

Appendix 4 – RMS discussion paper on proposed Koala connectivity structures

DRAFT

**Draft Discussion Paper
Woolgoolga to Ballina Upgrade
Proposed Koala Connectivity Measures
for
Section 10 (Broadwater to Coolgardie)**

Background

The Woolgoolga to Ballina Project was approved by the State Government in June 2014 and the Federal Government in August 2014 subject to very specific conditions of approval.

Koala Connectivity is a key component in both approvals, particularly between Richmond River, Wardell and on to Coolgardie Interchange (known as Section 10).

The Federal Approval conditions for Section 10 require Roads and Maritime (RMS) to prepare and submit a Ballina Koala Plan for consideration and approval 3 months prior to construction in Section 10 and that a population viability modelling must be undertaken on the Ballina Koala population over a period of no less than 50 years taking into account the impacts resulting from the road upgrade in Section 10.

While the approved route is located in mostly cleared land RMS is committed to making sure the koala and other species can safely cross under or over the new highway.

This draft discussion paper outlines the proposed mitigation measures as input into the population viability analysis being undertaken by Dr Rod Kavanagh.

Proposed Mitigation Measures

Attachment A describes the refinement of proposed mitigation measures for Section 10 over time:

- The release of Environmental Impact Statement (EIS) for the Woolgoolga to Ballina project in December 2012
- The release of Submissions and Preferred Infrastructure Report (SPIR) for the Woolgoolga to Ballina project in December 2013
- Additional measures announced by the Minister for Roads, Maritime and Freight in June 2014 and reaffirmed in January 2015. The announced additional measures included
 - Fully fencing nearly 16 kilometres of both sides of the new highway which will be connected to the fauna crossing structures.
 - Increasing the number of fauna crossings suitable for koalas by more than 400 per cent to that proposed in the December 2013 SPIR (from

six to approximately 25 structures by increasing the size of the drainage structures for use by koalas).

- Construction of a land-bridge (at least 30 metres wide) north of the Richmond River crossing, south of Bagotville.
- Planting some 130 hectares of koala food trees on RMS owned land near the new highway corridor where at least 50 per cent will be planted prior to construction and the remainder after construction.

It was noted more land may become available for planting as RMS completes the property acquisition for this section for the highway upgrade.

- Further proposed design refinements by the RMS in June and July 2015 following further feedback from experts and the project teams

Proposed Design Refinements for Section 10

The following summarises the proposed mitigation measures for the new highway upgrade

(a) Fully fencing the highway corridor

Providing koala fencing on both sides of the new highway as well as installation of koala roller grids to provide a 'closed system'



Fig 1. Koala Floppy top fencing installed on the Pacific Highway Bonville Upgrade- shown to be effective at preventing koalas accessing the highway.



Fig 2. Example of proposed koala roller grids to be installed

(b) Improved Connectivity Structures

As part of the further design refinements to provide additional and improved connectivity, RMS and its project team raised and rolled the gradeline of the new highway. The current revised gradeline and its comparison to the SPIR has been included as Attachment A, the additional earthwork quantities have been include in the costing spreadsheet included as Appendix B.

A series of workshops have been held with the expert panel and government agencies to go through the PVA progress and to highlight various mitigation measures strategies including the modified gradeline and inclusion of additional crossing structures.

There was general discussion on the merit of land bridges (fauna overpasses) vs the use of plank bridges in terms of which gives the best connectivity result for the koala for the same level of investment . A list of issues with Landbridges vs Plank Bridges are listed in Table 1

Table 1 – Land bridge vs Plank Bridges

Land bridges	Plank Bridges
Provide a single point of connectivity	Can provide multiple connectivity locations
Long construction period	Short construction period
Large construction impact e.g. significant volumes of material need to be removed and placed along the alignment	Minimal construction impact confined to plank bridge area
Long establishment time for growth on landbridge 2+ years	Existing growth abutting bridge can mostly be retained
Koala Connectivity may take longer	Koala Connectivity obtained upon opening of bridge

At the workshop with the expert panel and agencies on the 13 July 2015 it was agreed in principle that the provision of plank bridges and additional culverts in key koala hot spots provided better Koala Connectivity than the current proposed Landbridge and this will be tested in the PVA. The various refinements discussed are included as Attachment A . In conjunction with the removal of the Landbridge and the associated savings it has been possible to replace some of the 2.4x2.4 and 3.0x3.0 RCBC's with plank bridges and introduce new plank bridges in key koala hotspots and areas proposed for koala revegetation. Plank bridges provide enhanced fauna connectivity to RCBC's as can be seen in the detail below the openness of the plank bridges will facilitate the movement of koalas and are proven to be effective for koala connectivity.



