vegetation (patches and remnant trees) proposed for removal must be offset. The extent and quality of Net Gain offset requirements is determined by the conservation significance of the vegetation and the area of vegetation being removed. This significance is dependent on the conservation status of the EVC, the quality of the patch, the quality of habitat for rare or threatened species, or other attributes important for the protection of flora and fauna values.

Below the conservation significance of the vegetation within the study area is discussed. A breakdown of the potential offset requirements for the project is also provided.

Conservation significance

A large proportion of the native vegetation within the study area will be part of the Swamp Scrub and Tall Marsh (new wetland EVC 2006) Ecological Vegetation Communities. These EVCs are endangered in the Gippsland Bioregion. Other EVCs that may potentially occur within, or adjoining, the study area include: Plains Grassland (Endangered), Plains Grassy Woodland (Endangered), Swampy Woodland (Endangered), Swampy Riparian Woodland (Endangered), Mangrove Shrubland (Least Concern), Coastal Saltmarsh (Least Concern) and Estuarine Flats Grassland (Least Concern).

With the exception of vegetation within Section 5, the majority of the vegetation impacted by the proposed upgrade will be from an Endangered EVC. Based on vegetation quality alone, the conservation significance of native vegetation belonging to an Endangered EVC is either high or very high (DSE 2002, Appendix 3).

Further, the conservation significance of a patch can be elevated (irrespective of the conservation status of the EVC), if it supports habitat for rare or threatened species in a bioregion, or if it supports other attributes important for the protection of flora and fauna values (e.g. Ramsar Sites, DSE 2002, Appendix 3). Some of the vegetation within the proposed impact area for the Healesville – Koo Wee Rup Road Upgrade will be elevated (potentially to very high conservation significance) as a result of these factors.

Potential offset requirements

The majority (or all) of the patches of native vegetation within the study area will be of high to very high conservation significance. The Framework states that if clearing of vegetation of high and very high conservation significance is permitted, the following offset requirements must be met:

- the Net Gain offset target is 2 x (offsetting very high) or 1.5 x (offsetting high) the calculated loss in habitat hectares (i.e. the total offsets must be 1.5 – 2 times the loss);
- the offset site must support vegetation of the same vegetation/habitat type, or in the case of offsetting vegetation of high conservation significance, the offsets can be within any EVC if it is of very high conservation.
- The offset must be of a similar, or more effective, ecological function and land protection function than that being impacted by the loss;
- The native vegetation included within the offset must be 90% (very high) or 75% (high) of the quality of the vegetation proposed for removal;
- The proportion of revegetation included within the offset is limited to 10% for offsetting vegetation of very high conservation significance and 25% for high (i.e. 90% and 75% of the offset must be through the protection and management of an existing remnant patch or patches).
- The offset site must be located within the same bioregion as the loss.

The Framework also notes that if vegetation of very high conservation significance is proposed for removal, it requires approval from the Minister for Environment and Conservation.

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