Annual Review Canyon Coal Mine

Name of operation	Canyon Coal Mine
Name of operator	Whitehaven Coal Mining Ltd
Development consent/project approval number	DA 8-1-2005
Name of holder of development consent/project	Whitehaven Coal Mining Ltd
approval	
Mining lease number	ML 1464, ML 1471
Name of holder of mining lease	Whitehaven Coal Mining Ltd
Water licence number	WAL 29458
Name of holder of water licence	Whitehaven Coal Mining Ltd
MOP start date	7 September 2015
MOP end date	6 September 2022
Annual review start date 1	1 July 2015
Annual review end date	30 June 2016

I, Jamie Frankcombe, certify that this audit report is a true and accurate record of the compliance status of Canyon Coal Mine for the period July 1st 2015 until June 30th 2016, and that I am authorised to make this statement on behalf of Whitehaven Coal Mining Pty Ltd.

Note. a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).

Name of authorised reporting officer	Jamie Frankcombe
Title of authorised reporting officer	Director- Whitehaven Coal Mining Ltd
Signature of authorised reporting officer	Shallly
Date	27/09/2016
¹ NSW Annual Review Guideline was released in October 20	5.

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STATEMENT OF COMPLIANCE

The compliance status of the Canyon Coal Mine as at 30^{th} June 2016 is summarised in Table 1.

Table 2 notes non-compliances that occurred during the reporting period.

Table 1 - Statement of Compliance

Were all conditions of the relevant approval(s) complied with? 1			
ML 1471	No		
ML 1464	Yes		
DA 88-1-2005 MOD 3	No		
WAL 29458	No		

Table 2 - Non-compliances

Relevant Approval	Condition Schedule and Number	Condition Description (summary)			Where Addressed in Annual Review
DA- 8-1-2005 MOD 3	2(2)	The Proponent shall carry out the development: Generally in accordance with the EIS; and In accordance with the conditions of this consent.	NC	Several non- compliances with the Development Consent were identified during the 2015 Independent Environmental Audit process.	Section 9.2
DA- 8-1-2005 MOD 3	3(3)	The Applicant shall carry out the development in a way that prevents and/or minimises the air pollution generated by the development.	NC	Stabilisation of void batters and gravel pit area required during next reporting.	Section 9.2
DA- 8-1-2005 MOD 3	3(20)	The Applicant shall: (a) prepare a detailed site water balance for all the development site; (b) measure water use on site; (c) review the site water balance for the development annually; and (d) report the results of this review in the AEMR, to the satisfaction of the Secretary.	NC	Although no water has been taken on site during the reporting period, this has not been recorded in a water log book. Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log book.	Section 9.2
DA- 8-1-2005	3(21)	The Applicant shall implement a	NC	Soil erosion occurring	Section 9.2

MOD 3		range of erosion and sediment		in gravel pit area and	
IVIOD 3		-		on void batters. To be	
	controls at the site, in general accordance with the requirements			seeded next reporting	
		· ·		-	
		of the Department of Housing's		period.	
		Managing Urban Stormwater: Soils			
		and Construction manual, to			
		minimise erosion and the discharge			
		of sediment from the site.			
DA- 8-1-2005	3(30)	At least 6 months prior to the	NC	Audit of offset strategy	Section 9.2
MOD 3		cessation of mining, unless the		to be completed	
		Secretary directs otherwise, the		during next reporting	
		Applicant shall commission, and		period.	
		pay the full cost of, an Independent		F	
		Audit of the offset strategy.			
DA 0.4.2005	F(C)	, idant or the onlock shakes,	NC		Castian 0.2
DA- 8-1-2005	5(6)	By the end of September 2006, and	NC	Independent	Section 9.2
MOD 3		every 3 years thereafter, unless the		Environmental Audits	
		Secretary directs otherwise, the		were not undertaken	
		Applicant shall commission and pay		in 2009 or 2012.	
		the full cost of an Independent			
		Environmental Audit of the			
		development.			
ML 1471	30	The lease holder shall conduct	NC	Sail arasian assurring	Section 9.2
				Soil erosion occurring	
		operations in a manner as not to		in gravel pit area and	
		cause or aggravate soil erosion.		on void batters. To be	
				seeded next reporting	
				period.	
WAL 29458	MW0635-	The licence holder must record	NC	Logbook not	Section 9.2
	00001	water taken in a logbook.		maintained.	
				Whitehaven are	
				currently in the	
				process of	
				decommissioning the	
				bore on site, therefore	
				eliminating the	
				requirement for a log	
				book.	
WAL 29458	MW0633-	The Personal Little Control	NC	1! ! .	Section 9.2
VV/\L 25450		The licence holder must record the	110	Logbook not	30000011 3.2
	00001	following in the logbook:		maintained.	
	00001	(i) each date and period of time		Whitehaven are	
	00001	(i) each date and period of time during which water is taken under		Whitehaven are currently in the	
	00001	(i) each date and period of time during which water is taken under this licence;		Whitehaven are currently in the process of	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on		Whitehaven are currently in the process of decommissioning the	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date;		Whitehaven are currently in the process of decommissioning the bore on site, therefore	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval number of the water supply work		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval number of the water supply work		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval number of the water supply work used to take the water on that		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log	
	00001	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval number of the water supply work used to take the water on that date;		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log	
WAL 29458	00001 MW0632-	(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval number of the water supply work used to take the water on that date; (iv) the purpose or purposes for which the water taken on that date.	NC	Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log book.	Section 9.2
WAL 29458		(i) each date and period of time during which water is taken under this licence; (ii) the volume of water taken on that date; (iii) the water supply work approval number of the water supply work used to take the water on that date; (iv) the purpose or purposes for	NC	Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log	Section 9.2

	00001	licence nominates only a metered work with a data logger. A "logbook" means a written record, kept in hard copy or electronic form, which accurately records all information required to be kept for this licence.		Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log book.	
WAL 29458	MW0637- 00001	The licence holder must retain the information required to be recorded in the logbook for 5 years from the date to which that information relates.	NC	Logbook not maintained. Whitehaven are currently in the process of decommissioning the bore on site, therefore eliminating the requirement for a log book.	Section 9.2
WAL 29458	MW0831- 00001	The licence holder must notify the Minister, in writing, immediately upon becoming aware of a breach of any condition of this licence. Note: a notification does not authorise a breach, or continuing breach, of a condition of this licence.	NC	Notification made within this Annual Review.	Section 9.2

Compliance status key for Table 2

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

1 INTRODUCTION

This is the 15th Annual Review (AR), formally Annual Environmental Management Report, produced for the Canyon Coal Mine, and it has been prepared in accordance with Condition 3 of Mining Leases (MLs) 1464 and 1471 (Mining Act 1992) and Condition 5 (Schedule 5) of DA 8-1-2005 MOD 3. The AR follows the format required by the NSW Government Annual Review Guideline (October, 2015).

Canyon Coal Mine (Canyon) is located within the Narrabri Shire, approximately 30 km northwest of Gunnedah, 16 km east-south-east of Boggabri and immediately north of the former Vickery Coal Mine (Figure 1).

Mining at Canyon ceased in July 2009, and the mine is now in Closure, with a small area leased to Hitachi as a maintenance compound.

1.1 Mine Contacts

The management personnel responsible for the Canyon Coal Mine and their relevant contact details are as follows:

- Mrs Jill Johnson, Group Manager Environment oversees day to day environmental and rehabilitation performance across the site. Contact: (02) 6741 9321.
- Mr Nigel Wood, General Manager, Open Cut Operations oversees Open Cut
 Operations for the Whitehaven Group. Contact: (02) 6741 9309.

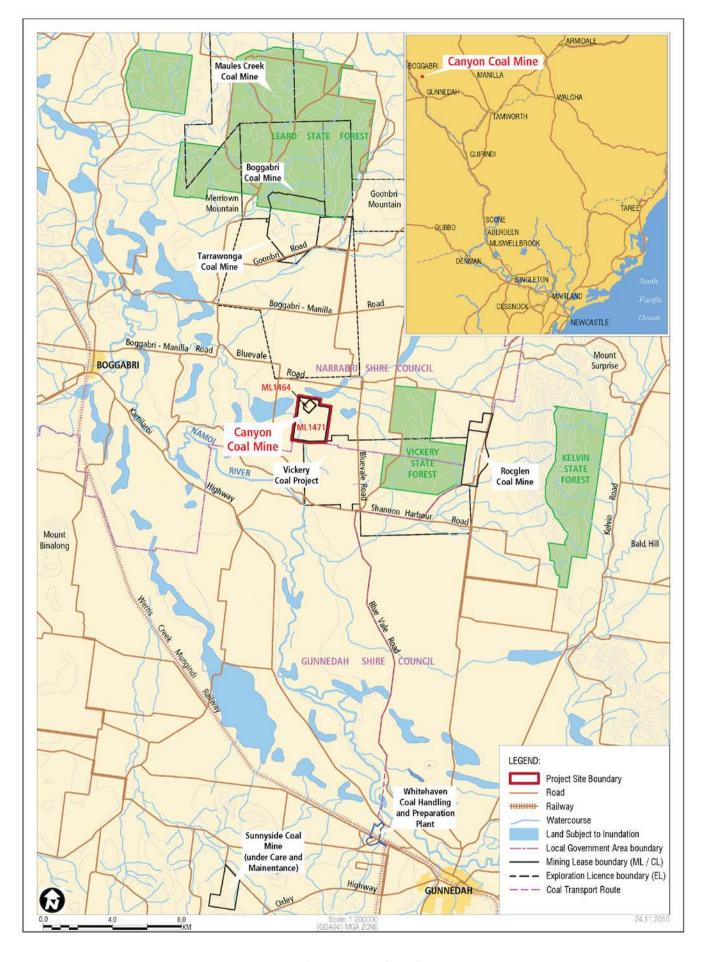


Figure 1 - Locality Plan

2 APPROVALS

2.1 Tenements, Licences, and Approvals

Table 3 identifies the approvals in place for the Canyon Coal Mine at the end of the reporting period, the issuing / responsible Authority, dates of issue, expiry date and relevant comments.

Table 3 - Tenements, Licences and Approvals

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Department of Planning and Environment	Development Consent DA 88-1- 2005, Modification 3	3 September 2015	3 September 2020	-
Department of Primary Industry- Division of Resources and Energy	ML 1471	7 th September 2000	7 th September 2021	-
Department of Primary Industry- Division of Resources and Energy	ML 1464	21 August 2006	21 st August 2027	-
Department of Primary Industry - Water	WAL 29458 (90WA822498)	12 September 2012	In perpetuity	-

3 OPERATIONS SUMMARY

3.1 Mining Operations

No mining operations have occurred at the Canyon Coal Mine during the reporting period.

Table 4 - Production Summary

Material	Approved Limit	Previous Reporting Period (actual)	This Reporting Period (actual)	Next Reporting Period (forecast)
Waste Rock/Overburden	n/a	0	0	0
ROM Coal/Ore	n/a	0	0	0
Coarse Reject	n/a	0	0	0
Fine Reject (Tailings)	n/a	0	0	0
Saleable Product	n/a	0	0	0

Fuel usage onsite was limited to that used within the leased Hitachi compound, and consisted of 44,480L of diesel, primarily consumed by the onsite generator.

3.2 Next Reporting Period

Operations forecast for the next reporting period are expected to be limited to environmental monitoring and maintenance earthworks, if and as required.

4 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

There were no actions required from the 2015 Annual Environmental Management Report.

5 ENVIRONMENTAL PERFORMANCE

The following sub-sections document the implementation and effectiveness of the various control strategies adopted at the Canyon Coal Mine.

5.1 Air Quality

5.1.1 Criteria

The air quality criteria applicable to the Canyon Coal Mine are specified in DA 8-1-2005 MOD 3, and are summarised below.

- Maximum increase in deposited dust 2 g/m²/month.
- Maximum mean total deposited dust level (insoluable solids) 4 g/m²/month.
- Mean annual Total Suspended Particulate (TSP) matter (all sources) concentration 90
 μg/m³.
- Mean annual PM₁₀ particulate level 30 μ g/m³.
- 24 hour average PM₁₀ particulate level 50 μg/m³.

5.1.2 Dust Monitoring

Monitoring of deposited dust is undertaken on a monthly basis, with results presented below in Table 5.

Table 5 Deposited Dust Monitoring Data

Site	Property Name	Annual Mean Total Insoluble Solids (g/m2/month)	Annual Mean Ash (g/m2/month)
D1	Whitehaven	1.9	0.8
D2	Merton	1.4	0.6
D5*	Wilga	0.8	0.3
D7*	Wilga	2.0	0.8
D8*	Gundawarra	2.6	1.6
D10*	Merton	2.2	0.6
D11 *	Merton	1.6	0.8
D12	Whitehaven	6.0	5.7
D13b	Womboola	1.1	0.9
D15*	Merton	3.1	1.0
D16*	Merton	2.2	1.1

^{*}Sites no longer monitored; monitoring ceased in April 2016. Averages for the period calculated for these sites over the 9 months of monitoring.

NOTE: Remaining 4 sites averages calculated over the full 12 months of the reporting period.

A review of Table 5 shows that the annual average limit for deposited dust was exceeded at one location, D12, during the reporting period. D12 is located on Whitehaven owned land, outside of the Mining Lease. D12 received very low results for each month in the reporting period, except for December 2015 and January 2016, which resulted in the exceedance for this site. The dominant wind directions during these months were from the east, northeast and north indicating the potential for impact from site, however no rehabilitation work, earth works, or maintenance works were undertaken on the former mine site during either month. This location has been retained in the latest Air Quality Management Plan for continued monitoring.

5.1.3 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

5.1.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

5.2 Biodiversity

5.2.1 Flora

Rehabilitation monitoring was undertaken during the reporting period in spring 2015, by EcoLogical Australia (ELA), with results provided in Appendix 1. Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery was assessed during this monitoring, comparing changes between the 2014 and 2015 monitoring campaigns, and found that there was no substantial change in photosynthetically active biomass (PAB) in most of the rehabilitation zones. No management actions were recommended by ELA, as changes are consistent with control zone trends. Woodland monitoring showed a continued increase in structural complexity and suitable fauna habitat in Woodland Zones.

Soil pit samples are required every 3 years by the Rehabilitation Monitoring Program, and were last undertaken in 2014 by ELA, with results included in Appendix 2. Changes in soil core monitoring results were found not to be significant.

Investigations undertaken by Geoff Cunningham Natural Resource Consultants Pty Ltd as part of the Stage 2 Mine EIS identified no Threatened flora species, ROTAP species or Endangered Ecological communities within the DA Area.

Biodiversity management of the Biobank Offset Site for Canyon Coal Mine was also undertaken during the reporting period, with the annual results reported in Appendix 3.

5.2.2 Fauna

A series of investigations into the occurrence of Threatened fauna within the DA Area were undertaken by Countrywide Ecological Service as part of the Stage 2 EIS preparation phase, with two vulnerable micro bat species and a koala recorded within open woodland areas within the "Womboola" property.

Targeted monitoring for *Neophema pulchella* (Turquoise Parrot) and *Pomatostomus temporalis* (Grey-crowned Babbler), both listed as threatened under the Threatened Species Conservation (TSC) Act, is undertaken during the rehabilitation monitoring. Grey-crowned Babblers were not recorded in any rehabilitation sites from 2011 to 2014, however in the 2015 monitoring undertaken by ELA they were recorded at one site, W04. Turquoise Parrot remains unrecorded on site. In addition to these threatened species, the following were also present during this reporting period:

- 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).

5.2.3 Weeds

Weed control is undertaken by Whitehaven's own qualified personnel on an as-needs basis, following the detection of weeds within the monthly environmental inspections. During the period spraying was undertaken a number of times, as listed below.

2015: August, September, November

2016: January, February, May, June, July

These occurrences primarily involved the spot spraying of African Boxthorn (*Lycium ferocissimum*) and Prickly Pear (*Opuntia*), although spraying of broad leaf weeds around the leased compound is also undertaken as needed.

5.2.4 Feral Animal Control

Feral animals are not a significant land management issue on Canyon Coal Mine's landholding and are limited to isolated occurrences of pigs, foxes, hares and rabbits. In view of the low frequency of occurrence, and in the absence of an extensive programme by all surrounding landowners, no broad scale feral animal control programme was considered warranted during the reporting period. One pig trap has been in place on site since April 2016, however no animals have been captured.

5.2.5 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

5.2.6 Proposed Improvements to Environmental Management

Ongoing campaign weed spraying will be undertaken as required on site, along with opportunistic feral animal control.

5.3 Blasting

5.3.1 Criteria

Blasting criteria for the Canyon Coal Mine are noted in DA 8-1-2005 MOD 3, however they are not relevant for this reporting period, as no blasting has been undertaken onsite.

5.3.2 Key Environmental Performance/Management Issues

No blasts were undertaken during the reporting period.

5.3.3 Proposed Improvements to Environmental Management

No blasting is proposed within the next reporting period.

5.4 Operational Noise

5.4.1 Criteria

DA 8-1-2005 MOD 3 details the noise criteria for site operations and coal haulage, however there was no requirement for noise monitoring during the reporting period.

5.4.2 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

5.4.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

5.5 Aboriginal Heritage Management

5.5.1 Environmental Management Measures

Four Aboriginal heritage sites have been discovered since 1999, during investigations for the Canyon Coal mine. Two of these sites, Whitehaven 3 and Whitehaven 4, were located within the Mining Lease area. Whitehaven 3, a scar tree located adjacent to the southern mine lease boundary, has been protected by fencing to minimise the potential for adverse impacts. Whitehaven 4 was located within the extraction area, and artefacts at this site were salvaged by representatives of the Red Chief LALC in accordance with a Section 90 Permit (No 2051) prior to disturbance. The remaining two heritage sites, Whitehaven 1 and Whitehaven 2, although not located within the Mine Lease boundary, have also been fenced and demarcated to avoid disturbance.

5.5.2 Consultation

No soil stripping has been undertaken for the Canyon Coal Mine. No additional Aboriginal cultural heritage items have been discovered during the reporting period, and no consultation with Aboriginal stakeholders was conducted.

5.5.3 Environmental Management Measures

Given the status of the site the environmental management measures for Aboriginal Heritage are limited to ensuring that any identified heritage sites remain undisturbed.

5.5.4 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

5.5.5 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

5.6 Natural Heritage

There are no features of natural heritage within the Project Approval area and hence no specific management procedures are required.

5.7 Bushfire Management

5.7.1 Environmental Management Measures

Canyon Coal Mine is located within an area of cleared agricultural land, and Whitehaven Coal personnel liaise with the local Rural Fire Service, as required. All fire breaks were graded on the 10th October 2015 in preparation for summer. There have been no bushfire incidents on, or adjacent to, the mine site during this reporting period.

5.7.2 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

5.7.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

5.8 Public Safety

5.8.1 Environmental Management Measures

Access to the site is restricted to authorised personnel only.

5.8.2 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

5.8.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

5.9 Waste

No waste was produced by Whitehaven Coal Mining (WHC) at the Canyon mine site during the reporting period, although the removal of a waste oil drum at the historic workshop site was undertaken. The small compound currently leased to Hitachi is managed by the tenants, who maintain responsibility of their own waste treatment and removal.

5.10 Environmental Performance Summary

An environmental performance summary for Canyon Coal Mine is presented in Table 6 below.

Table 6 - Environmental Performance

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / Key Management Implications	Implemented / proposed management actions
Erosion	N/A	Areas of surface erosion occurring on void batters and gravel pit area.	Nil	Stabilisation of void batters and gravel pit to be achieved through the sowing of a cover crop during next reporting period.

6 WATER MANAGEMENT

6.1 Surface Water Management

Surface water monitoring on site is limited to the void, and wet weather monitoring as required, with the complete surface water monitoring results presented in Appendix 4.

Previously surface water monitoring was undertaken in both the upper and lower voids quarterly, however in accordance with the DP&E approval of the updated Water Management plan in February 2016, this monitoring was altered during the period to include only the lower void on a 6 monthly basis.

This period has seen a return to normal oil and grease levels, following two high readings in late 2015, while the long term water results are continuing to show a slight upward trend in pH and EC readings.

6.1.1 Discharges

There were no wet weather discharges during the reporting period.

