



(ABN 65 086 426 253)

Annual Environmental Management Report

for the

**Canyon Coal Mine
(MLs 1464 and 1471)**

01 July 2014 – 30 June 2015

Whitehaven Coal Mining Limited
Annual Environmental Management Report
for the
Canyon Coal Mine
(MLs 1464 and 1471)

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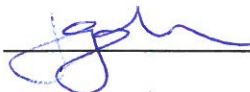
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APPENDICES

Appendix 1 – Rehabilitation Monitoring Report 2014

1 INTRODUCTION

The purpose of this report is to provide an update on the progressive closure of Whitehaven’s Canyon Mine (ML 1464 and ML 1471) for the period 1st July 2014 – 30th June 2015.

2 ACHIEVEMENTS

2.1 Outline

Since mining ceased in July 2009, progressive rehabilitation, environmental monitoring and maintenance have occurred. Since closure in July 2009, over 17,000 trees and understorey species have been planted.

Overall the site is presenting an area that blends in with the surrounding agricultural landscape (Plate 1 and Plate 2). The final void area is generally a stable landscape that possesses good vegetation cover and drainage structures resulting in a secure void water body.



Plate 1 – Surrounding Landscape



Plate 2 - Zone 2(d) Native Vegetation

The site has been fenced for the exclusion of stock and public access, with the fence being of the agricultural type to enhance the blending in with the surrounding agricultural landscape. The exclusion of stock and vehicle access has assisted in the success of the site's rehabilitation. Site personnel maintain observations of site to ensure both weeds and feral animals are eradicated on an as needs basis.

The offset requirements for the Canyon site have been endorsed as being included in Whitehaven's Regional Biobank site as evidenced by a letter of approval from the Department of Planning. The Biobank site was registered with the OEH on 28th June 2012.

The following sub-sections provide a more detailed summary of the progress within each domain (as shown in Plate 18). Table 2 provides an updated schedule of works, with revised timeframes, where required.

2.2 Infrastructure Areas

1(a) Site Office and Facilities and Former Orica Hardstand

The crib and office facilities were removed in August 2010 with the exception of the toilet block, which is used by the environmental team and contractors associated with closure activities. The area, including the car park, was then topsoiled and seeded.

Additionally, a small waterway was constructed to slowly drain away runoff into storage dams to the east of this area. The former Orica hardstand is yet to be rehabilitated, as it currently provides a useful safe stopping area for haul trucks on the passing haul road.

Plate 3 shows the area of the former office and crib room facilities.



Plate 3 - Zone 1(a) - Former Office and Crib Facilities

1(b) Workshop, Fuel Farm and Hardstand

In mid 2010, the two 50,000L diesel storage tanks were removed from the bunded area which had a capacity of 240,000L. The bunded area, which also contained stored oils, incorporated a clay over plastic over clay liner to minimise the potential of soil contamination in the event of a spill. Pipes and lockable valves were in place to enable removal of spills and rainwater from the area.

On 18th August 2010, soil testing for hydrocarbon contamination was conducted around the old fuel storage area which comprised collecting soil samples from 8 separate pits. Soil samples were taken at the surface, 1m and 2m intervals from pits dug out by a backhoe. Four pits were located around the fuel storage area, one within the storage area and the remaining three down slope of the site to determine whether there has been any soil contamination away from the direct location. These samples were tested for total metals, recoverable metals and total petroleum hydrocarbons.

Analysis of the soil samples was conducted by ALS Laboratory Group Environmental Division in Sydney. Results of the sampling indicated that in two locations the levels of

C10 – C36 Fractions of Hydrocarbons (Diesels and Lubricating Oils) exceeded the threshold concentrations for sensitive land use set in the NSW EPA Guidelines for Assessing Service Station Sites (2004). Heavy metals analysis indicated all samples were well within threshold limits.

Based on these results, the contaminated material was excavated and disposed of within a designated bunded area in September 2010 for future bioremediation. Following excavation of this material it was noted that contamination was present at greater depths than first identified. Subsequently, additional soil samples were collected to a depth of 2.5m, along with a resample of the two locations within the pit, to ensure all contaminated material was removed. Results of these sites found that contaminated material had been removed from all but one area (2 samples within the one large pit).

Wet weather hampered the continuation of remediation of the fuel storage area. When conditions permitted, the additional contaminated soil was excavated and stored in the bunded area onsite for bioremediation. Once bioremediated, the soil was disposed of offsite as general waste.

The former workshop has been decommissioned to the basic structure, as a potential agricultural shed for future land use on the site. The hardstand and storage area has had all mining related stores removed. The wash down sump has had an oil and grease analysis completed, with results indicating all parameters within compliance levels.

For the purposes of the commitments provided in the original Closure Plan, works in this domain have been completed. However, following submission of the Closure Plan Whitehaven sought approval from Narrabri Shire Council (NSC) for construction of offices, a storage shed and hardstand areas for a centralised maintenance storage area for Whitehaven's open cut mines. Consent was issued by NSC in mid 2011 and the final occupation certificate was issued in early 2012. The Maintenance Facility will remain for the foreseeable future and therefore may need to be excised from the Canyon ML at the time of relinquishment.

Plate 4 shows the area of the former fuel farm and hardstand and the remaining workshop.



Plate 4 - Zone 1(b) - Workshop, Fuel Farm and Hardstand Area

1(c) Coal loading bin and ROM Pad

The removal of coal loader and associated infrastructure was completed in September 2010, with the loadout bin being commissioned at Whitehaven's Sunnyside Coal Mine. The ROM pad and ROM facilities area totalled 7.5 ha and was reshaped, stabilised with contours and waterways for drainage, top-soiled and seeded with a summer pasture mix. The waterway spills into a rehabilitated area to the south of the pad that is designed to slowly drain runoff into the final void. This area has also been top-soiled and seeded with a summer pasture mix for prevention of erosion. Further planting of native trees in clump formations was undertaken in November 2011.

Plate 5 shows the area of the former ROM pad.



Plate 5 - Zone 1(c) - ROM Pad and Coal Loading Facilities

1(d) Explosives Magazine

The explosives magazine has been partially rehabilitated with the removal of blast storage containers. Fence removal and reshaping/seeding of area is still to occur. Plate 6 shows the remaining explosive magazines.



Plate 6 - Zone 1(d) - Explosives Magazine

2.3 Rehabilitation Zones

2(a-f) - Pasture and Native Vegetation Zones

Infill planting of 350 trees occurred south of the ROM pad and west of the haul road (Zone 2(f)) in October 2009.

A total of 5,660 tubestock were planted over January and February 2010 in the designated native vegetation rehabilitation zones 2(b), (d), (e) and (f). The tubestock consisted of a diverse range of shrub and tree species native to the area. Whitehaven made particular effort to ensure a significant mix of overstorey and understorey species were planted. This will ensure that the native vegetation zones regenerate in a way that enhances the original landscape by providing improved biodiversity.

A planting campaign of 3,800 tubestock, which incorporated a mix of tree and understorey species were planted over June 2010 using a contracted tree planting machine. The area targeted was native vegetation Zone 2(f) within the south-east corner of the site.

Further infill planting of 1,000 understorey species was undertaken in September 2010 in Zones 2(b) and 2(d). Areas targeted within the zones were those on the mid-plateau section of rehabilitation which is a native vegetation zone consisting of trees planted

around five years ago. The infill planting will ensure the introduction of a shrubby understorey such as Hop Bush and Golden Wattle, and hence will further improve the ecological merit of the area. Preparation for the planting involved adding fresh rip lines between existing vegetation and undertaking grass/weed control with a pre-spray of glyphosate, two weeks prior to planting.

Further infill planting of 320 understorey tubestock occurred in June 2011 on the western area of the rehabilitation.

In February 2013, 72 tubestock were planted in 3 clumps on the plateau identified as 2(a) Pasture Zone 1. Each clump included 2 tubes of 12 different tree or understorey species.

Plate 7 to Plate 13 provide examples of native vegetation rehabilitation at the site while Table 1 includes a summary of the number and type of species planted.



Plate 7 - Zone 2(a) - Pasture Zone 1



Plate 8 - Zone 2(b) - Pasture Zone 2



Plate 9 - Zone 2(c) - Native Vegetation Zone 1 (Photo 1)



Plate 10 - Zone 2(c) - Native Vegetation Zone 1 (Photo 2)



Plate 11 - Zone 2(d) - Native Vegetation Zone 2



Plate 12 - Zone 2(e) - Native Vegetation Zone 3



Plate 13 - Zone 2(f) - Native Vegetation Zone 4

Table 1 – Rehabilitation Species List

Date	Scientific Name	Common Name	Approx Quantity
13-Jul-09	<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	160
	<i>Eucalyptus albens</i>	White Box	160
	<i>Eucalyptus populnea</i>	Bimble Box	80
	<i>Eucalyptus pilligaensis</i>	Pilliga Grey Box	40
15-Jul-09	<i>Eucalyptus melliodora</i>	Yellow Box	40
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	120
	<i>Eucalyptus melanophloia</i>	Silver-leaf Ironbark	40
	<i>Eucalyptus albens</i>	White Box	40
	<i>Eucalyptus populnea</i>	Bimble Box	80
	<i>Eucalyptus pilligaensis</i>	Pilliga Grey Box	80
21-Jul-09	<i>Eucalyptus albens</i>	White Box	80
	<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	80
	<i>Eucalyptus melanophloia</i>	Silver-leaf Ironbark	80
	<i>Eucalyptus populnea</i>	Bimble Box	160
	<i>Eucalyptus pilligaensis</i>	Pilliga Grey Box	80
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	160
28-Sep-09	<i>Eucalyptus albens</i>	White Box	1030
	<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	400
	<i>Eucalyptus melanophloia</i>	Silver-leaf Ironbark	
	<i>Eucalyptus populnea</i>	Bimble Box	400
	<i>Eucalyptus pilligaensis</i>	Pilliga Grey Box	400
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	800
	<i>Acacia Deanii</i>	Deane's Wattle	600
	<i>Casuarina cristata</i>	Belah	400
	<i>Brachychiton populneus</i>	Kurrajong	300
20-Oct-09	<i>Eucalyptus albens</i>	White Box	75
	<i>Eucalyptus melliodora</i>	Yellow Box	75
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	100
	<i>Eucalyptus populnea</i>	Bimble Box	100
14-Jan-10	<i>Acacia deanei</i>	Deans Wattle	200
	<i>Acacia decorai</i>	Western Golden Wattle	200
	<i>Acacia oswaldii</i>	Umbrella Wattle	120
	<i>Acacia salicina</i>	Black Wattle	160
	<i>Alectryon oleifolium</i>	Bullock Bush	30
	<i>Allocasaurina leuhmanii</i>	Bull Oak	160
	<i>Atalya hemoglauca</i>	White Wood	240
	<i>Brachychiton populneus</i>	Kurrajong	360
	<i>Callitris glaucophylla</i>	White Cypress	120
	<i>Casuarina cristate</i>	Belah	40
	<i>Dodonea heteromorpha</i>	Hop Bush	200
	<i>Dodonea viscosa</i>	Sticky Hop Bush	800
	<i>Hovea lanceolata</i>	Lance-leaf Hovea	80
	<i>Notolea microcarpa</i>	Native Olive	40
	<i>Parsonia eucalyptaphylla</i>	Gargaloo	80
	<i>Pittosporum angustifolium</i>	Budda Bush	800
	<i>Senna articimoides</i>	Silver Cassia	80
	<i>Eremophila debile</i>	Winter Apple	20
	<i>Eucalyptus clauroclada</i>	Baradine Red Gum	320
	<i>Eucalyptus melanophloia</i>	Silver Leaf Ironbark	280
	<i>Eucalyptus albens</i>	White Box	200
	<i>Eucalyptus melliodora</i>	Yellow Box	240
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	280
<i>Eucalyptus populnea</i>	Bimble Box	240	
<i>Eucalyptus pilliganensis</i>	Pilliga Box	600	
25-Feb-10	<i>Atalya hemoglauca</i>	White Wood	120
	<i>Eucalyptus populnea</i>	Bimble Box	100
	<i>Dodonea heteromorpha</i>	Hop Bush	80

Date	Scientific Name	Common Name	Approx Quantity
	<i>Dodonea viscosa</i>	Sticky Hop Bush	80
	<i>Pittosporum angustifolium</i>	Budda Bush	320
	<i>Eucalyptus albens</i>	White Box	60
	<i>Eucalyptus clauroclada</i>	Baradine Red Gum	80
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	200
	<i>Eucalyptus melliodora</i>	Yellow Box	40
	<i>Eucalyptus pilliganensis</i>	Pilliga Box	160
	<i>Callitris glaucophylla</i>	White Cypress	30
	<i>Casuarina cristate</i>	Belah	80
	<i>Davisea genistifolia</i>	Broom Bitter Pea	400
	<i>Indigofera australis</i>	Native Indigo	20
25-Jun-10	<i>Dodonea viscosaa</i>	Sticky Hop Bush	300
	<i>Pittosporum angustifolium</i>	Budda Bush	300
	<i>Eucalyptus melliodora</i>	Yellow Box	350
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	200
	<i>Eucalyptus albens</i>	White Box	350
	<i>Eucalyptus populnea</i>	Bimble Box	150
	<i>Brachychiton populneus</i>	Kurrajong	150
28-Sep-10	<i>Dodonea viscosaa</i>	Sticky Hop Bush	300
	<i>Pittosporum angustifolium</i>	Budda Bush	150
	<i>Acacia deanei</i>	Deans Wattle	200
	<i>Acacia decorai</i>	Western Golden Wattle	150
	<i>Dodonea heteromorpha</i>	Hop Bush	200
28-29 June 2011 Western side rehab near fire break	<i>Senna coronilloides</i>		40
	<i>Pittosporum angustifolium</i>	Budda Bush	40
	<i>Acacia hakeoides</i>		40
	<i>Dodonaea viscosa</i>	Sticky Hop Bush	80
	<i>Acacia decora</i>	Western Golden Wattle	40
	<i>Acacia salicina</i>	Black Wattle	40
	<i>Senna artemisioides</i>	Punty Bush	40
10-Nov-11 Old coal loader and opposite weighbridge	<i>Brachychiton populneum</i>	Kurrajong	40
	<i>Callitris glaucophylla</i>	White Cypress Pine	20
	<i>Capparis mitchelli</i>	Wild Orange	10
		Acacia	40
	<i>Eucalyptus albens</i>	White Box	20
	<i>Eucalyptus populnea</i>	Bimble Box/Poplar Box	20
	<i>Eucalyptus crebra</i>	Silver Narrow-leaved Ironbark	40
16-Nov-11 Old coal loader and opposite weighbridge	<i>Eucalyptus melanophloia</i>	Silver Leaf Ironbark	30
	<i>Eucalyptus crebra</i>	Narrow-leaf Ironbark	20
	<i>Eucalyptus populnea</i>	Bimble Box/Poplar Box	20
	<i>Eucalyptus albens</i>	White Box	30
	<i>Acacia deanei</i>	Deans Wattle	20
	<i>Dodonaea viscosa</i>	Sticky Hop Bush	20
	<i>Brachychiton populneus</i>	Kurrajong	80
	<i>Callitris glaucophylla</i>	White Cypress Pine	20
7-Feb-13 2(a) Pasture zone 1 - Northern emplacement plateau (2 trees x each species x 3 clumps) and 5(b) Emplacement Area 2 (2 trees x each species x 1 clump)	<i>Eucalyptus pilliganensis</i>	Pilliga Box	8
	<i>Eucalyptus populnea</i>	Bimble Box	8
	<i>Brachychiton populneus</i>	Kurrajong	16
	<i>Dodonaea viscosa</i>	Sticky Hop Bush	8
	<i>Eucalyptus beyeri</i>	Beyer's Ironbark	8
	<i>Casuarina christata</i>	Belah	8
	<i>Indigofera australis</i>	Native Indigo	8
	<i>Acacia decora</i>	Western Golden Wattle	8
	<i>Acacia salicina</i>	Black Wattle	8
	<i>Senna artemisioides</i>	Punty Bush	8
	<i>Hardenbergia violacea</i>	Sarsaparilla	8
07 & 08-July-14	<i>Acacia oswaldii</i>	Umbrella Wattle	8
	<i>Acacia decora</i>	Western Golden Wattle	160

Date	Scientific Name	Common Name	Approx Quantity
2(e) – within area affected by fire	<i>Brachychiton populneus</i>	Kurrajong	80
	<i>Eucalyptus albens</i>	White box	80
	<i>Eucalyptus beyeri</i>	Beyer's Ironbark	80
	<i>Eucalyptus chloroclada</i>	Baradine Red Gum	80

2.4 Final Void

3 - Void

Although a summer cover crop consisting of predominately Japanese Millet was present in the void area, the intensity of rainfall events over late December 2009 and early January 2010 (a total of 184.6mm fell from the 22/12/09 – 3/1/10) resulted in numerous instances of gully erosion through contour banks and dam walls within the void. The major areas affected included the southern side of the void with three small instances of gully erosion through contours, and one small instance on the northern side of the void. A large channel was also eroded through the dam wall which was acting as a water velocity control structure in the lower void. These areas were further affected by 180.8 mm of rainfall over the following months of February and March 2010, creating major damage to the first void dam to the east with a large channel cut through the dam wall. In total an area of around 0.5ha was affected by erosion in the void.

Remediation work began in May 2010 with dozer contractors patching the problematic areas and reseeding with a winter cover crop consisting of predominately Rye Corn to further stabilise the soil. Major work occurred on the dam entering the void (to the east) with the wall filled and enlarged to incorporate a new rock lined spillway turfed with kikuyu grass. This work has prevented further instances of channelling through the dam wall and slowed water entering the void from the east, therefore reducing the chances of gully erosion through the lower water structures to the west. Works on the southern side of the void were also undertaken and included shaping and seeding of steeper slopes that were previously left due to access issues.

Earthen mounds were installed in June 2010 within the void to provide an alternative to rip-lines and were anticipated to be incorporated into future tree planting campaigns. Mounds also provide further stability within the void slope acting as smaller intermediate contours between larger contours, catching water runoff and therefore providing moisture to developing tubestock.

The approximate 35.9 ha of the void was re-seeded in September 2010 with a summer pasture mix to provide further stability on void slopes. The seed mix consisted of 250kg of Japanese Millet, 50kg Bambatsi Panic, 50kg Purple Pigeon Grass and 50kg Premier Digit Grass, which equates to approximately 11kg/ha of pasture. The new crop was required to replace the annual winter species crop and was particularly important in the prevention of erosion of slopes during summer storms.

As discussed previously, heavy rains in early 2012 resulted in new erosion on the southern face of the void. The area was remediated in late 2012 and again in the reporting period. Whilst works like this will occur as required, at this stage progression to final rehabilitation of the void have been delayed due to the pending Vickery Coal Project which will ultimately result in the Canyon void being backfilled with waste rock from the Vickery Project. Plate 14 and Plate 15 show the final void in January 2014.



Plate 14 - Zone 3 - Final Void (Photo 1)



Plate 15 - Zone 3 - Final Void (Photo 2)

2.5 Enrichment Planting Zones

4(a-c) Enrichment Zones

Enrichment planting in zones 4a and 4c has not occurred. These zones formed part of the biodiversity offset for Canyon however, as discussed in Section 2.1 the Canyon's offset requirements have been included in Whitehaven's Regional Biobank Area. As a result, enrichment planting in these zones will not be undertaken.

Enrichment planting in zone 4b will also not be undertaken pending approval of the Vickery Coal Project as the Vickery waste emplacement will cover this area.

2.6 Emplacement Areas

(5a-b) – Emplacement Areas 1 and 2

Both reject emplacement 1 (north), Plate 16, and 2 (south), Plate 17, areas have been filled, reshaped, top-soiled and seeded with summer pasture mix during September 2010.



Plate 16 - Zone 5(a) - Emplacement Area 1



Plate 17 - Zone 5(b) - Emplacement Area 2



Plate 18 – Closure Domain Areas

Table 2 - Update of Completed Works

DOMAIN	ACTIVITY	COMPLETION DATE
1(a) Infrastructure Area: Site Office and Facilities Crib Room First Aid Room Car Park Area Former Orica Hardstand	Removal of relocatable offices, piers and associated infrastructure	Completed
	Ripping of hardstand areas, removal of concrete pathway, sowing of cover crop	Former Orica hardstand will remain for the foreseeable future. All other actions completed.
1(b) Infrastructure Area: Workshop Fuel Farm Storage/Hardstand Area	Dismantling of workshop and removal off site.	Main shed remains
	Break up and removal of concrete off site	Completed
	Removal of wash down facilities (Truck tray and oil separating tank)	Remains as part of Maintenance Facility
	Removal of all stored items from hardstand area	Completed
	Removal of fuel tanks, pumps and associated infrastructure from fuel farm	Completed
	Soil sampling at depth ranges at workshop area, fuel farm and downslope of fuel farm, and at washdown bay.	Completed
	Soil remediation or removal if required	Completed
	Ripping of hardstand areas, replacement of topsoil, placement of drainage structures and sowing of cover crop	Part of this area has remained for the Maintenance Facility.
1(c) Infrastructure Area: Coal Loading Bin ROM Pad Coal Loading facilities and road access area	Dismantling of Coal Bin and loader and transfer off site.	Completed
	Relocation of structures associated with coal loader	Completed
	Removal of all coal stockpiles at the ROM Pad	Completed
	Deep ripping of ROM Coal Pad and road access area	Completed
	Replacement of topsoil, placement of drainage structures	Completed
	Sowing of cover crop	Completed
	Planting to native vegetation	Completed
1(d) Infrastructure Area Explosives Magazine	Dismantling and removal of magazine	Partially Completed
	Deep ripping and replacement of topsoil	To remain at this stage.
	Sowing to cover crop	To remain at this stage.
2(a) Pasture Zone 1	Reshaping, replacement of subsoil and topsoil, drainage structure establishment	Completed
	Establishment of cover crop	Completed
	Establishment of monitoring plot	Completed
	Planting of clumps of native	Completed

DOMAIN	ACTIVITY	COMPLETION DATE
	vegetation	
2(b) Pasture Zone 2	Deep Ripping of compaction zones (ie access roads, truck park area)	Completed
	Replacement of topsoil, placement of drainage structures	Completed
	Sowing to cover crop	Completed
2(c) Native Vegetation Zone 1	Reshaping, replacement of subsoil and topsoil, drainage structure establishment	Completed
	Establishment of cover crop	Completed
	Establishment of monitoring plot	Completed
	Establishment of riplines	Completed
	Planting to native vegetation	Completed
	Infill planting with understorey species	Completed
2(d) Native Vegetation Zone 2	Reshaping, replacement of subsoil and topsoil, drainage structure establishment	Completed
	Establishment of cover crop	Completed
	Establishment of monitoring plot	Completed
	Establishment of riplines	Completed
	Planting to native vegetation	Completed
	Infill planting with understorey species	Completed
2(e) Native Vegetation Zone 3	Reshaping, replacement of subsoil and topsoil, drainage structure establishment	Completed
	Establishment of cover crop	Completed
	Establishment of riplines	Completed
	Planting to native vegetation	Completed
2(f) Native Vegetation Zone 4	Cessation of active mining	Completed
	Reshaping, replacement of subsoil and topsoil, drainage structure establishment	Completed
	Establishment of cover crop	Completed
	Establishment of riplines	Completed
	Planting to native vegetation	Completed
3 Final Void	Final Shaping at depth of approximately 25 metres	Completed
	Final batter grades achieved in accordance with MOP	Completed
	Subsoil and topsoil replaced	Completed
	Drainage structures installed	Completed
	Banks of void sown to cover crop	Completed
	Banks of void planted out to native vegetation	Tubestock planting suspended pending progress of Vickery Project, which will redevelop the void as a waste emplacement. Void has established

DOMAIN	ACTIVITY	COMPLETION DATE
		cover vegetation.
4(a) Enrichment Planting Zone 1	Establishment of rip lines through existing native pasture	Replaced by Biobank site (see section 2.5)
	Planting to native vegetation	Replaced by Biobank site (see section 2.5)
4(b) Enrichment Planting Zone 2	Planting to concentrated clump of native vegetation within existing rehabilitation area	Suspended pending progress of Vickery Project, which will redevelop the area as a waste emplacement.
4(c) Enrichment Planting Zone 3	Establishment of riplines through existing native pasture	Replaced by Biobank site (see section 2.5)
	Planting to native vegetation	Replaced by Biobank site (see section 2.5)
5(a) Emplacement Area 1	Reject emplacement area filled	Completed
	Reject emplacement covered with a minimum of 3 metres of inert overburden material	Completed
	Replacement of subsoil and topsoil	Completed
	Drainage structures in place	Completed
	Cover crop established	Completed
5(b) Emplacement Area 2	Reject emplacement area filled	Completed
	Reject emplacement covered with a minimum of 3 metres of inert overburden material	Completed
	Replacement of subsoil and topsoil	Completed
	Drainage structures in place	Completed
	Cover crop established	Completed
	Rip lines established	Completed
	Planting to native vegetation	Completed

3 ENVIRONMENT AND COMMUNITY

Monitoring of environmental parameters continues to be carried out on site during the closure process. These include air quality, wet weather discharge, void water, groundwater and flora and fauna monitoring. Despite ongoing monitoring and application of consent criteria, it would be difficult to attribute any exceedances to the site given there is no production and the site is well rehabilitated.

3.1 Air Quality

Air quality is monitored monthly, with the intention of staged removal of monitoring points on relinquishment of area. Results are shown in Figure 1.

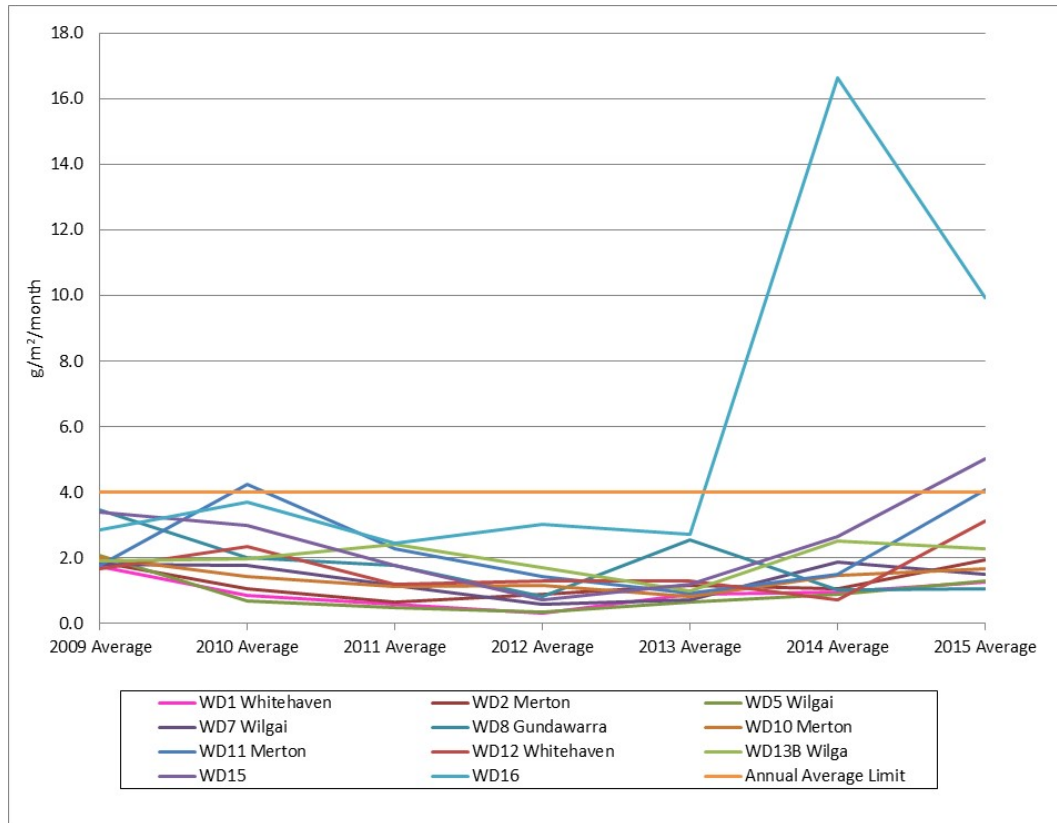


Figure 1 - Annual Average Deposited Dust Results

Figure 1 shows the annual average for each monitoring point since July 2009, compared with the consent limit of $4\text{g/m}^2/\text{month}$. It should be noted that September 2009 results have been excluded from the graphed data for all monitoring locations as these results were skewed by regional bushfires. December 2010 and January 2011 deposited dust results have also been excluded from WD-13B Womboola as they were highly anomalous with results from that monitoring location during other months as well as results from other monitoring locations during December and January.

The graph shows that all monitoring locations have generally remained below the annual average criteria of $4\text{g/m}^2/\text{month}$ since mining ceased in mid 2009. Of note is the increase in annual averages for 2014 and 2015, where results appear to capture non-mining contamination and extraneous sources.

3.2 Wet Weather Discharge – Surface Water

Wet weather surface water quality is monitored on the basis of wet weather discharge events, with the intention of staged removal of the relevant monitoring points on relinquishment of the area. WW8 (SD-2) and WW9 (SD-3) are the licenced discharge points, whilst WW11 and WW12 provide upstream and downstream water

quality comparisons. No wet weather discharges occurred during the period July 2014 – June 2015.

3.3 Void – Surface Water

During final shaping of the void, care was taken to ensure the RL of the void floor was higher than the RL of the extracted coal seam in order to avoid groundwater seepage into the void. Initial water quality testing since completion of the final void is indicative of EC levels expected in surrounding surface water storages, with no indication of groundwater infiltration. The EC continued to increase during the reporting period (average result 1670 μ s/cm), which is expected with the ongoing dry weather and decreased volume of water in the void. The initial 2-3 years following closure of the site were wet years which resulted in increased volumes of rainfall runoff reporting to the void. The last 3 years have been consistently drier which has resulted in decreasing storage in the void. pH levels remained between 8.5 and 8.83 from July 2014 to June 2015, which is consistent with longer term trends.

3.4 Groundwater

Quarterly groundwater monitoring incorporates Standing Water Level (SWL), field Electrical Conductivity (EC) and field pH. Six monthly monitoring includes SWL, field pH and EC as well as laboratory analysis of EC, pH, metals and trace elements.

Figure 2 shows the SWL at all monitoring locations, with the exception of GW8, has remained very consistent throughout the period July 2013 to June 2014. Any variations in SWL at this stage are considered to be influenced by non-mining activities or seasonal variation. GW8 is located on the adjacent property “Wilga”. Figure 3 shows trends of general variation in EC within each monitoring location.

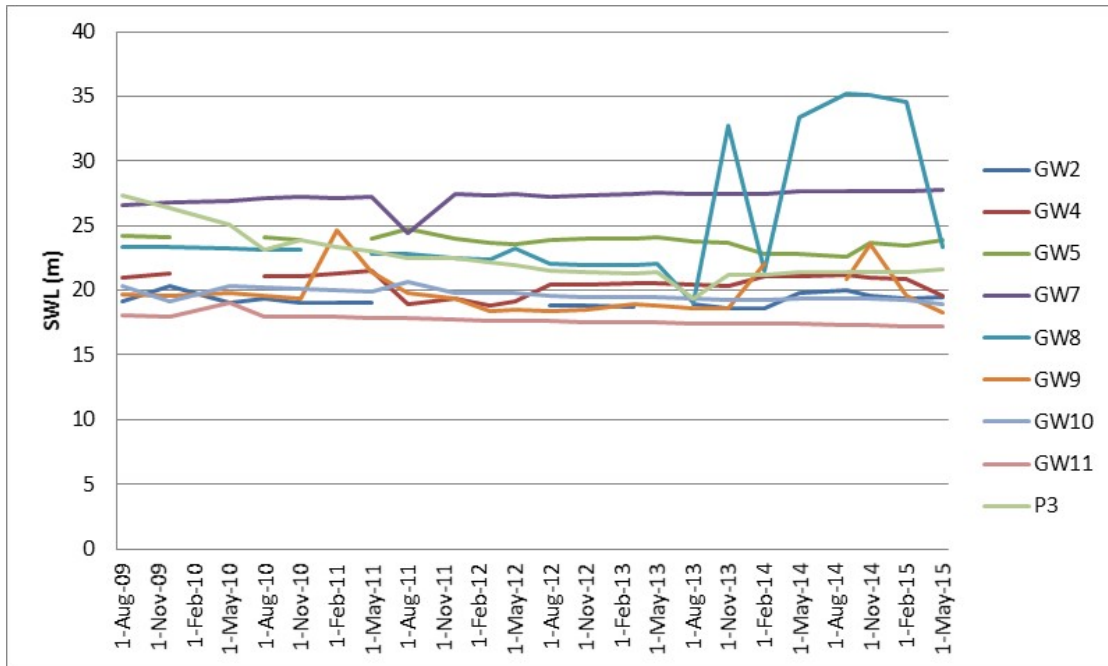


Figure 2 - Standing Water Level (2009 - 2015)

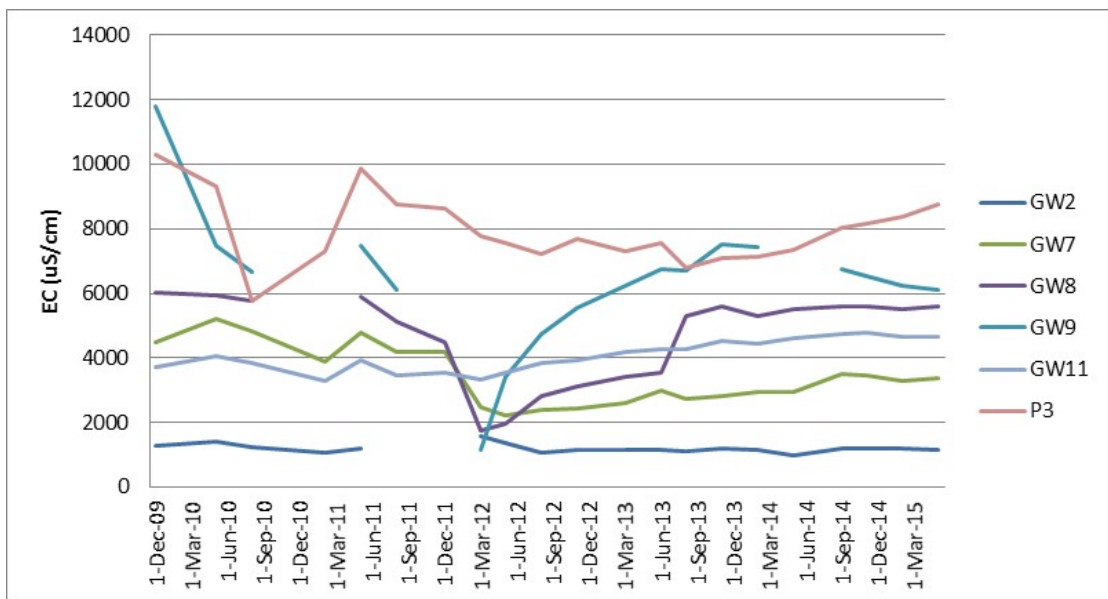


Figure 3 - Groundwater Electrical Conductivity (2009 - 2015)

3.5 Flora and Fauna

Annual rehabilitation monitoring of the site continues to be undertaken, as detailed in Appendix 1.

Image capture and NDVI analysis identified an area of substantial increase in vegetation growth. Field verification showed that the increase was due to regeneration following the 2013 fire event. Exotic groundcover was lower than pre-fire records and species recorded during the survey were not environmental or

noxious weeds, so no specific management actions were recommended by Eco Logical Australia.

Groundcover composition and biomass monitoring was not undertaken as previous results have been highly variable and largely attributed to land management regime and seasonal conditions. Remote sensing analysis was used to target investigation of areas showing relative biomass and cover change.

Topsoil character analyses indicated no significant changes in chemical attributes (EC, pH, TN, OC) since 2011 baseline monitoring with the exception of exchangeable phosphorus which has declined significantly across all zones excluding one control zone. Available phosphorus is still within desirable range for re-establishment of native plants, therefore no changes to management have been recommended.

Monitoring of woodland areas yielded results that are consistent with the 2013 drought conditions, i.e. decrease in native cover and increase in litter, therefore there are no management recommendations in relation to this. Many planted trees have had their plastic tree guards removed since 2013 and appear to be responding well.

Eco Logical Australia have provided some recommendations for improvements to management and monitoring of the site. These have been, or will be, considered.

3.6 Complaints

No complaints were received in the period July 2014 to June 2015. This is not unexpected given the site is in closure. The last complaint was recorded in 2007 when the site was in operation.

Appendix 1 –
Rehabilitation Monitoring Report 2014



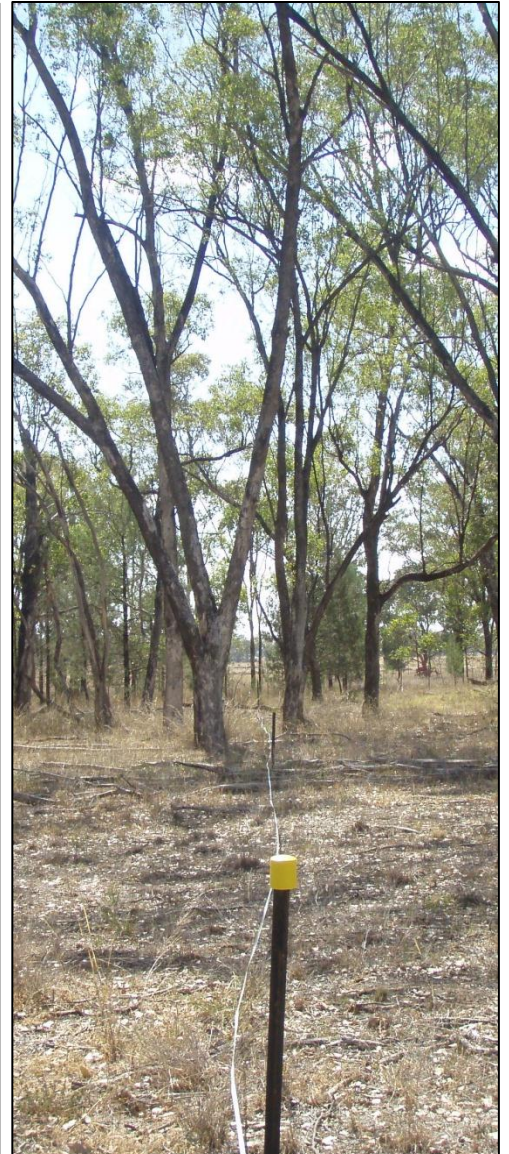
Canyon Coal Mine – Rehabilitation Monitoring Report

Volume 1

Spring 2014

Prepared for
Whitehaven Coal Mining Limited

20 March 2015



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Abbreviations

Abbreviation	Description
DBH	Diameter at Breast Height
DPI	Department of Primary Industries
ELA	Eco Logical Australia
EMS	Environmental Management System
MCP	Mine Closure Plan
MDS	Multidimensional Scaling
MOP	Mining Operations Plan
NDVI	Normalised Differential Vegetation Index
PAB	Photosynthetically Active Biomass
PFC	Projected Foliage Cover
RMP	Rehabilitation Monitoring Program
TPFC	True Projected Foliage Cover
WCM	Whitehaven Coal Mining Limited

Key outcomes

- Few of the trees and shrubs affected by the 2013 fire event appear to be re-sprouting; we recommend planting with endemic species in this zone
- Temporal changes in vegetation cover and composition occurred across all zones and is indicative of dry seasonal conditions, rather than impacts from land management
- Exchangeable phosphorus levels have declined significantly across the pasture rehabilitation zone and in two of the three control monitoring zones.

