

Main Roads WA – Revegetation Plan for Pastoral Areas

CPS 818 /6

Date:	May 2012.	Project:	Material Pit Expansion Great Northern Highway SLK 568
Manager:	Main Roads WA.		
Location and size of clearing:	The location of clearing is 12.6km west of the Great Northern Highway SLK 568 (Lease 3114/956).		
Location and size of revegetation:	The location of clearing is 12.6km west of the Great Northern Highway SLK 568 (Lease 3114/956).		
Clearing description:	Machine clearing.		
Revegetation description:	Replacement of topsoil material regeneration. Spread of seed collected at the site.		
Reason for revegetation:	Revegetation of temporary cleared areas, in accordance with condition 14 of clearing permit CPS 818/6 and offset requirements.		
Revegetation / rehabilitation requirements:	Revegetation of 12 hectares of previously disturbed areas		
	Revegetation of 12.65 hectares of proposed disturbed areas.		

Main Roads WA – Revegetation Plan for Pastoral Areas

CPS 818 /6

**Site
preparation:**

All vegetation will be cleared from the works area and non-weed infested vegetation is stockpiled. Stockpiled vegetation will be placed in a manner that will prevent damage to adjacent vegetation by machinery. Weed infested vegetation will be disposed of at an appropriate site and not used for revegetation purposes. Burning of the cleared vegetation will not be permitted.

Topsoil will be stripped to a maximum depth of 100mm, and will be stored in a weed free (as far as possible) area, as close as possible to the area to be rehabilitated. Topsoil will be placed in windrows of less than 1.5m in height and reinstated as soon as practicable to maintain viability of in-situ seeds.

Seed to be collected in the Summer Months focusing on the following species:

Species List from Biological Survey conducted in August 2010

Amaranthaceae *Ptilotus chamaecladus*
Amaranthaceae *Ptilotus drummondii*
Amaranthaceae *Ptilotus obovatus* Cotton Bush
Apocynaceae *Rhyncharrhena linearis* Bush Bean
Araliaceae *Trachymene ornata* Spongefruit
Asparagaceae *Thysanotus* sp. (insufficient material)
Asteraceae *Brachyscome ibiderifolia*
Asteraceae *Calotis hispidula* Bindy Eye
Asteraceae *Chthonocephalus pseudevax* Woolly Groundheads
Asteraceae *Dielitzia tysonii*
Asteraceae *Gnephosis brevifolia*
Asteraceae *Gnephosis tenuissima*
Asteraceae *Helipterum craspedioides* Yellow Billy Buttons
Asteraceae *Lemooria burkittii*
Asteraceae *Olearia stuartii*
Asteraceae *Rhodanthe battii*
Asteraceae *Rhodanthe manglesii*
Asteraceae *Schoenia cassiniana* Schoenia
Asteraceae *Waitzia acuminata* Orange Immortelle
Chenopodiaceae *Enchylaena tomentosa* Barrier Saltbush
Chenopodiaceae *Maireana planifolia* Low Bluebush
Chenopodiaceae *Rhagodia eremaea* Thorny Saltbush
Colchicaceae *Wurmbea* sp. (insufficient material)
Crassulaceae *Crassula colorata* Dense Stonecrop
Euphorbiaceae *Euphorbia Tannensis* subsp.
eremophila
Desert Spurge
Fabaceae *Acacia aneuravar. fuliginea* Mulga
Fabaceae *Acacia aneuravar. intermedia* Mulga
Fabaceae *Acacia aneuravar. microcarpa* Mulga
Fabaceae *Acacia craspedocarpa* Hop Mulga
Fabaceae *Acacia grasbyi* Miniritchie
Fabaceae *Acacia jamesiana*
Fabaceae *Acacia murrayana* Sandplain Wattle
Fabaceae *Acacia ramulosavar. linophylla* Horse Mulga
Fabaceae *Acacia ramulosavar. ramulosa* Horse Mulga
Fabaceae *Acacia tetragonophylla* Kurara
Fabaceae *Mirbelia rhagodioides*
Fabaceae *Senna charlesiana*
Fabaceae *Senna glutinosasubsp.*
chatelainiana
Fabaceae *Senna artemisioidessubsp. filifolia*
Geraniaceae *Erodium cygnorum* Blue Heronsbill

Goodeniaceae *Goodenia berardiana*
Goodeniaceae *Goodenia pinnatifida* Cut-leaf Goodenia
Goodeniaceae *Scaevola spinescens* Currant Bush
Goodeniaceae *Velleia rosea* Pink Velleia
Haloragaceae *Haloragis gossei*
Hemerocallidaceae *Dianella revoluta* Blueberry Lilv

Main Roads WA – Revegetation Plan for Pastoral Areas

CPS 818 /6

Weed control: Appropriate weed control will be carried out when weeds are present, both prior to topsoil stripping and where weeds become established on or between the stockpiled materials. Weed control will take place prior to the respreading of topsoil to ensure weeds are killed and not transported to other areas.