6.1.2 Water Take

During the reporting period no water was taken from any bores on site.

6.2 Groundwater Management

6.2.1 Environmental Performance/Management

Groundwater monitoring was also altered during the reporting period in line with the current approved Water Management Plan. Current requirements include 6 monthly monitoring of:

- Standing water level, pH, conductivity, Cl, Na, and oil and grease at GW-11 and P3; and
- Standing water level at GW-7, GW-8, AND GW-9.

Water quality results and standing water levels have remained relatively consistent throughout the monitoring period, with the exception of GW11 and GW8. GW11 results indicate an increasing conductivity trend, along with a slight calcium concentration increase, while all other monitored parameters remain consistent. GW8 continues to show large fluctuations in standing water level, as it has for the previous 3 years. GW8 is located on mine owned land, and is currently leased. It is expected that the drawn down is being caused by farm use, with a solar pump installed on the bore, and therefore unrelated to Whitehaven Coal.

Full monitoring data results for GW11 and GW8, along with all other groundwater monitoring sites, are included in Appendix 5.

6.3 Rehabilitation Performance during the Reporting Period

6.3.1 Status of Mining and Rehabilitation

Table 7 - Rehabilitation Status

	Mine Area Type ¹	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
		2014-15 (ha)	2015-16(ha)	2016-17 (ha)
A.	Total Mine Footprint	416.98	416.98	416.98
В.	Total Active Disturbance	2.9	2.9	2.9
C.	Land Being Prepared for Rehabilitation	0	0	0
D.	Land Under Active Rehabilitation	249.8	249.8	249.8
E.	Completed Rehabilitation	0	0	0

¹Refer Annual Review Guideline (p.11) for description of mine area types.

6.3.2 Post Rehabilitation Land Uses

The overall closure goal for Canyon is for the restored landform to be capable of sustaining pre-mining land-uses. WHC considers that rehabilitating Canyon to produce a mix of grazing and native vegetation land uses is most appropriate and compatible with the surrounding land uses and landscapes.

6.3.3 Renovation or Removal of Buildings

No renovation or removal of buildings occurred during the reporting period.

6.3.4 Other Rehabilitation Undertaken

No additional rehabilitation of explorations areas, infrastructure, shafts, adits, dams, fence lines or bunds occurred during the reporting period.

6.3.5 Departmental Sign-off of Rehabilitated Areas

No departmental sign-off of rehabilitated areas was received during the reporting period.

6.3.6 Variations in Activities against MOP/RMP

Not applicable.

6.3.7 Trials, Research Projects and Initiatives

No rehabilitation trials, research projects or other initiatives were undertaken during the reporting period.

6.3.8 Key Issues to Achieving Successful Rehabilitation

The key issues to achieving successful rehabilitation are:-

- Landform stability (Final Void);
- Soil quality;
- Water quality;
- · Pasture development; and
- Land management, including weed control.

Management measures to address these key issues, including both trigger levels and response, are described in the Closure MOP prepared by SLR Consulting Australia, and approved in September 2015 by the Division of Resources and Energy.

6.4 Actions for Next Reporting Period

Seeding of the gravel pit area and void batters to address surface erosion will be undertaken within the next reporting period.

7 COMMUNITY

Whitehaven Coal maintains an open door policy for interested local groups, including local residents, landholders, schools and community groups, to visit the mine where practically possible. Furthermore, Canyon has a designated complaints line advertised on the Whitehaven Coal website and, in the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded. A complaints register is maintained on Whitehaven's website. No complaints have been received for the site since 2008.

A Community Consultative Committee (CCC) for Canyon is covered under the terms of reference of the Vickery Coal Mine CCC, and last met in April 2016.

Community contributions are managed in accordance the Whitehaven Coal Donations and Sponsorship Policy.

8 INDEPENDENT AUDIT

The most recent independent audit of Canyon Coal Mine was undertaken by Environmental Resource Management Australia Pty Ltd (ERM) in early 2016, with the site component completed on the 23rd of March. Outstanding items from the 2016 Audit Action Plan, and how they are being addressed, are summarised in Table 8 below.

Table 8 2016 Independent Audit- Outstanding Actions

Condition/Plan	Proposed Action	Status
Minister's Conditions of Approval DA 8-1-2005 MOD 3	Consider completing maintenance on the groundwater pumps or decommission if no longer required.	Following investigation WHC have decided to decommission the pump on site which is no longer in use. Decommission has not yet been completed.
	Consider stabilising the gravel pit area until the Vickery Project commences and permanent soil stabilisation works are completed.	Seeding of gravel pit area to be undertaken by December 2016.
	Ensure the transport management plan for the Vickery Project outlines the requirements of this consent condition for any material transported to the Canyon Mine prior to works commencing.	TMP to be updated prior to commencement of Vickery construction.
	Although the lease holder is the current user of water on site, the condition is still relevant and water use should be recorded and reported.	No water take occurred on site during the reporting period. Pump to be decommissioned.
	Consider including the requirement to report volume discharged from site and the method for estimating /calculating the volume of any discharges from site into the Water Management Plan	WMP to be updated.
	Consider submitting the revised plan to DPI (Water), EPA and DP&E requesting comment. Consider including evidence of any consultation and liaison into the annex of the plan.	Consultation to be undertaken. Consultation and liaison records not to be included in WMP.
	As the updated Air Quality	AQMP was approved by DP&E

	Monitoring Program has not been	4/02/2016. D12 is located on
	submitted to the DP&E consider	Company owned land.
	informing the DP&E and potentially	Action complete.
	impacted residents until the	
	updated plan is accepted by DP&E.	
	Consider including line items in the	Future revisions to be noted in
	revision history table to record any	table.
	reviews completed of the	
	Environment Management	
	Strategy.	
Mining Leases 1464 & 1471	Consider obtaining evidence from	Complete by December 2016
	the Director General if no records	
	within Whitehaven Coal. Note: this	
	refers to evidence of payment of	
	security.	
Water Access Licence 29458	Consider including record keeping	WMP to be updated.
	requirement for the water access	
	licence into the Water	
	Management Plan.	
Closure Mining Operations Plan	Consider adding into the Air Quality	AQMP to be updated.
	Monitoring Program mitigation	
	measures for managing dust and	
	actions to be taken in the case of	
	exceedances of the air quality	
	parameters.	
	Consider including in the	To be included in the next Annual
	references section of the	Rehabilitation Monitoring Report.
	Rehabilitation Monitoring Reports	
	the list of operational records as	
	discussed in this commitment to	
	indicate these records have been	
	considered.	
	MOP to be updated to reflect EPL	Next MOP amendment.
	surrender.	
Water Management Plan	Although the water in the void will	Investigation has begun, with
	remain on site, further	Whitehaven currently in the
	investigation is required to	process of selecting an appropriate
	determine the reason for higher pH	Environmental Consultant to advise
	than the groundwater and surface	on the matter.
	water pH.	
	·	
Rehabilitation Monitoring Program	Consider completing LiDAR	To be included in the next Annual
	assessment as detailed in the	Rehabilitation Monitoring Report.
	Rehabilitation Monitoring Plan	
	Consider including methodology of	To be included in the next Annual
	fauna assessments in monitoring	Rehabilitation Monitoring Report.
	reports.	
	Consider the inclusion of ANOVA	To be included in the next Annual
	test in the annual rehabilitation	Rehabilitation Monitoring Report.

Consider the inclusion of	To be included in the next Annual
management response triggers	Rehabilitation Monitoring Report.
linked to pasture or soil condition	
in the annual reports.	
Evidence of review of the program	To be included in the next Annual
after the first round of sampling to	Rehabilitation Monitoring Report.
be provided.	
Consider updating the	RMP to be updated.
Rehabilitation Monitoring Program	
to reflect the review	
recommendations once	
stakeholder feedback has been	
requested and received (see	
below).	
Consider issuing the letter outlining	Letter to be issued.
the review to key stakeholders to	
ensure acceptance of the proposed	
changes.	

9 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

9.1 Reportable Incidents

No environmental incidents occurred at Canyon Coal Mine during the reporting period.

9.2 Non-compliances

All of the non-compliances with relevant approvals have been ranked as either administrative or low, with very limited potential for significant environmental harm, and are addressed below.

- Conditions 3(3), and 3(21) of DA- 8-1-2005 MOD 3, and Condition 30 of ML 1471 all
 concern soil erosion, and the effects thereof. These conditions will be addressed in the
 seeding of soil erosion areas identified in the site gravel pit and on void batters. This
 work is to be undertaken within the next reporting period, and is scheduled for
 December 2016.
- Non compliances with DA-8-1-2005 MOD 3 Condition 3(20), and WAL 29458 are being
 addressed through the decommissioning of the remaining pump on site, which will
 prevent any water take on site and eliminate the requirement for a water log book.

- Condition 3(30) of DA- 8-1-2005 MOD 3 requires an audit of the offset strategy, and is scheduled to be undertaken by the Whitehaven Coal Environmental Specialist (Biodiversity) during the next reporting period.
- Condition 5(6) of DA- 8-1-2005 MOD 3 concerns the requirement to undertake Independent Environmental Audits (IEA). Whitehaven have undertaken an IEA in 2016, and received a Warning Letter regarding this non-compliance, see Section 9.3.

9.3 Regulatory Actions

A Warning Letter was received from the DP&E, following the non-compliance with Schedule 5, Condition 6 of the Development Approval by failing to undertake IEAs in 2009 and 2012. Whitehaven undertook an IEA in early 2016, with the next scheduled audit date in 2018.

10 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The following measures will be continued, or implemented, in the next reporting period to improve the environmental or community performance of the operation:-

- The maintenance of woodland and rehabilitated areas;
- Compliance with all relevant conditions of the lease, licences and consents;
- Completion of outstanding Independent Environmental Audit actions; and
- The continuation of environmental monitoring and management.

APPENDIX 1 REHABILITATION MONITORING REPORT 2015



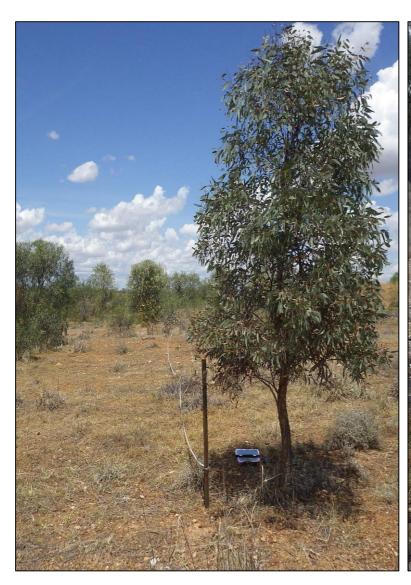
Canyon Coal Mine – Rehabilitation Monitoring Report

Volume 1

Spring 2015

Prepared for Whitehaven Coal Mining Limited

25 May 2016





DOCUMENT TRACKING

Item	Detail
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Reviewed by	Dr Paul Frazier; Dr Lachlan Copeland
Approved by	Dr Paul Frazier
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Abbreviations

Abbreviation	Description
CWD	Coarse Woody Debris
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 additional planting with local species in this zone
- Temporal changes in vegetation cover and composition occurred across Control and Rehabilitation zones and is indicative of seasonal conditions rather than impacts from land management.

Recommendations

- Planting of additional local 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.

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 Scope and objectives

The aim of this monitoring report is to document the spring 2015 monitoring results and provide a quantitative assessment of rehabilitation performance against nearby control landscapes.

Specific monitoring objectives for 2015 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.

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 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 2015 monitoring program, including results, conclusion and recommendations. Volume 2 contains the collated field survey data from 2011, 2012, 2013, 2014 and 2015 monitoring periods and 2015 weather data.

1.4 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 1 (ELA 2011).

Table 1: Summary of rehabilitation objectives for Canyon Mine

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

Detailed methods for rehabilitation monitoring are provided in the RMP (ELA 2011). The spring 2015 monitoring was undertaken in accordance with the methods prescribed (Table 2). Any minor alterations from the original methods are detailed in the following sub-sections.

Table 2: Multi-scale monitoring program summary

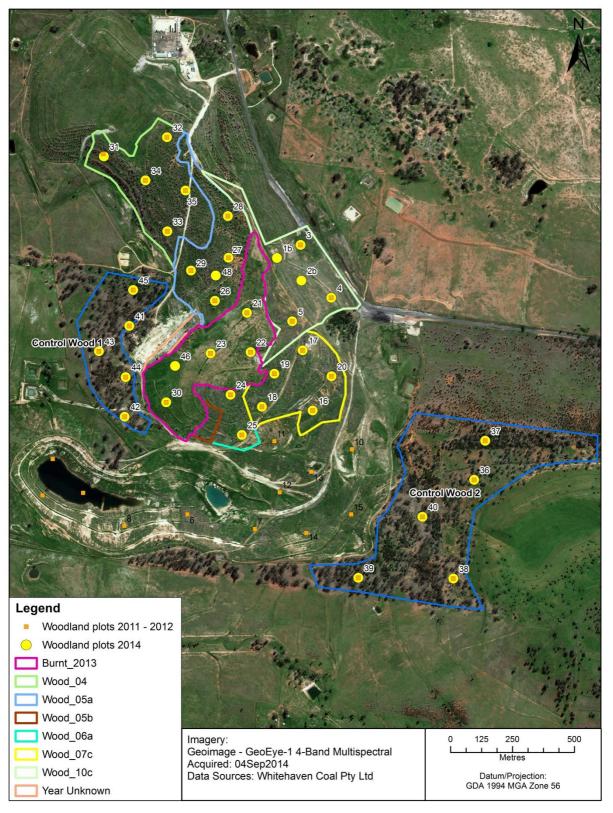
Data source	Туре	Scale	Purpose
Remote sensing	Multi-spectral imaging	Entire site	Agricultural pasture cover/biomass Woodland cover/biomass Erosion monitoring Direct field survey
Woodland survey	Vegetation survey:	Woodland zones	Woodland health and function
	Fauna survey (Birds – winter and spring)	Woodland zones	Woodland health and function
	Soil survey (every 3 years)	Woodland zones	Soil condition
	Soil Survey (every 3 years)	Pasture zones	Soil nutrient status

3.1 Survey dates

Four-band multi-spectral imagery was captured across the entire target area (including control areas) on 11 September 2015.

Ecologist Dr Stephen Debus undertook terrestrial fauna and habitat monitoring of woodland areas between 7 – 8 April 2015 (autumn), 13 – 14 July 2015 (winter), and 12 - 13 October 2015 (spring).

Botanist Dr Lachlan Copeland and Environmental Scientist Emily Southwell undertook monitoring of woodland areas (vegetation transects only) between 27 – 30 October 2015.



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 1: Woodland vegetation monitoring plots for spring 2015 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)

3.2 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 (Table 3; Volume 2, Section 1). Rainfall in the six months preceding the spring surveys was well above average, with the exception of July and August. Rainfall was more than twice the historical monthly average in April (Table 3; Volume 2, Section 1).

Conditions during the autumn bird survey were moderate and dry. Minimum temperatures were 8.8 and 9°C, both below the historical average of 12.8°C. Maximum temperatures reached 18.6 and 22.1°C and were also below the historical maximum temperature of 25.2. Conditions were dry during the winter bird survey. Minimum temperatures were 4.8 and 5.4°C, at and above the historical average. Maximum temperatures were 12.4 and 13.1°C, both below the historical average of 16.1°C (Table 3; Volume 2, Section 1). Minimum temperatures during the spring survey were 11.2 and 18.1°C, falling below and above the historical minimum temperature respectively. Maximum temperatures were 5.9 and 7.5°C above the historical average (Table 3; Volume 2, Section 1).

Table 3: Temperatures and rainfall during 2015 fauna surveys

Date	Min temp (°C)	Min temp (°C) Average temp (°C)		Rainfall (mm)	
7/04/2015	9	16.3	22.1	0	
8/04/2015	8.8	13.4	18.6	0	
13/07/2015	5.4	8.1	12.4	0.4	
14/07/2015	4.8	9	3.1	0	
12/10/2015	11.2	22.2	31.2	0	
13/10/2015	18.1	24.7	32.8	0	

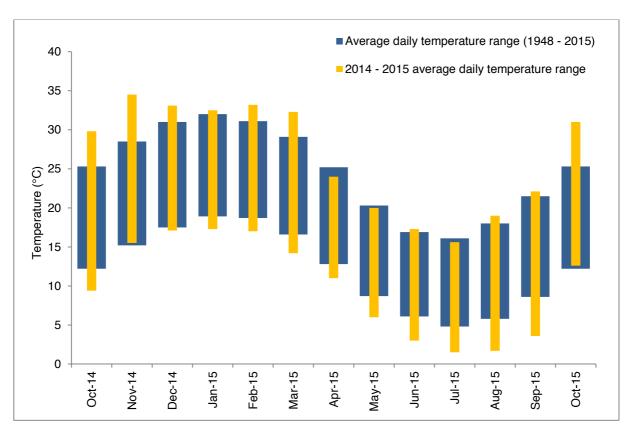


Figure 2: Historical average (Gunnedah Resource Centre 55024; BoM 2015) and recorded average daily temperature range (WCM weather station).

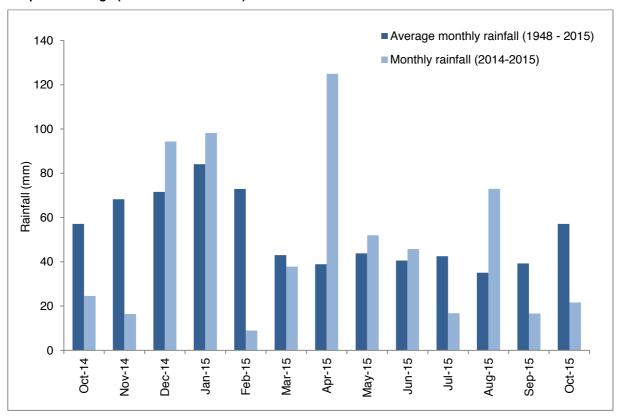


Figure 3: Historical average (Gunnedah Resource Centre 55024; BoM 2015) and recorded monthly rainfall (WMC).

4 Results & discussion

4.1 Remote sensing monitoring

Changes in the 2014 and 2015 Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery were assessed.

4.1.1 Relative plant biomass & bare soil assessment

There was no substantial change in photosynthetically active biomass (PAB) in most of the rehabilitation zones. One substantial area of increase on the western perimeter of Wood 10c requires ground-truthing to determine the cause of the change (Table 4; Figure 4). Large areas of increase in groundcover are evident with comparison of the 2014 and 2015 true colour image in Wood 6a and Wood 7c (Table 4).

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 (Table 4; Figure 4).

Table 4: Remote sensing analysis outcomes

Rehabilitation Zone	Comment
Control Wood 1	No substantial change
Control Wood 2	No substantial change
Wood 4	No substantial areas of significant change detected. Scattered areas of increase and decrease attributed to shift in shadow from canopy species
Wood 5a	No substantial change
Wood 5b	No substantial change
Wood 6a	No substantial areas of significant change. Large areas of groundcover increase evident in true colour image
Wood 7c	No substantial areas of significant change. Large areas of groundcover increase evident in true colour image
Wood 10c	One substantial area of increase on the western perimeter of this zone; ground-truthing required to assess the cause of the change
Burnt_2013	No substantial change
Control Pasture 1	Substantial decrease attributed to agricultural land management
Control Pasture 2	No substantial change
Pasture 2004	No substantial change

4.1.2 Monitoring triggers and management actions required

NDVI analysis identified an area of substantial concentrated groundcover increase in Wood 10c. This area requires ground-truthing to determine the nature of the increase (i.e. weed outbreak or other).