Recommendations

- Planting of additional endemic trees and shrubs at Wood_10c and Wood_07c to improve habitat complexity. This should be done with reference to control data collected on native species composition and density from remnant vegetation communities adjacent to the site.
- Rhodes Grass can reduce native biodiversity. For future plantings it is important to find an alternative, preferably a mix of groundcover species that are native to the local area
- African Boxthorn and Prickly Pear are present on site, although in low numbers. These weeds should be removed and managed
- Removal of remaining plastic tree guards on planted trees as they are impeding growth
- Pigs were present throughout the woodland sites. Management advice can be obtained from the DPI.
- According to the Rehabilitation Monitoring Program Landscape stability assessment using LiDAR is due in 2015
- In order to better understand the use of rehabilitated woodland areas by fauna we recommend that bird abundance data be collected and used in the analysis
- Erosion remediation works within Plot 1B (Wood_10c) should be monitored opportunistically by WCM staff between monitoring periods until groundcover is re-established.

1 Introduction

This Rehabilitation Monitoring Report has been prepared by Eco Logical Australia (ELA) for Whitehaven Coal Mining Ltd (WCM) in accordance with the *Rehabilitation Monitoring Program for Canyon Coal Mine* (RMP) (ELA 2011). The Canyon Open Cut Coal Mine ceased production in mid-2009 and is currently in mine closure phase.

1.1 Background

Canyon Open Cut Coal Mine (Canyon) is owned and managed by WCM. The mine was established in 2000 as a trial coal mining operation and progressed to long-term operations later that same year. Further expansion towards the south was approved in 2005 to incorporate additional coal reserves, before mining ceased in July 2009.

The mine is located within the Narrabri Shire, approximately 30 km north-west of Gunnedah and 15 km east of Boggabri in the Gunnedah coalfields of NSW. The mine lies within the Mining Leases 1464 and 1471. The mine exists on the former “Whitehaven” and “Womboola” properties, as well as a small section of the “Merton” property. Prior to mining activities, these properties were used for agricultural cultivation and grazing.

Progressive rehabilitation at Canyon aims to restore ecosystem function. Recognising the heterogeneity of the landscape around Canyon, the rehabilitation program has created eight unique rehabilitation zones of either woodland or pasture. Monitoring methods and objectives to assess the effectiveness of rehabilitation are outlined in the RMP (ELA 2011).

1.2 Project scope

Rehabilitation monitoring surveys were undertaken in accordance with the RMP (ELA 2011) and included:

- Remote-sensing based landscape assessment (multi-spectral imagery)
- Soil monitoring in both the pasture and woodland zones
- Native vegetation and fauna surveys
- Analysis of results including statistical analysis (where appropriate).

1.3 Aims & objectives

The aim of this monitoring report is to document the spring 2014 monitoring results and provide a quantitative assessment of rehabilitation performance against nearby control landscapes.

Specific monitoring objectives for 2014 include:

- Quantitative tracking of rehabilitation performance
- Assess key aspects of flora and vegetation structure (upper, mid and lower strata) in woodland areas
- Compare data with previous monitoring events
- Evaluate monitoring results against monitoring triggers and rehabilitation objectives as outlined in the RMP
- Provide recommendations to improve the rehabilitation or monitoring methods and mine closure procedures for WCM.

1.4 Report structure

This report is presented in two volumes. Volume 1 contains a summary of the rehabilitation objectives and provides a summary of the spring 2014 monitoring program, including results, conclusion and recommendations. Volume 2 contains the collated field survey data from 2011, 2012, 2013 and 2014 monitoring periods and 2014 weather data.

1.5 Rehabilitation monitoring - management triggers

A multi-scale, multi-data source rehabilitation monitoring approach has been developed and implemented at Canyon. Remote sensing has been used to monitor the entire target area, including control areas, while targeted field work was used in agricultural and native vegetation environments, both within control and impact areas.

A two-tiered system of triggers for management was developed to respond to any changes identified via remote sensing. The first tier of response is triggered by changes detected in the remote sensing time series analysis. This instigates further investigations such as targeted, rapid, on-ground assessments. The second tier of response is triggered if changes are confirmed or discovered on-ground. These triggers instigate the development of site-specific management responses and remedial actions (ELA 2011).

2 Rehabilitation objectives

A summary of the objectives for rehabilitation at Canyon, as stated in the relevant management plans, is provided in Table 2-1 (ELA 2011).

Table 2-1: Summary of rehabilitation objectives for Canyon Mine

Stated rehabilitation objectives (EMS, MOP, MCP)
Maintain and/or restore biodiversity and ecological integrity of areas affected by mining or agriculture within the mining lease
Maintain and/or re-establish agricultural land (pasture establishment) of comparable land capability to that of the pre-disturbance environment
Provide a revegetated post-mining landform which is consistent with surrounding landforms and, with the exception of the final void, provides no obvious evidence of a prior mining land use
Create low maintenance, geotechnically stable final landform
Minimise visual exposure by ensuring rehabilitation blends with the adjoining landscape
Minimise erosion and sedimentation
Establish rehabilitated areas that will provide habitat for fauna and corridors for fauna movement between rehabilitated areas, regrowth areas and remnant vegetation
Control vermin, feral animals and noxious weeds
Ensure successful implementation of the approved biodiversity offset strategy
Monitor rehabilitation success using selected physical and biological parameters
Re-establish native vegetation communities using locally collected seed
Develop and implement a flora and fauna monitoring program which provides statistically valid conclusions on rehabilitation success and recommendations for improved outcomes (if required)
Exclude bushfires and control noxious weeds and feral animals
Develop native vegetation communities in the stock exclusion zone (i.e. rehabilitated areas and remnants) which emulate the structure and floristics of undisturbed areas (as demonstrated by monitoring)
Establish native vegetation communities more extensive than currently exist in the area of the mine
Create rehabilitated areas that are used by native fauna (as demonstrated by monitoring)
Refine the rehabilitation / offset strategy based on monitoring outcomes, site experience and improved technologies

Stated rehabilitation objectives (EMS, MOP, MCP)

Re-establish approximately 16 ha of Class II capability land (including an area classified as Class III prior to mining) using soils reclaimed from existing Class II areas

Elsewhere, establish landform, soil profiles and vegetation communities consistent with pre-disturbance land capabilities

3 Methods

The Canyon RMP (ELA 2011) recommends that it be reviewed every 3 years. The review is to examine the monitoring program effectiveness and recommend any improvements. After 3 years of implementation, ELA reviewed the implementation and outcomes of the RMP in relation to indicator appropriateness, field survey, analysis and technology changes in August 2014. Key amendments of the RMP are described in Table 3-1.

The spring 2014 monitoring was undertaken in accordance with the methods prescribed in the RMP (ELA 2011) (Table 3-1). Any minor alterations from the original methods are detailed in the following sub-sections.

Table 3-1: Multi-scale monitoring program summary

Data source	Type	Scale	Purpose	Recommended amendments to the RMP in 2014
Remote sensing	LiDAR (every 3 years)	Entire site	Topographic form and change Woodland parameters	Ongoing capture and analysis of LiDAR should be considered.
	Multi-spectral imaging (annually)	Entire site	Agricultural pasture cover/biomass Woodland cover/biomass Erosion monitoring Direct field survey	-
	EM38/31 (every 3 – 5 years)	Pasture zones	Soil moisture and nutrient zones	Removed from the RMP. Replaced by regular inspections and remote sensing.
Woodland survey	Vegetation survey (annually)	Woodland zones	Woodland health and function	-
	Fauna survey (Birds – winter and spring)	Woodland zones	Woodland health and function	-
	Soil survey (every 3 years)	Woodland zones	Soil condition	-
Agricultural survey	Pasture survey (annually)	Pasture zones	Pasture biomass and composition	Removed from the RMP. Replaced by remote sensing and on ground inspections.
	Soil Survey (every 3 years)	Pasture zones	Soil nutrient status	-

3.1 Woodland surveys

Monitoring plots for the woodland vegetation survey were as per those used during the 2013 monitoring period (Figure 3-1).

The RMP (ELA 2011) recommends that five soils pits be established for analysis of horizon boundaries and ecological function, three in the rehabilitation zone and one in each control zone. As one of the soil pits from 2011 was located in the area likely to be disturbed by future operations only two soil pits were established in the rehabilitation zone and subsequently monitored, including for the 2014 survey.

3.2 Soil sampling

As nominated in the RMP (ELA 2011) assessment of key soil parameters are required every three years. Baseline parameters were described in 2011. The 2014 monitoring round included a 150 mm soil core from eight locations within each monitoring zone: the rehabilitated pasture zone, control pasture 1, control pasture 2 and control pasture 2 (Figure 3-2). Each sample was analysed at EastWest EnviroAg Laboratory (NATA Accredited Laboratory 15708) for:

- Electrical conductivity (soil:water 1:5)
- pH (CaCl₂)
- Total nitrogen (Kjeldahl)
- Exchangeable phosphorus (Colwell)
- Organic carbon (Walkley-Black).

Soil profile and condition assessment is also recommended every three years; eight soil pits were dug across the site in order to assess this parameter (Figure 3-3).

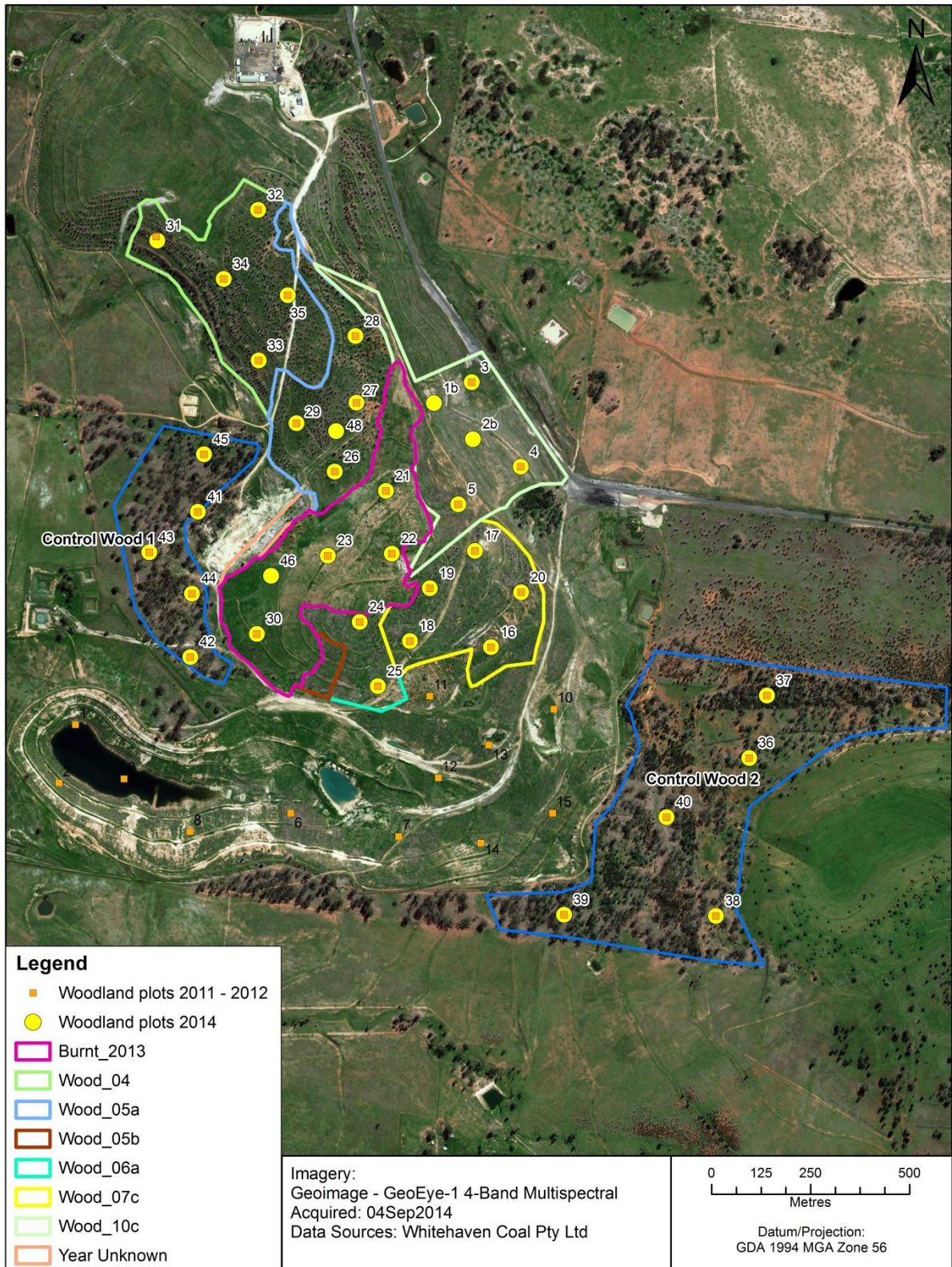
3.3 Survey dates

Multi-spectral imagery was captured across the entire target area (including control areas) on 4 September 2014 using 4-Band GeoEye-1.

Ecologist Dr Stephen Debus undertook terrestrial fauna and habitat monitoring of woodland areas between 25 - 26 August 2014 (winter), and 3 – 4 November 2014 (spring).

Ecologist Ben Martin undertook soil sampling between 8 – 10 October 2014.

Botanist Dr Lachlan Copeland and Environmental Scientist Emily Southwell undertook monitoring of woodland areas (vegetation transects only) between 17 – 21 November 2014.



This map is not guaranteed to be free from error or omission. Eco Logical Australia Pty Ltd and its employees disclaim liability for any act done on the information in the map and any consequences of such acts or omissions.

Figure 3-1: Woodland vegetation monitoring plots for spring 2014 survey (also shown are monitoring plots from 2011 – 2012) (note: Year Unknown refers to rehabilitation zone where it is unknown in which year rehabilitation took place)

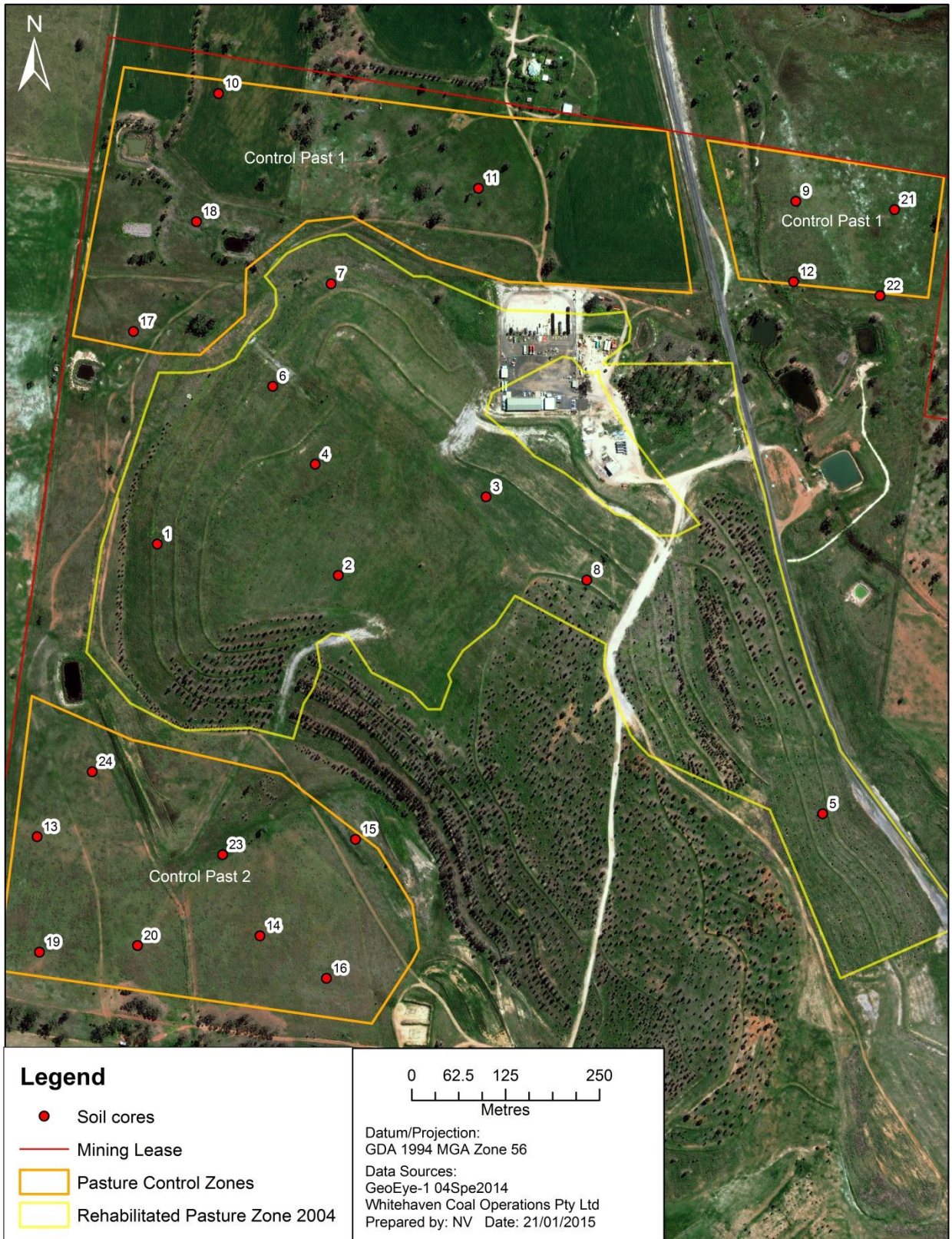


Figure 3-2: Location of soil cores

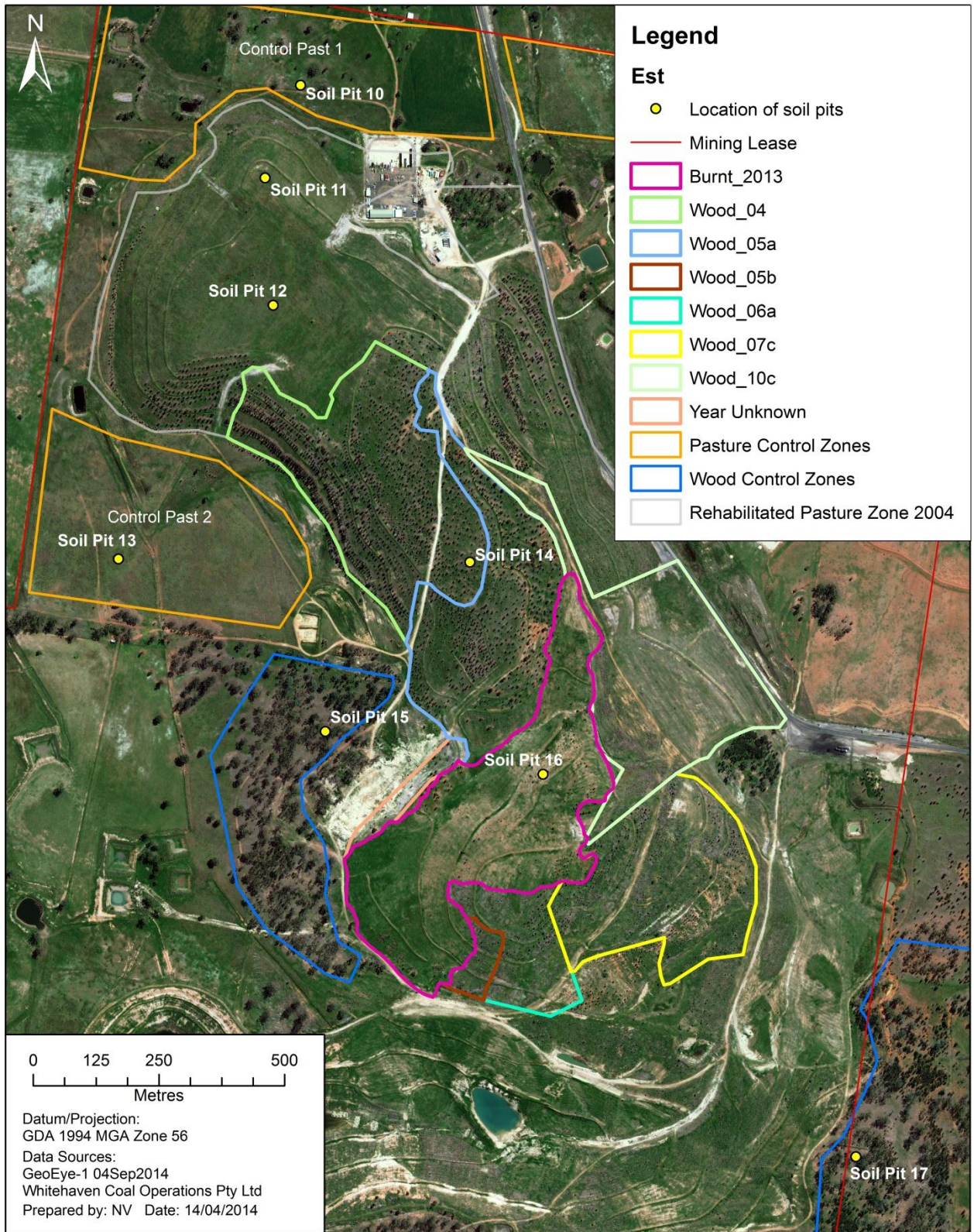


Figure 3-3: Location of soil pits (note: Year Unknown refers to rehabilitation zone where it is unknown in which year rehabilitation took place)

3.4 Weather

Temperatures in the three months preceding the spring monitoring period were cool to warm, with average minimum temperatures lower than the historical mean, and average maximum temperatures higher than the historical mean (Figure 3-4; Volume 2, Section 1). Rainfall in the six months preceding the spring surveys was well below average, with the exception of August 2014 where monthly rainfall was more than twice the historical monthly average (Figure 3-5; Volume 2, Section 1).

Conditions were mostly dry during the winter bird survey; 20.8 mm of rain was recorded on the third day (26 August 2014). Minimum temperatures during the winter survey were lower than historical averages; maximum temperatures were between 7.3 and 8.4°C above the historical average (Volume 2, Section 1).

Conditions for the spring bird survey were dry. The first day was unseasonably cold, recording a minimum temperature 10°C below historical averages; the second day was on par with the historical mean (15.9°C). Maximum temperatures remained relatively constant with historical averages, recording 29.4 and 29.3°C on the first and second day respectively (Volume 2, Section 1).

Conditions were dry during flora surveys. Minimum temperatures for the first three days of the survey were at least 3.9°C below the historical mean, and at least 5.9°C above during the final two days. Maximum temperatures were 4.2 to 11.2°C above the historical mean (Volume 2, Section 1).

The combination of below average rainfall, warmer than average daytime temperatures and consequentially higher evaporation rates means that conditions for all surveys were extremely dry.

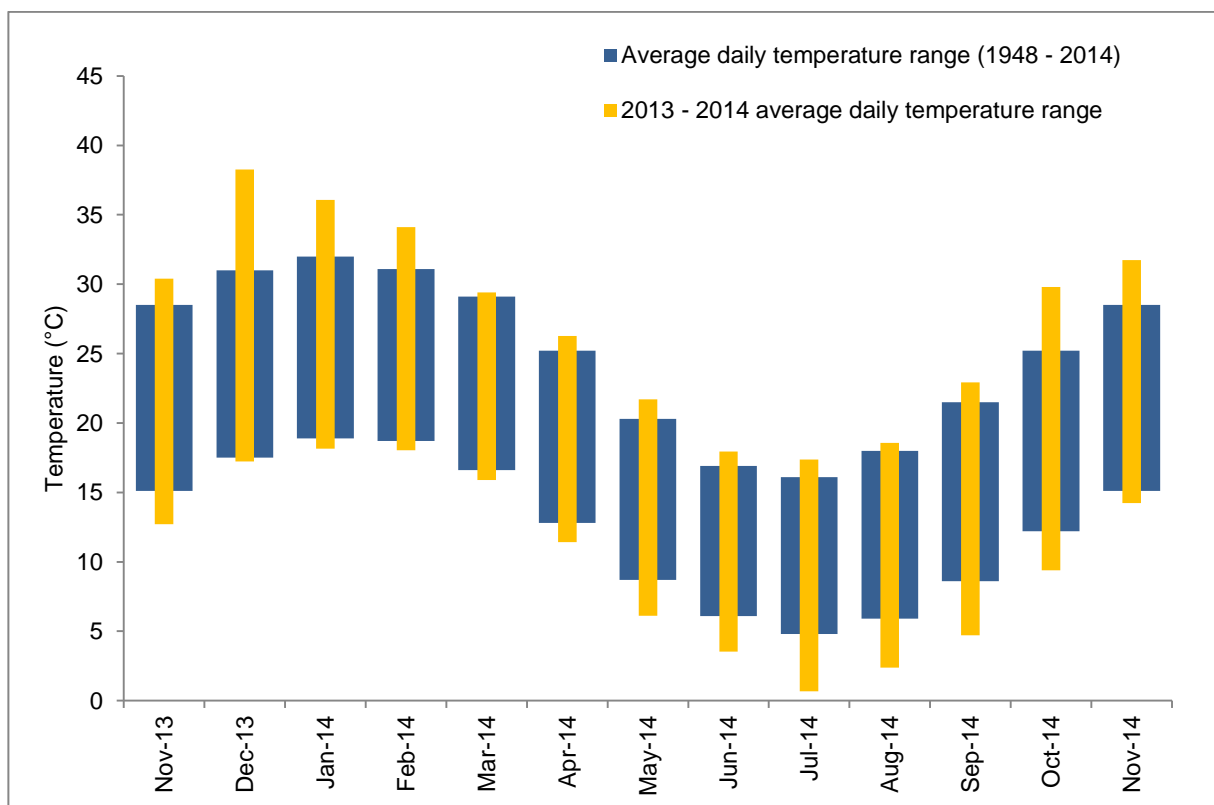


Figure 3-4: Historical average (Gunnedah Resource Centre 55024; BoM 2014) and recorded average daily temperature range (WHC weather station).

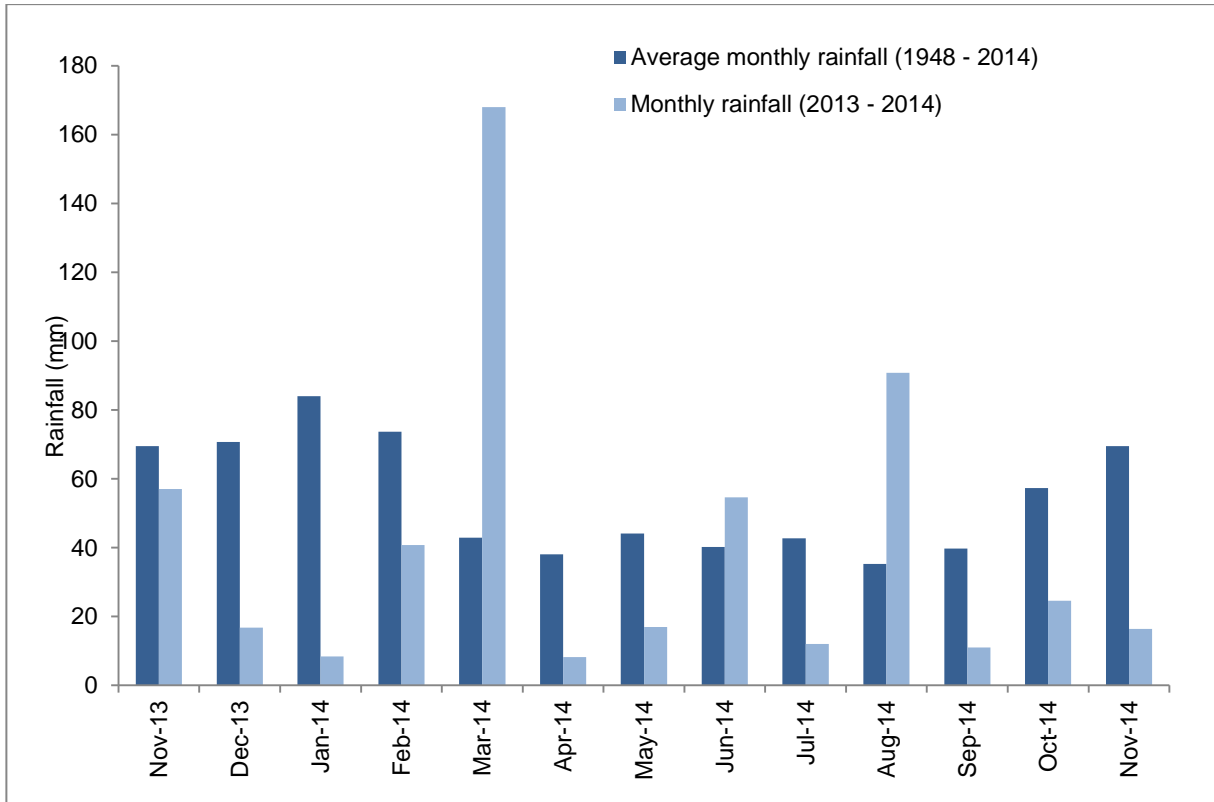


Figure 3-5: Historical average (Gunnedah Resource Centre 55024; BoM 2014) and recorded monthly rainfall (Whitehaven weather station).

4 Results & discussion

4.1 Remote sensing monitoring

4.1.1 Topographic form

Not undertaken in 2014.

4.1.2 Soil electrical conductivity

Not undertaken in 2014

4.1.3 Relative plant biomass & bare soil assessment

Changes in the Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery captured on 2014 and 25 August 2013 were assessed. All rehabilitation zones, excluding Burnt_2013, presented no substantial areas of significant change and only scattered areas of groundcover increase. A substantial area of significant increase in photosynthetically active biomass (PAB) was identified along the eastern boundary of the Burnt_2013 zone.

Scattered areas of increase and decrease in PAB across the image can be attributed to shadow position and slight image shift; this is particularly pronounced around dam perimeters (Figure 4-1).

4.1.4 Monitoring triggers

NDVI analysis identified an area of substantial groundcover increase. Field investigations confirmed that the increase was attributed to the natural response from the 2013 fire event. Exotic groundcover was lower than pre-fire records and species recorded during the survey were not environmental or noxious weeds, so no specific management actions were triggered (ELA 2011) (Table 4-1).

Table 4-1: Remote sensing monitoring triggers for management

Trigger	Investigation	Management
Remote sensing change detection identifies areas of substantial change (> +/-2 std dev from average) in area greater than 0.1 ha	Investigate sources of change via desktop assessment: 1. Obvious external influence e.g. fire, major storm, or unrelated development) 2. Potentially due to weed infestation, erosion / sedimentation, poor cover establishment	Respond to change based on likely source of impact: Identify region of change and tag it as non-project specific impact Undertake directed field investigation via rapid field checking protocol (Table 5-11 in ELA 2011)

4.2 Management actions required

No specific management actions required.

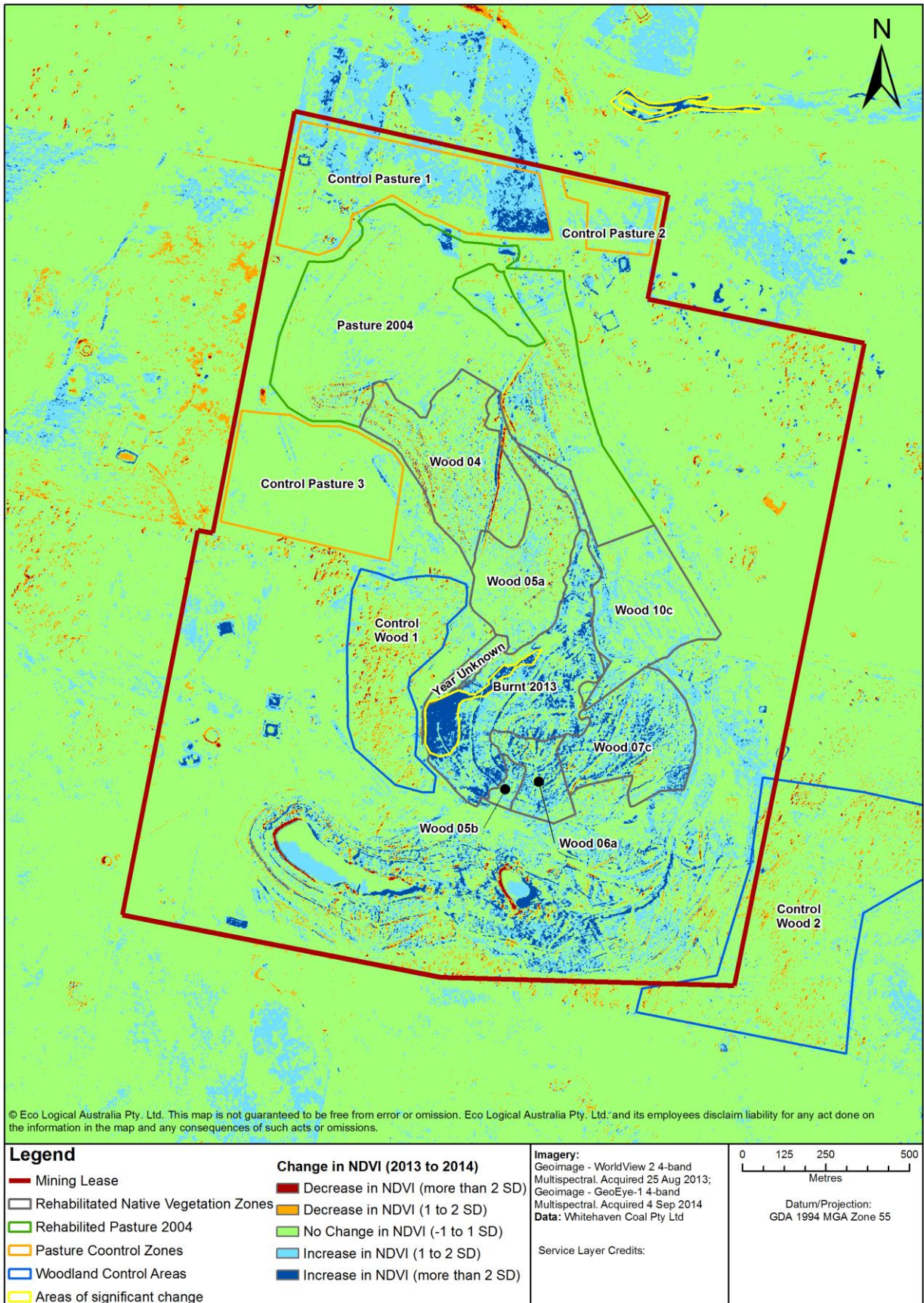


Figure 4-1: NDVI change detection analysis

4.3 Soil sampling

4.3.1 Soil cores

Soils from 24 plots were analysed for chemical attributes (EC, pH, TN, P, OC). The results of soil sampling are summarised in Volume 2, Section 5.1.

Baseline monitoring in 2011 indicated soil pH varied from mid to low, ranging from 4.9 (Control Pasture 2) to 7.91 (Control Pasture 1). Soil analysis in 2014 indicated that there was no significant difference in pH levels within any monitoring zones between monitoring periods. The rehabilitated sites were approximately 10% higher in pH than the control sites, with each averaging 6.76 and 6.17 respectively.

Soil electrical conductivity (EC) varied across all zones, ranging from 0.03 dS/m (Control Pasture 2) to 0.47 dS/m (Control Pasture 1), and averaging at 0.10 dS/m. The threshold suitable for agricultural activities is 0.15 dS/m (Reid & Dirou 2004). All control and rehabilitation sites increased in EC compared to 2011 baseline data, with the exception of two sites, one in the rehabilitated zone and another on Control Pasture 2, which decreased. These changes between monitoring periods were not significant ($p > 0.05$), averaging approximately 10-20% different from 2011 baseline data.

Total nitrogen (TN) varied across all sites, ranging from 413 to 2444 mg/kg, and averaging 982 mg/kg within the rehabilitation zone and 407 to 1744 mg/kg within the control zones, averaging at 910 mg/kg. Average TN increased across all monitoring zones from 2011 baseline data; Control Pasture 1 increased approximately 2%, Control Pasture 2 increased 17% and the rehabilitation zone increased 40%. It should be noted that the average increase at the rehabilitation zone was largely distorted by one site which when removed from the calculations the average increase for the rehabilitation site was only 8%. Hence, there was no significant difference recorded within monitoring zones between monitoring periods.

Baseline monitoring in 2011 indicated exchangeable phosphorus varied across all zones, ranging from 14.60 to 35.80 mg/kg. Monitoring in 2014 indicated exchangeable phosphorus declined significantly at all zones, ranging from 6.75 to 27.90 mg/kg, except Control Pasture 1, which had only marginal decreases across the monitoring zone. Research indicates that diverse perennial native pastures in temperate Australia only persist when the available soil phosphorus is below approximately 20 mg/kg (Colwell) (Dorrough *et al.* 2008). If soil phosphorus increases above this level, soil fertility favours short-lived fast growing (typically exotic) plants which inevitably outcompete most of the diverse long-lived native plants that originally dominated Australia's temperate woodlands (Figure 4-2) (Dorrough *et al.* 2008).

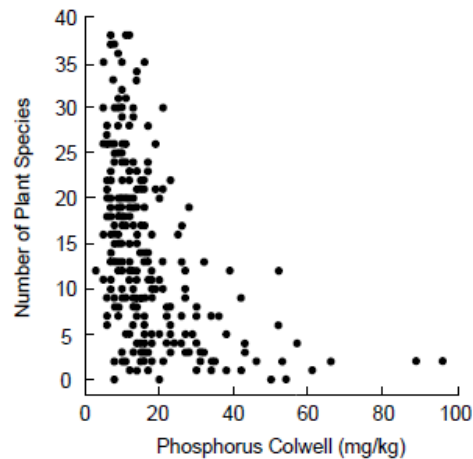


Figure 4-2: Decline in diversity of plants (as measured by number of species) as available soil phosphorus increases (Dorrough *et al.* 2008).

Organic matter increased at all zones compared to baseline values, with 2014 levels ranging from 0.7 to 5.8% in the rehabilitation zone, and 1.3 to 5.0% in the control zones (Control Pasture 2 and Control Pasture 1 respectively). The change was significantly different at Control Pasture 3, which increased by 44%. The increase in organic matter across all sites may be attributed to current land management practices (i.e. minimal soil and pasture disturbance) and seasonal variation (high winter rainfall).

4.3.2 Soil pits

Soil pits on the rehabilitation areas showed variable profile reconstruction with topsoil depth ranging from 16 cm (rehabilitation pit 12) to 31 cm (rehabilitation pit 11). The control sites presented a similar topsoil profile with depths ranging from 18cm (control pit 10) to 17cm (control pit 13). All rehabilitated soil areas showed good establishment with grass and other plant roots penetrating through the top horizon. No roots were found below the top horizon in both the control and rehabilitated pits. Mine overburden was found below 64 cm in rehabilitation pit 11 and below 26 cm in rehabilitation pit 12. Soil fauna were not identified in any pits (Volume 2, Section 5.2).

4.3.3 Monitoring triggers

The statistically significant decline in soil phosphorus triggered a management response (Table 4-2). However, given that diverse native perennial pasture species persist on soils of low fertility, no management recommendation have been made.

Table 4-2: Management recommendations for rehabilitated pasture zones.

Trigger	2014 monitoring outcomes	Management recommendations
Statistically significant change detected in soil character (pH, EC, OM, N or P)	Statistically significant decline detected in P	No management actions required
Soil erosion	None identified	No management actions required

4.4 Woodland monitoring

Woodland zones rehabilitated in 2004 and 2005 (Wood_04 and Wood_05a) continue to increase in structural complexity and show an increase in suitable fauna habitat and a corresponding increase in the number of animals using the sites. More recently rehabilitated sites are yet to show similar trends.

4.4.1 Vegetation

Woodland rehabilitation is yet to reach a stage where there is a canopy layer; therefore there is no True Projected Foliage Cover (TPFC) for any of the rehabilitated sites. Some of the planted trees now form a midstorey layer. All rehabilitation zones have planted seedlings and/or juveniles, however Wood_10c only recorded juveniles within one of five monitoring plots. Fire appears to have killed many of the juvenile trees in Burnt_2013, despite some individuals showing early signs of resprouting during 2013 monitoring.

