Appendix I

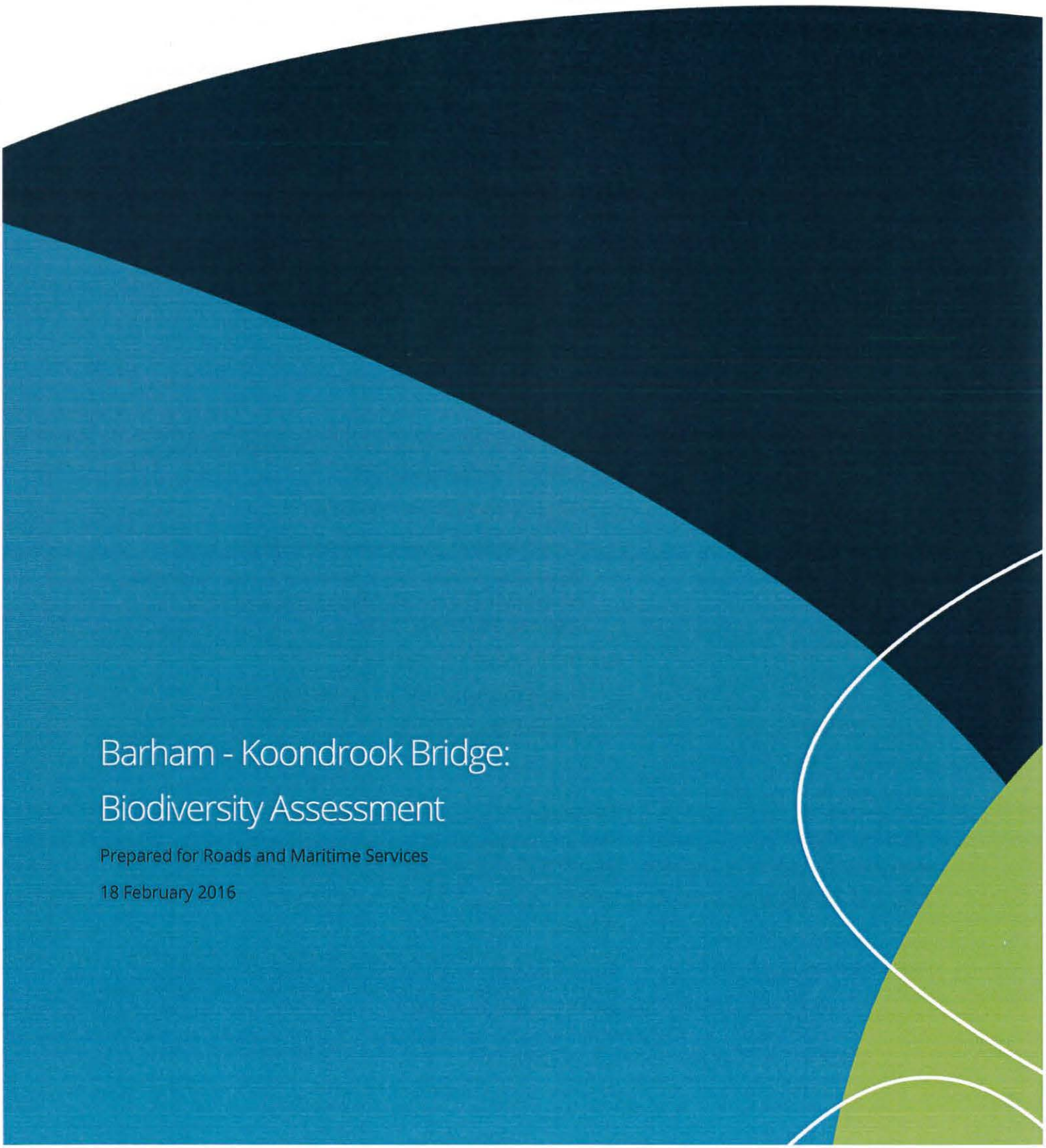
Victorian biodiversity assessment

Roads & Maritime

Victorian Biodiversity Assessment

Barham-Koondrook Bridge Restoration Work

February 2016



Barham - Koondrook Bridge: Biodiversity Assessment

Prepared for Roads and Maritime Services

18 February 2016

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Biosis staff involved in this project were:

- Michael Goddard (assistance in the field)
- Lachlan Milne (mapping)

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Summary

NGH Environmental Pty Ltd on behalf of Roads and Maritime Services (Roads and Maritime) commissioned Biosis Pty Ltd to conduct a biodiversity assessment for the Barham-Koondrook Bridge Rehabilitation Proposal. Roads and Maritime had previously commissioned NGH Environmental to conduct a biodiversity assessment for the proposal in October 2015, collecting a range of information on the biodiversity values of the area immediately surrounding the bridge. NGH Environmental's report (NGH Environmental 2015) describes the vegetation and fauna habitat present, assesses the likelihood of threatened species occurring and discusses the implications of some biodiversity legislation for the proposal.

In order to facilitate the application for a planning permit for the work NGH Environmental engaged Biosis on behalf of Roads and Maritime to conduct additional survey of the study area to compliment the information contained in NGH's report. The aim of this investigation was to supplement NGH's initial survey by providing detailed mapping of the extent of native vegetation within the Victorian jurisdiction and information on flora species that are protected under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act). This report is intended to compliment the Roads and Martime Review of Environmental Factors by providing additional information and is not intended as a stand-alone report. This report should therefore be considered in conjunction with the Roads and Martime Review of Environmental Factors.

Ecological values

Key ecological values identified within the study area are as follows:

- Riverine Grassy Woodland vegetation. Highest quality areas occur on the Bank of the Murray River
- A significant large old tree located on the bank of the Murray River
- Three flora species protected under the FFG Act
- Noxious weeds listed under the Catchment and Land Protection Act.

Government legislation and policy

An assessment of the proposal in relation to key biodiversity legislation and policy is provided and summarised below.

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
FFG Act	Three protected species identified on site.	Protected Flora Permit required.	Site is public land
Planning & Environment Act	All indigenous vegetation to be cleared.	Planning permit required, including permission to lop or remove native vegetation.	Permit application needs to address provisions of Environmental Significance Overlays (ESO) ESO1 and ESO2.
CaLP Act	Four species of noxious weeds identified	N/A	Comply with requirements to control/eradicate

Permitted clearing of native vegetation: Biodiversity assessment guidelines (the Guidelines)

Based on the current design, the proposed development would require the removal of 0.122 hectares of native vegetation from within an area classified as location risk A. Therefore the planning permit application will be assessed on the low risk-based pathway. The strategic biodiversity score of the native vegetation to be removed is 0.491.

If a permit is granted, the offset requirements would be 0.040 general biodiversity equivalence units.

The general offset must be within North Central Catchment Management Authority or Ganawarra Shire Council and must have a minimum strategic biodiversity score of 0.392.

There are no options for providing an on-site offset for the vegetation losses and the best option for sourcing offsets for the proposal would be to purchase the offset credits from the Victorian native vegetation credit register.

Recommendations

The primary measure to reduce the impact to biodiversity values within the study area is to minimise removal of native vegetation and terrestrial and aquatic habitat. It is critical that this be considered during the design phase of the proposal. Vegetation along the Murray River is important in a region that has been highly modified and cleared of most of it native vegetation. It also provides important habitat and linkages for local fauna, including aquatic fauna.

Consideration should be given to the very large old River Red-gum identified on the banks of the Murray River (Plate 2, Figure 2 & Figure 3). This tree is an important feature of the local area. It provides potential habitat for local fauna and if possible work should be designed to avoid impacting this tree.

Wherever possible trees and native vegetation that do not require complete removal for the work should be protected. Areas of native vegetation to be retained should be fenced as no-go-zones for the duration of the work. Where trees are to be retained the Tree Protection Zone (TPZ) of each tree should be fenced as a no-go-zone.

Where trees are to be physically retained but the impact to tree protection zones can not be avoided, measures should be taken to protect the root zone, trunk and branches from construction related damage. The Australian Standard for protection of trees on development sites (AS 4970 – 2009) contains a number of recommendations for protecting trees and this standard should be consulted during the work.

Note that where work inside a TPZ cover an area >10% of the TPZ the tree is likely to be considered lost for the purposes of the relevant planning provisions and the Guidelines, regardless of whether mitigation measures are put in place. However, the mitigation measures would give the trees the greatest chance of survival during the work.

Impact to aquatic habitats should be avoided wherever possible. Sedimentation has the potential to have an impact on aquatic fauna both within the study area and down stream. Work should be designed to minimise in-stream and bank work that have the potential to cause sedimentation. Options for sedimentation management should be investigated including appropriate sediment traps and batters.

1. Introduction

1.1 Proposal background

NGH Environmental Pty Ltd on behalf of Roads and Maritime Services (Roads and Maritime) commissioned Biosis Pty Ltd to conduct a biodiversity assessment for the Barham-Koondrook Bridge Rehabilitation proposal. The bridge spans the Murray River, connecting Barham in New South Wales (NSW) with Koondrook in Victoria. The proposal therefore has potential implications for biodiversity in two separate state jurisdictions: NSW and Victoria.

NGH Environmental conducted a separate biodiversity assessment for the proposal in October 2015, collecting a range of information on the biodiversity values of the area immediately surrounding the bridge. NGH Environmental's report describes the vegetation and fauna habitat present, assesses the likelihood of threatened species occurring and discusses the implications of biodiversity legislation for the proposal.

In order to facilitate the application for a planning permit for the work NGH Environmental on behalf of Roads and Maritime engaged Biosis to conduct an additional survey of the study area to compliment the information contained in NGH's report. The aim of this investigation was to supplement NGH's initial survey by providing detailed mapping of the extent of native vegetation within the Victorian jurisdiction and information on flora species that are protected under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act). This report does not consider New South Wales state biodiversity legislation and policy. It is intended to compliment NGH Environmental's report by providing this additional information and is not intended as a stand-alone report. This report should be considered in conjunction with the NGH report.