Table 5: 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)

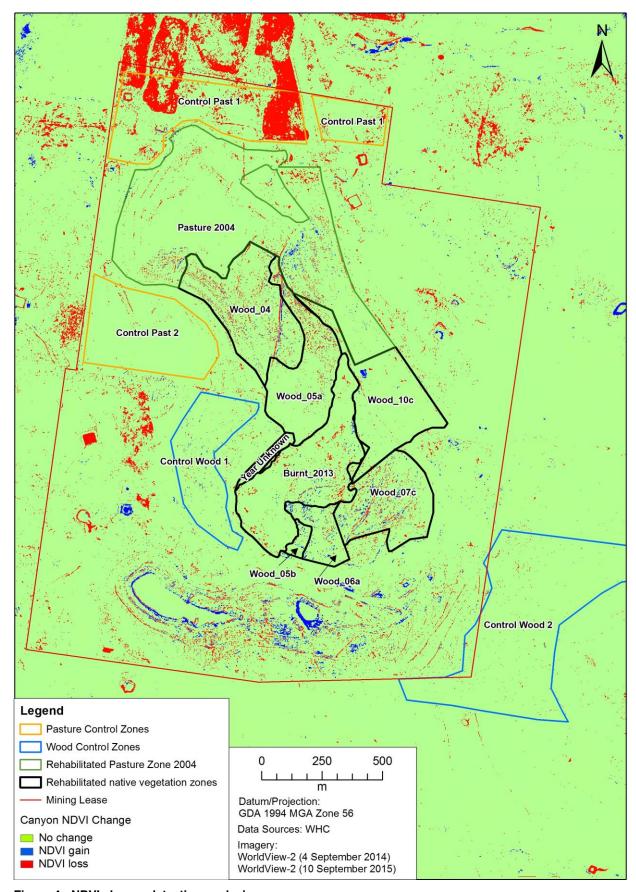


Figure 4: NDVI change detection analysis

4.2 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 point where there is a canopy layer present; as a result there is no True Projected Foliage Cover (TPFC) in any of the rehabilitation zones. Planted trees in all rehabilitation sites excepting Wood_10c continue to form a midstorey layer, with both increases and minor decreases in TPFC. Larger decreases in TPFC for the midstorey occur at Burnt_2013.

The established canopy layer within the control plots have an average TFPC of 5.7%, while the rehabilitation plots are yet to establish a canopy layer. Average TFPC for the midstorey layer remains low for both control and rehabilitation plots (>2%). The rehabilitated sites comprise a midstorey dominated by juvenile tree species that will eventually grow to form the canopy layer. Compared to the control plots however, which have a combination of both tree and shrub species contributing to the midstorey layer, the rehabilitation plots lack diversity and structural complexity. These differences in species composition are confirmed in Cluster and nMDS analysis, where rehabilitation zones have some similarity to the control zones (40%), but the control zones are 60% similar to each other (Volume 2, Section 3.3). As a result it is likely that the rehabilitated sites, when mature, will lack these features of the control plots.

Native species richness remains below that recorded in 2011 at most control and rehabilitation zones and decreased species richness since 2014 was recorded in all zones except Wood_04 and Wood_05a (

Figure 5). Despite declining native species richness at Burnt_2013 since the 2014 monitoring period, it remains higher than records prior 2013. Mean exotic species richness is variable across zones. Exotic species richness has remained stable or increased in the control zones (Control Woodland 1 and Control Woodland 2 respectively) and remains higher than 2011 records. Despite increased exotic species richness, native species richness in these two zones remains greater. Declining exotic species richness was recorded in all rehabilitation zones, and remains greater than native species richness in all rehabilitation zones except Wood_05a and Wood_04. A particularly wet late autumn and early winter appears to have led to a proliferation of winter annual weed species and these exotic forbs were still present during the spring survey.

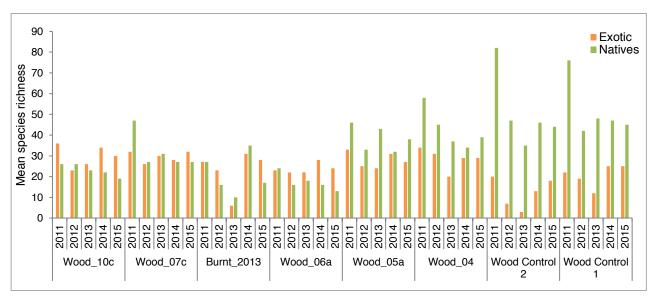


Figure 5: Mean native and exotic groundcover species richness across zones (2011 - 2015)

Changes in mean native species cover since 2014 have been variable in both control and rehabilitation zones (Figure 6). However, since 2011 there has been an overall decline of native cover in all zones, and this decrease is statistically significant in all zones, except Wood_07c, Burnt_2013 and Wood_10c (Volume 2, Section 4.7). Mean exotic species cover has also increased significantly at all rehabilitation sites, except Wood_06a and the control sites where increased cover was also recorded but was not significant (Volume 2, Section 4.7). Mean leaf litter cover has decreased significantly across all rehabilitation and control zones, except Wood_06a and Burnt_2013 since 2011. Decreased leaf litter cover was also recorded at Wood_06a and Burnt_2013, but was not statistically significant (p>0.05). Since 2014, mean bare ground cover has generally decreased or remained stable. This trend has been observed since 2011 and is a result of increased exotic species cover.

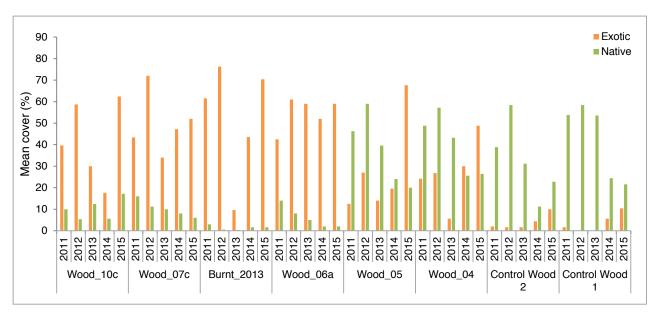


Figure 6: Mean native and exotic groundcover at each monitoring zone (2011 - 2015)

Cluster and nMDS show that native groundcover species composition has temporal and spatial variability within zones, but does not differ substantially between all zones. Generally, the control zones, Wood_04 and Burnt 2013 have less variability than the rehabilitation zones (Volume 2; Section 3.6).

In the 2014 monitoring period remedial works within Wood_10c (plot 1B) was identified to be at risk of erosion due to decreased groundcover, particularly during intense rainfall events. Since 2014, groundcover has increased at plot 1B (Wood_10c). However, dense thickets of *Sisybrium irio* (London Rocket) make up a large proportion of the groundcover recorded at plot 1B. London Rocket is an annual or biennial weed, which may not provide long term cover.

Two noxious weeds persist on site, *Opuntia stricta* (Common Prickly Pear) at Wood_05a and Wood 10c and *Lycium ferocissimum* (African Boxthorn) at Wood_10c. In 2014 Common Prickly Pear was recorded at Control Wood 1, Control Wood 2 and Wood_05a, and African Boxthorn at Wood_07c. Despite the absence of these species in previously affected plots, their presence in new plots still requires ongoing management. 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 recommends suitable management methods (DPI 2012).

Amount of Coarse Woody Debris (CWD) did not vary much between 2014 and 2015, where there are decreases this may be a result of pieces being obscured by increased groundcover and hence undetected during the field survey.

4.1.1 Fauna

An analysis of bird species composition shows that bird species composition fluctuates between years at all monitoring zones, but is slightly more stable at the control zones. This is mainly 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 Woodland 2 across all seasons, with up to twice as many species recorded in this zone during each monitoring period compared with the other control and rehabilitation zones. Control Woodland 2 is a larger area than Control Woodland 1 and has better vegetation structure (more dense with a shrub layer), so higher bird diversity is expected.

Bird species richness at the rehabilitated zones is generally lower than the control sites (Figure 7). This is confirmed in the nMDS analysis where there is a distinct difference between species recorded at the control sites compared to the rehabilitation sites. Data for all seasons at control sites are closely clustered together compared to rehabilitation sites, indicating that species are stable (Volume 2, Section 4). Bird species richness at W04 remained high in the spring monitoring period despite a decline in winter. Increased species richness was recorded at W06 in winter and spring. The remaining rehabilitation sites still have lower species richness than the control zones, with lower numbers generally recorded at the most recently rehabilitated sites (W06 and W07). Temporal trends at the rehabilitated sites remain consistent with the control zones, where a decline in species richness is recorded during the winter survey period. W06 showed similar trends to Control Woodland 2 where an increase in species richness was recorded in the spring monitoring period after a decline during the autumn and winter survey periods. The remaining rehabilitation zones have exhibited trends similar to Control Woodland 1 where a decline in species richness since was recorded in the spring monitoring period. Additionally, the composition of species guilds at the rehabilitation sites are yet to be representative of either control sites (Volume 2, Section 4).

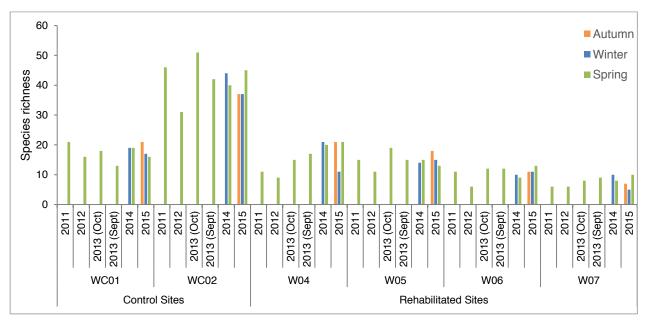


Figure 7: Bird species richness at each monitoring plot for all seasons (2011 - 2015). Autumn surveys commenced in 2014 and winter surveys commenced in 2015.

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 were not recorded in any rehabilitation sites from 2011 to 2014, however in the 2015 monitoring period they have been recorded in rehabilitation site W04. Turquoise Parrot remains unrecorded on site. In addition to these threatened species, the following were also present in the current monitoring period:

- 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 the 2015 monitoring period. 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. As recorded in the previous monitoring report, Eastern Grey Kangaroo and Common Wallaroo populations were also found in the rehabilitated zones. Four exotic species, Lepus capensis (Hare), Oryctolagus cuniculus (Rabbit), Vulpes vulpes (Fox) and Sus scrofa (Feral Pig) were also recoded as in the rehabilitated zones, as well as being present in the reference zones. Hare was recorded in three rehabilitation zones (Wood_05a, Wood_06a and Wood_07), and the fox within Wood_05. Feral Pigs were less widespread than in the 2014 monitoring period. Unlike the previous monitoring report, reptiles and amphibians were recorded in the 2015 period. Of the amphibians Limnodynastes tasmaniensis (Spotted Grass-Frog) was present in rehabilitated zone Wood 05, and of the reptiles, Egemia stirolata (Tree Skink), Morethia boulengeri (Boulenger's Skink) and Pogona barbata (Eastern Bearded Dragon) were recorded. Tree skinks were recorded in rehabilitations zones, Wood 05, Wood 06 and Wood 07 as well as reference zone WC 01. Boulenger's Skink was recorded in the same zones as the Tree Skinks, with the addition of reference site WC_02. Eastern Bearded Dragon was recorded in only one control site, Wood 05, and reference site WC 01.

4.1.2 Monitoring triggers

Monitoring triggers that require action are the presence of feral pigs and the presence of weed species (including two that are classed as noxious) (Table 6).

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

Table 6: Management recommendations for woodland zones.

Trigger	2015 Monitoring outcomes	Management
Statistically significant change detected in either:	Exotic groundlayer species composition increased	
Native overstorey (cover, health, richness, recruitment)	significantly in Wood_10c, Wood_07c, Burnt_2013,	No management actions required at this stage as changes are
Mid storey (cover, richness)	Wood_04, Wood_05a and Control Wood 1.	consistent with control zone trends.
Ground cover (cover, richness)	Native groundlayer species	
Weeds (cover, richness)	richness decreased	

Trigger	2015 Monitoring outcomes	Management		
% ground cover	significantly in Control Wood 1 & 2, Wood_04, Wood_05a and Wood_06a.			
Exotic fauna	Feral Pigs, Hares and Foxes 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 Recommendations and conclusion

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.

5.2 Woodland monitoring

Monitoring of woodland areas indicate that groundcover has increased since the previous monitoring period, however, much of this cover can be attributed to exotic species. This increase has likely been a response by competitive exotic species to rainfall in the lead up to the 2015 spring survey period. Additionally, native groundcover has decreased significantly since the 2014 monitoring period. No management actions are recommended since these changes were consistent with control zone trends.

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. As per the previous monitoring report (ELA 2014) these should be managed to prevent spread.

Additional local 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.

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.

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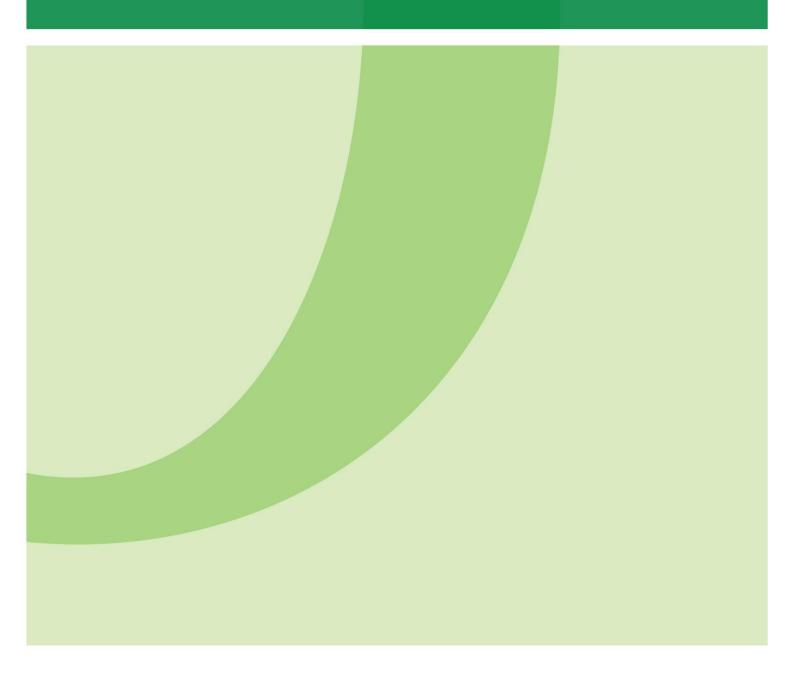
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Canyon Coal Mine – Rehabilitation Monitoring Report Volume 2

Spring 2015

Prepared for Whitehaven Coal Mining Limited

23 March 2016





DOCUMENT TRACKING

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1 Weather Data

Table 1: Canyon Mine and Gunnedah historical monthly weather data

	Canyon Mine Monthly Mean#					Historical Averages*				
Month	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
Oct-14	9.4	29.8	24.6	24.6	5.0	6.0	12.2	25.3	57.1	5.9
Nov-14	15.5	34.5	16.4	41.0	5.0	18.4	15.2	28.5	68.3	6.2
Dec-14	17.1	33.1	94.4	135.4	12.0	67.8	17.5	31	71.6	6.6
Jan-15	17.3	32.5	98.2	233.6	10.0	20.0	18.9	32	84.1	6.0
Feb-15	17.0	33.2	9.0	242.6	7.0	54.4	18.7	31.1	72.9	5.3
Mar-15	14.2	32.3	37.8	280.4	11.0	1.0	16.6	29.1	43	4.1
Apr-15	11.0	24.0	125.0	405.4	7.0	11.8	12.8	25.2	38.9	3.5
May-15	6.0	20.0	52.0	457.4	10.0	24.0	8.7	20.3	43.8	4.3
Jun-15	3.0	17.3	45.8	503.2	14.0	24.2	6.1	16.9	40.6	4.6
Jul-15	1.5	15.6	16.8	520.0	12.0	4.2	4.8	16.1	42.5	4.9
Aug-15	1.7	19.0	73.0	593.0	4.0	15.8	5.8	18	35.1	4.5
Sep-15	3.6	22.1	16.6	609.6	4.0	10.2	8.6	21.5	39.3	4.5
Oct-15	12.6	31.0	21.6	631.2	3.0	21.2	12.2	25.3	57.1	5.9

[#] Whitehaven Coal Mine data

^{*} Gunnedah Resource Centre Station 55024 (BoM 2015)

2 Woodland vegetation monitoring results

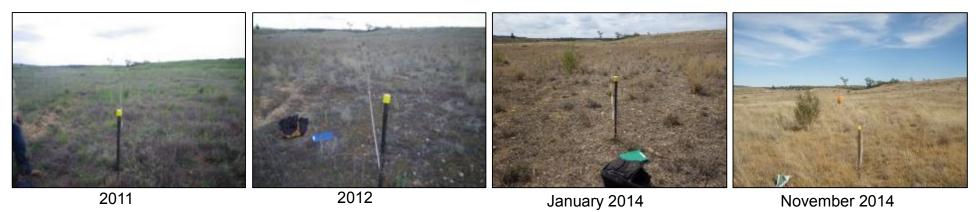
Table 2: Survey dates for each monitoring plot in 2015

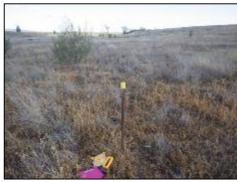
Treatment	Zone	Plot	Start Easting	Start Northing	Date of survey
Rehabilitated woodland	Wood_10c	1B	229675	6596115	28/10/2015
		2B	229774	6596024	28/10/2015
		3	229771	6596171	28/10/2015
		4	229896	6595954	28/10/2015
		5	229740	6595863	30/10/2015
	Wood_07c	16	229821	6595502	30/10/2015
		17	229780	6595743	30/10/2015
		18	229616	6595515	30/10/2015
		19	229667	6595648	30/10/2015
		20	229897	6595639	30/10/2015
	Burnt_2013	21	229560	6595883	28/10/2015
		22	229569	6595737	28/10/2015
		23	229398	6595736	28/10/2015
		46	229265	6595679	29/10/2015
		30	229230	6595533	29/10/2015
	Wood_06a	24	229491	6595561	30/10/2015
		25	229534	6595400	30/10/2015
	Wood_05b	26	229426	6595954	28/10/2015
		27	229482	6596119	28/10/2015
		28	229483	6596294	27/10/2015
		29	229324	6596068	28/10/2015
		48	229429	6595045	28/10/2015
	Wood_04	31	228975	6596539	29/10/2015
		32	229234	6596607	27/10/2015
		33	229232	6596224	28/10/2015
		34	229147	6596433	29/10/2015
		35	229302	6596389	27/10/2015
Control woodland	Control Wood 2	36	230471	6595217	28/10/2015
		37	230521	6595381	28/10/2015
		38	230387	6594823	28/10/2015
		39	230004	6594823	28,10,2015
		40	230264	6595071	28/10/2015

Treatment	Zone	Plot	Start Easting	Start Northing	Date of survey
	Control Wood 1	41	229092	6595856	29/10/2015`
		42	229060	6595481	29/10/2015
		43	228970	6595744	29/10/2015
		44	229062	6595639	29/10/2015
	45	229093	6595989	29/10/2015	

3.1 Plot photographs

Plot 3





2015

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Plot 4







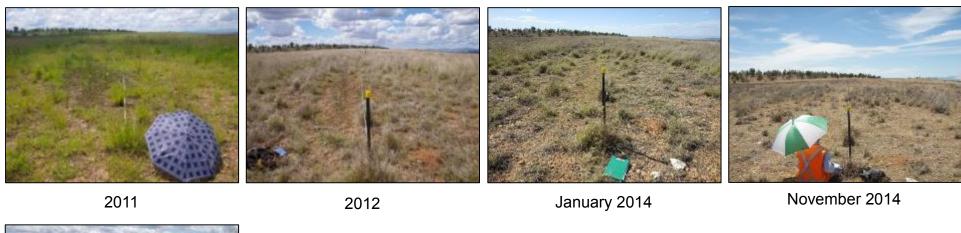


2011 2012 January 2014 November 2014



2015

Plot 5





2015

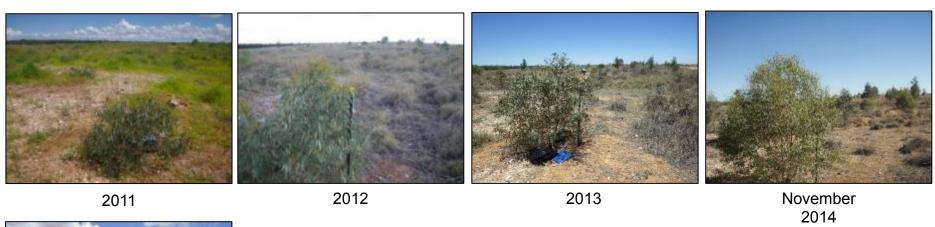
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Plot 16



