Gippsland Renewable Energy Zone™ (G-REZ™) Transmission Line - Preliminary Ecological Constraints Assessment

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Template 2.8.1

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Abbreviations

Abbreviation	Description
AEMO	Australian Energy Market Operator
EE Act	*Environment Effects Act 1978.* Victorian legislation that requires the environmental effects of certain works to be assessed.
EES	Environment Effects Statement.
ELA	Eco Logical Australia Pty Ltd.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999.* Key piece of national legislation to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places.
EVC	Ecological Vegetation Class.
FFG Act	*Flora and Fauna Guarantee Act 1988.* Key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes.
G-REZ	Gippsland Renewable Energy Zone™
MNES	Matter of National Environmental Significance as defined under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
NEM	National Electricity Market
NVIM	Native Vegetation Information Management system.
PMST	Protected Matters Search Tool.
REZ	Renewable Energy Zone
VBA	Victorian Biodiversity Atlas.
VROTS	Vulnerable, rare, or threatened species listed on the Department of Environment, Land, Water and Planning's Advisory Lists, including: Rare or Threatened Plants 2014; Threatened Vertebrate Fauna 2013; and Threatened Invertebrate Fauna 2009.

Key terms

Term	Description
Area of Disturbance	The area surrounding the route alignment, up to a 100m wide easement, in which physical disturbance of all above and below ground features may occur during construction and/or operation of the project.
Ecotone	A transitional area of vegetation between two different plant communities.
Local vicinity	An area within a 10 km radius of each corridor within the study area
Nationally significant	A Matter of National Environmental Significance (MNES) listed as critically endangered, endangered, or vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
Preliminary route	The preliminary route upon which the survey and study areas are based.
State significant	Listed as critically endangered, endangered, or vulnerable in Victoria on a Department of Environment, Land, Water and Planning Advisory List (Department of Sustainability and Environment 2009; Department of Sustainability and Environment 2013; Department of Environment and Primary Industries 2014a). Listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.
Study area	The area over which all desktop assessments have been completed to determine the likelihood of ecological values occurring, inclusive of all four corridor options
Survey area	A 500m wide corridor within the study area in which the preliminary route occurs where field-based validation of the ecological constraints was conducted.

1. Introduction

1.1. Background

Tetra Tech Coffey (Tetra Tech) engaged Eco Logical Australia (ELA) to undertake a desktop ecological constraints assessment of four corridor options to inform preliminary assessments for the AusNet Transmission Group Pty Ltd (AusNet Services) Gippsland Renewable Energy Zone™ (G-REZ) Project. The G-REZ project will include a double circuit 500kv overhead transmission line extending between the Gippsland Renewable Energy Park and the Loy Yang Power Station or Hazelwood Terminal Station. Based on this desktop assessment, and informed by other project constraints, a least constrained corridor was selected by AusNet Services, and a preliminary field survey subsequently conducted to determine the potential impacts of the G-REZ project, mitigation measures and requirements for further detailed investigations.

1.2. Objectives

The principal objective of this report is to provide an overview of ecological 'red flags' or key constraints for the implementation of the G-REZ project, in line with the requirements of the Victorian *Planning and Environment Act 1987*, *Flora and Fauna Guarantee Act 1988* (FFG Act), *Environment Effects Act 1978* (EE Act) and the *Australian Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The objectives of the initial desktop study of the four corridor options (the study area) were to:

- Identify existing ecological values within the survey area along each of the four corridor options.
- Provide high level advice on alterations to the preliminary route or design to avoid impacts on these values.
- Inform preparation of referrals (or equivalent) to the Victorian and Commonwealth governments.
- Define the scope of further assessment along the preliminary route.

The objectives of the field survey were to:

- Validate the desktop-based assessment of ecological values along the preliminary route.
- Inform the nature and extent of further detailed assessments required for the preliminary route.
- Provide an inventory of high priority land access requirements for further detailed assessments required to support approvals.

1.3. Scope of works

The analysis outlined in this report involved a comprehensive desktop assessment to characterise ecological values and inform a preliminary impact assessment. An initial field survey was also undertaken to review potential constraints along the preliminary route.

Specifically, the following tasks were undertaken:

- A detailed desktop assessment to review relevant biological databases, modelling and literature.

- A preliminary determination of the likelihood of ecological values (e.g. vegetation communities, threatened species, etc.) occurring within the different corridor options based on desktop information.
- An estimation of native vegetation extent and potential removal in the study area based on desktop resources.
- A preliminary impact assessment on values considered likely to occur within the study area based on desktop resources.
- Identification of legislative implications based on the findings of the preliminary impact assessment.
- Limited and rapid field surveys to broadly characterise ecological values along the preliminary route and assess specific environmental sensitivities.
- Recommendations for further studies and mitigation measures.

2. Project description

This section details the need for the project and describes the project components.

2.1. Need for project

The Australian Energy Market Operator (AEMO), responsible for transmission planning for the National Electricity Market (NEM), have published an Integrated System Plan in response to the market transitioning from coal-fired generation to renewable generation and decentralised energy resources (AEMO 2020). The Integrate System Plan identifies six renewable energy zones (REZs) and associated transmission investment required to service this market transition: Ovens Murray (V1), Murray River (V2), Western Victoria (V3), South West Victoria (V4), Gippsland (V5) and Central North Victoria (V6).

2.2. Gippsland Renewable Energy Zone transmission line

The G-REZ project is located in Gippsland, Victoria, traversing between Giffard and Hazelwood. The study area (inclusive of all four corridor options) are situated within the West Gippsland Catchment Management Authority, the Gippsland Plain bioregion and cross both the Wellington Shire Council and Latrobe City Council local government areas. Gippsland Plain bioregion comprises 78 ecological vegetation classes (EVCs), 34 of which are listed as endangered and 19 of which are listed as vulnerable, and includes flat, low lying coastal and alluvial plains with gently undulating terrain. A further description of the landscape is provided in Tetra Tech (2021). The G-REZ project has high potential for efficient energy generation being near existing Loy Yang and Hazelwood Terminal Stations in the La Trobe Valley and proposed wind and solar developments. These Terminal Stations are strong nodes in the Victorian transmission network and suitable connection points, with the G-REZ project having the potential to produce and transmit three to four gigawatts of renewable energy through AusNet Services proposed 500 kV transmission line connecting Giffard via proposed terminal station to Hazelwood Terminal Station.

Following a study on the corridor options for G-REZ by Tetra Tech (2021) for AusNet Services, feasible (potential) corridors within which potential terminal station sites and routes for the proposed transmission circuit/s were identified. This included three primary areas:

- A southern area along Basslink.
- A central area through the southern part of the Holey Plains State Park north of Merriman Creek valley.
- A northern area around Holey Plains State Park.

Within these three areas, a shortlist of the four least constrained corridors and terminal sites was proposed based on statutory requirements, environmental considerations, engineering considerations, and societal expectations. The potential ecological constraints of each of the four corridors have been assessed through a desktop study. Subsequently, a preliminary route within the preferred corridor was selected by AusNet Services, based on the desktop assessment and other project constraints, for preliminary ground-truthing.

3. Methods

3.1. Nominated areas

The study area for the desktop assessment comprises four corridors, each approximately 2.6 km in width and 80 to 100 km in length. A map of each of the corridor options is provided in Figure 1 and described below:

Giffard to Hazelwood, including:

- Corridor Option A – Giffard to Hazelwood north of Basslink
- Corridor Option B – Giffard to Hazelwood north of Holey Plains State Park

Giffard to Loy Yang, including:

- Corridor Option C - Giffard to Loy Yang north of Basslink
- Corridor Option D - Giffard to Loy Yang north of Holey Plains State Park

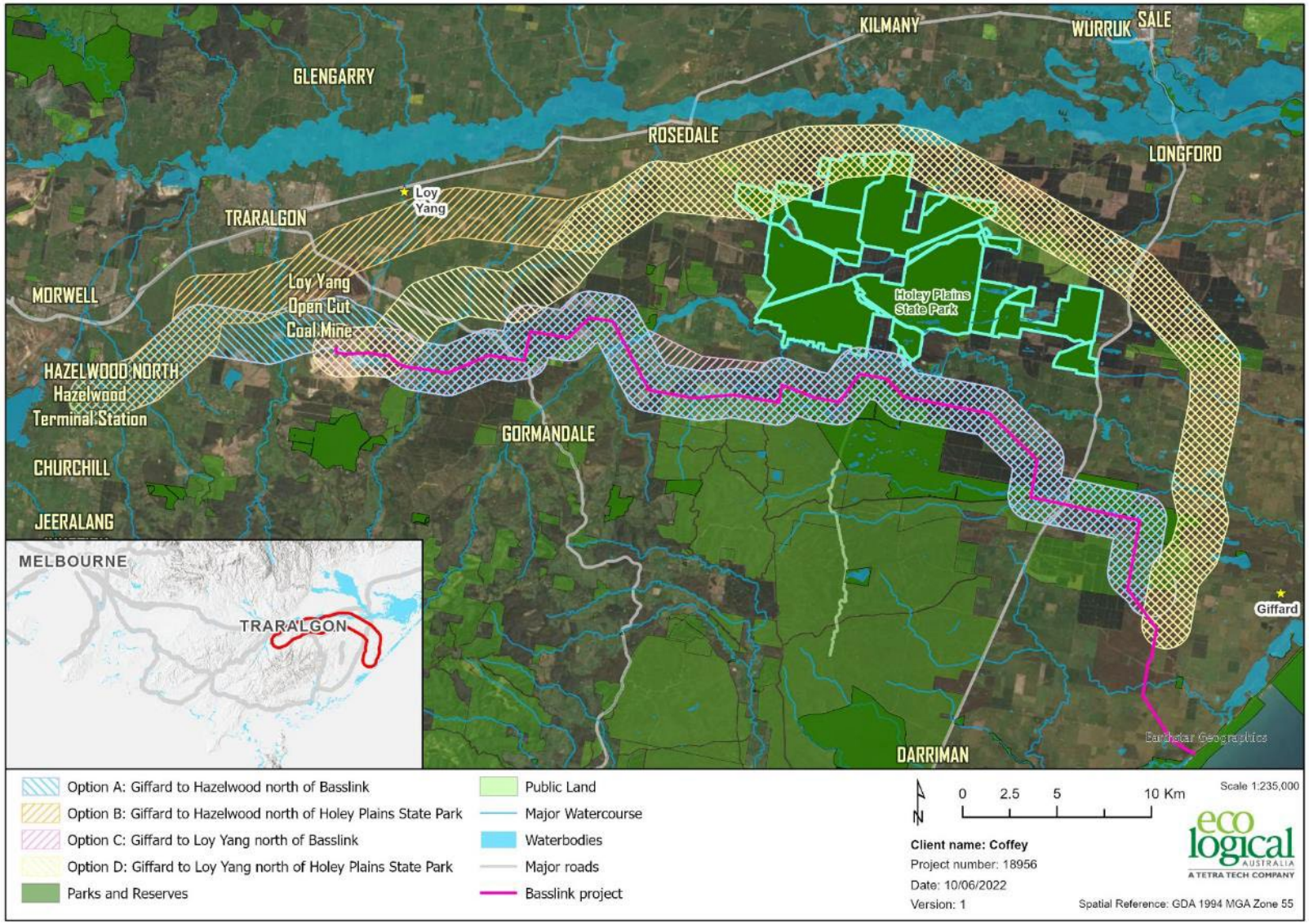

Figure 1: Potential corridor options

3.2. Database and literature review

Relevant information sources were reviewed to identify the presence or likely occurrence of biodiversity values across the study area and surrounds. This included online databases (e.g. Victorian Biodiversity Atlas, Native Vegetation Information System, Protected Matters Search Tool and VicPlan), spatial datasets (e.g. modelled vegetation and habitat extent), scientific literature and relevant environmental legislation, regulations, and policies. All online database searches were centred on the study area and covered an investigation area within a 10 km radius of each corridor.

Previous assessment reports that were reviewed to inform the assessment also include:

- Tetra Tech 2021. Gippsland Renewable Energy Zone project: Corridor and site options study and approvals pathway. Report prepared for AusNet Transmission Group.
- Biosis 2014. Esso Pipeline Replacement Project – Longford to Hastings: Flora and fauna survey and impact mitigation. Report prepared for WorleyParsons.
- Biosis 2001. Flora and fauna assessment of the proposed Old Rosedale Road Alignment Option for Basslink. Basslink supporting study #1.

3.3. Likelihood of occurrence

Based on the results of the desktop review, the likelihood of occurrence was determined for significant flora, fauna, and ecological communities within the study area ('significant' defined as values listed as threatened under the EPBC Act and FFG Act). Likelihood of occurrence is a determination of the potential for these species to be present and make substantial use of the study area, and for the potential of threatened communities to occur. Species were ranked as having either no, low, medium, or high likelihood of occurrence, or as being present, by accessing information contained in public biological datasets (e.g. past records, species distribution models and modelled vegetation communities), previous studies and considering species habitat requirements (including surrounding habitat connectivity). Species ranked as medium, high, or present were investigated in further detail for the possibility of targeted surveys. The determinations of a species likelihood provided are not absolute; rather, they represent a species' potential to occur in the study area and local vicinity. The results of the likelihood of occurrence analysis for the preferred corridor are provided in Appendix B.

3.4. Review of impacts and implications for preliminary route selection

A preliminary review of potential impacts and implications has been undertaken for the four corridor options. The assessment considered potential impacts on native vegetation, significant species, and communities without implementation of site-specific mitigation measures (Tetra Tech 2021). Landscape-scale avoidance, such as utilising cleared farmland rather than remnant bushland, has been assumed where the corridors are unconstrained. Options B and D north of Holey Plains State Park were considered the least constrained corridors from a biodiversity perspective, as they traverse more plantation land and modified farming land. Of these two options, AusNet Services selected Option B as the preferred corridor, within which a preliminary route was developed, based on the desktop assessment and other project constraints.

3.5. Preliminary field survey

To further refine the assessment of ecological constraints for the preliminary route , a preliminary field survey was undertaken on public land along the preliminary route to determine the extent and nature of vegetation and habitat for threatened species. The survey involved a rapid field-based assessment along the 500m wide survey area by ELA ecologists Danielle Woodhams and Julia Ryeland from 15 to 18 March 2022. All public lands (roadsides, parks and reserves) within the survey area were surveyed (Figure 2) to provide an indication of the extent and nature of native vegetation, including an assessment of the likelihood of threatened species occurring. A formal Vegetation Quality Assessment was not conducted, but instead each area was assigned to the descriptions outlined in Table 1, with a constraint level associated with each. The constraint level is based on the likelihood of legislative implications, including potential offset requirements.

Table 1: Constraint categories assigned during the field survey

Constraint category	Vegetation type	Included vegetation
Low	Introduced	• Naturalised • Planted
Moderate	Native (exempt)	• Planted natives • Regrowth less than 10 years old
High	Native	• Remnant • Regrowth greater than 10 years old • Planted for conservation • Planted for biodiversity and / or land management
No access	N/A	Some areas mapped as government roads were behind fences and locked gates on private land, or when inspected, no road existed where one was mapped. As such, these areas were not able to be inspected to give a constraint category and were mapped as such.

3.6. Limitations

This assessment was designed and undertaken with the purpose of informing ecological constraints within the shortlisted corridors within which, route selection and environmental and planning referrals will be taken forward for the preliminary route. It is based on desktop information and targeted preliminary ground truthing.

The field survey was not intended to provide an inventory of all values within the study or survey area and further detailed assessments (e.g. vegetation quality assessments and threatened species surveys) will be required along the preliminary route.

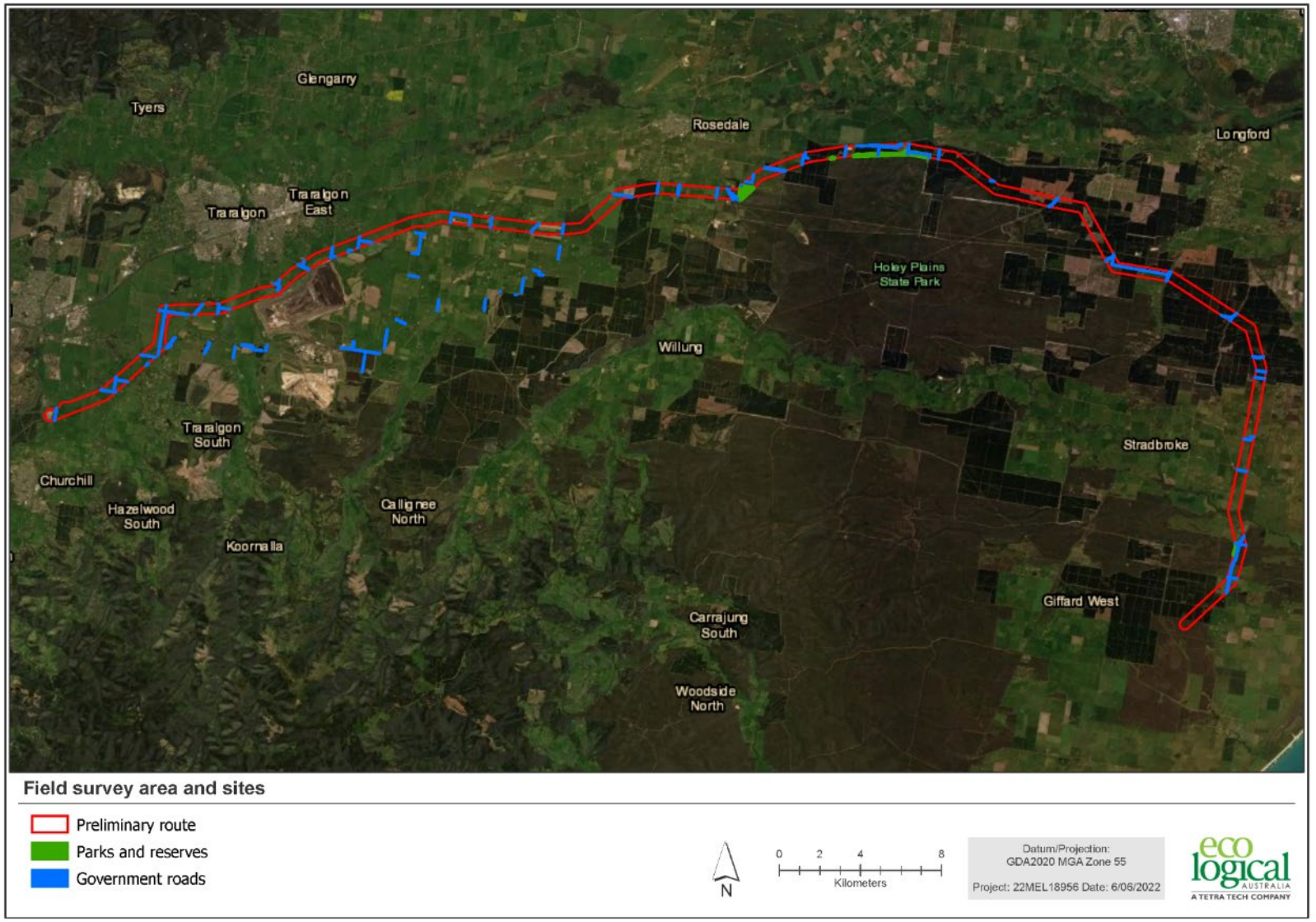

Figure 2: Field survey areas and sites

4. Results

4.1. Preliminary baseline description

The linear nature of the corridors and broad study area means the potential routes will traverse a range of landforms from near coastal plains around Giffard, through low foothills and sandy ridges associated with the eastern extent of the Strzelecki Ranges and Holey Plains State Park, to the inland floodplains of the Latrobe Valley. Recognising that vegetation communities (or Ecological Vegetation Classes [EVCs]) and associated habitats occur in a mosaic across the landscape, and vary with local topography and soils, the assessment has identified the following broad categories within the study area and local vicinity (10 km radius of the study area):

- Heathy forests and woodlands including Lowland Forest (EVC 16), Heathy Woodland (EVC 48), Damp-sands Heath Woodland (EVC 3). These typically occur on low slopes or plains with sandy soils to the east of the Latrobe valley.
- Grassy woodlands and grasslands including Plains Grassy Woodlands (EVC 55), Plains Grassy Forest (EVC 151) and Plains Grasslands (EVC 132). Occur typically within the La Trobe Valley on alluvial sediments.
- Swamp scrubs and swampy woodlands associated with coastal floodplains or minor water courses east of Latrobe Valley. Includes Swamp Scrub (EVC 53) and Riparian Scrub (EVC 191).
- Damp forests (EVC 29). Small patches may occur within steep gullies on south facing slopes.
- Ephemeral wetlands and swamps including Sedge Wetlands (EVC 136) and Plains Grassy Wetland (EVC125). Occurs frequently in depressions within Heathy forests and woodlands in eastern sections outside Latrobe Valley.
- Riparian woodlands associated with major watercourses, primarily in the Latrobe Valley. Includes Floodplain Riparian Woodland (EVC 56) and Swampy Riparian Woodland (EVC 83).
- Farmland comprised predominantly of introduced pasture species. May include scattered remnant trees or remnant grassland elements where pasture improvement has not occurred.

The findings of the desktop assessment for the preferred corridor are summarised in Table 2 and presented in Figures 3 – 8.

Table 2: Summary of findings including significant ecological values considered likely to occur in the preferred corridor

Feature	Assessment findings	Significant communities or species
Native vegetation	Since European colonisation, native vegetation has been removed from large parts of the Gippsland Plains, including areas covered by the preferred corridor and surrounds. However, significant areas of remnant vegetation remain in the following locations: • Giffard Nature Conservation Reserve and adjoining lands. • Merriman Creek and associated tributaries and reserves, including Merrimans Creek Flora Reserve. • Holey Plains State Park and adjoining lands. • Rosedale Racecourse and Recreation Reserve. • Major and minor road reserves, including Giffard Road, South-Gippsland Highway, Rosedale-Longford Road, Rosedale-Flynns Creek Road, Hyland Highway, Broomfields Lane, Scales Road, Traralgon Creek Road, Hazelwood Road, and Firmins Lane. • Major and minor watercourses in the Latrobe Valley including Blind Joe Creek, Sheepwash Creek, Flynns Creek, Taralgon Creek, Plough Creek, Waterhole Creek and Bennetts Creek. In addition, remnant vegetation persists in private land to varying degrees depending on past and current land use. This may include derived vegetation communities (e.g. grasslands and scattered trees) and small patches of remnant forests, woodlands, and scrubs. Revegetation around mines at Hazelwood and Loy Yang A, including along constructed waterways, may also qualify as native vegetation. An analysis of the extent of modelled vegetation within the preferred corridor study area identified approximately 4,214 hectares (Appendix A, Figures 3 – 8).	Vegetation Classes listed as endangered or of high conservation significance include: **Endangered EVCs:** • Swamp Scrub (EVC 53). • Plains Grassy Woodland (EVC 55). • Swampy Riparian Woodland (EVC 83). • Plains Grassy Wetland (EVC 125). • Floodplain Riparian Woodland (EVC 56). Additionally, large areas of Damp Forest (EVC 29) occur, for which are considered of 'least concern' under the Bioregional Conservation Status
EPBC Act listed communities	The following nationally or state significant ecological communities may be present within the preferred corridor and/or its surrounds:	• EPBC Act listed Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland. May be present within Grassy woodland and Grasslands vegetation communities in the Latrobe Valley. • EPBC Act listed Natural Damp Grassland of the Victorian Coastal Plains. May be associated with native grassland vegetation within coastal plains around Giffard. May be present within private land with 'native' pastures.