1.2 Scope of assessment

The objectives of this investigation are to:

- Describe the vascular flora (ferns, conifers, flowering plants) within the study area
- Map native vegetation and other habitat features
- Conduct a vegetation quality assessment
- Review the implications of the proposal against Victoria's *Permitted clearing of native vegetation: Biodiversity assessment guidelines* ('the Guidelines'), the FFG Act and the *Catchment and Land Protection Act 1994*(CaLP Act)
- Identify the potential impact of the proposed development and provide recommendations to mitigate such impact during development design
- Recommend any further assessments of the site that may be required (such as a vegetation impact assessment or targeted searches for significant species).

1.3 Location of the study area

The study area is located on the Victorian side of the Murray River adjacent to the existing bridge on Grigg Rd/Thule Street, between Koondrook and Barham (Figure 1). An area spanning 50 m to the east and west of the existing bridge was assessed. The land is currently zoned Public Conservation and Resource Zone (PCRZ) along the Murray River, Road Zone 1 (RDZ1) along Grigg Rd and Road Zone 2 (RDZ2) along Murrabit-Koondrook Rd.

The study area is within the Murray Fans Bioregion and the Gannawarra Shire.

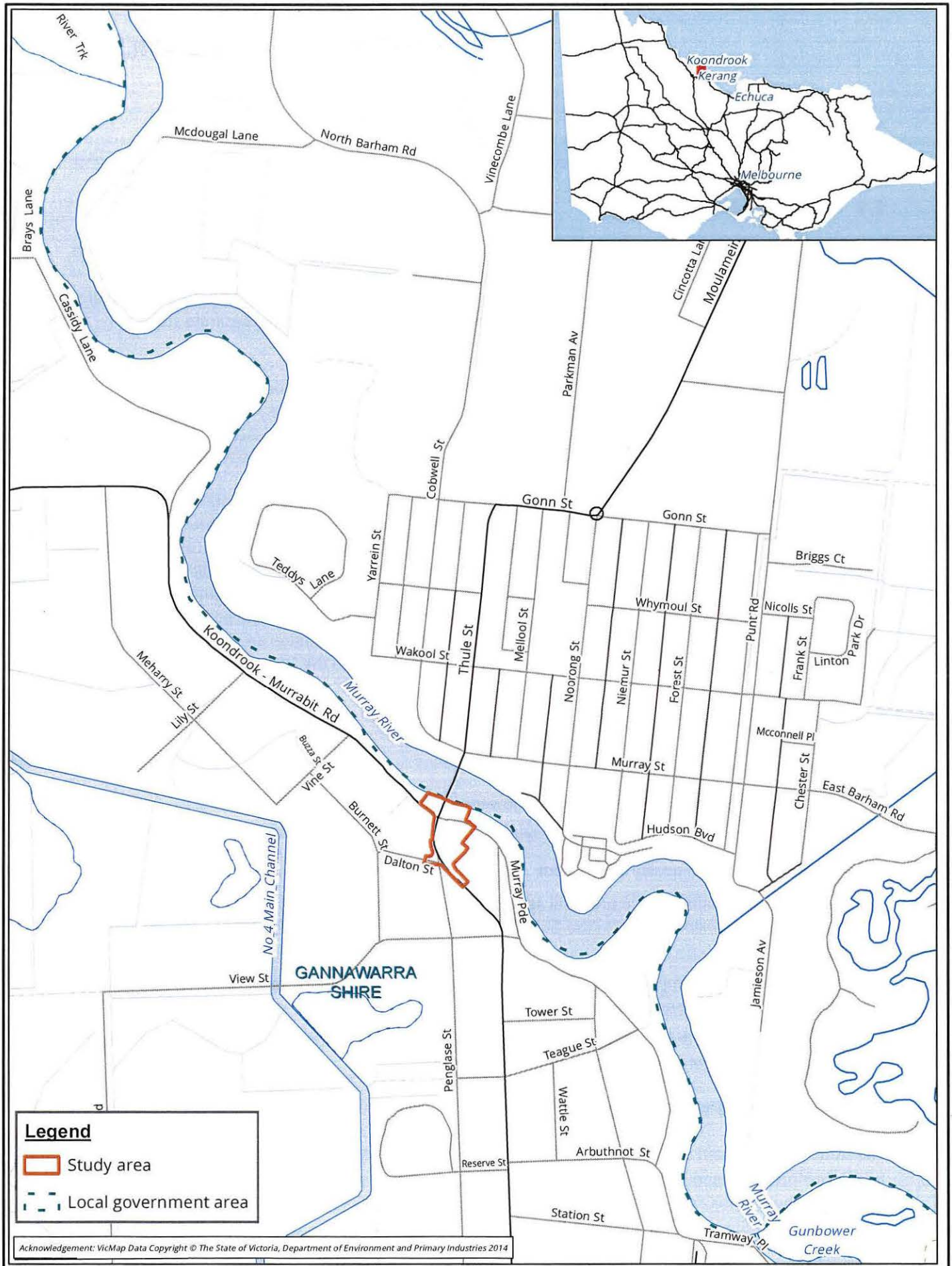

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Figure 1: Location of the study area - Koondrook Bridge, Koondrook, Victoria

Matter: 21251,
Date: 15 December 2015,
Checked by: MG, Drawn by: LDM, Last edited by: jshepherd
Location:P:\21200s\21251\Mapping\

Scale 1:12,500 @ A4, GDA 1994 MGA Zone 55

2. Methods

2.1 Definitions of significance

The significance of a species or ecological community is determined by its listing status under Commonwealth or State legislation / policy (Table 1).

Table 1: Criteria for determining significance of species & ecological communities

Significance	
National	Listed as critically endangered, endangered or vulnerable under the EPBC Act
State	Listed as critically endangered, endangered, vulnerable or rare in Victoria on a Department of Environment, Land, Water & Planning (DELWP) Advisory List (DSE 2013a; DEPI 2014a) Listed as threatened under the FFG Act

2.2 Site investigation

2.2.1 Flora assessment

Biosis inspected the study area on 30 October 2015. We recorded the type (Ecological Vegetation Class), quality and extent of all native vegetation within the study area. Photos and a flora species list were recorded, paying particular attention to flora species protected under Victoria's *Flora and Fauna Guarantee Act 1988* (FFG Act). Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses' (Clause 72).

The Guidelines classify native vegetation into two categories (DEPI 2013a):

- A **remnant patch** of native vegetation (measured in hectares) is either:
  - An area of native vegetation, with or without trees, where at least 25 percent of the total perennial understorey cover is native plants
  - An area with three or more indigenous canopy trees where the tree canopy cover is at least 20 percent.

Remnant patch vegetation is classified into ecological vegetation classes (EVCs). An EVC contains one or more floristic (plant) communities, and represents a grouping of broadly similar environments. Definitions of EVCs and benchmarks (condition against which vegetation quality at the site can be compared) are determined by DELWP.

- A **scattered tree** is defined as (extent measured by number of trees):
  - An indigenous canopy tree that does not form part of a remnant patch of native vegetation.

A canopy tree is a mature tree that is greater than three metres in height and is normally found in the upper layer of a vegetation type. Ecological vegetation class descriptions provide a list of the typical canopy species. A condition score and extent is applied to each scattered tree based on information provided by DELWP's Native Vegetation Information Management (NVIM) system.

A Vegetation Quality Assessment was undertaken for all remnant patch native vegetation identified in the study area. This assessment is consistent with DELWP's Habitat hectare method (DSE 2004) and the Guidelines (DEPI 2013a). For the purposes of this assessment the limit of the resolution for the Habitat

hectare assessment process is taken to be 0.001 Habitat hectares (Hha). That is, if native vegetation is present with sufficient cover but its condition and extent would not result in the identification of at least 0.001 Habitat hectares then that vegetation will not be mapped or assessed as a separate habitat zone.

Species nomenclature for flora follows the Flora Information System (FIS).

2.2.2 Permits

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Research Permit/Management Authorisation and Permit to Take Protected Flora & Protected Fish issued by DELWP under the *Wildlife Act 1975, Flora and Fauna Guarantee Act 1988* and *National Parks Act 1975* (Permit number 10007569)
- Approvals 07.15 and 14.12 from the Wildlife and Small Institutions Animal Ethics Committee
- Permit RP1220 issued by DELWP (Fisheries Victoria) under the *Fisheries Act 1995.*

2.3 Qualifications

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as low abundance, patchy distribution, species dormancy, seasonal conditions, and migration and breeding behaviours. In many cases these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The current flora and fauna assessment was conducted in late spring, which is a suitable time for survey. All key species were able to be identified in enough detail to facilitate this assessment and seasonal factors do not limit the results.

Biodiversity Assessment Reports (BAR) and Biodiversity Impact Offset Requirement (BIOR) reports are prepared through DELWP's NVIM system or requested through DELWP's Native Vegetation Transitional Guidance team. Biosis supplies relevant site-based spatial information as inputs to DELWP and we are entirely reliant on DELWP's output reports for moderate and high risk pathway applications. Biosis makes every effort to ensure site and spatial information entered into the NVIM, or supplied to DELWP, is an accurate reflection of proposed native vegetation removal.

2.4 Legislation and policy

The implications for the proposal were assessed in relation to two key pieces of biodiversity legislation and policy including:

- Threatened taxa, communities and threatening processes listed under Section 10 of the *Flora & Fauna Guarantee Act 1988* (FFG Act); associated action statements and listing advice
- Permitted Clearing of native vegetation: Biodiversity assessment guidelines (DEPI 2013a)
- Provisions under the Gannawarra Shire planning scheme
- Catchment and Land Protection Act 1994.

Other legislation and policy such as the federal *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*, and any relevant NSW state biodiversity legislation, is addressed in the original environmental assessment undertaken by NGH Environmental, and not discussed in this report.

2.5 Mapping

NGH Environmental supplied site plans and the definition of the work footprint used for assessing the impact of the proposed development in this report.

Mapping was conducted using hand-held (uncorrected) GPS units (WGS84) and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the GPS units (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files which contain our flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

3. Results

The ecological features of the study area are described below and mapped in Figure 2.