Plot 17





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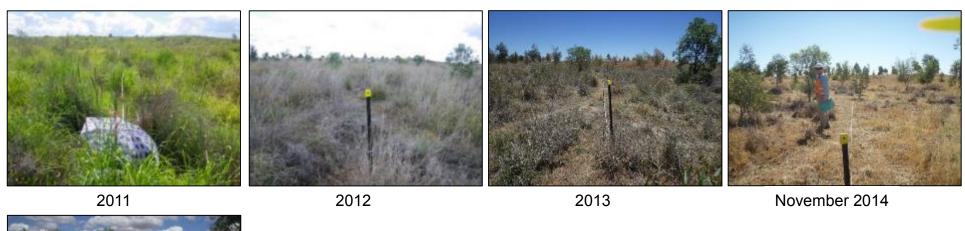
Plot 18





2011

Plot 19





2015

Plot 21





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14

Plot 22

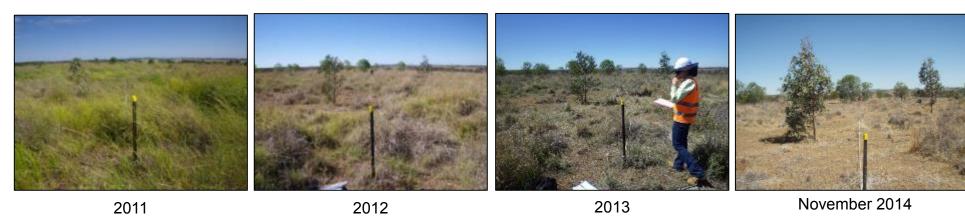


Plot 23





Plot 24



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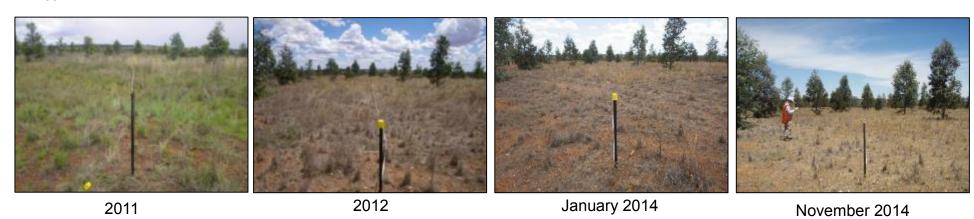
Plot 26





2015

Plot 27





2015

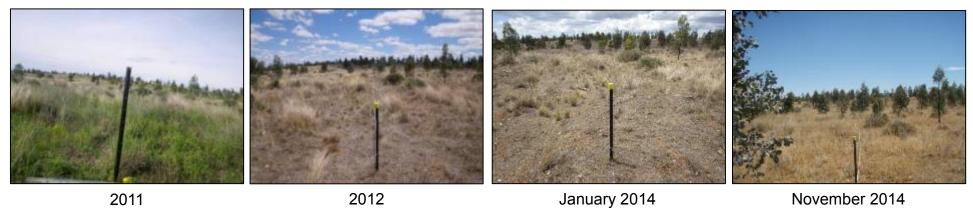
Plot 28





2015

Plot 29





2015

Plot 30





2015

Plot 24



2011 2012 2013 November 2014



2015

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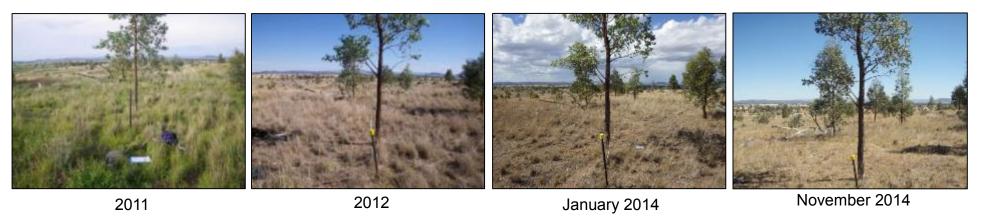
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Plot 32





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Plot 33



Plot 34



Plot 35





2015

Plot 36



2011 2012 January 2014 November 2014



2015

Plot 37



2011 2012 January 2014 November 2014



2015

Plot 38





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Plot 39



No image





November 2014

2011

2015

2012 January 2014

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Plot 40





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Plot 41



Plot 42





2015

Plot 43



2015

Plot 44



2011 2012 2013 November 2014



2015

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Plot 45



2015

Plot 46 (Established 2013)



Plot 48 (Established 2013)



3.2 Canopy & midstorey information

Table 3: Control Wood 1 habitat characteristics (2011, 2012, 2014 and 2015)

Monitoring Zo	one												Co	ntrol Woo	d 1											
Plot Number Year	_Monitoring	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
	Large Tree ≥ 60 cm DBH	50	-	-	-	-	60	-	-	-	-	50	-	-	-	-	50	-	-	-	-	50	-	-	-	-
	Mature Tree ≥ 30 cm DBH	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-
Canopy	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	10 x 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DBH Thresholds	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	No. of native canopy species	1	1	1	1	1	1	1	1	1	1	2	2	-	2	2	2	2	2	3	3	1	1	1	1	1
	No. of large trees	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	2	2	2	2	2	2	2		2	2
	Juveniles present (Y/N)	n	n	n	у	у	у	у	n	у	у	у	у	у	у	у	n	у	у	у	у	у	у	у	у	у
Canopy	Mature trees present (Y/N)	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у
Species and Age Classes	Seedlings present (Y/N)	n	n	у	n	n	-	у	n	n	n	у	n	у	n	n	n	n	n	n	n	-	у	у	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):	у	у	у	у	у	у	у	у	у	у	у	у	у	У	у	у	у	У	у	у	у	у	у	у	у
Coarse Woody	Total length of CWD (m)	24	27.5	35	51	51	86	147.5	209	232	225	3	1	3	6	8	105	79	97	233	241	15	8	47	41	43

Monitoring Z	one												Со	ntrol Woo	d 1											
Plot Number Year	_Monitoring	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Debris (CWD)	No. of sections of CWD	13	12	19	33	33	35	60	90	93	92	3	1	3	6	6	24	29	33	68	70	7	6	14	19	19
Midstorey,	No. of native midstorey species	0	0	0	0	0	1	1	0	1	1		1	1	1	3	3	1	1	3	4	2	3	4	3	5
Understorey Species	No. of native species in ground layer	34	19	19	22	21	35	17	20	12	13		19	20	17	17	37	15	21	24	44	35	19	20	13	19
	% Projected Crown Cover- Canopy Species	72	60	50	74	72	20	12	12	28	8	12	6	8	8	0	58	66	72	68	68	38	36	42	38	38
Transect	% Projected Crown Cover - Midstorey Species	0	0	0	0	0	4	4	0	4	0	12	12	8	8	0	6	6	0	0	0	10	10	8	10	10
	% True Projected Foliage Cover - Canopy	14.8	8.4	6	11	12	2	1.6	1	3	1	2.8	0.6	1	1	0	12.7	8.9	10	12	12	9.2	5.4	6	6	7
	% True Projected Foliage Cover - Midstorey	0	0	0	0	0	0.4	0.4	0	0.4	0	2.4	2.4	1	1	0	0.9	0.6	1	0	0	1.5	1.75	7	1	1

Table 4: Control Wood 2 habitat characteristics (2011, 2012, 201, 2014 and 2015)

Monitoring Z	one												Co	ntrol Woo	d 2											
Plot Number Year	_Monitoring	36_2011	36_2012	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
	Large Tree ≥ 60 cm DBH	50	-	-	-	-	50	-	-	-	-	50	-	-	-	-	50	-	-	-	-	50	-	-	-	-
	Mature Tree ≥ 30 cm DBH	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	30	-	-	-	-	30	-	-	-	-
Canopy	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-		-	-	-	-
DBH Thresholds	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-		-	-	-	_		-	-	_	-		-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-		-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-		-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-		-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-		-	-	-	-
	No. of native canopy species	1	1	1	1	1	2	2	2	2	2	3	3	2	3	3	2	2	2	2	2	1	1	1	1	1
	No. of large trees	2	2	0	2	2	0	0	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	1	1	1
	Juveniles present (Y/N)	у	у	у	у	у	у	у	у	у	у	у	у	у	n	n	n	у	у	у	у	у	у	у	n	n
Canopy	Mature trees present (Y/N)	у	у	у	у	у	у	-	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	У
Species and Age Classes	Seedlings present (Y/N)	у	у	у	n	n	n	у	у	n	n	у	у	у	n	n	n	у	у	у	у	n	у	у	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):	у	у	у	у	у	у	-	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у
Coarse Woody	Total length of CWD (m)	none	2	4	5	0	27	80	74	97	54	4	9	6	10	4	62	28	38	43	30	99	102	103	138	125
Debris (CWD)	No. of sections of CWD	none	2	3	4	0	8	44	32	50	27	3	7	4	9	4	15	15	16	22	15	42	68	42	76	67

Monitoring Zo	one												Со	ntrol Woo	d 2											
Plot Number_ Year	_Monitoring	36_2011	36_2012	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
Midstorey,	No. of native midstorey species	1	2	2	2	3	3	5	5	4	3	1	2	2	2	3	4	2	5	3	3	2	2	3	2	2
Understorey Species	No. of native species in ground layer	36	12	15	16	16	39	11	14	19	19	35	22	18	12	20	35	9	17	19	22	39	25	16	21	21
	% Projected Crown Cover- Canopy Species	42	40	38	44	34	16	22	20	16	14	22	20	14	14	32	52	40	36	36	40	28	30	28	26	28
Transect	% Projected Crown Cover - Midstorey Species	0	0	0	0	0	52	52	56	56	48	0	0	0	0	0	0	0	0	0	0	20	16.6	24	20	24
	% True Projected Foliage Cover - Canopy	8	7	5	6	6	2	4	2	2	2	3	4	2	3	5	9	8	5	5	6	7	8	4	5	6
	% True Projected Foliage Cover - Midstorey	0	0	2	0	0	10	13	12	10	13	0	1	1	0	0	0	0	2	0	0	4	3	1	6	5

Table 5: Rehabilitated zone Wood_04 habitat characteristics (2011, 2012, 2013, 2014 and 2015)

Monitoring Zo	one												V	Vood_04												
Plot Number Year	_Monitoring	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_2011	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
	Large Tree ≥ 60 cm DBH	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 ≥ 30 cm DBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy DBH Thresholds	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ı	-	-	-	-	1	-	-	-
00.10.00	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ı	-	-	-	-	1	-	-	-
	Canopy ≥ x m	-	-	-	-	_	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	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	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	0	0	0	0
	Juveniles present (Y/N)	у	n	у	у	у	у	-	у	у	у	у	n	у	у	у	у	у	у	у	у	у	у	у	у	у
Canopy	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	n	n	n	n
Species and Age Classes	Seedlings present (Y/N)	n	n	n	n	n	n	-	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	у	n	n
3143363	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	У	У	n	n	n	-	у	n	n	n	У	у	У	у	n	У	У	n	n	n	у	у	n	у
Coarse Woody Debris (CWD)	Total length of CWD (m)	14, deliberately imported	54.5	58	54	55	113	-	89	192	164	53	55	37	48	52	51	51	55	67	70	none	0	0	5	3

Monitoring Zo	one												V	Vood_04												
Plot Number Year	_Monitoring	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_2011	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
	No. of sections of CWD	8	22	17	26	28	30	-	34	95	85	6	11	6	10	14	14	16	16	28	30	none	0	0	4	3
Midstorey, Understorey	No. of native midstorey species	None - but young trees forming a midstorey	4	6	5	5	-	-	4	4	5	0	3	5	5	5	3 (inc. sml trees)	3	4	4	3	5 -planted	4	8	7	6
Species	No. of native species in ground layer	0	19	13	14	17	14	-	12	12	10	25	21	14	13	19	31	19	15	12	10	22	22	17	7	13
	% Projected Crown Cover- Canopy Species	-	0	0	0	0	6	-	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0
Transect	% Projected Crown Cover - Midstorey Species	-	0	0	0	0	-	-	8	0	8	-	0	0	0	0	-	0	0	0	0	-	0	4	4	4
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	1.2	0	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	6	0	0	0	1.4	4	0	1	0	5	4	0	0	0	8	4	0	0	0	8	10	0.4	0.4

Table 6: Rehabilitated zone Wood_05a habitat characteristics (2011, 2012, 2013, 2014 and 2015)

Monitoring Zo	one												Wood_05a	a										
Plot Number	_Monitoring	26_2011	26_2012	26_2013	26_2014	26_2015	27_2011	27_2012	27_2013	27_2014	27_2015	28_2011	28_2012	28_2013	28_2014	28_2015	29_2011	29_2012	29_2013	29_2014	29_2015	48_2013	48_2014	48_2015
	Large Tree ≥ 60 cm DBH	Note: Cover of trees in plot is ~ 1%	-	-	-	-	Note: Cover of trees in plot is ~ 3%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mature Tree ≥ 30 cm DBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy DBH	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thresholds	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	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	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	0	0	0
	Juveniles present (Y/N)	у	у	у	у	у	у	у	у	у	у	у	у	у	у	у	n	у	у	у	у	у	у	у
	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	n	n	n
Canopy Species	Seedlings present (Y/N)	n	n	у	n	n	n	n	n	n	n	n	n	у	n	n	n	n	n	n	n	у	n	n
and Age Classes	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	у	у	n	n	n	n	n	n	у	n	у	у	у	у	n	у	у	n	n	n	n	n
Coarse	Total length of CWD (m)	37	126	106	139		64	17	13	45		72	77	58	80		10	10	9	27		17	17	
Woody Debris (CWD)	No. of sections of CWD	13	41	38	52		17	6	3	16		21	29	16	38		8	9	8	23		9	7	

Monitoring Zo	one											,	Wood_05a	a										
Plot Number_ Year	_Monitoring	26_2011	26_2012	26_2013	26_2014	26_2015	27_2011	27_2012	27_2013	27_2014	27_2015	28_2011	28_2012	28_2013	28_2014	28_2015	29_2011	29_2012	29_2013	29_2014	29_2015	48_2013	48_2014	48_2015
Midstorey,	No. of native midstorey species	1, plus planted Eucs	4	3	4	3	-	4	6	6	7	0	3	3	5	2	3	5	5	5	6	5	6	4
Understorey Species	No. of native species in ground layer	24	22	15	11	11	19	17	9	13	15	22	18	17	15	15	35	23	23	16	15	16	6	12
	% Projected Crown Cover- Canopy Species	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	0
Transect	% Projected Crown Cover - Midstorey Species	-	4	4	4	4	-	0	0	0	0	-	0	4	4	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	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0.2	8	0.4	0.4	0	3	2	0	0	0	5	2	1	0	0	2	2	0	0	6	0	0

Table 7: Rehabilitated zone Wood_06a habitat characteristics (2011, 2012, 201, 2014 and 2015)

Monitoring Zone						Wood	d_06a				
Plot Number_Monitoring	g Year	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
	Large Tree ≥ 60 cm DBH	Planted trees on site 1.5 - 2 m tall, covers ~2% of plot	-	-	-	-	No planted trees	-	-	-	-
	Mature Tree ≥ 30 cm DBH	-	-	-	-	-	-	-	-	-	-
Canopy DBH Thresholds	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	=	Ī	-	-	-	-	-	-	-	-
	No. of native canopy species	0	0	0	0	0	0	0	0	0	0
	No. of large trees	0	0	0	0	0	0	0	0	0	0
	Juveniles present (Y/N)	у	У	y	y	у	n	n	n	n	n
	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	n
Canopy Species and	Seedlings present (Y/N)	n	n	n	n	n	n	n	n	n	n
Age Classes	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	у	у	n	n	n	n	n	n	n
Coarse Woody Debris	Total length of CWD (m)	19	11	8	14	15	4	3	1	2	2
(CWD)	No. of sections of CWD	5	3	3	7	7	3	2	1	2	2
Midstorey,	No. of native midstorey species	15	2	2	5	3	0	0	0	0	1
Understorey Species	No. of native species in ground layer	2	14	16	12	11	14	5	8	9	5
	% Projected Crown Cover- Canopy Species	0	0	10	0	0	0	0	0	0	0
Transect	% Projected Crown Cover - Midstorey Species	0	4	10	8	8	0	0	0	0	0
	% True Projected Foliage Cover - Canopy	0	0	0	0	0	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0.8	3	1	2	0	0	0	0	0

Table 8: Fire impact area Burnt_2013 habitat characteristics (2011, 2012, 2013, 2014 and 2015)

Monitoring Zo	one											Burnt_2013												
Plot Number_	_Monitoring Year	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46_2013	46_2014	46_2015
	Large Tree ≥ 60 cm DBH	-	-	-	-	-	-	-	-	-	-	Note: Very weedy site and no trees planted in plot	-	-	-	-	-	-	-	-	-	-	-	-
	Mature Tree ≥ 30 cm DBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy DBH	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	_	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thresholds	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	_	-	-	-	ı	-	-	-	-	-	-	-	•	-
	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	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	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	0	0	0
	Juveniles present (Y/N)	у	У	n	У	У	у	У	n	У	У	у	n	n	n	n	n	у	n	У	у	n	n	n
Canopy	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	n	n	n	n	У	n	n	n	n	n	n	n	n	n
Species	Seedlings present (Y/N)	n	n	n	У	у	n	n	n	У	у	n	n	n	У	у	n	n	n	n	n	n	n	n
and Age Classes	Advanced regrowth present (Y/N) (note in rehab sites this pertains to planted trees as sites were devoid of trees prior to rehab):	n	у	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Coarse Woody	Total length of CWD (m)	0	0	0	0	0	22	67	55	75	58	22	55	20	19	28	15	32	30	32	30	49	47.5	50
Debris (CWD)	No. of sections of CWD	0	0	0	0	0	5	19	20	29	18	5	26	7	7	13	4	12	16	18	16	17	12	13
Midstorey,	No. of native midstorey species	0	5	3	6	5	1	2	0	2	0	0	0	0	1	1	1	1	0	2	2	0	0	0
Understorey Species	No. of native species in ground layer	4	3	1	5	4	5	4	2	13	7	8	4	0	7	4	0	12	4	17	8	4	17	7
	% Projected Crown Cover- Canopy Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transect	% Projected Crown Cover - Midstorey Species	0	2	0	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hallsect	% 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	0	0	0
	% True Projected Foliage Cover - Midstorey	0	2	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 9: Rehabilitated zone Wood_07c habitat characteristics (2011, 2012, 2013, 2014 and 2015)

Monitoring Zor	ne											١	Nood_0	07c												
Plot Number_l	Monitoring Year	16_2011	16_2012	16_2013	16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_2011	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014	20_2015
	Large Tree ≥ 60 cm DBH	Overall tree cover is ~2%	-	-	-	-	Overall tree cover is ~2%	-	-	-	-	One planted tree 2 m tall	-	-	-	-	-	-	-	-	-	Overall tree cover ~5 %	-	-	-	-
	Mature Tree ≥ 60 cm DBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ı	-	_
Canopy DBH Thresholds	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	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	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	0	0	0	0	0
	Juveniles present (Y/N)	у	У	у	у	У	у	у	у	у	у	n	n	n	n	n	у	у	у	У	у	у	у	у	у	у
Canopy	Mature trees present (Y/N)	n	n	n	n	n	n	n	n	n	у	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Species and	Seedlings present (Y/N)	n	У	у	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	У		у	у
Age Classes	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	у	у	n	у	n	n	у	n	n	n	у	у	n	n	n	n	n	n	n
Coarse Woody	Total length of CWD (m)		0.5	0	2	2	7	5	6	6	7	91	297	263	138	135	none	0	2	0	0	1	0	0	0	0
Debris (CWD)	No. of sections of CWD		1	0	2	2	1	1	1	1	1	19	91	84	37	36		0	2	0	0	1	0	0	0	0
Midstorey, Understorey	No. of native midstorey species	1 (planted)	5	5	4	6	0	2	4	6	5	1 (planted)	1	1	1	2	1 (planted)	3	5	6	7	1 (planted?)	4	7	7	8
Species	No. of native species in ground layer	29	12	17	12	11	4	2	1	3	3	23	15	16	16	14	16	4	12	9	4	11	8	6	6	5
	% Projected Crown Cover- Canopy Species	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0		0	0	0	0
Transect	% Projected Crown Cover - Midstorey Species	4	4	8	6	4	-	0	4	4	0	-	0	0	0	0	-	0	0	4	0	2	4	16	16	14
Tanoot	% 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	0	0	0	0	0
	% True Projected Foliage Cover - Midstorey	2	1.2	4	2	1	0	0.4	1.2	1	0	0	0	1	0	0	0	2	3	0.4	0	0.2	0.8	3	2	2