The established canopy layer within the control plots have a TPFC of approximately 5%, while the rehabilitation plots have not yet established a canopy layer. Average TPFC for the midstorey layer is low for both the rehabilitation and control plots (<2%). The midstorey of the rehabilitated sites are dominated by juvenile tree species that will eventually grow into the canopy; the control plots however, have a combination of juvenile tree and shrub species contributing to the midstorey layer. This suggests that, once mature, the rehabilitated sites may have a midstorey layer that lacks the diversity and structural complexity of the control sites (Volume 2, Section 3.2 and 3.3). The current lack of similarity between control and rehabilitated vegetation communities is confirmed by Non-metric Multidimensional Scale (nMDS) analyses (Volume 2, Figures 3.1 to 3.6). These suggest that at their current stage of succession, the canopy and midstorey of the earliest rehabilitation sites (Wood_04 and Wood_05a) have greater similarity to the control sites than the more recently rehabilitated sites (Wood_06a, Wood_07c, Wood_10c and Burnt_2013). While the nMDS plots indicate temporal trends toward greater similarity between the control and rehabilitation sites, the zones still differ significantly.

Native groundcover communities in the rehabilitated and control areas showed a large amount of spatial and temporal variation for most sites (see Cluster and nMDS analysis in Volume 2, Section 3.6). This indicates that the groundcover vegetation is naturally variable. The earliest zones rehabilitated (Wood_04 and Wood_05a) are more similar to the control zones than those rehabilitated in 2007, 2010 or burnt in 2013.

Native groundcover species richness is still below that recorded in 2011 at most control and rehabilitation sites. The dry conditions appear to have had a more severe impact on native species in the rehabilitated area than in the control plots, where native species have continued to increase from 2012 and 2013, but have not yet reached the highest levels recorded in 2011. This may be because the native groundcover communities in the control sites have been established longer, and as such are better buffered to survive dry periods (i.e. the canopy provides more shade at the control sites therefore the groundcover species endure less stress). Native species richness remains generally higher in Wood_04 and Wood_05a plots than at Wood_07c and at Wood_10c. However, native species richness continued to decline from levels recorded during 2012 and 2013 monitoring at most plots in Wood_04 and Wood_05a, whilst at most plots in Wood_07c and Wood_10c there was an increase during this time (Volume 2, Figure 3-14 to 3-19).

As expected, native groundcover species richness at Burnt_2013 has increased significantly since 2013 survey, which was undertaken only a few months after the area was affected by the 2013 fire event. All Burnt_2013 plots have the highest native groundcover species richness recorded since monitoring commenced in 2011.

Native groundcover species have greater species richness than exotics at all control plots for all monitoring periods, with the exception of two plots within Control Wood 1, which contain just over 50% exotic species, a substantial increase from 2013 results. Exotic groundcover species richness within the rehabilitation sites has generally increased since 2013, with most plots having higher exotic species richness than native (Volume 2, Figure 3-14 to 3-19). Of particular concern are dense patches of

Rhodes Grass in the more recently rehabilitated zones (Wood_10c, Wood_7c and Wood_6a), which can be a major threat to the establishment of native pastures and can eventually become a monoculture. The presence of Rhodes Grass within Burnt_13 has not recovered to the levels recorded prior to the 2013 fire event.

Two noxious weed species persist on site. Prickly Pear was recorded at Control Wood 1, Control Wood 2 and Wood_05a, and African Boxthorn at Wood_07c. The control of noxious weeds on private land is the responsibility of the land owner or occupier and is one of the management objectives for Canyon Mine. Both species are classified as Class 4, so should be managed to reduce spread and inhibit reproduction. WCM should refer to the site MCP for weed management procedures. NSW Department of Primary Industries (DPI) also recommend suitable management methods (DPI 2012).

Groundcover composition varies through time across all monitoring zones, data can be found in Volume 2, Section 3.7. Native species cover and temporal trends in Wood_05a and Wood_04 are similar to the two control zones, which have approximately 25% cover, almost half that recorded in previous years. The remaining proportion of groundcover within the control zones is predominantly leaf litter, while a combination of leaf litter and exotics was present in Wood_05a and Wood_04. Exotic species within the ground layer of the control zones have increased in cover, however still only make up approximately 5% of total cover. Similarly, Wood_04 and Wood_05a have increased in exotic cover since 2013, with the difference in Wood_04 is statistically significant ($p < 0.05$) (Volume 2, Table 3.22).

Mean native species cover increased in all monitoring zones from 2011 to 2012, except for Wood_07c where it remained relatively steady. Mean cover has continued to decrease since 2012, with all sites now below 2011 levels. The decrease in native species cover was significant ($p < 0.05$) in all control and rehabilitation zones, excluding the later rehabilitation zones, Wood_07c, Wood_10c and Burnt_2013 (Volume 2, Section 4.7).

Mean exotic species cover has increased across all control and rehabilitation zones, excluding Wood_10c, which has halved and Wood_6a, which has remained relatively steady. A similar trend has occurred for leaf litter, which has increased across all sites, except Wood_04 and Wood_07c, where it has remained steady. It was noted that more than 75% of the leaf litter recorded at all sites (except Wood_07c), was derived from exotic species, in particular Rhodes Grass and various annual species (Volume 2, Section 4.7).

Remedial works (re-profiling, supplementary topsoil and seeding) were undertaken within one Wood_10c plot (Plot 1B) in September 2014 in response to erosion. As a result of this work, groundcover has declined; to this effect, exotic species richness has also declined and Rhodes Grass is no longer present within this plot.

The amount of Large Woody Debris (LWD) has remained steady across most monitoring plots. Exceptions to this are for some plots in Control Wood 1, where length and number of sections increased between 2012 and 2014, and some plots in Control Wood 2, where fallen logs and debris have been pushed into piles (Volume 2, Section 3.2). This increase in LWD in control plots is because these sites have trees of sufficient maturity to drop branches and contribute to the LWD present as habitat on the ground. As there are no mature trees at rehabilitation sites, the amount of LWD is likely only to decrease until the trees mature, unless brought in from other areas.

4.4.2 Fauna

Analysis of bird species composition shows that bird species composition fluctuates between years at all monitoring zones, but with slightly more stability in the control zones (Volume 2, Figure 4.2 and 4.3).

This is primarily due to the young habitat within the rehabilitated zones being less complex than the more mature woodland control sites.

Bird species richness is consistently highest at Control Wood 2, with up to twice as many species recorded in this zone during each monitoring period compared with the other control and rehabilitation zones. Control Wood 2 is a larger area than Control Wood 1 and has better vegetation structure (more dense and with a shrub layer), so higher bird diversity is expected. Control Wood 1 is also dominated by Noisy Miners, which aggressively exclude some woodland bird species and are now listed as a Key Threatening Process.

Bird species richness at the rehabilitated sites is generally lower than the control sites, however Wood_04 has had a continual increase since monitoring began in 2011 and is now similar to the numbers found in Control Wood 1, although actual species and representative guilds differ. The remaining rehabilitated sites still have lower species richness than the control zones, with the lowest numbers recorded at more recently rehabilitated sites (Wood_06a and Wood_07c). However, the temporal trends at the rehabilitated sites remain consistent with the control zones. Wood_05a and Wood_06a have decreased slightly in species richness from 2013 monitoring similar to Control Wood 2, and Wood_07c has exhibited trends similar to Control Wood 1, remaining relatively constant. The composition of species guilds at the rehabilitation sites are yet to be representative of either control site (Volume 2, Table 4.1 – 4.2).

The Rehabilitation Monitoring Program for Canyon Coal Mine (ELA 2011) recommends targeted monitoring for *Neophema pulchella* (Turquoise Parrot) and *Pomatostomus temporalis* (Grey-crowned Babbler), both listed as threatened under the TSC ACT. Grey-crowned Babblers have been recorded annually since 2011 in both control zones but not in the rehabilitated zones. The Turquoise Parrot has not been recorded on site. In addition to these threatened species, the following were also present:

- *Chthonicola sagittata* (Speckled Warbler) Control Wood 2 in 2011, 2012, 2013 and 2014 (Vulnerable – TSC Act)
- *Falco subniger* (Black Falcon) over Control Wood 1 in 2012 and Wood_07c in 2014 (Vulnerable – TSC Act)
- *Hieraaetus morphnoides* (Little Eagle) over Control Wood 1 in 2011 (Vulnerable – TSC Act)
- *Melanodryas cucullata* (Hooded Robin) Control Wood 2 in 2012 2013 and 2014. (Vulnerable - TSC Act).

Of the non-bird fauna, seven mammal species were observed during monitoring. *Macropus giganteus* (Eastern Grey Kangaroo), *Macropus robustus* (Common Wallaroo), and *Wallabia bicolor* (Swamp Wallaby) have been seen across the control sites in all survey years and appear widespread. Eastern Grey Kangaroo and Common Wallaroo populations also extend into the rehabilitated zones. The remaining four mammal species observed were exotic, including *Lepus capensis* (Hare), *Oryctolagus cuniculus* (Rabbit), *Vulpes vulpes* (Fox) and *Sus scrofa* (Feral Pig). The exotic mammals were recorded within the control and rehabilitation zones; Hare was seen in three rehabilitation zones (Wood_04, Wood_05a and Wood_06a), and the Fox within Wood_06a, whilst pigs were widespread throughout. No reptile or amphibian species were recorded in 2014 (Volume 2, Table 4.3).

4.4.3 Soil pits

Soil pits in the rehabilitation zone (pits 14 and 16) showed a high content of gravel and rock within the top horizon. Two horizons were found above the mine overburden in pit 14, the top horizon was 23 cm deep and the second horizon had finer gravel present and went to 83 cm. Pit 16 had one horizon above the mine overburden, this top horizon was 36 cm deep. In the control pits gravel was present throughout pit 15, but was absent in the lower horizons. Pit 17 was the opposite, with gravel and large rocks increasing with depth (Volume 2, Section 5.2).

No plant roots were identified in the rehabilitation profiles. In the control pits, grass roots were identified in the first horizon of both pits; pit 17 also had tree roots in the first and second horizons. This is primarily due to the vegetation within the control sites being more established and complex than rehabilitation sites. No evidence of soil fauna was recorded (Volume 2, Section 5.2).

4.4.4 Monitoring triggers

Monitoring triggers requiring action are the presence of feral pigs and the presence of weed species (including two that are classed as noxious) (Table 4-3).

Plastic tree guards remain around some of the planted trees and are impeding growth; these should be removed.

Table 4-3: Management recommendations for woodland zones.

Trigger	2014 Monitoring outcomes	Management
Statistically significant change detected in either: Native overstorey (cover, health, richness, recruitment) Mid storey (cover, richness) Ground cover (cover, richness) Weeds (cover, richness) % ground cover	Exotic groundlayer species composition increased significantly in Wood_04. Native groundlayer species richness decreased significantly in Control Wood 1 & 2, Wood_04, Wood_05a and Wood_06a.	No management actions required at this stage as changes are synonymous with control zone trends.
Exotic fauna	Feral Pigs observed on site	Refer to MCP and/or DPI for management procedures
Weed infestation	Rhodes grass is a threat to native groundcover species diversity Prickly Pear and African Boxthorn persist on site	Refer to MCP and/or DPI for management procedures
Soil erosion	None identified	No management actions required at this stage

5 Conclusion & recommendations

5.1 Remote sensing monitoring

Image capture and NDVI analysis identified an area of substantial increase in vegetation growth. Field verification showed that the increase was due to regeneration following the 2013 fire event. Exotic groundcover was lower than pre-fire records and species recorded during the survey were not environmental or noxious weeds, so no specific management action is required.

Land surface stability assessment using LiDAR is recommended in the RMP (ELA 2011). Acquisition of this data will enable quantitative temporal comparison of key land surface condition parameters in both the agricultural and native vegetation environments.

5.2 Pasture monitoring

Groundcover composition and biomass monitoring was not undertaken as previous results have been highly variable and largely attributed to land management regime and seasonal conditions. Remote sensing analysis was used to target investigation of areas showing relative biomass and cover change. ELA recommend that more useful and practical weed assessments be carried and acted upon through continual assessment made by mine site staff, opportunistic assessments (noting significant weed outbreaks including noxious weeds) and via remote sensing following baseline pasture species surveys.

Topsoil character analyses indicated no significant changes in chemical attributes (EC, pH, TN, OC) since 2011 baseline monitoring with the exception of exchangeable phosphorus which has declined significantly across all zones excluding one control zone. Available phosphorus is still within desirable range for re-establishment of native plants, therefore no changes to management are recommended.

Topsoil character (pH, EC, Organic matter, N, P) and soil profile assessment are recommended every 3 years (ELA 2011) and are next due in 2017.

5.3 Woodland monitoring

Monitoring of woodland areas yielded results that are consistent with the 2013 drought conditions, i.e. decrease in native cover and increase in litter, therefore there are no management recommendations in relation to this. The following suggestions have been made in order to improve monitoring and rehabilitation outcomes.

Additional indigenous tree and shrub species should be planted at Wood_10c and Wood_07c to improve habitat complexity. Most trees and shrubs within Burnt_2013 have not recovered, ELA recommend that this zone be replanted. This should be done with reference to control data collected on native species composition and density from remnant vegetation communities adjacent to the site.

Rhodes Grass can reduce native biodiversity. For future plantings it is important to find an alternative, preferably a mix of groundcover species that are native to the local area. African Boxthorn and Prickly Pear are present on site in low abundance. These should be managed to prevent spread.

Many planted trees have had their plastic tree guards removed since 2013 and appear to be responding well. Any plastic guards that remain on planted trees should be removed to encourage growth.

ELA recommends remedial works within Wood_10c zone (plot 1B) be monitored by WCM staff for further evidence of erosion throughout the year, particularly after intense rain events, as risk of erosion still exists due to decreased groundcover.

In order to better understand the use of rehabilitated woodland areas by fauna ELA recommend that bird abundance data be collected and used in the analysis. This will give WCM a better indication as to whether birds are transient or inhabiting the sites. It will also provide a more detailed understanding of bird species assemblages and species interaction in each area; for example, Noisy Miners are known to be aggressive towards other bird species and if a high abundance of Noisy Miners is recorded within an area it is likely that this will be a contributing factor to reduced bird species diversity.

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1 Weather Data

Table 1-1: Daily weather data at time of field surveys

	Date	Min temp (°C)	Average temp (°C)	Max temp (°C)	Rainfall (mm)	Min Wind Speed (m/s)	Average Wind Speed (m/s)	Max Wind Speed (m/s)
Fauna	24/08/2014	3.2	11.7	20.3	0	0	1.2	0
	25/08/2014	2.2	11.0	20.5	0	0	0.6	1.9
	26/08/2014	2.2	11.1	19.4	20.8	0	1.3	1.1
	3/11/2014	5.1	18.6	29.4	0	0	1.2	5.7
	4/11/2014	15.9	22.2	29.3	0	0	1	2.2
Flora	17/11/2014	11.5	22.4	32.7	0	0	1.3	2.5
	18/11/2014	10.9	22.5	32.4	0	0	1.2	2.2
	19/11/2014	11.2	24.6	35.5	0	0	0.9	6.3
	20/11/2014	21.8	29.9	37.3	0	0.6	2.2	6.5
	21/11/2014	21	31.7	39.7	0	0	3	0.6

Data obtained from WHC weather station.

Table 1-2: Canyon Mine and Gunnedah historical monthly weather data

Month	Gunnedah Mine Monthly Mean [#]						Historical Averages [*]			
	Min Temp (°C)	Max Temp (°C)	Rainfall (mm)	Cumulative rainfall (mm)	No. of rain days	Maximum daily rainfall (mm)	Min Temp (°C)	Max Temp (°C)	Rainfall (mm)	No. of rain days
Nov-13	12.7	30.4	57.0	57.0	9.0	6.0	15.1	28.5	69.5	
Dec-13	17.2	38.3	16.8	73.8	4.0	18.4	17.5	31.0	70.7	
Jan-14	18.2	36.1	8.4	82.2	5.0	67.8	18.9	32.0	84.0	5.5
Feb-14	18.0	34.1	40.8	123.0	5.0	20.0	18.7	31.1	73.7	5.1
Mar-14	15.9	29.4	168.0	291.0	12.0	54.4	16.6	29.1	42.9	4.0
Apr-14	11.4	26.3	8.2	299.2	4.0	1.0	12.8	25.2	38.1	3.4
May-14	6.1	21.7	17.0	316.2	6.0	11.8	8.7	20.3	44.1	4.1
Jun-14	3.5	18.0	54.6	370.8	12.0	24.0	6.1	16.9	40.2	4.8
Jul-14	0.7	17.4	12.0	382.8	6.0	24.2	4.8	16.1	42.7	4.8
Aug-14	2.4	18.6	90.8	473.6	8.0	4.2	5.9	18.0	35.3	4.7
Sep-14	4.7	22.9	11.0	484.6	3.0	15.8	8.6	21.5	39.7	4.5
Oct-14	9.4	29.8	24.6	509.2	5.0	10.2	12.2	25.2	57.3	5.3
Nov-14	14.2	31.7	16.4	525.6	5.0	21.2	15.1	28.5	69.5	5.7

Whitehaven Coal Mine data

* Gunnedah Resource Centre Station 55024 (BoM 2014)

2 Remote sensing analysis

Rehabilitation Zone	Comment
Control Wood 1	No significant change
Control Wood 2	No significant change
Wood 4	No substantial areas of significant change detected. Linear areas of apparent change in the east of the zone attributed to slight shift in image alignment
Wood 5a	No significant change
Wood 5b	No substantial areas of significant change. Scattered areas of groundcover increase
Wood 6a	No substantial areas of significant change. Scattered areas of groundcover increase
Wood 7c	No substantial areas of significant change. Scattered areas of groundcover increase
Wood 10c	No substantial areas of significant change. Scattered areas of groundcover increase
Burnt_2013	Substantial area of significant change to the east of the zone. Field investigations confirm the change is a natural groundcover response to the 2013 fire event. Scattered areas of groundcover increase across the remainder of the zone.

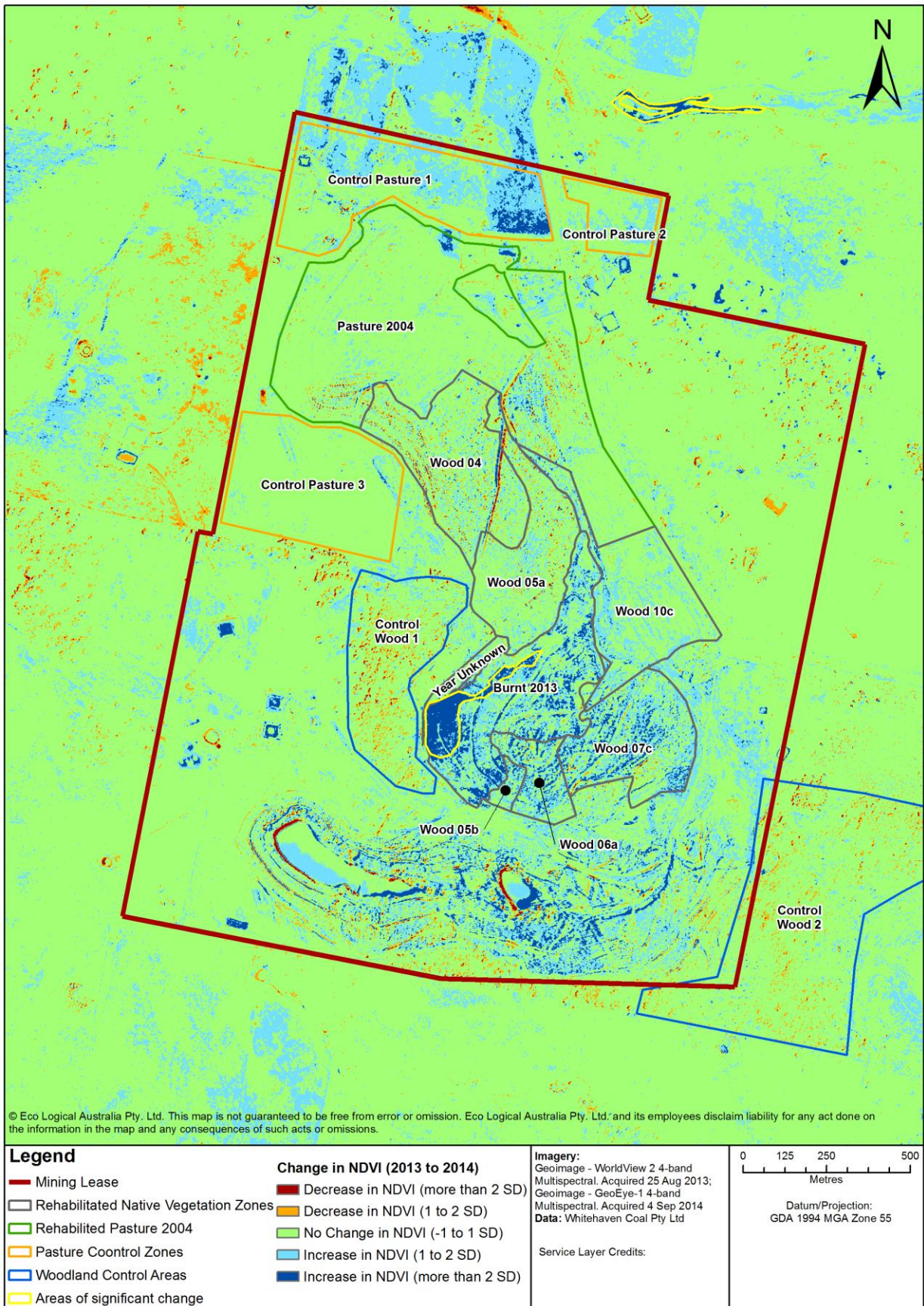


Figure 2-1: NDVI change detection analysis

3 Woodland vegetation monitoring results

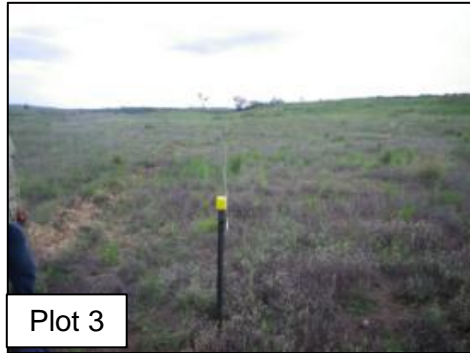
Table 3-1: Non-metric multi-dimensional scaling plot for pasture species composition in in pasture monitoring zones for 2011, 2012 and 2013 monitoring periods (symbolised by monitoring year)

Treatment	Zone	Plot	Start Easting	Start Northing	Date of survey
Rehabilitated woodland	Wood_10c	1B	229675	6596115	18/11/2014
		2B	229774	6596024	18/11/2014
		3	229771	6596171	18/11/2014
		4	229896	6595954	18/11/2014
		5	229740	6595863	18/11/2014
	Wood_07c	16	229821	6595502	17/11/2014
		17	229780	6595743	17/11/2014
		18	229616	6595515	17/11/2014
		19	229667	6595648	17/11/2014
		20	229897	6595639	17/11/2014
	Burnt_2013	21	229560	6595883	18/11/2014
		22	229569	6595737	18/11/2014
		23	229398	6595736	18/11/2014
		46	229265	6595679	17/11/2014
		30	229230	6595533	17/11/2014
	Wood_06a	24	229491	6595561	17/11/2014
		25	229534	6595400	17/11/2014
	Wood_05b	26	229426	6595954	18/11/2014
		27	229482	6596119	18/11/2014
		28	229483	6596294	18/11/2014
		29	229324	6596068	18/11/2014
		48	229429	6595045	18/11/2014
	Wood_04	31	228975	6596539	18/11/2014
		32	229234	6596607	18/11/2014
		33	229232	6596224	18/11/2014
		34	229147	6596433	18/11/2014
		35	229302	6596389	18/11/2014

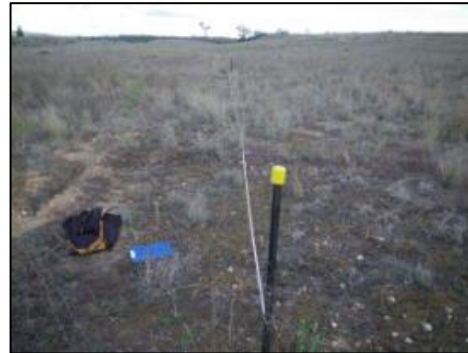
Treatment	Zone	Plot	Start Easting	Start Northing	Date of survey
Control woodland	Control Wood 2	36	230471	6595217	21/11/2014
		37	230521	6595381	21/11/2014
		38	230387	6594823	20/11/2014
		39	230004	6594823	18/11/2014
		40	230264	6595071	20/11/2014
	Control Wood 1	41	229092	6595856	19/11/2014
		42	229060	6595481	20/11/2014
		43	228970	6595744	19/11/2014
		44	229062	6595639	19/11/2014
		45	229093	6595989	19/11/2014

3.1 Plot photographs

2011



2012



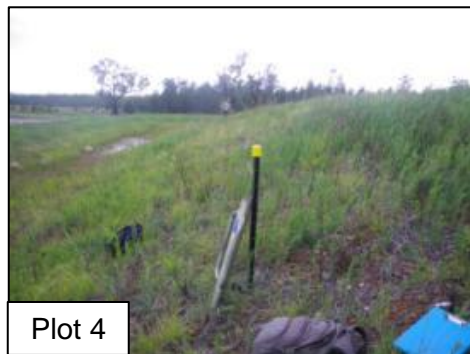
January 2014



November 2014



2011



2012



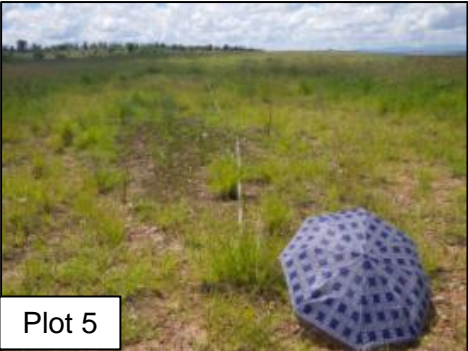
January 2014



November 2014



2011



2012



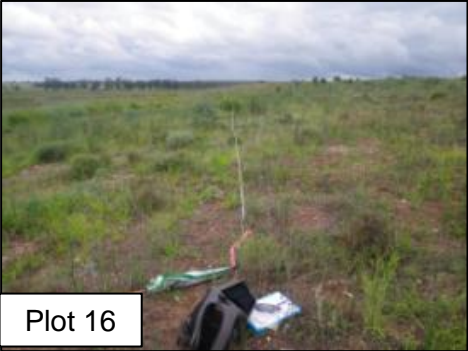
January 2014



November 2014



2011



2012



January 2014



November 2014

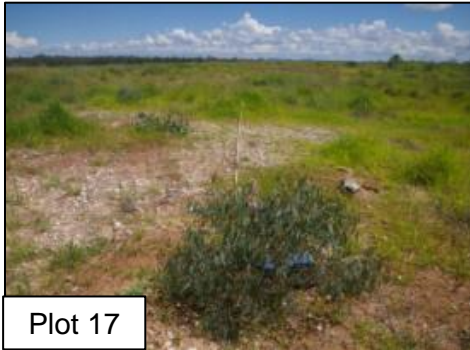


2011

2012

2013

November 2014



Plot 17



2011

2012

2013

November 2014



Plot 18



2011



Plot 19

2012



2013



November 2014



2011



Plot 20

2012



January 2014



November 2014



2011

2012

2013

November 2014

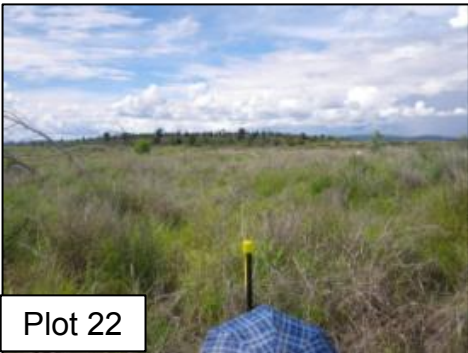


2011

2012

2013

November 2014



2011

2012

2013

November 2014

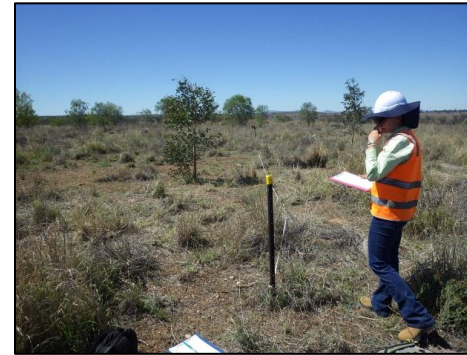


2011

2012

2013

November 2014



2011

2012

2013

November 2014

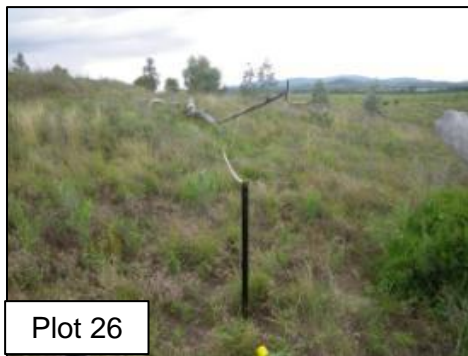


2011

2012

2013

November 2014



2011

2012

January 2014

November 2014

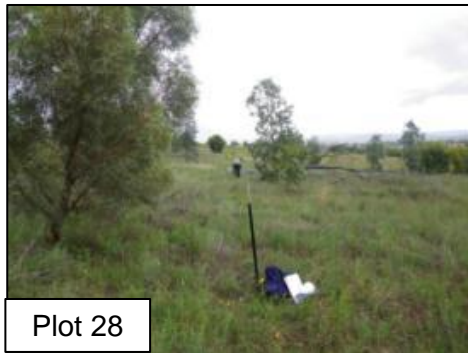


2011

2012

January 2014

November 2014



2011



2012



January 2014



November 2014



2011



2012



January 2014



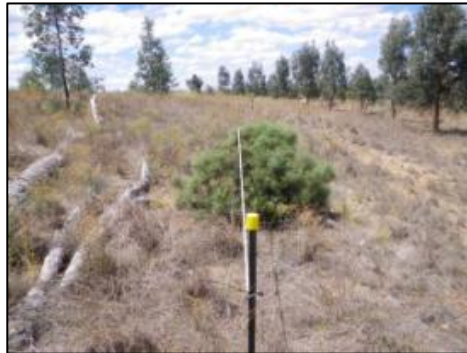
November 2014



2011



2012



January 2014



November 2014



2011



2012



January 2014



November 2014



2011

2012

2013

November 2014



2011

2012

January 2014

November 2014

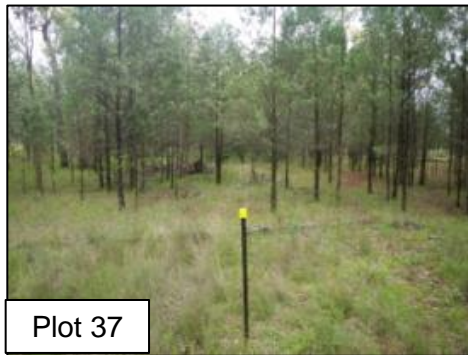


2011

2012

January 2014

November 2014



2011

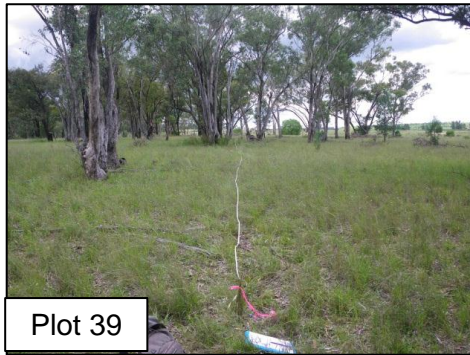
2012

January 2014

November 2014



2011



2012

No image

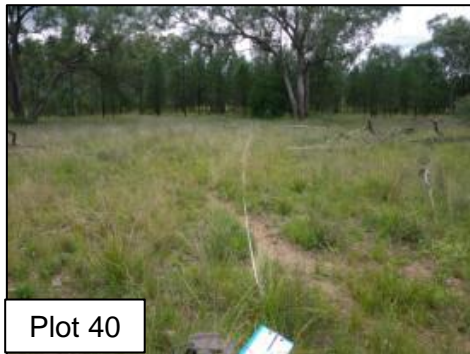
January 2014



November 2014



2011



2012



January 2014



November 2014



2011



2012



2013



November 2014



2011



2012



2013



November 2014



2011



2012



2013



November 2014



2011



2012



2013



November 2014



3.2 Canopy & midstorey information

Table 3-2: Control Wood 1 habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Control Wood 1																				
Plot Number_Monitoring Year		41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014	
Canopy DBH Thresholds	Large Tree ≥	50	-	-	-	60	-	-	-	50	-	-	-	50	-	-	-	50	-	-	-	
	Mature Tree ≥	-	-	-	-	30	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	
	Advanced Regrowth (x cm to x cm)	-	-	-	-	10 x 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sapling ≤ x cm to x cm	-	-	-	-	1 to 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Seedlings < x cm dbh	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Canopy Species and Age Classes	No. of native canopy species	1	1	1	1	1	1	1	1	2	2	-	2	2	2	2	3	1	1	1	1	
	No. of large trees	0	0	0	0	0	0	0	0	0	0	-	0	2	2	2	2	2	2		2	
	Juveniles present (Y/N)	n	n	n	y	y	y	n	y	y	y	y	y	n	y	y	y	y	y	y	y	
	Mature trees present (Y/N)	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y
	Seedlings present (Y/N)	n	n	y	n	-	y	n	n	y	n	y	n	n	n	n	n	n	-	y	y	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y
Coarse Woody Debris (CWD)	Total length of CWD (m)	24	27.5	35	51	86	147.5	209	232	3	1	3	6	105	79	97	233	15	8	47	41	
	No. of sections of CWD	13	12	19	33	35	60	90	93	3	1	3	6	24	29	33	68	7	6	14	19	
Midstorey, Understorey Species	No. of native midstorey species	0	0	0	0	1	1	0	1		1	1	1	3	1	1	3	2	3	4	3	
	No. of native species in ground layer	34	19	19	22	35	17	20	12		19	20	17	37	15	21	24	35	19	20	13	
Transect	% Projected Crown Cover- Canopy Species	72	60	50	74	20	12	12	28	12	6	8	8	58	66	72	68	38	36	42	38	
	% Projected Crown Cover - Midstorey Species	0	0	0	0	4	4	0	4	12	12	8	8	6	6	0	0	10	10	8	10	
	% True Projected Foliage Cover - Canopy	14.8	8.4	6	11	2	1.6	1	3	2.8	0.6	1	1	12.7	8.91	10	12	9.2	5.4	6	6	
	% True Projected Foliage Cover - Midstorey	0	0	0	0	0.4	0.4	0	0.4	2.4	2.4	1	1	0.9	0.6	1	0	1.5	1.75	7	1	

Table 3-3: Control Wood 2 habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Control Wood 2																			
Plot Number_Monitoring Year		36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014
Canopy DBH Thresholds	Large Tree ≥	50	-	-	-	50	-	-	-	50	-	-	-	50	-	-	-	50	-	-	-
	Mature Tree ≥	-	-	-	-	-	-	-	-	30	-	-	-	30	-	-	-	30	-	-	-
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	1	1	1	1	2	2	2	2	3	3	2	3	2	2	2	2	1	1	1	1
	No. of large trees	2	2	0	2	0	0	0	0	1	1	0	1	1	1	0	0	1	1	1	1
	Juveniles present (Y/N)	y	y	y	y	y	y	y	y	y	y	y	n	n	y	y	y	y	y	y	n
	Mature trees present (Y/N)	y	y	y	y	y	-	y	y	y	y	y	y	y	y	y	y	y	y	y	y
	Seedlings present (Y/N)	y	y	y	n	n	y	y	n	y	y	y	n	n	y	y	y	n	y	y	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	y	y	y	y	y	-	y	y	y	y	y	y	y	y	y	y	y	y	y	y
Coarse Woody Debris (CWD)	Total length of CWD (m)	none	2	4	5	27	80	74	97	4	9	6	10	62	28	38	43	99	102	103	138
	No. of sections of CWD	none	2	3	4	8	44	32	50	3	7	4	9	15	15	16	22	42	68	42	76
Midstorey, Understorey Species	No. of native midstorey species	1	2	2	2	3	5	5	4	1	2	2	2	4	2	5	3	2	2	3	2
	No. of native species in ground layer	36	12	15	16	39	11	14	19	35	22	18	12	35	9	17	19	39	25	16	21
Transect	% Projected Crown Cover- Canopy Species	42	40	38	44	16	22	20	16	22	20	14	14	52	40	36	36	28	30	28	26
	% Projected Crown Cover - Midstorey Species	0	0	0	0	52	52	56	56	0	0	0	0	0	0	0	0	20	16.6	24	20
	% True Projected Foliage Cover - Canopy	8	7	5	6	2	4	2	2	3	4	2	3	9	8	5	5	7	8	4	5
	% True Projected Foliage Cover - Midstorey	0	0	2	0	10	13	12	10	0	1	1	0	0	0	2	0	4	3	1	6

Table 3-4: Rehabilitated zone Wood_04 habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Wood_04																			
Plot Number_Monitoring Year		31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014
Canopy DBH Thresholds	Large Tree ≥	Note: No trees along transect but 2 rows of young trees within plot	-	-	-	-	-	-	-	Note: Estimated cover for 20 x 50 m plot 3%	-	-	-	Note: Estimated planted tree cover for 20 x 50 m plot 2%	-	-	-	Note: Estimated planted tree cover for 20 x 50 m plot 5%	-	-	-
	Mature Tree ≥	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Canopy Species and Age Classes	No. of native canopy species	No canopy yet	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	y	n	y	y	y	-	y	y	y	n	y	y	y	y	y	y	y	y	y	y
	Mature trees present (Y/N)	n	n	n	n	n	-	n	n	n	n	n	n	n	n	n	n	n	n	n	n
	Seedlings present (Y/N)	n	n	n	n	n	-	n	n	n	n	n	n	n	n	n	n	n	n	y	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	y	y	n	n	-	y	n	n	y	y	y	n	y	y	n	n	y	y	n
Coarse Woody Debris (CWD)	Total length of CWD (m)	14, deliberately imported	54.5	58	54	113	-	89	192	53	55	37	48	51	51	55	67	none	0	0	5
	No. of sections of CWD	8	22	17	26	30	-	34	95	6	11	6	10	14	16	16	28	none	0	0	4
Midstorey, Understorey Species	No. of native midstorey species	none - but young trees sort of making a midstorey	4	6	5	-	-	4	4	0	3	5	5	3 (inc. sml trees)	3	4	4	5 -planted	4	8	7
	No. of native species in ground layer	0	19	13	14	14	-	12	12	25	21	14	13	31	19	15	12	22	22	17	7
Transect	% Projected Crown Cover- Canopy Species	-	0	0	0	6	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0
	% Projected Crown Cover - Midstorey Species	-	0	0	0	-	-	8	0	-	0	0	0	-	0	0	0	-	0	4	4
	% True Projected Foliage Cover - Canopy	0	0	0	0	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0	6	0	0	1.4	4	0	0	5	4	0	0	8	4	0	0	8	10	0.4

Table 3-5: Rehabilitated zone Wood_05a habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Wood_05a																	
Plot Number_Monitoring Year		26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014
Canopy DBH Thresholds	Large Tree ≥	Note: Cover of trees in plot is ~ 1%	-	-	-	Note: Cover of trees in plot is ~ 3%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mature Tree ≥	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y
	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
	Seedlings present (Y/N)	n	n	y	n	n	n	n	n	n	n	y	n	n	n	n	n	y	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	y	y	n	n	n	n	n	n	y	y	y	n	y	y	n	n	n
Coarse Woody Debris (CWD)	Total length of CWD (m)	37	126	106	139	64	17	13	45	72	77	58	80	10	10	9	27	17	17
	No. of sections of CWD	13	41	38	52	17	6	3	16	21	29	16	38	8	9	8	23	9	7
Midstorey, Understorey Species	No. of native midstorey species	1, plus planted Eucs	4	3	4	-	4	6	6	0	3	3	5	3	5	5	5	5	6
	No. of native species in ground layer	24	22	15	11	19	17	9	13	22	18	17	15	35	23	23	16	16	6
Transect	% Projected Crown Cover- Canopy Species	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	0	0
	% Projected Crown Cover - Midstorey Species	-	4	4	4	-	0	0	0	-	0	4	4	-	0	0	0	0	0
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0.2	8	0.4	0	3	2	0	0	5	2	1	0	2	2	0	6	0