Species recorded during the flora and fauna assessment are listed in Appendix 1. Unless of particular note, these species are not discussed further.

3.1 Vegetation & fauna habitat

Native vegetation within the study area includes several patches of the Riverine Grassy Woodland Ecological Vegetation Class (EVC 295). Directly adjacent to the river the vegetation is in two discrete remnant patches separated by the road leading to the Barham-Koondrook Bridge (Figure 2). South of Murray Parade, two additional patches of Riverine Grassy Woodland were mapped (Figure 2) along with two scattered River Red-gum trees. We recorded 43 flora species within the study area (Appendix 1).

Patches of vegetation adjacent to the Murray River are of a higher quality than those to the south of Murray Parade. The vegetation of both areas is dominated by River Red-gum *Eucalyptus camaldulensis*, with a relatively disturbed understorey that is maintained as public open space. The vegetation immediately adjacent to the Murray River contains an understorey mostly dominated by exotic grasses such as Couch *Cynodon dactylon*, Kikuyu *Cenchrus clandestinus* and a range of other common weeds (see Table 1). However, indigenous understorey species could be found throughout including the indigenous grass species Slender Wallaby-grass *Rytidosperma racemosum* var. *racemosum* and Common Wallaby-grass *Rytidosperma setaceum*, indigenous forbs such as Cotton Fireweed *Senecio quadridentatus* and Fuzzy New Holland Daisy *Vittadinia cuneata* var. *cuneata*, and shrubs such as Silver Wattle *Acacia dealbata*. The vegetation on the Murray River also contained a number of large old trees with hollows that provide important potential habitat for fauna.

Plate 1: Riverine Grassy Woodland within the study area

Acknowledgements: Vicmap (c) State of Victoria

Legend

- Study area
- Victorian border (top of bank)
- Very Large Old Tree
- Scattered River Red Gums
- Tree protection zone

Riverine Grassy Woodland (EVC295)

- NSW - outside study area
- Vic - within study area

Figure 2: Ecological features of the study area

0 10 20 30 40

Metres

Scale: 1:1,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Date: 13 January 2016,
Checked by: MG, Drawn by: LDM, Last edited by: jshepherd
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21251_F2_EcoFeatures2

On the Murray River bank there is one particularly large tree present. It has a diameter at breast height (DBH) of 168 cm and its crown appeared to contain large hollows that are likely to be utilised by native bird species and arboreal mammals. It is quite possible that this tree is in excess of 200 years old and thus is also part of the heritage and amenity of the area. The location of this tree is shown on Figure 2, Figure 3 and Plate 2.

South of Murray Parade the vegetation consisted of a number of smaller River Red-gum that appear to have regenerated naturally. The understorey is dominated by exotic species, predominantly grasses, with no indigenous shrubs or forbs recorded.

Several trees had canopies that extended beyond the state border into NSW. Their canopies were overhanging the Murray River and its southern bank (Figure 2). The area of canopy within NSW was not included in patch area calculations or vegetation quality assessments because it fell outside the Victorian jurisdiction. This area of canopy, if proposed for removal, would need to be considered under relevant NSW regulations and legislation.

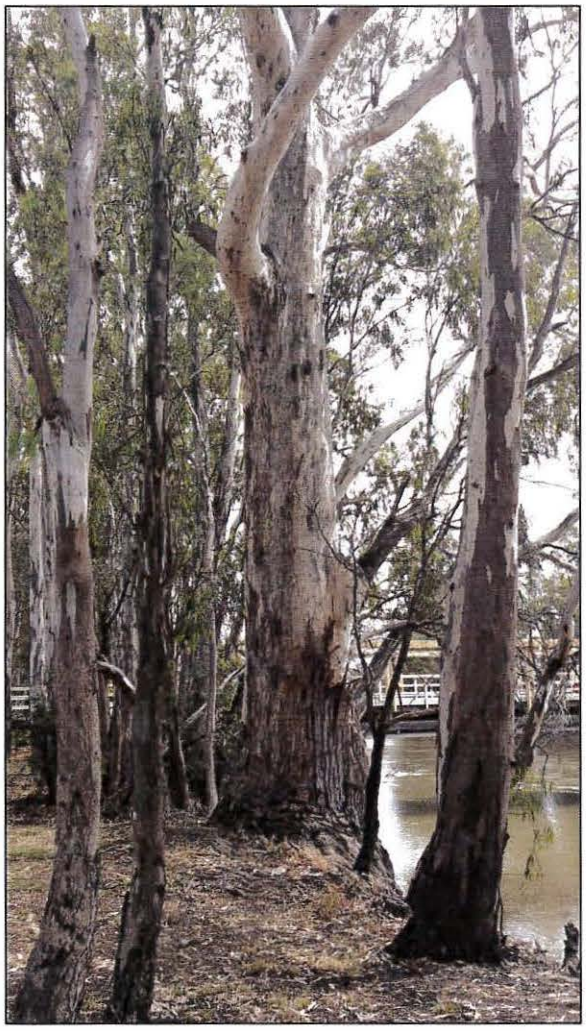

Plate 2: Very large old River Red-gum within the study area.

Legend

- Study area
- Victorian border (top of bank)
- Scour protection
- Clearing footprint
- Very Large Old Tree
- Scattered River Red Gum
- Tree protection zone

Riverine Grassy Woodland (EVC295)

- NSW - outside study area
- Vic - within study area
- Vic - within study area - to be removed

Acknowledgements: Vicmap (c) State of Victoria

Figure 3: Proposed impact of the work

0 10 20 30 40

Metres

Scale: 1:1,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Matter: 21251,
Date: 10 February 2016,
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3.1.1 Habitat hectares

Areas of uniform quality for each EVC within the patches are termed 'habitat zones' and are assessed separately. The condition score of the habitat zone is multiplied by the extent of the zone to give a value in Habitat hectares.

Two habitat zones are identified (Table 2). HZ 1A is located on the bank of the Murray River and HZ 2A is located south of Murray Parade. The results of the condition assessment are provided in Table 2 with the number of Habitat hectares in each habitat zone.

Table 2: Habitat hectares of native vegetation within the study area

Site ID			1	2	
Habitat Zone			A	A	
EVC Name (EVC #)			Riverine Grassy Woodland (EVC 295)	Riverine Grassy Woodland (EVC 295)	
		Max Score	**Score**	**Score**	
Site Condition	Large Old Trees	10	8	0	
	Canopy Cover	5	5	5	
	Lack of Weeds	15	2	2	
	Understorey	25	15	5	
	Recruitment	10	10	0	
	Organic Matter	5	5	4	
	Logs	5	5	2	
	Total Site Score		50	18	
Landscape Value	Patch Size	10	8	1	
	Neighbourhood	10	0	0	
	Distance to Core	5	4	3	
	Total Landscape Score		12	4	
HABITAT SCORE		100	62	22	
Habitat points = #/100		1	0.62	0.22	**Total**
Habitat Zone area to be removed (ha)			0.080	0.042	**0.122**
Habitat hectares to be cleared (Hha)			0.0496	0.00924	**0.059**

3.2 Significant species and ecological communities

3.2.1 FFG Act listed species

FFG Act protected species recorded within the study area are identified in Appendix 1 (flora). Three species identified on site are protected under the FFG Act:

- Cotton Fireweed
- Fuzzy New Holland Daisy
- Yellow Twin-heads *Eclipta platyglossa* subsp. *platyglossa*.

These species are found scattered throughout areas of Riverine Grassy Woodland on the banks of the Murray River.

3.2.2 DELWP advisory list of rare and threatened species

To support decision making under the Guidelines, DELWP has produced models for Victoria describing the extent of habitat for most listed rare or threatened species. These models are called 'habitat importance models' and they assign a 'habitat importance score' to a location based on the importance of that location in the landscape as habitat for a particular rare or threatened species, in relation to other suitable habitat for that species (DEPI 2013a).

Under the Guidelines, these models form the basis for determining the impact of potential native vegetation clearing on rare and threatened species. The models only apply where a clearing proposal is considered on the moderate or high risk-based application pathways. As the current proposal will be assessed under a low risk based pathway (see Section 5.2 for details), these species will not be considered further in this report.

3.2.3 Significant ecological communities

No significant ecological communities were identified on site.

4. Biodiversity legislation and government policy

This section provides an assessment of the proposal in relation to key biodiversity legislation and government policy. This section does not describe the legislation and policy in detail. Where available, links to further information are provided.

4.1 State

4.1.1 Flora and Fauna Guarantee Act 1988 (FFG Act)

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from DSE to 'take' protected flora species from public land. A permit is generally not required for removal of protected flora from private land.

Link for further information: http://www.depi.vic.gov.au/environment-and-wildlife/threatened-species-and-communities/flora-and-fauna-guarantee-act-1988

Native vegetation on site contains three protected flora species as identified in Section 3.2.1 and Appendix 1. The study area is on public land and a protected flora permit from DELWP would be required if any of these species would be affected by the proposal.

4.1.2 Catchment and Land Protection Act 1994 (CaLP Act)

The CaLP Act identifies and classifies certain species as noxious weeds or pest animals, and provides a system of controls on noxious species.

Four species listed as noxious weeds under the Victorian Catchment and Land Protections Act 1994 (CaLP Act) were recorded within the study area (Appendix 1):

- Spear Thistle *Cirsium vulgare* – Regionally restricted
- Patterson's Curse *Echium plantagineum* – Regionally controlled
- Horehound *Marrubium vulgare* – Regionally controlled
- Soursob *Oxalis Pes-caprae* - Regionally restricted.

The proponent/land owner must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of and as far as possible eradicate established pest animals. The State is responsible for eradicating State prohibited weeds from all land in Victoria.

Link for further information: http://www.depi.vic.gov.au/agriculture-and-food/pests-diseases-and-weeds/protecting-victoria-from-pest-animals-and-weeds/legislation-policy-and-permits/legislation

4.1.3 Planning and Environment Act 1987 (incl. Planning Schemes)

The *Planning and Environment Act 1987* controls the planning and development of land in Victoria, and provides for the development of planning schemes for all municipalities.