Table 10: Rehabilitated zone Wood_10c habitat characteristics (2011, 2012, 2013, 2014 and 2015)

Monitoring Zo	one										Woo	od_10c										
Plot Number	_Monitoring Year	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
	Large Tree ≥ 60 cm DBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mature Tree ≥ 30 cm DBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
•	Advanced Regrowth (x cm to x cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canopy DBH	Sapling ≤ x cm to x cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thresholds	Seedlings < x cm dbh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tillesilolus	Canopy ≥ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midstorey x m to x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ground layer ≤ x m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
'	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	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	0
Canopy	Juveniles present (Y/N)	n	n	n	n	n	n	n	n	n	у	у	n	n	n	n	n	n	n	n	n	n
Species	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	n
and Age	Seedlings present (Y/N)	n	n	n	n	n	n	n	у	n	n	n	n	n	n	n	n	n	n	n	n	n
Classes	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	n	n	n	n
Coarse Woody	Total length of CWD (m)	0	9	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0
Debris (CWD)	No. of sections of CWD	0	9	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	
Midstorey, Understorey	No. of native midstorey species	0	0	0	0	0	0	-	1	1	5	5	-	0	0	0	0	-	0	0	0	0
Species	No. of native species in ground layer	11	3	7	7	8	5	-	15	13	7	5	9	17	5	8	10	8	1	4	6	3
	% Projected Crown Cover- Canopy Species	0	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0
Transect	% Projected Crown Cover - Midstorey Species	0	0	0	0	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	0	0	0
	% True Projected Foliage Cover - Midstorey	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0

Table 11: Average True Projected Foliage Cover (%) of plots within each monitoring zone (2011 – 2015)

NA ita-si		Averag	e True Projected	Foliage Cover (%)	
Monitoring zone	2011	2012	2013	2014	2015
Burnt_2013	0	0.6	0.2	0.2	0.2
Wood_10c	0	0	0.2	0	0.4
Wood_07c	0.44	0.88	3	1.08	0.5
Wood_05a	0	4.04	4	0.28	0.08
Wood_04	0	4.48	5.6	0.08	0.28
Control Wood 2	2.72	3.40	3.6	3.2	3.6
Control Wood 1	1.04	1.03	1.8	0.28	0.68

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

Table 12: Overstorey and midstorey cover scores in 20 x 50 m Woodland Plots (Wood_10c and Wood_07c) for 2011 - 2015 (note plots 1b and 2b established in 2013)

Mideter			_	_	_	_	_	_	0.	<u>~</u>	Woo	od_10)_c	01	<u>~</u>		10	_	CI.	~		10	_	_		_	_	_			_				od_7	/c	_								
Midstorey / Overstorey	Species	1B_201	1B_207	1B_207	2B_207	2B_201	2B_201	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015	16_201	16_201	16_201	16_201	16_201	17_201	17_201	17_201	17_201	17_201	18_201	18_2U	18_201	18_201	18_201	19_201	19_201	19_201	19_201	20 201	20_201	20_201	20_201
М	Acacia deanei Green Wattle								1	1	1	2																								1		2		2					
М	Acacia decora Western Silver Wattle																																												
М	Acacia filicifolia Fern-leaved Wattle																																												
М	Acacia fimbriata Fringed Wattle																																												
М	Acacia floribunda White Sally Wattle																																												
М	Acacia homalophylla Yarran																																												
М	Acacia longifolia																																											i i	
М	Acacia mearnsi Black Wattle																																												
М	Acacia pendula Weeping Myall																						1	1	1	1	1	1				1										1	1	2	1 1
М	Acacia salicina Cooba																							2	2	1	1					2		1		1	1		2	2	2	2	3	3	1 1
М	Acacia saligna? Golden Wreath Wattle																																												
М	Acacia sp.																																											1	
М	Alectryon oleifolius Western Rosewood																						1															1				2			
М	Alphitonia excelsa Red Ash																																												
М	Alstonia constricta Bitter Bark																																												
М	Pittosporum angustifolium											1															1																		
M	Brachychiton populneus Kurrajong										1																																		
М	Callitiris glaucophylla White Cypress Pine																																												1
М	Casuarina cristata Belah																																											1	1
М	Clematis microphylla Small-leaved Clematis																																												
М	Dodonaea viscosa Sticky Hop-bush																																									2			
М	Dodonaea viscosa subsp. angustifolia																																												1

									V	Noo	d_10	С																				V	/ood_	7c											
Midstorey / Overstorey	Species	1B_201	1B_201	1B_201	2B_201 2B_201	2B_201	3_2011	3_2012	3_2013	3_2014	3_2015		4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015	16_201	16_201	16_201	16 201	16_201	17_201	17_201	17_201	107-/1	17_201	18_201		18_201	18_201	19_201	19_201	19_201	19_201	19_201	20_201	20 201	202	20_201	20_201
М	Dodonaea viscosa subsp. cuneata Wedge-leaf Hop- bush																																											1	
М	Dodonaea sp.																									2																1	1		_
М	Eucalyptus albens White Box																									2					3									2		1	1		2
М	Eucalyptus blakelyi Blakely's Red Gum																						2	2	2			1	2 2	2							1	1	1	1				1	1
М	Eucalyptus crebra Narrow-leaved Ironbark																																					1	1		2	2		1	
N	Eucalyptus fibrosa? Red Ironbark										1																																		
М	Eucalyptus melanophloia Silver-leaved Ironbark									1	1																																		
М	Eucalyptus microcarpa Grey Box																							2							2									2		2	2		1
М	Eucalyptus melliodora Yellow Box																							2				1	1 2	2					1		1	2	1						1
М	Eucalyptus populnea subsp. bimbil Bimble Box									1																															,	1 1	1	1	
М	Eucalyptus sideroxylon Mugga Ironbark																																												
М	Eucalyptus viridis Green Mallee																									1			1		1									1					
M	Eucalyptus sp. (unknown) (Gum)																												1				1						1						
М	Eucalyptus sp. (unknown) (flakey bark)																																												
М	Eucalyptus sp. (unknown) (stringy bark)																																												
М	Eucalyptus sp. (unknown) (ironbark)																																												
М	<i>Geijera parviflora</i> Wilga																																												
М	Jasminum lineare Desert Jasmine										1																													1					
М	*Lycium ferocissimum African Boxthorn									1												1														1		1							
М	Myoporum montanum Western Boobialla																																												

											Wo	od_1	0_c																					ood_											
Midstorey / Overstorey	Species	1B_201	1B_201	1B_201	2B_201	2B_201	2B_201	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015	16_201	16_201	16_201	7 0	17_201	17_201	17_201	17_201	17_201	18_201	18_201	18_201	18_201	18_201	19_201	19 201	19 201	19 201	20 201	20 201	20_201	20_201	20_201
М	Notelaea microcarpa Native Olive						,																																						
М	Pimelea neo-anglica Poison Pimelea																																												
М	Parsonsia eucalyptophylla Gargaloo																																												
0	Brachychiton populneus Kurrajong																						1	1																	1				
0	Callitiris glaucophylla White Cypress Pine																																												
0	Casuarina cristata Belah																																								2				
0	Eucalyptus albens White Box																						1				1										1				1				
0	Eucalyptus blakelyi Blakely's Red Gum																						1				1										1								
0	Eucalyptus crebra Narrow-leaved Ironbark																										1										1				2				
0	Eucalyptus fibrosa? Red Ironbark																																												
0	Eucalyptus melanophloia Silver-leaved Ironbark																																												
0	Eucalyptus melliodora Yellow Box																																				1								
0	Eucalyptus microcarpa Grey Box																																												
0	Eucalyptus molucanna/albens																																												
0	Eucalyptus populnea subsp. bimbil Bimble Box																										1														1				
0	Eucalyptus sp. (unknown)																						1	1								1					1								
0	Var. planted Euc sp.																																												
Total numb	er of species	0	0		0	0		0	1	1	5		0	0	0	0		0	0	0	0		7	5	5 3	3	5	2	4	2		1	1	1	2		8 3	3 6	5 5	5	8	4	7	7	

Table 13: Overstorey and midstorey cover scores in 20 x 50 m Woodland Plots (Burnt_2013 and Wood_06a) for 2011 - 2015 (note plot 46 established in 2013)

												Ві	urnt_2	013															Wood	d_06a				
Midstorey / Overstorey	Species	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46_2013	46_2014	46_2015	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
М	Acacia deanei Green Wattle																								1			1	1					
М	Acacia decora Western Silver Wattle																																	
М	Acacia filicifolia Fern-leaved Wattle																																	
М	Acacia fimbriata Fringed Wattle																																	
М	Acacia floribunda White Sally Wattle																																	· · · · · · · · · · · · · · · · · · ·
М	Acacia homalophylla Yarran																																	
М	Acacia longifolia																																	
М	Acacia mearnsi Black Wattle																																	
М	Acacia pendula Weeping Myall																																	
М	Acacia salicina Cooba	1	2		2	2				1						1										2	2	1	2					1
М	Acacia saligna? Golden Wreath Wattle																								1									
M	Acacia sp.																																 	<u> </u>
М	Alectryon oleifolius Western Rosewood																																	<u> </u>
М	Alphitonia excelsa Red Ash																																ļ	<u> </u>
М	Alstonia constricta Bitter Bark																																<u> </u>	<u> </u>
M	Pittosporum angustifolium																															<u> </u>	<u> </u>	
М	Brachychiton populneus Kurrajong																																	<u> </u>
М	Callitiris glaucophylla White Cypress Pine	1				1																												
М	Casuarina cristata Belah		1		1																													<u> </u>
М	Clematis microphylla Small-leaved Clematis																																	
М	Dodonaea viscosa Sticky Hop-bush							1										1																
М	Dodonaea viscosa subsp. angustifolia						1														1							1						<u> </u>
М	Dodonaea viscosa subsp. cuneata Wedge-leaf Hop-bush																1			1														
M	Dodonaea sp.												ļ																			<u> </u>	 ├	
М	Eucalyptus albens White Box																												2					<u> </u>
М	Eucalyptus blakelyi Blakely's Red Gum		1		1																1					2	1	1				<u> </u>	 	
M	Eucalyptus crebra Narrow-leaved Ironbark																																 	

												Bu	rnt_20	013															Wood	d_06a				
Midstorey / Overstorey	Species	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46_2013	46_2014	46_2015	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
N	Eucalyptus fibrosa? Red Ironbark					2																												
M	Eucalyptus melanophloia Silver-leaved Ironbark		2	1	1			1		1																		1						
M	Eucalyptus microcarpa Grey Box																																	
М	Eucalyptus melliodora Yellow Box				1	2																												
М	Eucalyptus populnea subsp. bimbil Bimble Box		2	1	1	2																												
М	Eucalyptus sideroxylon Mugga Ironbark																																	
М	Eucalyptus viridis Green Mallee																																	
М	Eucalyptus sp. (unknown) (Gum)			1																1														
М	Eucalyptus sp. (unknown) (flakey bark)																																	
М	Eucalyptus sp. (unknown) (stringy bark)																																	
М	Eucalyptus sp. (unknown) (ironbark)																																	
M	Geijera parviflora Wilga																																	
M	Jasminum lineare Desert Jasmine																																	
M	*Lycium ferocissimum African Boxthorn																								1									
M	Myoporum montanum Western Boobialla																																	
M	Notelaea microcarpa Native Olive																																	
M	Pimelea neo-anglica Poison Pimelea																																	
M	Parsonsia eucalyptophylla Gargaloo																																	
0	Brachychiton populneus Kurrajong																																	
0	Callitiris glaucophylla White Cypress Pine																																	
0	Casuarina cristata Belah	1																																
0	Eucalyptus albens White Box																																	
0	Eucalyptus blakelyi Blakely's Red Gum	1																							1									
0	Eucalyptus crebra Narrow-leaved Ironbark																																	
0	Eucalyptus fibrosa? Red Ironbark																																	

												Вι	urnt_20)13															Wood	d_06a				
Midstorey / Overstorey	Species	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46_2013	46_2014	46_2015	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
0	Eucalyptus melanophloia Silver-leaved Ironbark						1																											
0	Eucalyptus melliodora Yellow Box																								1									
0	Eucalyptus microcarpa Grey Box																																	· ——
0	Euc. molucanna/albens																																	
0	Eucalyptus populnea subsp. bimbil Bimble Box	1																																
0	Eucalyptus sp. (unknown)																																	
0	Var. planted Euc sp.																		·														·	
Total number	of species	5	5	3	6		2	2	0	2		0	0	0	0	1	1	1	0	2	2	0	0	0	5	4	3	5	5	0	0	0	0	1



Figure 1: nMDS of midstorey and canopy species composition in Control and Rehabilitation zones (red square indicates data captured in nMDS subset in Figure 2

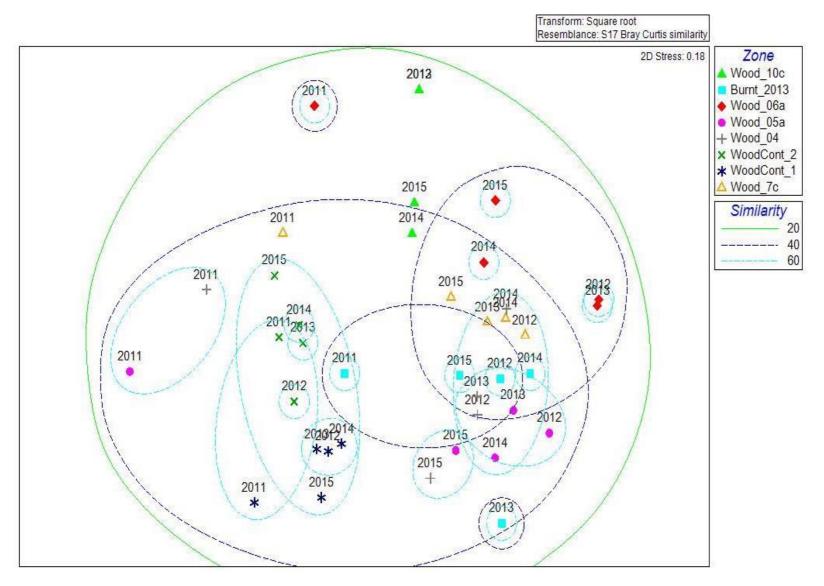


Figure 2: nMDS subset of midstorey and canopy species composition in Control and Rehabilation zones.

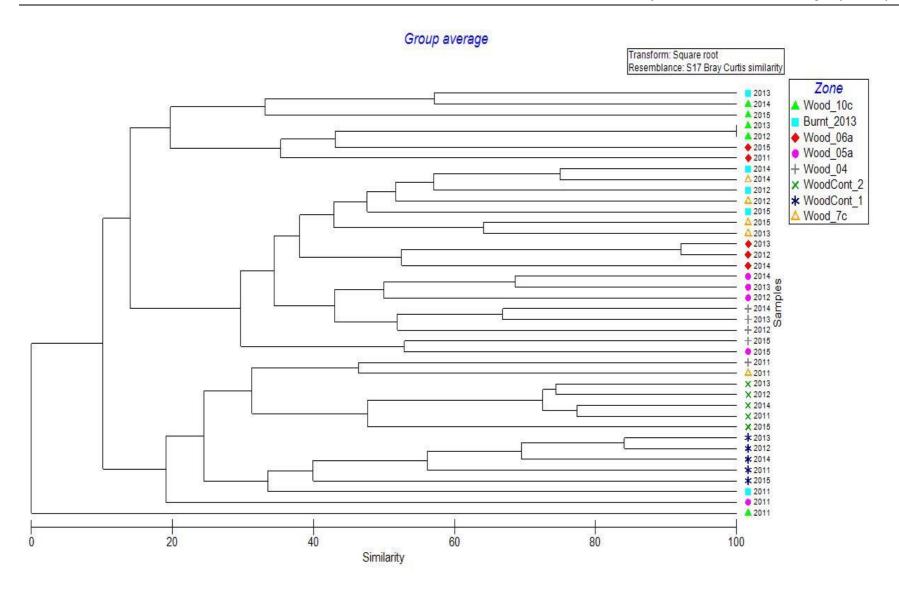


Figure 3: Cluster analysis of midstorey and canopy species composition in Control and Rehabilitation zones.

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

Table 14: Overstorey and midstorey cover scores in 20 x 20 m Woodland Plots located in Wood_10c for 2011 - 2015 monitoring periods (note plots 1b and 2b established in 2013)

												Wo	od_10	0_c									
Species	Common Name	Notes	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Acacia deanei	Green Wattle									1	1	1	2										
Acacia decora	Western Silver Wattle																						
Acacia floribunda	White Sally Wattle																						
Acacia homalophylla	Yarran																						
Acacia longifolia																							
Acacia pendula	Weeping Myall																						
Acacia salicina	Native Willow																						
Acacia filicifolia	Fern-leaved Wattle	Species uncertain at present growth stage																					
Acacia mearnsii	Black Wattl																						
Alectryon oleifolius	Western Rosewood																						
Alstonia constricta	Quinine Tree																						
Brachychiton populneus	Kurrajong											1	1										
Callitris glaucophylla	White Cypress Pine																						
Clematis microphylla	Small-leaved clematis																						
Dodnaea viscosa subsp. angustifolia	Sticky Hop-bush																						
Dodonaea viscosa	Sticky Hop-bush																						
Dodonaea viscosa subsp. cunneata	Wedge-leaf Hop-bush																						
Eucalyptus albens	White Box																						
Eucalyptus blakelyi	Blakely's Red Gum																						
Eucalyptus albens	White Box	Species uncertain at present growth stage																					
Eucalyptus blakelyi	Blakely's Red Gum	Species uncertain at present growth stage																					
Eucalyptus crebra	Narrow-leaved Ironbark	Species uncertain at present growth stage																					
Eucalyptus fibrosa	Red Ironbark	Species uncertain at present growth stage																					
Eucalyptus melanophloia	Silver-leaved Ironbark												1										
Eucalyptus melliodora	Yellow Box																						
Euclyptus microcarpa	Grey Box												1										
Euclyptus moluccana/albens																							
Eucalyptus populnea subsp. bimbil	Poplar Box																						
Eucalyptus sideroxylon	Mugga Ironbark																						
Eucalyptus viridis	Green Mallee																						
Eucalyptus sp. (unknown)												1											
Geijera parviflora	Wilga																						
Lycium ferocissium	African Boxthorn	Exotic			İ				1	1	1	1	1										
Parsonsia eucalyptophylla	Gargaloo																						
Total Number of Species			0	0	0	0	0	0	1	2	2	4	6	0	0	0	0	0	0	0	0	0	0

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 15: Overstorey and midstorey cover scores in 20 x 20 m Woodland Plots located in Wood_07c for 2011 - 2015 monitoring periods

													W	ood_()7c										
Species	Common Name	Notes	16_2011	16_2012	16_2013	16_2014	16_2015	17 2012	1 20	17_2013	17_2015	18_2011	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014
Acacia deanei	Green Wattle														1										
Acacia decora	Western Silver Wattle																						1		
Acacia floribunda	White Sally Wattle																						1		
Acacia homalophylla	Yarran																								
Acacia longifolia																							1		
Acacia pendula	Weeping Myall		1	1	1	1	1			1													1	2	1
Acacia salicina	Native Willow			1	2	1	1			1	2							2	1	2	2		2	3	2
Acacia filicifolia	Fern-leaved Wattle	Species uncertain at present growth stage																							
Acacia mearnsii	Black Wattl																						1		
Alectryon oleifolius	Western Rosewood																1					2	1		
Alstonia constricta	Quinine Tree																						1		
Brachychiton populneus	Kurrajong		1	1			1															1	1		
Callitris glaucophylla	White Cypress Pine																						1		
Clematis microphylla	Small-leaved clematis																						1		
Dodnaea viscosa subsp. angustifolia	Sticky Hop-bush																						1		
Dodonaea viscosa	Sticky Hop-bush																					1	1		1
Dodonaea viscosa subsp. cunneata	Wedge-leaf Hop-bush																						1		\rightarrow
Eucalyptus albens	White Box		1				2 '	1												1		1	1		\rightarrow
Eucalyptus blakelyi	Blakely's Red Gum		1				2 '	1			3						1	1					1		
Eucalyptus albens	White Box	Species uncertain at present growth stage																							
Eucalyptus blakelyi	Blakely's Red Gum	Species uncertain at present growth stage		2	1	2		1	:	2 1									1	2	2				2
Eucalyptus crebra	Narrow-leaved Ironbark	Species uncertain at present growth stage						1									1					1	2		1
Eucalyptus fibrosa	Red Ironbark	Species uncertain at present growth stage																							
Eucalyptus melanophloia	Silver-leaved Ironbark																								
Eucalyptus melliodora	Yellow Box				1			1		1 1	2						1	1	2	2	2				T
Euclayptus microcarpa	Grey Box																							2	
Eucalyptus moluccana/albens																									
Eucalyptus populnea subsp. bimbil	Poplar Box																			<u> </u>		1	1	1	1
Eucalyptus sideroxylon	Mugga Ironbark																			<u> </u>					
Eucalyptus viridis	Green Mallee									1															
Eucalyptus sp. (unknown)						1				1															
Geijera parviflora	Wilga																								
Lycium ferocissium	African Boxthorn	Exotic										1					1		1		1				
Parsonsia eucalyptophylla	Gargaloo																								
Total Number of Species			4	5	5	5	7 3	3 2	: 📑	3 6	7	1	0	0	1	0	5	4	5	6	7	7	6	8	8

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.

