

BROOKTON HIGHWAY UPGRADE 2008-11

Project Rehabilitation Plan

Munday's Tree Section 231.35slk-236.28slk

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Section of Munday's Tree Project; Planted in 1992

REVISION TABLE

Date	Section			Amendment
14/09/10 Version 3	6. Project Monitoring			monitoring frequency & duration
	8. Species list for Rehabilitation Works.			number of seedlings
	Figure 1			area of direct seeding

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Western end of the 'Mundays Tree' Section

1. ABOUT THIS DOCUMENT

Main Roads' Wheatbelt South division have been progressively re-constructing various sections of the Brookton Hwy since the early nineties. The above section 231.35slk-236.28slk has been identified for reconstruction and re-alignment due to an existing single lane seal, substandard line of sight and curve alignments.

The planned construction requires the clearing of native vegetation. In order to offset the vegetation removed, Main Roads will rehabilitate acquired lands, old road alignments and other areas cleared so that after construction, the net vegetated area will be greater than that cleared.

Within and adjoining the project area, to the East, a revegetated corridor exists. The area comprises approximately 4.8 ha, which was planted in 1992 by Main Roads, a joint initiative by Main Roads, adjoining landowners and local environmental people.

This document details the rehabilitation methods of an additional 2.5ha proposed to be revegetated.

2. PROJECT STAKEHOLDERS

Relevant stakeholders include Main Roads Western Australia (MRWA), project neighbours and landowners, the Kondinin Shire Council, the Department of Environment and Conservation [DEC], Representative of the Wildflower Society, The Conservation Council of W.A., The Roadside Conservation Committee and other interested groups.



Eucalyptus macrocarpa, [Rose of the West] a local species which has been planted within the project area and along with another local species *Xylomelum angustifolium*, [sandplain woody pear] will be planted extensively within newly acquired lands of the project.

Photo taken of onsite remnant

3. SUMMARY OF REHABILITATION

Areas to be rehabilitated

All acquired farmland, closed road surfaces, all areas within the project definition that have had any native vegetation cleared, construction hardstand areas and access tracks.

Rehabilitation methods

Controlling weeds prior and post rehabilitation using selected herbicides.

Ripping, cultivating of hardstand banks, access tracks and existing sealed road surfaces.

Tyne cultivating and rotary hoeing of old sealed surfaces.

Planting of native species in seedling form and direct seeding.

Spreading of mulched native [cleared] vegetative material.

Revegetation performance will be monitored and infill planted in 2012 if needed.

Managing weed infested topsoil

3.1 TIMING

Works would be undertaken between the months of May 2011 through to July 2011, weather permitting. Weather being a critical factor – dry conditions will delay commencement date, and an extremely dry or wet season will affect germination. The success rate of plant species will largely be determined by weather conditions.

3.2 ANTICIPATED PROJECT OUTCOMES.

In total, approximately 7.6ha Ha of land will be rehabilitated by the end of this project, offsetting the 1.5 Ha of native vegetation which will be cleared for construction. Success of the rehabilitation would realise new vegetated corridors as near as or equivalent to the original bushland. These corridors will connect other remnant bushland areas, forming habitat, nesting sites and safe passage for locally migrating fauna species, and the

continuation of pollen and seed movement of plant species. Aesthetics, although considered a lesser factor than above will be of some benefit to tourism and general road users. It is expected that the corridors will mature and become semi sustainable within 10 – 25 years.



Local endemic species to be planted *Xylomelum angustifolium* [Sandplain Woody Pear]
Photo taken of onsite remnant

4. EXISTING ENVIRONMENT: SPECIES COMPOSITION

A site visit was carried out by environment officer Peter Denton in February 2010 to examine the existing vegetation. The following species were identified for use in the revegetation process, although some of the species are difficult to propagate and not readily available as growing plants. In this scenario reliance will be placed on natural regeneration.

The remnant vegetation in adjacent acquired farmland consists of *Eucalyptus salmonophloia*, *Eucalyptus flocktoniae*, *Eucalyptus loxophleba* forming a scattered canopy, underlined with some degraded forms of *atriplex* and *maeriana* species. Some of these existing trees will form part of the new corridor.