Reforms to the native vegetation permitted clearing regulations were gazetted on 20 December 2013 through planning scheme amendment VC105. The reforms made changes to the Victoria Planning Provisions including the State Planning Policy Framework (SPPF), Clause 52.16 and 52.17 of all planning scheme within

Victoria and introduced the Permitted clearing of native vegetation: Biodiversity Assessment Guidelines (DEPI 2013a).

Of particular relevance to the development proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Gannawarra Planning Scheme (the Scheme), including permit requirements. The Scheme (Clause 72) defines 'native vegetation' as 'Plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. It is an objective of Clause 12.01-2 of the SPPF (Native Vegetation Management) that permitted clearing of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity. For more information on these reforms refer to http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/native-vegetation.

Clause 52.17 (Native Vegetation) requires a planning permit to remove, destroy or lop native vegetation including some dead native vegetation, such as that identified in this report. It should be noted that where native vegetation does not meet the definition of a remnant patch or scattered trees, as described in Section 3.1, the Guidelines do not apply. However, a permit may still be required to remove, destroy or lop native vegetation under the provisions of the Scheme.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DELWP as a recommending referral authority if any of the following apply:

- The area of native vegetation to be removed is greater than 0.5 hectares
- The class of application is on the high risk-based pathway
- A property vegetation precinct plan applies to the site
- The native vegetation is on Crown land occupied or managed by the Responsible Authority.

None of these thresholds are met for this proposal and DELWP would not be a mandatory referral authority.

The need for a permit to remove native vegetation may also be triggered by overlays within the Scheme. The location of the overlays in relation to the study area can be determined via the following link: http://planningschemes.dpcd.vic.gov.au/. The provisions of the following overlays apply to the study area:

- Environmental Significance Overlay # 1 (ESO1) covers part of the study area. ESO1 is in place to protect watercourse environs and aims to protect the water quality of the Loddon Catchment. A permit is required for the removal of native vegetation within areas covered by this overlay
- Environmental Significance Overlay # 2 (ESO2) covers part of the study area. ESO2 exists to protect roadside vegetation in order to conserve the character of rural roads and to improve visual amenity. A permit is required for the removal of native vegetation under this overlay.

Victoria's Biodiversity Assessment Guidelines

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DEPI 2013a). The Guidelines replace Victoria's Native Vegetation Management – A Framework for Action.

The purpose of the Guidelines is to guide how the impact to biodiversity should be considered when assessing a permit application to remove, destroy or lop native vegetation. The objective for permitted clearing of native vegetation in Victoria is 'No net loss in the contribution made by native vegetation to Victoria's biodiversity'.

A detailed assessment of the implications for the proposal under the Guidelines is provided in Section 5 of this report.

5. Victoria's biodiversity assessment guidelines

The Guidelines were introduced in December 2013, and they describe the following objective for permitted clearing of native vegetation in Victoria:

"No net loss in the contribution made by native vegetation to Victoria's biodiversity"

This objective is to be achieved through Victoria's planning system using a risk-based approach that relies on strategic planning and the permit and offset system. The key strategies for achieving no net loss at the permit level are:

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

DELWP has provided biodiversity information tools to assist with determining the risk associated with permitted clearing and the contribution that native vegetation within the study area makes to Victoria's biodiversity.

All planning permit applications to remove native vegetation are assigned to a risk-based pathway determined by the extent and location of proposed clearing. The risk-based pathway will dictate the information to be provided in a planning permit application and the decisions guidelines the responsible authority (e.g. Council) and/or DELWP as a referral authority will use to assess the permit application.

The biodiversity information tools have two components:

Site-based information

The site-based information is observable at a particular site. Biosis has collected the requisite site-based information for the assessment against the Guidelines.

Landscape scale information

Landscape scale information requires consideration of information beyond the site. This information is managed by DELWP and can be accessed via the NVIM. Biosis has submitted the site-based data and location information to DELWP and a Biodiversity Information and Offset Requirements (BIOR) report has been prepared to accompany the planning application.

The following section summarises the results of the site-based assessment and the outputs generated by the BIOR report. The BIOR report identifies the risk-based pathway on which the planning application will be assessed. The full BIOR report can be viewed in Appendix 3.

Note: a glossary of terms used in relation to the Guidelines and Habitat hectares assessment is provided in Appendix 2.

5.1 Proposed removal of native vegetation

The extent of native vegetation patches and the number of scattered trees were mapped within the study area (Figure 2) and the condition was assessed in relation to standard methods provided by DSE (2004). The condition of native vegetation was assessed using the DSE Vegetation Quality Assessment Sheet (DSE 2004)

and pre-determined EVC benchmarks: http://www.dse.vic.gov.au/conservation-and-environment/ecological-vegetation-class-evc-benchmarks-by-bioregion.

The proposed removal of native vegetation was assessed in accordance with the concept design provided, and through consultation with Roads and Maritime. It is proposed to remove 0.122 hectares of native vegetation as shown in Table 2. Spatial data (shapefiles) of proposed vegetation removal were submitted to DELWP's native vegetation support team, who provided a BIOR report for the proposal. This is provided in Appendix 3 and summarised in the following sections.

5.1.1 Scour protection areas

Roads and Maritime propose to place rock on the bank of the Murray River to stabilise the banks. The area subject to this stabilisation work is identified as "scour protection area" in Figure 3. The purpose of this is to protect the banks from erosion that may expose and damage tree roots.

The scour protection zones identified in Figure 3 fall within the tree protection zones (TPZ) for a number of trees on the river bank. The placement of rock is intended to protect the trees from erosion that will eventually result in the loss of the trees. Though it is difficult to say with certainty that the placement of rock within the TPZs would have no impact on tree health, we consider that any potential impact would be relatively minor compared to the continued erosion of the river bank.

Trees in a riparian environment are able to draw water from the river and are thus less impacted by the placement of fill that might impede the flow of surface water to the root system. The placement of rock, to the minimum extent necessary to protect the banks, is also unlikely to result in significant compaction of the soil within the TPZ and, thus, unlikely to have a long term impact on the tree health.

DELWP have provided written advice confirming that the placement of rock within the scour protection zones identified in Figure 3 would not result in the trees being considered lost. This advice is included below:

> *"DELWP Native Vegetation Regulation does not consider the tree(s) on the bank to be lost as a result of bank stability works. We understand that the placement of rock will encroach within the tree protection zone, and that some compaction of the soil may occur, however, these works are being undertaken to prevent the continued erosion of the bank and protect the tree(s), and if not done will result in the loss of the tree(s). The placement of the rock itself will not result in direct loss of native vegetation.*
>
> *This advice is given on the understanding that encroachment of rock into the TPZ is as a result of bank stability works and not from the construction of the temporary bridge, in which case the tree should be deemed lost and considered in the permitted clearing regulation."*

For these reasons where the scour protection area falls within TPZs within the study area these trees have not been identified as 'lost' and are not included in the assessment of impact presented here.

Recommendations about how this work should proceed to avoid impacting to trees are provided in Section 6.

5.2 Determining the risk-based pathway

To determine the risk based pathway for the permit application, two factors are considered: **location risk** and **extent risk**.

Location risk has been pre-determined by DELWP for all locations in Victoria. The location of a particular site is determined using the *Native vegetation location risk map* available in the Native Vegetation Information Management (NVIM) system (http://nvim.depi.vic.gov.au).

The extent risk is based on the extent of native vegetation proposed to be removed. Extent risk is determined with reference to the:

- Area of any remnant patches of native vegetation proposed to be removed
- Number of any scattered trees proposed to be removed.

It is proposed to remove 0.122 ha of native vegetation from within location A, therefore, the application for removal of this native vegetation must meet the requirements of, and be assessed in, the low risk-based pathway. These requirements are provided in the Guidelines (DEPI 2013a).

5.3 Offset requirements

In order to ensure a gain to Victoria's biodiversity that is equivalent to the loss resulting from permitted clearing of native vegetation, compensatory offsets are required. Losses and gains are measured in biodiversity equivalence scores or units.

Under the Guidelines any losses of vegetation within sites that are assessed under the low risk-based pathway can be offset by the provision of a 'general offset'.

The offset required to compensate for the loss of habitat associated with this proposal is 0.040 General Biodiversity Equivalence Units (GBEUs). The general offset requirements are provided in the BIOR report in Appendix 5 and summarised in Table 3.

Table 3: Summary of DELWP Biodiversity Impacts and Offset Requirements report

Attribute	Outcome
Risk-based pathway	Low
Habitat hectares to be removed	0.059
Strategic Biodiversity Score	0.491
Offset type	General
Offset risk factor	1.5
Offset amount: General Biodiversity Equivalence Units	0.040
Minimum strategic biodiversity score	0.392
Offset Vicinity	North Central Catchment Management Authority **or** Ganawarra Shire Council

5.4 Proposed offset strategy

There are no options for providing an on-site offset for the vegetation losses and the best option for sourcing offsets for the proposal would be to purchase "over the counter" offset credits from the Victorian native vegetation credit register.

Purchasing over the counter offsets is the least onerous option in terms of time and resources for Roads and Maritime. Credits are purchased through a registered offset broker who arranges registration of the site, all management plans and legal on title agreements to ensure that the site is protected and managed accordingly. A quote should be sought from a registered offset broker for these services.

As an alternative option, Roads and Maritime may choose to secure a third party offset themselves. Under this arrangement Roads and Maritime would enter into an agreement with a landholder for the landholder to retain and manage native vegetation as a general third party offset site.

The third party offset site would need to be on freehold land located in the North Central Catchment Management Authority or Ganawarra Shire Council with a strategic biodiversity score of at least 0.392.

Based on the offset site security standards detailed in page 6 of DEPI 2013b, the offset owner would be required to enter into a security agreement that meets the following security standards:

- Contains a legally enforceable provision
- Has no termination date
- Is implemented by a statutory body on the list of statutory bodies that have agreed to the Agreement with the Secretary to the Department of Environment and Primary Industries (DEPI) for implementing offsets on freehold land. DELWP maintains an up to date list of the statutory bodies who have provided written confirmation to the agreement. The list is available on the DELWP website.