Feature	Assessment findings	Significant communities or species
EPBC Act listed flora species	Thirteen species are listed under the EPBC Act (i.e. nationally significant):	• *Amphibromus fluitans* River Swamp Wallaby-grass • *Caladenia tessellate* Thick-lip Spider-orchid • Commersonia prostrata Dwarf Kerrawang • *Dianella amoena* Matted Flax-lily • Eucalyptus strzeleckii Strzelecki Gum • Platysace ericoides Heath Platysace • *Pomaderris pilifera* subsp. *pilifera* Striped Pomaderris • Prasophyllum frenchii Maroon Leek-orchid • Prostanthera galbraithiae Wellington Mint-bush • Pterostylis chlorogramma Green-striped Greenhood • Pterostylis fischii Fisch's Greenhood • Pterostylis X toveyana Mentone Greenhood • Xerochrysum palustre Swamp Everlasting
EPBC Act listed fauna species	Twenty-six species are listed under the EPBC Act (i.e. nationally significant):	• *Antechinus minimus maritimus* Swamp Antechinus • *Apus pacificus* Fork-tailed Swift • *Ardea ibis* Cattle Egret • *Botaurus poiciloptilus* Australasian Bittern • *Galaxiella pusilla* Dwarf Galaxis • *Gallinago hardwickii* Latham's Snipe • *Gallinago megala* Swinhoe's snipe • *Gallinago stenura* Pin-tailed snipe • *Grantiella picta* Painted Honeyeater • *Haliaeetus leucogaster* White-bellied Sea-Eagle • *Heleioporus australiacus* Giant Burrowing Frog • *Himantopus himantopus* Black-winged Stilt • *Hirundapus caudacutus* White-throated Needletail • *Lathamus discolor* Swift Parrot • *Litoria aurea* Green and Golden Bell Frog • *Litoria raniformis* Growling Grass Frog • *Merops ornatus* Rainbow Bee-eater • *Monarcha melanopsis* Black-faced Monarch

Feature	Assessment findings	Significant communities or species
		• *Motacilla flava* Yellow Wagtail • *Myiagra cyanoleuca* Satin Flycatcher • *Neophema chrysogaster* Orange-bellied Parrot • *Prototroctes maraena* Australian Grayling • *Pseudomys novaehollandiae* New Holland Mouse • *Pteropus poliocephalus* Grey-headed Flying-fox • *Rostratula australis* Australian Painted-snipe • *Tringa stagnatilis* Marsh Sandpiper. •
EPBC Act listed migratory species	Fifteen of the species identified were also listed as migratory species under the EPBC Act. Thirty of the species identified were also listed as marine species under the EPBC Act (See Appendix B)	• *Calidris ferruginea* Curlew Sandpiper • *Neophema chrysogaster* Orange-bellied parrot • *Numenius madagascariensis* Eastern Curlew • *Calidris canutus* Red Knot • *Arenaria interpres* Ruddy Turnstone • *Calidris melanotos* Pectoral Sandpiper • *Calidris ruficollis* Red-necked Stint • *Gallinago hardwickii* Latham's Snipe • *Limosa lapponica* Bat-tailed Godwit • *Monarcha melanopsis* Black-faced Monarch • *Motacilla flava* Yellow Wagtail • *Numenius minutus* Little Curlew • *Rhipidura rufifrons* Rufous Fantail • *Hirundapus caudacutus* White-throated needletail • *Myiagra cyanoleuca* Satin Flycatcher
State significant communities	Three state significant communities have the potential to occur along the preferred corridor and/or its surrounds:	• Forest Red Gum Grassy Woodland Community • Plains Grassland (South Gippsland) Community • Warm Temperate Rainforest (Coastal East Gippsland) Community

Feature	Assessment findings	Significant communities or species
State significant flora species	The desktop review identified total of 46 significant flora species considered likely to occur within the preferred corridor and/or its surrounds.	See Appendix B
State significant species	The desktop review identified a total of 55 significant fauna species considered likely to occur within the preferred corridor and/or its surrounds.	See Appendix B

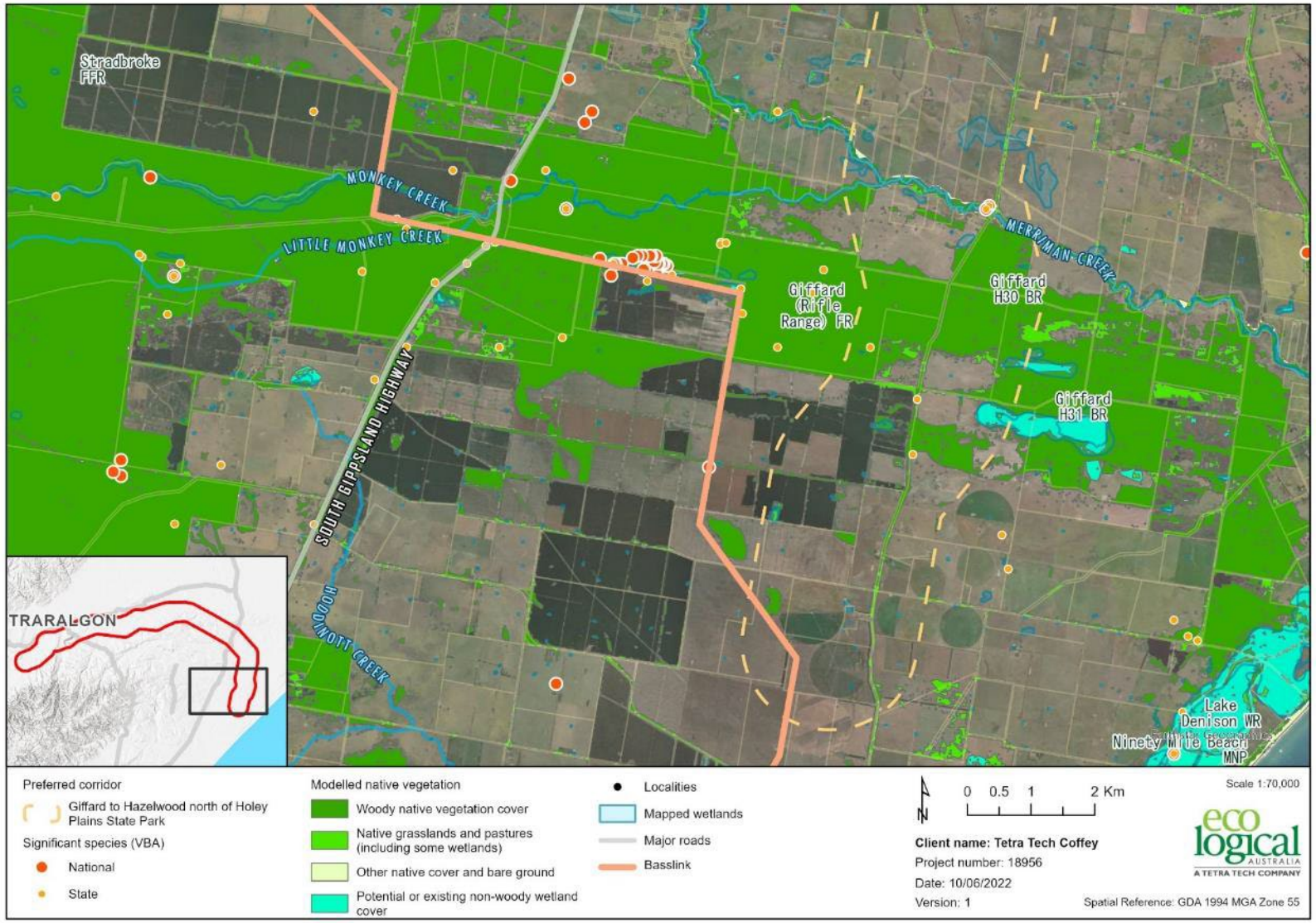

Figure 3: Desktop-assessed ecological constraints – Map 1

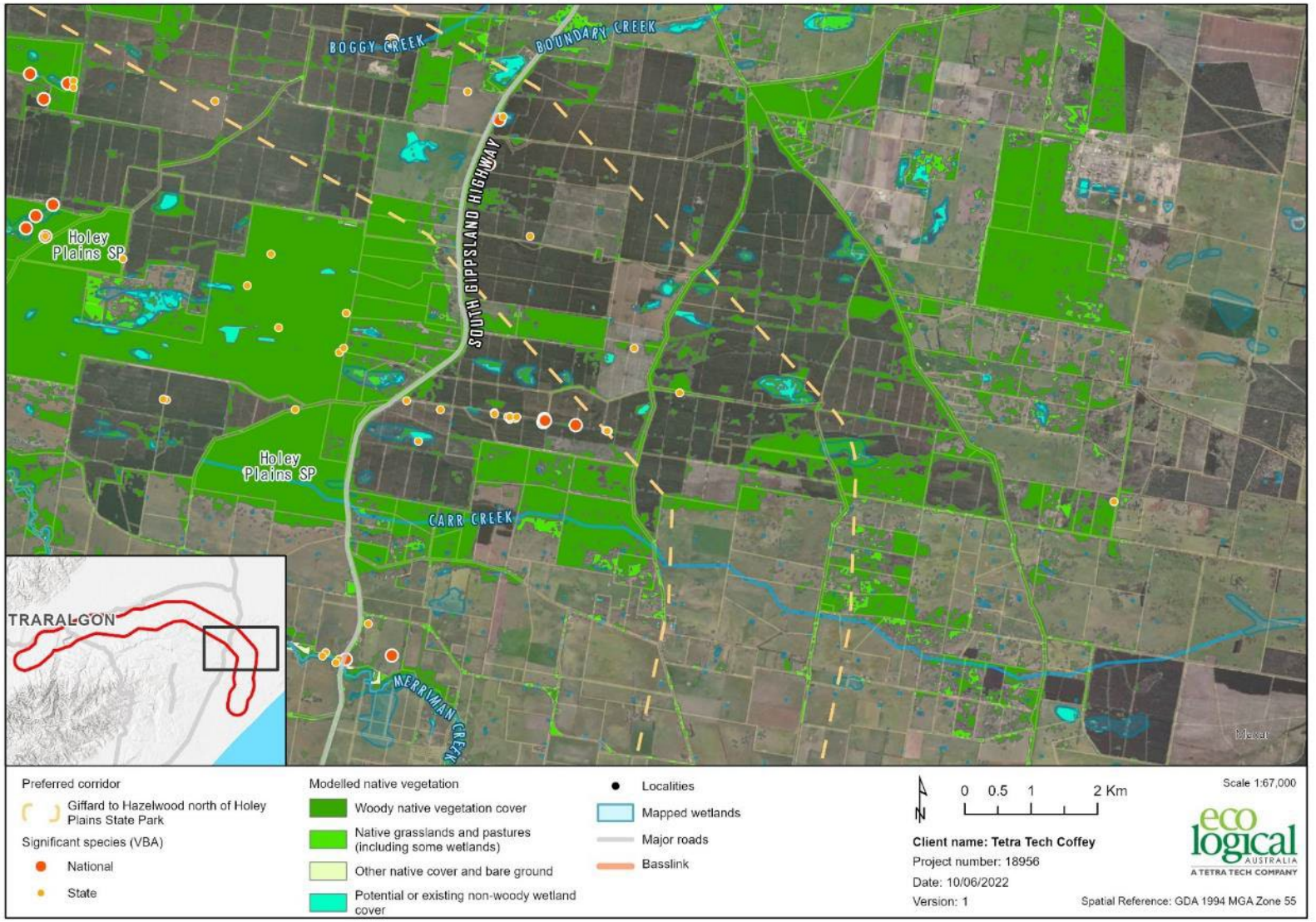

Figure 4: Desktop-assessed ecological constraints – Map 2

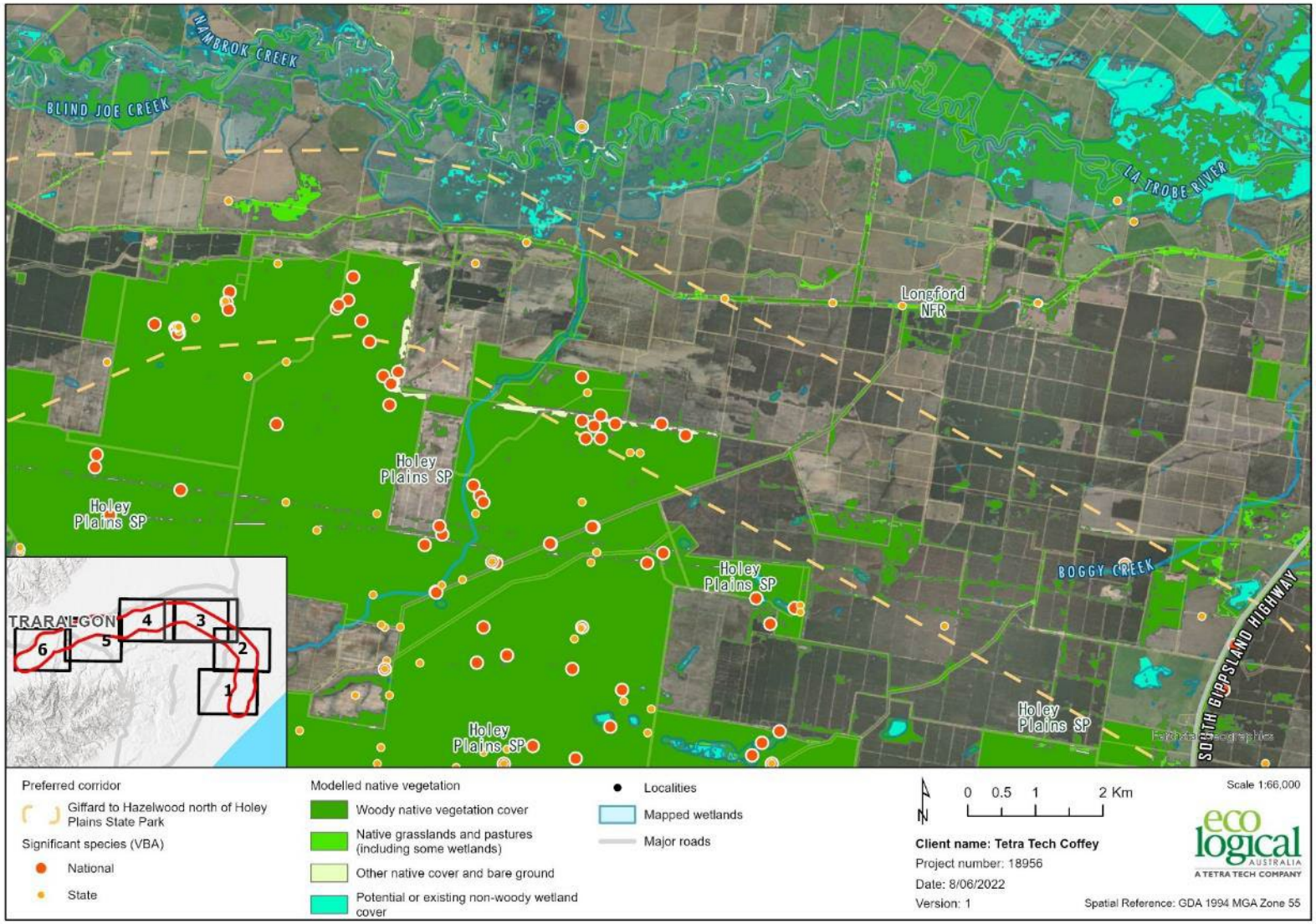

Figure 5: Desktop assessed ecological constraints – Map 3

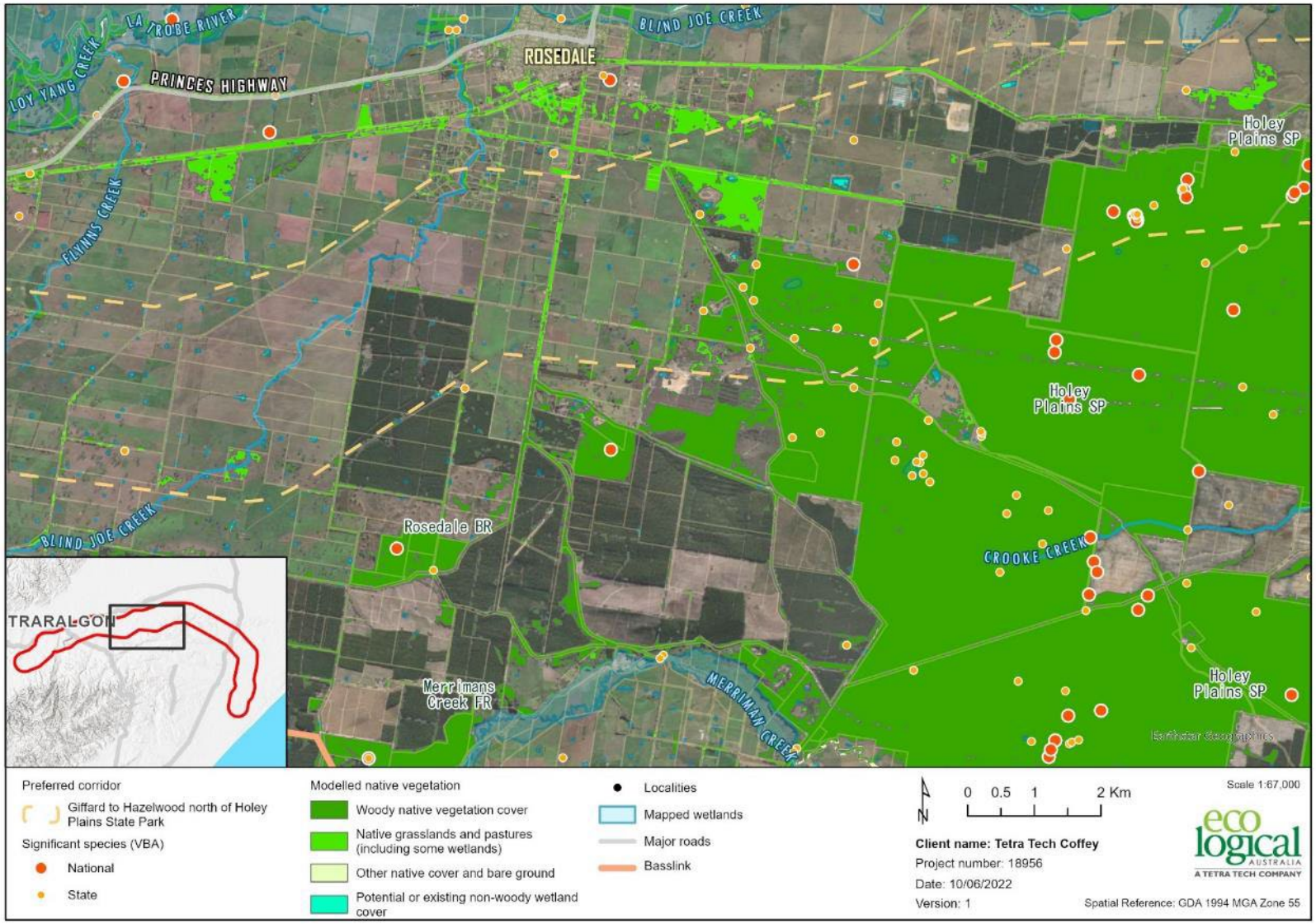

Figure 6: Desktop-assessed ecological constraints – Map 4

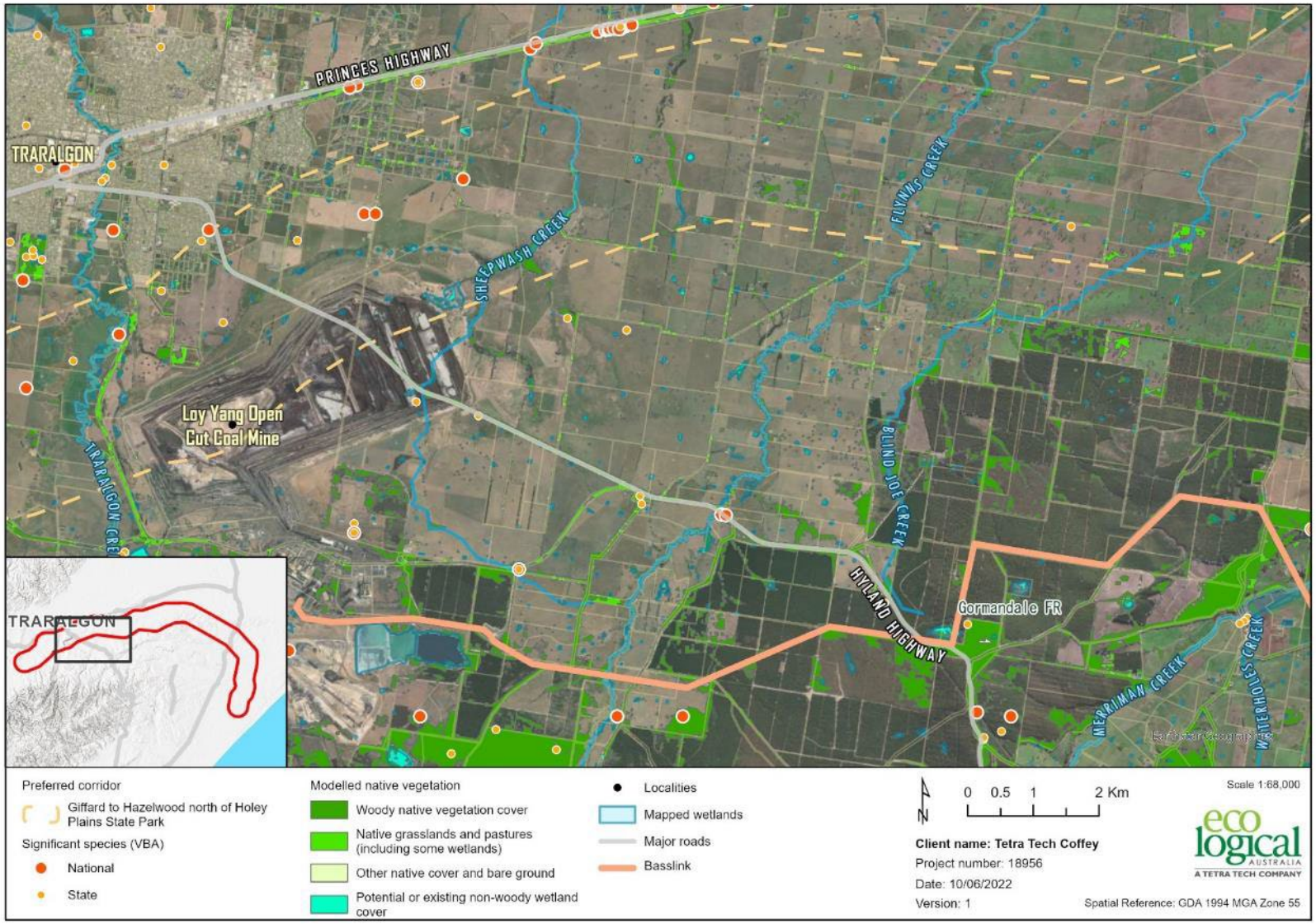

Figure 7: Desktop-assessed ecological constraints – Map 5

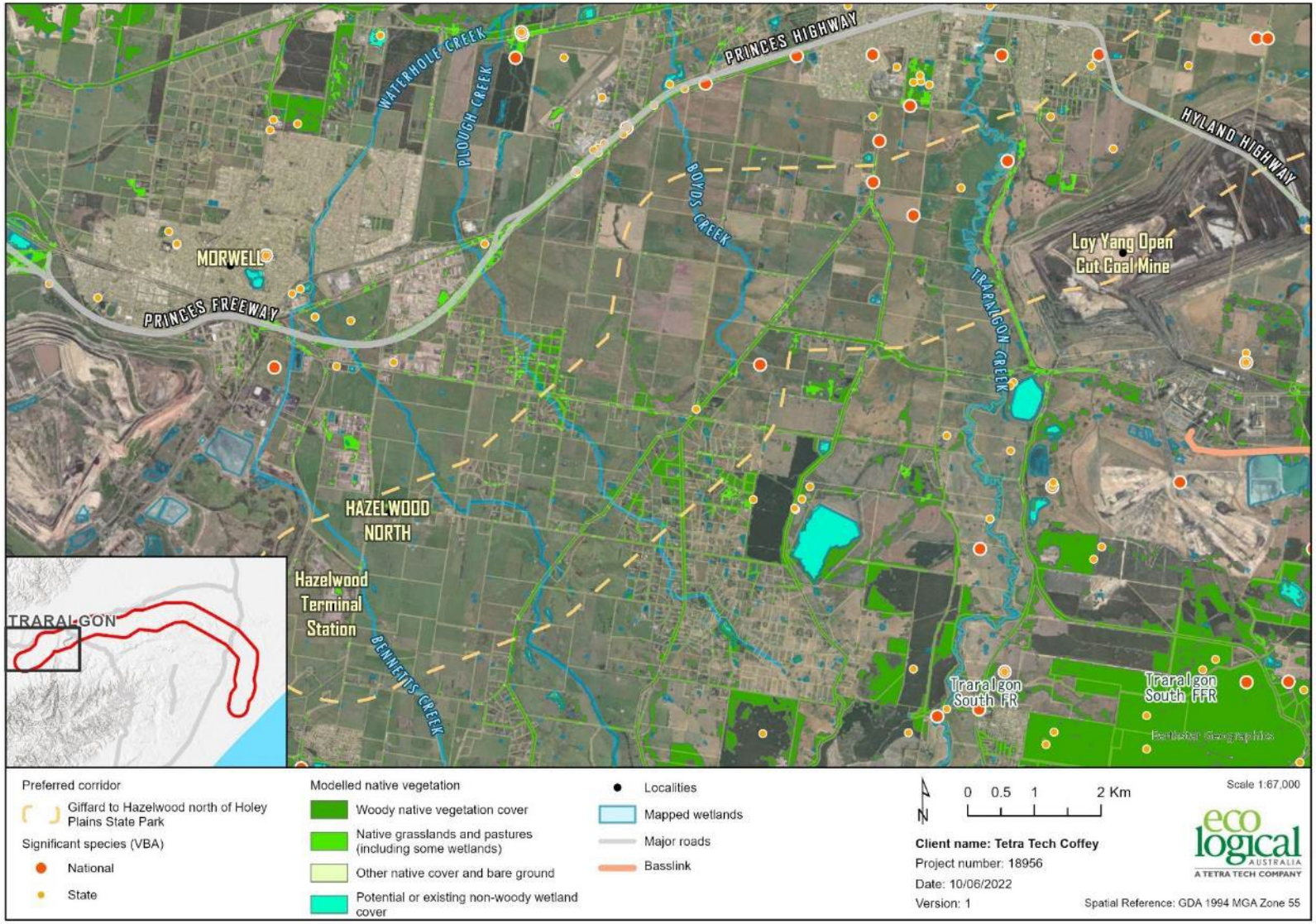

Figure 8: Desktop-assessed ecological constraints – Map 6

4.2. Potential project impacts and management measures

Major infrastructure projects have the potential to impact on ecological values in a variety of different ways. Impacts may occur during or after construction, and may be 'direct' in nature, such as the removal of a tree, or 'indirect', such as impacts to habitat downstream of the project from the release of sediment into waterways. In developing management measures, it is therefore important to consider all potential sources of impacts a project of this nature may have. Potential sources are listed in and Table 3

The following hierarchical preliminary avoidance and mitigation measures are recommended to inform ongoing refinement of the preliminary route to achieve minimal impact to site-specific ecological values:

1. Avoid direct and indirect adverse impacts.
2. Mitigate and manage any unavoidable direct and indirect adverse impacts.
3. Offset any residual significant impacts.