Table 3-6: Rehabilitated zone Wood_06a habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Wood_06a							
Plot Number_Monitoring Year		24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014
Canopy DBH Thresholds	Large Tree ≥	Planted trees on site 1.5 - 2 m tall, covers ~2% of plot	-	-	-	No planted trees	-	-	-
	Mature Tree ≥	-	-	-	-	-	-	-	-
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	y	y	y	y	n	n	n	n
	Mature trees present (Y/N)	n	n	n	n	n	n	n	n
	Seedlings present (Y/N)	n	n	n	n	n	n	n	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	y	y	n	n	n	n	n
Coarse Woody Debris (CWD)	Total length of CWD (m)	19	11	8	14	4	3	1	2
	No. of sections of CWD	5	3	3	7	3	2	1	2
Midstorey, Understorey Species	No. of native midstorey species	15	2	2	5	0	0	0	0
	No. of native species in ground layer	2	14	16	12	14	5	8	9
Transect	% Projected Crown Cover- Canopy Species	0	0	10	0	0	0	0	0
	% Projected Crown Cover - Midstorey Species	0	4	10	8	0	0	0	0
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0.8	3	1	0	0	0	0

Table 3-7: Fire impact area Burnt_2013 habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Burnt_2013																		
Plot Number_Monitoring Year		21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	
Canopy DBH Thresholds	Large Tree ≥	-	-	-	-	-	-	-	-	Note: Very weedy site and no trees planted in plot	-	-	-	-	-	-	-	-	-	-
	Mature Tree ≥	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	y	y	n	y	y	y	n	y	y	n	n	n	n	n	y	n	y	n	n
	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	n	n	n	y	n	n	n	n	n	n
	Seedlings present (Y/N)	n	n	n	y	n	n	n	y	n	n	n	n	y	n	n	n	n	n	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Coarse Woody Debris (CWD)	Total length of CWD (m)	0	0	0	0	22	67	55	75	22	55	20	19	15	32	30	32	49	47.5	
	No. of sections of CWD	0	0	0	0	5	19	20	29	5	26	7	7	4	12	16	18	17	12	
Midstorey, Understorey Species	No. of native midstorey species	0	5	3	6	1	2	0	2	0	0	0	1	1	1	0	2	0	0	
	No. of native species in ground layer	4	3	1	5	5	4	2	13	8	4	0	7	0	12	4	17	4	17	
Transect	% Projected Crown Cover- Canopy Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	% Projected Crown Cover - Midstorey Species	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	% True Projected Foliage Cover - Midstorey	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	

Table 3-8: Rehabilitated zone Wood_07c habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Wood_07c																				
Plot Number_Monitoring Year		16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014	
Canopy DBH Threshold	Large Tree ≥	Overall tree cover is ~2%	-	-	-	Overall tree cover is ~2%	-	-	-	One planted tree 2 m tall	-	-	-	-	-	-	-	Overall tree cover ~5 %	-	-	-	
	Mature Tree ≥	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	No. of large trees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Juveniles present (Y/N)	y	y	y	y	y	y	y	y	n	n	n	n	y	y	y	y	y	y	y	y	
	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
	Seedlings present (Y/N)	n	y	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	y		y
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	n	n	n	n	y	y	n	n	n	y	n	n	y	y	n	n	n	n	n	n
Coarse Woody Debris (CWD)	Total length of CWD (m)		0.5	0	2	7	5	6	6	91	297	263	138	none	0	2	0	1	0	0	0	
	No. of sections of CWD		1	0	2	1	1	1	1	19	91	84	37		0	2	0	1	0	0	0	
Midstorey, Understorey Species	No. of native midstorey species	1 (planted)	5	5	4	0	2	4	6	1 (planted)	1	1	1	1 (planted)	3	5	6	1 (planted?)	4	7	7	
	No. of native species in ground layer	29	12	17	12	4	2	1	3	23	15	16	16	16	4	12	9	11	8	6	6	
Transect	% Projected Crown Cover- Canopy Species		0	0	0	-	0	0	0	-	0	0	0	-	0	0	0		0	0	0	
	% Projected Crown Cover - Midstorey Species	4	4	8	6	-	0	4	4	-	0	0	0	-	0	0	4	2	4	16	16	
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	% True Projected Foliage Cover - Midstorey	2	1.2	4	2	0	0.4	1.2	1	0	0	1	0	0	2	3	0.4	0.2	0.8	3	2	

Table 3-9: Rehabilitated zone Wood_10c habitat characteristics (2011, 2012, 2013 and 2014)

Monitoring Zone		Wood_10c															
Plot Number_Monitoring Year		1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014
Canopy DBH Thresholds	Large Tree ≥	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mature Tree ≥	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy Species and Age Classes	No. of native canopy species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	n	n	n	n	n	n	n	y	n	n	n	n	n	n	n	n
	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
	Seedlings present (Y/N)	n	n	n	n	n	y	n	n	n	n	n	n	n	n	n	n
	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Coarse Woody Debris (CWD)	Total length of CWD (m)	0	9	0	0	-	0	0	0	-	0	0	0	-	0	0	0
	No. of sections of CWD	0	9	0	0	-	0	0	0	-	0	0	0	-	0	0	0
Midstorey, Understorey Species	No. of native midstorey species	0	0	0	0	-	1	1	5	-	0	0	0	-	0	0	0
	No. of native species in ground layer	11	3	7	8	-	15	13	7	9	17	5	8	8	1	4	6
Transect	% Projected Crown Cover- Canopy Species	0	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0
	% Projected Crown Cover - Midstorey Species	0	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0

Table 3-10: Average True Projected Foliage Cover (%) of plots within each monitoring zone (2011, 2012, 2013 and 2014)

Monitoring zone	Average True Projected Foliage Cover (%)			
	2011	2012	2013	2014
Burnt_2013	0	0.6	0.2	0.2
Wood_10c	0	0	0.2	0
Wood_07c	0.44	0.88	3	1.08
Wood_05a	0	4.04	4	0.28
Wood_04	0	4.48	5.6	0.08
Control Wood 2	2.72	3.40	3.6	3.2
Control Wood 1	1.04	1.03	1.8	0.28

3.3 Overstorey and midstorey cover scores (20 x 50 m woodland plots)

Table 3-11: Overstorey and midstorey cover scores in 20 x 50 m Woodland Plots (Wood_10c and Wood_07c) for 2011, 2012, 2013 and 2014 (note plots 1b and 2b established in 2013)

Midstorey / Overstorey	Species	Wood_10_c																Wood_7c																						
		1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014			
M	<i>Acacia deanei</i> Green Wattle						1	1	1																			1	2		2	1								
M	<i>Acacia decora</i> Western Silver Wattle																																							
M	<i>Acacia filicifolia</i> Fern-leaved Wattle																																							
M	<i>Acacia fimbriata</i> Fringed Wattle																																							
M	<i>Acacia floribunda</i> White Sally Wattle																																							
M	<i>Acacia homalophylla</i> Yarran																																							
M	<i>Acacia longifolia</i>																																							
M	<i>Acacia mearnsii</i> Black Wattle																																							
M	<i>Acacia pendula</i> Weeping Myall																	1	1	1	1	1													1	1	2	1		
M	<i>Acacia salicina</i> Cooba																		2	2	1					1		1		2	2				3	3	1			
M	<i>Acacia saligna?</i> Golden Wreath Wattle																																							
M	<i>Acacia sp.</i>																																							
M	<i>Alectryon oleifolius</i> Western Rosewood																	1											1						2					
M	<i>Alstonia constricta</i> Bitter Bark																																							
M	<i>Brachychiton populneus</i> Kurrajong								1																															
M	<i>Callitris glaucophylla</i> White Cypress Pine																																							
M	<i>Casuarina cristata</i> Belah																																					1	1	
M	<i>Clematis microphylla</i> Small-leaved Clematis																																							
M	<i>Dodonaea viscosa</i> Sticky Hop-bush																																					2		
M	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i>																																							
M	<i>Dodonaea viscosa</i> subsp. <i>cuneata</i> Wedge-leaf Hop-bush																																							1
M	<i>Dodonaea sp.</i>																																						1	
M	<i>Eucalyptus albens</i> White Box																																						1	
M	<i>Eucalyptus blakelyi</i> Blakely's Red Gum																					2	2	2		1	2	2				1	1	1				1		
M	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark																																			1	1		2	1
N	<i>Eucalyptus fibrosa?</i> Red Ironbark																																							

Midstorey / Overstorey	Species	Wood_10_c																Wood_7c																																		
		1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014															
M	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark								1																																											
M	<i>Eucalyptus microcarpa</i> Grey Box																				2																								2							
M	<i>Eucalyptus melliodora</i> Yellow Box																				2				1	1	2												1	2	1											
M	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box												1																																	1	1	1				
M	<i>Eucalyptus sideroxylon</i> Mugga Ironbark																																																			
M	<i>Eucalyptus viridis</i> Green Mallee																																																			
M	<i>Eucalyptus</i> sp. (unknown) (Gum)																																																			
M	<i>Eucalyptus</i> sp. (unknown) (flakey bark)																																																			
M	<i>Eucalyptus</i> sp. (unknown) (stringy bark)																																																			
M	<i>Eucalyptus</i> sp. (unknown) (ironbark)																																																			
M	<i>Geijera parviflora</i> Wilga																																																			
M	<i>Jasminum lineare</i> Desert Jasmine																																																			
M	* <i>Lycium ferocissimum</i> African Boxthorn																																																			
M	<i>Myoporum montanum</i> Western Boobialla																																																			
M	<i>Notelaea microcarpa</i> Native Olive																																																			
M	<i>Pimelea neo-anglica</i> Poison Pimelea																																																			
M	<i>Parsonia eucalyptophylla</i> Gargaloo																																																			
O	<i>Brachychiton populneus</i> Kurrajong																																																			
O	<i>Callitris glaucophylla</i> White Cypress Pine																																																			
O	<i>Casuarina cristata</i> Belah																																																			
O	<i>Eucalyptus albens</i> White Box																																																			
O	<i>Eucalyptus blakelyi</i> Blakely's Red Gum																																																			
O	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark																																																			
O	<i>Eucalyptus fibrosa?</i> Red Ironbark																																																			
O	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark																																																			
O	<i>Eucalyptus melliodora</i> Yellow Box																																																			
O	<i>Eucalyptus microcarpa</i> Grey Box																																																			
O	<i>Euc. Moluccana / albens</i>																																																			

Midstorey / Overstorey	Species	Wood_10_c																Wood_7c																							
		1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014				
O	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box																					1																1			
O	<i>Eucalyptus</i> sp. (unknown)																	1	1											1											
O	Var. planted Euc sp.																																								
Total Species		0	0	0	0	0	1	1	5	0	0	0	0	0	0	0	7	5	5	3	5	2	4	2	1	1	1	2	8	3	6	5	8	4	7	7					

Table 3-12: Overstorey and midstorey cover scores in 20 x 50 m Woodland Plots (Burnt_2013 and Wood_06a) for 2011, 2012, 2013 and 2014 (note plot 46 established in 2013)

Midstorey / Overstorey	Species	Burnt_2013													Wood_06a												
		21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014
M	<i>Acacia deanei</i> Green Wattle																			1			1				
M	<i>Acacia decora</i> Western Silver Wattle																										
M	<i>Acacia filicifolia</i> Fern-leaved Wattle																										
M	<i>Acacia fimbriata</i> Fringed Wattle																										
M	<i>Acacia floribunda</i> White Sally Wattle																										
M	<i>Acacia homalophylla</i> Yarran																										
M	<i>Acacia longifolia</i>																										
M	<i>Acacia mearnsii</i> Black Wattle																										
M	<i>Acacia pendula</i> Weeping Myall																										
M	<i>Acacia salicina</i> Cooba	1	2		2				1												2	2	1				
M	<i>Acacia saligna?</i> Golden Wreath Wattle																			1							
M	<i>Acacia</i> sp.																										
M	<i>Alectryon oleifolius</i> Western Rosewood																										
M	<i>Alstonia constricta</i> Bitter Bark																										
M	<i>Brachychiton populneus</i> Kurrajong																										
M	<i>Callitris glaucophylla</i> White Cypress Pine	1																									
M	<i>Casuarina cristata</i> Belah		1		1																						
M	<i>Clematis microphylla</i> Small-leaved Clematis																										
M	<i>Dodonaea viscosa</i> Sticky Hop-bush						1								1												
M	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i>					1																	1				
M	<i>Dodonaea viscosa</i> subsp. <i>cuneata</i> Wedge-leaf Hop-bush													1		1											
M	<i>Dodonaea</i> sp.																										
M	<i>Eucalyptus albens</i> White Box																										
M	<i>Eucalyptus blakelyi</i> Blakely's Red Gum		1		1																2	1	1				
M	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark																										
N	<i>Eucalyptus fibrosa?</i> Red Ironbark																										
M	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark		2	1	1		1		1														1				

Midstorey / Overstorey	Species	Burnt_2013													Wood_06a												
		21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014
M	<i>Eucalyptus microcarpa</i> Grey Box																										
M	<i>Eucalyptus melliodora</i> Yellow Box				1																						
M	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box		2	1	1																						
M	<i>Eucalyptus sideroxylon</i> Mugga Ironbark																										
M	<i>Eucalyptus viridis</i> Green Mallee																										
M	<i>Eucalyptus</i> sp. (unknown) (Gum)			1													1										
M	<i>Eucalyptus</i> sp. (unknown) (flakey bark)																										
M	<i>Eucalyptus</i> sp. (unknown) (stringy bark)																										
M	<i>Eucalyptus</i> sp. (unknown) (ironbark)																										
M	<i>Geijera parviflora</i> Wilga																										
M	<i>Jasminum lineare</i> Desert Jasmine																										
M	* <i>Lycium ferocissimum</i> African Boxthorn																				1						
M	<i>Myoporum montanum</i> Western Boobialla																										
M	<i>Notelaea microcarpa</i> Native Olive																										
M	<i>Pimelea neo-anglica</i> Poison Pimelea																										
M	<i>Parsonsia eucalyptophylla</i> Gargaloo																										
O	<i>Brachychiton populneus</i> Kurrajong																										
O	<i>Callitris glaucophylla</i> White Cypress Pine																										
O	<i>Casuarina cristata</i> Belah	1																									
O	<i>Eucalyptus albens</i> White Box																										
O	<i>Eucalyptus blakelyi</i> Blakely's Red Gum	1																				1					
O	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark																										
O	<i>Eucalyptus fibrosa?</i> Red Ironbark																										
O	<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark					1																					
O	<i>Eucalyptus melliodora</i> Yellow Box																					1					
O	<i>Eucalyptus microcarpa</i> Grey Box																										
O	<i>Euc. Moluccana/albens</i>																										
O	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i> Bimble Box	1																									

Midstorey / Overstorey	Species	Burnt_2013													Wood_06a												
		21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014
O	<i>Eucalyptus</i> sp. (unknown)																										
O	Var. planted Euc sp.																										
Total species		5	5	3	6	2	2	0	2	0	0	0	0	1	1	0	2	0	0	5	2	2	5	0	0	0	0

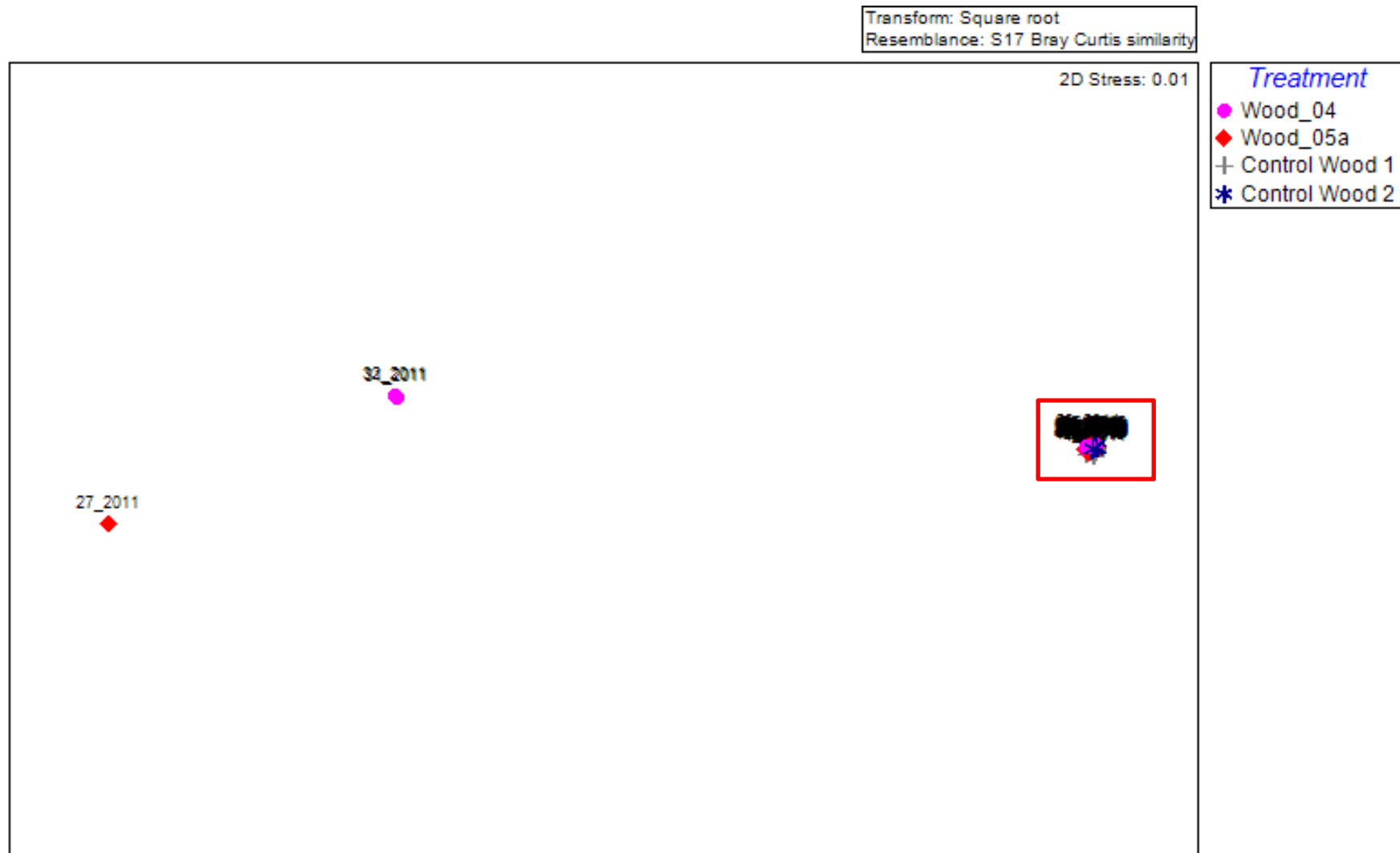


Figure 3-1: nMDS of midstorey and canopy species composition in Wood_04 and Wood_05a (red square indicates data captured in nMDS subset in Figure 3-2)

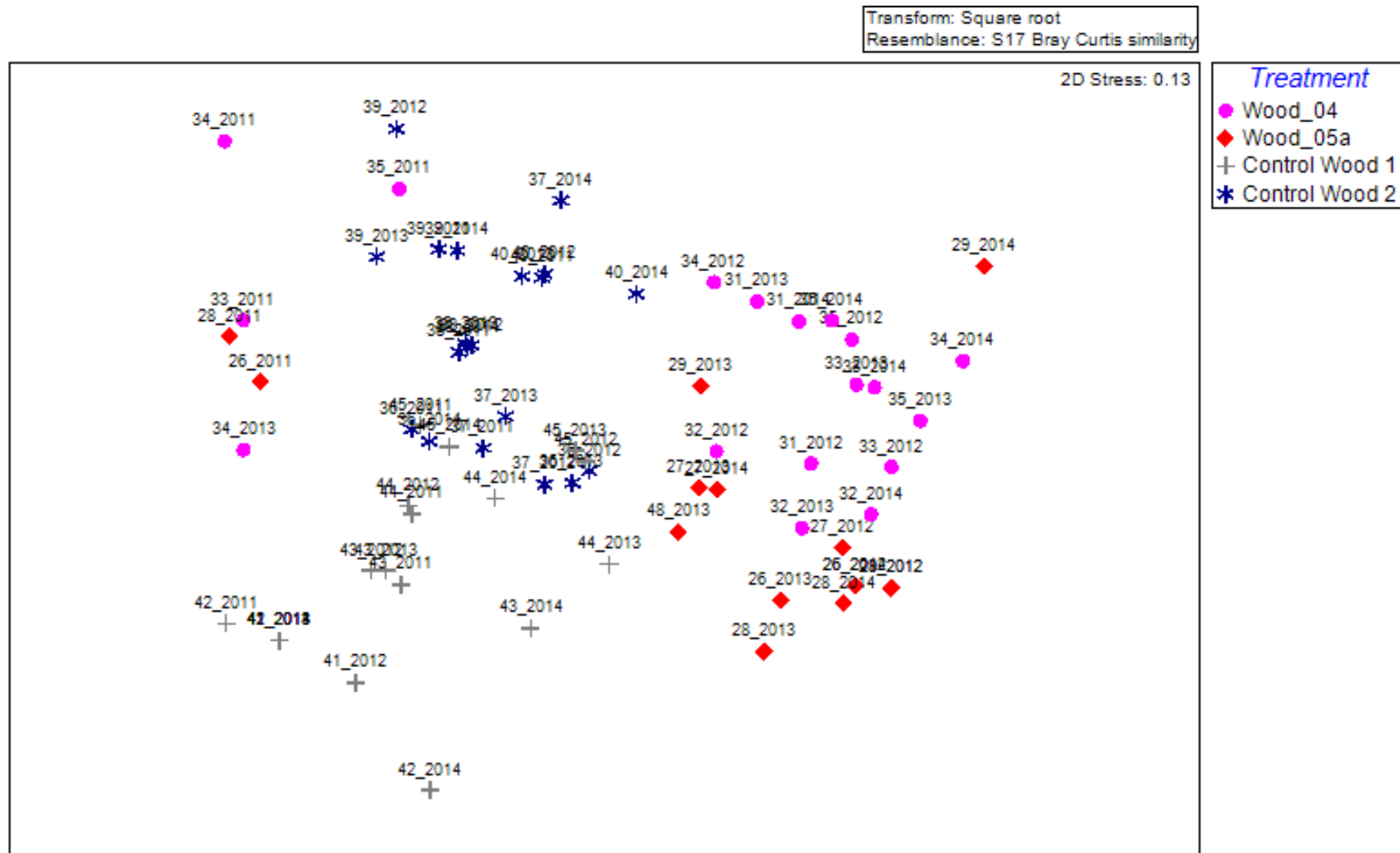


Figure 3-2: nMDS subset of midstorey and canopy species composition in Wood_04 and Wood_05a.

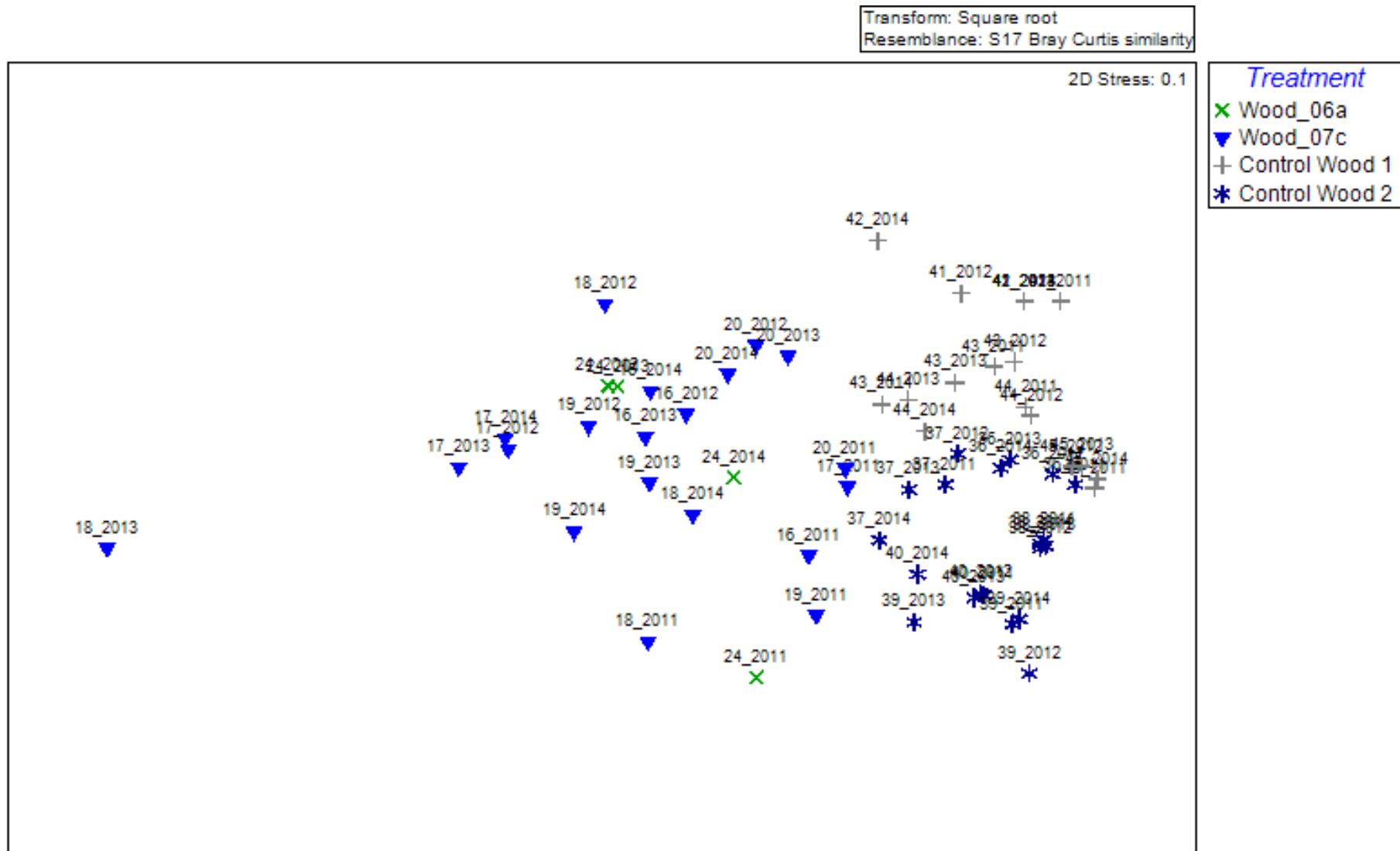


Figure 3-3: nMDS of midstorey and canopy species composition in Wood_06a and Wood_07c.

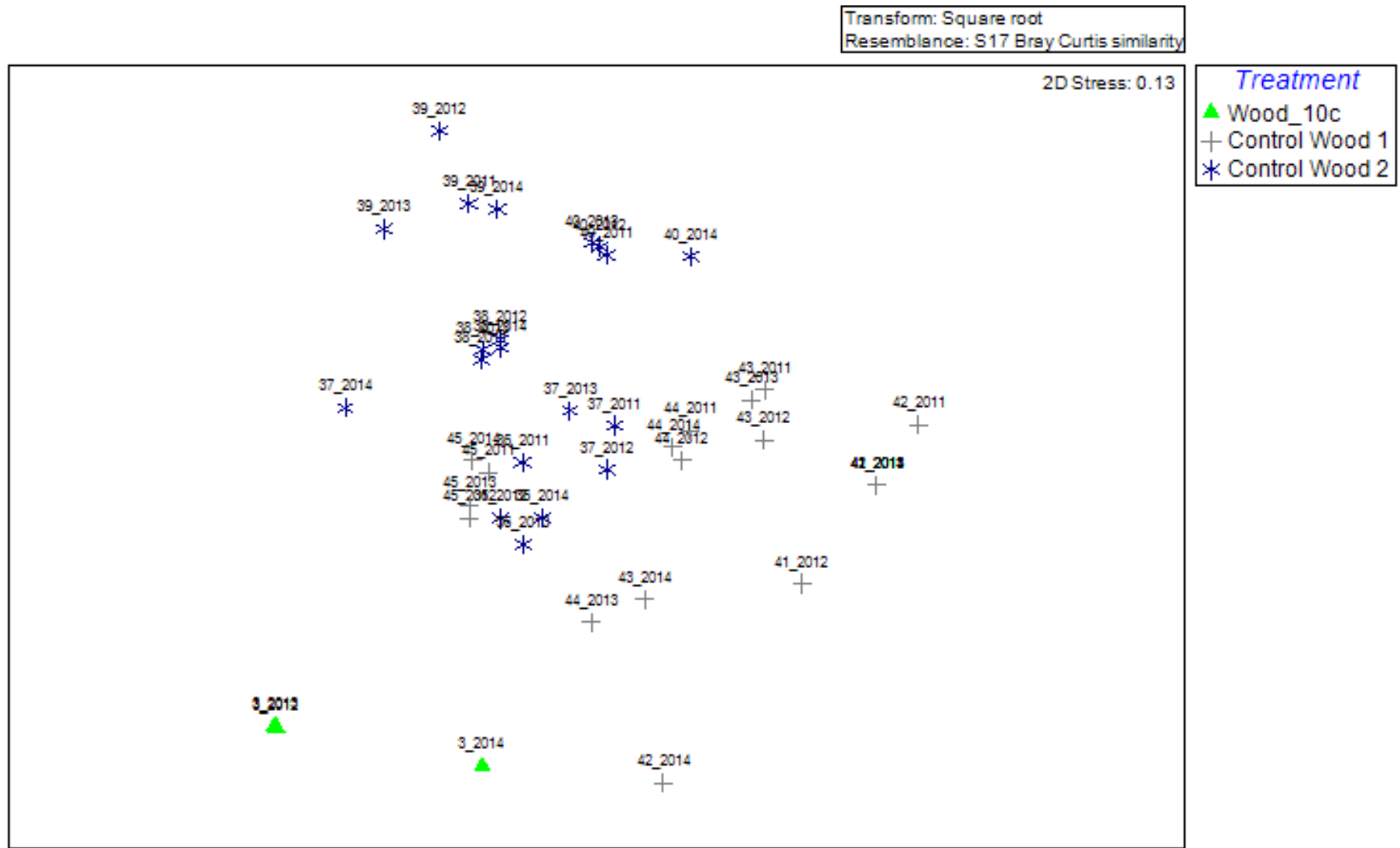


Figure 3-4: nMDS of midstorey and canopy species composition in Wood_10c.

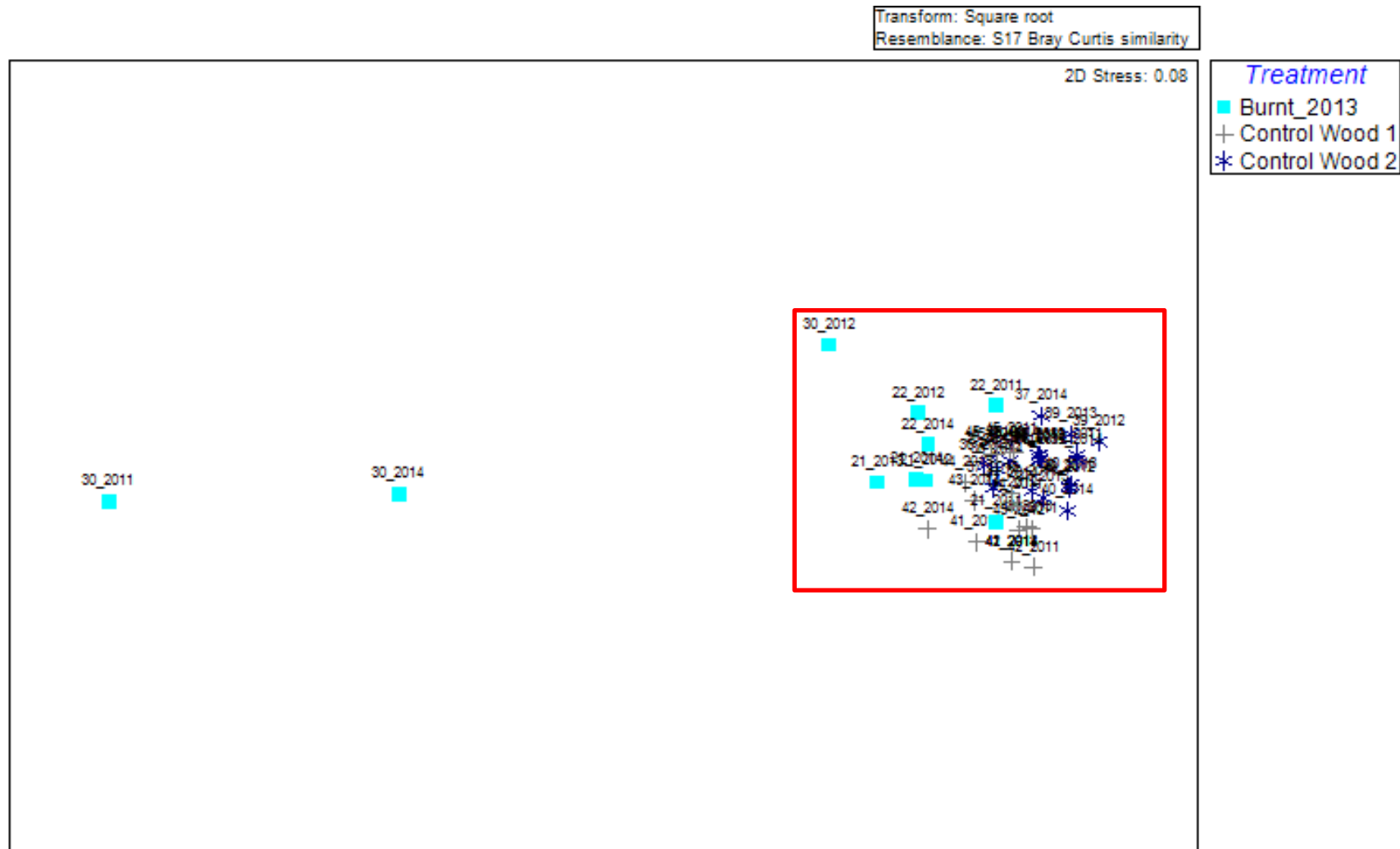


Figure 3-5: nMDS of midstorey and canopy species composition in Burnt_2013 (red square indicates data captured in nMDS subset in Figure 3-6)

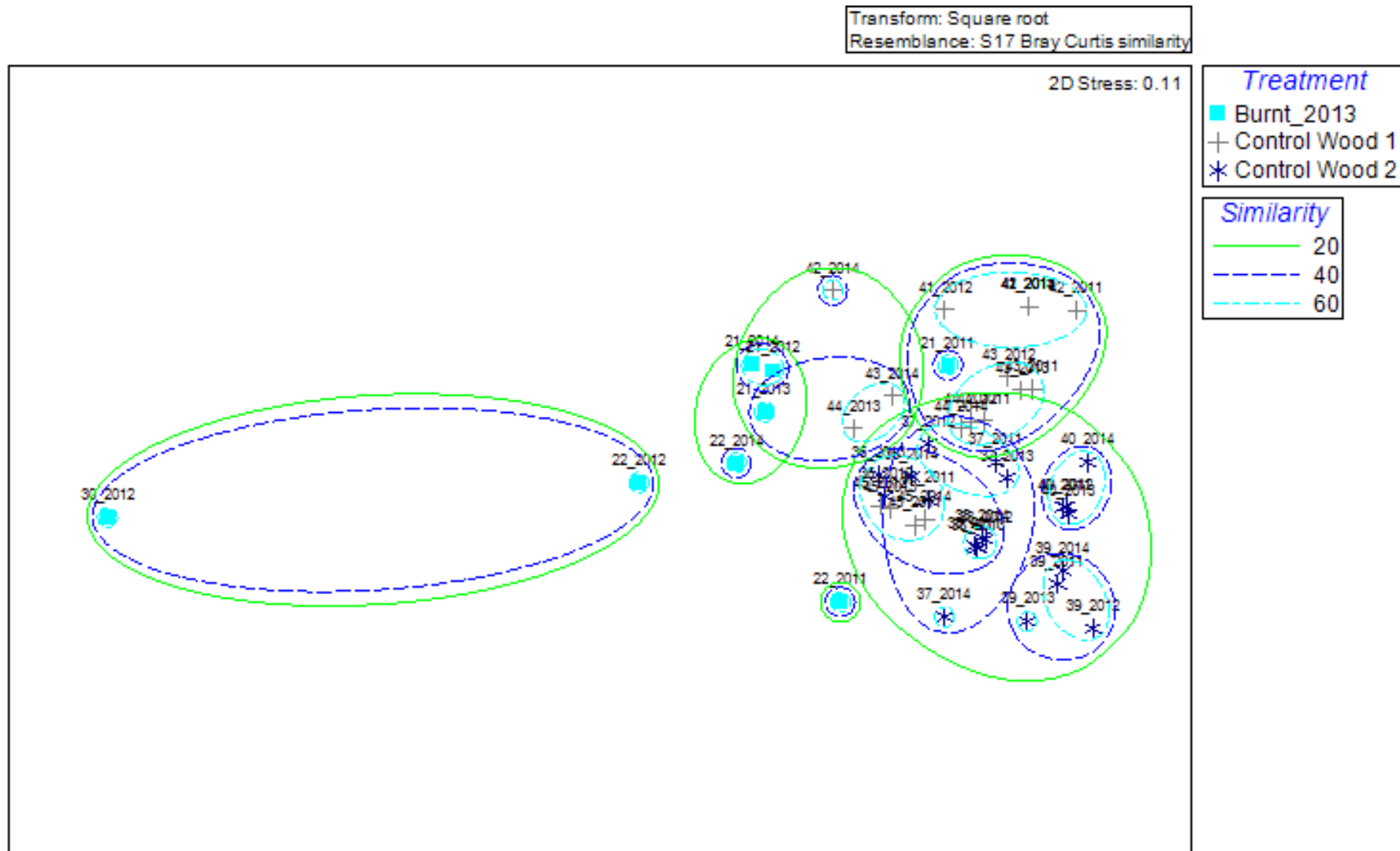


Figure 3-6: nMDS subset of midstorey and canopy species composition in Burnt_2013.