For a third party offset a management plan would need to be developed and this area would need to be actively managed for a nominated 10 year period and then maintained as an offset in perpetuity.

6. Key recommendations

This section provides recommendations to assist Roads and Maritime to design the work to minimise the impact on biodiversity. All recommendations in this section should be considered in conjunction with the recommendations and requirements provided by NGH Environmental's assessment and report on the site (NGH Environmental 2015).

The primary measure to reduce the impact to biodiversity values within the study area is to minimise removal of native vegetation and terrestrial and aquatic habitat. It is critical that this be considered during the design phase of the proposal. Vegetation along the Murray River is important in a region that has been highly modified and cleared of most of it native vegetation. It also provides important habitat and habitat connectivity for local fauna, including aquatic fauna.

Consideration should be given to the very large old River Red-gum identified on the banks of the Murray River (Plate 2, Figure 2, Figure 3). Although this tree gets no additional protection because of its size under policy and legislation, it is likely to provide habitat for local fauna and if possible work should be designed to avoid impact to this tree.

Impacts to trees and native vegetation

Wherever possible, trees and native vegetation that do not require complete removal for the proposed work should be protected. Areas of native vegetation to be retained should be fenced as no-go-zones for the duration of the work. Where trees are to be retained the Tree Protection Zone (TPZ) of each tree should be fenced as a no-go-zone. The tree protection zone is a circular zone centred on the tree trunk with a radius that is 12 times the diameter of the tree at 1.3m from ground level, or Diameter at Breast Height (DBH), up to a maximum radius of 15 m.

$$TPZ\ radius\ = DBH\ \times 12$$

Where trees are to be physically retained but impact to tree protection zones can not be avoided measures should be taken to protect the root zone, trunk and branches from construction related damage. The Australian Standard for protection of trees on development sites (AS 4970 – 2009) contains a range of recommendations for protecting trees. This document can be consulted during the works. Appropriate measures include:

- Temporary physical protection for the trunk and/or branches such as foam or rubber padding surrounded by batons strapped around the outside of the trunk (not nailed or screwed into the trunk)
- Ground protection such as >100mm of mulch covered by geotextile matting and rumble boards or steel plates to distribute weight of machinery and minimise ground compaction.

Note that where work is inside a TPZ cover an area >10% of the TPZ the tree is likely to be considered lost for the purposes of the relevant planning provisions and the Guidelines, regardless of whether the above are put in place. However, the above recommendations would give the trees the greatest chance of survival during the work.

Scour protection areas

Proposed scour protection areas along the banks of the Murray River should take into account the location of trees. Most of the scour protection areas fall within TPZs, and ground disturbance must not occur. The placement of rock within these areas should be of the minimum amount required to protect the bank.

Vehicles and plant should not move through areas of retained vegetation in order to place rock within the scour protection areas. The bank may only be accessed from areas where vegetation has been cleared and offset in line with the relevant planning permit, or from the river. Where this can not be achieved, additional access points would need to be identified, added to the work footprint and vegetation losses offset under the Guidelines.

Aquatic habitats

Impact to aquatic habitats should be avoided wherever possible. Sedimentation has the potential to have an impact on aquatic fauna both within the study area and down stream. Work should be designed to minimise in-stream and bank work that have the potential to cause sedimentation. Options for sedimentation management should be investigated including appropriate sediment traps and batters.

Measures should be taken to ensure that pollution does not enter the waterway. This includes ensuring that vehicle parking, servicing and refuelling areas are located a sufficient distance from the waterway. Spill kits and procedures should be in place to contain any chemical spills before they impact the waterway.

References

DEPI 2013a. *Permitted clearing of native vegetation - Biodiversity assessment guidelines.* Victorian Government Department of Environment and Primary Industries, Melbourne (September 2013).

DEPI 2013b. *Native vegetation gain scoring manual, version 1*. Victorian Government Department of Environment and Primary Industries, Melbourne (May 2013).

DEPI 2014a. *Advisory List of Rare or Threatened Plants in Victoria – 2014*. Victorian Government Department of Environment & Primary Industries, East Melbourne.

DEPI 2014b. *Permitted clearing of native vegetation – Biodiversity assessment handbook.* Version 0.2. Victorian Government Department of Environment and Primary Industries, Melbourne (January 2014).

DNRE 2002. *Victoria's Native Vegetation Management: A Framework for Action.* Victorian Government Department of Natural Resources & Environment, East Melbourne.

DSE 2004. *Native Vegetation: Sustaining a living landscape. Vegetation Quality Assessment Manual – Guidelines for applying the Habitat hectares scoring method. Version 1.3.* Victorian Government Department of Sustainability & Environment, Melbourne.

DSE 2013. *Advisory List of Threatened Vertebrate Fauna in Victoria – 2013.* Victorian Government Department of Environment & Primary Industries, Melbourne.

DSE 2007. *Native Vegetation – Guide for assessment of referred planning permit applications*. Victorian Government Department of Sustainability & Environment, East Melbourne.

DSE 2010. Victorian Biodiversity Atlas 'VBA_FAUNA25, FAUNA100 & FAUNARestricted, FLORA25, FLORA100 & FLORARestricted' August 2010 © The State of Victoria. Victorian Government Department of Sustainability & Environment, Melbourne.

NGH Environmental 2015. *Biodiversity Assessment: Barham Bridge – Truss and Victorian approach span restoration.* NGH Environmental, Sydney.

Appendices

Appendix 1: Flora

Notes to tables:

EPBC Act:
CR - Critically Endangered
EN - Endangered
VU - Vulnerable

DEPI 2014a:
e - endangered
v - vulnerable
r - rare

PMST – Protected Matters Search Tool

FFG Act:
L - listed as threatened under FFG Act
P - protected under the FFG Act (public land only)

Noxious weed status:
SP - State prohibited species
RP - Regionally prohibited species
RC - Regionally controlled species
RR - Regionally restricted species

- Native species outside natural range

A1.1 Flora species recorded from the study area

Table A1.1. Flora species recorded from the study area.

Status	Scientific Name	Common Name
Indigenous Species		
	Acacia dealbata	Silver Wattle
	Carex tereticaulis	Poong'ort
	Chloris truncata	Windmill Grass
	Dichondra repens	Kidney-weed
P	*Eclipta platyglossa*	Yellow Twin-heads
	Enteropogon acicularis	Spider Grass
	Eucalyptus camaldulensis	River Red-gum
	Eucalyptus largiflorens	Black Box
	Exocarpos strictus	Pale-fruit Ballart
	Juncus subsecundus	Finger Rush
	Oxalis perennans	Grassland Wood-sorrel
	Rytidosperma racemosum var. *racemosum*	Slender Wallaby-grass
	Rytidosperma setaceum	Bristly Wallaby-grass
P	*Senecio quadridentatus*	Cotton Fireweed
P	*Vittadinia cuneata* var. *cuneata*	Fuzzy New Holland Daisy
Introduced Species		
#	*Brachychiton populneus* subsp. *populneus*	Kurrajong
	Acetosella vulgaris	Sheep Sorrel
	Avena fatua	Wild Oat

Status	Scientific Name	Common Name
	Bromus catharticus	Prairie Grass
	Bromus diandrus	Great Brome
	Bromus hordeaceus subsp. *hordeaceus*	Soft Brome
	Cenchrus clandestinus	Kikuyu
RR	*Cirsium vulgare*	Spear Thistle
	Cynodon dactylon	Couch
RC	*Echium plantagineum*	Paterson's Curse
	Fraxinus angustifolia	Desert Ash
	Hordeum leporinum	Barley-grass
	Hypochaeris radicata	Flatweed
	Lepidium africanum	Common Peppercress
	Lolium rigidum	Wimmera Rye-grass
	Malva nicaeensis	Mallow of Nice
RC	*Marrubium vulgare*	Horehound
	Modiola caroliniana	Red-flower Mallow
RR	*Oxalis pes-caprae*	Soursob
	Paronychia brasiliana	Whitlow Wort
#	*Paspalidium jubiflorum*	Warrego Summer-grass
	Paspalum dilatatum	Paspalum
	Phalaris aquatica	Toowoomba Canary-grass
	Plantago coronopus	Buck's-horn Plantain
	Plantago lanceolata	Ribwort
	Rumex crispus	Curled Dock
	Sonchus oleraceus	Common Sow-thistle
	Trifolium dubium	Suckling Clover

Appendix 2: Glossary – Biodiversity Assessment Guidelines

Items marked with 'A' are cited from DEPI (2013a) ; items marked with 'B' are cited from DSE (2007b) and items marked with a 'C' are cited from DEPI (2014b).

Avoid [A]

Avoiding removing any native vegetation when undertaking a use or development. This can be either by not permitting or not going ahead with the use or development, or locating it elsewhere so that removing native vegetation is not required.

Benchmark [B]

A standard vegetation -quality reference point, dependent on vegetation type, which is applied in Habitat hectare assessments. Represents the average characteristics of a mature and apparently long undisturbed state of the same vegetation type.

Biodiversity [A]

The variety of all life forms, the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part.

Biodiversity Interactive Map (BIM)

Web based interactive map available on the DSE website that provides information on the biodiversity of Victoria and displays flora and fauna data from the Victorian Biodiversity Atlas.

Bioregion [B]

Biogeographic areas that capture the patterns of ecological characteristics in the landscape or seascape, providing a natural framework for recognising and responding to biodiversity values. A landscape based approach to classifying the land surface using a range of environmental attributes such as climate, geomorphology, lithology and vegetation.

BushBroker [A]

A program coordinated by DELWP to match parties that require native vegetation offsets with third party suppliers of native vegetation offsets.

Canopy Tree [C]

Is a mature tree greater than three metres in height and is normally found in the upper layer of a vegetation type. Immature trees that are not yet able to flower and are less than three metres in height are considered part of the understorey (see definition of understorey).