3.5 Groundcover species - Braun-Blanquet cover scores

Table 16: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood_10c for 2011 - 2015 monitoring periods (note plots 1b and 2b established in 2013)

					1	1	1	ı	1	1	1	v	Vood_10_		1	1	1			1	1	1	
Species	Species	Notes	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Abutilon oxycarpum	Straggly Lantern-bush																						
Abutilon sp.																							
Acacia deanei (seedling)	Green Wattle																						
Acacia decora (seedling)	Western Silver Wattle																						
Acacia salicina (seedling)	Cooba																						
Aira sp.		Exotic																					
Alternanthera denticulata	Lesser Joyweed													1									
Alternanthera sp. A																							
Ammi majus	Bishop's-weed	Exotic				1	1	1						1	1			1					
Anagallis arvensis	Scarlet Pimpernel	Exotic				2	2	2							2	2	2	2	2	2		2	2
Arenaria leptoclados	Council importer	Exotic						_							_	_	_	_	_	 -		_	-
Aristida leptopoda	White Speargrass	LXOUG																					\vdash
Aristida personata	Purple Wire-grass		2				2		1	2	2	2					1						+
Aristida personata Aristida sp.	Turple Wire-grass			2	2				'		3	3	3				<u>'</u>						+
Aristida vagans	Threeawn Speargrass										3	3	3										+
Arthropodium sp.	Threeawn Speargrass								-														₩
	Twining Woodruff		+						+														
Asperula cunninghamii		Ee.																					
Asphodelus fistulosus	Onion Weed	Exotic							1						0	0			0				₩
Aster subulatus	Wild Aster	Exotic	1											1	2	2			2	2			—
Atriplex muelleri															.								—
Atriplex semibaccata	Creeping Saltbush												_		1								
Austrodanthonia bipartita	Wallaby Grass												2										
Austrodanthonia racemosa																							
Austrodanthonia racemosa var. obtusata																							
Austrodanthonia sp.															1								
Austrostipa aristiglumis	Plains Grass																						<u> </u>
Austrostipa ramosissima	Stout Bamboo Grass																						
Austrostipa scabra	Speargrass		3	2					2	2	2		3										
Austrostipa sp.																							
Austrostipa verticillata	Slender Bamboo Grass																						
Avena fatua	Wild Oats	Exotic																					
Avena sp.		Exotic							1	1		1	1										
Bidens pilosa	Cobblers Pegs	Exotic																					
Bidens subalternans	Greater Beggar's Ticks	Exotic		1					2	3	2		1										
Boerhavia dominii	Tarvine																						
Boerhavia sp.																							1
Bothriochloa bladhii	Forest Blue Grass													3									
Bothriochloa decipiens	Red Grass						2					3			2		2						
Bothriochloa macra	Red Grass																						
Bothriochloa sp.	1300 37000										3		2			2							<u> </u>
Brachychiton populneus	Kurrajong										1		_			_							
Brachyscome ciliaris	Variable Daisy																						+-
Bromus catharticus	Prairie Grass	Exotic																					+
Bromus molliformis	Soft Brome	Exotic																					+
	OUIT DIVING	Exotic			1	<u> </u>	<u> </u>		1		<u> </u>		2							1	1		+
Bromus sp. Brunoniella australis	Blue Trumpet	EXULC							+														+
		Evoti-			1	-	-		1	-	-	-			-		-			1	1		+
Bryophyllum delagoense	Mother-of-millions	Exotic	-		1				1				<u> </u>							1			
Bulbine bulbosa	Native Leek			-	1															1			
Calandrinia sp.					1	<u> </u>	<u> </u>		1	-	<u> </u>				-		-			1	<u> </u>		
Callitris glaucophylla	N 11				1	ļ	ļ		<u> </u>		ļ		<u> </u>							1			
Calotis lappulacea	Yellow Burr-daisy	I	1	1	1	1	1	Ī	1	Ì	ĺ	Ì	1	i	ı 1	I	Ì	Ī	Ī	1	1	Ī	1

												\	Nood_10_	С									
			က	4	2	m	4	2		01					01			10	_	01	T	_	10
Species	Species	Notes	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Carex inversa																	1						
Carthamus lanatus	Saffron Thistle	Exotic	2	1			1		1	2	2	2					2						
Centaurea melitensis	Maltese Cockspur	Exotic	2		3	1	2	3	2		2	3	3		1	1	3	2				1	2
Centaurea solstitialis	St Barnaby's Thistle	Exotic												1			2					1	
Centaurea sp.		Exotic																					
Centaurium erythraea	Common Centaury	Exotic																					
Centaurium sp.		Exotic												1					2				
Chamaesyce sp.					1		1		2	2	1				1			1					
Cheilanthes distans	Bristly Cloak Fern																						
Cheilanthes sieberi																							
Chenopodium desertorum																							
Chenopodium pumilio	Small Crumbweed																						
Chloris gayana	Rhodes Grass	Exotic	3		3	4	2	3		3	2			3	4	4	4	3	5	5	4	4	4
Chloris pectinata	Comb Chloris																						1
Chloris truncata	Windmill Grass								2	2		1							1				
Chloris ventricosa	Plump Windmill Grass																						
Chondrilla juncea	Skeleton Weed	Exotic	1						1	2													
Chrysocephalum apiculatum	Yellow Buttons																						
Cichorium intybus	Chicory	Exotic																					
Cirsium vulgare	Spear Thistle	Exotic								1					1							1	1
Convolvulus graminetinus	·		1					1		1				1	1			1					<u> </u>
Conyza bonariensis	Flaxleaf Fleabane	Exotic	1						1	2				4					2				<u> </u>
Conyza parva		Exotic		1											2								+
Conyza sp.		Exotic		-																			
Cotula australis	Common Cotula																						
Cyclospermum leptophyllum	Slender Celery	Exotic												2		1	1				1		
Cymbopogon refractus	Barbed Wire Grass																						+
Cynodon dactylon	Couch														2								+
Cyperus concinnus														1		1							
Cyperus fulvus	Sticky Sedge													·		·							
Cyperus gracilis	Slender Flat-sedge																						
Cyperus rotundus	Nutgrass	Exotic																					
Datura ferox	ratgrade	Exotic																					
Daucus glochidiatus	Native Carrot	Exolic																					
Desmodium brachypodum	Large Tick-trefoil																						
Desmodium varians	Slender Tick-trefoil																						+
Dianella revoluta	Blueberry Lily																						+
Dianella sp.	Didobon'y Lily																	1	1			1	+
Dichanthium sericeum	Queensland Bluegrass		2						3	3	2											1	+
Dichelachne micrantha	Shorthair Plumegrass																	1	1			1	+
Dichondra repens	Kidney Weed								2									1	1			1	+
Dichondra sp. A	radicy Weed																	1	1			1	+
Dichopogon fimbriatus	Nodding Chocolate Lily																	1	1			1	+
Digitaria brownii	Cotton Panic Grass																						+
Digitaria divaricatissima	Umbrella Grass		2						3	2	2												+
Digitaria uivancaussima Digitaria sanguinalis	Crab Grass	Exotic						 	J					2		 			1				+
Digitaria sanguirians Digitaria sp.	Olab Olass	LAUG						 							1	 			1				+
Echinochloa crus-galli	Barnyard Grass	Exotic						 						 	'	 			1				+
Echinochloa sp.	Damyaru Grass	LAUG		-				-				-		2		-	-		-			-	+
	Patterson's Curse	Exotic	-	1	2	-	-	-	2	1	2	2	2			2	1	2	-			-	+
Echium plantagineum	ratterson's curse	EXOUC		1				-	4	1	2	2	2	1		2	1	4	-				+
Eclipta platyglossa	Down, Calthursh				1			-					+	1	4	1			-				+
Einadia hastata	Berry Saltbush				1			-					+	1	1	1			-				+
Einadia nutans	Climbing Saltbush				+			1					+	1		1			-				+
Einadia polygonoides	Fighture of				+			1					+	'		1			-				+
Einadia trigonos	Fishweed			1	1			1					1	1		1	1				1		

												V	Wood_10_	.c									
			13	4	15	13	4	15	_	2	8				7	က	4	2	_	7	က	4	2
Species	Species	Notes	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Elymus scaber																							
Enchylaena tomentosa	Ruby Saltbush																						
Enneapogon nigricans																							
Enneapogon sp.			1						2	1	2												
Enteropogon acicularis												2						2			1		
Enteropogon sp.																					1		
Eragrostis alveiformis																							
Eragrostis brownii	Brown's Lovegrass																						
Eragrostis elongata	Clustered Lovegrass																						
Eragrostis lacunaria	Bristly Love-grass																						
Eragrostis leptostachya	Paddock Lovegrass																						1
Eragrostis parviflora	Weeping Lovegrass										 										1		†
Eragrostis setifolia	Bristly Love-grass										 										1		1
Eragrostis sp.											+								+		+	+	+
Eremophila debilis	Winter Apple					<u> </u>			 		 										 		+
Eriochloa pseudoacrotricha	Early Spring Grass							 	2		†			1		2	1		1	 	+	+	+
Eriochloa sp.	Larry opining Grade										+			·		_			 		+	+	+
Erodium crinitum	Blue Storksbill	+			<u> </u>		2	 	+	 	+							<u> </u>	+	 	+	+	+
Euchiton sp.	Dide Glorkabili							 	+	 	+								+	 	+	+	+
Euchiton sphaericus								 	+	 	+			2	1				1	 	+	+	+
Eulalia aurea	Silky Browntop							 	 	 	+				ı				 ' 	 	+	 	+
Evolvulus alsinoides var. decumbens	Sliky Browntop							 	 	 	+									 	+		+
	Common Frings sadas							 		 	 								-	<u> </u>	+		+
Fimbristylis dichotoma	Common Fringe-sedge	Cyatia				2	2	<u> </u>		 	 					1	1	2	 	<u> </u>	+		+
Galenia pubescens	Galenia	Exotic				2	2	2		 	 					1	1	2	 	 	+		+
Geijera parviflora	Notice Consider							 	 	 	 								 	 			+
Geranium solanderi	Native Geranium							 	 	 	 	4							 	 			+
Glossogyne tannensis			1					 	 	 	 	1							 	 			+
Glycine clandestina			1					 		 	 								 		+		+
Glycine tabacina	Name of Oatter Book	E C .						 	1	 	 	4							 	1			+
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic						 	1	 	1	1							 	 			+
Gomphocarpus sp.		Exotic								 	 									<u> </u>	 	ļ!	
Gomphrena celosioides	Gomphrena Weed	Exotic								 	 									<u> </u>	 	ļ!	
Gonocarpus elatus										 	 									<u> </u>	 	ļ!	
Goodenia cycloptera								<u> </u>		<u> </u>	<u> </u>								<u> </u>	<u> </u>		<u> </u>	
Goodenia fascicularis								<u> </u>		<u> </u>	<u> </u>								<u> </u>	<u> </u>		<u> </u>	
Goodenia glabra								<u> </u>		<u> </u>	<u> </u>								<u> </u>	<u> </u>		<u> </u>	
Goodenia pinnatifida								<u> </u>	 '		<u> </u>								 	<u> </u>	 	<u> </u>	
Gypsophila tubulosa	Annual Chalkwort							<u> </u>	 '		<u> </u>								 	<u> </u>	 	<u> </u>	
Haloragis heterophylla	Rough Raspwort							<u> </u>			<u> </u>				1					<u> </u>		<u> </u> !	
Hedypnois rhagadioloides subsp. cretica	Cretan Weed	Exotic						<u> </u>			<u> </u>									<u> </u>		<u> </u> !	
Helianthus sp.	Sunflower	Exotic						<u> </u>			<u> </u>									<u> </u>		<u> </u> !	
Hibiscus trionum								<u> </u>			<u> </u>									<u> </u>		<u> </u> !	
Hordeum sp.	Barley Grass	Exotic						<u> </u>	ļ	<u> </u>	<u> </u>									ļ		ļ <u></u>	
Hyparrhenia hirta	Coolatai Grass	Exotic		<u> </u>				<u> </u>		3	<u> </u>								<u> </u>			<u> </u>	
Hypochaeris microcephala	White Flatweed	Exotic		ļ		1		1	 '	<u> </u>	<u> </u>								<u> </u>	<u> </u>		1	1
Hypochaeris radicata	Flatweed	Exotic		ļ				<u> </u>	 '	<u> </u>	<u> </u>								<u> </u>	<u> </u>		<u> </u>	
Jasminum suavissimum										<u> </u>										<u> </u>		1	
Juncus sp.																							
Juncus usitatus	Pinrush														1								
Lachnagrostis filiformis	Blown Grass							1	2								1					1	
Lactuca saligna	Willow-leaved Lettuce	Exotic							1										1			1	1
Lactuca serriola	Prickly Lettuce	Exotic						2		1				3	1		2	1	1		1	2	2
Lepidium africanum		Exotic			2		1		2							1							
Lepidium bonariense		Exotic				1								1							1		
				1	1	I		1	$\overline{}$		т	ı	1	1		1	1	1	T	1	$\overline{}$		T

												١	Nood_10_	c									
Species	Species	Notes	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Leptorhynchos panaetioides	Woolly Buttons		2															1			2	2	1
Linaria pelisseriana	Pelisser's Toadflax	Exotic																					1
Linaria sp.																							
Linum marginale	Native Flax																						
Lolium rigidum	Wimmera Ryegrass	Exotic								2													
Lolium sp.		Exotic										2	2								'		<u> </u>
	Mat-rush																						
Lomandra filiformis	Wattle Mat-rush																						
Lomandra longifolia	Spiny-headed Mat-rush																				<u> </u>		
Lomandra multiflora																					<u> </u>		
	African Boxthorn	Exotic																			<u> </u>		
	Hyssop Loosestrife																				<u> </u>		
	Black Cotton Bush																				<u> </u>		
	Wingless Bluebush																				<u> </u>		
Maireana microphylla	Small-leaf Bluebush																						
Malva sp.		Exotic																			<u> </u>		
	Spiked Malvastrum	Exotic																			<u> </u>		
-	Prickly Malvastrum																				<u> </u>		
	White Horehound	Exotic																					
Medicago minima	Wooly Burr Medic	Exotic			3		3	4				3	4				2	3			'	3	3
Medicago polymorpha	Burr Medic	Exotic	2		2	2	3	2	2	2	2	3	2			2	2	2			2	3	1
Medicago sativa	Lucerne	Exotic																					<u> </u>
Medicago sp.		Exotic							1														
Medicago truncatula	Barrel Medic	Exotic																					
Melilotus indicus	Hexham Scent	Exotic					1					2			2		3	3			'	2	3
Melilotus sp.		Exotic				1										2							
Mentha satureioides	Creeping Mint																						
Microlaena stipoides	Weeping Grass																				<u> </u>		
Misopates orontium	Lesser Snapdragon	Exotic										1		1									
	Grass Lily																				<u> </u>		
Nicotiana sp.																							
Nyssanthes diffusa	Barbwire Weed																						
	Common Prickly Pear	Exotic						1													<u> </u>		
Oxalis exilis																							
Oxalis perennans																							
Oxalis sp.																							
Panicum buncei																							
Panicum effusum	Hairy Panic								2	1													
Panicum maximum		Exotic				1					1			2		2							
Papaver sp.																							
Panicum queenslandicum	Yadbila Grass																						
Panicum sp.											1												
Parsonsia eucalyptophylla	Gargaloo																				'		<u> </u>
	Warrego Grass																						
Paspalidium sp.						1																	<u> </u>
	Paspalum	Exotic			1																		
Paspalum sp.		Exotic																					
Petrorhagia nanteuilii		Exotic	1	2			2	2			1	2	2					2				2	1
	Canary Grass	Exotic																				$oxed{oxed}$	
	Petty Spurge																						
Pimelea microcephala	Shrubby Rice-flower																						
Pimelea neo-anglica	Shrubby Rice-flower																						
Pimelea sp.																							
Plantago debilis																							_
Plantago lanceolata	Lamb's Tongues	Exotic																					<u> </u>
		•	•	•	•	•	•	•	•	-		•	•	•		•	•						