Table 3: Findings and implications of the constraint's assessment for the preferred corridor

Feature	Potential impacts and implications	
Native vegetation	Given the size and scale of the project the removal of native vegetation will be unavoidable. A review of modelled vegetation extent in relation to the preferred corridor identified few locations which are likely to be constrained. Locations where potential constraints may occur include: • Giffard Nature Conservation Reserve and adjoining lands. • Holey Plains State Park and adjoining lands. • Road reserves and waterways to the east of Loy Yang power station. • Road reserves and waterways between Loy Yang power station and Hazelwood North. Given previously cleared land, including farmland, plantations, easements, and road reserves, could potentially be used, it is reasonable to assume that removal of native vegetation can be minimised. The extent of clearance is likely to be in the order of several hectares and it is therefore uncertain if the project will require an EE Act referral based on the following criteria: • potential clearing of 10 ha or more of native vegetation from an endangered EVC, or that is likely to be of very high conservation significance. • potential clearing of 10 ha or more of native vegetation (in combination with one other criteria). Unless exempt or precluded by other approval processes (e.g. a Planning Scheme Amendment), a planning permit will be required for the removal of any native vegetation under Clause 52.17 (Native Vegetation) of the local planning schemes. This includes isolated or individual plants which may occur within the preferred corridor. Irrespective of the approval pathway, the proponent will need to show consideration of Victoria's Native Vegetation Removal Regulations where the project impacts any 'patches' or 'scattered trees'. This will include the requirement to demonstrate avoidance and minimisation of impacts prior to offsets being considered.	• Review design options focusing on locations identified as supporting significant areas of native vegetation to maximise avoidance. Where possible use previously cleared land including farmland, plantations, and easements to reduce the extent and significance of clearance. • Undertake ground-truthing field surveys of significant areas and public lands (e.g. roads) as a priority to inform detailed designs.
Significant fauna	Based on the likely extent of suitable habitat and prevalence of the species within the region, there is a moderate likelihood of significant (unmitigated) impact to 26 significant fauna species. Of these the following six are listed under the EPBC Act: • *Grantiella picta* Painted Honeyeater • Lathamus discolor Swift Parrot • *Litoria aurea* Green and Golden Bell Frog	• Avoid large areas of native vegetation wherever possible, and particularly those supporting large, old trees or dense heathy habitats. • Avoid waterways and low-lying areas which may support wetland or swamp habitats.

Feature	Potential impacts and implications	
	• *Neophema chrysogaster* Orange-bellied Parrot • *Prototroctes maraena* Australian Grayling • Pseudomys novaehollandiae New Holland Mouse The location of suitable habitat for all species, along with potential mitigation measures, is provided in Appendix B. Where impacts to EPBC Act listed species are considered significant and unavoidable, an EPBC Act referral will be required. This may require additional assessments and approvals, and implementation of additional measures to further avoid, minimise or offset impacts. Impacts to FFG Act listed species may also trigger an EE Act referral based on one or more of the following criteria: • potential long-term loss of a significant proportion (e.g. 1 to 5 percent) of known remaining habitat or population of a threatened species. • potential loss of a genetically important population, including because of loss or fragmentation of habitats (in combination with one other criteria). • potential loss of critical habitat (in combination with one other criteria).	• Avoid areas of native vegetation that provide faunal movement corridors and connectivity between patches of vegetation. • Where possible utilise already cleared areas, including existing tracks, easements, farmland, and plantations. • Undertake ground-truthing field surveys of key habitats and public lands (e.g. roads) to refine the likelihood of occurrence and impact assessments.
Significant flora	Based on the likely extent of suitable habitat and prevalence of the species within the region, there is a moderate or high likelihood of significant (unmitigated) impacts to 23 significant flora species. Of these the following six are listed under the EPBC Act: • *Amphibromus fluitans* River Swamp Wallaby-grass • Commersonia prostrata Dwarf Kerrawang • *Dianella amoena* Matted Flax-lily • Eucalyptus strzeleckii Strzelecki Gum • Prostanthera galbraithiae Wellington Mint-bush • Pterostylis fischii Fisch's Greenhood The location of suitable habitat for all species, along with potential mitigation measures, is provided in Appendix B. Where impacts to EPBC Act listed species are considered significant and unavoidable, an EPBC Act referral will be required. This may require additional assessments and approvals, and implementation of additional measures to further avoid, minimise or offset impacts. Impacts to FFG Act listed species may also trigger an EE Act referral based on one or more of the following criteria:	• Undertake ground-truthing field surveys of key habitats and public lands (e.g. roads) to refine the likelihood of occurrence and impact assessments. • Avoid large areas of native vegetation wherever possible. • Avoid waterways and low-lying areas which may support wetland or swamp habitats. • Where possible utilise already cleared areas, including existing tracks, easements, farmland, and plantations.

Feature	Potential impacts and implications	
	• potential long-term loss of a significant proportion (e.g. 1 to 5 percent) of known remaining habitat or population of a threatened species. • potential loss of a genetically important population, including because of loss or fragmentation of habitats (in combination with one other criteria). • potential loss of critical habitat (in combination with one other criteria). Where impacts to FFG Act listed species occur on public land, an FFG Act permit for their removal will also be required.	
Significant communities	Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland are common throughout the Latrobe Valley, albeit restricted to small patches associated with roadsides, reserves, and occasionally private land. There is a moderate likelihood that the project may have a significant (unmitigated) impact on this EPBC Act listed community. The local range for Natural Damp Grassland of the Victorian Coastal Plains community sits outside the study area to the south of Giffard. Whilst small, localised patches of this community may persist within the study area, these are likely to be extremely rare due to the conversion of much of the area to farming with improved pastures. As a result, there is a low likelihood of significant impacts to this community. Where impacts to EPBC Act listed communities are considered significant and unavoidable, an EPBC Act referral will be required. This may require additional assessments and approvals, and implementation of additional measures to further avoid, minimise or offset impacts.	Avoid areas of native woodland and grasslands vegetation within the Latrobe Valley. Undertake ground-truthing field surveys of key habitats and public lands (e.g. roads) to determine prevalence of threatened ecological communities and refine impact assessments.

4.3. Field validation of the preliminary route

Areas of accessible land (i.e. public land such as government roads, parks and reserves) along the preliminary route and its surrounds was visited and rapidly assessed on foot during the field survey (15 to 18 March 2022), assigning each a constraint category (Table 4). Several localities in the west of the survey area (closest to Rosedale and Loy Yang) were observed from the roadside to have large scattered trees on private property, with several roadsides consisting of > 25% native understorey. These areas will require assessment to determine if they meet the EPBC listed Gippsland Red Gum Grassy Woodland and Associated Native Grassland. Other areas, particularly around Giffard Bushland Reserve and Holey Plains State Park had large sections of remnant vegetation, which will likely require targeted survey(s). Private properties that are likely to contain native vegetation or species habitat were identified from aerial imagery and field surveys (via observations from roadsides). Their priority based on the potential constraint category they hold (with higher potential constraints having a higher priority for future surveys) are shown in Figures 9 – 13, along with the constraint categories of the field assessed public land sites. An assessment of required future surveys at each location was also conducted and is summarised in Section 5.

Table 4: Summary of ecological constraints identified along the preliminary route and surrounds during the field survey

Ecological Constraint Category	Prevalent areas	Implication
Low	Along the boundaries of the plantation near Longford, the road verges were predominantly vegetated by exotic species that have naturally spread along the roadsides. Introduced species (particularly exotic grasses) were often found occurring along roadsides bordering agricultural land, particularly near Rosedale. The survey area closest to Loy Yang has several areas where planted woody exotics were present such as Pines	No implications for impacts
Moderate	Several areas consisted predominately of regenerating native vegetation that was less than 10 years old, particularly throughout the plantation in larger previously cleared patches	The vegetation characterised as a moderate constraint, is exempt from consideration under the Native Vegetation Removal Regulations. However, where possible, these areas should be avoided as they may provide a source of native vegetation seed for the local area and habitat for some native species
High	Native remnant vegetation was observed in two states along the survey areas. Patches of remnant vegetation with intact canopy cover were observed along roadsides and throughout Giffard Bushland Reserve and Holey Plains State Park. These areas were vegetated by mature *Banksia serrata* Saw Banksia and *Eucalyptus obliqua or E. cephalocarpa*, *Acacia melanoxylyn,* and *Kunzea* sp. (in the Swampy Woodland areas) Several roadside verges throughout the survey area were found to be dominated by native grasses such as *Themeda triandra* Kangaroo Grass and *Rytidosperma pallidum* Common Wallaby-grass	Removal of native vegetation within this constraint category will require further assessment under the Native Vegetation Removal Regulations. Targeted surveys are required in these locations for threatened species.

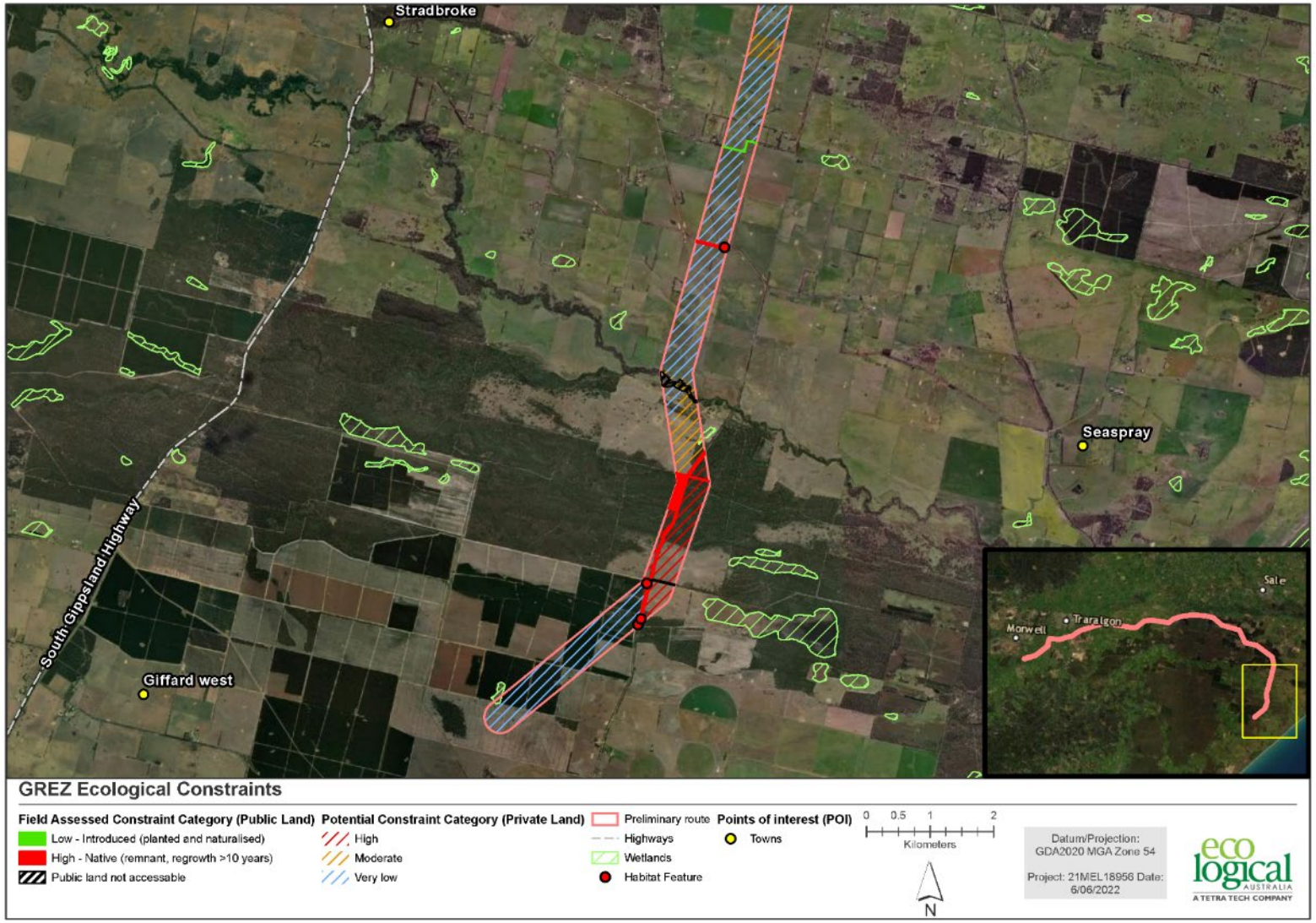

Figure 9: Ecological constraints of the southeast of the survey area near Giffard

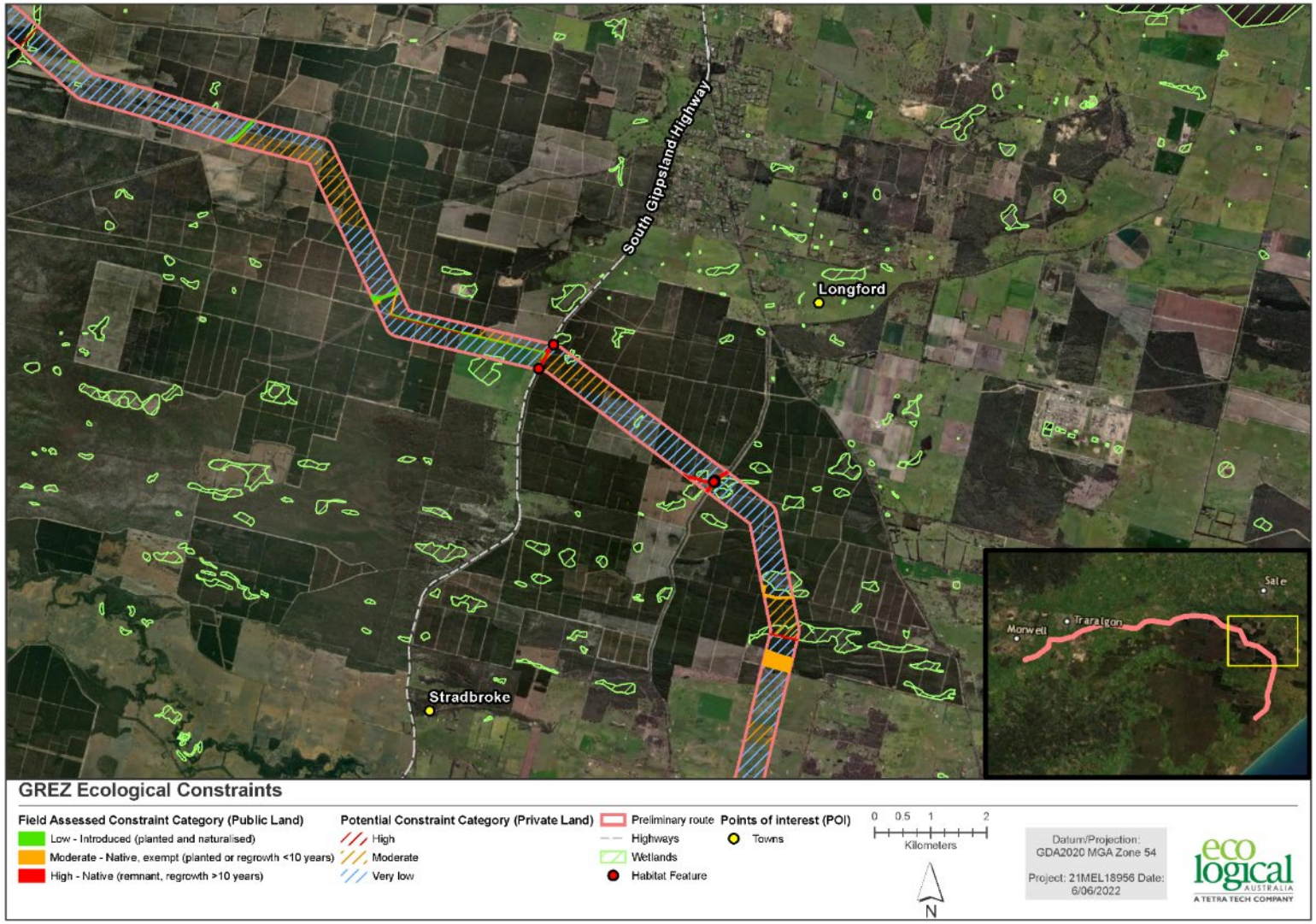

Figure 10: Ecological constraints of the east of the survey area near Longford

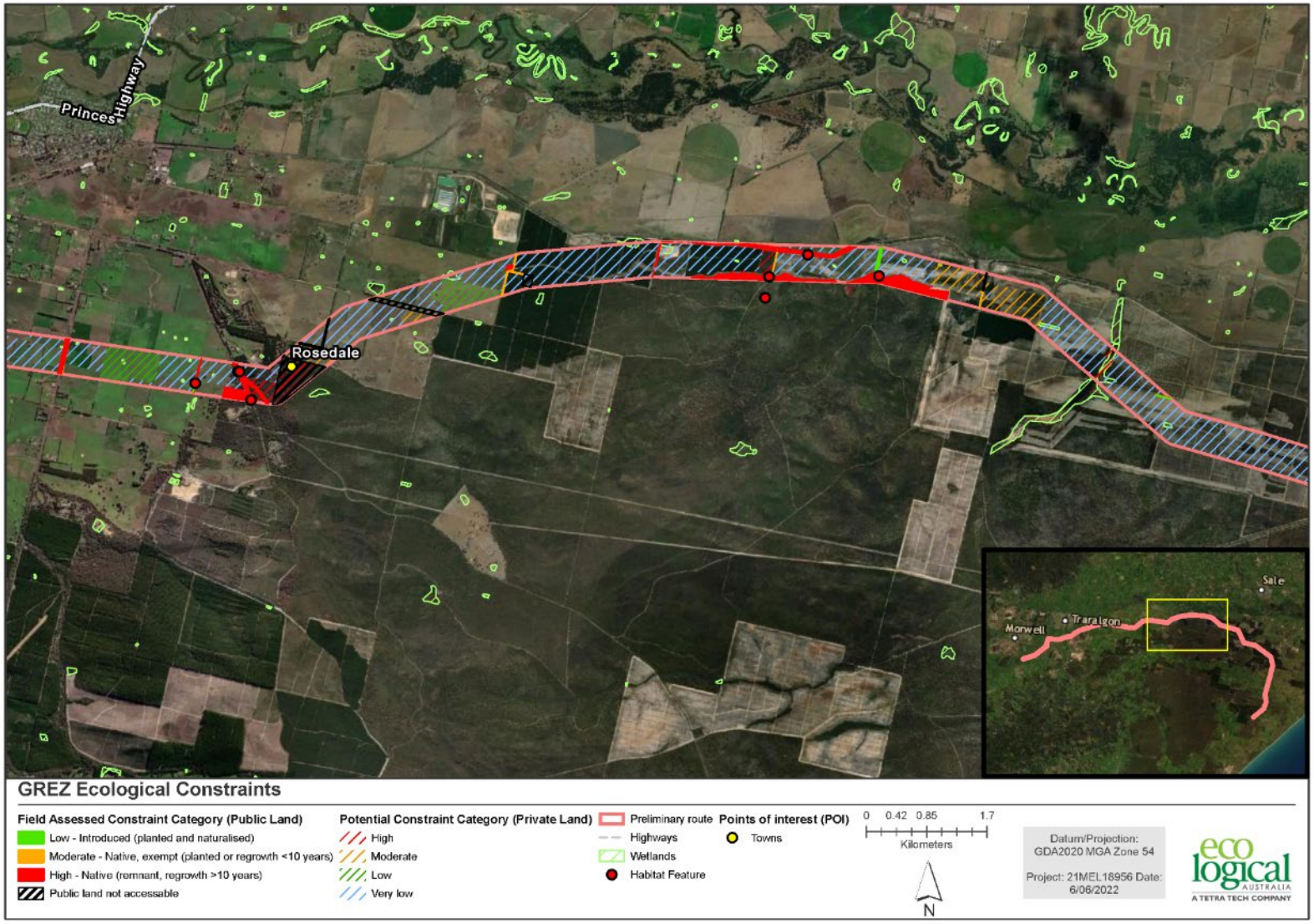

Figure 11: Ecological constraints of the central regions of the survey area near Holley Plains State Park

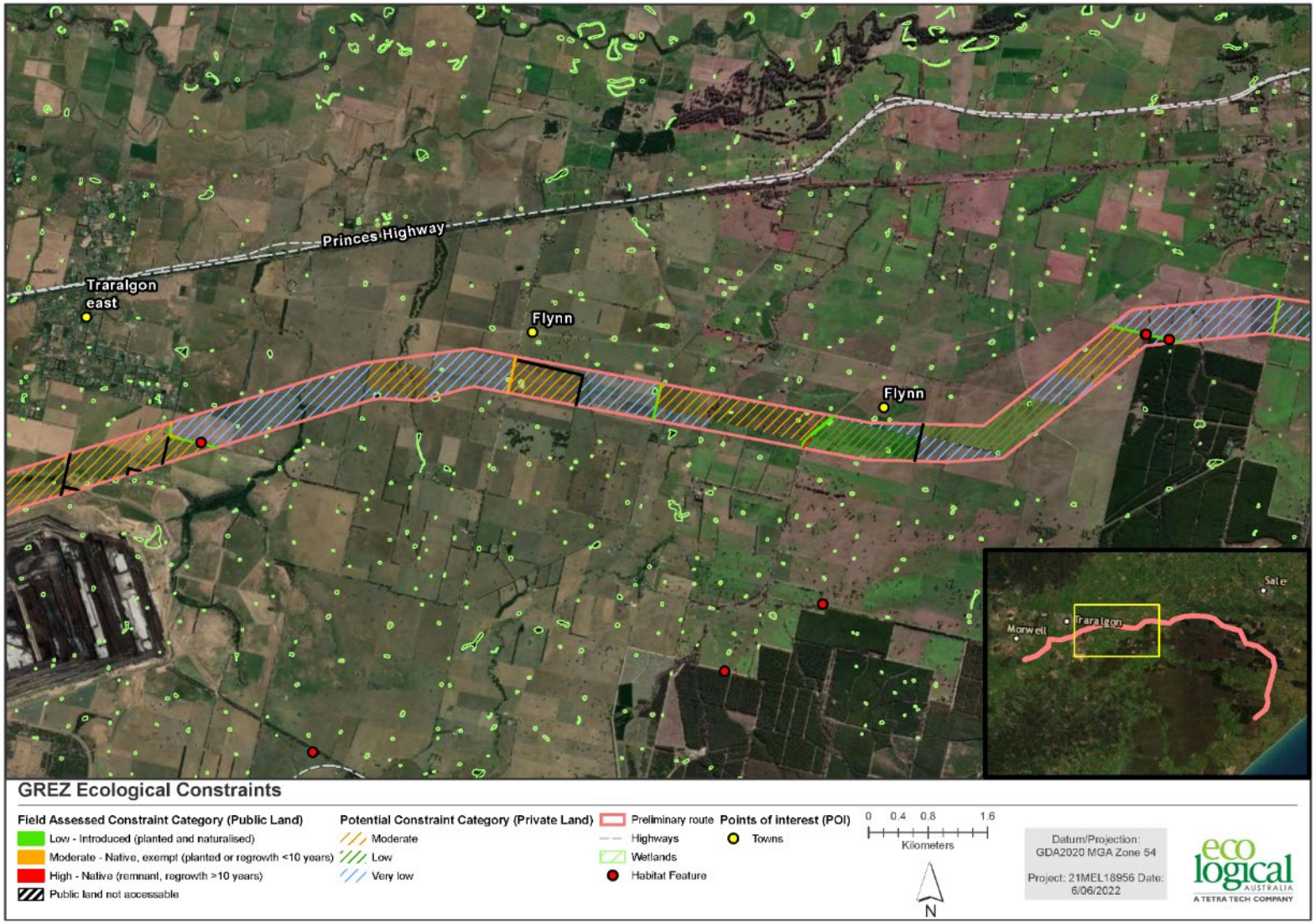

Figure 12: Ecological constraints in the west of the survey area between Rosedale and Loy Yang