Condition score

The score assigned to a habitat zone that indicates the quality of the vegetation relative to the ecological vegetation class benchmark, usually expressed as a percentage or on a scale of 0 to 1.

Degraded treeless vegetation [B]

Vegetation that is neither a wetland, a remnant patch nor scattered tree(s).

DBH (Diameter at Breast Height) [B]

The diameter of the main trunk of a tree measured 1.3 m above ground level.

Dispersed habitat [A]

Habitat for a rare or threatened species whose habitat is spread over a relatively broad geographic area.

Ecological vegetation class (EVC) [A]

A native vegetation type classified on the basis of a combination of its floristic, life form, environmental and ecological characteristics.

EVC (see Ecological vegetation class) [B]

Extent risk [A]

The level of risk to biodiversity from the removal of native vegetation based on the area and/or number of scattered trees to be removed.

Forb

A herbaceous flowering plant that is not a graminoid (grass, sedge or rush).

Gain [A]

Predicted improvement in the contribution to Victoria's biodiversity achieved from an offset, calculated by combining site gain with the strategic biodiversity score or habitat importance score of the site. Gain is measured with biodiversity equivalence scores or units.

Gain Target [B]

The amount of gain that needs to be achieved to offset a loss measured in Habitat hectares.

General biodiversity equivalence score / units [A]

Score or units used to quantify the relative overall contribution of a site to Victoria's biodiversity.

General offset [A]

An offset that is required when a proposal to remove native vegetation is not deemed, by application of the specific-general offset test, to have a significant impact on habitat for any rare or threatened species.

General provisions [A]

Operational requirements in planning schemes which are consistent across the state, relating to matters such as administrative provisions, ancillary activities and referral of applications.

Habitat hectares [A]

Combined measure of condition and extent of native vegetation. This measure is obtained by multiplying the site's condition score (measured between 0 and 1) with the area of the site (in hectares).

Habitat hectares benchmark [A]

A reference point for each vegetation type that represents the average condition of mature stands that are likely to reflect pre-settlement circumstances.

Habitat hectares site assessment [A]

A site-based measure of the condition of native vegetation with reference to the benchmark for the same type of native vegetation. The assessment generates a condition score of between 0 and 1.

Habitat importance map [A]

A map that indicates the importance of locations as habitat for a particular rare or threatened species. This map is based on modelled data.

Habitat importance score [A]

Measure of the importance of the habitat located on a site for a particular rare or threatened species.

Habitat zone [B]

A discrete area of native vegetation consisting of a single vegetation type (EVC) within an assumed similar quality. This is the base spatial unit for conducting a Habitat hectare assessment. Separate *Vegetation Quality Assessments* (or Habitat hectare assessments) are conducted for each habitat zone within the designated assessment area.

Highly localised habitat [A]

Habitat for rare or threatened species whose habitat is spread over a very restricted area (i.e. less than 2,000 ha). This can also be applied to a similarly limited sub-habitat that is disproportionately important for a wide-ranging rare or threatened species.

Improvement gain [B]

This is gain resulting from management commitments beyond existing obligations under legislation to improve the current vegetation quality. Achieving improvement gain is predicated on maintenance commitments being already in place. For example, control of any threats such as grazing that could otherwise damage the native vegetation must already be agreed. Typical actions leading to an improvement gain include reducing or eliminating environmental weeds, enhancement planting or revegetation over a 10-year management period. If the vegetation is to be used as an offset, a commitment to maintain the improvement gain (i.e. no subsequent decline in quality) will be required in perpetuity.

Incorporated document [A]

A document that is included in the list of incorporated documents in a planning scheme. These documents affect the operation of the planning scheme.

Indigenous vegetation [B]

The type of native vegetation that would have normally been expected to occur on the site prior to European settlement.

Landholder [A]

An owner, occupier, proprietor or holder of land.

Landowner [A]

Owner of land.

Landscape scale information [A]

Mapped or modelled information based on data collected across the landscape rather than just on a particular site.

Large Old Tree (LOT) [B]

A tree with a DBH equal to or greater than the large tree diameter as specified in the relevant EVC benchmark.

Listed species

A flora or fauna species listed under the Commonwealth *Environment Protection and Biodiversity Act 1999* or listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.

Local Planning Policy Framework [A]

Framework outlining a Municipal Strategic Statement and the Local Planning Policies that apply to the local government area.

Location risk [A]

The risk that removing native vegetation in a particular location will have an impact on the persistence of a rare or threatened species.

Loss[A]

Loss in the contribution to Victoria's biodiversity when native vegetation is fully or partially removed, as measured in biodiversity equivalence scores or units.

Maintenance Gain [B]

This is gain from commitments that contribute to the maintenance of the current vegetation quality over time (i.e. avoiding any decline). Includes foregoing certain entitled activities that could otherwise damage or remove native vegetation, such as grazing or firewood collection. Also typically requires a commitment to ensure no further spread of environmental weeds that may otherwise result in the loss of vegetation quality over time. If the vegetation is to be used as an offset, a commitment to maintain the vegetation quality will be required in perpetuity.

Minimise [A]

Locating, designing or managing a use or development to reduce the impacts on biodiversity from the removal of native vegetation.

Native (indigenous) vegetation [B]

Native vegetation is plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses (as defined in Clause 72 of the planning scheme).

Native vegetation credit [A]

Gains in the contribution that native vegetation makes to Victoria's biodiversity that are registered on the native vegetation credit register. Native vegetation credits are offered for sale to parties who are required to offset the removal of native vegetation.

Native vegetation credit register [A]

A statewide register of native vegetation credits that meet minimum standards for security and management of sites. The register is administered by the Department of Environment and Primary Industries, and records the creation, trade and allocation of credits to meet specific offset requirements.

Native vegetation extent [A]

Area of land covered by native vegetation or the number of scattered trees.

Native Vegetation Information Management (NVIM) system [A]

An online tool used to access information about Victoria's native vegetation.

Native vegetation particular provision [A]

Clause 52.17 in the Victoria Planning Provisions that relates to the removing, destroying or lopping of native vegetation.

No net loss [A]

An outcome where a particular gain in the contribution to Victoria's biodiversity is equivalent to an associated loss in the contribution to Victoria's biodiversity from permitted clearing.

Offset [A]

Protection and management (including revegetation) of native vegetation at a site to generate a gain in the contribution that native vegetation makes to Victoria's biodiversity. An offset is used to compensate for the loss to Victoria's biodiversity from the removal of native vegetation.

Offset Management Plan (OMP)

A document which sets out the requirements for establishment, protection and management of an offset site.

Offset market [A]

A system which facilitates trade of native vegetation credits between parties requiring offsets and third party suppliers of offsets.

Old tree [B]

A tree with a DBH equal to or greater than 0.75 of the large tree diameter as specified in the relevant EVC benchmark. Includes medium old trees and large old trees (see separate definitions). Some Regional Native Vegetation Plans additionally define very large old trees (1.5 times large tree diameter).

On-site offset [B]

An offset located on the same property as the clearing.

Particular Provisions [A]

Provisions in the Victoria Planning Provisions that relate to specific activities (for example, native vegetation is a Particular Provision).

Patch (see Remnant Patch)

Permit[A]

A legal document that gives permission for a use or development on a particular piece of land.

Perennial [A]

A plant that lives for more than two years. Perennials include species that are always visible e.g. shrubs and trees, but also include species that are not always visible above ground.

Permitted clearing [A]

Removal of native vegetation for which a planning permit has been granted to remove native vegetation.

Permitted clearing regulations [A]

The rules in the planning system that regulate permits for the removal of native vegetation.

Planning provisions – See Victoria Planning Provisions.

Prior management gain

This gain acknowledges actions to manage vegetation since State-wide planning permit controls for native vegetation removal were introduced in 1989.

Planning scheme [A]

Policies and provisions for the use, development and protection of land in a local government area.

Planning system [A]

Victoria's land-use planning system that includes the Victoria Planning Provisions and each local government's planning scheme.

Property Vegetation Plan [B]

A plan which relates to the management of native vegetation within a property, and which is contained within an agreement made pursuant to section 69 of the Conservation, Forests and Lands Act 1987.

Protected species

A flora species protected under the *Victorian Flora and Fauna Guarantee Act 1988.*

Protection (of a tree) [B]

An area with twice the canopy diameter of the tree(s) fenced and protected from adverse impacts: grazing, burning and soil disturbance not permitted, fallen timber retained, weeds controlled, and other intervention and/or management if necessary to ensure adequate natural regeneration or planting can occur.

Rare or threatened species [A]

A species that is listed in:

- DELWP's Advisory List of Rare or Threatened Plants in Victoria as 'endangered', 'vulnerable', or 'rare', but does not include the 'poorly known' category
- DELWP's Advisory List of Threatened Vertebrate Fauna in Victoria as 'critically endangered', 'endangered' or 'vulnerable', but does not include 'near threatened' or 'data deficient' categories
- DELWP's Advisory List of Threatened Invertebrate Fauna in Victoria as 'critically endangered', 'endangered' or 'vulnerable', but does not include 'near threatened' or 'data deficient' categories.

Recruitment [B]

The production of new generations of plants, either by allowing natural ecological processes to occur (regeneration etc), by facilitating such processes such as regeneration to occur, or by actively revegetating (replanting, reseeding). See Revegetation.

Referral authority [A]

An authority that a permit application is referred to for decision under Section 55 of the Planning and Environment Act 1987. All referral requirements are specified in Clause 66 of planning schemes.

Remnant patch of native vegetation [A]

Either:

- an area of native vegetation , with or without trees, where at least 25 per cent of the total perennial understorey plant cover is native plants
- an area with three or more indigenous canopy trees where the tree canopy cover is at least 20 per cent.

Remnant vegetation [B]

Native vegetation that is established or has regenerated on a largely natural landform. The species present are those normally expected in that vegetation community. Largely natural landforms may have been subject to some past surface disturbance such as some clearing or cultivation (or even the activities of the nineteenth century gold rushes) but do not include man-made structures such as dam walls and quarry floors.