3.4 Tree & shrub species >1 m tall in 20 x 20 m plots

Table 3-13: Overstorey and midstorey cover scores in 20 x 20 m Woodland Plots located in Wood_10c and Wood_07c for 2011, 2012, 2013 and 2014 monitoring periods (note plots 1b and 2b established in 2013)

Species	Wood_10c																Wood_07c																				
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014	
<i>Acacia deanei</i> Green Wattle						1	1	1																				1									
<i>Acacia decora</i> Western Silver Wattle																																					
<i>Acacia floribunda</i> White Sally Wattle																																					
<i>Acacia homalophylla</i> Yarran																																					
<i>Acacia longifolia</i>																																					
<i>Acacia pendula</i> Weeping Myall																	1	1	1	1					1										1	2	1
<i>Acacia salicina</i> Native Willow																		1	2	1				1						2	1	2		2	3	2	
[^] <i>Acacia filicifolia</i> Fern-leaved Wattle																																					
<i>Acacia mearnsii</i> Black Wattle Wattle																																					
<i>Alectryon oleifolius</i> Western Rosewood																												1					2				
<i>Alstonia constricta</i> Quinine Tree																																					
<i>Brachychiton populneus</i> Kurrajong								1									1	1															1				
<i>Callitris glaucophylla</i> White Cypress Pine																																					
<i>Clematis microphylla</i> Small-leaved clematis																																					
<i>Dodonaea viscosa subsp. angustifolia</i> Sticky Hop-bush																																					
<i>Dodonaea viscosa</i> Sticky Hop-bush																																		1			1
<i>Dodonaea viscosa subsp. cuneata</i> Wedge-leaf Hop-bush																																					
<i>Eucalyptus albens</i> White Box																	1					1												1			
<i>Eucalyptus blakelyi</i> Blakely's Red Gum																	1				1								1	1							
[^] <i>Eucalyptus albens</i> White Box																																					
[^] <i>Eucalyptus blakelyi</i> Blakely's Red Gum																		2	1	2		1	2	1							1	2				2	
[^] <i>Eucalyptus crebra</i> Narrow-leaved Ironbark																					1						1				1	2		1			1
[^] <i>Eucalyptus fibrosa</i> Red Ironbark																																					
<i>Eucalyptus melanophloia</i> Silver-leaved Ironbark																																					
<i>Eucalyptus melliodora</i> Yellow Box																			1			1	1	1					1	1	2	2					

Species	Wood_10c																Wood_07c																					
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014		
<i>Eucalyptus microcarpa</i> Grey Box																																					2	
<i>Eucalyptus moluccana/albens</i> <i>Eucalyptus populnea subsp. bimbil</i> Poplar Box																																						
<i>Eucalyptus sideroxylon</i> Mugga Ironbark																																						
<i>Eucalyptus viridis</i> Green Mallee																								1														
<i>Eucalyptus sp. (unknown)</i> <i>Geijera parviflora</i> Wilga								1												1				1														
* <i>Lycium ferocissimum</i> African Boxthorn					1	1	1	1																	1				1		1							
<i>Parsonia eucalyptophylla</i> Gargaloo																																						
Total Number of Species		0		0	1	2	2	4	0	0	0	0	0	0	0	0	4	4	4	4	3	2	2	6	1	0	0	1	5	3	4	3	6	4	4	6		

*Denotes exotic species; ^Species uncertain at present growth stage
 Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

Species	Wood_10_c														Wood_7c																						
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014	
* <i>Centaurea melitensis</i> Maltese Cockspur	2		1	2	2		2	3		1	1	3				1	2	2	2	3	2		2	2	1	2	2	3		1	2	3	1			2	
* <i>Centaurea solstitialis</i> St Barnaby's Thistle									1			2				1								1	1	1		1									
* <i>Centaurea</i> sp.																																					
* <i>Centaurium erythraea</i> Common Centaury																																					
* <i>Centaurium</i> sp.									1				2															1					1				
<i>Chamaesyce</i> sp.				1	2	2	1			1																											
<i>Cheilanthes distans</i> Bristly cloak fern																																					
<i>Cheilanthes sieberi</i>																																					
<i>Chenopodium desertorum</i>																																					
<i>Chenopodium pumilio</i> Small Crumbweed																																					
* <i>Chloris gayana</i> Rhodes Grass	3		4	2		3	2		3	4	4	4	5	5	4	4		2	2		4	5	4	4	3	3	4	4	5	5	4	4	4	4	4	3	
<i>Chloris pectinata</i> Comb Chloris																																					
<i>Chloris truncata</i> Windmill grass					2	2		1					1				1								3				1								
<i>Chloris ventricosa</i> Plump Windmill Grass																	1	2	2	2																	
* <i>Chondrilla juncea</i> Skeleton Weed	1				1	2											1																				
<i>Chrysocephalum apiculatum</i> Yellow Buttons																																					
* <i>Cirsium vulgare</i> Spear Thistle						1				1						1	1								1	1					1	1	1	1		1	
<i>Convolvulus graminetinus</i>	1					1			1	1							1		1										1		1						
* <i>Conyza bonariensis</i> Flaxleaf Fleabane	1				1	2			4				2				2				2				2			2	1	1							
* <i>Conyza parva</i>		1								2																									1		
* <i>Conyza</i> sp.																																					
<i>Cotula australis</i> Common Cotula																																					
* <i>Cyclosporum leptophyllum</i> Slender Celery									2		1	1			1		2	1				1	1	2	2	2	1	2	2			2					
<i>Cymbopogon refractus</i> Barbed Wire Grass																																1					
<i>Cynodon dactylon</i> Couch										2								2				1															
<i>Cyperus concinnus</i>										1		1																									
<i>Cyperus fulvus</i> Sticky Sedge																																					
<i>Cyperus gracilis</i> Slender Flat-sedge																																					

Species	Wood_10_c														Wood_7c																									
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014				
<i>Enteropogon acicularis</i>							2																			1			1											
<i>Enteropogon</i> sp.																																								
<i>Eragrostis alveiformis</i>																																								
<i>Eragrostis brownii</i> Brown's Lovegrass																																								
<i>Eragrostis elongata</i> Clustered Lovegrass																																								
<i>Eragrostis lacunaria</i> Bristly Love-grass																																								
<i>Eragrostis leptostachya</i> Paddock Lovegrass																																								
<i>Eragrostis parviflora</i> Weeping Lovegrass																																								
<i>Eragrostis setifolia</i> Bristly Love-grass																																								
<i>Eragrostis</i> sp.																										1														
<i>Eremophila debilis</i> Winter Apple																																								
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass					2			1		2		1					3		2	1					3									2						
<i>Eriochloa</i> sp.																																								
<i>Erodium crinitum</i> Blue Storksbill				2																						1														
<i>Euchiton</i> sp.																								1																
<i>Euchiton sphaericus</i>								2	1			1													2															
<i>Eulalia aurea</i> Silky Browntop																																								
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>																																								
<i>Fimbristylis dichotoma</i> Common Fringe-sedge																																								
* <i>Galenia pubescens</i> Galenia			2	2							1	1																												
<i>Geijera parviflora</i>																																								
<i>Geranium solanderi</i> Native Geranium																													1											
<i>Glossogyne tannensis</i>							1																																	
<i>Glycine clandestina</i>	1																1												1											
<i>Glycine tabacina</i>														1															1											
* <i>Gomphocarpus fruticosus</i> Narrow-leaved Cotton Bush					1		1	1																																
* <i>Gomphocarpus</i> sp.																																								
* <i>Gomphrena celosioides</i> Gomphrena Weed																																								

Species	Wood_10_c														Wood_7c																							
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014		
<i>Gonocarpus elatus</i>																										1												
<i>Goodenia cycloptera</i>																																						
<i>Goodenia fascicularis</i>																	2																	1				
<i>Goodenia glabra</i>																																						
<i>Goodenia pinnatifida</i>																																						
<i>Gypsophila tubulosa</i> Annual Chalkwort																	1	2																				
<i>Haloragis heterophylla</i> Rough Raspwort										1																												
* <i>Hedypnois rhagadioloides</i> subsp. <i>cretica</i> Cretan Weed																																						
* <i>Helianthus</i> sp. Sunflower																																						
<i>Hibiscus trionum</i>																																						
* <i>Hordeum</i> sp. Barley Grass																																						
* <i>Hyparrhenia hirta</i> Coolatai Grass						3																																
* <i>Hypochaeris microcephala</i> White Flatweed			1													1							2						1									
* <i>Hypochaeris radicata</i> Flatweed																																						
<i>Jasminum suavissimum</i>																																						
<i>Juncus</i> sp.																											1											
<i>Juncus usitatus</i> Pinrush										1																												
<i>Lachnagrostis filiformis</i> Blown Grass					2						1				1														1					1				
* <i>Lactuca saligna</i> Willow-leaved Lettuce					1							1			1	2	1					1	1	1	1				1	2		1						
* <i>Lactuca serriola</i> Prickly Lettuce						1		3	1		2	1		1	2	1			1				1	2	2			2	1	2	1					1		
* <i>Lepidium africanum</i>				1	2						1							1					2			2	1	1		1								
* <i>Lepidium bonariense</i>			1						1						1		2						1					1										
<i>Leptochloa</i> sp.																																						
<i>Leptorhynchus panaetioides</i> Woolly Buttons	2																1	2	2	3	2	1	2								2	2	1	1	1	1		
* <i>Linaria pelisseriana</i> Pelisser's Toadflax																																						
<i>Linum marginale</i> Native Flax																																						
* <i>Lolium rigidum</i> Wimmera Ryegrass						2																					4											
* <i>Lolium</i> sp.							2												2	2							2	2										

Species	Wood_10_c														Wood_7c																								
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014			
<i>Oxalis perennans</i>																		1																					
<i>Oxalis</i> sp.																	2								1			1											
<i>Panicum buncei</i>																	1																						
<i>Panicum effusum</i> Hairy Panic					2	1																																	
* <i>Panicum maximum</i>			1				1		2		2									2	1	2		3	2			2		2		2							
<i>Panicum queenslandicum</i> Yadbila Grass																																							
<i>Panicum</i> sp.							1																																
<i>Parsonsia eucalyptophylla</i> Gargaloo																																							
<i>Paspalidium jubiflorum</i> Warrego Grass																																							
<i>Paspalidium</i> sp.			1																1					1		2	2			2									
* <i>Paspalum dilatatum</i> Paspalum																																							
* <i>Paspalum</i> sp.																																							
* <i>Petrorhagia nanteuillii</i>	1	2		2			1	2								2																	1						
* <i>Phalaris</i> sp. Canary Grass																																							
<i>Phyllanthus virgatus</i> Petty Spurge																																							
<i>Pimelea microcephala</i> Shrubby Rice-flower																																							
<i>Pimelea neo-anglica</i> Shrubby Rice-flower																																							
<i>Plantago debilis</i>																											1												
* <i>Plantago lanceolata</i> Lamb's Tongues																																							
<i>Poa sieberiana</i> Snow Grass																																							
* <i>Polycarpon tetraphyllum</i> Four-leaved Allseed																																							
* <i>Polygonum aviculare</i> Wireweed																								1								1							
<i>Portulaca oleracea</i> Pigweed																	1																						
* <i>Rapistrum rugosum</i> Turnip Weed			1	2		2	2	2					1			2								2			3				1						2		
<i>Rhodanthe anthemoides</i>																																							
<i>Rostellularia adscendens</i>	1																																						
<i>Rumex brownii</i> Swamp Dock																											1												
* <i>Rumex crispus</i> Curled Dock																																				1			

Species	Wood_10_c														Wood_7c																							
	1B_2013	1B_2014	2B_2013	2B_2014	3_2011	3_2012	3_2013	3_2014	4_2011	4_2012	4_2013	4_2014	5_2011	5_2012	5_2013	5_2014	16_2011	16_2012	16_2013	16_2014	17_2011	17_2012	17_2013	17_2014	18_2011	18_2012	18_2013	18_2014	19_2011	19_2012	19_2013	19_2014	20_2011	20_2012	20_2013	20_2014		
* <i>Sorghum halepense</i> Johnson Grass					1																																	
* <i>Spergularia</i> sp.												1								1						1												
<i>Sporobolus caroli</i>																	1			1						2								2				
<i>Sporobolus creber</i> Slender Rat's Tail Grass																																						
* <i>Stachys arvensis</i> Stagger Weed																																						
<i>Stackhousia viminea</i> Slender Stackhousia																																						
<i>Swainsona galegifolia</i> Smooth Darling-pea																																						
<i>Themeda australis</i> Kangaroo Grass																																						
* <i>Tragopogon porrifolius</i> Oyster Plant																																						
<i>Tragus australianus</i> Small Burgrass																																						
<i>Trianthema</i> sp.																																						
* <i>Trifolium angustifolium</i> Narrow-leaved Clover																																						
* <i>Trifolium arvense</i> Haresfoot Clover			2	2	3	2	2	2		2	2	2		2	2			2	3	2	2	2	3		2	1	3	2	2	1	3	2	2	2	2	3		
* <i>Trifolium campestre</i> Hop Clover			1	2	2		2	2			2	2	1	2	1				1			1	2		2	1	2	2	2	2	2	2	2	2		2		
* <i>Trifolium dubium</i> Yellow Suckling Clover										1																1												
* <i>Trifolium glomeratum</i> Clustered Clover				1							1	2			1				2				2			2	2	2			1					2		
* <i>Trifolium repens</i> White Clover																																						
<i>Triptilodiscus pygmaeus</i>																																						
* <i>Urochloa panicoides</i> Urochloa Grass		2																																				
* <i>Verbascum thapsus</i> Great Mullein																																						
* <i>Verbascum virgatum</i> Twiggy Mullein																																						
* <i>Verbena bonariensis</i> Purpletop											1																											
<i>Verbena gaudichaudii</i>										1		1			1		1											1	1	2	1							
* <i>Verbesina encelioides</i>																																						
* <i>Vicia</i> sp.																																						
<i>Vittadinia cuneata</i> Fuzzweed	2		2			2	1					1			1	1										2	1			2				2	1	1		
<i>Vittadinia dissecta</i> Dissected New Holland Daisy																																						
<i>Vittadinia muelleri</i>	1					1	1			1		1				1																				1		

Table 3-15: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Burnt_2013 and Wood_06a for 2011, 2012, 2013 and 2014 monitoring periods (note plot 46 established in 2013)

Species	Burnt_2013																		Wood_06a									
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014		
<i>Abutilon oxycarpum</i> Straggly Lantern-bush																												
<i>Abutilon</i> sp.												1						1										
<i>Acacia deanei</i> (seedling) Green Wattle																				1	1							
<i>Acacia decora</i> (seedling) Western Silver Wattle																					1							
<i>Acacia salicina</i> (seedling) Cooba																												
* <i>Aira</i> sp.																												
<i>Alternanthera denticulata</i> Lesser Joyweed																												
<i>Alternanthera</i> sp. A																												
* <i>Ammi majus</i> Bishop's-weed																1												
* <i>Anagallis arvensis</i> Scarlet Pimpernel	1			2		2		2	2	2			2	2		2		2			2	2			2	2		
* <i>Arenaria leptoclados</i>																												
<i>Aristida leptopoda</i> White Speargrass																												
<i>Aristida personata</i> Purple Wire-grass								2										2			2							
<i>Aristida</i> sp.																												
<i>Aristida vagans</i> Threeawn Speargrass																												
<i>Arthropodium</i> sp.																												
<i>Asperula cunninghamii</i> Twining Woodruff																												
* <i>Asphodelus fistulosus</i> Onion Weed																												
* <i>Aster subulatus</i> Wild Aster						2																2	2					
<i>Atriplex muelleri</i>													2			2												
<i>Atriplex semibaccata</i> Creeping Saltbush																												
<i>Austrodanthonia bipartita</i> Wallaby Grass																												
<i>Austrodanthonia racemosa</i>																												
<i>Austrodanthonia racemosa</i> var. <i>obtusata</i>																												
<i>Austrodanthonia</i> sp.	1												2			2				2	2	2						
<i>Austrostipa aristiglumis</i> Plains Grass																												
<i>Austrostipa ramosissima</i> Stout Bamboo Grass																		1										

Species	Burnt_2013																		Wood_06a							
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014
<i>Austrostipa scabra</i> Speargrass							1						2	2		2	2	2		2	2	2				
<i>Austrostipa</i> sp.																										
<i>Austrostipa verticillata</i> Slender Bamboo Grass																										
* <i>Avena fatua</i> Wild Oats																										
* <i>Avena</i> sp.																										
* <i>Bidens pilosa</i> Cobblers Pegs																										
* <i>Bidens subalternans</i> Greater Beggar's Ticks								1																		
<i>Boerhavia dominii</i> Tarvine																										
<i>Boerhavia</i> sp.																										
<i>Bothriochloa bladhii</i> Forest Blue Grass																										
<i>Bothriochloa decipiens</i> Red Grass							2				2									2		2				
<i>Bothriochloa macra</i> Red Grass				2																						
<i>Bothriochloa</i> sp.																										
<i>Brachychiton populneus</i> Kurrajong																										
<i>Brachyscome ciliaris</i> Variable Daisy																										
* <i>Bromus catharticus</i> Prairie Grass																							1	2		2
* <i>Bromus molliformis</i> Soft Brome						1								2						2	2	2				2
* <i>Bromus</i> sp.														2												
<i>Brunoniella australis</i> Blue Trumpet																										
* <i>Bryophyllum delagoense</i> Mother-of-millions																										
<i>Bulbine bulbosa</i> Native Leek							1								1		1									
<i>Calandrinia</i> sp.																										
<i>Callitris glaucophylla</i>																										
<i>Calotis lappulacea</i> Yellow Burr-daisy													2	2		1										
<i>Carex breviculmis</i>																										
<i>Carex inversa</i>													1	1	1	2		2								2
* <i>Carthamus lanatus</i> Saffron Thistle				2				1			1					2							1	1	2	2
* <i>Centaurea melitensis</i> Maltese Cockspur				2		1		3			1	3	2		3		3			2	2	2		2	2	3

Species	Burnt_2013																		Wood_06a							
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014
* <i>Centaurea solstitialis</i> St Barnaby's Thistle							2																			
* <i>Centaurea</i> sp.																										
* <i>Centaureum erythraea</i> Common Centaury																								1		
* <i>Centaureum</i> sp.					1								1						1			2				
<i>Chamaesyce</i> sp.																		1								
<i>Cheilanthes distans</i> Bristly cloak fern																										
<i>Cheilanthes sieberi</i>																										
<i>Chenopodium desertorum</i>																										
<i>Chenopodium pumilio</i> Small Crumbweed																										
* <i>Chloris gayana</i> Rhodes Grass	5	5	2	2	5	6	3	3	5	6	3	3	3	6	3	4	2	3	4	5	4	4	5	5	4	4
<i>Chloris pectinata</i> Comb Chloris																										
<i>Chloris truncata</i> Windmill grass																										
<i>Chloris ventricosa</i> Plump Windmill Grass													2													
* <i>Chondrilla juncea</i> Skeleton Weed																										
<i>Chrysocephalum apiculatum</i> Yellow Buttons																										
* <i>Cirsium vulgare</i> Spear Thistle		2	1	1	1	2	1	1				1		1											1	1
<i>Convolvulus graminetinus</i>								1				1						1			1			1	1	
* <i>Conyza bonariensis</i> Flaxleaf Fleabane	2									2		1							2			2	2			2
* <i>Conyza parva</i>																										
* <i>Conyza</i> sp.																										
<i>Cotula australis</i> Common Cotula																										
* <i>Cyclospermum leptophyllum</i> Slender Celery					1	1		2	2	2		2	2	2					2			2			1	2
<i>Cymbopogon refractus</i> Barbed Wire Grass																										
<i>Cynodon dactylon</i> Couch																							2			1
<i>Cyperus concinnus</i>																										
<i>Cyperus fulvus</i> Sticky Sedge																										
<i>Cyperus gracilis</i> Slender Flat-sedge																										
* <i>Cyperus rotundus</i> Nutgrass																										

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>*Datura ferox</i>																											
<i>Daucus glochidiatus</i> Native Carrot				2									1	1		1							1				
<i>Desmodium brachypodium</i> Large Tick-trefoil																											
<i>Desmodium varians</i> Slender Tick-trefoil																											
<i>Dianella revoluta</i> Blueberry Lily																											
<i>Dianella</i> sp.																											
<i>Dichanthium sericeum</i> Queensland Bluegrass																							1				
<i>Dichelachne micrantha</i> Shorthair Plumegrass																											
<i>Dichondra repens</i> Kidney Weed																											
<i>Dichondra</i> sp. A									1													1	1				
<i>Dichopogon fimbriatus</i> Nodding Chocolate Lily																											
<i>Digitaria brownii</i> Cotton Panic Grass																											
<i>Digitaria divaricatissima</i> Umbrella Grass													1									1					
<i>*Digitaria sanguinalis</i> Crab Grass																											
<i>Digitaria</i> sp.																											
<i>*Echinochloa crus-galli</i> Barnyard Grass																											
<i>Echinochloa</i> sp.																											
<i>*Echium plantagineum</i> Patterson's Curse								2			2																1
<i>Eclipta platyglossa</i>																											
<i>Einadia hastata</i> Berry Saltbush																											
<i>Einadia nutans</i> Climbing Saltbush						1		1												1	1		1				
<i>Einadia polygonoides</i>													1			1		1				1		1			
<i>Einadia trigonos</i> Fishweed									1									1									
<i>Elymus scaber</i>																											
<i>Enchylaena tomentosa</i> Ruby Saltbush																											
<i>Enneapogon nigricans</i> Niggerheads																											
<i>Enneapogon</i> sp.																							1				
<i>Enteropogon acicularis</i>														1													

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>Enteropogon</i> sp.																											
<i>Eragrostis alveiformis</i>																											
<i>Eragrostis brownii</i> Brown's Lovegrass																											
<i>Eragrostis elongata</i> Clustered Lovegrass																											
<i>Eragrostis lacunaria</i> Bristly Love-grass																											
<i>Eragrostis leptostachya</i> Paddock Lovegrass																											
<i>Eragrostis parviflora</i> Weeping Lovegrass																											
<i>Eragrostis setifolia</i> Bristly Love-grass																											
<i>Eragrostis</i> sp.																											
<i>Eremophila debilis</i> Winter Apple																											
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass																											
<i>Eriochloa</i> sp.																											
<i>Erodium cicutarium</i> Blue Storksbill											2						1		1								
<i>Euchiton</i> sp.																											
<i>Euchiton sphaericus</i>																1											
<i>Eulalia aurea</i> Silky Browntop																											
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>																											
<i>Fimbristylis dichotoma</i> Common Fringe-sedge																											
* <i>Galenia pubescens</i> Galenia																											
<i>Geijera parviflora</i>																											
<i>Geranium solanderi</i> Native Geranium																											
<i>Glossogyne tannensis</i>																											
<i>Glycine clandestina</i>																											
<i>Glycine tabacina</i>																											
* <i>Gomphocarpus fruticosus</i> Narrow-leaved Cotton Bush																											
* <i>Gomphocarpus</i> sp.																											
* <i>Gomphrena celosioides</i> Gomphrena Weed																											
<i>Gonocarpus elatus</i>																											

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>Goodenia cycloptera</i>																											
<i>Goodenia fascicularis</i>																											
<i>Goodenia glabra</i>																											
<i>Goodenia pinnatifida</i>																											
<i>Gypsophila tubulosa</i> Annual Chalkwort																				1							
<i>Haloragis heterophylla</i> Rough Raspwort																											
* <i>Hedypnois rhagadioloides</i> subsp. <i>cretica</i> Cretan Weed																					2						
* <i>Helianthus</i> sp. Sunflower																											
<i>Hibiscus trionum</i>			1																								
* <i>Hordeum</i> sp. Barley Grass																											
* <i>Hyparrhenia hirta</i> Coolatai Grass																											
* <i>Hypochaeris microcephala</i> White Flatweed																											
* <i>Hypochaeris radicata</i> Flatweed																									1		
<i>Jasminum suavissimum</i>																											
<i>Juncus</i> sp.															1												
<i>Juncus usitatus</i> Pinrush																											
<i>Lachnagrostis filiformis</i> Blown Grass									1			1		1										1			
* <i>Lactuca saligna</i> Willow-leaved Lettuce		1		1	2				1		1			1					2	1			2	2	2	1	
* <i>Lactuca serriola</i> Prickly Lettuce	2	1		2	2	1		2	2	2			2	2					2		1	2	2	2	1	2	
* <i>Lepidium africanum</i>								1	2	1			2						2	1	1		1			1	
* <i>Lepidium bonariense</i>																											
<i>Leptochloa</i> sp.																											
<i>Leptorhynchus panaetioides</i> Woolly Buttons					1	1		2	2	2		2	1						2		2	1					1
* <i>Linaria pelisseriana</i> Pelisser's Toadflax																											
<i>Linum marginale</i> Native Flax												1															
* <i>Lolium rigidum</i> Wimmera Ryegrass																									3		
* <i>Lolium</i> sp.																								1			3
<i>Lomandra confertifolia</i> Mat-rush																											

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>Lomandra filiformis</i> Wattle Mat-rush																											
<i>Lomandra longifolia</i> Spiny-headed Mat-rush																											
<i>Lomandra multiflora</i>																											
* <i>Lycium ferocissimum</i> African Boxthorn																											
<i>Lythrum hyssopifolia</i> Hyssop Loosestrife																											
<i>Maireana decalvans</i> Black Cotton Bush																											
<i>Maireana enchylaenoides</i> Wingless Bluebush																											
<i>Maireana microphylla</i> Small-leaf Bluebush																											
* <i>Malva</i> sp.																											
* <i>Malvastrum americanum</i> Spiked Malvastrum																											
<i>Malvastrum coromandelianum</i> Prickly Malvastrum																											
* <i>Marrubium vulgare</i> White Horehound																											
* <i>Medicago minima</i> Woolly Burr Medic				2						3												2				2	
* <i>Medicago polymorpha</i> Burr Medic				3						3	2	2										2				2	2
* <i>Medicago sativa</i> Lucerne																											
* <i>Medicago</i> sp.	2																										2
* <i>Medicago truncatula</i> Barrel Medic																											
* <i>Melilotus indicus</i> Hexham Scent	2	2		3	2					3		1												1			1
* <i>Melilotus</i> sp.																											
<i>Mentha saturoioides</i> Creeping Mint																											
<i>Microlaena stipoides</i> Weeping Grass																											
* <i>Misopates orontium</i> Lesser Snapdragon																											
<i>Murdannia graminea</i> Grass Lily																											
<i>Nicotiana</i> sp.																											
<i>Nyssanthes diffusa</i> Barbwire Weed																											
* <i>Opuntia stricta</i> Common Prickly Pear																											
<i>Oxalis exilis</i>																											
<i>Oxalis perennans</i>																											

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>Oxalis</i> sp.													1														
<i>Panicum buncei</i>																							1				
<i>Panicum effusum</i> Hairy Panic													1														
* <i>Panicum maximum</i>					2	1	2		2	3			4		2				3		2			2			
<i>Panicum queenslandicum</i> Yadbila Grass																											
<i>Panicum</i> sp.																											
<i>Parsonsia eucalyptophylla</i> Gargaloo																											
<i>Paspalidium jubiflorum</i> Warrego Grass																											
<i>Paspalidium</i> sp.													2			1		2	2		2	2					
* <i>Paspalum dilatatum</i> Paspalum																											
* <i>Paspalum</i> sp.														1													
* <i>Petrorhagia nanteuilii</i>	2	2		2		1		2	2	2		2							2	2		2					1
* <i>Phalaris</i> sp. Canary Grass																											
<i>Phyllanthus virgatus</i> Petty Spurge																											
<i>Pimelea microcephala</i> Shrubby Rice-flower																											
<i>Pimelea neo-anglica</i> Shrubby Rice-flower																											
<i>Plantago debilis</i>																											
* <i>Plantago lanceolata</i> Lamb's Tongues																											
<i>Poa sieberiana</i> Snow Grass															1												
* <i>Polycarpon tetraphyllum</i> Four-leaved Allseed																											
* <i>Polygonum aviculare</i> Wireweed																							1				
<i>Portulaca oleracea</i> Pigweed																			1	1	2						
* <i>Rapistrum rugosum</i> Turnip Weed												2				1		2		1	1	2			2	2	
<i>Rhodanthe anthemoides</i>																											
<i>Rostellularia adscendens</i>																											
<i>Rumex brownii</i> Swamp Dock																											
* <i>Rumex crispus</i> Curled Dock									1	1																	
<i>Rumex</i> sp.								1																			

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>Salsola australia</i>							1				1				1		2										
<i>Schenkia spicata</i> Spike Centaury																											
* <i>Schkuhria pinnata</i>																											
<i>Sclerolaena birchii</i> Galvanised Burr					1	1				1			2	2			1	2	1	2	2	1	1	1		2	
<i>Sclerolaena diacantha</i> Grey Copperburr																											
<i>Sclerolaena muricata</i> Black Rolypoly													2							2			2	2			
<i>Sclerolaena muricata</i> var. <i>muricata</i> Black Rolypoly																											
<i>Sclerolaena muricata</i> var. <i>villosa</i> Black Rolypoly																1	1			2	2				2	1	
<i>Senecio quadridentatus</i> Cotton Fireweed	2	1				1	2	2	2	2				2		1			1	2	2	2	1	2	2	2	
* <i>Setaria incrassata</i> Purple Pigeon Grass	3					3							3						3		1		3				
* <i>Setaria</i> sp.									2							2				3		1					
<i>Sida corrugata</i> Corrugated Sida														1			1	1	1								
<i>Sida cunninghamii</i> Ridged Sida																1											
* <i>Sida rhombifolia</i> Paddy's Lucerne																											
<i>Sida</i> sp.																1											
* <i>Sida spinosa</i>													1		2	1			1				1		2		
<i>Sida subspicata</i>																											
* <i>Sisymbrium irio</i> London Rocket																			1								
* <i>Sisymbrium officinale</i> Hedge Mustard		1		2					1				2								2						1
* <i>Sisymbrium orientale</i> Indian Hedge Mustard	1					1		2				1		1		2		2			2			1			
* <i>Sisymbrium</i> sp.																											
<i>Solanum esuriale</i> Quena																											
* <i>Solanum nigrum</i> Black-berry Nightshade				2								2														1	
<i>Solanum parvifolium</i>																											
<i>Solanum</i> sp.																											
* <i>Sonchus asper</i> subsp. <i>glaucescens</i>																											1
* <i>Sonchus oleraceus</i> Common Sowthistle	2	1		1	2	1		1	2	2		2	2			1		1		2		1	2	2		1	
* <i>Sorghum halepense</i> Johnson Grass																											

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>*Spergularia</i> sp.																											
<i>Sporobolus caroli</i>																				2							
<i>Sporobolus creber</i> Slender Rat's Tail Grass																							1				
<i>*Stachys arvensis</i> Stagger Weed																											
<i>Stackhousia viminea</i> Slender Stackhousia																											
<i>Swainsona galegifolia</i> Smooth Darling-pea																											
<i>Themeda australis</i> Kangaroo Grass																											
<i>*Tragopogon porrifolius</i> Oyster Plant																											
<i>Tragus australianus</i> Small Burgrass																											
<i>Trianthema</i> sp.																						1					
<i>*Trifolium angustifolium</i> Narrow-leaved Clover																						1					
<i>*Trifolium arvense</i> Haresfoot Clover	2	2		2	2	2		2	2	2		2	2	2		3		3	1	2		3	2	2	2	2	2
<i>*Trifolium campestre</i> Hop Clover		1		2	2	1		2	2			2	2	2		1		2			2	2	2	2	2	2	2
<i>*Trifolium dubium</i> Yellow Suckling Clover												3								2		3		2			
<i>*Trifolium glomeratum</i> Clustered Clover								3					1			2		2	2				2		2	2	2
<i>*Trifolium repens</i> White Clover																											
<i>Triptilodiscus pygmaeus</i>																											
<i>*Urochloa panicoides</i> Urochloa Grass																											
<i>*Verbascum thapsus</i> Great Mullein																											
<i>*Verbascum virgatum</i> Twiggy Mullein																											
<i>*Verbena bonariensis</i> Purpletop																											
<i>Verbena gaudichaudii</i>													1	1								1				1	1
<i>*Verbesina encelioides</i>																											
<i>*Vicia</i> sp.																											
<i>Vittadinia cuneata</i> Fuzzweed				1				1					1		1						2	2	2				
<i>Vittadinia dissecta</i> Dissected New Holland Daisy																											
<i>Vittadinia muelleri</i>									1	2																	1
<i>Vittadinia</i> sp.					2				1										2				2				

Species	Burnt_2013																		Wood_06a								
	21_2011	21_2012	21_2013	21_2014	22_2011	22_2012	22_2013	22_2014	23_2011	23_2012	23_2013	23_2014	30_2011	30_2012	30_2013	30_2014	46_2013	46_2014	24_2011	24_2012	24_2013	24_2014	25_2011	25_2012	25_2013	25_2014	
<i>Vulpia</i> sp.																											
<i>Wahlenbergia communis</i> Tufted Bluebell	1	1			2		1	1					2		1								1		1		
<i>Wahlenbergia gracilis</i> Sprawling Bluebell																											1
<i>Wahlenbergia luteola</i>																											
<i>Walwhalleya prolata</i>																											
* <i>Xanthium occidentale</i> Noogoora Burr																											
* <i>Xanthium spinosum</i> Bathurst Burr																											
<i>Xerochrysum bracteatum</i> Golden Everlasting																2		1		1	1		1				1
<i>Xerochrysum viscosum</i> Sticky Everlasting													1														
<i>Zornia dyctiocarpa</i> Zornia																											
Total number of species	15	13	3	21	17	18	6	31	24	17	2	26	35	24	7	32	5	27	28	26	29	27	34	21	25	33	

*Denotes exotic species

Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

Species	Wood_05a																Wood_04																															
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014										
<i>Austrostipa scabra</i> Speargrass	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	2	3	3	3	2	3			2	3	2	3	3	3	3														
<i>Austrostipa</i> sp.									2				2	2						2	2											2	2															
<i>Austrostipa verticillata</i> Slender Bamboo Grass												2							2										2																			
* <i>Avena fatua</i> Wild Oats														1																																		
* <i>Avena</i> sp.		1	1								1		1	1		2	1		2			2																										
* <i>Bidens pilosa</i> Cobblers Pegs																																												1				
* <i>Bidens subalternans</i> Greater Beggar's Ticks		2						2	2	2			2		1		1	2	2		2		1						1	2							2							2				
<i>Boerhavia dominii</i> Tarvine																											1																					
<i>Boerhavia</i> sp.																				1				2					1											1								
<i>Bothriochloa bladhii</i> Forest Blue Grass																																																
<i>Bothriochloa decipiens</i> Red Grass	2	4		3	2	4		3		4		3		3		2		3	4	4		3	3	4		3	3	3		3	2	3			3	3	3								3			
<i>Bothriochloa macra</i> Red Grass			3								3						3																															
<i>Bothriochloa</i> sp.							3								3						3				3				3																3			
<i>Brachychiton populneus</i> Kurrajong																																																
<i>Brachyscome ciliaris</i> Variable Daisy																																																
* <i>Bromus catharticus</i> Prairie Grass																																																
* <i>Bromus molliformis</i> Soft Brome				2							2						2					1																								2		
* <i>Bromus</i> sp.			1					2					1																																			
<i>Brunoniella australis</i> Blue Trumpet																																																
* <i>Bryophyllum delagoense</i> Mother-of-millions																																																
<i>Bulbine bulbosa</i> Native Leek																																																
<i>Calandrinia</i> sp.																																																
<i>Callitris glaucophylla</i>																																																
<i>Calotis lappulacea</i> Yellow Burr-daisy				1		2		2	2	2		2	2	2							2						1	2			1	1																
<i>Carex breviculmis</i>			2																																													
<i>Carex inversa</i>	1	1							1	1		2	1		2				1	2				1				1			2	2	1	2														
* <i>Carthamus lanatus</i> Saffron Thistle	2	2	2	2	2	2	2	3	2	2	2	2		2		2	2	2			2	2	2	2	2	2	1			2		2										1	2		2			
* <i>Centaurea melitensis</i> Maltese Cockspur	2	1	1	2				2			2	3	2	2	2	3	2		2		2	3	2	2	2	3	2	2	2																			

Species	Wood_05a																Wood_04																								
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014			
* <i>Centaurea solstitialis</i> St Barnaby's Thistle																																									
* <i>Centaurea</i> sp.																																									
* <i>Centaurium erythraea</i> Common Centaury																																						1			
* <i>Centaurium</i> sp.																											2														
<i>Chamaesyce</i> sp.					1								1																									1			
<i>Cheilanthes distans</i> Bristly cloak fern																																							1		
<i>Cheilanthes sieberi</i>																		1	1																		1	1			
<i>Chenopodium desertorum</i>																																							1		
<i>Chenopodium pumilio</i> Small Crumbweed																																									
* <i>Chloris gayana</i> Rhodes Grass												1		1				1					2	3	3	2		2					1	2		2	2	1	2		
<i>Chloris pectinata</i> Comb Chloris																																									
<i>Chloris truncata</i> Windmill grass	1	2											2														1											2			
<i>Chloris ventricosa</i> Plump Windmill Grass	2	2						1					2	2	2	2		1																		1		3	3	2	3
* <i>Chondrilla juncea</i> Skeleton Weed	1	2	1	1	1	2	1																																	2	
<i>Chrysocephalum apiculatum</i> Yellow Buttons																																								1	
* <i>Cirsium vulgare</i> Spear Thistle																																									
<i>Convolvulus graminetinus</i>	2	1	2	2	1	1	1			1	1		1	1		1	1											1	1							2	1		2	1	1
* <i>Conyza bonariensis</i> Flaxleaf Fleabane	2	2		1																																		1	2		
* <i>Conyza parva</i>																									1																
* <i>Conyza</i> sp.																																									
<i>Cotula australis</i> Common Cotula																																									
* <i>Cyclosporum leptophyllum</i> Slender Celery	2								2									1																				2	2		
<i>Cymbopogon refractus</i> Barbed Wire Grass												1																											2		
<i>Cynodon dactylon</i> Couch																																									
<i>Cyperus concinnus</i>																																									
<i>Cyperus fulvus</i> Sticky Sedge	1				1				1	1			1																									1			
<i>Cyperus gracilis</i> Slender Flat-sedge																																								1	
* <i>Cyperus rotundus</i> Nutmuss																																									

Species	Wood_05a																Wood_04																																
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014											
<i>*Datura ferox</i>																																							1										
<i>Daucus glochidiatus</i> Native Carrot									1										1								1		2																				
<i>Desmodium brachypodium</i> Large Tick-trefoil																																																	
<i>Desmodium varians</i> Slender Tick-trefoil																			1																														
<i>Dianella revoluta</i> Blueberry Lily																																																	
<i>Dianella</i> sp.																																																	
<i>Dichanthium sericeum</i> Queensland Bluegrass	3		2		3			3	2			2											3				3				2	1					3												
<i>Dichelachne micrantha</i> Shorthair Plumegrass																			2																														
<i>Dichondra repens</i> Kidney Weed																																																	
<i>Dichondra</i> sp. A												2	2			1			2											2	2	1						1	2	2									
<i>Dichopogon fimbriatus</i> Nodding Chocolate Lily																																																	
<i>Digitaria brownii</i> Cotton Panic Grass					1																									1																			
<i>Digitaria divaricatissima</i> Umbrella Grass								2		2		2															1												2										
<i>*Digitaria sanguinalis</i> Crab Grass																																																	
<i>Digitaria</i> sp.																																											2						
<i>*Echinochloa crus-galli</i> Barnyard Grass																																																	
<i>Echinochloa</i> sp.																																																	
<i>*Echium plantagineum</i> Patterson's Curse	1		1	2	1	1	2			1	2	2	1										1																										
<i>Eclipta platyglossa</i>																																																	
<i>Einadia hastata</i> Berry Saltbush																																																	
<i>Einadia nutans</i> Climbing Saltbush																	1																																
<i>Einadia polygonoides</i>	2				2	1	1			1	1	1		1	1				1									1														1	1						
<i>Einadia trigonos</i> Fishweed																											1				1									1									1
<i>Elymus scaber</i>																											1																						
<i>Enchylaena tomentosa</i> Ruby Saltbush																																																	
<i>Enneapogon nigricans</i> Niggerheads																							1					1																					
<i>Enneapogon</i> sp.	1				2			1			1						2						1		1		2		2	1					1														
<i>Enteropogon acicularis</i>		1	2								2		1		2																					1			1					1	2				