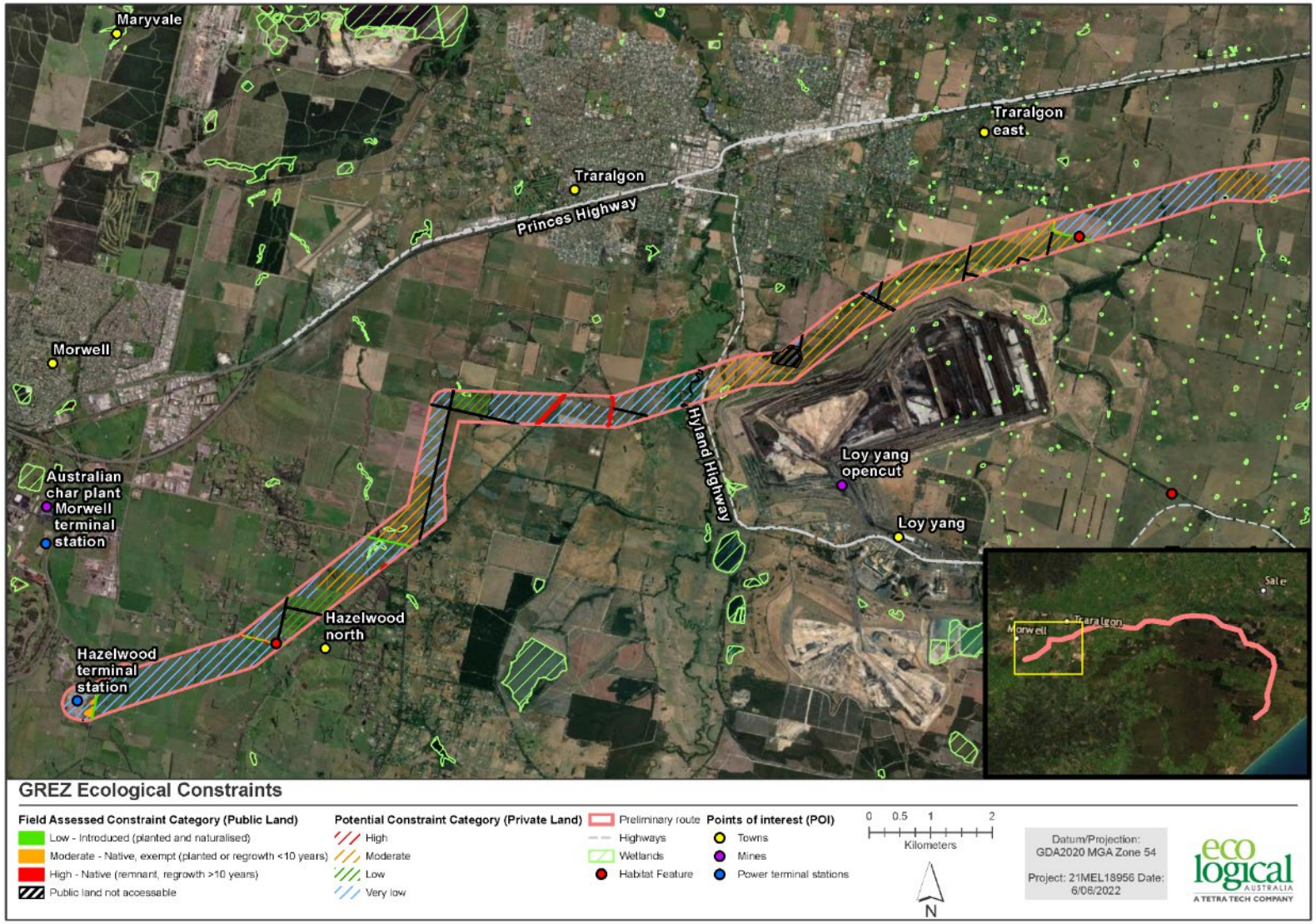

Figure 13: Ecological constraints of the survey area southwest of Loy Yang

5. Conclusions

5.1. Summary of findings

Large parts of the Gippsland Plains have been modified due to changed land use (i.e. farming and plantations), resulting in clearance of large areas of native vegetation and associated habitats. However, significant areas of remnant vegetation and associated fauna habitat remain (Figure 9 - 13). A summary of the assessment findings of the preferred corridor is provided in Table 5.

Table 5: Findings of the ecological assessment for the preferred corridor

Study area (including local vicinity)		Survey area
Potential native vegetation and threatened communities	**Potential threatened species and habitat**	**Field-based validation of constraints**
The preferred corridor study area supports 4,214 hectares of modelled native vegetation. The preferred corridor is less constrained by high native vegetation cover than the other corridor options. The preferred corridor intersects the largest area of the Latrobe Valley among the corridor options, which increases the likelihood of significant impacts to the EPBC Act listed Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland	The corridor intersects fewer areas of native vegetation and/or water bodies than the other corridor options, which provide habitat for national and state significant species. The preferred corridor has the potential for impacts to 49 state significant flora and fauna species, of which 12 are considered nationally significant.	Throughout the survey area along the preliminary route, areas of high native remnant vegetation cover were observed near Holey Plains State Park and Giffard Bushland Reserve. These areas pose high ecological constraints. These areas require further assessment to determine the ecological communities for which they are consistent with. Private properties where large scattered trees were observed from the roadside will require assessment to determine if they meet the EPBC listed Gippsland Red Gum.

Several significant ecological values were identified as being of particular risk to the G-REZ project due to their known prevalence within the preferred corridor and its surrounds. The values are summarised in Table 6.

Table 6. Key significant ecological values for consideration during route refinement and design

Key values
Commersonia prostrata Dwarf Kerrawang (EPBC Act) in wetlands in Giffard Nature Conservation Reserve.
Prostanthera galbraithiae Wellington Mint-bush (EPBC Act) in Holey Plains State Park.
Dianella amoena Matted Flax-lily (EPBC Act) in the Latrobe Valley.
Eucalyptus strzeleckii Strzelecki Gum (EPBC Act) in the Latrobe Valley.
Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland (EPBC Act) in the Latrobe Valley.

It is recommended that refinement of the preliminary route and design consider the presence of native vegetation and habitat for threatened species with the aim to avoid or minimise impacts as much as possible.

5.2. Design recommendations

Preliminary recommendations to guide the refinement of route design include:

- Review design options focusing on locations identified as supporting significant areas of native vegetation to maximise avoidance. As a priority:
    - Avoid areas supporting large, old trees. These will require mapping in the field.
    - Avoid areas of native woodland, heathland, and grassland vegetation within the Latrobe Valley.
    - Avoid waterways and low-lying areas which may support wetland or swamp habitats.
    - Avoid areas of native vegetation that provide faunal movement corridors and connectivity between patches of vegetation.
- Where possible utilise already cleared areas, including existing tracks, easements, farmland, and plantations.

A two-stage approach will be used to provide recommendations for refinement of the preliminary route, including:

1. Desktop-mapping of the extent of vegetation within the preferred corridor (up to 2.6 km in width), validated through on ground surveys to identify the EVC, accuracy of extent, tree size and tree location
2. Where native vegetation cannot be avoided, a Vegetation Quality Assessment (including Habitat condition assessment and Tree census) of the impact footprint will be undertaken based on the final route and construction approach.

Targeted surveys will be conducted throughout both stages such as through Holey Plains State Park and Giffard Bushland Reserve, high-quality roadside remnants, and roadsides and public land in Latrobe Valley (in localities predicted for EPBC listed Gippsland Red Gum) where avoidance may be difficult.

5.3. Detailed assessment requirements for the preliminary route

Sites identified as having native vegetation present during the rapid survey will require further detailed assessments in the form of vegetation quality assessments, habitat condition assessments, tree census and targeted surveys (where applicable). Although initial surveys can be conducted on public lands, the preliminary route will need to be surveyed in its entirety to confirm the presence or absence of ecological values. Private properties that are likely to contain native vegetation or species habitat within the survey area were identified in Figures 9 – 13. Access to these properties should be gained as a priority to allow for further detailed surveys to be conducted. Detailed assessment requirements are outlined in Table 7, Table 8 and Table 9.

Table 7: Future works plan

Assessment	Purpose	Informs	Timeframe	Location
Vegetation Quality Assessment	Determine the nature, extent, and quality of vegetation within the survey area to allow an analysis of impacts in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation.*	Presence of state and nationally significant communities (EPBC Act, FFG Act, EE Act). Impacts associated with the removal of native vegetation (EE Act, Environment and Planning Act).	3 months *Can be undertaken concurrently with habitat condition assessment.* **Anytime, ideally Spring**	Survey area
Habitat Condition Assessment	Determine the nature, extent and quality of flora and fauna habitat within the survey area to determine the likelihood of state and nationally significant species occurring within the survey area.	Likely occurrence of state and nationally significant species and requirements for targeted surveys (see below) (EPBC Act, FFG Act, EE Act).	3 months *Can be undertaken concurrently with vegetation quality assessment.* **Anytime, ideally Spring**	Survey area
Tree census	Develop a register of all canopy trees within the survey area that may be impacted by the proposed works. Based on information recorded for each tree, specific mitigation measures can be developed to minimise and avoid impacts.	Impacts associated with the removal of native vegetation (EE Act, Environment and Planning Act). Targeted surveys for canopy tree species (e.g. Strzelecki Gum) (EPBC Act, FFG Act, EE Act).	3 months *Can be undertaken concurrently with vegetation condition assessment.* **Anytime**	Area of disturbance + 17 m
Targeted surveys	Informs the likely presence or absence of significant species in areas of suitable habitat, allowing an accurate determination on likely impacts to these species to be made.	Impacts to state and nationally significant flora and fauna species (EPBC Act, FFG Act, EE Act).	12 months minimum. See survey schedule below. *Requires completion of habitat condition assessment to inform locations for assessment.* *Some surveys may be completed concurrently with approvals process. Multiple surveys will be required for some species (e.g. owls, waders)*	Areas determined to be suitable habitat during condition assessment

Table 8. Recommended targeted surveys

Survey Group	Species/Communities	Method	Location
Threatened Ecological Communities	Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland Natural Damp Grassland of the Victorian Coastal Plains.	Vegetation field assessment against community composition and structure thresholds	Areas of remnant grassland and grassy woodland vegetation between Rosedale and Loy Yang
Flora (Winter)	*Bossiaea heterophylla* (Variable Bossiaea) *Grevillea chrysophaea* (Golden Grevillea)	Transects surveys spaced at approximately 5-20 m intervals across all areas of suitable habitat. Two surveys minimum.	Woodland between Rosedale and Loy Yang
Flora (Spring)	*Eucalyptus Arenicola (*Gippsland Lakes Peppermint*)* *Eucalyptus strzeleckii* (Strzelecki Gum) *Eucalyptus yarraensis* (Yarra Gum) *Astrotricha parvifolia subsp. 1* (Small-leaf Star-hair) *Caladenia aurantiaca* (Orange-tip Finger-orchid) *Commersonia prostrata* (Dwarf Kerrawang) *Prostanthera galbraithiae* (Wellington Mint-bush) *Sowerbaea juncea* (Rush Lily) *Zieria veronicea subsp. veronicea* (Pink Zieria) *Craspedia canens* (Grey Billy-buttons) *Diuris punctata var. punctata* (Purple Diuris) *Pomaderris aurea* (Golden Pomaderris)	Transects surveys spaced at approximately 5-20 metre intervals across all areas of suitable habitat. Two surveys minimum.	Roadsides and remnant patches of damp to dry forest throughout preliminary route

Survey Group	Species/Communities	Method	Location
Flora (Summer)	*Dianella amoena* (Matted flax-lily) *Amphibromus fluitans* (River Swamp Wallaby-grass)	Transects surveys spaced at approximately 5-20 metre intervals across all areas of suitable habitat. Two surveys minimum.	Roadsides and grassy flats between Rosedale and Loy Yang Riparian vegetation, particularly present along the eastern portion of the preliminary route
Mammals	*Pteropus poliocephalus* (Grey-headed Flying Fox)	Target surveys in areas of suitable canopy	Along preliminary route where canopy species are present
Frogs	*Pseudophryne semimarmorata* (southern toadlet)	Nocturnal targeted surveys using call play-back and active searches with spotlights	Permanent and ephemeral waterbodies in Lowland Forest/Heathy Woodland Mosaic along preliminary route
Owls	*Ninox strenua* (powerful owl)	Spotlighting call play-back, and active searches for roosts (tree hollows).	Near rivers and creek lines associated with larger areas of native forests and woodland, likely near Holey Plains State Park and Giffard Bushland Reserve
Waterbirds	*Biziura lobata* (Musk Duck) *Aythya australis* (Hardhead) *Ardea ibis* (Cattle Egret) *Ardea intermedia plumifera* (Intermediate Egret) *A. alba modesta* (Eastern Great Egret)	Targeted surveys in areas with suitable waterbodies	Waterbodies, particularly present near Loy Yang
Other birds	*Hirundapus caudacutus* (White-throated Needletail)	Targeted surveys along preliminary route	Along preliminary route

Survey Group	Species/Communities	Method	Location
	Haliaeetus leucogaster (White-bellied Sea-eagle)	Targeted surveys along preliminary route	Along preliminary route, particularly in proximity to waterways

Table 9: Survey schedule for species with a high likelihood of occurrence. Survey periods are based on best practice industry guidelines (based on known flowering periods for flora and breeding period or seasonal movements for fauna).

= survey period

Taxon	Target Group	Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flora	Trees and shrubs Year-round surveys (spring optimal)	*Eucalyptus Arenicola (*Gippsland Lakes Peppermint*)*	■	■	■	■	■	■	■	■	■	■	■	■
		Eucalyptus strzeleckii (Strzelecki Gum)	■	■	■	■	■	■	■	■	■	■	■	■
		Eucalyptus yarraensis (Yarra Gum)	■	■	■	■	■	■	■	■	■	■	■	■
Flora	Trees and shrubs Winter flowering	*Bossiaea heterophylla* (Variable Bossiaea)				■	■	■						
		Grevillea chrysophaea (Golden Grevillea)						■	■	■	■	■	■	
Flora	Trees and shrubs Spring flowering	*Astrotricha parvifolia subsp. 1* (Small-leaf Star-hair)									■	■	■	
		Caladenia aurantiaca (Orange-tip Finger-orchid)									■	■	■	
		Commersonia prostrata (Dwarf Kerrawang)									■	■	■	
		Prostanthera galbraithiae (Wellington Mint-bush)									■	■	■	
		Sowerbaea juncea (Rush Lily)									■	■	■	
		Zieria veronicea subsp. veronicea (Pink Zieria)									■	■	■	
		Craspedia canens (Grey Billy-buttons)									■	■	■	
		Diuris punctata var. punctata (Purple Diuris)									■	■	■	
		Pomaderris aurea (Golden Pomaderris)									■	■	■	
Flora	Grasses and lilies	*Dianella amoena* (Matted flax-lily)	■	■									■	■
		Amphibromus fluitans (River Swamp Wallaby-grass)	■	■									■	■
Fauna	Mammals	*Pteropus poliocephalus* (Grey-headed Flying Fox)										■	■	■
Fauna	Owls	*Ninox strenua* (Powerful Owl)			■	■	■	■	■	■				

Taxon	Target Group	Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fauna	Waterbirds	*Biziura lobata* (Musk Duck) *Aythya australis* (Hardhead) *Ardea ibis* (Cattle Egret) *Ardea intermedia plumifera* (Intermediate Egret) *A. alba modesta* (Eastern Great Egret)												
Fauna	Other birds	*Hirundapus caudacutus* (White-throated Needletail)												
		Haliaeetus leucogaster (White-bellied Sea-eagle)												
Fauna	Amphibians - Autumn active	*Pseudophryne semimarmorata* (Southern Toadlet)												

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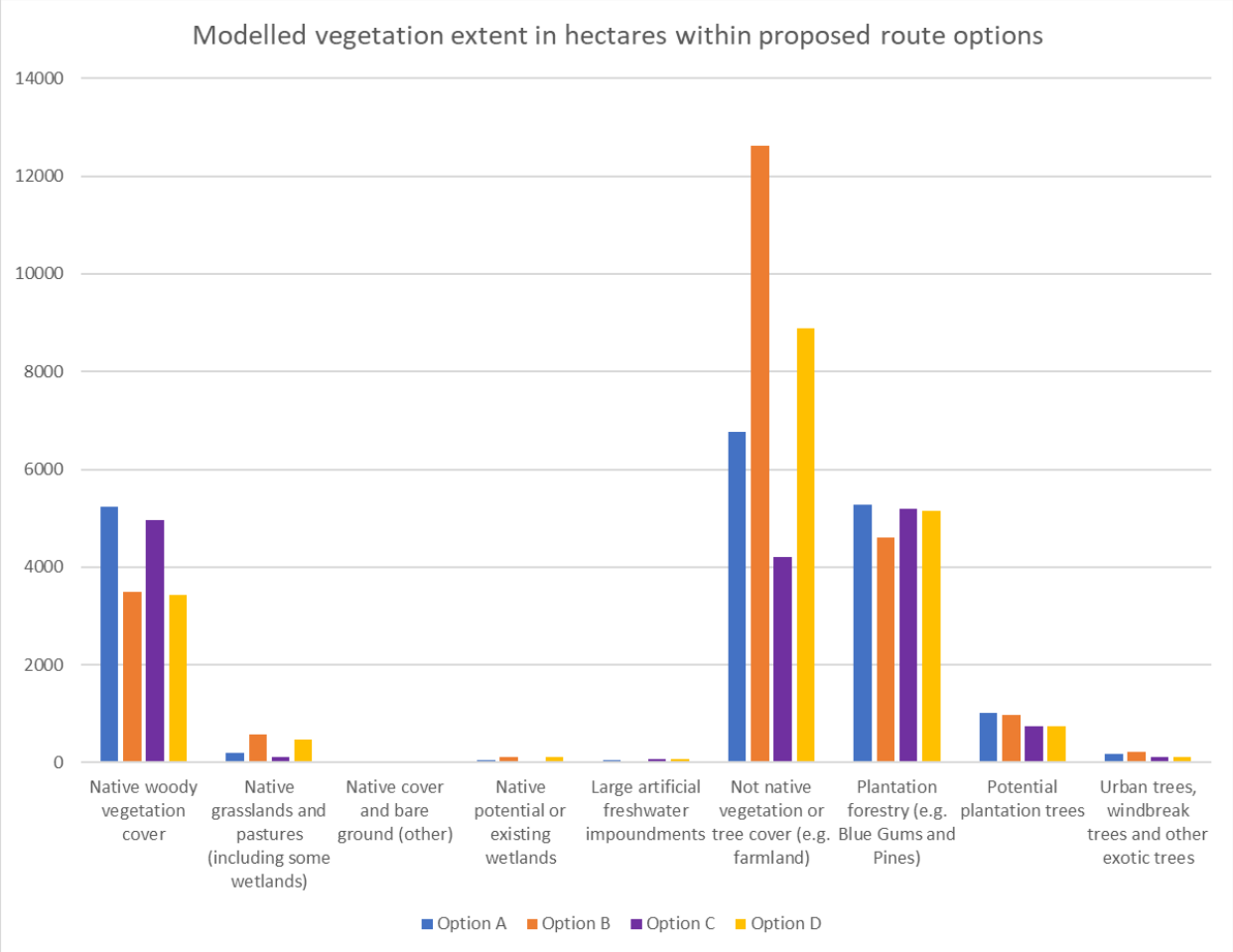
Appendix A Native Vegetation Extent

Table A1: Modelled vegetation extent in hectares based on DELWP's 2017 Native Vegetation extent dataset.