The following species were identified within the project area; *Eucalyptus salmonophloia*, *Eucalyptus loxophleba*, , *Allocasuarina heugeliana*, *Allocasuarina humilis*, *Leptospermum erubescens*, *Acacia acumminata*, *Austrostipa elegantissima*, *Melaleuca uncinata*, *Cassytha glabella*, *Acacia erinacea*, *Calothamnus quadrifidus* *Verticordia habrantha* *Allocasuarina campestris*, *Santalum accuminatum*, *Maireana brevifolia*, *Templetonia sulcata*, *Dianella revoluta*, *Xylomelum angustifolium*, *Actinostrobos arenaria*, *Eucalyptus longicornis*, *atriplex semibaccata*, *Billardiera [marianthus] bicolour*, *Eremophila decipiens*

The acquired farmland area has been developed for more than 80 years. The soil is slightly acidic due to long term use of chemicals and chemical fertilisers. This area and associated road reserve is dominated by feral weeds including wild oats, various brome grass species, wild radish, veldt grass and barley grass.

Later in this document, the methodology is outlined to address these weed species before, during and after the revegetation process.



Billardiera [marianthus] bicolour

5. DETAILED METHODOLOGY

1. Seed will be collected where possible from roadside and farmland remnants before clearing takes place.
2. The area shall be sprayed with glyphosate in June 2010 after full weed germination.
3. The sites are to be ripped by grader or bulldozer and tyned in February/March at construction completion.
4. The rip lines will be 250mm deep at 2metre spacings.
5. Direct seeding will take place in lighter sandy gravel soils in June weather permitting.
6. Seedlings are to be planted in June /July after weed spraying.
7. A follow up spray in Spring with Fusilade would be anticipated to control narrow leaf grasses.
8. No nitrogenous or other chemical fertilisers will be used in order to deter weed growth.
9. Saline areas will be planted with local salt tolerant species.

6. PROJECT MONITORING

All rehabilitated and revegetated sites will be monitored quarterly for a period of three years after planting by:

- a) photographic detail of individual sites
- b) on ground species identification, specifically for new germinants
- c) weed cover and management if >35% cover, seasonally for three years
- d) record rainfall / temperature during growing season. Over the past several years [due to drying seasons and climate change] rainfall has been a critical factor in determining the performance of seedlings. Over the past 5 years rainfall generally in the region has diminished by up to 25%. Change of climate will determine what species will be planted in the future and when they will be planted
- e) infill planting of failed areas (<70%) commencing in the 2011-12 season by way of Main Roads' annual Regional Revegetation Planning Scheme
- f) maintaining and updating records

7. MINIMISING DAMAGE DURING AND AFTER CONSTRUCTION.

7.1 Clearing

Where the re-alignment traverses existing fragile bushland areas, clearing will be kept to a minimum; and wherever possible only one side of the road reserve will be cleared.

No Clearing is to take place outside of the project area.

No clearing shall take place outside of the clearing line; [tagged trees shall remain in place]

7.2 Machinery

All machinery movements are to be strictly confined to and within the tagged clearing zone.

General Hygiene All servicing of machinery is to be carried out in one location only (preferably off site). Oil filters, mechanical parts and other disposable items are to be transferred to an approved refuse site, and not left on site. Any chemicals that are to be used on site must be accompanied by the relevant MSD sheets [Material Safety Data] and made readily available to all employees, visitors and contractors working on the site.

All care is to be taken not to spill fuels, chemicals, oils and greases at the worksite. All other refuse created during construction is to be taken to an approved refuse site.

7.3 Weed issues

Machinery travelling from outside of worksite to the worksite must be weed seed free. All soil debris must be washed off prior to entering worksite.

Machinery and other work vehicles must have tyres checked for calthrop and double gee before entering worksite. Special care is to be taken.

7.4 Disease Management

Since the project site receives less than 400 mm average annual rainfall, dieback (phytophthora cinnamomi) is not considered to be an issue, and does not warrant a dieback survey to be carried out.

7.5 Spoil management

Movement of all spoil material is to be confined to the immediate construction /project area. All topsoil within the construction/project area has been deemed weed infested and is not to be reused as topsoil for rehabilitation.

- All topsoil (weed-infested) is to be carted to landholders' borrow pit and buried >300mm deep.
- Any other weed free sub base gravels and soils as assessed by the Environment Officer can be used in on-site batter and embankment rehabilitation during and after construction.