Fig 3. 3D Model of typical 15m plank bridges for koala connectivity- note twin bridges and daylighting in the median



Fig 4. 3D Model of typical 15m plank bridges for koala connectivity



Fig 5: Fauna Underpass bridge at Pacific Highway Bonville Upgrade . . Results from AMBS monitoring have shown koalas using this underpass

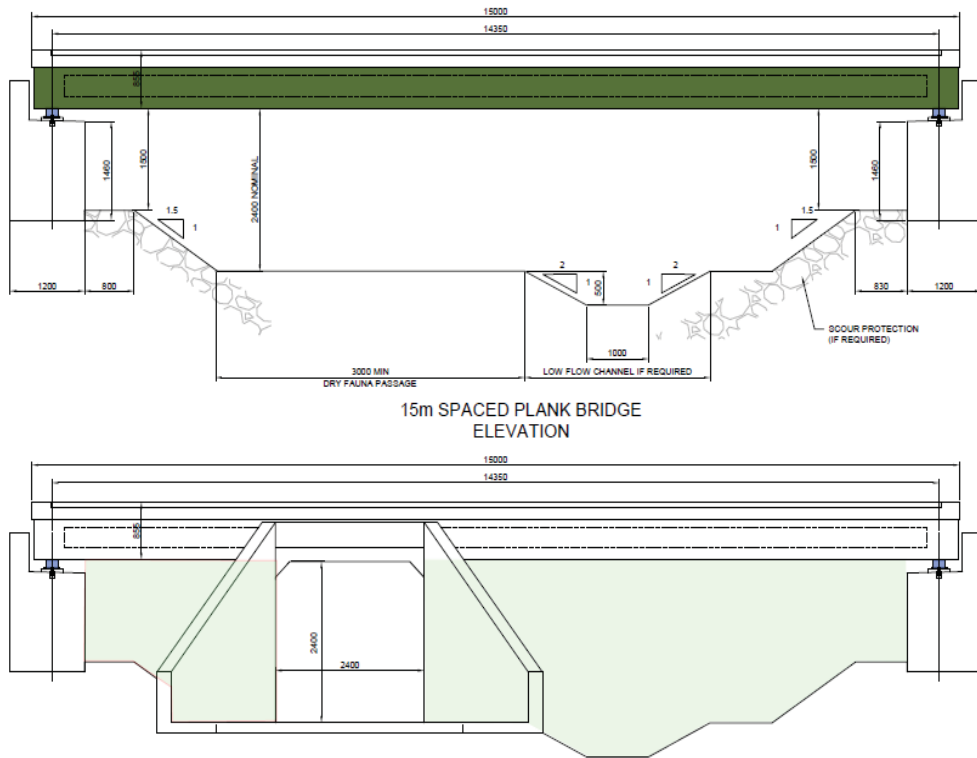


Fig 6: Comparison of culvert openings to plank bridges.

c) Additional Planting of food trees for koalas

RMS has purchased over 150 hectares of private land and has developed a revegetation strategy to transform 130 hectares of currently cleared land to koala habitat. Planted area will be protected in perpetuity through a conservation covenant mechanism. The areas of planting are shown below along with the location of Koala friendly crossings. Planting is planned to commence in Autumn or Spring next year.