Landcover type	Option A	Option B	Option C	Option D
Woody native vegetation cover	5230	3499	4972	3420
Native grasslands and pastures (including some wetlands)	209	566	122	473
Other native cover and bare ground	25	39	25	39
Potential or existing non-woody wetland cover	61	110	34	105
Large artificial freshwater impoundments	58	0	79	79
Not native vegetation or tree cover (e.g. farmland)	6772	12628	4209	8895
Plantation forestry (e.g. Blue Gums and Pines)	5282	4613	5184	5152
Potential plantation trees	1010	979	753	745
Urban trees, windbreak trees and other exotic trees	187	222	111	124



Appendix B Likelihood of occurrence for preferred corridor

Appendix B Likelihood of occurrence tables for the preferred corridor

Terms

Likelihood of occurrence	FFG Act	EPBC Act	Protected Matters Search Tool
FLORA **Present:** Recorded within the study area in the last ten years. **High:** High likelihood of occurrence. Recent records of the species in the local vicinity (i.e. within the last 10 years); and/or, the project area contains high quality suitable habitat. **Moderate:** Moderate likelihood of occurrence. Previous records of the species in the local vicinity; and/or, the project area contains moderate quality suitable habitat. **Low:** Low likelihood of occurrence. Limited previous records of the species in the local vicinity; and/or, the study area contains poor or limited habitat. May also be considered low if other environmental factors, such as the fragmented or isolated nature of the habitat, are present. **None:** No suitable habitat and/or outside species range. **FAUNA** **Present:** Known resident of the project area based on site observations, recent database records (i.e. within last ten years) or expert advice**.** **High:** Recent records of the species in the local vicinity (i.e. within the last 10 years); and/or, the study area contains high quality or critical/ preferred habitat. **Moderate:** Previous records of the species in the local vicinity; and/or, the study area contains moderate quality or seasonal habitat. **Low:** Limited previous records of the species in the local vicinity; and/or, the study area contains habitat the species may use opportunistically or en-route to areas of preferred habitat. **None:** No suitable habitat and/or outside species range.	**EX:** Extinct **CR:** Critically endangered **EN:** Endangered **VU:** Vulnerable	**EX:** Extinct **CR:** Critically endangered **EN:** Endangered **VU:** Vulnerable **CD:** Conservation dependent **Ma:** Marine species **Mi:** Migratory species	**PMST-K:** Species or species habitat known to occur within area **PMST-L:** Species or species habitat likely to occur within area **PMST-M:** Species or species habitat may occur within area **PMST-F:** Foraging, feeding or related behaviour likely to occur within area

Table B1. Significant fauna

Species data					Likelihood assessment					Preliminary impact assessment				
Scientific name	Common name	FFG	EPBC	Number of records	Last record	Source	Likelihood of occurrence	Habitat requirements	Rationale	Location of suitable habitat	Likelihood of Significant (Unmitigated) Impact	Impact Rationale	Potential mitigation	Potential Implications
Accipiter novaehollandiae	Grey Goshawk	EN		6	18/05/2020	Record (VBA)	Moderate	Mainly tall wet forests and gullies in the Otway Ranges but also woodlands, dry forests, wooded farmland and suburban parks in the Strzelecki Ranges, Gippsland Plains and Otway Plains.	The species has been recorded within vegetation communities highly prevalent along the study area (e.g. 83 Swampy Riparian Woodland, 29 Damp Forest, 48 Heathy Woodland). Infrequent records have been made (n = 5), with the last made in 2004. As such, it has a moderate likelihood to currently persist in the study area.	Much of the study area likely presents suitable foraging habitat for the species, particularly along gully lines, along which most records occur.	Low	Significant impacts to the species are likely to occur from the removal of breeding habitat in mature forests within the preliminary route, as the species rarely uses forest regrowth less than 30 years old for breeding (Marchant & Higgins 1993). The removal of old growth trees suitable for nest placement are likely to be able to be avoidable.	The removal of old growth trees suitable for nest placement are likely to be able to be avoidable.	Offsets may be required to satisfy the Guidelines.
Actitis hypoleucos	Common Sandpiper	EN	Ma	1	2/12/2006	Record (VBA)	Low	Prefers the muddy edges or rocky shores of fresh or saline coastal wetlands. Less often recorded inland on the muddy or sandy edges of lakes, dams, waterholes and bore drains.	The Common Sandpiper is occasionally recorded inland, during the summer following the migration from the Northern Hemisphere.	The species has a higher potential to occur at the far eastern sections of the study area where it nears shorelines. It may occasionally, and has been reported on one occasion, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Anseranas semipalmata	Magpie Goose	VU		9	31/03/2007	Record (VBA)	Low	Open wetlands, swamps, floodplains and wet grasslands.	The Magpie Goose may occur as a vagrant in the study area, around low areas with wetlands and swamps (with only one previous occurrence in a 10kms). However, no substantial wetlands occur in the study area that would support high numbers of this species.	Small floodplains and wetlands occur in the study area that would provide marginal foraging habitat for vagrants, but would be unlikely to support large numbers.	NA	NA	NA	None

Species data					Likelihood assessment					Preliminary impact assessment				
Antechinus minimus maritimus	Swamp Antechinus		VU	NA	NA	Modelled (PMST)	Moderate	Mainly occurs in damp areas with dense vegetation at about 1−2 m above ground level, including dense wet heathlands, tussock grasslands, sedgelands, damp gullies, swamps and some shrubby woodlands. Found in Coastal Victoria as far east as Wilson's Promontory.	Some heathland vegetation occurs throughout the eastern sections of the study area, suitable for the species. The species has potential to occur on the fringes of vegetation with consistently high percentage of understorey cover across them, which the study area borders.	Healthland/Heathy woodlands occur in the eastern sections of the study area.	Low	Removal of large sections of understorey, could have a significant impact on the species.	Areas with dense understorey in healthy woodland should be avoided, as this has potential to impact species occurrence in these areas.	An EPBC referral to the Commonwealth Government may also be required.
Anthochaera phrygia	Regent Honeyeater	CR	CE	7	31/01/1979	Record (VBA)	Low	Mainly occurs in box-ironbark forests and woodlands in northern Victoria.	The species a highly mobile however, there are no recent records and the species is unlikely to make use of the study area given the preferred habitat is box-ironbark forest which does not occur within the study area.	The species can utilise a broad range of habitats, particularly where flowering is prolific. The preferred habitat of the species, box ironbark open-forest and woodland, does not occur in the study area.	Low			Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Apus pacificus	Fork-tailed Swift		Mi,Ma	NA	Modelled (PMST)	Moderate	Primarily an aerial species which forages in flight and may occasionally land.	Widespread but sparsely scattered in all regions of Victoria (Higgins 1999).	Potentially seen travelling across much of the study area.	Low	Species occurs a wide range of habitat types, travelling long distance. Likely seen moving through study area, but impacts are unlikely to have a negative impact on the species due to its ability to utilise a wide range of areas.	Avoid remnant stands of Eucalypts which may provide foraging habitat.	An EPBC referral to the Commonwealth Government may also be required.
Ardea alba modesta	Eastern Great Egret	VU		49	18/05/2020	Record (VBA)	High	Widespread in Australia. Inhabits swamps and marshes, grasslands, margins of rivers and lakes, salt pans, estuarine mudflats and other wetland habitats.	A relatively large number of records have been made in the eastern sections of the study area.	Small floodplains and wetlands occur throughout the study area that would provide foraging habitat for the species (e.g. EVC 18 & 56)	Low	Overall, only small areas of suitable wetlands occur in the study area. The preliminary route is unlikely to go through any significant wetlands, which would displace the species and cause a significant impact.	Avoidance of wetlands suitable for foraging, especially where habitat could sustain large enough numbers for breeding.	Offsets may be required to satisfy the Guidelines.

Species data					Likelihood assessment				Preliminary impact assessment				
Ardea ibis	Cattle Egret		Ma	NA	NA	Modelled (PMST)	High	Occurs in grasslands, woodlands and terrestrial wetlands, often occurring in association with farm animals, particularly cattle. It roosts in trees and ground vegetation near lakes and swamps.	Small floodplains and wetlands occur throughout the study area, with many likely throughout farmland areas suitable for the species.	Small floodplains and wetlands occur throughout the study area that would provide foraging habitat for the species (e.g. EVC 18 & 56).	Low	Overall, only small areas of suitable wetlands occur in the study area. The preliminary route is unlikely to go through any significant wetlands, which would displace the species and cause a significant impact.	Avoidance of wetlands suitable for foraging, especially where habitat could sustain large enough numbers for breeding.	An EPBC referral to the Commonwealth Government may also be required.
Ardea intermedia plumifera	Intermediate egret	CR		9	18/05/2020	Record (VBA)	High	Mostly an inhabitant of the shallows in terrestrial wetlands, and prefers freshwater swamps, billabongs, floodplains and wet grasslands with dense aquatic vegetation. It is only occasionally seen in estuarine or intertidal habitats.	Small floodplains and wetlands occur throughout the study area, with many likely throughout farmland areas suitable for the species.	Small floodplains and wetlands occur throughout the study area that would provide foraging habitat for the species (e.g. EVC 18 & 56).	Low	Overall, only small areas of suitable wetlands occur in the study area. The preliminary route is unlikely to go through any significant wetlands, which would displace the species and cause a significant impact.	Avoidance of wetlands suitable for foraging, especially where habitat could sustain large enough numbers for breeding.	Offsets may be required to satisfy the Guidelines.
Ardeotis australis	Australian Bustard	CR		1	01/01/1847	Record (VBA)	Low	Primarily an inland and tropical species.	Although the species is rarely seen in south-eastern Australian, rarely sighted outside north-western Australia (and only as an occasional visitor to these areas). Only one record occurs within 10kms of the study area from 1847.	No suitable habitat exists to support large populations, with the study area being outside is usual range.	NA	NA	NA	None
Arenaria interpres	Ruddy Turnstone	CR	Ma, Mi	1	1/01/1977	Record (VBA)	Low	Widespread within Australia during its non-breeding period of the year. It is found in most coastal regions, with occasional records of inland populations. It strongly prefers rocky shores often with shallow pools or beaches where there are large deposits of rotting seaweed.	Species very uncommon in inland areas, usually occurring along the coastline on exposed rocks or reefs, shallow pools, and on beaches. Only one record occurs south of the study area, in a coastal region.	May occur occasionally at the small number of wetlands in the study area as a vagrant. The species in unlikely to occur with regularity in the study area.	NA	NA	NA	None

Species data				Likelihood assessment					Preliminary impact assessment				
Aythya australis	Hardhead	VU	122	18/05/2020	Record (VBA)	High	Prefers open freshwater swamps and wetlands and occasionally in sheltered estuaries. They are rarely seen on land and tend to roost on low branches and stumps near the water. They prefer deep, fresh open water and densely vegetated wetlands for breeding.	A large number of records have been made of this species within a 10km radius, of the study area including some within the study area. This species prefers deep, fresh open water and densely vegetated wetlands, for which there are a small number of throughout the study area.	Small floodplains and wetlands occur in the study area that would provide marginal foraging habitat the species. Potential breeding habitat occurs throughout the study area.	Moderate	This species has been recorded throughout many wetland, lakes and rivers around the study area.	Avoidance of wetlands and lakes suitable for foraging, especially where habitat could sustain large enough numbers for breeding.	May trigger EE Act referral where impacts to other species or communities also likely.
Biziura lobata	Musk Duck	VU	47	5/12/2011	Record (VBA)	High	Prefers deep fresh open water and densely vegetated wetlands and swamps. Occasionally found in estuaries and bays.	A moderate number of records have been made of this species within a 10km radius, of the study area including some within the study area. This species prefers deep, fresh open water and densely vegetated wetlands, for which there are a small number of throughout the study area.	Small floodplains and wetlands occur in the study area that would provide marginal foraging habitat the species. Potential breeding habitat occurs throughout the study area	Moderate	This species has been recorded throughout many wetland, lakes and rivers around the study area.	Avoidance of wetlands and lakes suitable for foraging, especially where habitat could sustain large enough numbers for breeding.	May trigger EE Act referral where impacts to other species or communities also likely.
Botaurus poiciloptilus	Australasian Bittern	CR	EN	14	4/04/2019	Record (VBA)	Moderate	Prefers permanent freshwater wetlands with tall aquatic vegetation such as bullrushes (Typha spp.) and spikerushes (Eleocharis spp.) occasionally occur in rice fields and saltmarshes.	A moderate number of records have been made of this species in the eastern sections of the study area, near Hazelwood Pondage and surrounding wetlands.	Suitable habitat may occur throughout where there are permanent freshwater wetlands (e.g. EVC 56 and 83).	Low	This species has been recorded in a small number of man-made water bodies. It is unlikely that suitable breeding habitat or high quantity foraging habitat will be removed.	Avoidance of wetlands and lakes suitable for foraging, especially where vegetation could sustain large enough numbers for breeding.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Calamanthus pyrrhopygius	Chestnut-rumped Heathwren	VU		15	21/09/2017	Record (VBA)	Moderate	Prefers heathlands and woodlands with dense shrub and ground-layer vegetation, most commonly found in rocky areas.	Heathy woodlands (EVC 48) occur throughout the study area, with a moderate number of relatively recent records.	Heathy woodlands, throughout northern and southern study areas	Moderate	This species breeds near the ground in tussocks or dense shrubs, in heathy areas. If this vegetation is removed, the impact could alter the local reproductive success.	Avoid dense shrubs in heathy areas.	May trigger EE Act referral where impacts to other species or communities also likely.

Species data					Likelihood assessment					Preliminary impact assessment				
Calidris canutus	Red Knot	EN	EN, Ma, Mi	2	1/01/1977	Record (VBA)	Low	Non-breeding migratory species that occurs along the coast in sandy estuaries with tidal mudflats, coastal wetlands, sheltered sandy beaches, sewage ponds and saltworks.	Occasionally recorded inland, during the summer following the migration, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Calidris ferruginea	Curlew Sandpiper	CR	CE, Ma, Mi	4	10/09/2017	Record (VBA)	Low	Non-breeding migratory species that occurs primarily on intertidal mudflats of estuaries, lagoons, mangroves, and less often on beaches, rocky shores and around lakes, dams. Can also occur on suitable inland habitats in the Kerang area, Mildura, and western districts.	Occasionally recorded inland, during the summer following the migration, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Calidris melanotos	Pectoral Sandpiper	Ma, Mi	NA	NA	Modelled (PMST)	Low	Non-breeding migratory species that prefers shallow fresh to saline wetlands with open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. Also occurs in swamps, saltmarshes, lakes and inundated grasslands.	Occasionally recorded inland, during the summer following the migration, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None

Species data				Likelihood assessment					Preliminary impact assessment				
Calidris ruficollis	Red-necked Stint	Ma, Mi	NA	NA	Modelled (PMST)	Low	Coastal species which occurs in sheltered inlets, bays, lagoons, estuaries, intertidal mudflats and protected sandy or coralline shores. Occasionally occurs in saltworks, sewage farms, saltmarsh, shallow wetlands, lakes, swamps, riverbanks, dams, flooded paddocks or damp grasslands.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Charadrius ruficapillus	Red-capped Plover	Ma	NA	NA	Modelled (PMST)	Low	Widespread throughout Australia. Inhabits sandy beaches, saltmarshes, and saline wetlands and lakes.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None

Species data				Likelihood assessment					Preliminary impact assessment				
Climacteris affinis	White-browed Treecreeper	EN	1	19/10/2004	Record (VBA)	Low	In Victoria, White-browed Treecreepers are restricted to localised populations in regenerating native pine (*Callitris spp*.) and/or Buloke (*Allocasuarina luehmannii*) and Belah (*Casuarina pauper*) woodlands, or in fairly dense thickets of smaller shrubs, including Sugarwood (*Myoporum platycarpum*), Weeping Pittosporum (*Pittosporum phillyraeoides*), Small Cooba (*Acacia ligulata*), Umbrella Wattle (*A. osswaldii*) and Slender Hopbush (*Dodonaea viscosa spp*.) Habitat includes grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	No areas of suitable habitat within the study area, with suitable habitat occurrence approximately 10km's to the south.	None within the study area.	NA	NA	NA	None

Species data					Likelihood assessment					Preliminary impact assessment				
Dasyurus maculatus maculatus	Spot-tailed Quoll	EN	EN	2	1/01/1975	Record (VBA)	Low	Occurs in a range of environments from rainforest to open woodland. Particularly wet eucalypt forests with rocky outcrops, extensive riparian vegetation and ground dwelling prey. Highly mobile but requires suitable den sites such as rock crevices, caves, hollow logs, burrows and tree hollows. In Victoria, locations include East Gippsland, the Strzelecki Range, and Wilson's Promontory NP.	The species is primarily present in North East and East Gippsland, with uncommon occurrences in south-eastern Gippsland where the study area occurs.	Marginal foraging habitat occurs in the study area, but no individuals are likely to have the core of their range within the study area.	Low	Marginal foraging habitat occurs, but no individuals are likely to have the core of their range within the study area. Any individuals found in the study area are likely to be moving through it from the southern remanent damp forest.	Avoid areas of large intact remnant forest. Avoid removal of rocky out crops or hollow bearing trees that may be used for den sites.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Dasyurus viverrinus	Eastern Quoll	EN	EN	1	01/01/1899	Record (VBA)	No	The species now survives in several discrete areas of Victoria, including eastern Victoria (including north-eastern Victoria and lowland East Gippsland) and South Gippsland, in the Strzelecki Ranges. It inhabits Dry sclerophyll forest, scrub, heathland and cultivated land.	The species is regionally extinct and only occurrence was made in 1899.	The species is regionally extinct.	NA	NA	NA	None
Delma impar	Striped Legless Lizard	VU	VU	NA	NA	Modelled (PMST)	Low	Occurs in grassland with complex grass structure, including native and exotic tussock grasses with high biomass, surface rocks, arthropod burrows or cracking soils. Occurs on roadsides and can persist in disturbed areas with low-moderate intensity grazing but not in cropped or ploughed land.	No recent records, no cracking soils and study area is not within any areas of important habitat for this species.	None	Low	No recent records, no cracking soils and study area is not within any areas of important habitat for this species.		

Species data				Likelihood assessment					Preliminary impact assessment				
Egretta garzetta	Little Egret	EN	26	10/11/2018	Record (VBA)	Moderate	Prefers swamps, billabongs, floodplain pools, mudflats, mangroves and channels; breeds in trees standing in water.	Small floodplains and wetlands occur throughout the study area. A moderate number of records have been made of this species in the eastern sections of the study area, near Hazelwood Pondage and surrounding wetlands, and in the north east, nearing the Gippsland Lakes.	Small floodplains and wetlands occur throughout the study area that would provide foraging habitat for the species (e.g. EVC 18 & 56).	Moderate	Only small areas of suitable wetlands occur in the study area. The preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands and lakes suitable for foraging. Avoid removal of tree stands in water.	May trigger EE Act referral where impacts to other species or communities also likely.
Engaeus rostrogaleatus	Strzelecki Burrowing Crayfish	EN	2	10/05/1999	Record (VBA)	No	Has a very restricted distribution along a 30 km section of the Eastern Strzelecki Ranges in South Gippsland at high altitudes generally above 400 m. Typically found in the flood-bed regions of ferny gullies in wet sclerophyll forest and on creek banks.	No suitable habitat in the study area, with suitable high elevation, wet sclerophyll forest south of the study area but none within the study area.	None within the study area.	NA	NA	NA	None
Euastacus bispinosus	Glenelg Spiny Crayfish	EN	EN	1	13/11/2003	Record (VBA)	No	N/A	Records are likely misidentifications as this species does not occur in this region.	None within the study area.	NA	NA	NA	None
Falco hypoleucos	Grey Falcon		VU	NA	Modelled (PMST)	Moderate	Primarily occurs inland in arid areas but can occur elsewhere in Australia. Prefers lightly timbered woodland and Acacia scrub.	The species has potential to forage over much of the study area, particularly across cleared or semi-cleared areas.	Cleared, semi-cleared and grassland areas across the study area.	Low	There is likely to be a low impact to the foraging habitat of the species, which can forage in disturbed areas. Breeding is usually confined to the arid zone, where the annual rainfall is less than 250 mm, and therefore is unlikely to occur in the study area.	Avoidance of potential nesting trees (usually in tall eucalypts close to a watercourse).	An EPBC referral to the Commonwealth Government may also be required.

Species data					Likelihood assessment					Preliminary impact assessment				
Falco subniger	Black Falcon	CR		8	18/05/2020	Record (VBA)	Moderate	Sparsely distributed across Victoria. Occurs in woodland, shrubland and grassland in particularly along wooded watercourses and agricultural land with scattered remnant trees.	The species has potential to forage over much of the study area, particularly along predominate streams and rivers.	Potential to occur across much of the study area.	Low	There is likely to be a low impact to the foraging habitat of the species, which can forage in disturbed areas. Removal of breeding trees may have a significant impact on the species but may be easily avoided.	Avoidance of potential nesting trees (usually in tall eucalypts close to a watercourse).	Offsets may be required to satisfy the Guidelines.
Galaxiella pusilla	Dwarf Galaxis	EN	VU	15	16/07/2020	Record (VBA)	Moderate	Occurs from the Mitchell River Basin in Central Gippsland, Victoria, to the Cortina Lakes, near the Coorong in South Australia. Typically occurs in well vegetated slow flowing, still, shallow temporary or permanent freshwater habitats including swamps, drains and backwaters of streams and creeks. Some wetlands be may partially or completely dry during summer.	Study area occurs in the core of the species range, with recent records made close to the study area (2020). Multiple suitable waterbodies occur across the study area.	Small water bodies occur throughout the study area that would provide habitat for the species (e.g. EVC 18 & 56), particularly to the east of the study area near the Morwell river.	Low	Overall, small areas near the eastern section of the study are likely suitable and are unlikely to be removed during works.	Avoidance of wetlands, streams and lakes.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Gallinago hardwickii	Latham's Snipe	Ma, Mi	NA	NA		Modelled (PMST)	Moderate	Non-breeding migratory species that occurs in freshwater wetlands with low dense vegetation on or near the coast. Preferred wetland vegetation includes sedges, grasses, lignum, reeds and rushes. Also occurs in saltmarsh and creek edges on migration, drainage ditches along roadsides and railways, crops and pasture.	Suitable habitat occurs study area around small wetlands and lakes.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands, and in the north east, nearing the Gippsland Lakes.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands, streams and lakes.	An EPBC referral to the Commonwealth Government may also be required.

Species data				Likelihood assessment					Preliminary impact assessment				
Gallinago megala	Swinhoe's snipe	Ma	NA	NA	Modelled (PMST)	Moderate	Few definite records occur in Australia, but potential habitat occurs along much of the coast of Victoria. Occurs around the edges of fresh and brackish wetlands, including swamps, billabongs, river pools, small streams and sewage ponds. They are also found in drying claypans and inundated plains.	Suitable habitat occurs study area around small wetlands and lakes.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands, and in the north east, nearing the Gippsland Lakes.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands, streams and lakes.	An EPBC referral to the Commonwealth Government may also be required.
Gallinago stenura	Pin-tailed snipe	Ma	NA	NA	Modelled (PMST)	Moderate	Cryptic shorebird of wetlands, wet meadows, and both flooded and dry agricultural fields. Looks very similar to other snipe species.	Suitable habitat occurs study area around small wetlands and lakes.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands, and in the north east, nearing the Gippsland Lakes.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands, streams and lakes.	An EPBC referral to the Commonwealth Government may also be required.
Gelochelidon macrotarsa	Australian Gull-billed Tern	1	1/05/1985	Record (VBA)	Low	Prefers marshier habitats of freshwater swamps, brackish and salt lakes and occasionally on beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	NA	None

Species data					Likelihood assessment					Preliminary impact assessment				
Grantiella picta	Painted Honeyeater	VU	VU	NA	NA	Modelled (PMST)	Moderate	Prefers forest/woodland, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands with mistletoe a high number of mature trees. Also occurs in acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens.	The species a highly mobile and has the potential to use large areas across the study area as foraging habitat.	The species can utilise a broad range of habitats, particularly where flowering is prolific, and mistletoes are present.	Moderate	The removal of foraging habitat is likely to be marginal, with the species easily able to move to utilise alternative habitat.	Avoid remnant stands of Eucalypts which may provide foraging habitat.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Haliaeetus leucogaster	White-bellied Sea-Eagle	CR	Ma	119	5/09/2019	Record (VBA)	High	Occurs on beaches and estuaries, inland wetlands, lakes, reservoirs, saltmarsh, major inland streams and adjacent terrestrial habitats.	A large number of records have been made of this species within a 10km radius, of the study area including some within the study area. This species can occur in coastal and inland regions, particularly along rivers.	Given there are multiple rivers that occur in the study area, and some inland wetlands, the species is highly to traverse much of the study area during foraging.	Low	Small areas of suitable wetlands and water bodies occur in the study area suitable for foraging. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. high quality habitat such as Gippsland Lakes), which would displace the species and cause a significant impact. Removal of large mature trees and stags along water ways could have significant impacts on breeding of individuals who likely use the same nest over multiple years.	Avoidance of wetlands, streams and lakes. Avoid removal of large mature trees near waterways that may be used as nesting trees.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.

Species data				Likelihood assessment					Preliminary impact assessment				
Heleioporus australiacus	Giant Burrowing Frog	VU	NA	NA	Modelled (PMST)	Moderate	N/A	Small floodplains and wetlands occur throughout the study area, with many likely suitable for the species to breed. Limited surveys have been conducted for this species.	Small floodplains and wetlands occur throughout the study area, with many likely suitable for the species to breed.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact. The species appears to be dependent on areas with native vegetation (Penman et al. 2004), and therefore waterbodies in cleared areas are unlikely to be suitable.	Avoidance of wetlands and lakes suitable for foraging and breeding.	An EPBC referral to the Commonwealth Government may also be required.
Hieraaetus morphnoides	Little Eagle	VU		23	14/01/2011	Record (VBA)	Moderate	Widespread species. Occurs primarily in wooded farmland and dry woodlands.	A moderate number of records have been made across the study area with many areas representing suitable habitat.	Suitable habitat likely occurs throughout the study area, as the species can utilised disturbed landscapes such as farmland.	Low	Foraging habitat of the species is unlikely to be impact as the species can forage in disturbed, cleared areas. Removal of known nesting trees could have a significant impact on the reproductive success of the species.	Avoid removal of large mature trees near waterways that may be used as nesting trees.	Offsets may be required to satisfy the Guidelines.
Himantopus himantopus	Black-winged Stilt	Ma	NA	NA	Modelled (PMST)	Moderate	N/A	Suitable habitat occurs study area around small wetlands and lakes.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands, and in the north east, nearing the Gippsland Lakes.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands, streams and lakes.	An EPBC referral to the Commonwealth Government may also be required.