Species	Wood_05a																Wood_04																							
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014		
<i>Enteropogon</i> sp.																																								
<i>Eragrostis alveiformis</i>																																								
<i>Eragrostis brownii</i> Brown's Lovegrass																																								
<i>Eragrostis elongata</i> Clustered Lovegrass																																								
<i>Eragrostis lacunaria</i> Bristly Love-grass																																								
<i>Eragrostis leptostachya</i> Paddock Lovegrass	2																					1																		
<i>Eragrostis parviflora</i> Weeping Lovegrass																																								
<i>Eragrostis setifolia</i> Bristly Love-grass																																								
<i>Eragrostis</i> sp.																																								
<i>Eremophila debilis</i> Winter Apple	1	1			1	1	1	1		1		1		1											1	1														
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass					1				1				1																							1				
<i>Eriochloa</i> sp.															1																									
<i>Erodium crinitum</i> Blue Storksbill												2																									3			
<i>Euchiton</i> sp.																											1													
<i>Euchiton sphaericus</i>																																								
<i>Eulalia aurea</i> Silky Browntop																																						2		2
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>																																								
<i>Fimbristylis dichotoma</i> Common Fringe-sedge																																								
* <i>Galenia pubescens</i> Galenia																																								
<i>Geijera parviflora</i>																						1																		
<i>Geranium solanderi</i> Native Geranium																																								
<i>Glossogyne tannensis</i>																											1	1												
<i>Glycine clandestina</i>	2			1					2		1	1			1	1	1											1	1							1	2	1	1	
<i>Glycine tabacina</i>		1				1						1		1	1							2	1		2	1	2	1	2	1	1	1	1				1			
* <i>Gomphocarpus fruticosus</i> Narrow-leaved Cotton Bush																																								
* <i>Gomphocarpus</i> sp.																																								
* <i>Gomphrena celosioides</i> Gomphrena Weed																																								
<i>Gonocarpus elatus</i>																																								

Species	Wood_05a																Wood_04																							
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014		
<i>Goodenia cycloptera</i>																																								
<i>Goodenia fascicularis</i>																																								
<i>Goodenia glabra</i>																																								
<i>Goodenia pinnatifida</i>																																								
<i>Gypsophila tubulosa</i> Annual Chalkwort																																								
<i>Haloragis heterophylla</i> Rough Raspwort	1		2					2											2				2				1			2	2			2						
* <i>Hedypnois rhagadioloides</i> subsp. <i>cretica</i> Cretan Weed			2				2			2						2									2							2								
* <i>Helianthus</i> sp. Sunflower																									1										1			1		
<i>Hibiscus trionum</i>																																								
* <i>Hordeum</i> sp. Barley Grass																																								
* <i>Hyparrhenia hirta</i> Coolatai Grass																																								
* <i>Hypochaeris microcephala</i> White Flatweed																																					1			
* <i>Hypochaeris radicata</i> Flatweed																																								
<i>Jasminum suavissimum</i>																																								
<i>Juncus</i> sp.																																					1			
<i>Juncus usitatus</i> Pinrush																																								
<i>Lachnagrostis filiformis</i> Blown Grass		1																																						
* <i>Lactuca saligna</i> Willow-leaved Lettuce	1	1				1			1					1							1						1				1									
* <i>Lactuca serriola</i> Prickly Lettuce	2	1							1			1								2	1						1	1		1					2	1				
* <i>Lepidium africanum</i>		1			2			1	1		1	2	1	1								1					2								2		1			
* <i>Lepidium bonariense</i>																																								
<i>Leptochloa</i> sp.																																								
<i>Leptorhynchus panaetioides</i> Wooly Buttons				2							1	1		2	2	2											1													
* <i>Linaria pelisseriana</i> Pelisser's Toadflax																			1																					
<i>Linum marginale</i> Native Flax	1	1	1	1		2											1			1	1		2																	
* <i>Lolium rigidum</i> Wimmera Ryegrass		1				2								2																										
* <i>Lolium</i> sp.	1						2										2																							
<i>Lomandra confertifolia</i> Mat-rush																																								

Species	Wood_05a																Wood_04																							
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014		
<i>Oxalis</i> sp.	1							1				1							1								1				2				1					
<i>Panicum buncei</i>																																								
<i>Panicum effusum</i> Hairy Panic	2				2			2				2																												
* <i>Panicum maximum</i>																																								
<i>Panicum queenslandicum</i> Yadbila Grass																															2									
<i>Panicum</i> sp.																																								
<i>Parsonsia eucalyptophylla</i> Gargaloo																																								
<i>Paspalidium jubiflorum</i> Warrego Grass																																								
<i>Paspalidium</i> sp.													3		2	1	2			2					2					2	2	3	2	2						
* <i>Paspalum dilatatum</i> Paspalum																																								
* <i>Paspalum</i> sp.																																								
* <i>Petrorhagia nanteuillii</i>	2	2	2	2	2	2	2	2	2	2		3	2	2			2	2	2	2	2	2		2	2			2	2		2	2	3		2	2	2			
* <i>Phalaris</i> sp. Canary Grass																					1																			
<i>Phyllanthus virgatus</i> Petty Spurge													2							1																				
<i>Pimelea microcephala</i> Shrubby Rice-flower	1																			1																				
<i>Pimelea neo-anglica</i> Shrubby Rice-flower																																								
<i>Plantago debilis</i>			1		1							1	2	1					1								1													
* <i>Plantago lanceolata</i> Lamb's Tongues																																								
<i>Poa sieberiana</i> Snow Grass																			3	2	2	2								1	2									
* <i>Polycarpon tetraphyllum</i> Four-leaved Allseed																										1				2	1									
* <i>Polygonum aviculare</i> Wireweed																													1									1		
<i>Portulaca oleracea</i> Pigweed							1																																	
* <i>Rapistrum rugosum</i> Turnip Weed						1	3							1	1						1	2			1				1		2	2	2				1	2		
<i>Rhodanthe anthemoides</i>																																								
<i>Rostellularia adscendens</i>																																								
<i>Rumex brownii</i> Swamp Dock		1			1		1						1																1	1	1					1				
* <i>Rumex crispus</i> Curled Dock																																								
<i>Rumex</i> sp.																																								

Species	Wood_05a																		Wood_04																					
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014		
<i>Salsola australia</i>				1				1				1																								1				
<i>Schenkia spicata</i> Spike Centaury																																								
* <i>Schkuhria pinnata</i>					1																																			
<i>Sclerolaena birchii</i> Galvanised Burr				1	1	1			1		1	2	1	1	2	1																				1	1	1	1	
<i>Sclerolaena diacantha</i> Grey Copperburr																																								
<i>Sclerolaena muricata</i> Black Rolypoly													1																											
<i>Sclerolaena muricata</i> var. <i>muricata</i> Black Rolypoly															1																									
<i>Sclerolaena muricata</i> var. <i>villosa</i> Black Rolypoly		1				1			1	1				1																										
<i>Senecio quadridentatus</i> Cotton Fireweed	3	3	2			2			3	3		2	1	2	1				2	3	2	1		2				2	3	1	1		2	2		3	3	2	1	
* <i>Setaria incrassata</i> Purple Pigeon Grass																																								
* <i>Setaria</i> sp.																																								
<i>Sida corrugata</i> Corrugated Sida								1						1	2				1	2	2	1		1	1	1			2		1					1	1			
<i>Sida cunninghamii</i> Ridged Sida																					1																			
* <i>Sida rhombifolia</i> Paddy's Lucerne																																								
<i>Sida</i> sp.																																								
* <i>Sida spinosa</i>	2		2	2	2	2	2	2	2	2	2				1	1	2		2	1	2	2	2	1							2		2	2	2		2	2		
<i>Sida subspicata</i>																																								
* <i>Sisymbrium irio</i> London Rocket																																								
* <i>Sisymbrium officinale</i> Hedge Mustard				2					2	2										2							2		1		2	2				2	2		2	
* <i>Sisymbrium orientale</i> Indian Hedge Mustard	1	2	1	2					2		2	2		1	2	1		2				2		2		2	2			1	3			2	2	1	2	2		
* <i>Sisymbrium</i> sp.													2							1				1																
<i>Solanum esuriale</i> Quena			1		1				1				1		2		1						1		1											1	1	2		
* <i>Solanum nigrum</i> Black-berry Nightshade																				1																				
<i>Solanum parvifolium</i>																																								
<i>Solanum</i> sp.																																								
* <i>Sonchus asper</i> subsp. <i>glaucescens</i>																																								
* <i>Sonchus oleraceus</i> Common Sowthistle	2				2				1	2													1	2	1		2	2						1	2	1				
* <i>Sorghum halepense</i> Johnson Grass																																								

Species	Wood_05a																Wood_04																													
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014								
<i>*Spergularia</i> sp.																																														
<i>Sporobolus caroli</i>																																														
<i>Sporobolus creber</i> Slender Rat's Tail Grass								1																																						
<i>*Stachys arvensis</i> Stagger Weed																			1			2																				2				
<i>Stackhousia viminea</i> Slender Stackhousia																																														
<i>Swainsona galegifolia</i> Smooth Darling-pea																			1	1	2	1					2	2	2	1																
<i>Themeda australis</i> Kangaroo Grass		2												3			3	1									3	3	2	2									1							
<i>*Tragopogon porrifolius</i> Oyster Plant																																														
<i>Tragus australianus</i> Small Burgrass																																														
<i>Trianthema</i> sp.																																														
<i>*Trifolium angustifolium</i> Narrow-leaved Clover	2	2	1		2			2	2																																			1		
<i>*Trifolium arvense</i> Haresfoot Clover	2	2		3	2	2	2	2	2		3				3	2	2			2	2	2	2	2	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2			
<i>*Trifolium campestre</i> Hop Clover	2	2		2	2			2			2				2	1	2		2	2	2	2	2			2	2			1	2				1	1	1					2				
<i>*Trifolium dubium</i> Yellow Suckling Clover																																														
<i>*Trifolium glomeratum</i> Clustered Clover				1																		2																			1		1	2		
<i>*Trifolium repens</i> White Clover																																														
<i>Triptilodiscus pygmaeus</i>																																														
<i>*Urochloa panicoides</i> Urochloa Grass																																														
<i>*Verbascum thapsus</i> Great Mullein																				1																										
<i>*Verbascum virgatum</i> Twiggy Mullein					1																1																									
<i>*Verbena bonariensis</i> Purpletop																																														
<i>Verbena gaudichaudii</i>	2	1			1			1	1			2	1	1		1			2	1			2																2	1	2					
<i>*Verbesina encelioides</i>																																										2				
<i>*Vicia</i> sp.																																														
<i>Vittadinia cuneata</i> Fuzzweed		1	2					2		2	2			1	1	1										1		1					1	1	1											
<i>Vittadinia dissecta</i> Dissected New Holland Daisy								1																																						
<i>Vittadinia muelleri</i>																													1																	
<i>Vittadinia</i> sp.					2			2				1												1				2				2						2								

Species	Wood_05a																Wood_04																												
	26_2011	26_2012	26_2013	26_2014	27_2011	27_2012	27_2013	27_2014	28_2011	28_2012	28_2013	28_2014	29_2011	29_2012	29_2013	29_2014	48_2013	48_2014	31_2011	31_2012	31_2013	31_2014	32_2011	32_2012	32_2013	32_2014	33_2011	33_2012	33_2013	33_2014	34_2011	34_2012	34_2013	34_2014	35_2011	35_2012	35_2013	35_2014							
<i>Vulpia</i> sp.														2																															
<i>Wahlenbergia communis</i> Tufted Bluebell	2	1				2	1	1	2	1	1		2				1		2	2	1		2		1		2	2	1		2		1						1						
<i>Wahlenbergia gracilis</i> Sprawling Bluebell																																													
<i>Wahlenbergia luteola</i>																															1														
<i>Walwhalleya prolata</i>																																													
* <i>Xanthium occidentale</i> Noogoora Burr																																													
* <i>Xanthium spinosum</i> Bathurst Burr																																													
<i>Xerochrysum bracteatum</i> Golden Everlasting								1	1							1						1																1	1						
<i>Xerochrysum viscosum</i> Sticky Everlasting													1							2																									
<i>Zornia dyctiocarpa</i> Zornia																																													
Total number of species	40	41	29	27	33	28	18	28	38	27	27	29	46	37	31	26	28	21	46	31	23	31	30	24	20	27	39	29	20	25	43	31	20	29	37	39	31	26							

*Denotes exotic species

Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

Table 3-16: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Control Wood 2 and Control Wood 1 for 2011, 2012, 2013 and 2014 monitoring periods

Species	Wood Control 2																Wood Control 1																															
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014								
<i>Abutilon oxycarpum</i> Straggly Lantern-bush																																																
<i>Abutilon</i> sp.					1				1	1	1				1								1																									
<i>Acacia deanei</i> (seedling) Green Wattle																																																
<i>Acacia decora</i> (seedling) Western Silver Wattle											1																																					
<i>Acacia salicina</i> (seedling) Cooba																																																
* <i>Aira</i> sp.																																																
<i>Alternanthera denticulata</i> Lesser Joyweed					1																																				1							
<i>Alternanthera</i> sp. A																																																
* <i>Ammi majus</i> Bishop's-weed									1	1																																						
* <i>Anagallis arvensis</i> Scarlet Pimpernel		2		1					2	2		2				2										1	2	2					2		1		2		2		2				2			
* <i>Arenaria leptoclados</i>								1																																								
<i>Aristida leptopoda</i> White Speargrass																																																
<i>Aristida personata</i> Purple Wire-grass	2	2	3	2	3	3	3		3	3	2	3	3	3	3	4	3	3	3			3	3	3	4	4	4	3	4	4	4	3	3	4	3	3	4	3	3		2	2	3					
<i>Aristida</i> sp.																																																
<i>Aristida vagans</i> Threeawn Speargrass	1								1																																							
<i>Arthropodium</i> sp.							1									1																											1					
<i>Asperula cunninghamii</i> Twining Woodruff									2	1																																						
* <i>Asphodelus fistulosus</i> Onion Weed																																																
* <i>Aster subulatus</i> Wild Aster																																																
<i>Atriplex muelleri</i>																																																
<i>Atriplex semibaccata</i> Creeping Saltbush																																																
<i>Austrodanthonia bipartita</i> Wallaby Grass																																																
<i>Austrodanthonia racemosa</i>													1																																2			
<i>Austrodanthonia racemosa</i> var. <i>obtusata</i>	2							1																																				1				
<i>Austrodanthonia</i> sp.			1		1				1				1			2								1		1	2																					
<i>Austrostipa aristiglumis</i> Plains Grass																																																
<i>Austrostipa ramosissima</i> Stout Bamboo Grass																																																

Species	Wood Control 2																Wood Control 1																							
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014
<i>Austrostipa scabra</i> Speargrass	3	3	2	2	3	3	2	2	3	3	2	3	3	3	2	2	3	3	3	3	4	3				1	2	2	2	2	2	2	2	2	2	2	2	2	3	3
<i>Austrostipa</i> sp.						1																				2								2	2			3	2	
<i>Austrostipa verticillata</i> Slender Bamboo Grass					4																2							2				2				2	3		2	
* <i>Avena fatua</i> Wild Oats																																								
* <i>Avena</i> sp.																																								
* <i>Bidens pilosa</i> Cobblers Pegs																											1													
* <i>Bidens subalternans</i> Greater Beggar's Ticks	1				1				2																1	2											2	2	2	
<i>Boerhavia dominii</i> Tarvine																			1					1			1				1									
<i>Boerhavia</i> sp.	1				1				1	2			1				1	1	1	1				1				1				1								
<i>Bothriochloa bladhii</i> Forest Blue Grass																																								
<i>Bothriochloa decipiens</i> Red Grass	1	3		3				2	2	3				4		3	1	3			2		3	3	3	2		3	3		3	2			2		3	3		
<i>Bothriochloa macra</i> Red Grass																							3								3			3	2					
<i>Bothriochloa</i> sp.			3				1				3				3				3																				3	
<i>Brachychiton populneus</i> Kurrajong																																								
<i>Brachyscome ciliaris</i> Variable Daisy																																								
* <i>Bromus catharticus</i> Prairie Grass																																							1	
* <i>Bromus molliformis</i> Soft Brome																																							2	
* <i>Bromus</i> sp.																																								
<i>Brunoniella australis</i> Blue Trumpet	2		1		2			2	1				2	1	1		2	1		1		2	1							2	1			1						
* <i>Bryophyllum delagoense</i> Mother-of-millions																																								
<i>Bulbine bulbosa</i> Native Leek				1				1								1		1	2																					
<i>Calandrinia</i> sp.																																								
<i>Callitris glaucophylla</i>																																								
<i>Calotis lappulacea</i> Yellow Burr-daisy	2				2	1			2		2		2					1		2	2	1		1	2	1		2	2	2	1	2	1	2				1		
<i>Carex breviculmis</i>																									1															
<i>Carex inversa</i>					1												2				2	2	1	2	1	1	1	1	2	1		2	2			1		2	2	3
* <i>Carthamus lanatus</i> Saffron Thistle																											1	1												
* <i>Centaurea melitensis</i> Maltese Cockspur																						1				1	1	1								1		1	2	2

Species	Wood Control 2																Wood Control 1																											
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014				
<i>*Centaurea solstitialis</i> St Barnaby's Thistle																																										1		
<i>*Centaurea sp.</i>																																												
<i>*Centaurium erythraea</i> Common Centaury																																												
<i>*Centaurium sp.</i>																																												
<i>Chamaesyce sp.</i>								1	1			1		1		1	1	1						1		1																		
<i>Cheilanthes distans</i> Bristly cloak fern												1					2		2																									
<i>Cheilanthes sieberi</i>					2												2					1						2	1		2	1					2	1						
<i>Chenopodium desertorum</i>																																												
<i>Chenopodium pumilio</i> Small Crumbweed								2																																				
<i>*Chloris gayana</i> Rhodes Grass																							2																					
<i>Chloris pectinata</i> Comb Chloris																	2																											
<i>Chloris truncata</i> Windmill grass																2						2																						
<i>Chloris ventricosa</i> Plump Windmill Grass									2							2	2	2				3	3	1	2	2	2	2					3	1	1	1		3	2					
<i>*Chondrilla juncea</i> Skeleton Weed																																										1		
<i>Chrysocephalum apiculatum</i> Yellow Buttons	2	1		1	2													1																										
<i>*Cirsium vulgare</i> Spear Thistle																																												
<i>Convolvulus graminetinus</i>																1			1									1																
<i>*Conyza bonariensis</i> Flaxleaf Fleabane								1															1					1	1															
<i>*Conyza parva</i>																																												
<i>*Conyza sp.</i>																							2																					
<i>Cotula australis</i> Common Cotula																																												
<i>*Cyclosporum leptophyllum</i> Slender Celery																									2	2		2										2						
<i>Cymbopogon refractus</i> Barbed Wire Grass	2		1	2			2		2	2																2	2														2			
<i>Cynodon dactylon</i> Couch																																												
<i>Cyperus concinnus</i>																																												
<i>Cyperus fulvus</i> Sticky Sedge	2				1			2					2											1				2		1	1						2			2	1			
<i>Cyperus gracilis</i> Slender Flat-sedge	2	1	2		2		1	2		1		2		1								2				1		1			1			2		2		2			2	1		
<i>*Cyperus rotundus</i> Nutgrass																																												

Species	Wood Control 2																Wood Control 1																															
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014								
<i>*Datura ferox</i>																																																
<i>Daucus glochidiatus</i> Native Carrot																		1								1													2									
<i>Desmodium brachypodum</i> Large Tick-trefoil				1					2			1																1												1	1							
<i>Desmodium varians</i> Slender Tick-trefoil	2												1																1	1				2														
<i>Dianella revoluta</i> Blueberry Lily																																																
<i>Dianella</i> sp.																																																
<i>Dichanthium sericeum</i> Queensland Bluegrass																		2								1																						
<i>Dichelachne micrantha</i> Shorthair Plumegrass													1												1																							
<i>Dichondra repens</i> Kidney Weed																		1																														
<i>Dichondra</i> sp. A					2																					1		2	2	2	2	2			2			3	2	1	2	2						
<i>Dichopogon fimbriatus</i> Nodding Chocolate Lily				1																						1																						
<i>Digitaria brownii</i> Cotton Panic Grass																		1																														
<i>Digitaria divaricatissima</i> Umbrella Grass																		2																														
<i>*Digitaria sanguinalis</i> Crab Grass																																																
<i>Digitaria</i> sp.																																																
<i>*Echinochloa crus-galli</i> Barnyard Grass									1																																							
<i>Echinochloa</i> sp.																																																
<i>*Echium plantagineum</i> Patterson's Curse																																																
<i>Eclipta platyglossa</i>																																																
<i>Einadia hastata</i> Berry Saltbush												1																													2	2						
<i>Einadia nutans</i> Climbing Saltbush	1																																															
<i>Einadia polygonoides</i>																																																
<i>Einadia trigonos</i> Fishweed									1									1																							2							
<i>Elymus scaber</i>																																										2	1	2	1	2	1	2
<i>Enchylaena tomentosa</i> Ruby Saltbush																																																
<i>Enneapogon nigricans</i> Niggerheads												2																																	1			
<i>Enneapogon</i> sp.	2				1							2		3		1	1												2																			
<i>Enteropogon acicularis</i>				1		2	1	1					1	2			2	1	2										1		2	1	2										2					

Species	Wood Control 2																Wood Control 1																										
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014			
<i>Enteropogon</i> sp.																																											
<i>Eragrostis alveiformis</i>																	1																										
<i>Eragrostis brownii</i> Brown's Lovegrass																						1																					
<i>Eragrostis elongata</i> Clustered Lovegrass																																								1			
<i>Eragrostis lacunaria</i> Bristly Love-grass										2	1												1																				
<i>Eragrostis leptostachya</i> Paddock Lovegrass					1	2		1																				1															
<i>Eragrostis parviflora</i> Weeping Lovegrass																																											
<i>Eragrostis setifolia</i> Bristly Love-grass	1								1								1																										
<i>Eragrostis</i> sp.																																											
<i>Eremophila debilis</i> Winter Apple	2	1	2	2	2		1	2	1	2		;	2	2	1	1	1	1	2		2	2	2	2	2	1	2	1			2			2	2	2	2			2	2		
<i>Eriochloa pseudoacrotricha</i> Early Spring Grass																																											
<i>Eriochloa</i> sp.																																											1
<i>Erodium cicutarium</i> Blue Storksbill																						1																					
<i>Euchiton</i> sp.																																											
<i>Euchiton sphaericus</i>																																											
<i>Eulalia aurea</i> Silky Browntop																	2																							3	1		
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>										1			1									1						1		1													
<i>Fimbristylis dichotoma</i> Common Fringe-sedge	1												2				2																						2	1			
* <i>Galenia pubescens</i> Galenia									1	1	2	2																															
<i>Geijera parviflora</i>																																											
<i>Geranium solanderi</i> Native Geranium																								1																			
<i>Glossogyne tannensis</i>	1				1				2				1				1											2	1														
<i>Glycine clandestina</i>	11	1			1	2				1			1									1				1				2	1				1								
<i>Glycine tabacina</i>	2				2				2	1			2			1	1					1			2				2													1	
* <i>Gomphocarpus fruticosus</i> Narrow-leaved Cotton Bush																																											2
* <i>Gomphocarpus</i> sp.																														1													
* <i>Gomphrena celosioides</i> Gomphrena Weed																	2	1																									
<i>Gonocarpus elatus</i>																																											

Species	Wood Control 2																Wood Control 1																																				
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014													
<i>Goodenia cycloptera</i>																																																					
<i>Goodenia fascicularis</i>																																																					
<i>Goodenia glabra</i>	1				2			2				1																2		2	1	1																					
<i>Goodenia pinnatifida</i>										1																																											
<i>Gypsophila tubulosa</i> Annual Chalkwort																																																					
<i>Haloragis heterophylla</i> Rough Raspwort		1											2													2	2	1		2	2	2	1	1						2	1												
* <i>Hedypnois rhagadioloides</i> subsp. <i>cretica</i> Cretan Weed																																															2						
* <i>Helianthus</i> sp. Sunflower																																																					
<i>Hibiscus trionum</i>																																																					
* <i>Hordeum</i> sp. Barley Grass																																																					
* <i>Hyparrhenia hirta</i> Coolatai Grass																																																					
* <i>Hypochaeris microcephala</i> White Flatweed											1															1																											
* <i>Hypochaeris radicata</i> Flatweed																																																					
<i>Jasminum suavissimum</i>	1	1	1	2			1	2																																													
<i>Juncus</i> sp.																																																					
<i>Juncus usitatus</i> Pinrush																																												1	1								
<i>Lachnagrostis filiformis</i> Blown Grass																											1																										
* <i>Lactuca saligna</i> Willow-leaved Lettuce																										1	1																										
* <i>Lactuca serriola</i> Prickly Lettuce									1																		2										1						2										
* <i>Lepidium africanum</i>	1	1								1							1		1	2	2	1	1	2				2	2						1					2	2							2					
* <i>Lepidium bonariense</i>																																																					
<i>Leptochloa</i> sp.																																															1						
<i>Leptorhynchus panaetioides</i> Wooly Buttons																																																					
* <i>Linaria pelisseriana</i> Pelisser's Toadflax	1																																																				
<i>Linum marginale</i> Native Flax														1		1		1																																			
* <i>Lolium rigidum</i> Wimmera Ryegrass																																																1					
* <i>Lolium</i> sp.																																																					2
<i>Lomandra confertifolia</i> Mat-rush							1			2																																											

Species	Wood Control 2																Wood Control 1																																	
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014										
<i>Lomandra filiformis</i> Wattle Mat-rush	1		1	1		1							1	2				2									1									2														
<i>Lomandra longifolia</i> Spiny-headed Mat-rush																	1																																	
<i>Lomandra multiflora</i>		1			2			1			1				1		1		1		1	2	1			1				1	1	1	2	1	1					1	1									
* <i>Lycium ferocissimum</i> African Boxthorn																																																		
<i>Lythrum hyssopifolia</i> Hyssop Loosestrife																																																		
<i>Maireana decalvans</i> Black Cotton Bush																																																		
<i>Maireana enchylaenoides</i> Wingless Bluebush					1	1		1										1	1	1	1		1	1																										
<i>Maireana microphylla</i> Small-leaf Bluebush					1	1	1	1			1			1		1	1	2	2	1	2	1	2	1	2	1	1	1	1										2	2	2	2								
* <i>Malva</i> sp.											1																																							
* <i>Malvastrum americanum</i> Spiked Malvastrum									1				1																																					
<i>Malvastrum coromandelianum</i> Prickly Malvastrum																						1																			2									
* <i>Marrubium vulgare</i> White Horehound																																																		
* <i>Medicago minima</i> Wooly Burr Medic										2																																								
* <i>Medicago polymorpha</i> Burr Medic										1																2																								
* <i>Medicago sativa</i> Lucerne																										1		1																						
* <i>Medicago</i> sp.																																																		
* <i>Medicago truncatula</i> Barrel Medic																																																		
* <i>Melilotus indicus</i> Hexham Scent																																																		
* <i>Melilotus</i> sp.																																																		
<i>Mentha saturoioides</i> Creeping Mint																																																		
<i>Microlaena stipoides</i> Weeping Grass					2																					2																								
* <i>Misopates orontium</i> Lesser Snapdragon	2			2				2	2		1	2				1		1											1		1											2	2		1	2				
<i>Murdannia graminea</i> Grass Lily																																																		
<i>Nicotiana</i> sp.																																																		
<i>Nyssanthes diffusa</i> Barbwire Weed																																																		
* <i>Opuntia stricta</i> Common Prickly Pear				1				1																					1	1	1	1															1	1		
<i>Oxalis exilis</i>																																																		
<i>Oxalis perennans</i>																																																		

Species	Wood Control 2																Wood Control 1																																
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014									
<i>Salsola australia</i>																					1			1																1									
<i>Schenkia spicata</i> Spike Centaury																																									1								
* <i>Schkuhria pinnata</i>																																																	
<i>Sclerolaena birchii</i> Galvanised Burr										1	1	1				1	2	2	1	2	1	2																											
<i>Sclerolaena diacantha</i> Grey Copperburr																																																	
<i>Sclerolaena muricata</i> Black Rolypoly																																																	
<i>Sclerolaena muricata</i> var. <i>muricata</i> Black Rolypoly																																																	
<i>Sclerolaena muricata</i> var. <i>villosa</i> Black Rolypoly																																																	
<i>Senecio quadridentatus</i> Cotton Fireweed			1					1							1		1								2	2	1	2		2									1										
* <i>Setaria incrassata</i> Purple Pigeon Grass																																																	
* <i>Setaria</i> sp.																																																	
<i>Sida corrugata</i> Corrugated Sida	2		1	1			2		1	1	2		1		1		2	1	1	1	2	1	2	1	1					1	1	1	1	2	1	2	2	1		2									
<i>Sida cunninghamii</i> Ridged Sida	1				2		1	1		1	1	1														1		1						1		1	1												
* <i>Sida rhombifolia</i> Paddy's Lucerne																																																	
<i>Sida</i> sp.	1																																																
* <i>Sida spinosa</i>																	1									1										1							1						
<i>Sida subspicata</i>													1																																				
* <i>Sisymbrium irio</i> London Rocket											1											1		1	1																								
* <i>Sisymbrium officinale</i> Hedge Mustard									1																																								
* <i>Sisymbrium orientale</i> Indian Hedge Mustard				1							2					2								2				2																				2	
* <i>Sisymbrium</i> sp.																																																	
<i>Solanum esuriale</i> Quena					1				1				2				2																																
* <i>Solanum nigrum</i> Black-berry Nightshade									2													1		1	1																								
<i>Solanum parvifolium</i>				2																																													
<i>Solanum</i> sp.																																																	
* <i>Sonchus asper</i> subsp. <i>glaucescens</i>																																																	
* <i>Sonchus oleraceus</i> Common Sowthistle									1								1					1				2	2	1	1												2	2							
* <i>Sorghum halepense</i> Johnson Grass																																																	

Species	Wood Control 2																Wood Control 1																																
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014									
* <i>Spergularia</i> sp.																																																	
<i>Sporobolus caroli</i>																																																	
<i>Sporobolus creber</i> Slender Rat's Tail Grass			2						1						2				2										1						1								2						
* <i>Stachys arvensis</i> Stagger Weed																																																	
<i>Stackhousia viminea</i> Slender Stackhousia	1			1	1				2	1			1				2							1							1	1	2	1					1										
<i>Swainsona galegifolia</i> Smooth Darling-pea																																																	
<i>Themeda australis</i> Kangaroo Grass																										1																4	3	3	2				
* <i>Tragopogon porrifolius</i> Oyster Plant																										1																							
<i>Tragus australianus</i> Small Burggrass																																																	
<i>Trianthema</i> sp.																																																	
* <i>Trifolium angustifolium</i> Narrow-leaved Clover																																																	
* <i>Trifolium arvense</i> Haresfoot Clover				1								2				2								2			2		1		2											2						3	
* <i>Trifolium campestre</i> Hop Clover																									2			1					2															2	
* <i>Trifolium dubium</i> Yellow Suckling Clover																																																	
* <i>Trifolium glomeratum</i> Clustered Clover																																																	2
* <i>Trifolium repens</i> White Clover																																																	
<i>Triptilodiscus pygmaeus</i>																																																2	
* <i>Urochloa panicoides</i> Urochloa Grass									2																																								
* <i>Verbascum thapsus</i> Great Mullein																																																	
* <i>Verbascum virgatum</i> Twiggy Mullein																																																	
* <i>Verbena bonariensis</i> Purpletop																																																	
<i>Verbena gaudichaudii</i>					1												1	1	1						1																			1					
* <i>Verbesina encelioides</i>																																																	
* <i>Vicia</i> sp.																																																	
<i>Vittadinia cuneata</i> Fuzzweed																			2	1	1				1	2			1				2						1	1	2	1							
<i>Vittadinia dissecta</i> Dissected New Holland Daisy																										2																							
<i>Vittadinia muelleri</i>																																																	
<i>Vittadinia</i> sp.					2												2																																

Species	Wood Control 2																Wood Control 1																										
	36_2011	36_2012	36_2013	36_2014	37_2011	37_2012	37_2013	37_2014	38_2011	38_2012	38_2013	38_2014	39_2011	39_2012	39_2013	39_2014	40_2011	40_2012	40_2013	40_2014	41_2011	41_2012	41_2013	41_2014	42_2011	42_2012	42_2013	42_2014	43_2011	43_2012	43_2013	43_2014	44_2011	44_2012	44_2013	44_2014	45_2011	45_2012	45_2013	45_2014			
<i>Vulpia</i> sp.																																											
<i>Wahlenbergia communis</i> Tufted Bluebell								2				2				2					2	1		1	2	1			2	1		1	2	1	1	1	2						
<i>Wahlenbergia gracilis</i> Sprawling Bluebell	1							1																																			
<i>Wahlenbergia luteola</i>																																											
<i>Walwhalleya prolata</i>					2			1																																			
* <i>Xanthium occidentale</i> Noogoora Burr								1																																			
* <i>Xanthium spinosum</i> Bathurst Burr								1	1																																		
<i>Xerochrysum bracteatum</i> Golden Everlasting		1		2				2		1		1	1			1	2	2					2					1										1				1	
<i>Xerochrysum viscosum</i> Sticky Everlasting																1																								1			
<i>Zornia dyctiocarpa</i> Zornia	1							2																																			
Total number of species	40	15	15	22	40	11	14	22	51	28	20	22	36	9	17	23	40	27	17	25	39	22	21	27	45	27	28	25	30	22	21	21	40	18	21	31	41	25	23	29			

*Denotes exotic species
 Braun-Blanquet cover scores: 1=projected foliage cover <5% of the plot, plants uncommon; 2=projected foliage cover <5% of the plot, plants common; 3=projected foliage cover 6-25% of the plot; 4=projected foliage cover of 26-50% of the plot; 5=projected foliage cover of 51-75% of the plot; 6=projected foliage cover of 76-100% of the plot.

3.6 Native groundcover species composition data analysis

Native groundcover species composition is variable between control plots and over time, with less than 20% similarity overall and no apparent trends as shown in the lack of any clear groupings in Figure 3-8. Groundcover communities at Wood_04 and Wood_05a also vary through time. Of all the rehabilitated zones, these two zones have the groundcover community most similar to the control plots. This is made evident by the proximity of the Wood_04 plot samples to those of Control wood 1 and 2 samples in Figure 3-8 and Figure 3-9. The remaining rehabilitated zones (Wood_06a, Wood_07c, Wood_10c and Burnt_13) have a high degree of variability through space and time (Figure 3-10 Figure 3-11, Figure 3-12 and Figure 3-13). There is little indication that species composition is progressing towards that of the control zones within Wood_6a and Wood_07c.