Control measures include the removal of weeds to an approved dumpsite, or treatment of weeds such as by using herbicides mixed in accordance with manufacturer's instructions and applied by a licensed operator. Where practicable, weeds will be removed prior to or when they are in flower, and prior to seeding.

All machinery will be cleared of soil build up and vegetative material before entering and leaving the site to help minimise the transportation of weeds and their seeds.

Exposed areas such as bare batters and borrow pits shall be promptly rehabilitated to reduce the potential for weed establishment. Where works are adjacent to good quality vegetation, where weeds from within the project area are likely to spread to and result in environmental harm to the adjacent area, those weeds will be controlled annually until 12 Dec 2017.

Regeneration / direct seeding / planting at an optimal time: The following rehabilitation works are undertaken on areas of disturbed earth requiring rehabilitation:

- Topsoil is uniformly respread to a typical depth of 100mm over the project area. In project areas where topsoil has not been removed and/or is not available, other substrate, such as gravel, may be substituted as a growth medium.
- Project areas will be ripped to a minimum depth of 200mm deep with rip lines approximately 300mm apart. Where slopes are present, rip lines shall follow natural contours.

The following rehabilitation works are undertaken at borrow / gravel pits:

- Overburden and then topsoil will be uniformly and evenly spread over the disturbed areas of the pit. Depending on the slope of drainage lines within the pit, small swales from the topsoil will be formed to reduce erosion velocities and encourage the deposition of seeds.
- The whole of the existing pit floor, including drainage lines, will be ripped to a depth of 300-500mm deep with rip lines between 500-800mm apart (if the material in the pit is able to be ripped).
- All stockpiled vegetation will be spread along the contour and the pit floor to help promote seed deposition and to reduce erosion velocities.
- Spread of seed collected at rate of 4kg/ha

Vegetation establishment period: The vegetation establishment period is for at least twelve months following the completion of the works. During this period, maintenance and monitoring will be undertaken (see below).

Main Roads WA – Revegetation Plan for Pastoral Areas

CPS 818 /6

**Ongoing
maintenance
and
monitoring:**

After revegetation works, revegetated areas will be inspected annually for a minimum of two years to monitor and control weeds and to measure the effectiveness of revegetation works.

When unwanted weed foliage cover exceeds 25% after the initial two year period, further actions will be implemented to monitor and control these weeds. The additional monitoring and weed control will be conducted annually until 12 Dec 2017 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

**Monitoring
commitments:**

Post revegetation site inspections will be carried out annually for a minimum of two years to monitor unwanted weeds and measure the effectiveness of revegetation works. Monitoring of sites where unwanted weed foliage cover exceeds 25% after the initial two year period will continue annually until 12 Dec 2017 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

**Management
commitments:**

Undertake annual weed control of unwanted weeds annually until 12 Dec 2017 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

**Agencies
consulted and
submissions
received:**

- Northern Agricultural Catchment Council;
- Department of Environment and Conservation Native Conservation Branch;
- Shire of Mt Magnet;
- Department of Water;
- Roadside Conservation Committee;
- Department of Agriculture and Food (Soil and Land Conservation Commission);
- Conservation Council of Western Australia.