8. SPECIES LIST FOR REHABILITATION WORKS.

Seedling planting 2metre spacing, rows 2 metres apart (2500/ha)

Sandy Gravel rises [eastern end of project area]

Santalum accuminatum
Santalum spicatum
Eucalyptus albida
Allocasuarina campestris
Banksia sphaerocarpa
Calothamnus quadrifidus
Dryandra armata
Leptospermum erubescens
Allocasuarina heugeliana
Melaleuca uncinata
Xylomelum angustifolium
Eucalyptus macrocarpa
Actinostrobos arenaria
Acacia lasiocalyx

Acquired Farmland areas [Lower landscape/ clay flats]

Eucalyptus salmonophloia
Eucalyptus loxophleba
Atriplex nummularia
Acacia hemetiles
Acacia erinacea
Eremophila decipiens [Cuttings]
Melaleuca accuminata
Melaleuca strobophylla
Atriplex semibaccata

Direct seeding species list

3 kilos mixed seed per hectare

Sandy gravel rises (eastern end of project area)

Eucalyptus albida
Xylomelum angustifolium
Eucalyptus macrocarpa
Dianella revoluta
Actinostrobos arenaria
Melaleuca uncinata
Austrostipa elegantissima
Allocasuarina campestris
Acacia lasiocalyx
Allocasuarina humilis.

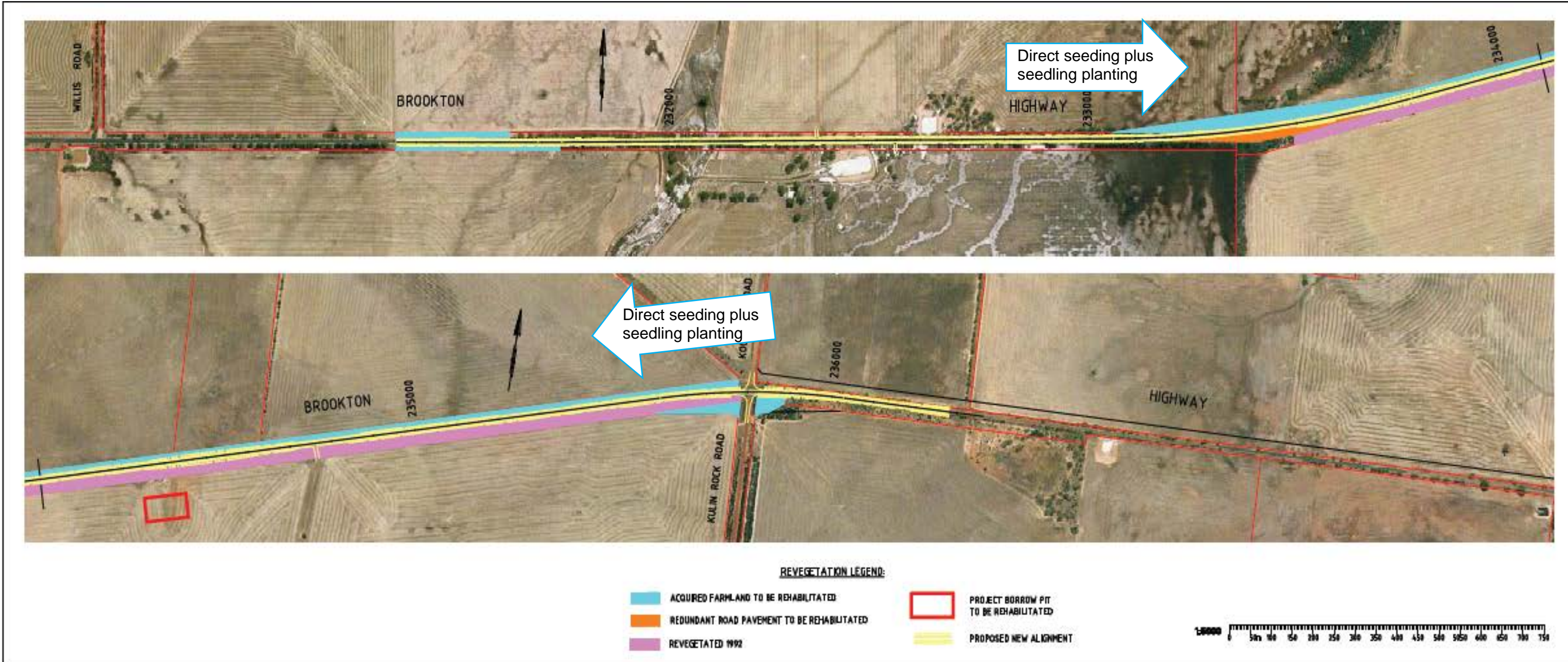


Figure 1: Proposed Revegetation Area