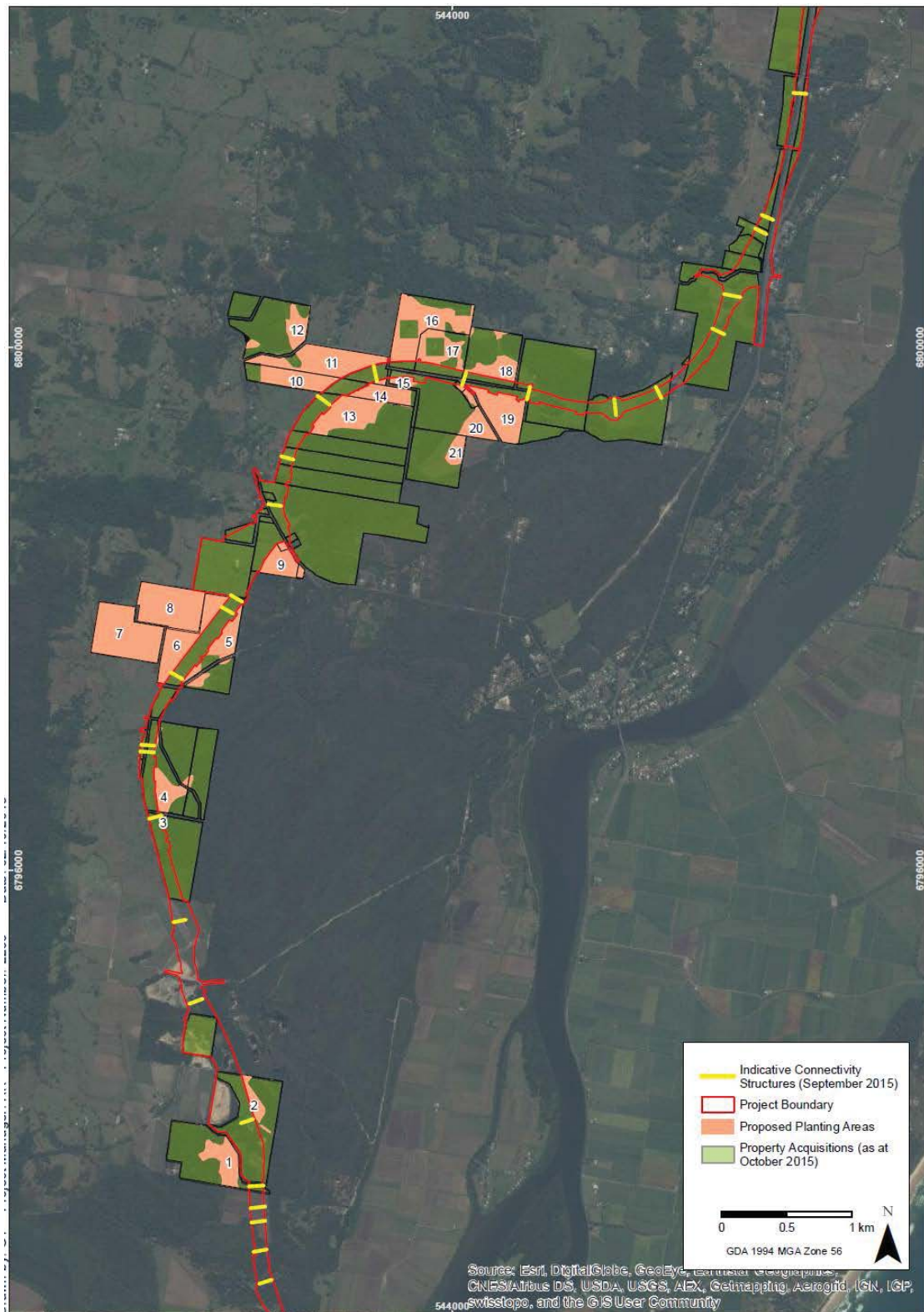


Fig 7. Proposed koala revegetation areas shown in pink shading. Source Niche Environment & Heritage

d) Maintaining connectivity during construction

The Minister for Roads and Freight committed to the construction of a land-bridge North of the Richmond River crossing. In conjunction with this, MCoA D9(f) states, "provision for the installation and vegetation planting of fauna overpasses prior to the commencement of construction".

As discussed in section (b) above, through the progression of the Koala Management Plan and Population Viability Analysis (PVA) a series of workshops have been held with koala experts and government agencies to go through the PVA progress and to highlight various mitigation measures including modified gradeline and inclusion of additional crossing structures. As a result the land-bridges have been removed and replaced with a number of plank bridges in koala connectivity hotspots and therefore the land-bridges can no longer be constructed prior to construction. An alternative approach to constructing connectivity structures early is to adopt the same connectivity strategy that is proposed for the emus in section 3, which allows koala connectivity across the construction corridor during out of hours on all proposed plank bridge locations within the koala hotspots of section 10 (south of chainage 154400). Koalas are mostly nocturnal and therefore this approach immediately allows koalas to move across the construction corridor at night time. This is an improvement from constructing structures early because it provides 8 crossing points for the duration of the construction lifecycle.

- All bridges will be constructed progressively across Section 10. As soon as each bridge is completed it will be tied in with the koala exclusion fence and site remediation completed to open up the crossing zone.
- Prior to and during bridge construction temporary fencing would be used to develop an koala passageway or race to direct koalas across the entire width of the construction corridor. The race would be established perpendicular to the corridor. Where there is a creek the race would be constructed along the creek and incorporate riparian habitat either side of the top of the creek bank. Where flatter and wider creeks occur, the area of the creek profile would also be retained inside the race. Where there is no creek, the race should be a minimum of 5 metres wide and set up through the centre of the crossing zone where possible.
- There will be a total of 8 koala races established associated with the plank bridges between Richmond River and chainage 154400. At the start of each work day temporary gates at either side of the race would be closed and then re-opened at the end of each work day. These gates would then also remain open during non-work days such as Sundays, wet days and public holidays.