Great Northern Highway Proposed Material Source at SLK 568

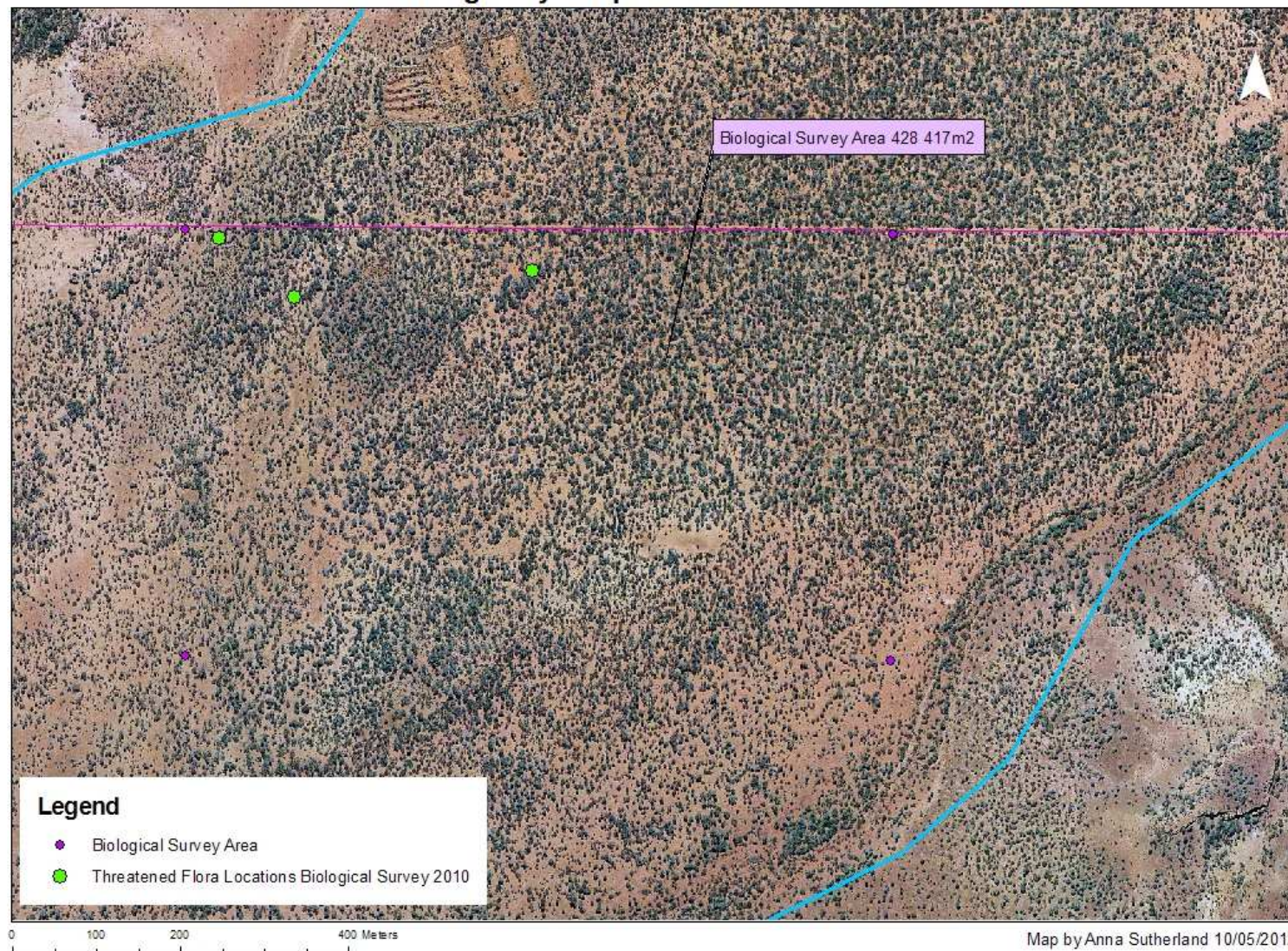


Figure 1: Location of temporary clearing and revegetation of 12 hectares

Aspect	Summer 2012	Autumn 2013	Winter 2013	Spring 2013	Summer 2013	Autumn 2014	Winter 2014	Spring 2014	Summer 2014	Autumn 2015	Winter 2015	Spring 2015	Summer 2015	Autumn 2016	Winter 2016	Spring 2016	Summer 2016
Initial weed control																	
Seed Collection																	
Site preparation																	
Weed control																	
Seedling planting																	
Follow up Weed control																	
Monitoring																	
Infill planting																	
Maintenance Weed control																	

Appendix 3 Revegetation Monitoring Sheet

Used for a Monitoring Quadrants

Site Number		SLK		Side of Road	
Current Site Conditions					
Revegetation History					
Revegetation Species Present in 10 m x 10 m					
Number of species present in 10 m x 10 m		Number of individual plants present in 10 m x 10 m		Approximate number of plants present in one ha	
Weed Species Present					
Additional Comments					

Photo Monitoring of Sites**Photo 1: Site Visit 26/8/2012****Photo 2: Site Visit 26/1/2012**