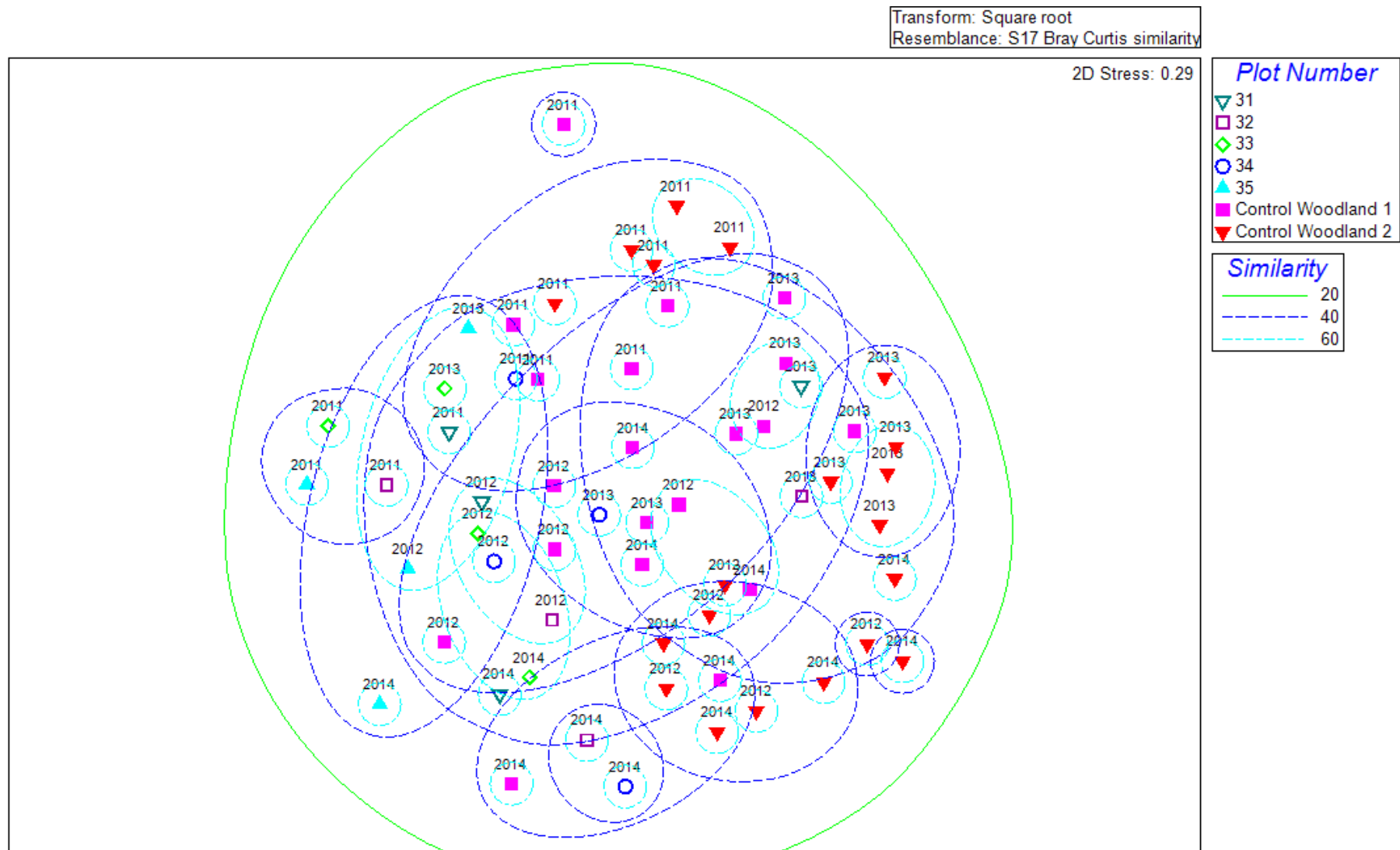


Figure 3-8: Non-metric multi-dimensional scaling plot for native groundcover species abundance in Woodland Control and Wood_04 plots for 2011, 2012, 2013 and 2014 monitoring periods

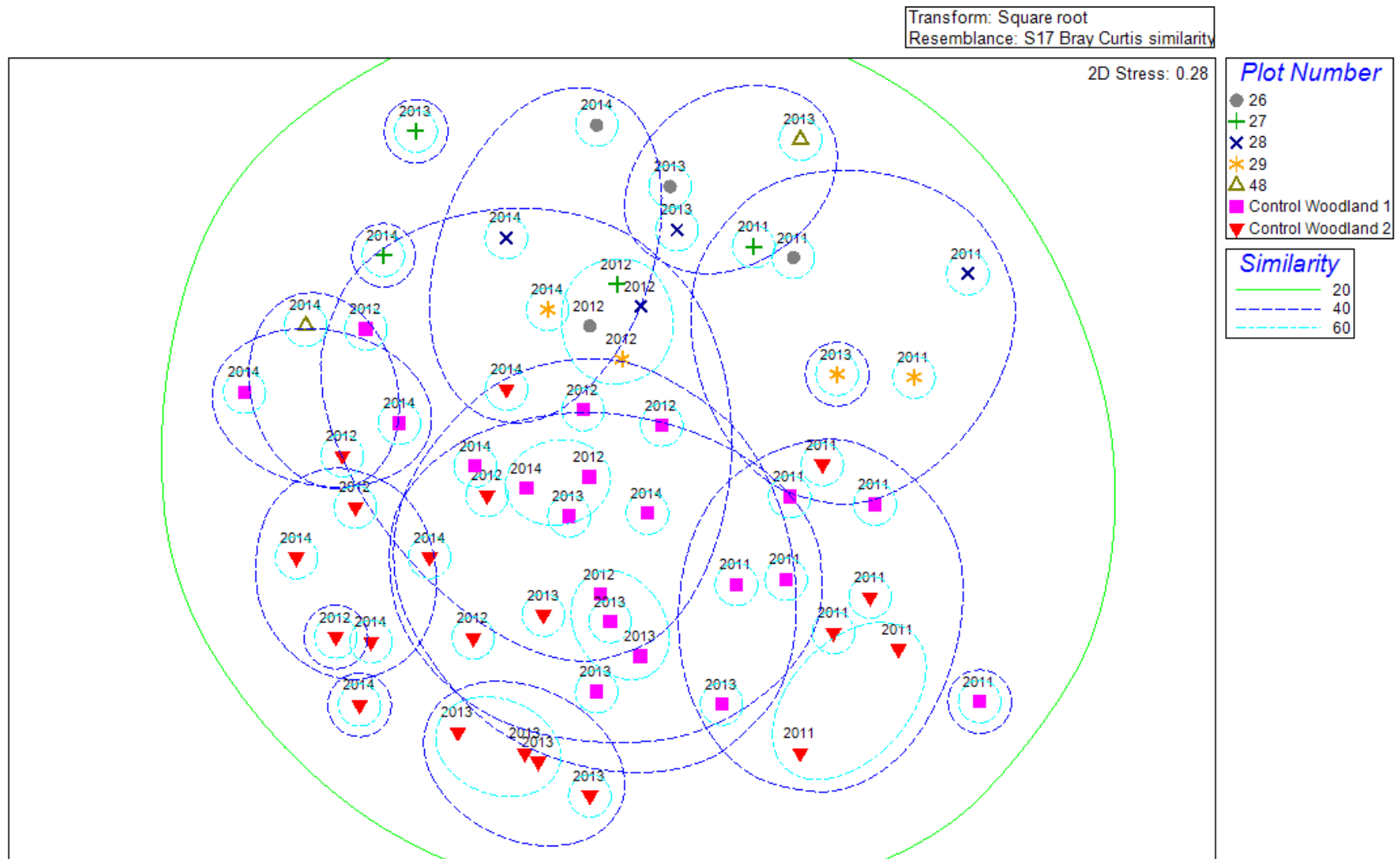


Figure 3-9: Non-metric multi-dimensional scaling plot for native groundcover species abundance in Woodland Control and Wood_05a plots for 2011, 2012, 2013 and 2014 monitoring periods

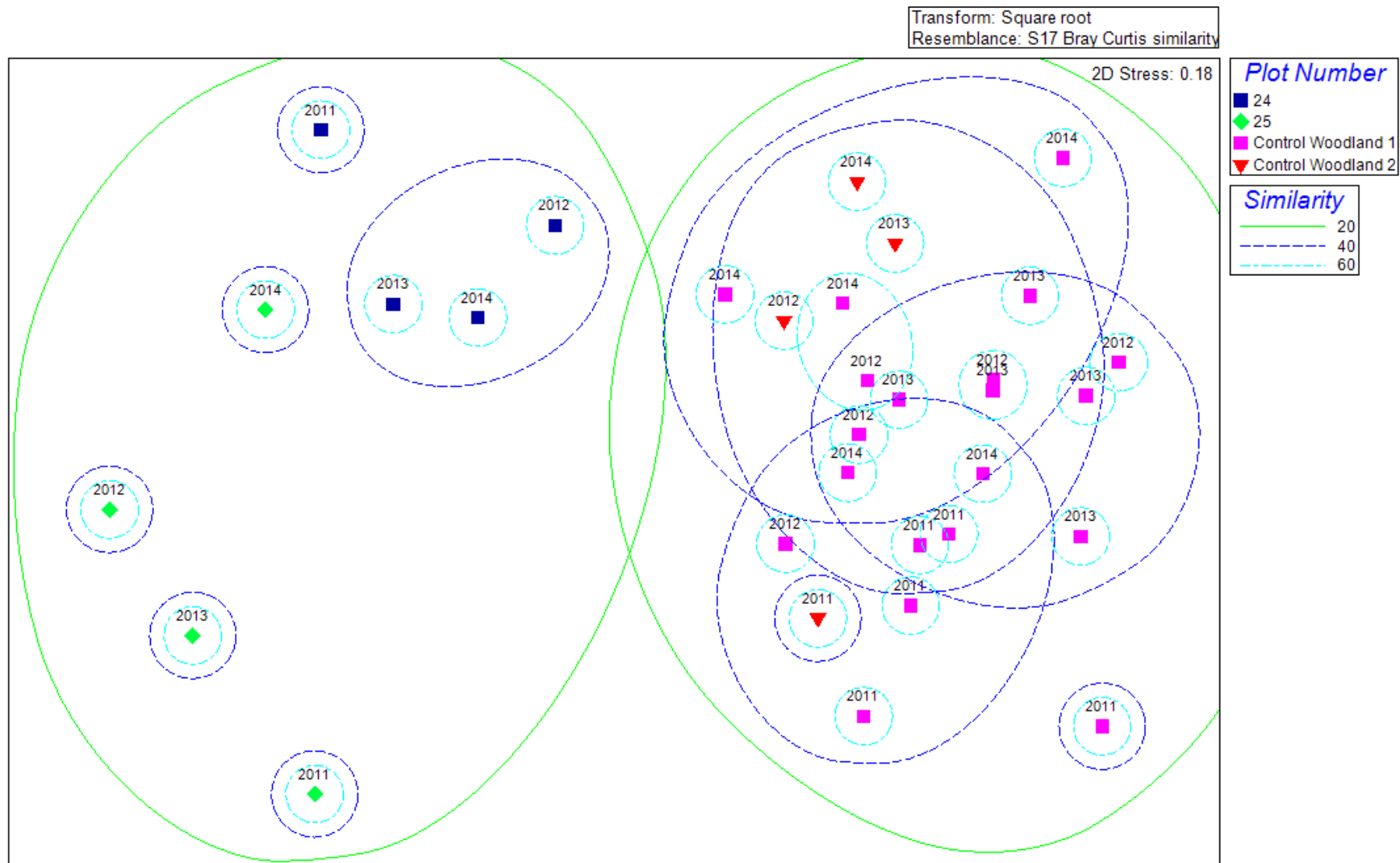


Figure 3-10: Non-metric multi-dimensional scaling plot for native groundcover species abundance in Woodland Control and Wood_06a plots for 2011, 2012, 2013 and 2014 monitoring periods

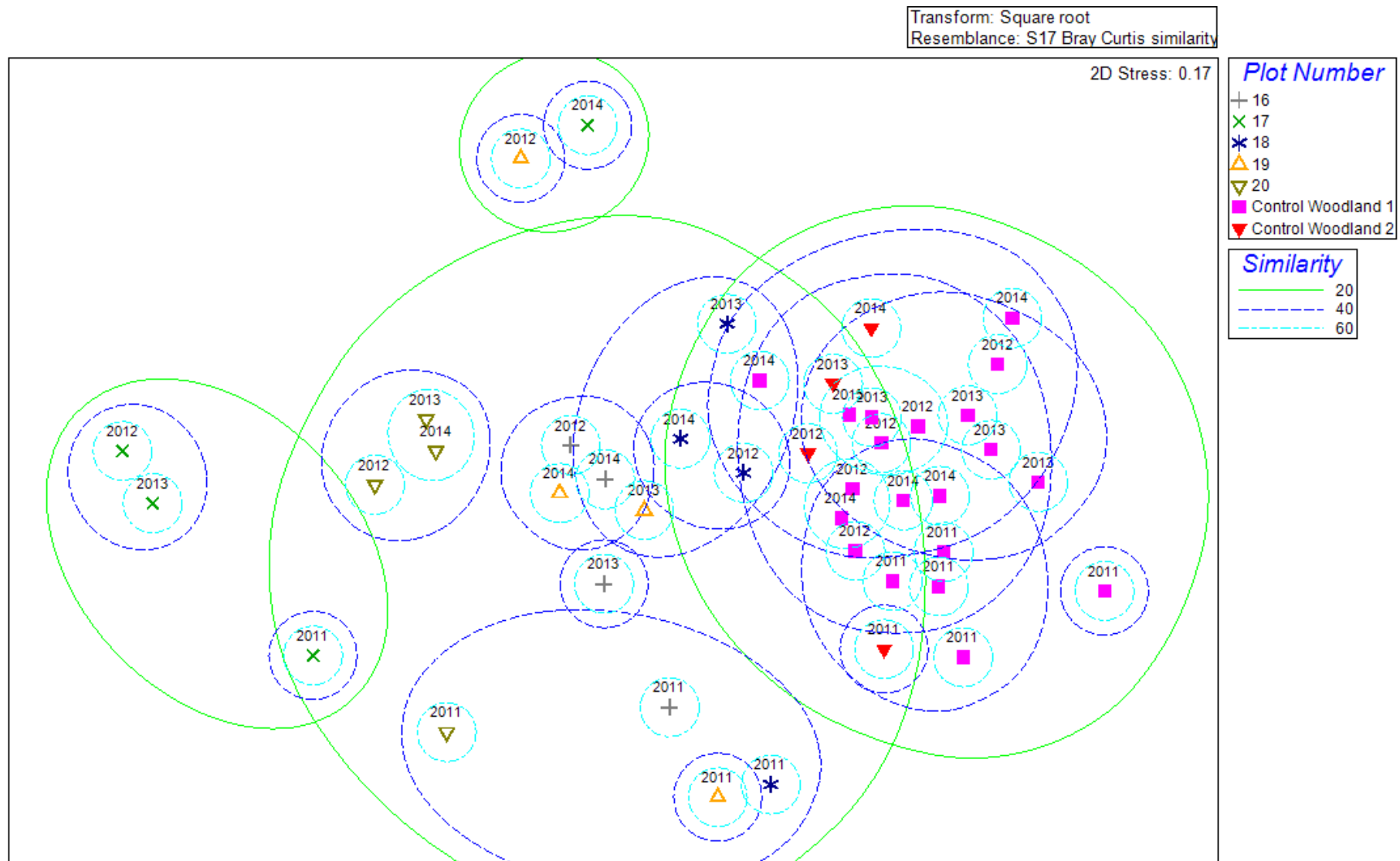


Figure 3-11: Non-metric multi-dimensional scaling plot for native groundcover species abundance in Woodland Control and Wood_07c plots for 2011, 2012, 2013 and 2014 monitoring periods

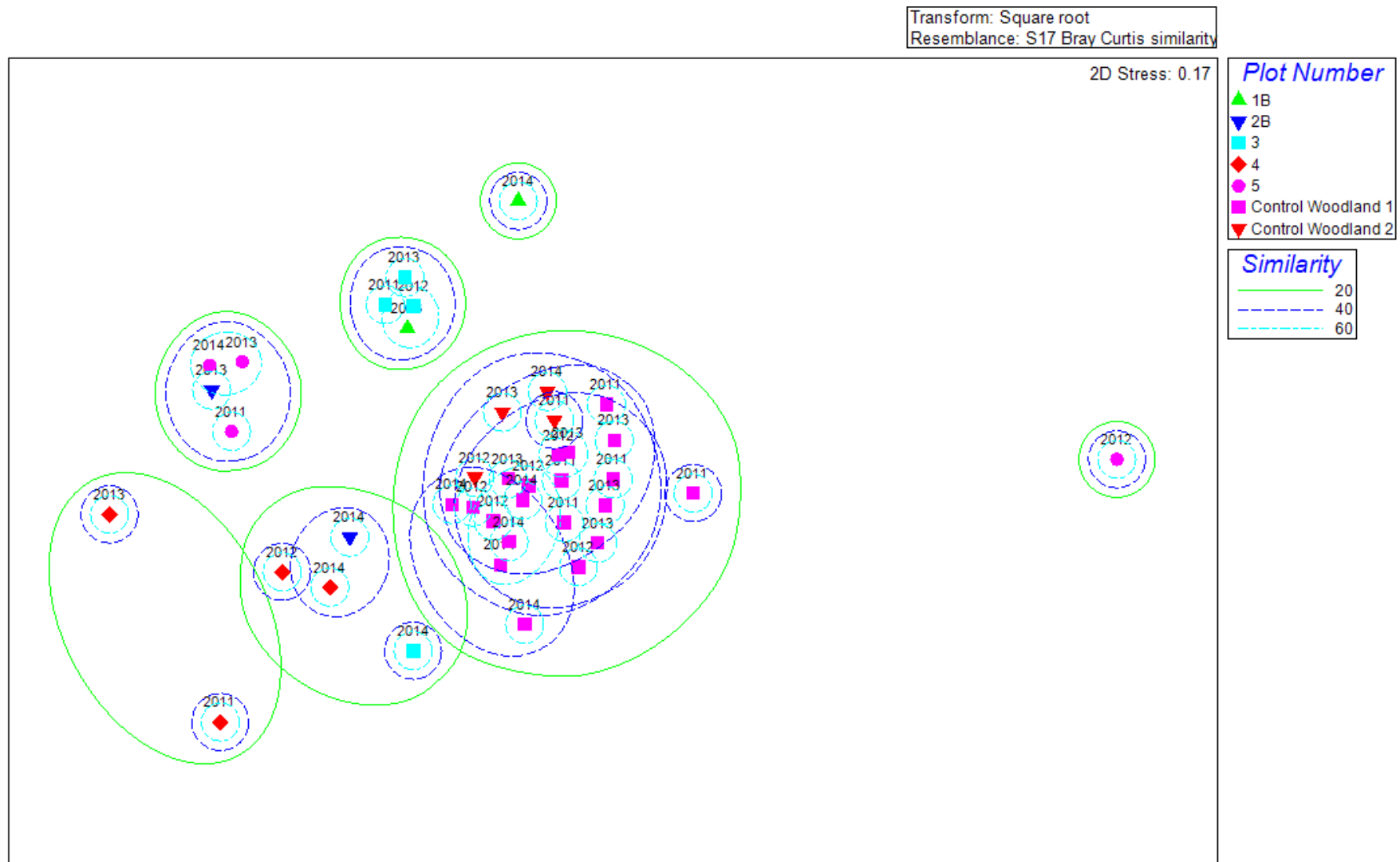


Figure 3-12: Non-metric multi-dimensional scaling plot for native groundcover species abundance in Woodland Control and Wood_10c plots for 2011, 2012, 2013 and 2014 monitoring periods

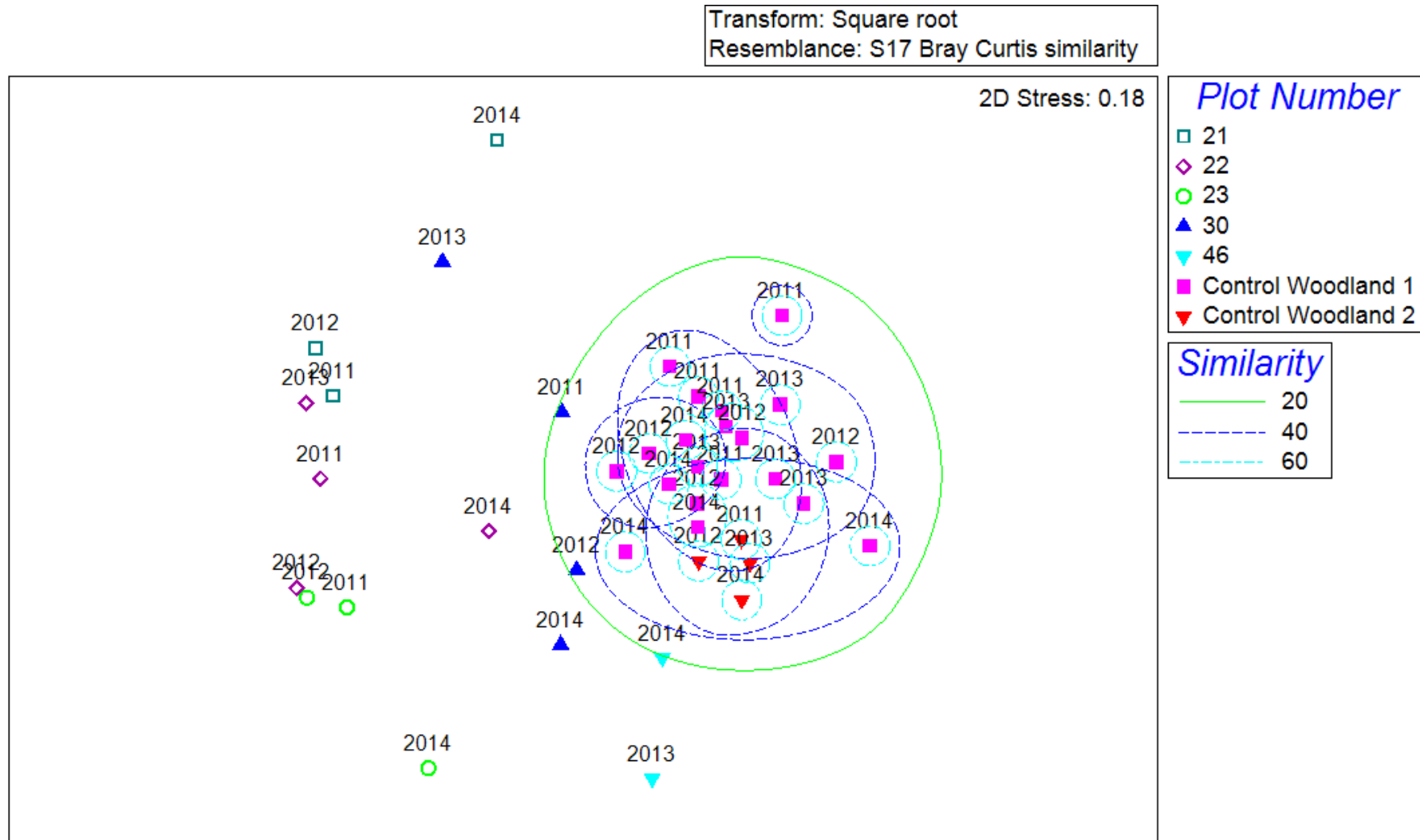


Figure 3-13: Non-metric multi-dimensional scaling plot for native groundcover species abundance in Woodland Control and Burnt_2013 plots for 2011, 2012, 2013 and 2014 monitoring periods

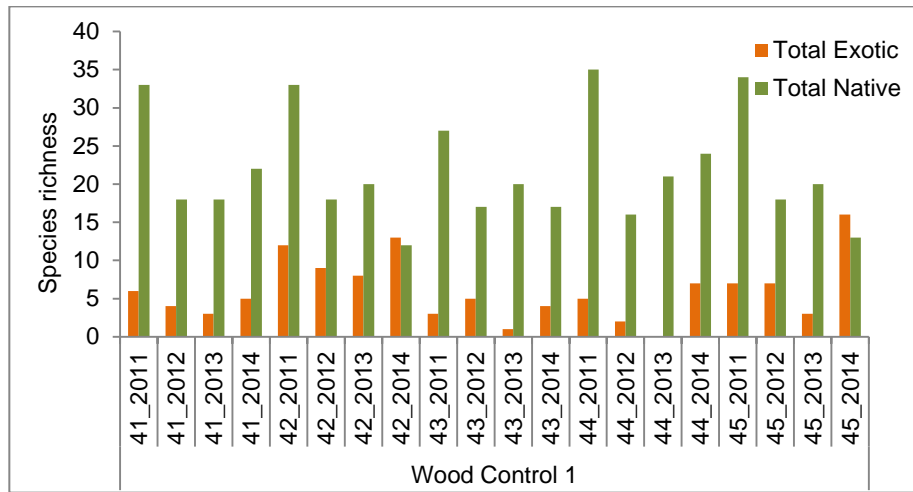


Figure 3-14: Groundcover species richness at Control Wood 1 (2011, 2012, 2013, and 2014)

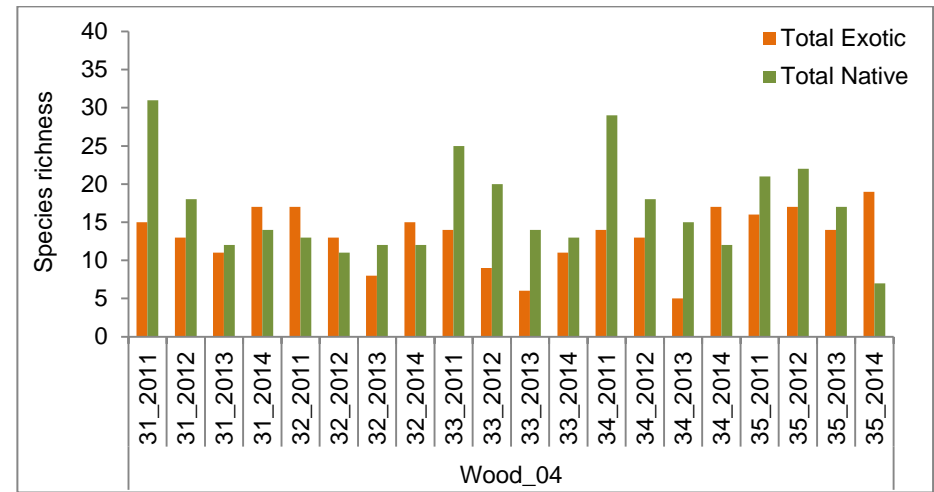


Figure 3-16: Groundcover species richness at Wood_04 (2011, 2012, 2013, and 2014)

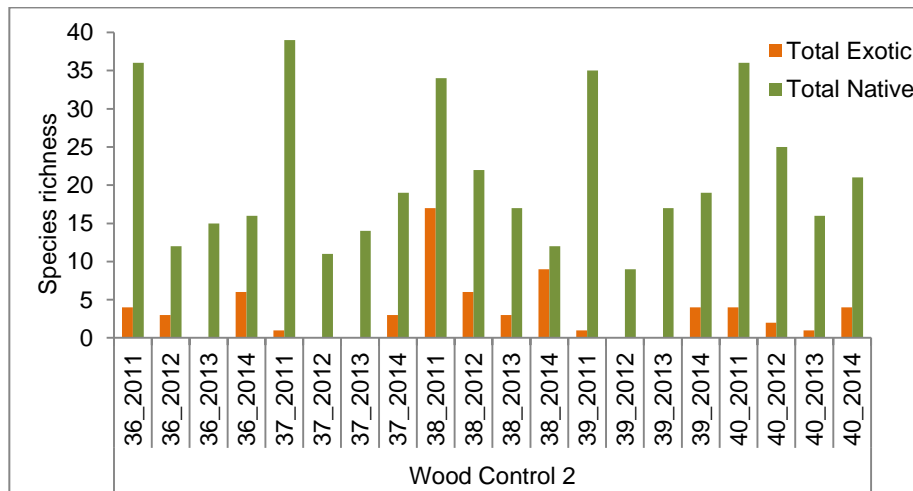


Figure 3-15: Groundcover species richness at Control Wood 2 (2011, 2012, 2013, and 2014)

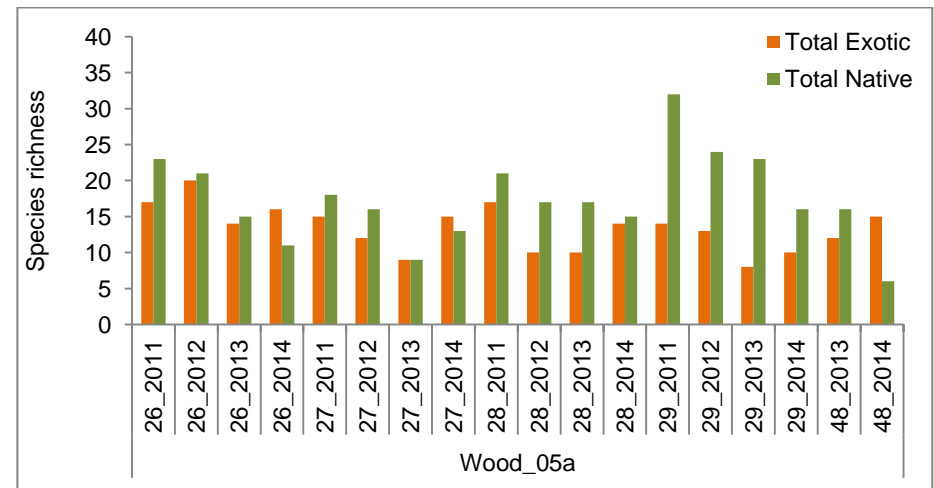


Figure 3-17: Groundcover species richness at Wood_05a (2011, 2012, 2013, and 2014)

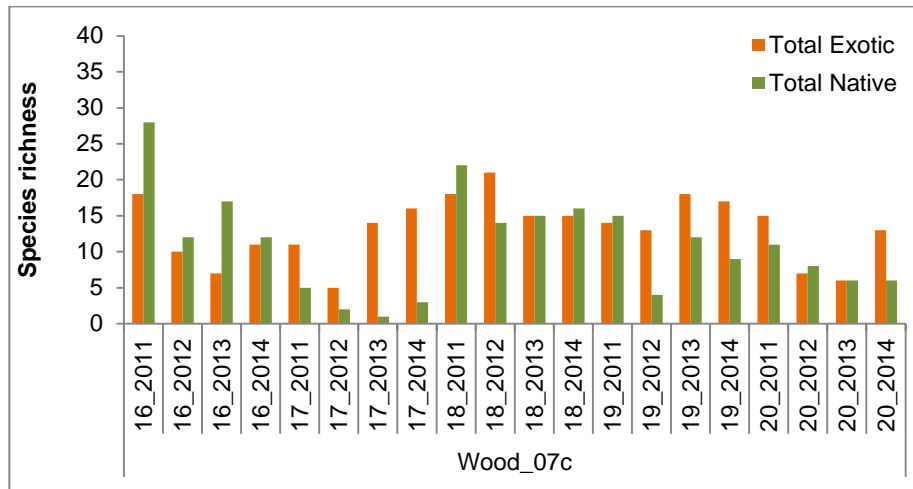


Figure 3-18: Groundcover species richness at Wood_07c (2011, 2012, 2013, and 2014)

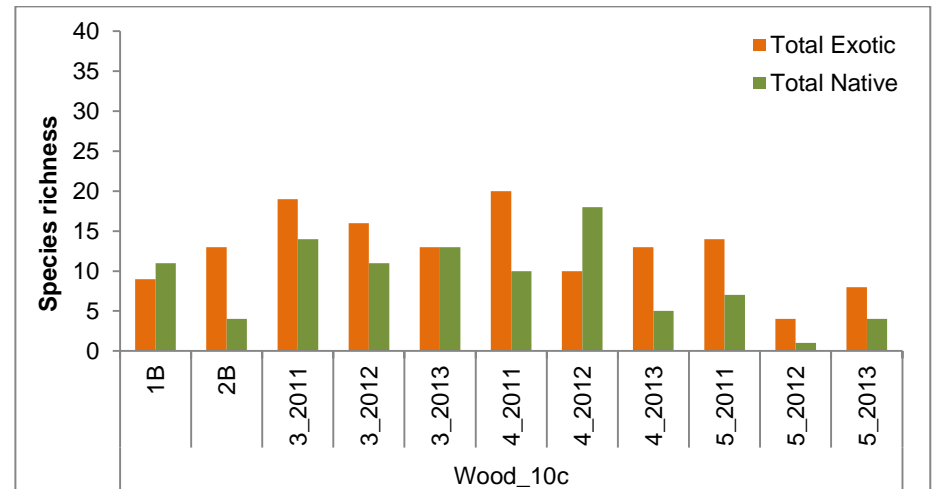


Figure 3-20: Groundcover species richness at Wood_10c (2011, 2012, 2013, and 2014)

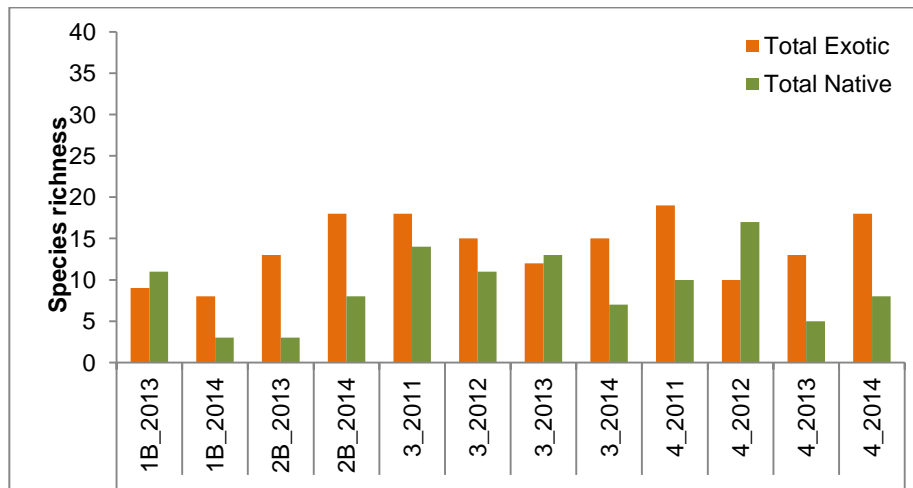


Figure 3-19: Groundcover species richness at Wood_10c (2011, 2012, 2013, and 2014)

3.7 Groundcover composition

Table 3-17: Groundcover composition (2011, 2012, 2013, and 2014)

Treatment	Plot	Native species cover (%)				Exotic species cover (%)				Leaf litter cover (%)				Cryptogam cover (%)				Bare ground (%)				Rocks (%)			
		2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Wood_10c	1B	-	-	30	0	-	-	8	6	-	-	22	16	-	-	0	0	-	-	24	78	-	-	16	0
	2B	-	-	0	0	-	-	46	28	-	-	22	66	-	-	0	0	-	-	32	6	-	-	0	0
	3	20	12	22	26	23	46	12	10	23	30	34	60	0	0	0	0	34	12	26	4	0	0	6	0
	4	10	4	6	2	38	56	38	18	23	22	22	66	0	0	0	0	29	18	32	14	0	0	2	0
	5	0	0	4	0	58	74	46	26	8	2	14	56	0	0	0	0	34	24	32	18	0	0	4	0
Wood_07c	16	50	44	20	14	21	36	8	42	21	14	50	42	0	0	0	0	8	6	22	2	0	0	0	0
	17	0	0	0	0	54	84	46	44	2	6	34	36	0	0	0	0	44	10	20	20	0	0	0	0
	18	16	12	24	10	36	80	46	66	48	8	28	24	0	0	0	0	0	0	2	0	0	0	0	0
	19	10	0	4	10	58	80	38	52	16	16	38	30	0	0	0	0	16	4	20	8	0	0	0	0
	20	4	0	2	6	48	80	32	32	4	8	10	42	0	0	0	2	44	12	54	16	0	0	2	2
Burnt_2013	21	0	0	0	0	54	78	6	40	30	18	50	54	0	0	36	0	16	4	8	6	0	0	0	0
	22	0	0	0	2	54	39	8	30	30	61	38	62	0	0	0	0	16	0	54	6	0	0	0	0
	23	4	2	0	0	68	96	12	48	26	2	40	46	0	0	0	0	2	0	40	6	0	0	8	0
	30	8	0	0	2	70	92	14	58	22	8	28	34	0	0	56	0	0	0	2	6	0	0	0	0
	46	-	-	2	4	-	-	8	42	-	-	58	42	-	-	0	0	-	-	30	12	-	-	2	0
Wood_06a	24	12	10	6	2	41	68	58	58	14	14	26	32	0	0	0	0	33	8	10	8	0	0	0	0
	25	16	6	4	2	44	54	60	46	8	6	12	44	0	0	0	0	32	34	0	8	0	0	24	0
Wood_05	26	33	48	34	8	14	40	30	16	43	10	30	70	0	0	0	0	10	2	6	6	0	0	0	0
	27	52	82	32	38	14	12	8	12	30	4	50	50	0	0	0	0	4	2	10	0	0	0	0	0
	28	36	54	42	16	10	20	6	26	48	26	48	50	0	0	0	0	6	0	4	8	0	0	0	0
	29	64	52	50	20	12	36	4	30	18	12	38	48	0	0	0	0	6	0	8	2	0	0	0	0
	48	-	-	40	38	-	-	22	14	-	-	38	48	-	-	0	0	-	-	0	0	-	-	0	0
Wood_04	31	58	64	40	22	34	36	2	46	4	0	56	30	0	0	0	0	4	0	2	2	0	0	0	0
	32	53	50	40	22	31	16	0	28	10	24	46	50	0	0	0	0	6	10	14	0	0	0	0	0
	33	48	58	40	44	14	16	4	10	28	12	52	42	0	0	0	0	10	14	4	4	0	0	0	0
	34	47	50	46	24	24	42	10	28	27	8	42	46	0	0	0	0	2	0	2	2	0	0	0	0
	35	38	64	50	16	18	24	12	38	36	12	38	44	0	0	0	0	8	0	0	2	0	0	0	0
Wood Control 2	36	44	72	30	10	2	0	0	10	34	26	52	74	0	0	0	0	20	2	14	6	0	0	4	0
	37	22	40	26	8	0	0	2	0	58	60	46	74	2	0	0	0	18	0	26	18	0	0	0	0
	38	26	40	26	2	6	8	6	6	12	46	42	78	0	0	0	0	56	6	24	14	0	0	2	0
	39	48	74	28	20	2	0	0	4	40	22	44	70	0	4	10	4	10	0	14	2	0	0	4	0
	40	54	66	46	16	0	0	0	2	38	30	48	70	0	0	0	0	8	4	6	12	0	0	0	0
Wood Control 1	41	50	40	44	30	0	0	0	0	38	60	54	62	0	0	0	0	12	0	2	8	0	0	0	0
	42	43	70	64	16	6	0	0	6	41	26	36	72	0	0	0	0	10	4	0	6	0	0	0	0
	43	50	54	54	26	0	0	0	0	40	42	40	66	0	0	0	0	10	4	6	8	0	0	0	0
	44	54	44	44	22	0	0	0	6	42	52	54	70	0	0	0	0	4	4	2	2	0	0	0	0
	45	72	84	62	28	2	0	0	16	26	16	34	54	0	0	0	0	0	0	4	2	0	0	0	0
Min (all sites)		0	0	0	0	0	0	0	0	2	0	10	16	0	0	0	0	0	0	0	0	0	0	0	0
Max (all sites)		72	84	64	44	70	96	60	66	58	61	58	78	2	4	56	4	56	34	54	78	0	0	24	2
Average (all sites)		31.58	36.24	26.00	27.00	25.94	36.76	16.00	17.00	26.91	21.30	38.22	39.22	0.06	0.12	2.76	3.76	15.52	5.58	15.03	16.03	0.00	0.00	2.00	3.00

Table 3-18: Groundcover ANOVA results (note cells shaded green indicate no significant temporal change ($p>0.05$) within Wood_10c, Wood_07c, Wood_06a and Burnt_2013; cells shaded red indicate significant ($p<0.05$) temporal change within zones

Monitoring zone		Wood_10c				Wood_07c				Wood_6a				Burnt 2013			
Monitoring year		2011	2012	2013	2014 ¹	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Native cover (%)	Mean	10.00	5.33	12.40	5.60	16.00	11.20	10.00	8.00	14.0 ^A	8.0 ^{AB}	5.0 ^B	2.0 ^B	3.00	0.50	0.40	1.60
	Standard deviation	10.00	6.11	12.91	11.44	19.95	19.06	11.14	5.29	2.82	2.82	1.41	0.0	3.82	1.00	0.89	1.67
	P-value	0.74				0.85				0.02				0.28			
Exotic cover (%)	Mean	39.67 ^{AB}	58.67 ^A	30.00 ^{AB}	17.60 ^B	43.40 ^{AB}	72.00 ^A	34.00 ^{AB}	47.2 ^{AB}	42.5	61.0	59.0	52.0	61.50 ^{AB}	76.25 ^A	9.60 ^C	43.60 ^B
	Standard deviation	17.56	14.19	18.60	9.63	15.03	20.20	15.68	12.70	2.12	9.9	1.41	8.49	8.70	26.00	32.80	10.33
	P-value	0.02				0.01				0.15				0.00			
Leaf litter (%)	Mean	18.00 ^A	18.00 ^A	22.80 ^A	52.80 ^B	18.2 ^{AB}	10.40 ^A	32.00 ^{AB}	34.00 ^B	11.0	10.0	19.0	38.0	27.00	22.25	42.6	47.6
	Standard deviation	8.66	14.42	7.15	21.00	18.47	4.34	14.70	7.82	4.24	5.66	9.9	8.48	3.83	26.66	11.54	10.80
	P-value	0.01				0.02				0.05				0.07			
Bare ground (%)	Mean	32.33	18.00	29.20	24.00	22.40	6.40	23.60	9.20	32.5	24.0	5.0	8.0	8.50 ^A	1.00 ^A	43.2 ^B	7.20 ^A
	Standard deviation	2.88	6.00	3.90	30.72	20.51	4.75	18.84	8.67	0.7	18.39	7.07	0.0	8.70	2.00	11.37	2.68
	P-value	0.76				0.18				0.14				0.00			

Common superscript indicates no significant difference in means ($p>0.05$).

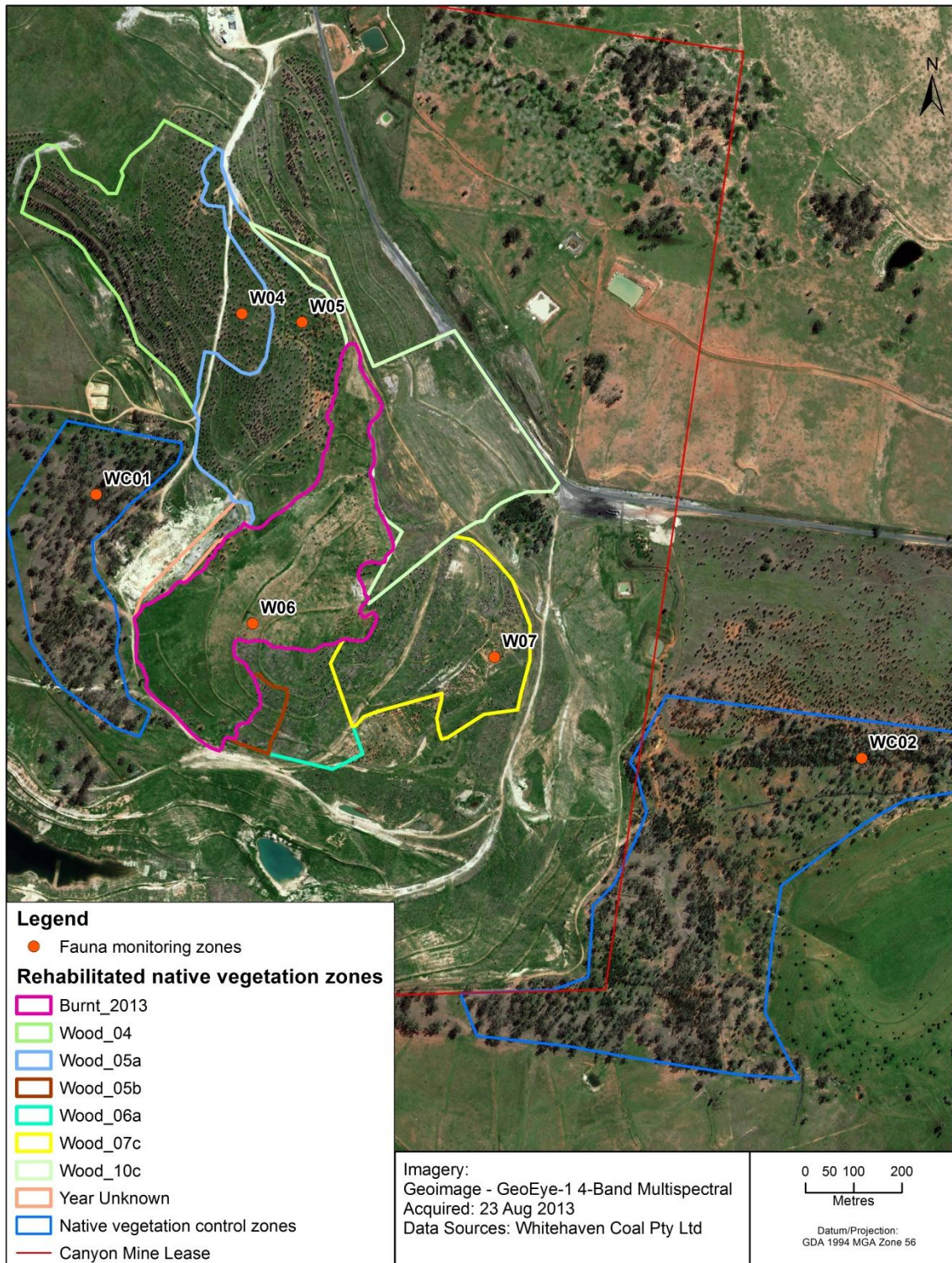
1 – One plot located within Wood_10c has recently been covered in topsoil and ploughed.