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			<u>е</u>	4	5	<u>е</u>	4	2		1						l		l			1	Ι.	
Species	Species	Notes	1B_2013	1B_2014	1B_201	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Poa sieberiana	Snow Grass																						
Polycarpon tetraphyllum	Four-leaved Allseed	Exotic																					
Polygonum aviculare	Wireweed	Exotic												1									
Portulaca oleracea	Pigweed																						
Rapistrum rugosum	Turnip Weed	Exotic			2	1	2	1		2	2	2						2	1			2	1
Rhodanthe anthemoides	·				1																		
Rostellularia adscendens			1																				
Rumex brownii	Swamp Dock																						
Rumex crispus	Curled Dock	Exotic																					
Rumex sp.											1					1							
Salsola australis					1							1	1	2									
Schenkia spicata	Spike Centaury																						
Schkuhria pinnata	opinio containi,	Exotic							1														
Sclerolaena birchii	Galvanised Burr		†		1	<u> </u>	1	1	-	<u> </u>								1			<u> </u>		
Sclerolaena diacantha	Grey Copperburr		†		† ·		 	<u> </u>		1						1		<u> </u>				1	
Sclerolaena muricata	Black Rolypoly																						
Sclerolaena muricata var. muricata	Black Rolypoly																	1					
Sclerolaena muricata var. villosa	Black Rolypoly																1	· ·					
Senecio quadridentatus	Cotton Fireweed					2	2	1	1						2	1	1	1	1		1	1	2
Setaria incrassata	Purple Pigeon Grass	Exotic					_		' '					1	_								
Setaria sp.	Tarpie i igeon crass	Exotic												'									
Sida corrugata	Corrugated Sida	LXOUG																					
Sida cunninghamii	Ridged Sida																						<u> </u>
Sida cummignamii Sida rhombifolia	Paddy's Lucerne	Exotic					-			-	1												
Sida mombilolla Sida sp.	raddy's Edderne	LXUIIC					-			-	1												
Sida spinosa		Exotic	2	1	2		2		1	1	2	2	2					2	1				
Sida subspicata		LXOUG		'					'	<u>'</u>									'				
Silybum marianum		Exotic					-			-	1												
Sisymbrium irio	London Rocket	Exotic			4																		<u> </u>
Sisymbrium officinale	Hedge Mustard	Exotic	1		-		2			-	1												
Sisymbrium orientale	Indian Hedge Mustard	Exotic	1		3				2	-	1		2	2			2	2					
Sisymbrium sp.	indian nedge ividstald	Exotic			3																1		
Solanum esuriale	Quena	EXOUC													1						1		
Solanum nigrum	Black-berry Nightshade	Exotic												1	1								
	Black-belly Nightshade	EXOUC	-											ı									
Solanum parvifolium Solanum sp.			-																				
Sonchus asper subsp. glaucescens		Exotic	-		1																		
	Common Sowthistle	Exotic	-		- '		1	1					2	2			1	1	1				
Sonchus oleraceus	Johnson Grass	Exotic	-				-		1								1	-	1				
Sorghum halepense	Johnson Grass	Exotic							'								1						
Spergularia sp.		EXOUC															1						
Sporobolus caroli	Clondor Datia Tail Organi		1			1	-			-						-		-			1		
Sporobolus creber	Stagger Wood	Exotic	1				-			-													
Stachys arvensis	Stagger Weed	EXOTIC	1								1												<u> </u>
Stackhousia viminea	Slender Stackhousia		1								1												<u> </u>
Swainsona galegifolia	Smooth Darling-pea		1	-								-	-			-	-	-				-	
Themeda australis	Kangaroo Grass																						
Tragopogon porrifolius	Oyster Plant	Exotic	1	-								-	-			-	-	-				-	
Tragus australianus	Small Burgrass		1			1	1			1						-		-			1		<u> </u>
Trianthema sp.			1	<u> </u>			ļ			ļ	1	<u> </u>	1			ļ	<u> </u>	ļ					<u> </u>
Trifolium angustifolium	Narrow-leaved Clover	Exotic	_				_	_	_	_	_	<u> </u>		_		_	<u> </u>	_	_			_	<u></u>
Trifolium arvense	Haresfoot Clover	Exotic	1	ļ		2	2	2	3	2	2	2	ļ	2		2	2	3	2		2	2	2
Trifolium campestre	Hop Clover	Exotic	ļ			1	2	3	2			2		2			2	1	2	1	2	1	3
Trifolium dubium	Yellow Suckling Clover	Exotic	ļ					1							1								<u> </u>
Trifolium glomeratum	Clustered Clover	Exotic		<u> </u>			1	2				<u> </u>					1	1	2			1	<u> </u>
Trifolium repens	White Clover	Exotic																					<u> </u>

												V	Vood_10_	C									
Species	Species	Notes	1B_2013	1B_2014	1B_2015	2B_2013	2B_2014	2B_2015	3_2011	3_2012	3_2013	3_2014	3_2015	4_2011	4_2012	4_2013	4_2014	4_2015	5_2011	5_2012	5_2013	5_2014	5_2015
Triptilodiscus pygmaeus																							
Urochloa panicoides	Urochloa Grass	Exotic		2																			
Verbascum thapsus	Great Mullein	Exotic																					
Verbascum virgatum	Twiggy Mullein	Exotic																					
Verbena bonariensis	Purpletop	Exotic														1							
Verbena gaudichaudii								2							1			1	1			1	1
Verbesina encelioides		Exotic																					
Vicia sp.		Exotic																					
Vittadinia cuneata	Fuzzweed		2			2				2	1								1		1	1	
Vittadinia disecta	Dissected New Holland Daisy																						
Vittadinia muelleri			1							1	1				1		1					1	
Vittadinia sp.									2														
Vulpia sp.																							
Wahlenbergia communis	Tufted Bluebell			1			1											1	1		1		
Wahlenbergia gracilis	Sprawling Bluebell																						
Wahlenbergia luteola																							
Walwhalleya proluta																							
Xanthium occidentale	Noogoora Burr	Exotic		1																			
Xanthium spinosum	Bathurst Burr	Exotic																					
Xerochrysum bracteatum	Golden Everlasting				2		1	1						1	1		1	2					
Xerochrysum viscosum	Sticky Everlasting																						
Zornia dyctiocarpa	Zornia																						
Total number of species			20	11	19	16	26	23	32	26	25	22	17	29	27	18	26	28	20	5	12	22	17

Table 17: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood_07c for 2011 - 2015 monitoring periods (note plot 46 established in 2013)

Table 17: Groundcover species cov											·	•			Nood_07												
			~	7	3	4	2	_	2	က	4	2	_				5	-	2	9	4	5	_	2	က	4	5
Species	Species	Notes	16_2011	16_2012	16_2013	16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_2011	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014	20_2015
Abutilon oxycarpum	Straggly Lantern-bush																										
Abutilon sp.																											
Acacia deanei (seedling)	Green Wattle																										1
Acacia decora(seedling)	Western Silver Wattle																										
Acacia salicina (seedling)	Cooba																										
Aira sp.		Exotic																								1	
Alternanthera denticulata	Lesser Joyweed																										
Alternanthera sp. A																											
Ammi majus	Bishop's-weed	Exotic																									
Anagallis arvensis	Scarlet Pimpernel	Exotic	2	2		2	2	2		2	2	2		2	2	2			1		2	2			2	2	2
Arenaria leptoclados		Exotic					2																				
Aristida leptopoda	White Speargrass																										
Aristida personata	Purple Wire-grass		1		2	2	2							3		1											
Aristida sp.	T diplo Triio glaco		·																								
Aristida vagans	Threeawn Speargrass				1																						
Arthropodium sp.	i i i coami opodigiaco																										
Asperula cunninghamii	Twining Woodruff																										+
Asphodelus fistulosus	Onion Weed	Exotic			1																						
Aster subulatus	Wild Aster	Exotic	2	2	1			2	2	1		2	2	2										1			+
Atriplex muelleri	Wild Astel	LXUIC			1					'													2	1	1		+
Atriplex semibaccata	Creeping Saltbush		1	1	1	1	1		-				-											'	'		+
Austrodanthonia bipartita	Wallaby Grass		2	'		'	!																1				
Austrodanthonia racemosa	Wallaby Glass		2														2						'				
Austrodanthonia racemosa var. obtusata					1																						
				1	3									2		2											₩
Austrodanthonia sp.	Plains Grass			<u> </u>	3											2											₩
Austrostina aristiglumis					1											4											
Austrostina analysi	Stout Bamboo Grass		2	2	-	2					1			2	2	1	2			2	2						₩
Austrostina sa	Speargrass		2	2	1	2					1			3	2	2	2			2	2						
Austrostipa sp.	Clander Develop Creek				1								1	2	1												
Austrostipa verticillata	Slender Bamboo Grass												1														
Avena fatua	Wild Oats	Exotic												4													
Avena sp.	10.111	Exotic			-									1													—
Bidens pilosa	Cobblers Pegs	Exotic			-										1												—
Bidens subalternans	Greater Beggar's Ticks	Exotic			-								1		1	2						2					—
Boerhavia dominii	Tarvine				1				-				-														
Boerhavia sp.			1		-																						—
Bothriochloa bladhii	Forest Blue Grass				-			2																			<u> </u>
Bothriochloa decipiens	Red Grass			3		2								2							2						—
Bothriochloa macra	Red Grass				_		_										_			1							—
Bothriochloa sp					2		2										2										
Brachychiton populneus	Kurrajong																										
Brachyscome ciliaris	Variable Daisy				ļ				ļ				ļ														
Bromus catharticus	Prairie Grass	Exotic	1		ļ				ļ				1	2													
Bromus molliformis	Soft Brome	Exotic			1																						
Bromus sp.		Exotic			1																						
Brunoniella australis	Blue Trumpet		ļ		1				ļ				ļ		ļ												<u> </u>
Bryophyllum delagoense	Mother-of-millions	Exotic			1																						<u> </u>
Bulbine bulbosa	Native Leek															1											
Calandrinia sp.																											
Callitris glaucophylla																											
Calotis lappulacea	Yellow Burr-daisy		1										2	1	1			2		1							
Carex breviculmis																											
				1									1			2											

														\	Wood_0	7c											
Species	Species	Notes	16_2011	16_2012	16_2013	16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_2011	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014	20_2015
Carthamus lanatus	Saffron Thistle	Exotic	2	2	1	2	3	1			2								2	2	2	3	1			1	
Centaurea melitensis	Maltese Cockspur	Exotic	2	2	2	3	2	2		2	2	2	1	2	2	3	4		1	2	3	3	1			2	2
Centaurea solstitialis	St Barnaby's Thistle	Exotic									1		1	1		1											
Centaurea sp.		Exotic																									
Centaurium erythraea	Common Centaury	Exotic																									
Centaurium sp.		Exotic																1					1				
Chamaesyce sp.																											
Cheilanthes distans	Bristly Cloak Fern																										1
Cheilanthes sieberi	,																										1
Chenopodium desertorum																											+
Chenopodium pumilio	Small Crumbweed																										+
Chloris gayana	Rhodes Grass	Exotic		2	2		3	4	5	4	4	3	3	3	4	4	3	5	5	4	4	3	4	4	4	3	3
Chloris pectinata	Comb Chloris	LXXXII		_			<u> </u>	-		-						-				-	-				-		+
Chloris truncata	Windmill Grass		1				1	 					3		+			1				1		+			+
Chloris ventricosa	Plump Windmill Grass		1	2	2	2	1	 							+			<u>'</u>						+			+
Chondrilla juncea	Skeleton Weed	Exotic	1	-			+ '	 		1	-		-	1	+	1			<u> </u>				1	+		 	+
Chrysocephalum apiculatum	Yellow Buttons	LAULIC	+ '-				+	 		1				1	+	1							1	+		 	+
Cichorium intybus	<u>Chicory</u>	Exotic																									+
	Spear Thistle	Exotic	1										1	1						1	1	1	1	1		1	+
Cirsium vulgare	Spear Thistie	EXOLIC	1		1							1	'	- '	-			1		1	ı	+ '	- '	- '		-	+
Convolvulus graminetinus	Floring Floring	F C .			I		1					1			1		4		4					1			+
Conyza bonariensis	Flaxleaf Fleabane	Exotic	2					2					2				1	2	1	1				_			
Conyza parva		Exotic													-									1			—
Conyza sp.		Exotic					1					1			-												
Cotula australis	Common Cotula			<u> </u>				-				<u> </u>			.			_						1		-	
Cyclospermum leptophyllum	Slender Celery	Exotic	2	1					1	1	2	1	2	2	1	2		2			2						
Cymbopogon refractus	Barbed Wire Grass																				1						
Cynodon dactylon	Couch			2					1																		
Cyperus concinnus																											
Cyperus fulvus	Sticky Sedge																										<u> </u>
Cyperus gracilis	Slender Flat-sedge																										
Cyperus rotundus	Nutgrass	Exotic	1																								
Datura ferox		Exotic																									
Daucus glochidiatus	Native Carrot																										
Desmodium brachypodum	Large Tick-trefoil																										
Desmodium varians	Slender Tick-trefoil																										
Dianella revoluta	Blueberry Lily																										
Dianella sp.																											
Dichanthium sericeum	Queensland Bluegrass		2																								
Dichelachne micrantha	Shorthair Plumegrass														<u></u>												
Dichondra repens	Kidney Weed																	1									
Dichondra sp. A													2		1				1								
Dichopogon fimbriatus	Nodding Chocolate Lily																										
Digitaria brownii	Cotton Panic Grass																										
Digitaria divaricatissima	Umbrella Grass		1										2					2									
Digitaria sanguinalis	Crab Grass	Exotic																								İ	
Digitaria sp.				1			1	1			1	1	1		1									1			1
Echinochloa crus-galli	Barnyard Grass	Exotic		1			1	1			1	1	1		1									1			1
Echinochloa sp.							1	1							1									1			
Echium plantagineum	Patterson's Curse	Exotic		1			1	1			1	1	1		1						1			1			1
Eclipta platyglossa			1			1	1								1							1		1			†
Einadia hastata	Berry Saltbush		† 	1							<u> </u>		<u> </u>		1		1							1			†
Einadia nutans	Climbing Saltbush		1		1		1	<u> </u>					1	1	1	1	1							1			+
Einadia polygonoides	5g Galladon		† '		† '		1	<u> </u>			1		† •	<u> </u>	1	<u> </u>	1							†			+
Einadia trigonos	Fishweed		1	1	1	1	+	 			1	<u> </u>	1		+		 '					1		+	-		+
Elymus scaber	1 101111000		+	+	+	1	+	 			<u> </u>	 	<u> </u>	2	1	2	2					1		+	1	 	+
Liyinus scabei			1	ı	1	1	1	1	l	1	I	1	l					I .	l	<u> </u>	<u>I</u>	1	1	1	1	1	

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Species	Species	Notes	16_2011	16_2012	16_2013	16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_2011	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014	20_2015
Enchylaena tomentosa	Ruby Saltbush																										
Enneapogon nigricans																											1
Enneapogon sp.							1																				
Enteropogon acicularis														1				1									1
Enteropogon sp.																											1
Eragrostis alveiformis																											1
Eragrostis brownii	Brown's Lovegrass																										1
Eragrostis elongata	Clustered Lovegrass																										+
Eragrostis lacunaria	Bristly Love-grass																										+
Eragrostis leptostachya	Paddock Lovegrass																										+
Eragrostis parviflora	Weeping Lovegrass																										+
Eragrostis setifolia	Bristly Love-grass																										+
Eragrostis sp.	Bridly Love grade												1														+
Eremophila debilis	Winter Apple												- '														+
Eriochloa pseudoacrotricha	Early Spring Grass		3		2	1							3	1	-	+							2				+
Eriochloa sp.	Larry Opining Orass					'							3					+ -									+
Erodium crinitum	Blue Storksbill		 	1				 					1			1					-	1				 	+
Euchiton sp.	Bide Storksbill										1		'														+
Euchiton sphaericus											ı		2														+
Eulalia aurea	Sillar Proventon																										+
Evolvulus alsinoides var. decumbens	Silky Browntop					1									-	-											+
	Common Frience and an																										+
Fimbristylis dichotoma	Common Fringe-sedge	F C .																									_
Galenia pubescens	Galenia	Exotic																									_
Geijera parviflora	Nation Consulting																	4									_
Geranium solanderi	Native Geranium																	1									4
Glossogyne tannensis																											4
Glycine clandestina			1															1									4
Glycine tabacina																		1									4
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic																									4
Gomphocarpus sp.	0 1 11	Exotic																									4
Gomphrena celosioides	Gomphrena Weed	Exotic																									
Gonocarpus elatus													1														
Goodenia cycloptera								-																			
Goodenia fascicularis			2																				1				_
Goodenia glabra																											_
Goodenia pinnatifida																											
Gypsophila tubulosa	Annual Chalkwort		1	2																							_
Haloragis heterophylla	Rough Raspwort																										
Hedypnois rhagadioloides subsp. cretica	Cretan Weed	Exotic																									
Helianthus sp.	Sunflower	Exotic																									
Hibiscus trionum																											
Hordeum sp.	Barley Grass	Exotic																									
Hyparrhenia hirta	Coolatai Grass	Exotic																									
Hypochaeris microcephala	White Flatweed	Exotic									2	1					1			1							
Hypochaeris radicata	Flatweed	Exotic																									
Jasminum suavissimum																											
Juncus sp.															1												
Juncus usitatus	Pinrush																										
Lachnagrostis filiformis	Blown Grass																		1					1			
Lactuca saligna	Willow-leaved Lettuce	Exotic	2	1						1	1	2	1	1					1	2			1				
Lactuca serriola	Prickly Lettuce	Exotic	1					1			1	1	2	2			2	2	1	2	1					1	1
Lepidium africanum		Exotic	1			1	2			2			2	1	1		2	1									
Lepidium bonariense		Exotic	2							1						1											
Leptochloa sp.							_																				
Leptorhynchos panaetioides	Woolly Buttons		1	2	2	3	3	2	1	2		2								2	2	2	1	1	1	1	2

														V	Nood_0	7c											
				12	13	4	15		12	13	4	15		12	13	4	15		12	13	4	15	-	12	13	4	15
Species	Species	Notes	16_2011	16_2012	16_2013	16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_201	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014	20_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic																									
Linaria sp.																											
Linum marginale	Native Flax																										
Lolium rigidum	Wimmera Ryegrass	Exotic		3								2		4													
Lolium sp.		Exotic			2	2	1								2	2											
Lomandra confertifolia	Mat-rush																										
Lomandra filiformis	Wattle Mat-rush																										1
Lomandra longifolia	Spiny-headed Mat-rush																										
Lomandra multiflora																											
Lycium ferocissimum	African Boxthorn	Exotic																			1						
Lythrum hyssopifolia	Hyssop Loosestrife																										
Maireana decalvans	Black Cotton Bush																										
Maireana enchylaenoides	Wingless Bluebush																										
Maireana microphylla	Small-leaf Bluebush												1			1	1										
Malva sp.		Exotic																									1
Malvastrum americanum	Spiked Malvastrum	Exotic																									1
Malvastrum coromandelianum	Prickly Malvastrum																										+
Marrubium vulgare	White Horehound	Exotic																				1					+
Medicago minima	Wooly Burr Medic	Exotic					3					3			2		3		1	2		3					3
Medicago polymorpha	Burr Medic	Exotic					2			2		2			2		3	2	'	2		2	2		2		2
Medicago sativa	Lucerne	Exotic													_								1		1		
Medicago sp.	Lucerne	Exotic											1	2								+	'	2	+ '-		+
Medicago truncatula	Barrel Medic	Exotic											'														+
Melilotus indicus	Hexham Scent	Exotic									3	2						2	2	2	3	2					+
Melilotus sp.	Hexham Scent	Exotic									3										3						+
Mentha satureioides	Creeping Mint	EXOLIC											-									-			-		+
													-									-			-		
Microlaena stipoides	Weeping Grass	Exotic											-				2					-			-		
Misopates orontium	Lesser Snapdragon	EXOLIC							-							-	2					-			-		+
Murdannia graminea	Grass Lily												-									-			-		
Nicotiana sp.	Barbwire Weed												-									-			-		+
Nyssanthes diffusa		F C .							1				1									1			1		1
Opuntia stricta Oxalis exilis	Common Prickly Pear	Exotic											1		1							1			1		+
					4								1		1							1			1		+
Oxalis perennans					1																						1
Oxalis sp.			2						1				1					1				1			1		1
Panicum buncei	Haira Basi's		1						1				1									1			1		1
Panicum effusum	Hairy Panic								1																		<u> </u>
Panicum maximum		Exotic						2	1	2		2	3	2				2		2		2	2		1		1
Papaver sp.	Valletta Ocaaa																										<u> </u>
Panicum queenslandicum	Yadbila Grass																										<u> </u>
Panicum sp.	0								1				1									1			1		1
Parsonsia eucalyptophylla	Gargaloo						1	1					1				1					1			1		1
Paspalidium jubiflorum	Warrego Grass						1	 		1	1	1	-			_	-		-	_		1			1		+
Paspalidium sp.					1								1		2	2	2			2							
Paspalum dilatatum	Paspalum	Exotic					-	1		1		-	1				-					1			1		1
Paspalum sp.		Exotic					-	1		1		-	1				-								1		+
Petrorhagia nanteuilii	0.000	Exotic					-	1		1		-	1				-				1	1			1		2
Phalaris sp.	Canary Grass	Exotic					-	ļ		1			1		ļ										 		1
Phyllanthus virgatus	Petty Spurge						1	ļ		1		1	1		ļ		1					1			1		1
Pimelea microcephala	Shrubby Rice-flower						1	1			ļ	ļ	1		ļ		1					1			1		1
Pimelea neo-anglica	Shrubby Rice-flower														<u> </u>							<u> </u>					1
Pimelea sp.															<u> </u>							<u> </u>					1
Plantago debilis								ļ		1			<u> </u>	1	ļ										<u> </u>		1
Plantago lanceolata	Lamb's Tongues	Exotic									ļ	ļ	1		ļ							1			1		1
Poa sieberiana	Snow Grass		<u></u>			<u> </u>		<u></u>	<u></u>		<u> </u>	<u></u>	<u> </u>		<u> </u>					<u> </u>		<u> </u>		<u></u>	<u> </u>	<u> </u>	