Species data					Likelihood assessment					Preliminary impact assessment				
Hirundapus caudacutus	White-throated Needletail	VU	VU, Ma, Mi	98	3/04/2019	Record (VBA)	High	Primarily an aerial species which forages in flight and may occasionally land. Occurs most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	The species is known to forage across many habitat types (with habitat type often seen to be not applicable in describing the occurrence of the species). A large number of records have been made near the study area.	Suitable foraging habitat across the study area.	Low	This species is an aerial forager, and therefore unlikely to be impacted by preliminary route. Removal of lowland forest may impact breeding success.	Avoidance of remnant lowland forest.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Hydroprogne caspia	Caspian Tern	EN	Mi	24	1/02/2019	Record (VBA)	Low	Prefers sheltered coastal environments with sandy or muddy edges including bays, lagoons, inlets and estuaries. Also occurs in open wetlands, including lakes and rivers, reservoirs, sewage ponds and saltworks. Significant regular breeding colonies are located at Corner Inlet, Mud Island in Port Philip Bay and Mallacoota.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Isoodon obesulus obesulus	Southern Brown Bandicoot	EN	EN	1	1/08/1976	Record (VBA)	Low	Prefers heathland, heathy open forest and woodland with dense ground cover up to 1 m tall on sandy and well drained soils. Also occurs in dense Blackberry thickets.	Although few records have been made of the species near the study area, suitable habitat does occur in the east of study area. However, no individuals have been observed in the area in the past 40 years.	The species may occur in scrubby heathlands and woodlands in the east of the study area (e.g. EVC 48).	NA	NA	NA	None
Ixobrychus dubius	Australian Little Bittern	EN		4	19/11/2018	Record (VBA)	Moderate	East of Melbourne, isolated records occur near Marthavale and the Lake Curlip Wildlife Reserve. Mainly found in dense emergent vegetation in freshwater wetlands, especially in reedbanks and Typha, as well as in inundated shrub thickets; can occur in small wetlands.	Suitable habitat occurs study area around small wetlands and lakes.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands (where the species has previously been recorded), and in the north east, nearing the Gippsland Lakes.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands, streams and lakes.	Offsets may be required to satisfy the Guidelines.

Species data					Likelihood assessment					Preliminary impact assessment				
Lathamus discolor	Swift Parrot	CR	CE	3	16/04/2017	Record (VBA)	Moderate	Non-breeding winter migrant. Prefers dry forest and woodland, particularly box-ironbark forest in central and NE Victoria, and eucalyptus sp. within greater Melbourne. Feeds on nectar and lerps of winter flowering eucalyptus including Grey Box (Eucalyptus microcarpa), Red Ironbark (Eucalyptus tricarpa), Mugga Ironbark (Eucalyptus sideroxylon) (far north-east Victoria), Yellow Gum (Eucalyptus leucoxylon) and White Box (Eucalyptus albens).	The species a highly mobile and has the potential to use large areas across the study area as foraging habitat.	The species can utilise a broad range of habitats, particularly where flowering is prolific. The preferred habitat of the species, species, box ironbark open-forest and woodland, does not occur in the study area.	Moderate	The removal of foraging habitat is likely to be marginal, with the species easily able to move to utilise alternative habitat. Breeding is unlikely to occur in this area.	Avoid remnant stands of Eucalypts which may provide foraging habitat.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Lewinia pectoralis	Lewin's Rail	VU		5	19/11/2018	Record (VBA)	Moderate	Occurs in coastal wetlands and swamps with dense riparian vegetation, and saltmarsh.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	Low	Small areas of suitable wetlands occur in the study area. The preliminary route is unlikely to go through any significant wetlands that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands and lakes suitable for foraging.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Limosa lapponica	Bar-tailed Godwit	VU	Ma, Mi	2	16/11/1977	Record (VBA)	No	Widespread along the coast of Victoria. Prefers large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays. Rarely inland.	No suitable habitat as the species rarely occurs inland.	None within the study area.	NA	NA	NA	None

Species data					Likelihood assessment					Preliminary impact assessment				
Lissolepis coventryi	Swamp Skink	EN		6	26/11/2007	Record (VBA)	Moderate	Occurs in densely vegetated swamps and associated watercourses, and adjacent wet heaths (tea-tree thickets), sedgelands and saltmarshes (Clemann 2000, SAC 2000, Manning 2002).	Although a low number of records have been made near the study area, suitable habitat occurs across the east of the study area.	Most likely to occur in Heathy woodlands (EVC 48) and Riparian Scrub (EVC 191).	Moderate	Removal of densely vegetated areas around heaths, swamps and water courses may displace this species.	Avoidance of vegetation removal near heathlands, wetlands, streams, lakes and heath.	May trigger EE Act referral where impacts to other species or communities also likely.
Litoria aurea	Green and Golden Bell Frog	VU	VU	1	18/05/2020	Record (VBA)	Moderate	Occurs in coastal plains and low foothills including lowland forest, wet heathland, riparian scrub and riparian forest in Gippsland. Breeding habitat includes, dams, wetlands, swamps within disturbed and non-disturbed areas with primarily permanent water but can also occurs in ephemeral waterbodies with dense emergent vegetation (DEWHA 2009).	Although a low number of records have been made near the study area, suitable habitat occurs across the east of the study area.	Most likely to occur in Heathy woodlands (EVC 48) and Riparian Scrub (EVC 191).	Moderate	Removal of vegetated areas around heaths, swamps and water courses may displace this species.		An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Litoria raniformis	Growling Grass Frog	VU	VU	38	28/09/1978	Record (VBA)	Moderate	The species persists in isolated populations in the greater Melbourne area, in the south-west of Victoria and a few sites in central Victoria and Gippsland. Occurs in a variety of still or slow-moving permanent and semi-permanent water bodies with abundant submerged and emergent vegetation and minimal tree canopy cover including farm dams, irrigation channels and disused quarries.	Small floodplains and wetlands occur throughout the study area, with many likely suitable for the species to breed. Limited records have been made for this species in the Gippsland area with the last record near the study area made more than 30 years ago.	Small floodplains and wetlands occur throughout the study area, with many likely suitable for the species to breed.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands and lakes suitable for foraging and breeding.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.

Species data					Likelihood assessment					Preliminary impact assessment				
Lophoictinia isura	Square-tailed Kite	CR		1	5/02/1986	Record (VBA)	Moderate	N/A	Although a small number of records have been made across the study area, the species can utilise a broad range of habitats present across the study area.	Suitable habitat likely occurs throughout the study area, as the species can utilised disturbed landscapes such as farmland as well as open eucalypt forests and woodlands.	Low	Foraging habitat of the species is unlikely to be impacted as the species can forage in disturbed, cleared areas. Removal of known nesting trees could have a significant impact on the reproductive success of the species.	Avoid removal of large mature trees near waterways that may be used as nesting trees.	Offsets may be required to satisfy the Guidelines.
Macquaria australasica	Macquarie Perch	EN	EN	1	9/11/1929	Record (VBA)	No	N/A	The species has not been recorded since 1929, likely due the disappearance of pristine waters which it requires. The study area is significantly outside the currently known distribution for the species.	Small floodplains and wetlands occur throughout the study area may be suitable, but giving the known distribution, the species is unlikely to occur.	NA	NA	NA	None
Mastacomys fuscus mordicus	Broad-toothed Rat		VU	NA	NA	Modelled (PMST)	Low	Occurs in high rainfall areas containing a moderate to dense ground layer of grasses, sedges, herbs and heaths. Mainly occurs in alpine and sub-alpine heathlands.	The species predominately occurs in sub-alpine and alpine areas in the east of the state, for do not occur across the study area. However, the species can occur at lower altitudes in South Gippsland Highlands, inhabiting areas with a dense wet understorey within tall open-forest and open-forest communities (Wallis et al. 1982).	Most likely to occur in the south east of the study area in areas of EVC 29 Damp Forest and EVC 16 Lowland Forest.	NA	NA	NA	None
Melanodryas cucullata	Hooded Robin	VU		6	12/06/1999	Record (VBA)	Moderate	Found all over mainland Australia. Inhabits lightly timbered woodland usually dominated by acacia and/or eucalypts.	Although this species predominately occurs further north of the study area in the East Gippsland Uplands bioregion, it can occupy diverse open woodlands containing Eucalyptus, Acacia or Callitris with an understorey of smaller trees, shrubs and grasses, including urban/disturbed and remnant vegetation. As such, it may occur across much of the study area.	The species may occur in much of the woodland vegetation across the study area including (e.g. EVC 16, 55).	Moderate	Removal of vegetation suitable for foraging and breeding, particularly edge habitats, with deep and sheltered edges, may locally displace the species.	Avoid remnant stands of trees which may provide foraging habitat.	May trigger EE Act referral where impacts to other species or communities also likely.

Species data				Likelihood assessment					Preliminary impact assessment				
Merops ornatus	Rainbow Bee-eater	Ma	NA	NA	Modelled (PMST)	Moderate	Widespread within Australia, although southern populations migrate north from February and return in September. Often occurs in open forest, woodlands and shrublands near water. May also occur in wooded farmland, quarries and orchards.	The species is known to forage across many habitat types and able to utilise a diversity range of habitats. Therefore, it has the potential to occur across the study area.	Suitable foraging habitat across the study area, including across open forests, woodlands and shrublands, and cleared areas, usually near water.	Low	This species is highly mobile and able to utilise a wide range of habitats in the surrounding area if displaced.	Avoidance of remnant stands of forest or woodland.	An EPBC referral to the Commonwealth Government may also be required.
Monarcha melanopsis	Black-faced Monarch	Ma, Mi	NA	NA	Modelled (PMST)	Moderate	Occurs along the eastern coastline but records are largely confined to east Gippsland. Inhabits rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, parks and gardens.	The species may be found across a wide range of habitat types, particularly during migration.	May occupy many vegetation communities across the study area but is most likely to occur in eucalypt woodlands, coastal scrub and damp gullies to the south of the study area (e.g. Damp and Wet Forest, EVC 29 & 30).	Low	This species is highly mobile and able to utilise a wide range of habitats in the surrounding area if displaced.	Avoidance of remnant stands of forest or woodland.	An EPBC referral to the Commonwealth Government may also be required.
Motacilla flava	Yellow Wagtail	Ma, Mi	NA	NA	Modelled (PMST)	Moderate	Non-breeding migratory species. Occurs in grassland habitat subject to inundation.	The species is highly mobile and potentially seen across much of the study area that is subject to inundation	Small floodplains and wetlands occur throughout the study area, with many likely suitable for the species to forage. No breeding occurs in Australia	Low	This species is highly mobile and able to utilise a wide range of habitats in the surrounding area if displaced	Avoidance of wetlands and lakes suitable for foraging	An EPBC referral to the Commonwealth Government may also be required.
Myiagra cyanoleuca	Satin Flycatcher	VU, Ma, Mi	NA	NA	Modelled (PMST)	Moderate	In Victoria, the species is widespread in the south and east. Prefers tall wetter Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	Potential habitat is present is present throughout the study area, particularly in areas where floodplains and wetlands occur	Throughout study area	Low	This species is highly mobile and able to utilise a wide range of habitats in the surrounding area if displaced	Avoidance remnant stands of Eucalyptus near wetlands and lakes suitable for foraging	An EPBC referral to the Commonwealth Government may also be required.
Nannoperca sp. 1	Flinders Pygmy Perch	VU	71	19/10/2020	Record (VBA)	Present	Records occur from eastern Victoria as far west as the Latrobe River. Typically occurs in lakes, ponds and slow-flowing rivers.	Many suitable lakes, ponds and rivers occur with a large number of recent records in the east of the study area.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River\	Moderate	If any waterbodies are disturbed, this may cause the local disappearance of this species	Avoidance of disturbance or removal of water bodies	May trigger EE Act referral where impacts to other species or communities also likely.

Species data					Likelihood assessment					Preliminary impact assessment				
Neophema chrysogaster	Orange-bellied Parrot	CR	CE, Ma, Mi	3	26/05/1984	Record (VBA)	Moderate	Non-breeding migratory species. Occurs in sheltered coastal habitats such as bays, lagoons and estuaries, coastal shrubland and occasionally grassy areas near saltmarsh, sewage ponds and pasture.	The species a highly mobile and has the potential to use large areas across the study area as foraging habitat.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands (where the species has previously been recorded), and in the north east, nearing the Gippsland Lakes.	Moderate	If potential foraging habitat is removed from near waterbodies, this could reduce the available foraging habitat for the species, particularly important around migration.	Avoid removal of vegetation around water bodies.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Ninox connivens	Barking Owl	EN		6	11/11/2009	Record (VBA)	Moderate	Prefers open woodlands and the edges of forests dominated by eucalyptus species, particularly red gum and often adjacent to farmland.	The species utilises a broad range of habitats present across the study area.	The species utilised a broad range of habitats along forest edges and has potential to forage over much of the study area, particularly where there are remnant patches of vegetation that contain potential breeding hollows.	Moderate	Where potential breeding trees are removed, there is potential for a significant disruption to breeding and displacement of the species.		May trigger EE Act referral where impacts to other species or communities also likely.
Ninox strenua	Powerful Owl	VU		44	21/04/2018	Record (VBA)	High	Prefers tall open continuous sclerophyll forest and woodlands with a dense understory but will also occur in more fragmented landscapes particularly if suitable adjacent habitat is present. Requires large, hollow-bearing eucalypts for breeding.	The species utilises a broad range of habitats present across the study area. A large number of records have been made of this species near the study area.	The species utilised a broad range of habitats along forest edges and has potential to forage over much of the study area, particularly where there are remnant patches of vegetation that contain potential breeding hollows.	Moderate	Where potential breeding trees are removed, there is potential for a significant disruption to breeding and displacement of the species.		May trigger EE Act referral where impacts to other species or communities also likely.

Species data					Likelihood assessment					Preliminary impact assessment				
Numenius madagascariensis	Eastern Curlew	VU	CE, Ma, Mi	NA	NA	Modelled (PMST)	Low	Non-breeding migrant. Occurs in sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Also occurs in saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Numenius minutus	Little Curlew		Ma, Mi	NA	NA	Modelled (PMST)	Low	N/A	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	The species has a higher potential to occur at the far eastern sections of the study area, where it nears shorelines. It may occasionally, occur near inland wetlands, but is likely a vagrant in this area.	NA	NA	NA	None
Ornithorhynchus anatinus	Platypus	VU	10	19/03/2014	Record (VBA)	Moderate	Prefers well vegetated freshwater creeks, slow-moving rivers, lakes joined by rivers, and built water storages such as farm dams. Builds burrows into riverbanks among tree roots.	Many suitable lakes, ponds and rivers occur with a moderate (given the cryptic nature of the species) number of recent records in the east of the study area.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and in undisturbed streams within the Strzelecki Ranges.	Moderate	If any waterbodies are disturbed, this may cause the local disappearance of this species.	Avoidance of disturbance or removal of water bodies.	May trigger EE Act referral where impacts to other species or communities also likely.
Oxyura australis	Blue-billed Duck	VU	45	23/05/2019	Record (VBA)	Moderate	Prefers deep permanent well vegetated freshwater swamps, large dams, lakes and open waters. Important breeding sites are primarily in south-west Victoria but also at a few sites in Port Phillip, north-east Victoria, Gippsland and north-west Victoria.	A moderate number of records have been made of this species in the eastern sections of the study area, near Hazelwood Pondage and surrounding wetlands. Many areas suitable for the species occur across the study area.	Suitable habitat may occur throughout where there are permanent freshwater wetlands (e.g. EVC 56 and 83).	Low	This species has been recorded in a small number of man-made water bodies. It is unlikely that suitable breeding habitat or high quantity foraging habitat will be removed.	Avoidance of wetlands and lakes suitable for foraging, especially where vegetation could sustain large enough numbers for breeding.	Offsets may be required to satisfy the Guidelines.

Species data					Likelihood assessment					Preliminary impact assessment				
Pachyptila turtur subantarctica	Fairy Prion (southern)	VU		NA	NA	Modelled (PMST)	No	N/A	No suitable habitat occurs near the study area, being an oceanic.	None	NA	NA	NA	None
Pandion haliaetus	Osprey		Ma	NA	NA	Modelled (PMST)	Low	Primarily a coastal species but may occur less frequently inland, along major rivers. Feeds on fish.	Occasionally recorded inland, but more commonly occurs along shorelines and intertidal wetlands and lagoons.	May occur along rivers throughout the study area.	NA	NA	NA	None
Petauroides volans	Southern Greater Glider	VU	VU	10	16/12/2017	Record (VBA)	Low	Restricted to eastern Australia; in Victoria, occurs as far west as the Wombat State Forest. Typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	Although a moderate number of records occurs within a 10km radius of the study area, these records are predominately in large stands of remnant forest.	May occur throughout study area where it borders large areas of remanent vegetation (e.g. lowland forests). The preliminary route does not traverse through significant patches of remnant vegetation.	NA	NA	NA	None
Phascogale tapoatafa	Brush-tailed Phascogale	VU		2	30/04/1962	Record (VBA)	Low	N/A	May occur across much of the forested sections study area, though more likely in remnant patches of vegetation.	May occur across much of the study area with significant canopy, though typically associated with box, ironbark and stringybark eucalyptus.	NA	NA	NA	None
Phoebetria palpebrata	Light-mantled Sooty Albatross	CR		1	13/06/1991	Record (VBA)	No	N/A	No suitable habitat as the species is found along coastlines.	None within the study area.	NA	NA	NA	None
Pluvialis fulva	Pacific Golden Plover	EN	Ma	3	12/03/2017	Record (VBA)	No	Non-breeding migrant that prefers coastal habitats including, beaches, mudflats and sandflats, estuaries and saltworks. Occasionally occurs in mangroves, low saltmarsh such as Sarcocornia, or beds of seagrass.	No suitable habitat as the species is found along coastlines.	None within the study area.	NA	NA	NA	None
Potorous longipes	Long-footed Potoroo	EN	EN	1	2/01/1900	Record (VBA)	Low	N/A	The species has not been recorded since 1900, and likely no longer occurs in the study area.	Although some habitat may occur in the eastern section of the study area, it is unlikely to be present given the lack of recent records.	NA	NA	NA	None

Species data					Likelihood assessment					Preliminary impact assessment				
Prototroctes maraena	Australian Grayling	EN	VU	7	23/03/2010	Record (VBA)	Present	Occurs in freshwater rivers and streams with moderate flow, gravel substrate and alternating pools and rifles. The species spends part of its lifecycle in freshwater and at least part of the larval and/or juvenile stages in coastal seas.	Many suitable lakes, ponds and rivers occur with a large number of recent records in the east of the study area.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River.	Moderate	If any waterbodies are disturbed, this may cause the local disappearance of this species.	Avoidance of disturbance or removal of water bodies.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pseudemoia rawlinsoni	Glossy Grass Skink	EN		3	13/05/2008	Record (VBA)	Moderate	Prefers margins of swamps and watercourses with rushy grasses and low dense vegetation.	Although a low number of records have been made near the study area, suitable habitat occurs across the east of the study area.	Most likely to occur in Heathy woodlands (EVC 48) and Riparian Scrub (EVC 191).	Moderate	Removal of densely vegetated areas around heaths, swamps and water courses may displace this species.	Avoidance of vegetation removal near heathlands, wetlands, streams, lakes and heath.	May trigger EE Act referral where impacts to other species or communities also likely.
Pseudomys novaehollandiae	New Holland Mouse	EN	VU	9	3/04/2017	Record (VBA)	Moderate	Occurs in heathlands, open forests and vegetated sand dunes within, coastal areas in Gippsland, south-east of Melbourne near Cranbourne and near Anglesea.	May occur in heathlands, woodlands with heath understorey, open forests and vegetated sand dunes, such as occur in the eastern sections of the study area.	Most likely to occur in Heathy woodlands (EVC 48) and Riparian Scrub (EVC 191).	Moderate	Removal of densely vegetated areas around heaths, swamps and water courses may displace this species.	Avoidance of vegetation removal near heathlands, wetlands, streams, lakes and heath.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pseudophryne semimarmorata	Southern Toadlet	EN		46	14/10/2020	Record (VBA)	High	Occurs in forests, woodlands, heaths and grasslands at lower elevations. Found under leaf litter, logs or rocks in damp areas and drainage lines but not necessarily near permanent water.	Large number of records have been made throughout the study area, particularly in EVC 698 Lowland Forest/Heathy Woodland Mosaic.	Suitable habitat may occur throughout where there are permanent freshwater wetlands (e.g. EVC 56, 83, 698).	Moderate	Small areas of suitable wetlands occur in the study area. The preliminary route is unlikely to go through any significant wetlands that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands and lakes suitable for foraging.	May trigger EE Act referral where impacts to other species or communities also likely.

Species data					Likelihood assessment					Preliminary impact assessment				
Pteropus poliocephalus	Grey-headed Flying-fox	VU	VU	3	1/05/1981	Record (VBA)	High	Wide ranging and highly mobile species that uses a range of habitats where flowering eucalyptus trees, fruit crops and urban gardens are present. Roosts are commonly in gullies, close to water with a dense canopy.	The species is highly mobile and potentially seen across much of the study area, given its ability to travel large distance and utilise a wide range of habitats.	The species is highly mobile and potentially seen across much of the study area that has suitable foraging canopy species.	Low	The removal of canopy species may reduce foraging habitat; however, this species utilises a wide area and no significant camps are known in the area which the preliminary route would displace.	Avoid removal of canopy trees suitable for roosting and foraging.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Rhipidura rufifrons	Rufous Fantail		Ma, Mi	NA	NA	Modelled (PMST)	Low	Prefers wet sclerophyll forests, often in gullies. May very occasionally forage in drier woodland, parks and gardens when on passage.	Preferred habitat does not occur in the study area, but the species may traverse the study area when moving between habitat patches.	None	NA	NA	NA	None
Rostratula australis	Australian Painted-snipe	CR	EN, Ma	1	1/01/1970	Record (VBA)	Moderate	Occurs in shallow fresh or brackish wetlands with permanent or semi-permanent water, cover of adjacent grasses and muddy edges. Also occurs in waterlogged grassland, sewage ponds and dams.	Suitable habitat occurs study area around small wetlands and lakes.	Suitable habitat may occur across much of the study area but particularly in the eastern sections of the study area, near Hazelwood Pondage and Morwell River and surrounding wetlands, and in the north east, nearing the Gippsland Lakes.	Low	Small areas of suitable wetlands and water bodies occur in the study area. However, the preliminary route is unlikely to go through any significant wetlands or lagoons (i.e. Gippsland Lakes) that would be preferred by a large number of individuals, which would displace the species and cause a significant impact.	Avoidance of wetlands, streams and lakes.	Offsets may be required to satisfy the Guidelines. An EPBC referral to the Commonwealth Government may also be required.
Saccolaimus flaviventris	Yellow-bellied Sheathtail Bat	VU		1	11/04/1990	Record (VBA)	Low	Occurs in a variety of habitats. Forages above the canopy but can also forage in treeless areas. Requires tree hollows for roosting and nesting.	Although there is significant potential habitat for foraging, the species hasn't been observed since 1990 and therefore is unlikely to occur in the study area.	Potential foraging habitat throughout the study area along forest/woodland margins. Hollows in remnant patches of trees may provide roosting and breeding habitat.	NA	NA	NA	None

Species data				Likelihood assessment					Preliminary impact assessment				
Sminthopsis leucopus	White-footed Dunnart	VU	18	22/09/2017	Record (VBA)	Present	Prefers coastal tussock grassland and sedgeland, wet heath, and forest or woodland with a dense heathy understorey or mid-storey vegetation. Shelters in bark nests in tree hollows, under fallen timber and grass tree skirts.	The species is more likely to occur in coastal regions outside the study area but may occur in heathlands and heathy woodlands (e.g. EVC 48 Heathy Woodland), such as occurs in the eastern sections of the study area.	Most likely to occur in the south east of the study area in areas of heathland and heathy woodland.	Moderate	Removal of densely vegetated areas around heaths, swamps and water courses may displace this species.	Avoidance of vegetation removal near heathlands, wetlands, streams, lakes and heath.	May trigger EE Act referral where impacts to other species or communities also likely.
Spatula rhynchotis	Australasian Shoveler	VU	57	1/02/2019	Record (VBA)	Moderate	Found throughout much of Victoria. Prefers permanent, well-vegetated wetlands with abundant aquatic vegetation but will use most freshwater habitats.	No records have been made within the study area however habitat for this species likely occurs.	EVC 136 is likely the most suitable vegetation community for this species. This EVC is located across most of the study area.	Moderate	Potential habitat for this species will be impacted by the preliminary route.	Avoid impacts to wetland vegetation. Prioritise clearing areas that are already cleared.	May trigger EE Act referral where impacts to other species or communities also likely.
Stagonopleura guttata	Diamond Firetail	VU	3	1/03/1978	Record (VBA)	Low	Found throughout south-eastern mainland Australia. Inhabits grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	This species has been recorded previously within the study area. Habitat for this species likely occurs across the majority of the study area.	Most woodland communities could support this species.	NA	NA	NA	None
Sternula albifrons	Little Tern	CR	Ma	1	9/09/2017	Record (VBA)	Low	Prefers sheltered coastal environments, including on mudflats in bays, lagoons, inlets and estuaries, particularly those with exposed sandbanks and beaches.	Lack of suitable habitat within the study area.	No suitable habitat likely occurs within the study area.	NA	NA	NA	None
Sternula nereis	Fairy Tern	CR	VU	1	4/11/2017	Record (VBA)	Low	Occurs in coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	Lack of suitable habitat within the study area.	No suitable habitat likely occurs within the study area.	NA	NA	NA	None

Species data					Likelihood assessment					Preliminary impact assessment				
Stictonetta naevosa	Freckled Duck	EN		128	13/06/2019	Record (VBA)	Moderate	Prefers large freshwater wetlands, generally with dense vegetation.	No records have been made within the study area although an abundance of habitat likely exists.	EVC 136 occurs across most of the study area.	Moderate	Potential habitat for this species will be impacted by the preliminary route.	Avoid impacts to wetland vegetation. Prioritise clearing areas that are already cleared.	May trigger EE Act referral where impacts to other species or communities also likely.
Thinornis cucullatus	Hooded Plover	VU	VU	4	11/05/2007	Record (VBA)	Low	Prefers sandy ocean beaches, estuaries with large amounts of washed up seaweed and inland salt lakes in the south-west.	There is likely to be a lack of habitat for this species within the study area.	There is a lack of habitat within the study area.	NA	NA	NA	None
Trapezites luteus luteus	Yellow Ochre Butterfly	EN		62	5/02/1972	Record (VBA)	Moderate	Occurs in a range of habitats where food sources are available including open woodland and grassland. Larvae feed on Lomandra filiformis and Lomandra longifolia.	There is likely an abundance of habitat within the study area for this species.	EVC 55 is likely to provide the most suitable habitat for this species. This EVC is located across the western portion of the preliminary route.	Moderate	Potential habitat for this species will be impacted by the preliminary route.	Minimise impacts to remnant grassland communities. Impact areas of low quality vegetation.	May trigger EE Act referral where impacts to other species or communities also likely.
Tringa nebularia	Common Greenshank	EN	Ma	16	1/02/2019	Record (VBA)	Low	Prefers sheltered coastal habitats with large mudflats and saltmarsh, mangroves or seagrass. Can occur inland, in estuaries and mudflats, mangrove swamps and lagoons, billabongs, swamps, sewage farms and flooded crops.	Occasionally recorded inland however is more likely to occur along coastal stretches outside.	Swamp EVCs may provide habitat for this species.	NA	NA	NA	None
Tringa stagnatilis	Marsh Sandpiper	CR	Ma	3	16/07/2018	Record (VBA)	Moderate	Prefers shallow freshwater and brackish wetlands, rivers, water meadows, sewage farms, drains, lagoons and swamps. Most records are found in Port Phillip Bay, but also in Gippsland.	Despite the lack of records, habitat for this species likely occurs across the study area.	Any farmland present within the study area. Riparian EVCs may also provide habitat for this species. These EVCs include EVC 53 and EVC 83, both of which are located across the majority of the study area.	Moderate	Potential habitat for this species will be impacted by the preliminary route.	Avoid riparian vegetation and farm dams where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.