Table 3-19: Groundcover ANOVA results (note cells shaded green indicate no significant temporal change ($p>0.05$) within Wood_04, Wood_05a, Control Wood 2 and Control Wood 1; cells shaded red indicate significant ($p<0.05$) temporal change within zones

Monitoring zone		Wood_04				Wood_05a				Control Wood 2				: Control Wood 1			
Monitoring year		2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Native cover (%)	Mean	48.80 ^A	57.20 ^A	43.20 ^A	25.6 ^B	46.25 ^{AB}	59.00 ^A	39.50 ^{AB}	24.00 ^B	38.80 ^{AB}	58.40 ^A	31.20 ^{BC}	11.20 ^C	53.80 ^A	58.40 ^A	53.60 ^A	24.40 ^A
	Standard deviation	7.46	7.01	4.60	10.71	14.48	15.54	8.23	13.49	14.04	17.05	8.44	7.01	10.92	18.41	9.53	5.55
	P-value	0.00				0.00				0.00				0.00			
Exotic cover (%)	Mean	24.20 ^A	26.80 ^A	5.60 ^B	30.00 ^A	12.50	27.00	12.00	19.60	2.00	1.60	1.60	4.40	1.60	0.00	0.00	5.60
	Standard deviation	8.44	11.80	5.18	13.49	1.91	13.22	12.11	7.92	2.45	3.58	2.07	3.85	2.61	0.00	0.00	6.54
	P-value	0.00				0.17				0.46				0.07			
Leaf litter (%)	Mean	21.00 ^A	11.20 ^A	46.80 ^B	42.40 ^B	34.75 ^A	13.00 ^B	40.8 ^A	53.2 ^A	36.40 ^A	36.80 ^A	46.40 ^A	73.20 ^B	37.40 ^A	39.20 ^A	43.60 ^A	64.80 ^B
	Standard deviation	13.42	8.67	7.29	7.54	13.5	9.31	8.19	9.44	16.46	15.85	3.85	3.35	6.54	18.14	9.74	7.15
	P-value	0.00				0.00				0.00				0.00			
Bare ground (%)	Mean	6.00	4.80	4.40	2.00	6.50	1.00	5.60	3.20	22.40	2.40	16.80	10.40	7.20	2.40	2.80	5.20
	Standard deviation	3.16	6.72	5.55	1.41	2.52	1.15	3.85	3.63	19.46	2.61	8.20	13.00	5.02	2.19	2.28	3.03
	P-value	0.60				0.08				0.06				0.12			

Common superscript indicates no significant difference in means ($p>0.05$).

4 Fauna data



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Table 4-1: Bird species and associated feeding guilds recorded at W04, W05, W06 and W07 in 2011, 2012, 2013 and 2014

Species	Guild	Rehabilitated Sites																							
		W04						W05						W06						W07					
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
<i>Acanthagenys rufogularis</i> Spiny-cheeked Honeyeater	Canopy feeder	X	X	X	X	X	X	X	X	X	X	X	X					X	X				X	X	X
<i>Acanthiza apicalis</i> Inland Thornbill	Generalist - insects																								
<i>Acanthiza chrysorrhoa</i> Yellow-rumped Thornbill	Ground forager - insects	X		X	X	X		X		X	X	X	X												
<i>Acanthiza nana</i> Yellow Thornbill	Canopy feeder																								
<i>Acanthiza uropygialis</i> Chestnut-rumped Thornbill	Generalist - insects																								
<i>Accipiter fasciatus</i> Brown Goshawk	Bird of Prey															X									
<i>Anas gracilis</i> Grey Teal	Water Bird																								
<i>Anas superciliosa</i> Pacific Black Duck	Water Bird																								
<i>Anthus novaeseelandiae</i> Australasian Pipit	Ground forager - insects																	X						X	X
<i>Aphelocephala leucopsis</i> Southern Whiteface	Ground forager - insects																								
<i>Aprosmictus erythropterus</i> Red-winged Parrot	Canopy feeder							X		X															
<i>Aquila audax</i> Wedge-tailed Eagle	Bird of Prey																								
<i>Ardea pacifica</i> White-necked Heron	Water bird																								
<i>Artamus superciliosus</i> White-browed Woodswallow	Generalist - insects																								

Species	Guild	Rehabilitated Sites																								
		W04						W05						W06						W07						
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	
<i>Aythya australis</i> Hardhead	Water Bird																									
<i>Barnardius zonarius</i> Australian Ringneck	Generalist - plant based					X	X						X													
<i>Cacatua galerita</i> Sulphur-crested Cockatoo	Generalist - plant based										X															
<i>Cacatua sanguinea</i> Little Corella	Ground forager - plant based						X			X						X		X							X	
<i>Cacomantis flabelliformis</i> Fan-tailed Cuckoo	Generalist - insects					X																				
<i>Chalcites basalis</i> Horsfield's Bronze-Cuckoo	Generalist - insects									X												X				
<i>Chenonetta jubata</i> Australian Wood Duck	Water Bird																									
* <i>Chthonicola sagittata</i> Speckled Warbler	Ground forager - insects																									
<i>Cincloramphus mathewsi</i> Rufous Songlark	Ground forager - insects	X		X	X		X			X	X															
<i>Cisticola exilis</i> Golden-headed Cisticola	Ground forager - insects													X	X	X	X			X		X	X			
<i>Coracina novaehollandiae</i> Black-faced Cuckoo-shrike	Generalist - insects			X	X		X	X		X	X		X			X										X
<i>Corcorax melanoramphos</i> White-winged Chough	Ground forager - insects						X																			
<i>Corvus coronoides</i> Australian Raven	Generalist - carnivorous			X			X							X												
<i>Corvus mellori</i> Little Raven	Ground forager - insects																									
<i>Corvus orru</i> Torresian Crow	Ground forager – plant based																									
<i>Coturnix ypsilophora</i> Brown Quail	Ground forager - plant based	X		X	X	X		X		X	X			X	X					X	X		X	X		

Species	Guild	Rehabilitated Sites																							
		W04						W05						W06						W07					
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
<i>Cracticus nigrogularis</i> Pied Butcherbird	Generalist - carnivorous			X				X	X		X		X		X										X
<i>Cracticus tibicen</i> Australian Magpie	Generalist - carnivorous	X	X	X	X		X	X	X	X		X			X	X		X	X		X				
<i>Cracticus torquatus</i> Grey Butcherbird	Generalist - carnivorous																								
<i>Dacelo novaeguineae</i> Laughing Kookaburra	Generalist - carnivorous																								
<i>Dicaeum hirundinaceum</i> Mistletoebird	Canopy feeder																								
<i>Egretta novaehollandiae</i> White-faced Heron	Water Bird																								
<i>Elanus axillaris</i> Black-shouldered Kite	Bird of Prey					X								X	X	X	X				X	X			
<i>Entomyzon cyanotis</i> Blue-faced Honeyeater	Canopy feeder																								
<i>Eolophus roseicapillus</i> Galah	Ground forager - plant based					X					X					X	X	X						X	
<i>Eopsaltria australis</i> Eastern Yellow Robin	Generalist - insects																								
<i>Eurystomus orientalis</i> Dollarbird	Aerial forager																								
<i>Falco berigora</i> Brown Falcon	Bird of Prey			X																					
<i>Falco cenchroides</i> Nankeen Kestrel	Bird of Prey					X	X	X				X	X		X		X	X	X	X	X	X			
<i>Falco longipennis</i> Australian Hobby	Bird of Prey												X	X								X	X		
<i>Falco peregrinus</i> Peregrine Falcon	Bird of Prey												X												
* <i>Falco subniger</i> Black Falcon	Bird of Prey																X								

Species	Guild	Rehabilitated Sites																									
		W04						W05						W06						W07							
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)		
<i>Fulica atra</i> Eurasian Coot	Water Bird																										
<i>Geopelia striata</i> Peaceful Dove	Ground forager - plant based																										
<i>Gerygone fusca</i> Western Gerygone	Canopy feeder				X	X	X				X																
<i>Glossopsitta concinna</i> Musk Lorikeet	Canopy feeder																										
<i>Grallina cyanoleuca</i> Magpie-lark	Ground forager - insects			X		X											X										
<i>Haliastur sphenurus</i> Whistling Kite	Bird of Prey																									X	
<i>*Hieraaetus morphnoides</i> Little Eagle	Bird of Prey																										
<i>^Hirundapus caudacutus</i> White-throated Needletail	Aerial forager													X													
<i>Hirundo neoxena</i> Welcome Swallow	Aerial forager						X																				
<i>Lalage sueurii</i> White-winged Triller	Generalist - insects				X	X	X				X	X	X														
<i>Lichenostomus penicillatus</i> White-plumed Honeyeater	Canopy feeder																										
<i>Lichenostomus virescens</i> Singing Honeyeater	Generalist	X	X	X	X	X	X	X	X	X	X	X				X	X	X							X		
<i>Malurus cyaneus</i> Superb Fairy-wren	Ground forager - insects	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X		X	X				X		X
<i>Malurus leucopterus</i> White-winged Fairy-wren	Ground forager - insects	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Manorina melanocephala</i> Noisy Miner	Generalist						X						X														
<i>Megalurus timoriensis</i> Tawny Grassbird	Ground forager - insects						X							X	X	X				X							

Species	Guild	Rehabilitated Sites																								
		W04						W05						W06						W07						
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	
<i>*Melanodryas cucullata</i> Hooded Robin	Ground forager - insects																									
<i>Microeca fascians</i> Jacky Winter	Ground forager - insects																									
<i>Neochmia modesta</i> Plum-headed Finch	Ground forager - plant based	X																								
<i>Northiella haematogaster</i> Blue Bonnet	Ground forager - plant based																									
<i>Nymphicus hollandicus</i> Cockatiel	Ground forager - plant based										X															
<i>Ocyphaps lophotes</i> Crested Pigeon	Ground forager - plant based	X	X		X	X		X	X		X	X	X						X							
<i>Pachycephala pectoralis</i> Golden Whistler	Canopy feeder					X																				
<i>Pachycephala rufiventris</i> Rufous Whistler	Canopy feeder			X			X																			
<i>Pardalotus punctatus</i> Spotted Pardalote	Canopy feeder					X																				
<i>Pardalotus striatus</i> Striated Pardalote	Canopy feeder			X		X					X															
<i>Pelecanus conspicillatus</i> Australian Pelican	Water bird																									
<i>Petrochelidon ariel</i> Fairy Martin	Aerial forager						X											X		X						
<i>Petrochelidon nigricans</i> Tree Martin	Aerial forager																	X								
<i>Petroica goodenovii</i> Red-capped Robin	Ground forager - insects																									
<i>Phaps chalcoptera</i> Common Bronzewing	Ground forager - plant based																									
<i>Philemon corniculatus</i> Noisy Friarbird	Canopy feeder																									

Species	Guild	Rehabilitated Sites																							
		W04						W05						W06						W07					
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
<i>Platycercus eximius</i> Eastern Rosella	Generalist - plant based				X	X			X			X	X												
<i>Plectorhyncha lanceolata</i> Striped Honeyeater	Generalist - plant based																								
<i>*Pomatostomus temporalis</i> Grey-crowned Babbler	Ground forager - insects																								
<i>Psephotus haematonotus</i> Red-rumped Parrot	Ground forager - plant based											X													
<i>Rhipidura albiscapa</i> Grey Fantail	Generalist - insects			X																					
<i>Rhipidura leucophrys</i> Willie Wagtail	Aerial forager	X	X	X	X		X	X	X	X		X			X							X			
<i>Scythrops novaehollandiae</i> Channel-billed Cuckoo	Canopy feeder						X																		
<i>Smicronis brevirostris</i> Weebill	Canopy feeder		X	X	X	X	X	X	X	X	X	X					X	X				X	X	X	
<i>Struthidea cinerea</i> Apostlebird	Ground forager - omnivorous																								
<i>Sturnus tristis</i> Common Myna	Ground forager - omnivorous																								
<i>#Sturnus vulgaris</i> Common Starling	Ground forager - omnivorous													X											
<i>Tachybaptus novaehollandiae</i> Australian Grebe	Water Bird																								
<i>Taeniopygia bichenovii</i> Double-barred Finch	Ground forager - plant based																								
<i>Taeniopygia guttata</i> Zebra Finch	Ground forager - plant based		X			X	X				X	X	X				X				X		X	X	X
<i>^Threskiornis spinicollis</i> Straw-necked Ibis	Water Bird																								

Species	Guild	Rehabilitated Sites																								
		W04						W05						W06						W07						
		2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	
<i>Todiramphus sanctus</i> Sacred Kingfisher	Generalist - carnivorous																									
# <i>Turdus merula</i> Common Blackbird	Ground forager - omnivorous								X																	
<i>Turnix varia</i> Painted Button-quail	Ground forager - omnivorous																									
<i>Vanellus tricolor</i> Banded Lapwing	Ground forager - insects																									

*V TSC Act; ^Migratory EPBC Act; #introduced.

Where there are no records, these species have been recorded at the control sites.

Table 4-2: Bird species and associated feeding guilds recorded at control sites and opportunistically in 2011, 2012, 2013 and 2014

Species	Guild	Control Sites												Opportunistic Observations				
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)					
<i>Acanthagenys rufogularis</i> Spiny-cheeked Honeyeater	Canopy feeder							X		X	X	X	X					
<i>Acanthiza apicalis</i> Inland Thornbill	Generalist - insects							X		X	X	X	X					
<i>Acanthiza chrysorrhoa</i> Yellow-rumped Thornbill	Ground forager - insects							X		X	X	X	X					
<i>Acanthiza nana</i> Yellow Thornbill	Canopy feeder							X		X	X		X					
<i>Acanthiza uropygialis</i> Chestnut-rumped Thornbill	Generalist - insects									X	X	X						
<i>Accipiter fasciatus</i> Brown Goshawk	Bird of Prey		X								X							X
<i>Anas gracilis</i> Grey Teal	Water Bird													X				
<i>Anas superciliosa</i> Pacific Black Duck	Water Bird								X					X	X	X	X	
<i>Anthus novaeseelandiae</i> Australasian Pipit	Ground forager - insects														X	X		
<i>Aphelocephala leucopsis</i> Southern Whiteface	Ground forager - insects												X					
<i>Aprosmictus erythropterus</i> Red-winged Parrot	Canopy feeder										X							
<i>Aquila audax</i> Wedge-tailed Eagle	Bird of Prey							X	X	X	X			X				
<i>Ardea pacifica</i> White-necked Heron	Water bird																	X

Species	Guild	Control Sites												Opportunistic Observations				
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)					
<i>Artamus superciliosus</i> White-browed Woodswallow	Generalist - insects							X		X		X						
<i>Aythya australis</i> Hardhead	Water Bird							X		X			X					
<i>Barnardius zonarius</i> Australian Ringneck	Generalist - plant based			X						X	X	X	X					
<i>Cacatua galerita</i> Sulphur-crested Cockatoo	Generalist - plant based	X			X	X		X			X			X	X			
<i>Cacatua sanguinea</i> Little Corella	Ground forager - plant based	X	X				X	X	X		X		X		X			
<i>Cacomantis flabelliformis</i> Fan-tailed Cuckoo	Generalist - insects											X						
<i>Chalcites basalis</i> Horsfield's Bronze-Cuckoo	Generalist - insects									X								
<i>Chenonetta jubata</i> Australian Wood Duck	Water Bird	X				X		X				X						
* <i>Chthonicola sagittata</i> Speckled Warbler	Ground forager - insects							X		X	X	X	X					
<i>Cincloramphus mathewsi</i> Rufous Songlark	Ground forager - insects							X		X	X	X						
<i>Cisticola exilis</i> Golden-headed Cisticola	Ground forager - insects								X									
<i>Coracina novaehollandiae</i> Black-faced Cuckoo-shrike	Generalist - insects					X	X			X	X	X	X					

Species	Guild	Control Sites												Opportunistic Observations				
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)					
<i>Corcorax melanoramphos</i> White-winged Chough	Ground forager - insects	X			X	X	X	X		X	X	X	X					
<i>Corvus coronoides</i> Australian Raven	Generalist - carnivorous	X		X		X		X	X	X		X	X					
<i>Corvus mellori</i> Little Raven	Ground forager - insects																X	X
<i>Corvus orru</i> Torresian Crow	Ground forager – plant based								X								X	
<i>Coturnix ypsilophora</i> Brown Quail	Ground forager - plant based							X										
<i>Cracticus nigrogularis</i> Pied Butcherbird	Generalist - carnivorous		X	X		X	X	X		X	X	X	X					
<i>Cracticus tibicen</i> Australian Magpie	Generalist - carnivorous	X	X	X	X		X	X	X	X	X		X					
<i>Cracticus torquatus</i> Grey Butcherbird	Generalist - carnivorous	X	X	X	X	X	X	X		X	X							
<i>Dacelo novaeguineae</i> Laughing Kookaburra	Generalist - carnivorous		X		X			X		X	X	X	X					
<i>Dicaeum hirundinaceum</i> Mistletoebird	Canopy feeder								X		X							
<i>Egretta novaehollandiae</i> White-faced Heron	Water Bird	X												X			X	X
<i>Elanus axillaris</i> Black-shouldered Kite	Bird of Prey		X															
<i>Entomyzon cyanotis</i> Blue-faced Honeyeater	Canopy feeder																	X
<i>Eolophus roseicapillus</i> Galah	Ground forager - plant based	X	X	X	X	X	X	X	X	X	X	X	X					
<i>Eopsaltria australis</i> Eastern Yellow Robin	Generalist - insects							X		X	X	X	X					

Species	Guild	Control Sites												Opportunistic Observations					
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)						
<i>Eurystomus orientalis</i> Dollarbird	Aerial forager							X	X										
<i>Falco berigora</i> Brown Falcon	Bird of Prey																		
<i>Falco cenchroides</i> Nankeen Kestrel	Bird of Prey	X			X		X												
<i>Falco longipennis</i> Australian Hobby	Bird of Prey	X			X	X					X	X	X						
<i>Falco peregrinus</i> Peregrine Falcon	Bird of Prey																		
* <i>Falco subniger</i> Black Falcon	Bird of Prey		X																
<i>Fulica atra</i> Eurasian Coot	Water Bird								X						X	X			
<i>Geopelia striata</i> Peaceful Dove	Ground forager - plant based							X	X	X									
<i>Gerygone fusca</i> Western Gerygone	Canopy feeder							X	X		X	X	X						
<i>Glossopsitta concinna</i> Musk Lorikeet	Canopy feeder	X													X		X	X	
<i>Grallina cyanoleuca</i> Magpie-lark	Ground forager - insects	X	X		X	X	X	X		X	X	X	X						
<i>Haliastur sphenurus</i> Whistling Kite	Bird of Prey				X										X				
* <i>Hieraaetus morphnoides</i> Little Eagle	Bird of Prey	X																	
^ <i>Hirundapus caudacutus</i> White-throated Needletail	Aerial forager								X										

Species	Guild	Control Sites												Opportunistic Observations						
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)		
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)							
<i>Hirundo neoxena</i> Welcome Swallow	Aerial forager																			
<i>Lalage sueurii</i> White-winged Triller	Generalist - insects							X			X	X	X							
<i>Lichenostomus penicillatus</i> White-plumed Honeyeater	Canopy feeder							X	X	X	X	X	X							
<i>Lichenostomus virescens</i> Singing Honeyeater	Generalist								X	X										
<i>Malurus cyaneus</i> Superb Fairy-wren	Ground forager - insects							X	X	X	X	X	X							
<i>Malurus leucopterus</i> White-winged Fairy-wren	Ground forager - insects																			
<i>Manorina melanocephala</i> Noisy Miner	Generalist	X	X	X	X	X	X	X		X	X	X	X							
<i>Megalurus timoriensis</i> Tawny Grassbird	Ground forager - insects																			
* <i>Melanodryas cucullata</i> Hooded Robin	Ground forager - insects								X		X	X	X							
<i>Microeca fascinans</i> Jacky Winter	Ground forager - insects									X	X	X	X							
<i>Neochmia modesta</i> Plum-headed Finch	Ground forager - plant based							X												
<i>Northiella haematogaster</i> Blue Bonnet	Ground forager - plant based					X		X		X	X	X	X							
<i>Nymphicus hollandicus</i> Cockatiel	Ground forager - plant based	X	X	X	X	X	X			X	X	X								

Species	Guild	Control Sites												Opportunistic Observations					
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)						
<i>Ocyphaps lophotes</i> Crested Pigeon	Ground forager - plant based	X	X	X	X	X	X	X		X	X	X	X						
<i>Pachycephala pectoralis</i> Golden Whistler	Canopy feeder											X							
<i>Pachycephala rufiventris</i> Rufous Whistler	Canopy feeder							X	X	X	X	X	X						
<i>Pardalotus punctatus</i> Spotted Pardalote	Canopy feeder											X							
<i>Pardalotus striatus</i> Striated Pardalote	Canopy feeder					X		X		X			X						
<i>Pelecanus conspicillatus</i> Australian Pelican	Water bird								X									X	
<i>Petrochelidon ariel</i> Fairy Martin	Aerial forager							X			X								
<i>Petrochelidon nigricans</i> Tree Martin	Aerial forager																		
<i>Petroica goodenovii</i> Red-capped Robin	Ground forager - insects							X	X	X	X	X	X						
<i>Phaps chalcoptera</i> Common Bronzewing	Ground forager - plant based							X			X	X	X						
<i>Philemon corniculatus</i> Noisy Friarbird	Canopy feeder								X	X	X	X							
<i>Platycercus eximius</i> Eastern Rosella	Generalist - plant based	X	X	X	X	X	X	X		X	X	X	X						
<i>Plectorhyncha lanceolata</i> Striped Honeyeater	Generalist - plant based							X		X	X	X							
* <i>Pomatostomus temporalis</i> Grey-crowned Babbler	Ground forager - insects	X	X	X	X	X	X	X	X	X	X		X						

Species	Guild	Control Sites												Opportunistic Observations				
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)					
<i>Psephotus haematonotus</i> Red-rumped Parrot	Ground forager - plant based		X	X	X		X	X		X	X	X	X					
<i>Rhipidura albiscapa</i> Grey Fantail	Generalist - insects							X		X	X	X	X					
<i>Rhipidura leucophrys</i> Willie Wagtail	Aerial forager							X		X	X	X	X					
<i>Scythrops novaehollandiae</i> Channel-billed Cuckoo	Canopy feeder				X		X		X									
<i>Smicronis brevirostris</i> Weebill	Canopy feeder						X		X	X	X	X	X					
<i>Struthidea cinerea</i> Apostlebird	Ground forager - omnivorous	X			X	X	X	X	X		X	X	X					
<i>Sturnus tristis</i> Common Myna	Ground forager - omnivorous								X			X						
# <i>Sturnus vulgaris</i> Common Starling	Ground forager - omnivorous			X		X	X			X		X				X		
<i>Tachybaptus novaehollandiae</i> Australian Grebe	Water Bird													X	X			
<i>Taeniopygia bichenovii</i> Double-barred Finch	Ground forager - plant based							X	X	X	X	X	X					
<i>Taeniopygia guttata</i> Zebra Finch	Ground forager - plant based																	
^ <i>Threskiornis spinicollis</i> Straw-necked Ibis	Water Bird								X					X				
<i>Todiramphus sanctus</i> Sacred Kingfisher	Generalist - carnivorous							X										
# <i>Turdus merula</i> Common Blackbird	Ground forager - omnivorous																	
<i>Turnix varia</i> Painted Button-quail	Ground forager - omnivorous	X						X			X							

Species	Guild	Control Sites												Opportunistic Observations					
		WC01						WC02						2012	2013 (Sep)	2013 (Oct)	2014 (Aug)	2014 (Nov)	
		2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)						
<i>Vanellus tricolor</i> Banded Lapwing	Ground forager - insects														X				

*V TSC Act; ^Migratory EPBC Act; #introduced.

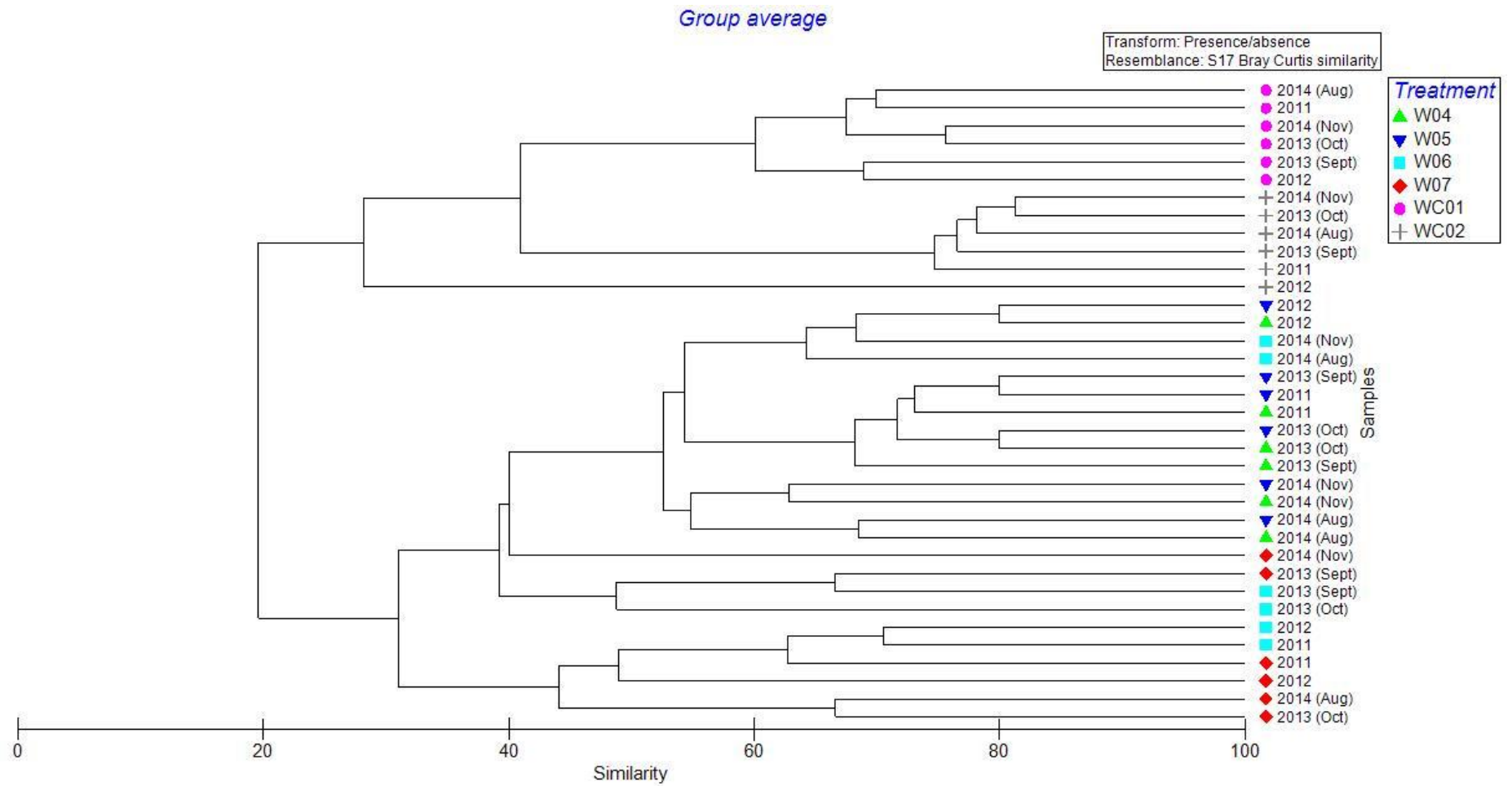


Figure 4-1: Cluster analysis of bird species recorded in all monitoring plots for 2011, 2012, 2013 and 2014 monitoring periods

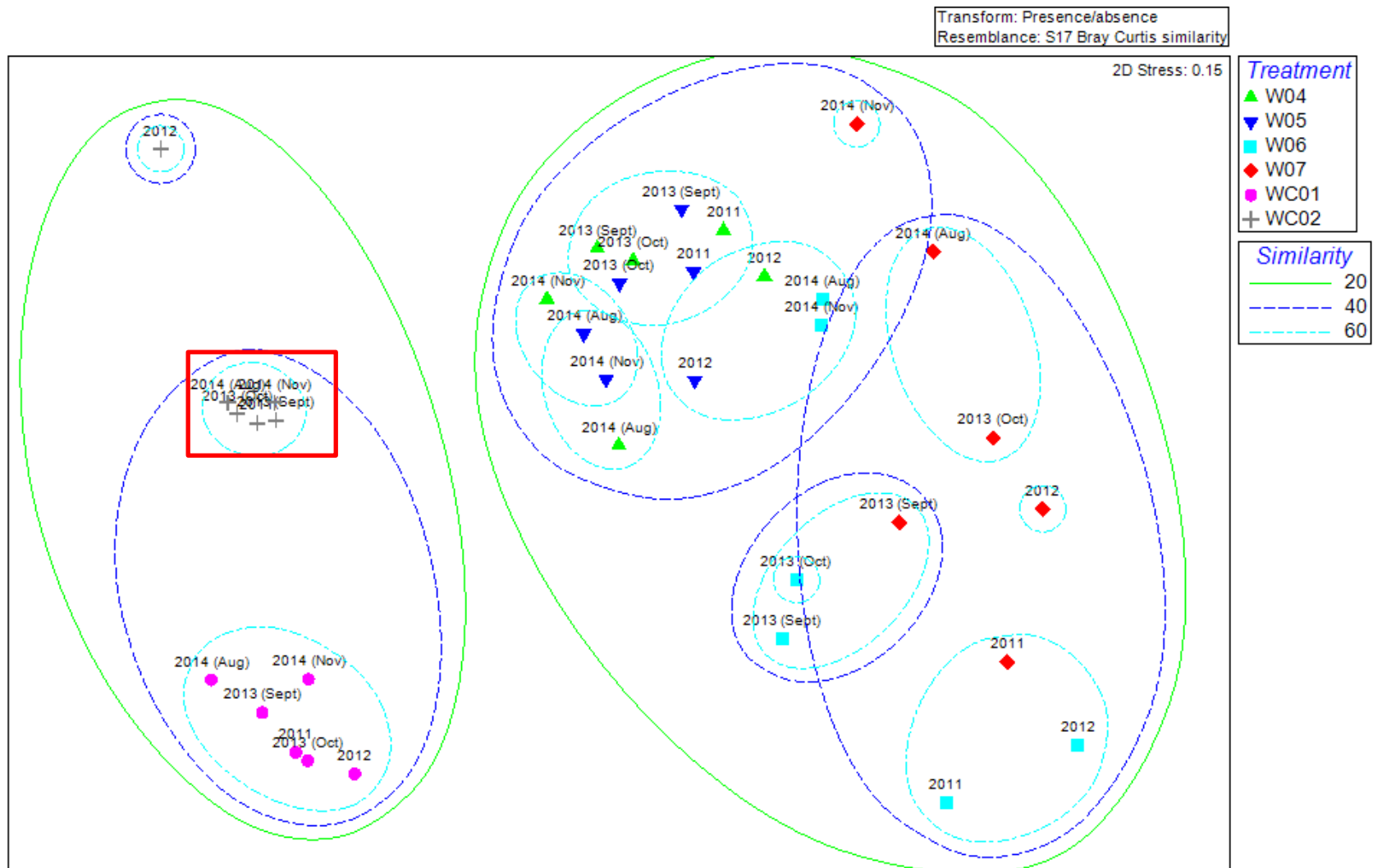


Figure 4-2: Non-metric multi-dimensional scaling plot for bird species recorded in all monitoring plots for 2011, 2012, 2013 and 2014 monitoring periods

Note: All sites contained within red square belong to control site WC02.

Table 4-3: Fauna species recorded within all monitoring zones (2011, 2012, 2013 and 2014)

Species	Rehabilitated Sites														Reference Sites																																					
	W04						W05				W06				W07				WC01				WC02																													
	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)																						
AMPHIBIANS																																																				
<i>Litoria caerulea</i> Green Tree-Frog						X	X																																													
<i>Litoria peronii</i> Peron's Tree-Frog																																			X	X	X															
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0											
REPTILES																																																				
<i>Cryptoblepharus virgatus</i> Wall Skink				X				X	X							X								X																X												
<i>Egernia striolata</i> Tree Skink				X					X							X				X															X	X																
<i>Morethia boulengeri</i> Boulenger's Skink				X																			X																													
<i>Pogona barbata</i> Eastern Bearded Dragon																							X																													
<i>Pseudechis porphyriacus</i> Red-bellied Black Snake																																							X													
Total	0	0	0	3	0	0	0	0	1	2	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	3	0	1	1	0	0	1	1	0	1	0	1	0	0	0												
MAMMALS																																																				
<i>Macropus giganteus</i> Eastern Grey Kangaroo	X	X			X	X	X	X			X	X				X	X	X	X																			X	X	X	X				X	X						
<i>Macropus robustus</i> Common Wallaroo		X				X	X	X					X	X			X	X							X	X	X									X												X				
* <i>Phascolarctos cinereus</i> Koala																																																	X			
<i>Wallabia bicolor</i> Swamp Wallaby																																																				X
# <i>Lepus capensis</i> Hare	X				X							X				X											X											X														

Species	Rehabilitated Sites														Reference Sites																					
	W04				W05				W06				W07				WC01				WC02															
	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)												
# <i>Oryctolagus cuniculus</i> Rabbit																			X				X	X	X	X										
# <i>Felis catus</i> Cat																																				
# <i>Sus scrofa</i> Feral Pig																		X					X	X		X	X									
<i>Vulpes vulpes</i> Fox		X																					X			X	X									
Total	2	3	0	0	2	2	2	2	0	0	1	2	1	1	0	0	3	3	1	1	0	0	0	3	2	3	0	0	5	3	4	3	0	0	4	6

* Denotes listed as threatened under the TSC Act; #Denotes exotic species

5 Soil Data

Table 5-1: Temporal comparison of soil nutrient status across each monitoring zone.

Parameter	Summary Statistic	Rehab		Control Pasture 1		Control Pasture 2	
		2011	2014	2011	2014	2011	2014
Electrical Conductivity (dS/m) (Soil:Water 1:5)	Min	0.03	0.05	0.03	0.04	0.02	0.03
	Max	0.14	0.17	0.23	0.47	0.13	0.14
	Mean	0.08	0.09	0.10	0.15	0.05	0.06
	P-value	0.63		0.45		0.73	
pH (CaCl ₂)	Min	5.66	5.87	4.96	4.86	4.90	5.52
	Max	7.78	7.53	7.91	7.13	7.71	7.22
	Mean	6.72	6.76	1.17	0.76	5.88	6.25
	P-value	0.94		0.77		0.33	
Total Nitrogen (mg/kg)	Min	352	413	368	407	598	563
	Max	1176	2444	1815	1744	970	1240
	Mean	701	982	932	954	742	865
	P-value	0.29		0.93		0.18	
Phosphorous (mg/kg) (Colwell)	Min	15.70	8.74	15.8	11.4	14.60	6.75
	Max	34.70	21.90	35.8	27.9	21.40	17.90
	Mean	21.58	14.18	23.76	16.44	17.14	12.63
	P-value	0.01		0.07		0.01	
Organic Carbon (%)	Min	0.53	0.72	0.91	2.01	1.01	1.31
	Max	2.56	5.76	4.21	4.99	2.01	2.96
	Mean	1.38	2.14	2.18	1.36	1.44	2.09
	P-value	0.25		0.43		0.01	

Table 5-2: Summary of soil nutrient status 2014

Zone	Summary Statistic	pH (CaCl ₂)	EC (dS/m) (Soil:Water 1:5)	TN (mg/kg)	P (mg/kg) (Colwell)	OC (%)
Rehab	Mean	6.76	0.09	981.75	14.18	2.14
	SD	0.65	0.05	676.24	4.80	1.66
Control Pasture 1	Mean	6.23	0.15	953.50	16.44	3.17
	SD	1.17	0.15	416.03	6.99	1.36
Control Pasture 2	Mean	6.25	0.06	865.38	12.63	2.09
	SD	0.50	0.03	210.22	3.79	0.51
Overall Mean		6.41	0.10	933.54	14.42	2.47
Overall SD		0.35	0.07	233.54	1.64	0.60

Soil Pit 10: Pasture Control (E: 229046, N: 6597191)



Horizon and Depth	Soil Description
1. 0 – 0.18 m	Chocolate brown sandy clay loam. Grass roots present.
2. 0.18 – 0.37 m	Grey sandy clay with gravel present throughout horizon. No roots present.
3. 0.37 – 1.0 m	Light brown medium clay with sparse rock throughout horizon. No roots.

Note:

Soil Pit 11: Pasture Rehabilitation (E: 228976, N: 6597007)



Horizon and Depth	Soil Description
1. 0 – 0.31 m	Brown – red / brown clay loam with fine gravel throughout horizon. Grass roots present.
2. 0.31 – 0.64 m	Brown – red / brown medium clay – medium clay with rocks present throughout horizon. No roots present.

Note:

0.64 m and below is mine overburden (grey rock).

Soil Pit 12: Pasture Rehabilitation (E: 228992, N: 6596753)



Horizon and Depth	Soil Description
1. 0 – 0.16 m	Brown clay loam with fine gravel throughout horizon. Roots present.
2. 0.16 – 0.26 m	Brown – orange/brown sandy clay – medium clay with rocks and gravel present throughout horizon. No roots present.

Note:

0.26 m and below is mine overburden (grey rock).

Soil Pit 13: Pasture Control (E: 228684, N: 6596248)



Horizon and Depth	Soil Description
1. 0 – 0.17 m	Brown – red / brown clay loam. Grass roots present.
2. 0.17 – 0.30 m	Brown – red / brown heavy clay with rock scattered throughout horizon.

Note:

Heavy clay continues below 0.30 m. The dig was abandoned due to extremely hard soils, together with the unlikely chance of soil profile change.

Soil Pit 14: Woodland Rehabilitation (E: 229384, N: 6596242)



Horizon and Depth	Soil Description
1. 0 – 0.23 m	Light brown medium clay with coarse gravel present. No plant roots observed.
2. 0.23 – 0.83 m	Light brown / orange medium clay. Some sand and fine gravel present, however only a very small percentage. No plant roots present.

Note:

0.83 m and below is mine overburden (grey rock).

Soil Pit 15: Woodland Control (E: 229096, N: 6595904)



Horizon and Depth	Soil Description
1. 0 – 0.20 m	Light brown sandy clay loam with gravel and rock present. Grass roots present within horizon.
2. 0.2 – 1.07 m	Light brown – grey and light orange – brown (mottled soil profile) heavy clay. No roots present.

Note:

Heavy clay continues below 1.07 m

Soil Pit 16: Woodland Rehabilitation (E: 229529, N: 6595819)



Horizon and Depth	Soil Description
1. 0 – 0.36 m	Red-brown medium clay with high content of gravel and rock

Note:

Gravel makes ribboning difficult but if gravel was not present, ribbon would be approximately 75 mm.

Below 0.36 m is grey rock

Soil Pit 17: Woodland Control (E: 230152, N: 6595058)



Horizon and Depth	Soil Description
1. 0 – 0.22 m	Brown sandy loam with many grass and tree roots present.
2. 0.22 – 0.55 m	Grey fine sandy loam. Rocks throughout profile. Some tree roots, no grass roots.

Note:

Large rocks (100 mm) with a matrix of fine sandy loam below 0.55 m

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