e) Construction Mitigation Measures

RMS has also developed Koala Management Plan for other Sections of the Woolgoolga to Ballina Upgrade these are also relevant to Section 10 and are summarised below:

- Pre-clearing surveys to identify Koalas within the construction corridor.
- Identification of exclusion zones and fencing to prevent damage to native vegetation and Koala habitat.
- Siting of ancillary facilities to avoid impacts to known and potential Koala habitat.
- Implementation of a dog policy to ensure that no domestic dogs are brought onto the site.
- Induction and training of construction staff to make them aware of Koala habitat requirements, clearing extents and no-go areas. This training would identify areas of Koala habitat, crossing zones and key threats to the species. The importance of following the clearing and rehabilitation protocols would be made clear to all project personnel.

- Clearing of trees will be undertaken in a way that ensures Koalas living in or near the clearing area have enough time to move out of the site without human intervention. In summary this involves:
- Staged clearing, i.e. sequential thinning or partial removal of trees in progressive stages, to allow Koalas to safely leave the clearing area and relocate to adjacent habitat.
- An ecologist will undertake surveys of the scheduled clearing area prior to vegetation clearing (i.e. early in the morning prior to the commencement of vegetation clearing activities) to identify trees in which a Koala is present and any adjacent trees with overlapping crowns.
- Suspension of clearing works for a minimum period of 48 hours if a Koala is found within a clearing area to allow the animal to move out of the construction site on its own volition.
- The direction of sequential clearing will be away from threatening processes or hostile environments, i.e. roads. The ecologist is responsible for verifying that sequential clearing has taken place.
- Each tree identified by the ecologist as being a risk to a Koala if felled, will not be felled, damaged or interfered with until the Koala has moved from the clearing site. The ecologist will physically move Koalas if necessary in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA Projects (RTA 2011).
- In the event that a Koala remains in the clearing site for more than 48 hours, it will be captured and translocated by a suitably qualified person to the nearest area of habitat identified as suitable for Koala release and where the individual is at no risk of further harm.
- An ecologist will be present on site prior to and during all vegetation clearing to allow Koalas to safely leave the clearing site and relocate to adjacent habitat without human intervention. In the event that a Koala does not move on its own volition after a period of two nights, it will be trapped. The 'corflute method' would be used for trapping Koalas. This typically involves the use of a plastic guard, or similar material (approximately 100 centimetres tall) and, optionally, a cage trap arrangement placed in the fence near the base of the target tree, as shown below



Fig 7. Trap designed to capture koalas (source AMBS 2011)

- Once captured, the Koala's health will be assessed and details recorded of age, sex, weight, body measurements, and presence of pouch or back young (for females). All healthy animals will be ear tagged, micro-chipped (using a PIT tag) and relocated into adjacent habitat identified for Koala release. Release points

will be not more than 100 metres away provided that suitable habitat is present. If an injured Koala is captured, it will be transported to an experienced wildlife veterinarian for treatment. Details of veterinarians will be provided in the FFMP. The NSW Code of Practice for Injured, Sick and Orphaned Koalas (OEH, 2011) (refer to Appendix C) will be followed for trapping and relocating Koalas and dealing with any injured Koalas encountered during the clearing procedure.

- Direct interactions with Koalas must only be conducted by a suitably qualified and experienced ecologist who holds the necessary capture and handling permits issued by the OEH, or other licensed wildlife carers.
- Areas where Koalas have been captured will be recorded for consideration of inclusion as a monitoring site
- A licensed wildlife carer/ecologist will be present on site during all vegetation clearing and habitat removal activities to redirect Koalas that may be encountered during clearing activities.
- Following the clearing works and throughout the remainder of the construction period, any observations of Koalas in the construction corridor will also follow the unexpected threatened species find procedure (RTA 2011).
- All construction vehicles will be required to comply with the speed limits set out in the CEMP and to remain within the designated construction corridor. The speed limit within the construction zone will range from 10 km/hr – 60 km/hr, depending on construction activities and construction machinery. Speed limits will be reduced to 80 km/hr on the existing Pacific Highway and 40 km/hr on local access roads.
- Given the likely increased traffic on local roads during the construction period, Koala awareness signs will be erected on local roads in potential road kill areas to make motorists aware of the potential for Koalas to cross the road and the need to restrain dogs, particularly between the hours of 6 pm and 6 am when Koalas are most active. Koala awareness signs will also to be constructed along the highway upgrade at locations in close proximity to the fauna crossing zones. Signage locations will be identified in the Koala Fencing Strategy

RMS is also considering whether translocation of Koalas under the construction footprint along with monitoring of translocated individuals is a suitable mitigation measures.