Species data				Likelihood assessment					Preliminary impact assessment				
Tyto novaehollandiae	Masked Owl	CR	1	30/03/2006	Record (VBA)	Moderate	In Victoria, the strongholds of the Masked Owl appear to be in East Gippsland and the Otway Ranges, and to a lesser extent in the Central Highlands, Midlands and Portland areas. Can be found in areas of tall grass, including grass tussocks, swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. Victorian Masked Owls occur along partially forested river flats near the coast, and may require open areas, such as clearings or forest edges, for foraging, as well as hollows, dense vegetation or caves for roosting.	Despite the lack of records, habitat for this species likely occurs across the whole of the study area.	Woodland patches and areas of remnant vegetation where hollows may have formed.	Moderate	Potential habitat for this species will be impacted by the preliminary route.	Avoid areas of remnant vegetation. Where possible, avoid impacting areas that contain a moderate/high canopy cover.	May trigger EE Act referral where impacts to other species or communities also likely.
Uperoleia martini	Martin's Toadlet	CR	10	4/10/2011	Record (VBA)	Moderate	Occurs in dry forest, woodlands, shrublands, grasslands and disturbed areas usually near water or in depressions subject to inundation. Distribution is along the coast from east Gippsland to near Yarram in south Gippsland. Prefers swamps and ponds adjacent to woodland or coastal scrub vegetation.	A large number of records have been made within the large remnant patch of EVC 48 within the study area.	Patches of EVC 48 are likely to provide habitat for this species within the study area.	Moderate	Potential habitat for this species will be impacted by the preliminary route.	Avoid areas of remnant EVC 48 vegetation.	May trigger EE Act referral where impacts to other species or communities also likely.
Varanus varius	Lace Monitor	EN	49	30/10/2017	Record (VBA)	Moderate	Occur in well-timbered areas, from dry woodlands to cool temperate southern forests. Requires tree hollows for nesting.	Numerous records within and surrounding the study area. Suitable habitat for this species is located within the study area.	Most vegetation types will support this species.	Moderate	Habitat required for this species will be impacted by the preliminary route.	Avoid areas of remnant vegetation. Avoid areas that have hollow-bearing trees.	May trigger EE Act referral where impacts to other species or communities also likely.

Table B2. Significant flora

Species data							Likelihood assessment				Preliminary impact assessment			
Scientific name	Common name	FFG	EPBC	Number of records	Last record	Source	Likelihood of occurrence	Habitat requirements	Rationale	Location of suitable habitat	Likelihood of Significant (Unmitigated) Impact	Impact Rationale	Potential mitigation	Potential Implications
Acacia howittii	Sticky Wattle	EN		1	4/03/2009	Record (VBA)	Low	Grows in moist forest. Widely cultivated and naturalising in some areas. (e.g. Daylesford, Greater Melbourne, Dandenong Ranges etc.). (Royal Botanic Gardens, 2020).	Suitable habitat for this species is limited within the study area.	Moist woodland communities present the most suitable habitat for this species. These EVCs include EVC 29 and EVC 30. These EVCs may occur toward the western extent and centre of the preliminary route.	N/A	N/A	N/A	N/A
Allocasuarina nana	Stunted Sheoak	CR		1	9/12/2011	Record (VBA)	Moderate	Known only from Mt Elizabeth and the upper Genoa River, growing in heath on sandstone in exposed situations. A collection from Mount Cannibal in Bunyip State Park requires conformation and is likely to be an error.	Suitable habitat for this species likely occurs across the study area.	EVC 48 likely provides habitat for this species. This EVC is located within the eastern portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Althenia marina	Sea Water-mat	CR		2	3/11/1979	Record (VBA)	No	Marine intertidal areas. Western Port Phillip Bay.	There is no intertidal habitat within the preliminary route.	No suitable habitat within the preliminary route.	N/A	N/A	N/A	N/A
Amphibromus fluitans	River Swamp Wallaby-grass		VU	10	39792	Record (VBA)	High	River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (Royal Botanic Gardens, 2020).	Only a small number of records have been made within the study area however there is likely a high abundance of potential habitat for this species within the preliminary route.	Suitable habitat is located along the eastern portion of the preliminary route where riparian vegetation is likely to occur.	Moderate	This species primarily occurs within riparian and wetland habitats. This class of vegetation may be impacted by the preliminary route without mitigation.	Avoid impacts to riparian/wetland vegetation where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.

Species data						Likelihood assessment					Preliminary impact assessment		
Amphibromus sinuatus	Wavy Swamp Wallaby-grass	CR	3	15/01/2013	Record (VBA)	Low	Permanent swamps in cool, sometimes elevated sites.	No records have been made within the preliminary route and permanent swamps unlikely.	Suitable habitat unlikely to occur within the preliminary route.	N/A	N/A	N/A	N/A
Astrotricha parvifolia subsp. 1	Small-leaf Star-hair	CR	13	41197	Record (VBA)	High	Known populations occur in *Pinus radiata* plantations on sandy soils, south of Longford. Capable of regenerating after fire from soil-stored seed.	Records for this species have been made within the vegetation surrounding the study area. This species is likely to be restricted to heathy vegetation or plantations on sandy soils.	Several sections of EVC 48 occur within the eastern portion of the preliminary route. The preliminary route intersects multiple plantations. This vegetation could support this species.	High	The preliminary route may impact large areas of habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Austrostipa rudis subsp. australis	Veined Spear-grass	EN	1	28/10/1983	Record (VBA)	Moderate	Uncommon, mostly in cool areas of southern Victoria. Usually at moderate altitude, in open-forest on sandy or sandstone-derived soils.	A single record made in 1983, with an accuracy of 4000 m has been made within the study area. There is however a high abundance of habitat for this species.	Any vegetation mapped as Lowland Forest (EVC 16) could act as habitat for this species. This EVC is located across the majority of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Billardiera scandens s.s.	Velvet Apple-berry	EN	4	41197	Record (VBA)	Moderate	Dry open-forests and woodlands in the north-east.	This species is more common in the north-east of the state. Suitable habitat may be sparse within the study area.	Any vegetation mapped as Lowland Forest (EVC 16) could act as habitat for this species. This EVC is located across the majority of the preliminary route.	Moderate	The preliminary route may impact large areas of habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Bossiaea heterophylla	Variable Bossiaea	EN	23	24/08/2015	Record (VBA)	High	Uncommon in Victoria and now confined to Gippsland east of Rosedale. Favours sandy soils in a variety of habitats including heath and open woodland.	Records for this species have been made within the large remnant patches to the north and south of the preliminary route. This species is likely contained to heathy vegetation.	One section within the eastern most portion of the preliminary route contains EVC 48. This EVC likely provides suitable habitat for this species.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data						Likelihood assessment				Preliminary impact assessment			
Brachyscome salkiniae	Elegant Daisy	VU	5	1/01/1987	Record (VBA)	Moderate	In forests and woodland on sandy or loamy soil, often on river banks and flats, throughout East Gippsland and extending west into the Latrobe Valley near Moe.	This species likely occurs across the study area, specifically in sandy/loam soils and riparian vegetation communities. Several records have been made near the western extent of the study area however these records are dated.	Favourable EVCs for this species are likely EVC 18, 56 and 83, all of which are riparian communities. These communities extend along most of the preliminary route.	Low	Likely to be limited habitat extent and/or populations within the preliminary route.	Avoid impacts to riparian/wetland vegetation where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Caladenia aurantiaca	Orange-tip Finger-orchid	EN	15	26/08/2003	Record (VBA)	High	Grows in damp coastal to near-coastal heaths or heathy woodlands east of Melbourne (e.g. Cranbourne, Yarram, Cape Conran, Mallacoota) on well-drained sandy soils.	A substantial number of records have been made within close proximity to the study area. Habitat for this species exists within the preliminary route.	EVC 48 likely provides habitat for this species. This EVC is located within the eastern portion of the preliminary route.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Caladenia orientalis	Eastern Spider-orchid	CR	1	1/02/1981	Record (VBA)	Moderate	The eastern spider-orchid is found in coastal heathland and heath-woodland, generally on deep sands. Individuals may have many years between flowering events and periodic fire is required to stimulate flowering and seed production.	A single record has been made within the wider locality. This record was made in 1981. The recorded distribution of this species is between Yarram and Grantville, which is south of the preliminary route.	This species likely occurs within heathy vegetation (EVC 48) of which this is primarily located toward the eastern portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Caladenia tessellata	Thick-lip Spider-orchid	VU	NA	NA	Modelled (PMST)	Moderate	In Victoria, the orchid grows in heathland, heathy or grassy woodland, and grassy or sedgy open forests in well drained sand and clay loams.	The only record that has been made was made in 1975. This record was made within remnant vegetation south of the preliminary route.	Suitable vegetation for this species occurs across the western and eastern portions of the study area. These vegetation communities include EVC 48 and EVC 55.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.

Species data							Likelihood assessment				Preliminary impact assessment			
Caladenia vulgaris	Slender Pink-fingers	VU		1	4/11/1995	Record (VBA)	Moderate	Can be locally common in heathland and coastal scrub on moisture-retentive sandy soils.	A single record has been made within a 5 km radius of the study area. This record has an accuracy of 10,000m. Potential habitat occurs within the study area.	Suitable habitat for this species occurs within the eastern portion of the study area, in the EVC 48 vegetation.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Commersonia prostrata	Dwarf Kerrawang	EN	EN	42	15/11/2012	Record (VBA)	High	Very rare, confined in Victoria to swampy land and lake margins in the Rosedale-Stradbroke-Providence Ponds area.	Numerous records of this species have been made within the study area. Most records were made within the last 30 years.	This species likely resides within the swamp/heath vegetation located within the eastern section of the preliminary route. Potential EVCs that this species could occur in include EVC 48 and EVC 53.	High	The preliminary route may impact extensive habitat which support numerous populations.	Avoid swamp/wetlands within heathy woodlands. If possible, the preliminary route should utilise already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Coronidium gunnianum	Pale Swamp Everlasting	CR		3	14/11/2013	Record (VBA)	Moderate	Usually at low elevations (under c. 100 m) in grasslands and riverine Eucalyptus camaldulensis woodland on soils that are prone to inundation.	Three records from within the study area. Habitat likely to occur across much of the eastern section of the preliminary route.	This species likely resides within the swamp/wetlands within woodland communities located within the eastern section of the preliminary route. Potential EVCs that this species could occur in include EVC 48 and EVC 53.	Low	Likely to be limited habitat extent and/or populations within the proposed preliminary route.	Avoid swamp/wetlands within heathy woodlands. If possible, the preliminary route should utilise already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Corybas aconitiflorus	Spurred Helmet-orchid	VU		1	3/07/1995	Record (VBA)	Moderate	Grows in sheltered positions, often on damp sand under ferns or shrubs.	No records have been made within the study area. Suitable habitat likely occurs within the proposed preliminary route.	EVC 3 may provide habitat for this species. This EVC is located along the eastern portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Corybas fimbriatus	Fringed Helmet-orchid	EN		2	41080	Record (VBA)	Moderate	Usually forming colonies on moist, shaded sandy soil near the coast and generally east of Western Port.	Records have been made within the preliminary route. Habitat likely exists within the study area.	Previous records have been made within EVC 16. This vegetation community is mapped across most of the preliminary route.	Moderate	The preliminary route may impact large areas of habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data						Likelihood assessment				Preliminary impact assessment			
Craspedia canens	Grey Billy-buttons	CR	41	43725	Record (VBA)	High	Known in Victoria only from grassland (often bordering swamps) at low altitude between c. Cranbourne and Traralgon.	Numerous records have been made with a 5 km radius of the study area. Habitat for this species likely exists in remnant grassland areas along the preliminary route.	Previous records have been made within EVC 151 vegetation. This vegetation occurs across the western most section of the preliminary route.	Moderate	The preliminary route may impact habitat that could support this species.	The extent of grassy woodland and forest habitat is difficult to determine without field surveys. Likely however to be restricted to small, remnants in roadsides and private land that can be avoided.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Cullen parvum	Small Scurf-pea	EN	2	38353	Record (VBA)	Moderate	Mainly in grasslands and grassy woodlands on basalt-derived soils.	No records have been made within the preliminary route however suitable habitat exists within much of the preliminary route.	EVC 55, EVC 151 and EVC 259 may all provide habitat for this species. These EVCs are located along the majority of the western portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Cyathea cunninghamii	Slender Tree-fern	CR	1	28/05/1997	Record (VBA)	Low	Of limited distribution in Victoria and confined to deep gullies in wet forests (e.g. Otway Range, Dandenong Ranges, Tarra-Bulga National Park, Wilsons Promontory, Mt Drummer in the far east) and seldom common.	There is limited habitat for this species within the preliminary route.	This species is likely to only occur within deep most gullies, of which there is unlikely to be any within the study area.	N/A	N/A	N/A	N/A
Cycnogeton microtuberosum	Eastern Water-ribbons	EN	12	15/01/2013	Record (VBA)	Moderate	Common in fresh, still or slow-flowing water to 50(–120) cm deep, in small creeks, swamps and farm dams. Also, in stagnant water that is often highly eutrophic and humic from farmland runoff.	No records have been made within the study area however habitat for this species likely occurs across the study area.	Aquatic habitats are suitable for this species. This includes farm dams. Areas with riparian communities may also provide habitat for this species. Farm dams and riparian vegetation occur across most of the study area.	Moderate	The preliminary route may impact habitat that could support this species.	Avoid swamp/wetlands within heathy woodlands. If possible, the preliminary route should utilise already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data						Likelihood assessment				Preliminary impact assessment			
Cymbonotus lawsonianus	Bear's-ear	EN	9	16/08/2009	Record (VBA)	Moderate	Scattered in woodland communities across northern Victoria from the 'Upper Murray' (precise locality unknown) to the Hattah-Kulkyne National Park and south to the Little Desert, with a few eastern collections from dryish areas south of the Great Dividing Range (e.g. Buchan, Heyfield, Omeo, upper Snowy River areas).	Records have been made for this species within close proximity to the study area. Suitable habitat for this species likely exists within the study area.	Woodland vegetation is suitable habitat for this species. Vegetation communities such as EVC 16 and EVC 23. These communities are located across a large proportion of the study area.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Deparia petersenii subsp. congrua	Japanese Lady-fern	EN	1	32685	Record (VBA)	Low	Found throughout the Asian and Indian region and on many Pacific islands (naturalized in the Americas). Rare in Victoria and confined to a few sites from Buchan eastwards, occurring in wet, shaded forests, river-flats or on damp rock faces.	A single record, with an accuracy of 4000m, has been made within a 5 km radius of the study area. Habitat for this species is limited within the study area.	Habitat for this species is likely constrained to damp vegetation located to the south of the study area. These EVCs include EVC 29 and EVC 30. Neither of these EVCs are likely to be impacted by the preliminary route.	N/A	N/A	N/A	N/A
Dianella amoena	Matted Flax-lily	CR	EN	39	12/02/2019	Record (VBA)	High	most commonly in lowland grasslands, grassy woodlands, valley grassy forest and creeklines of herb-rich woodland. Typically, the species occurs on well drained to seasonally wet fertile sandy loams to heavy cracking clays derived from Silurian or Tertiary sediments, or from volcanic geology.	Numerous records for this species have been made within the study area and surrounding locality. Suitable habitat for this species exists within the western portion of the study area.	EVC 55 and EVC 151 both provide habitat for this species. These EVCs are located within the western section of the preliminary route.	Moderate	The preliminary route may impact habitat that could support this species.	The extent of grassy woodland and forest habitat is difficult to determine without field surveys. Likely however to be restricted to small, remnants in roadsides and private land that can be avoided.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.

Species data						Likelihood assessment				Preliminary impact assessment			
Dianella longifolia var. grandis s.l.	Glaucous Flax-lily	CR	1	27/08/1992	Record (VBA)	Low	Occurs in lowland plains grassland and grassy woodlands (e.g. Volcanic Plain and Riverina) as well as around rocky outcrops at higher altitudes than the var. longifolia (e.g. between Swifts Creek and Omeo, Benambra-Corryong district, Don River near Launching Place). Overall, rather rare in the State.	A single record has been made within the study area. Suitable habitat for this species exists within the western portion of the study area.	EVC 55 and EVC 151 both provide habitat for this species. These EVCs are located within the western section of the preliminary route.	N/A	N/A	N/A	N/A
Diuris punctata var. punctata	Purple Diuris	EN	12	1/09/2003	Record (VBA)	High	Formerly widespread and common in Victoria, occurring in the open forests, woodlands and grasslands of the fertile lowlands, now much reduced through clearing for agriculture and restricted to relatively few, isolated sites, but sometimes locally abundant.	Records for this species have been made within the preliminary route. This species occurs within open forest and grassland vegetation.	EVC 55 and EVC 151 both provide habitat for this species. These EVCs are located within the western section of the preliminary route.	Moderate	The preliminary route may impact habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Dodonaea procumbens	Trailing Hop-bush	EN	EN	3	40724	Record (VBA)	Low	This species grows in low-lying, often winter-wet areas in woodland, low open forests, healthland and grasslands, on sands and clays. Victorian populations have been recorded in various plant communities including grassy woodland dominated by River Red Gum in western Victoria, heathy dry forest in central Victoria, damp heath in far-western Victoria.	No records for this species have been made within the study area. Suitable habitat for this species occurs north of the preliminary route.	EVC 56 is the most suitable ecological community within the study area. This community is mapped north of the preliminary route.	N/A	N/A	N/A	N/A

Species data						Likelihood assessment				Preliminary impact assessment			
Epilobium willisii	Carpet Willow-herb	EX	1	20/01/1972	Record (VBA)	Low	In Victoria confined to Lankeys Plain on the Dargo High Plains, occurring in moist depressions in grassland, but not noted in recent years.	This species is thought to be extinct. The one record that has been made within a 5 km radius of the study area has an accuracy of 10,000m.	EVC 55 and EVC 151 both provide habitat for this species. These EVCs are located within the western section of the preliminary route.	N/A	N/A	N/A	N/A
Eragrostis trachycarpa	Rough-grain Love-grass	EN	2	2/03/2012	Record (VBA)	Moderate	A relatively rare grass first collected at Providence Ponds in 1955 and mostly confined to seasonally moist sites in the lower catchment of the Gippsland Lakes (between Heyfield and Lakes Entrance). Relatively recent records of the grass from near Gellibrand Hill (c. 20 km NW of Melbourne CBD) and near Werribee may represent recent accidental introduction (e.g. with stock fodder) or a long-overlooked natural occurrence in the now-depleted grasslands and grassy woodlands of those areas.	A single record has been made within a 5 km radius of the study area. This species occurs within grassland vegetation.	EVC 55 could provide habitat for this species. This EVC is located within the western section of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	The extent of grassy woodland and forest habitat is difficult to determine without field surveys. Likely however to be restricted to small, remnants in roadsides and private land that can be avoided.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Eriocaulon scariosum	Common Pipewort	CR	1	26803	Record (VBA)	Low	Occurs in bog communities and drainage areas, often in running water.	A single record from 1973 has been made within a 5 km radius of the study area. This record has an accuracy of 4,000m. Habitat for this species is limited within the study area.	This species is confined to bog or drainage communities with running water. EVC 83 could support this species. This EVC occurs throughout the preliminary route.	N/A	N/A	N/A	N/A
Eucalyptus arenicola	Gippsland Lakes Peppermint	EN	30	42240	Record (VBA)	High	Occurs in coastal and near-coastal areas in the Gippsland Lakes region in sandy soils.	Numerous records for this species have been made within a 5 km radius of the study area. Vegetation within the study area could support this species.	Most records for this species have been made within EVC 16. This vegetation community is mapped across a large proportion of the preliminary route.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data						Likelihood assessment				Preliminary impact assessment			
Eucalyptus bosistoana	Coast Grey-box	EN	3	38398	Record (VBA)	Moderate	Occurs mostly on loamy soils east from Woodside, around the Gippsland Lakes and near the coast, extending inland further east along the Cann and Genoa River valleys.	Habitat for this species exists within and around the preliminary route.	Most records for this species have been made within EVC 16. This vegetation community is mapped across a large proportion of the preliminary route.	Moderate	The preliminary route may impact large areas of habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Eucalyptus crenulata	Buxton Gum	EN	1	23/09/2006	Record (VBA)	Low	Endemic in Victoria. Confined to swampy sites in foothills just north and south of the Great Dividing Range, near Buxton, Narbethong and Yarra Glen where it forms hybrids at points of contact with the far more widespread Swamp Gum, E. ovata. Also sparingly stablished at Traralgon in Victoria.	Outside known range	N/A	N/A	N/A	N/A	N/A
Eucalyptus fulgens	Green Scentbark	CR	23	39497	Record (VBA)	Moderate	Occurs east from Healesville and Woori Yallock to the Latrobe Valley near Driffield.	Numerous records for this species have been made within a 5 km radius of the study area. Vegetation within the study area could support this species.	Most records for this species have been made within EVC 16. This vegetation community is mapped across a large proportion of the preliminary route.	Moderate	The preliminary route may impact large areas of habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Eucalyptus globulus subsp. globulus	Southern Blue-gum	EN	1	2/03/2012	Record (VBA)	Low	Recent studies of variation in Southern Blue-gums (Jordan et al. 1993) suggest that populations of typical subsp. globulus occur in Victoria only in the area south of the Strzelecki Range, e.g. Port Franklin, Wilsons Promontory, and that other populations in south Gippsland and the Otway Ranges probably represent intergrades between *subsp. globulus* and *subsp. pseudoglobulus*.	Habitat for this species exists within and around the preliminary route.	This species is confined to wet elevated forests and foothills. EVCs that are most likely to support this species are EVC 29 and EVC 30. Both of these EVCs have a minor occurrence within the preliminary route.	N/A	N/A	N/A	N/A