Responsible authority [A]

The authority charged with the responsibility for administering and enforcing particular aspects of a planning scheme.

Revegetation [B]

Establishment of native vegetation to a minimum standard in formerly cleared areas, outside of a remnant patch.

Scattered tree [C]

An indigenous canopy tree that does not form part of a remnant patch of native vegetation (see definition of remnant patch of native vegetation).

Section 173 agreements [B]

A management agreement primarily between a landowner and the responsible authority according to section 173 of the Planning and Environment Act 1987.

Security Gain

This is gain from actions to enhance security of the on-going management and protection of native vegetation at the offset site, either by entering into an on-title agreement (for example under Section 173 of the *Planning and Environment Act 1987*), or by locating the offset on land that has greater security than the clearing site, or by transferring private land to a secure public conservation reserve.

Site [A]

An area of land that contains contiguous patches of native vegetation or scattered trees, within the same ownership.

Site-based information [A]

Information that is collected at a site.

Site gain [A]

Predicted improvement in the condition, or the condition and extent, of native vegetation at a site (measured in Habitat hectares) generated by the landowner committing to active management and increased security.

Site loss [A]

Loss in the condition, or condition and extent, of native vegetation when native vegetation is fully or partially removed, measured in Habitat hectares.

sp.

Species (one species).

spp.

Species (more than one species).

Species persistence [A]

The continued existence of a species into the future.

Specific biodiversity equivalence score / units [A]

With reference to a specific species, a score or units used to quantify the relative contribution of a site to Victoria's biodiversity.

Specific-general offset test [A]

A test used to determine whether a general or specific offset is required based on the impact of native vegetation removal on the habitat for rare or threatened species.

Specific offset [A]

An offset that is targeted to a particular species (or multiple species) impacted by the removal of native vegetation.

State Planning Policy Framework [A]

A collection of clauses in the Victoria Planning Provisions that inform planning authorities and responsible authorities of those aspects of state planning policy which they are to take into account and give effect to in planning and administering their respective areas.

Strategic biodiversity map [A]

A map that shows the relative value of a location in the landscape with regard to its condition, extent, connectivity and the support function it plays for species. The map is based on modelled data.

Strategic biodiversity score [A]

A score that quantifies the relative value of a location in the landscape with regard to its condition, extent, connectivity and the support function it plays for species.

Strategic planning [A]

A coordinated approach to planning where areas for conservation and areas which can be cleared are strategically identified.

Supplementary planting

Establishment of overstorey and/or understorey plants within a remnant patch. Typically includes the planting or direct-seeding of understorey life forms.

Taxon (plural taxa)

A term used to describe any taxonomic unit. This term is typically used when referring broadly to any scientifically recognised species, subspecies or variety.

Third-party offset [B]

An offset located on a property owned by a person other than the landowner who incurs the native vegetation loss being offset.

Understorey

Understorey is all vegetation other than mature canopy trees – includes immature trees, shrubs, grasses, herbs, mosses, lichens and soil crust. It does not include dead plant material that is not attached to a living plant. More information on understorey life forms is set out in the Vegetation Quality Assessment Manual (DSE 2004).

Vegetation Quality Assessment

The standard DELWP method for assessing remnant patches of vegetation. Details of the method are outlined in the Vegetation Quality Assessment Method (DSE 2004). The results of the assessment are expressed in Habitat hectares. Also referred to as a 'Habitat hectare assessment'

Victoria Planning Provisions [A]

A list of planning provisions that provides a standard template for individual planning schemes.

Zone [A]

A zone in the Victoria Planning Provisions is a set of permitted uses of land which are defined spatially.

Appendix 3: Biodiversity impact and offset requirement report

Biodiversity impact and offset requirements report

This report **does not represent an assessment by DELWP** of the proposed native vegetation removal. It provides biodiversity information for low risk-based pathway applications for permits to remove native vegetation under clause 52.16 or 52.17 of the planning schemes in Victoria.

Date of issue: **18/02/2016** **DELWP ref: BIO_0223**
Time of issue: **9:05 am**

Project ID	21251_VegClearing

Summary of marked native vegetation

Risk-based pathway	**Low**
Total extent	0.122 ha
Remnant patches	0.122 ha
Scattered trees	0 trees
Location risk	A

Strategic biodiversity score of all marked native vegetation	0.491

Offset requirements if a permit is granted

If a permit is granted to remove the marked native vegetation, a requirement to obtain a native vegetation offset will be included in the permit conditions. The offset must meet the following requirements:

Offset type	**General offset**
General offset amount (general biodiversity equivalence units)	0.040 general units
General offset attributes	
Vicinity	North Central Catchment Management Authority (CMA) **or** Gannawarra Shire Council
Minimum strategic biodiversity score	0.392[1]

See Appendices 1 and 2 for details in how offset requirements were determined.

NB: values presented in tables throughout this document may not add to totals due to rounding

[1] Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Next steps

This proposal to remove native vegetation must meet the application requirements of the low risk-based pathway and it will be assessed under the low risk-based pathway.

If you wish to remove the marked native vegetation you are required to apply for a permit from your local council. Council will then refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

The biodiversity assessment report from NVIM and this biodiversity impact and offset report should be submitted with your application for a permit to remove native vegetation you plan to remove, lop or destroy.

This report provides the following information to meet application requirements for a permit to remove native vegetation:

- Confirmation of the risk-based pathway of the application for a permit to remove native vegetation
- The area of the patch of native vegetation and/or the number of any scattered trees to be removed
- The strategic biodiversity score of the native vegetation to be removed
- The offset requirements should a permit be granted to remove native vegetation.

Refer to the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* and for a full list and details of application requirements.

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

Appendix 1 – Biodiversity impact of removal of native vegetation

Habitat hectares

Habitat hectares are calculated for each habitat zone within your proposal using the extent and condition scores in the GIS data you provided.

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
1-1-2	0.620	0.070	0.044
2-2-1	0.620	0.010	0.006
3-3-1	0.220	0.032	0.007
4-4-1	0.220	0.010	0.002
5-5-1	0.620	0.000	0.000
TOTAL			**0.059**

Clearing site biodiversity equivalence score(s)

The general biodiversity equivalence score for the habitat zone(s) is calculated by multiplying the habitat hectares by the strategic biodiversity score.

Habitat zone	Habitat hectares	Strategic biodiversity score	General biodiversity equivalence score (GBES)
1-1-2	0.044	0.436	0.019
2-2-1	0.006	0.237	0.001
3-3-1	0.007	0.643	0.005
4-4-1	0.002	0.643	0.001
5-5-1	0.000	0.237	0.000

Appendix 2 – Offset requirements detail

If a permit is granted to remove the marked native vegetation the permit condition will include the requirement to obtain a native vegetation offset.

To calculate the required offset amount required the biodiversity equivalence scores are aggregated to the proposal level and multiplied by the relevant risk multiplier.

Offsets also have required attributes:

- General offsets must be located in the same Catchment Management Authority (CMA) boundary or Local Municipal District (local council) as the clearing and must have a minimum strategic biodiversity score of 80 per cent of the clearing.[2]

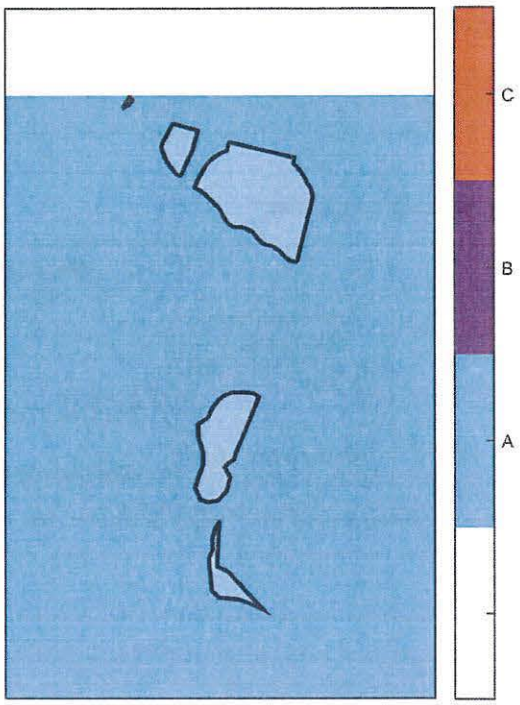
The offset requirements for your proposal are as follows:

Offset type	Clearing site biodiversity equivalence score	Risk multiplier	Offset requirements	
			Offset amount (biodiversity equivalence units)	Offset attributes
General	0.026 GBES	1.5	0.040 general units	Offset must be within North Central CMA or Gannawarra Shire Council Offset must have a minimum strategic biodiversity score of 0.392

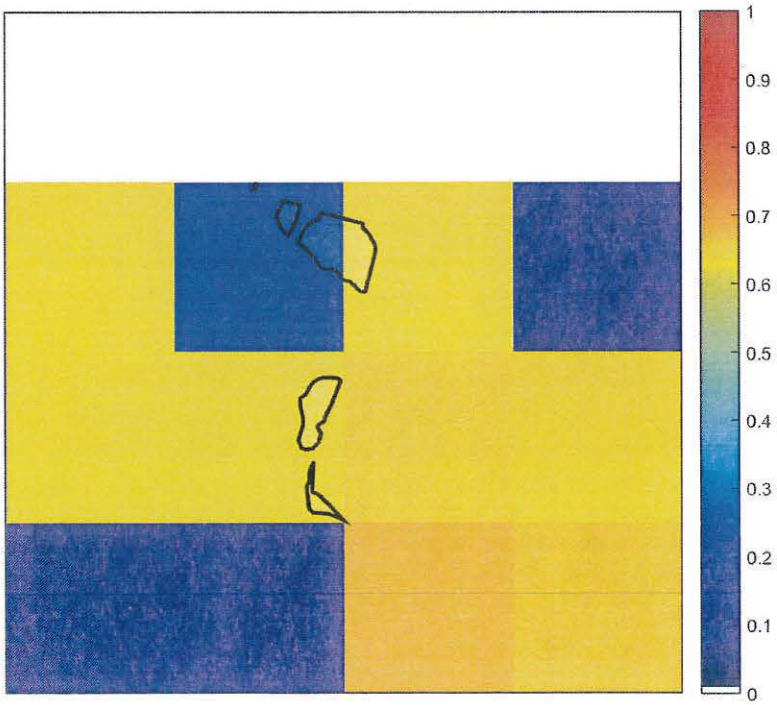
[2] Strategic biodiversity score is a weighted average across habitat zones where a general offset is required