Species data							Likelihood assessment				Preliminary impact assessment			
Eucalyptus strzeleckii	Strzelecki Gum	CR	VU	1425	44274	Record (VBA)	High	favours a range of sites including ridges, slopes and along the banks of streams, but particularly foothills and flats (Schinagl et al. 2014). Its preferred soils are grey, deep, fertile loams which are seasonally waterlogged. In a few cases it occurs on undulating or flat terrain close to creeks on the periphery of the ranges (Rule 1992). Herbarium specimens indicate an association with heavy clay loam and alluvial soils (MEL undated). Associated eucalypts include *E. viminalis, E. ovata, E. obliqua, E. globulus, E. radiata,and E. regnans*. Other commonly associated species include *Melaleuca ericifolia, Lepidosperma elatius* and *Poa labillardierei*, particularly on moist flats. The Strzelecki Ranges a a cretaceous sandstone formation of rolling hills fanning out from two central ridges, with annual rainfall in excess of 1000 mm over much of the area.	There is a high number of records that have been made within a 5 km radius of the study area. A large proportion of these records were made within remnant patches of vegetation surrounding the various mines within the La Trobe Valley. Despite this, habitat for this species still exists within the study area.	EVC 53, EVC 55 and EVC 151 may provide habitat for this species. These EVCs are primarily located along the western section of the study area.	Moderate	The preliminary route may impact large areas of habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Eucalyptus yarraensis	Yarra Gum	CR	26	15/10/2012	Record (VBA)	High	Extending west from Glengarry (near Traralgon) to Melbourne and north-west to Daylesford and Ararat. Collections of small-budded and -fruited swamp gums from east of Cavendish may be this taxon. Very small-fruited forms of the species occur in remnant stands in outer south-eastern to north-eastern Melbourne suburbs (e.g. Scoresby, Wantirna, Yan Yean).	Numerous records for this species have been made within a 5 km radius of the study area. Vegetation within the study area could support this species.	EVC 55 and EVC 151 both provide habitat for this species. These EVCs are located within the western section of the preliminary route.	Moderate	The preliminary route may impact habitat that could support this species.	The extent of grassy woodland and forest habitat is difficult to determine without field surveys. Likely however to be restricted to small, remnants in roadsides and private land that can be avoided.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data						Likelihood assessment					Preliminary impact assessment		
Euchiton umbricola	Cliff Cudweed	EN	1	30298	Record (VBA)	No	Uncommon in Victoria, confined almost exclusively to shaded cliff-faces (often near waterfalls) and boulders above c. 1000 m, but occurring disjointly at c. 400 m at Kinglake National Park.	Suitable habitat for this species includes shaded cliff faces, of which there are likely to be none within the study area.	No location within the study area.	N/A	N/A	N/A	N/A
Fimbristylis velata	Veiled Fringe-sedge	EN	3	15/01/2013	Record (VBA)	Moderate	Occasional on drying mud beside lakes and rivers and in seasonally wet depressions; mostly in northern Victoria, but recent collections in the south from, for example, Bairnsdale and Healesville areas.	No records have been made within the study area however habitat for this species likely occurs across the study area.	Riparian vegetation is likely to provide habitat for this species. This class of vegetation occurs across most of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Where possible avoid impacts to riparian vegetation. If impacts are required, attempt to reduce impacts to the bank of any stream.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Fissidens dealbatus	Nerveless Pocket-moss	EN	2	28/12/1974	Record (VBA)	Low	Damp, shaded, mineral soil, especially on stream banks and the sides of intermittent water courses.	Records for this species are limited and dated within the study area. Suitable habitat for this species is restricted to damp sheltered vegetation.	Damp riparian vegetation may be suitable for this species. EVC 29 and EVC 83 could provide suitable habitat. These two EVCs are located across most of the study area.	N/A	N/A	N/A	N/A
Geranium solanderi var. solanderi s.s.	Austral Crane's-bill	CR	1	21/02/2006	Record (VBA)	Low	An uncommon species of damp to dryish, usually sheltered sites in grassy woodlands, often along drainage lines or in seepage areas.	A single record has been made for this species within a 5 km radius of the study area. Grassland EVCs may provide habitat for this species.	EVC 55 could provide suitable habitat for this species. This EVC is confined to the western portion of the preliminary route.	N/A	N/A	N/A	N/A
Glycine latrobeana	Clover Glycine	VU	VU	NA	NA	Modelled (PMST)	Low	Clover Glycine is found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer.	Outside known distribution.	N/A	N/A	N/A	N/A

Species data						Likelihood assessment				Preliminary impact assessment			
Grevillea chrysophaea	Golden Grevillea	VU	67	19/09/2018	Record (VBA)	High	Growing usually in eucalypt woodland or heath in silty sand to sandy loam in the Brisbane Ranges (Anakie-Steiglitz area), and Gippsland in the area roughly enclosed by Traralgon, Woodside and Sperm Whale Head-Licola.	Numerous records have been made with a 5 km radius of the study area. Habitat for this species likely exists in the heathy EVCs that occur within the preliminary route.	This species likely occurs within EVC 48. This EVC is located in the eastern section of the preliminary route.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Lachnagrostis robusta	Salt Blown-grass	EN	1	17/12/1998	Record (VBA)	No	Occurs around margins of salt lakes and saline depressions mostly across the Volcanic Plain, with eastern outliers near Tooradin and Seaspray and a few sites west of the Grampians (Douglas, Natimuk areas).	The habitat requirements for this species are unlikely to be met by the vegetation within the study area.	No areas within the study area are likely to contain salt lakes.	N/A	N/A	N/A	N/A
Lachnagrostis rudis subsp. rudis	Rough Blown-grass	CR	1	7/12/2011	Record (VBA)	Low	Uncommon, occurs in moist, shaded forests and swamp margins near the coast, scattered from near the South Australian border to Lake Tyers area in Gippsland.	No records of this species have been made within the study area. Suitable habitat for this species is limited within the study area.	This species occurs in swamp margins near the coast. As such, EVC 191 may provide habitat for this species. This EVC is located along the eastern portion of the preliminary route.	N/A	N/A	N/A	N/A
Lachnagrostis semibarbata var. filifolia	Purple Blown-grass	EN	2	1/03/1991	Record (VBA)	Low	Mainly in grassland, occasionally woodland communities in somewhat saline depressions of the volcanic plain, but also known from seasonal, slightly brackish swampy sites east of Melbourne.	Grassland EVCs may provide habitat for this species.	EVC 55 could provide suitable habitat for this species. This EVC is confined to the western portion of the preliminary route.	N/A	N/A	N/A	N/A

Species data							Likelihood assessment				Preliminary impact assessment			
Lachnagrostis semibarbata var. semibarbata	Purple Blown-grass	EN		1	23/10/2000	Record (VBA)	Moderate	Scattered from near Melbourne to the South Australian border, mainly in grassland, occasionally woodland communities in somewhat saline depressions of the volcanic plain, but also known from seasonal, slightly brackish swampy sites east of Melbourne (e.g. Cranbourne, Safety Beach, Giffard, Sale areas).	Ephemeral grassy wetlands may provide habitat for this species.	Potential for localised habitat to occur throughout the preliminary route.	Low	Likely to be limited populations within the preliminary route.	The extent of ephemeral wetland habitat is difficult to determine without field surveys. However likely this can be avoided through design or construction approach.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Lepidium hyssopifolium s.s.	Basalt Peppercress	EN	EN	NA	NA	Modelled (PMST)	Low	Known to establish on open, bare ground with limited competition from other plants. Previously recorded from Eucalypt woodland with a grassy ground cover, low open Casuarina woodland with a grassy ground cover and tussock grassland (Leigh et al. 1984). Recently recorded localities have predominantly been in weed-infested areas of heavy modification, high degradation and high soil disturbance such as road and rail verges, on the fringes of developed agricultural land or within small reserves in agricultural land. Many populations are now generally found amongst exotic pasture grasses and beneath exotic trees such as the Radiata Pine (*Pinus radiata)* and Monterey Cypress (*Cupressus macrocarpus*), often associated with other species of Lepidium (Ayers et al. 1996; MEL collection records; Tumino 2010). The lack of competition from other shade-tolerant species allows the Basalt Pepper-cress to persist	Outside known distribution.	N/A	N/A	N/A	N/A	N/A

Species data							Likelihood assessment						
Leptorhynchos elongatus	Lanky Buttons	EN		2	26/11/1994	Record (VBA)	Low	Largely confined in Victoria to eastern uplands (Benambra, Omeo, Wulgulmerang, Corryong areas) where occasional in grassy Eucalyptus pauciflora woodlands. Rare further west (e.g. near Castlemaine) in dry open-forest, formerly known from southern mallee areas (e.g. Jeparit, Nhill), but now possibly extinct there.	Suitable habitat unlikely to occur within study area. Only two records in local region.	N/A	N/A	N/A	N/A	N/A
Oxalis rubens	Dune Wood-sorrel	EN		1	16/04/2003	Record (VBA)	No	coastal dunes and scrub, growing on stabilised sand-dunes, in Banksia integrifolia woodland, and beaches among Spinifex sericeus.	No habitat for this species within the study area.	There is no habitat for this species within the study area.	N/A	N/A	N/A	N/A
Platysace ericoides	Heath Platysace	EN	VU	2	37865	Record (VBA)	Moderate	In Victoria confined to the coastal plain and foothills mostly between Moe and Orbost, usually occurring in dryish forest, often with shallow, rocky soils.	Suitable habitat likely exists within the study area.	EVC 3 likely provides habitat for this species. This EVC is located within the preliminary route.	Low	Likely to be limited habitat extent and/or populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Poa billardierei	Coast Fescue	EN		1	19/09/1979	Record (VBA)	Low	Of scattered occurrence on coastal sand dunes from near Nelson in the far south-west to the NSW border, but infrequently collected in recent times.	No habitat for this species within the study area.	N/A	N/A	N/A	N/A	N/A

Species data							Likelihood assessment				Preliminary impact assessment			
Pomaderris aurea	Golden Pomaderris	EN		11	34274	Record (VBA)	High	Scattered in dryish foothill forests and heathy woodlands in the east and north-east (e.g. Holey Hill, Stockdale, Jamieson, Bright, Beechworth, Corryong, Bruthen and upper Genoa River areas) ascending into wetter montane forests on and near the Nunniong Plateau and Mt Elizabeth.	Numerous records have been made within the remnant vegetation located in the study area. Suitable habitat for this species likely occurs within the study area.	EVC 48 is the most suitable vegetation community for this species. This EVC is located along the eastern section of the preliminary route.	Moderate	The preliminary route may impact habitat that could support this species.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Pomaderris pilifera subsp. pilifera	Striped Pomaderris	EN	EN	1	31686	Record (VBA)	Moderate	Scattered from Warburton area eastwards, south of the Dividing Range with an isolated occurrence between Mitta Mitta and Tallangatta in the north-east of the State. Usually in dryish open-forest or woodland, usually on shallow soils, occasionally fringing watercourses.	A single record has been made for this species within a 5 km radius of the study area. Despite this, suitable habitat likely occurs within the study area.	EVC 48 is the most suitable vegetation community for this species. This EVC is located along the eastern section of the preliminary route.	Low	Likely to be limited habitat extent and/or populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pomaderris vacciniifolia	Round-leaf Pomaderris	CR		2	9051	Record (VBA)	Low	Endemic in Victoria. Largely confined to moist forest and scrubs in the upper catchment of the Yarra, Plenty and Yea Rivers in an area bounded by Healesville, Marysville and Whittlesea, but also in the Tyers-Walhalla areas.	The distribution of this species likely limits it from occurring within the study area.	EVC 48 is the most suitable vegetation community for this species. This EVC is located along the eastern section of the preliminary route.	N/A	N/A	N/A	N/A

Species data							Likelihood assessment				Preliminary impact assessment			
Prasophyllum frenchii	Maroon Leek-orchid	EN	EN	NA	NA	Modelled (PMST)	Moderate	Occurs in grassland and grassy woodland habitats, on sandy to black clay loams that are generally damp but well drained, although some sites are seasonally waterlogged. Sites include the seasonally damp transition zone on the margins of shallow freshwater marshlands. Little is known of specific habitat requirements, and some sites have been disturbed by periodic fire or stock grazing.	No records of this species have been made within the study area. Vegetation within the study area may still act as habitat for this species.	EVC 55 could provide suitable habitat for this species. This EVC is confined to the western portion of the preliminary route.	Low	Likely to be limited habitat extent and/or populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Prostanthera galbraithiae	Wellington Mint-bush	EN	VU	96	9/07/2020	Record (VBA)	High	GipP. Endemic in the Holey Hill-Dutson area (south of Sale), in heathy open-forest, usually on gravelly sand.	Numerous records have been made within the remnant vegetation in the study area. Suitable habitat for this species likely occurs within the study area	EVC 48 is the most suitable vegetation community for this species. This EVC is located along the eastern section of the preliminary route.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pseudanthus ovalifolius	Oval-leaf Pseudanthus	VU	1	13/11/1899	Record (VBA)	Low	Of disjunct occurrence in Victoria, usually found on dry sandy, or shallow, shaley soils.	A single record has been made outside of the study area. This record was made in 1978 and has an accuracy of 500m.	Riparian scrub vegetation (EVC 191) may provide suitable habitat for the species. This vegetation occurs sporadically across the whole preliminary route.	N/A	N/A	N/A	N/A

Species data							Likelihood assessment				Preliminary impact assessment			
Pterostylis chlorogramma	Green-striped Greenhood	EN	VU	1	30/08/2007	Record (VBA)	Moderate	Moist areas of heathy shrubby forest on well-drained soils.	All records have for this species have been made outside of the study area, south of the preliminary route.	EVC 48 and EVC 191 are likely to both provide habitat for this species. This EVC is located along the eastern section of the preliminary route where as EVC 191 occurs across most of the study area.	Low	Likely to be limited habitat extent and/or populations within the preliminary route (habitat for this species is highly localised to Holey Plains State Park).	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pterostylis fischii	Fisch's Greenhood	VU	EN	4	1/09/2003	Record (VBA)	Moderate	Restricted and uncommon in eastern Victoria, from near-coastal open forests and woodlands to montane woodlands, often among grass and bracken, on well-drained soils.	Several records have been made within the study area. There is likely to be suitable habitat for this species within the study area.	EVC 16, EVC 55 and EVC 151 are provide suitable habitat for this species. EVC 55 and 151 are located primarily within the western portion of the preliminary route whereas EVC 16 occurs across most of the study area.	Moderate	The preliminary route may impact habitat that could support this species.	The extent of grassy woodland and forest habitat is difficult to determine without field surveys. Likely however to be restricted to small, remnants in roadsides and private land that can be avoided.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pterostylis grandiflora	Cobra Greenhood	EN		5	40667	Record (VBA)	Low	Moist well drained soils in open forests. Dappled shade	All records of this species have been made at least 10 km west of the preliminary route. Suitable habitat for this species is limited within the study area.	EVC 151 may provide habitat for this species. This EVC is confined to the western extent of the preliminary route.	N/A	N/A	N/A	N/A
Pterostylis incognita	Sale Greenhood	EX		1	21/09/1895	Record (VBA)	Low	Endemic to Victoria where known only from the type collection near Sale presumably in grassland or grassy woodland.	Assumed extinct. A record has been made within a 10 km radius of the study area. This record was made in 1895 and has an accuracy of 25 km.	Grassland EVCs may provide habitat for this species. These EVCs include EVC 55 and EVC 151. These vegetation communities are located along the western portion of the study area.	N/A	N/A	N/A	N/A
Pterostylis pedoglossa	Prawn Greenhood	CR		1	16/02/1972	Record (VBA)	Low	Scattered in coastal and near-coastal heath and grasstree plains east of Melbourne, often on moist peaty soils.	This species requires coastal vegetation. The only record made was in 1972 and has an accuracy of 10,000 m.	No suitable habitat within the preliminary route.	N/A	N/A	N/A	N/A

Species data							Likelihood assessment						Preliminary impact assessment	
Pterostylis X ingens	Sharp Greenhood	VU		2	1/01/1967	Record (VBA)	Low	Favours moist areas around swamps and stream banks on heavy soils.	The most recent record of this species was from 1967. Habitat for this species is limited within the study area.	This species requires swamp vegetation. EVC 48 and EVC 146 may provide habitat for this species. These communities are within the eastern section of the preliminary route.	N/A	N/A	N/A	N/A
Pterostylis X toveyana	Mentone Greenhood	EN	EN	2	41435	Record (VBA)	Moderate	Grows in moist areas of open forest and in coastal scrub, usually on sandy soils.	This species has been recorded within close proximity to the study area. Suitable habitat for this species likely occurs across the study area.	This species has been previously recorded in EVC 16 vegetation. This vegetation community occurs across a large proportion of the study area.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Pultenaea blakelyi	Blakely's Bush-pea	CR		1	34700	Record (VBA)	Low	This species is tentatively treated as native in Victoria. It is currently known from a single collection on private property near Traralgon, where it is not believed to have been planted. However, the absence of other records of this species in the general area does not support this idea.	Known to be limited to a single property near Traralgon. Primarily occurs in NSW.	Grows in dry and wet sclerophyll forest. EVC 16 could provide habitat for this species. This EVC can be found across most of the preliminary route.	N/A	N/A	N/A	N/A
Ranunculus amplus	Lacey River Buttercup	CR		1	5/11/2008	Record (VBA)	Moderate	Scattered throughout southern Victoria, but most common in south-west. Grows in stream verges and swamps. Plants are usually partially submerged, with emergent leaves and flowering stems.	This species has not been recorded within the study area however suitable habitat likely occurs within the preliminary route.	Verges of streams are likely to provide habitat for this species. EVCs that could support this habitat include EVC 191.	Low	Likely to be limited populations within the preliminary route.	Avoid impacts to riparian/wetland vegetation where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data							Likelihood assessment			Preliminary impact assessment			
Senecio diaschides	Shingle Fireweed	EN	1	7/12/2011	Record (VBA)	Low	In Victoria apparently confined to river valleys in the east, with records from along the Avon, Macalister, Murrindal, Buchan and Snowy Rivers, commonly occurring in sand or amongst rocks near the watercourse.	This species has very specific habitat requirements. Habitat for this species is unlikely to occur within the study area.	No river valleys occur within the study area however riparian vegetation could act as habitat for this species. EVC 191 is the most likely vegetation community that could support this species.	N/A	N/A	N/A	N/A
Senecio glomeratus subsp. longifructus	Annual Fireweed	VU	1	2/03/2012	Record (VBA)	Moderate	Grows adjacent to streams and swamps throughout the south and north-east of the State.	Suitable habitat likely occurs within the study area.	This species is known to occur in streams and swamps. EVC 48, EVC 53 and EVC 191 may all provide habitat for this species. These EVCs are located across the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Avoid impacts to riparian/wetland/swampy vegetation where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Senecio psilocarpus	Swamp Fireweed	VU	NA	NA	Modelled (PMST)	Low	Restricted to several sites in herb-rich winter-wet swamps throughout the south of the state, to the west of Sale. Grows on volcanic clays and peaty soils.	No records have been made for this species within a 10 km radius of either preliminary route. Available habitat for this species is limited.	Wetlands and swamps within preliminary route may provide habitat for this species.	N/A	N/A	N/A	N/A
Sowerbaea juncea	Rush Lily	VU	8	19/10/2020	Record (VBA)	High	Locally common in damp, near-coastal heath and woodland communities in the far east (from near Mario to the NSW border) with scattered, disjunct occurrences in the northern part of Wilsons Promontory and areas between Traralgon and Sale south to near Yarram.	Records for this species have been made within the past 12 months. Suitable habitat for this species likely exists within the study area.	Records for this species have been made within both EVC 48 and EVC 191. These two EVCs are located within the preliminary route. EVC 48 is confined to the eastern portion of the preliminary route where as EVC 191 can be found across most of the study area.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Thelymitra epipactoides	Metallic Sun-orchid	EN	EN	1	01/10/1895	Record (VBA)	Low	Found in coastal heathland, grassland and woodland, but extending further inland into similar habitats in the west of its range. On moist or dry sandy soils.	A single record has been made within a 10 km radius of the proposed corridor. This record is dated. Habitat may occur across the study area.	EVC 48 vegetation located within the eastern section of the preliminary route may provide habitat for this species.	N/A	N/A	N/A	N/A

Species data						Likelihood assessment				Preliminary impact assessment			
Thelymitra hiemalis	Winter Sun-orchid	CR	1	10/07/2012	Record (VBA)	Moderate	Found in heathland and heathy woodland on well-drained soils.	Despite a single record being made within close proximity to the study area, the habitat required for this species is widespread across the preliminary route.	EVC 48 and EVC 191 may provide habitat for this species. EVC 48 is confined to the eastern portion of the preliminary route where as EVC 191 can be found across most of the study area.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Tmesipteris elongata	Slender Fork-fern	CR	5	1/03/1983	Record (VBA)	Low	Known from few scattered localities in Victoria (Otway and Strzelecki Ranges, upper Tyers River, Wilsons Promontory) and rare. Epiphytic on Dicksonia antarctica.	All records for this species occur approximately 8 km south west of the preliminary route. The most recent record was made in 1983.	This species is an epiphyte that requires *Dicksonia antarctica*. Suitable habitat for this species may include sheltered damp gulley's. This habitat does not occur within the preliminary route.	N/A	N/A	N/A	N/A
Tmesipteris ovata	Oval Fork-fern	CR	4	1/03/1983	Record (VBA)	Low	Not common in Victoria, localized in wet forest near Gembrook and Emerald, Morwell National Park, Wilsons Promontory and East Gippsland.	All records for this species occur approximately 8 km south west of the preliminary route. The most recent record was made in 1983.	Requires wet forest. This habitat type likely occurs south of the preliminary route in the Stradbroke Flora and Fauna Reserve.	N/A	N/A	N/A	N/A
Triglochin minutissima	Tiny Arrowgrass	EN	1	2/03/2012	Record (VBA)	Low	Scattered on damp saline soils near salt-lakes and forming part of herbfield in coastal saltmarshes.	Habitat for this species is unlikely to occur within the study area.	This species required damp saline soils near salt-lakes or coastal salt marshes. This habitat does not occur within the study area.	N/A	N/A	N/A	N/A
Viola fuscoviolacea	Dusky Violet	EN	1	33546	Record (VBA)	Moderate	Grows in damp alpine herbfields of the alps (e.g. Buffalo Plateau, Bogong High Plains, Mt Wellington, Nunniong Plateau) with isolated occurrences in near-coastal Lepidosperma longitudinale sedgeland between Wilsons Promontory and Sale.	May occur within sedgeland within heathy woodland elements.	This species requires near coastal sedgelands. EVC 48 may provide sedgeland habitat where the soils are most damp. EVC 48 primarily occurs within the eastern portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

Species data							Likelihood assessment				Preliminary impact assessment			
Xanthosia leiophylla	Parsley Xanthosia	EN		4	18/12/1978	Record (VBA)	Moderate	Uncommon in Victoria, where known from sandy heathland and heathy woodland, mostly in the south-west, but also recorded from Wilsons Promontory.	Suitable habitat likely occurs within the study area.	EVC 48 is likely to provide the most suitable habitat for this species. This vegetation community is located within the eastern portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.
Xerochrysum palustre	Swamp Everlasting	CR	VU	2	11/11/2009	Record (VBA)	Moderate	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. The species will also grow in more marginal wetland habitats such as seasonally wet areas of native grassland and heath communities.	Despite the low number of records that have been made within a 10 km radius of the study area, there is likely to be suitable habitat within the preliminary route.	EVC 48 may provide sedgeland habitat where the soils are most damp. EVC 48 primarily occurs within the eastern portion of the preliminary route.	Low	Likely to be limited populations within the preliminary route.	Avoid impacts to riparian/wetland/swampy vegetation where possible.	An EPBC Act referral may be required in project has a significant impact on this species. May trigger EE Act referral where impacts to other species or communities also likely.
Zieria veronicea subsp. veronicea	Pink Zieria	EN		12	15/10/2012	Record (VBA)	High	Widespread in sandy mallee and mallee-heath communities of western Victoria with a southerly outlier near Casterton, and disjunct populations in sandy lowland heaths around the Gippsland Lakes.	Suitable habitat likely occurs within the study area.	EVC 48 is likely to provide the most suitable habitat for this species. This vegetation community is located within the eastern portion of the preliminary route.	High	The preliminary route may impact extensive habitat which support numerous populations.	Focus preliminary route within already cleared areas, along existing tracks or farmland where possible.	May trigger EE Act referral where impacts to other species or communities also likely. FFG Act permit required for removal on public land.

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