Appendix 3 – Images of marked native vegetation

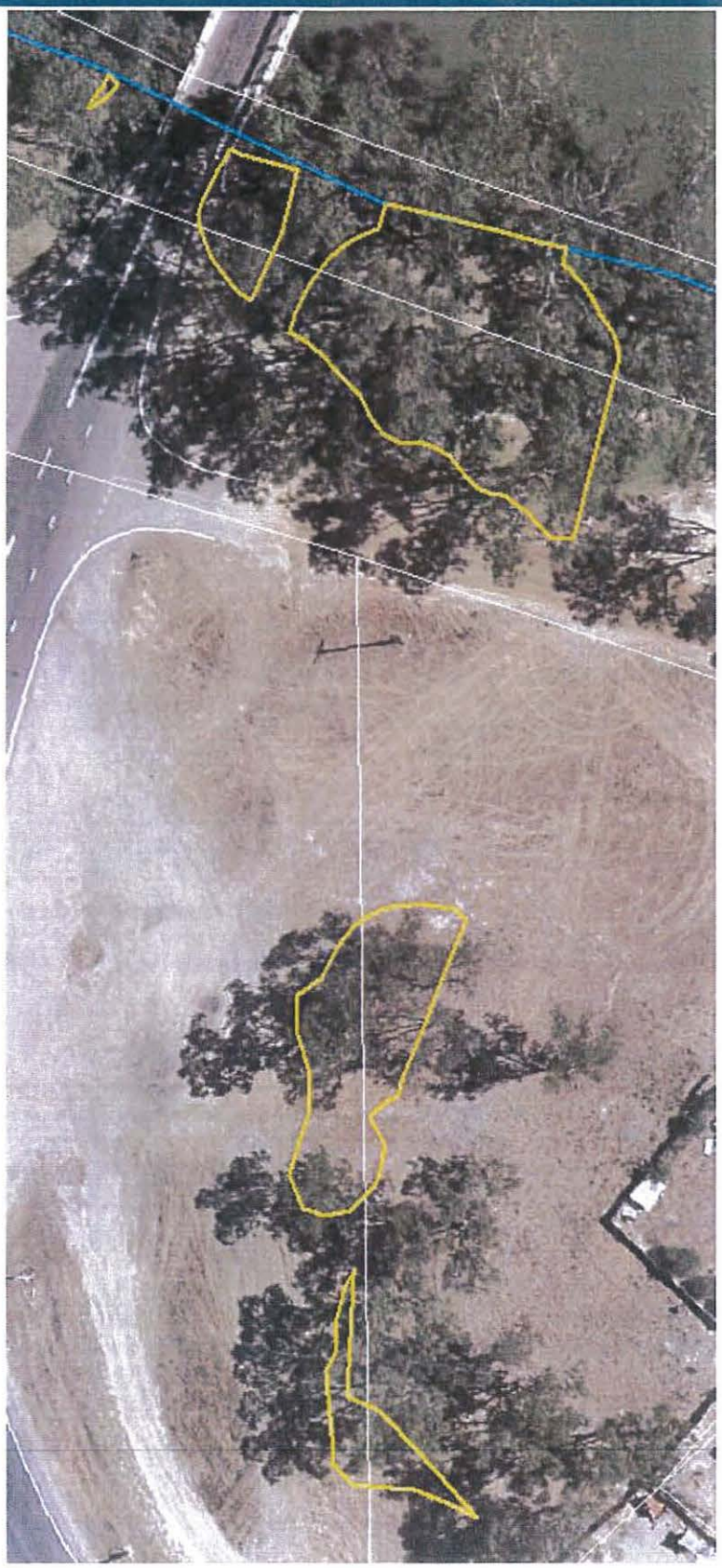
1. Native vegetation location risk map



2. Strategic biodiversity score map



3. Aerial photograph showing marked native vegetation



Glossary

Condition score

This is the site-assessed condition score for the native vegetation. Each habitat zone in the clearing proposal is assigned a condition score according to the habitat hectare assessment method. This information has been provided by or on behalf of the applicant in the GIS file.

Dispersed habitat

A dispersed species habitat is a habitat for a rare or threatened species whose habitat is spread over a relatively broad geographic area greater than 2,000 hectares.

General biodiversity equivalence score

The general biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to Victoria's biodiversity. The general biodiversity equivalence score is calculated as follows:

$$\textit{General biodiversity equivalence score} = \textit{habitat hectares} \times \textit{strategic biodiversity score}$$

General offset amount

This is calculated by multiplying the general biodiversity equivalence score of the native vegetation to be removed by the risk factor for general offsets. This number is expressed in general biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$\textit{Risk adjusted general biodiversity equivalence score} = \textit{general biodiversity equivalence score clearing} \times 1.5$$

General offset attributes

General offset must be located in the same Catchment Management Authority boundary or Municipal District (local council) as the clearing site. They must also have a strategic biodiversity score that is at least 80 per cent of the score of the clearing site.

Habitat hectares

Habitat hectares is a site-based measure that combines extent and condition of native vegetation. The habitat hectares of native vegetation is equal to the current condition of the vegetation (condition score) multiplied by the extent of native vegetation. Habitat hectares can be calculated for a remnant patch or for scattered trees or a combination of these two vegetation types. This value is calculated for each habitat zone using the following formula:

$$\textit{Habitat hectares} = \textit{total extent (hectares)} \times \textit{condition score}$$

Habitat importance score

The habitat importance score is a measure of the importance of the habitat located on a site for a particular rare or threatened species. The habitat importance score for a species is a weighted average value calculated from the habitat importance map for that species. The habitat importance score is calculated for each habitat zone where the habitat importace map indicates that species habitat occurs.

Habitat zone

Habitat zone is a discrete contiguous area of native vegetation that:

- is of a single Ecological Vegetation Class
- has the same measured condition.

Highly localised habitat

A highly localised habitat is habitat for a rare or threatened species that is spread across a very restricted area (less than 2,000 hectares). This can also be applied to a similarly limited sub-habitat that is disproportionately important for a wide-ranging rare or threatened species. Highly localised habitats have the highest habitat importance score (1) for all locations where they are present.

Minimum strategic biodiversity score

The minimum strategic biodiversity score is an attribute for a general offset.

The strategic biodiversity score of the offset site must be at least 80 per cent of the strategic biodiversity score of the native vegetation to be removed. This is to ensure offsets are located in areas with a strategic value that is comparable to, or better than, the native vegetation to be removed. Where a specific and general offset is required, the minimum strategic biodiversity score relates only to the habitat zones that require the general offset.

Offset risk factor

There is a risk that the gain from undertaking the offset will not adequately compensate for the loss from the removal of native vegetation. If this were to occur, despite obtaining an offset, the overall impact from removing native vegetation would result in a loss in the contribution that native vegetation makes to Victoria's biodiversity.

To address the risk of offsets failing, an offset risk factor is applied to the calculated loss to biodiversity value from removing native vegetation.

$$Risk\ factor\ for\ general\ offsets = 1.5$$

$$Risk\ factor\ for\ specific\ offset = 2$$

Offset type

The specific-general offset test determines the offset type required.

When the specific-general offset test determines that the native vegetation removal will have an impact on one or more rare or threatened species habitat above the set threshold of 0.005 per cent, a specific offset is required. This test is done at the permit application level.

A general offset is required when a proposal to remove native vegetation is not deemed, by application of the specific-general offset test, to have an impact on any habitat for any rare or threatened species above the set threshold of 0.005 per cent. All habitat zones that do not require a specific offset will require a general offset.

Proportional impact on species

This is the outcome of the specific-general offset test. The specific-general offset test is calculated across the entire proposal for each species on the native vegetation permitted clearing species list. If the proportional impact on a species is above the set threshold of 0.005 per cent then a specific offset is required for that species.

Specific offset amount

The specific offset amount is calculated by multiplying the specific biodiversity equivalence score of the native vegetation to be removed by the risk factor for specific offsets. This number is expressed in specific biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$Risk\ adjusted\ specific\ biodiversity\ equivalence\ score = specific\ biodiversity\ equivalence\ score\ clearing \times 2$$

Specific offset attributes

Specific offsets must be located in the modelled habitat for the species that has triggered the specific offset requirement.

Specific biodiversity equivalence score

The specific biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to the habitat of the relevant rare or threatened species. It is calculated for each habitat zone where one or more species habitats require a specific offset as a result of the specific-general offset test as follows:

$$\textit{Specific biodiversity equivalence score} = \textit{habitat hectares} \times \textit{habitat importance score}$$

Strategic biodiversity score

This is the weighted average strategic biodiversity score of the marked native vegetation. The strategic biodiversity score has been calculated from the *Strategic biodiversity map* for each habitat zone.

The strategic biodiversity score of native vegetation is a measure of the native vegetation's importance for Victoria's biodiversity, relative to other locations across the landscape. The *Strategic biodiversity map* is a modelled layer that prioritises locations on the basis of rarity and level of depletion of the types of vegetation, species habitats, and condition and connectivity of native vegetation.

Total extent (hectares) for calculating habitat hectares

This is the total area of the marked native vegetation in hectares.

The total extent of native vegetation is an input to calculating the habitat hectares of a site and in calculating the general biodiversity equivalence score. Where the marked native vegetation includes scattered trees, each tree is converted to hectares using a standard area calculation of 0.071 hectares per tree. This information has been provided by or on behalf of the applicant in the GIS file.

Vicinity

The vicinity is an attribute for a general offset.

The offset site must be located within the same Catchment Management Authority boundary or Local Municipal District as the native vegetation to be removed.