Company of the comp															V	Nood_07	7c											
Page-1000 Page	Species	Species	Notes				16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_2011	_2012	_2013	_2014		19_2011	19_2012	19_2013	19_2014		20_2011	20_2012	20_2013	20_2014	20_2015
Part Part	Polycarpon tetraphyllum	Four-leaved Allseed	Exotic																									
Representation of the Period Period	Polygonum aviculare	Wireweed	Exotic								1										1							
Representation of the Period Period		Pigweed		1				1																				1
Proceedings with extensional part Procedure with extensional part Pr	Rapistrum rugosum		Exotic			1	2	2				2					3	3				1	2				2	
Service Services		·																1										
Fundamental Control Dook	Rostellularia adscendens																											
Particle Particle	Rumex brownii	Swamp Dock						1	1						1								1					1
Sales Carriary Sale	Rumex crispus	-	Exotic																		1							
Senior Agriculture Senior Seni	Rumex sp.																											
Selection properties Selection spread Selection spread Selection spread Selection selection Selection Selection selection Selection Selection Selection selection Selection Selection selection Selection Selection Selection selection Selection				2		1	2		1								2					1		2	1			
Schellerian meritani	Schenkia spicata	Spike Centaury																										
Septembers Default			Exotic																									
Selectioner resultation Select Recognity 2 2	·	Galvanised Burr		2	1	2	1	2						1	1		2	2			1	1	2	2	1	2	2	1
Schericker nunceator was nunceator Schericker nunceator Scheri								1	1		1				1			1			1		1		1			
Selectional registration Foreign				2	2			1	1		1			2	2			1	1		1		1	1	1			
Seefer Quantification Control Freeders						2					1				1			1			1		2		1			
Service of control c							1	1								2	1	2							2	1	1	1
Selection Purple Pigeon Grass Eurolic		• • •			1	1	2	2				1			2		2		2	1	2	2				2	2	2
Setton op, Set			Exotic						2					3										2				<u> </u>
Selse conveyagem Compaged Sides	-	J. J. J. J. J. J. J. J. J. J. J. J. J. J	_												3					1								<u> </u>
Self- control plane Self- control plane	· · · · · · · · · · · · · · · · · · ·	Corrugated Sida														1					1							
Sign Annotation Paddy Luceme Exotic																												†
Solida springs		_	Exotic																									<u> </u>
Significant Significant		Table of Careerine																										
Sche subspicate Substantian			Exotic	2										2		2			1		2	1	2					
Skymbrium mainimm London Rocket Exolic Skymbrium officinale London Rocket Exolic Skymbrium officinale Skymbrium officinale Exolic Skymbrium officinale				_															-		 							—
Signification Condon Rocket Exotic Significant microsite Heige Mustard Exotic Significant microsite Significant microsite Indian Hedge Mustard Exotic Significant microsite Indian Hedge Mustard Exotic Significant microsite Indian Hedge Mustard Exotic Significant microsite Significan			Exotic															1										
Seymbrium officinate		London Rocket															2											
Indian Hedge Mustard																												
Signification Scotts Statum estricties Ouena Council C			_	1	1	1	2	2				2			2		2	2			2	3	2	1		1	2	2
Solanum esuriale		- Interior in a grant and an a	_		1	-															 	<u> </u>						
Solarum parvifolium Black-berry Nightshade Exotic 1		Quena		2		1								2		2		1										—
Solanum partifilium Solanum partifilium Solanum partifilium			Fxotic													_		·						1				
Solanum sp. Exotic Solanum sp. Exotic		Ziden zen y mignendae												•														
Sonchus asper subsp. glaucescens	·																											
Sonchus oleraceus Common Sowthistle Exotic 2 2 1 1 1 2 1 1 1 2 1 2 1 1			Fxotic																									
Sorghum halepense		Common Sowthistle	_	2	2			1	2		1	1			2	1	2			1				2			1	1
Spergularia sp. Exotic				-	 	1		<u> </u>	-	1	 	<u> </u>			 	<u> </u>	† -	<u> </u>	1		†	1		† -	†		1	
Sporobolus caroli		5555.1 51465	_		1	1	1			1	<u> </u>			1	<u> </u>	1		<u> </u>	1		†	1		1	†			
Sporobolus creber Slender Rat's Tail Grass Exotic Stadys arvensis Stagger Weed Exotic Stackhousia Slender Stackhousia Slender Stackhousia Slender Stackhousia Slender Stackhousia Slender Stackhousia Smooth Darling-pea Smooth Darling-p		<u> </u>		1	1	1				1	<u> </u>			•	<u> </u>	1		<u> </u>	1		†	1		2	†			<u> </u>
Stachys arvensis Stagger Weed Exotic 1 <		Slender Rat's Tail Grass		<u> </u>	1	1	† ·			1	<u> </u>				<u> </u>	1		<u> </u>	1		†	1		† -	†			<u> </u>
Stackhousia Slender Stackhousia Security of the properties of t			Exotic		1	1				1	<u> </u>				<u> </u>	1		<u> </u>	1		†	1	1	1	†			<u> </u>
Swainsona galegifolia Smooth Darling-pea Image: Control of the peak o					1	1				1	<u> </u>				<u> </u>	1		<u> </u>	1		†	1	- 	1	†			<u> </u>
Themeda australis Kangaroo Grass Kangaroo Grass Miscopogon porrifolius Misc										1	<u> </u>				<u> </u>	1		<u> </u>			+			1	+			
Tragopogon porrifolius Oyster Plant Exotic Image: Control of the co										1	<u> </u>				<u> </u>	1		<u> </u>			+			1	+			
Tragus australianus Small Burgrass Sm		_	Exotic		+					1	-				-	1		-	-		+	+		1	+			+
Trianthema sp. Narrow-leaved Clover Exotic Second Second <td></td> <td></td> <td>LAGIIC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td><u> </u></td> <td></td> <td> </td> <td></td> <td><u> </u></td> <td>1</td> <td></td> <td><u> </u></td> <td></td> <td></td> <td>+</td> <td></td> <td></td> <td>1</td> <td>+</td> <td></td> <td></td> <td> </td>			LAGIIC							1	<u> </u>				<u> </u>	1		<u> </u>			+			1	+			
Trifolium angustifolium Narrow-leaved Clover Exotic Image: Cloud of the cl		Cina. Bargiado								1	<u> </u>				<u> </u>	1		<u> </u>			+			1	+			
Trifolium arvense Haresfoot Clover Exotic 2 3 2 2 2 3 2 2 2 1 3 2 2 2 3 Trifolium campestre Hop Clover Exotic 1 1 2 3 2 1 2 3 2 <t< td=""><td></td><td>Narrow-leaved Clover</td><td>Exotic</td><td></td><td>+</td><td></td><td></td><td></td><td></td><td>1</td><td>-</td><td></td><td> </td><td></td><td>-</td><td>1</td><td></td><td>-</td><td>-</td><td></td><td>+</td><td>+</td><td></td><td>1</td><td>+</td><td></td><td></td><td>+</td></t<>		Narrow-leaved Clover	Exotic		+					1	-				-	1		-	-		+	+		1	+			+
Trifolium campestre Hop Clover Exotic 1 1 2 3 2 1 2 3 2			_		+	2	3		2	2	2	3	2		2	1	3	2	2	2	1	3		2	2	2	3	2
Trifolium dubium Yellow Suckling Clover Exotic 1			_		+								_				+				2						-	2
Trifolium glomeratum Clustered Clover Exotic 2 2 2 2 2 1 2 Trifolium repens White Clover Exotic			_			1	 '			1	- '-		1		-	 '		 			+	+ -			+-			+-
Trifolium repens White Clover Exotic Exotic						1	2			1	 	2	'		 '	2	2	 	2		+	1		1	+		2	+
						1				1	 		 		 			 			+	+ '		1	+			+
	Triptilodiscus pygmaeus	VVIIIC OIOVEI	LAUGE	1	1	1	1	1	+	1	-	1			1	1	1	-			+	1	1	1	+	1	1	+

														V	Nood_07	c'											
Species	Species	Notes	16_2011	16_2012	16_2013	16_2014	16_2015	17_2011	17_2012	17_2013	17_2014	17_2015	18_2011	18_2012	18_2013	18_2014	18_2015	19_2011	19_2012	19_2013	19_2014	19_2015	20_2011	20_2012	20_2013	20_2014	20_2015
Urochloa panicoides	Urochloa Grass	Exotic																									
Verbascum thapsus	Great Mullein	Exotic																									
Verbascum virgatum	Twiggy Mullein	Exotic																									
Verbena bonariensis	Purpletop	Exotic																									
Verbena gaudichaudii			1									1						1	1	2	1						
Verbesina encelioides		Exotic																									
Vicia sp.		Exotic																									
Vittadinia cuneata	Fuzzweed			1	2										2	1	1			2				2	1	1	
Vittadinia disecta	Dissected New Holland Daisy																										
Vittadinia muelleri																								1			
Vittadinia sp.			2										1					2					2			1	
Vulpia sp.																											
Wahlenbergia communis	Tufted Bluebell		1		1								1					1		1	1						
Wahlenbergia gracilis	Sprawling Bluebell																										
Wahlenbergia luteola																											
Walwhalleya proluta																											
Xanthium occidentale	Noogoora Burr	Exotic																									 I
Xanthium spinosum	Bathurst Burr	Exotic																									
Xerochrysum bracteatum	Golden Everlasting												1			1	2						1				 I
Xerochrysum viscosum	Sticky Everlasting																										
Zornia dyctiocarpa	Zornia																										
Total number of species			46	22	24	23	23	16	7	15	19	20	40	35	30	31	29	29	17	30	26	19	26	15	12	19	16

Table 18: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Burnt_2013 for 2011 - 2015 monitoring periods (note plot 46 established in 2013)

													В	Burnt_201	3										
Species	Species	Notes	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46	46_2014	46_2015
Abutilon oxycarpum	Straggly Lantern-bush																								
Abutilon sp.																1								1	
Acacia deanei (seedling)	Green Wattle																								
Acacia decora (seedling)	Western Silver Wattle																								
Acacia salicina (seedling)	Cooba																								
Aira sp.		Exotic																							
Alternanthera denticulata	Lesser Joyweed																								
Alternanthera sp. A																									
Ammi majus	Bishop's-weed	Exotic																			1				
Anagallis arvensis	Scarlet Pimpernel	Exotic	1			2	2		2		2	2	2	2			2	2	2		2			2	
Arenaria leptoclados		Exotic										2													
Aristida leptopoda	White Speargrass																								
Aristida personata	Purple Wire-grass										2													2	
Aristida sp.																									
Aristida vagans	Threeawn Speargrass																								
Arthropodium sp.																									
Asperula cunninghamii	Twining Woodruff																								
Asphodelus fistulosus	Onion Weed	Exotic																							
Aster subulatus	Wild Aster	Exotic							2																
Atriplex muelleri	Tring / total	Exotio							_									2			2	2			
Atriplex semibaccata	Creeping Saltbush																	_			_	_			
Austrodanthonia bipartita	Wallaby Grass																								
Austrodanthonia racemosa	Wallaby Grass																								-
Austrodanthonia racemosa var. obtusata																									-
Austrodanthonia sp.			1					-										2			2				-
Austrostipa aristiglumis	Plains Grass		1																						
Austrostipa ramosissima	Stout Bamboo Grass							1						1			-							1	<u> </u>
Austrostipa scabra	Speargrass Speargrass										1	2						2	2		2	2	2	2	2
Austrostipa sp.	Speargrass										'														
Austrostipa verticillata	Slender Bamboo Grass							1						1			-								<u> </u>
Avena fatua	Wild Oats	Exotic																							
	Wild Oats	Exotic																							
Avena sp. Bidens pilosa	Cobblers Pegs	Exotic			-					-			-	-							-				
					-					-		1	1	-			2				-				
Bidens subalternans Boerhavia dominii	Greater Beggar's Ticks Tarvine	Exotic										1	1	-			2								1
	rarvine							1						1											1
Boerhavia sp.	Farrat Blue Crass													1											1
Bothriochloa bladhii	Forest Blue Grass										_			1		_									1
Bothriochloa decipiens	Red Grass										2					2									+
Bothriochloa macra	Red Grass					2		1						1											1
Bothriochloa sp.	12									-				-											<u> </u>
Brachychiton populneus	Kurrajong									-				-											<u> </u>
Brachyscome ciliaris	Variable Daisy									-				-											<u> </u>
Bromus catharticus	Prairie Grass	Exotic	1					1				ļ		1		1	-								_
Bromus molliformis	Soft Brome	Exotic					ļ	1	1		ļ			1			<u> </u>		2			2			
Bromus sp.	DI T	Exotic	1		1					1		1				1			2		1	1	1		<u> </u>
Brunoniella australis	Blue Trumpet							1						1											<u> </u>
Bryophyllum delagoense	Mother-of-millions	Exotic	1		1		ļ	1		1				1		1	ļ					_		_	<u> </u>
Bulbine bulbosa	Native Leek				1		ļ	ļ		ļ	1	ļ		1							1	2	ļ	1	2
Calandrinia sp.								<u> </u>																	<u> </u>
Callitris glaucophylla					1		ļ			1											1				
Calotis lappulacea	Yellow Burr-daisy																	2	2		1				
Carex breviculmis																									
Carex inversa																		1	1	1	2	2		2	

													В	urnt_201	3					,					
Species	Species	Notes	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46	46_2014	46_2015
Carthamus lanatus	Saffron Thistle	Exotic				2	2					1	1			1					2	2			
Centaurea melitensis	Maltese Cockspur	Exotic				2	2		1		3	2				1	2	3	2		3	3		3	4
Centaurea solstitialis	St Barnaby's Thistle	Exotic									2														+
Centaurea sp.	·	Exotic																							+
Centaurium erythraea	Common Centaury	Exotic																							+
Centaurium sp.		Exotic						1										1							+
Chamaesyce sp.																								1	+
Cheilanthes distans	Bristly Cloak Fern																								+
Cheilanthes sieberi																									+
Chenopodium desertorum																									+
Chenopodium pumilio	Small Crumbweed																								+
Chloris gayana	Rhodes Grass	Exotic	5	5	2	2	3	5	6	3	3	3	5	6	3	3	3	3	6	3	4	3	2	3	3
Chloris pectinata	Comb Chloris	LXOLIO	<u> </u>	<u> </u>							<u> </u>			<u> </u>			Ŭ				-		_		+
Chloris truncata	Windmill Grass																								+-
Chloris ventricosa	Plump Windmill Grass																	2							+-
Chondrilla juncea	Skeleton Weed	Exotic																							+-
Chrysocephalum apiculatum	Yellow Buttons	LXUIC																							+
	reliow Buttons	Cyatia											-												+
Cichorium intybus	Con and Thinkle	Exotic	1		1	1	1	1	2	1	1					4			4						+-
Cirsium vulgare	Spear Thistle	Exotic	1	2	1	1	1	1	2	1	1	1				1			1					-	+-
Convolvulus graminetinus	E										1	1				1								1	₩
Conyza bonariensis	Flaxleaf Fleabane	Exotic	2											2		1									+-
Conyza parva		Exotic					-																		₩
Conyza sp.		Exotic					-										1								₩
Cotula australis	Common Cotula										_					_									┿
Cyclospermum leptophyllum	Slender Celery	Exotic						1	1		2		2	2		2		2	2						\bot
Cymbopogon refractus	Barbed Wire Grass																								\bot
Cynodon dactylon	Couch																								
Cyperus concinnus																									
Cyperus fulvus	Sticky Sedge																								
Cyperus gracilis	Slender Flat-sedge																								
Cyperus rotundus	Nutgrass	Exotic																							
Datura ferox		Exotic																							<u> </u>
Daucus glochidiatus	Native Carrot					2												1	1		1				
Desmodium brachypodum	Large Tick-trefoil																								
Desmodium varians	Slender Tick-trefoil																								
Dianella revoluta	Blueberry Lily																								
Dianella sp.																									
Dichanthium sericeum	Queensland Bluegrass																								
Dichelachne micrantha	Shorthair Plumegrass																								
Dichondra repens	Kidney Weed																								
Dichondra sp. A													1												
Dichopogon fimbriatus	Nodding Chocolate Lily																								1
Digitaria brownii	Cotton Panic Grass																								
Digitaria divaricatissima	Umbrella Grass																	1							
Digitaria sanguinalis	Crab Grass	Exotic																							
Digitaria sp.			1				1			1	1	1		1						1					1
Echinochloa crus-galli	Barnyard Grass	Exotic	1				1			1	1	1		1						1					1
Echinochloa sp.			1								1									1					1
Echium plantagineum	Patterson's Curse	Exotic	1				2				2					2	2								+
Eclipta platyglossa			1				-				-						_			<u> </u>					+
Einadia hastata	Berry Saltbush		1																	<u> </u>					2
Einadia nutans	Climbing Saltbush		1				1		1	1	1	1								<u> </u>	1				+
Einadia polygonoides	Similaring Galloudin		+						<u> </u>		- '-	1	<u> </u>	1				1		-	1			1	1
Einadia trigonos	Fishweed		+									 '	1	1				 		-	 '			1	+ '
Finadia moonos		1	1	1	1	i	1		1	1	1	1	1	1	i		1	ı	1	1	i	1			1

													В	surnt_201	3										
				2	3	4	5	_	2	2	4	2	_	2	<u>8</u>	4	15	_	2	2	4	5		4	15
Species	Species	Notes	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46	46_2014	46_2015
Enchylaena tomentosa	Ruby Saltbush																								
Enneapogon nigricans																									
Enneapogon sp.																									
Enteropogon acicularis																			1						
Enteropogon sp.																									
Eragrostis alveiformis																									
Eragrostis brownii	Brown's Lovegrass																								
Eragrostis elongata	Clustered Lovegrass																								
Eragrostis lacunaria	Bristly Love-grass																								
Eragrostis leptostachya	Paddock Lovegrass																								
Eragrostis parviflora	Weeping Lovegrass																								
Eragrostis setifolia	Bristly Love-grass																								
Eragrostis sp.																									
Eremophila debilis	Winter Apple																								
Eriochloa pseudoacrotricha	Early Spring Grass																								
Eriochloa sp.																									
Erodium crinitum	Blue Storksbill										2										1			1	
Euchiton sp.																									
Euchiton sphaericus																		1							
Eulalia aurea	Silky Browntop																								
Evolvulus alsinoides var. decumbens																									
Fimbristylis dichotoma	Common Fringe-sedge																								
Galenia pubescens	Galenia	Exotic																							
Geijera parviflora																									
Geranium solanderi	Native Geranium			1		1	1														1				
Glossogyne tannensis																									
Glycine clandestina			1			1		1																	
Glycine tabacina																							1		
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic																							
Gomphocarpus sp.		Exotic																							
Gomphrena celosioides	Gomphrena Weed	Exotic																							
Gonocarpus elatus																									
Goodenia cycloptera																									
Goodenia fascicularis																									
Goodenia glabra																									
Goodenia pinnatifida																									
Gypsophila tubulosa	Annual Chalkwort																								
Haloragis heterophylla	Rough Raspwort																								
Hedypnois rhagadioloides subsp. cretica		Exotic																							
Helianthus sp.	Sunflower	Exotic																							
Hibiscus trionum					1																				
Hordeum sp.	Barley Grass	Exotic																							
Hyparrhenia hirta	Coolatai Grass	Exotic																							
Hypochaeris microcephala	White Flatweed	Exotic																							
Hypochaeris radicata	Flatweed	Exotic							ļ				ļ					ļ	1			ļ			
Jasminum suavissimum	-	1							ļ				ļ					ļ	1	1		ļ			
Juncus sp.		1																	1	1					
Juncus usitatus	Pinrush	1																	1	1					
Lachnagrostis filiformis	Blown Grass	 	1										1		!	1			1	1					1
Lactuca saligna	Willow-leaved Lettuce	Exotic	<u> </u>	1		1		2	<u> </u>				1		1	1			1	1					
Lactuca serriola	Prickly Lettuce	Exotic	2	1		2		2	1		2		2	2	1	1	1	2	2	1					1
Lepidium africanum		Exotic	1								1		2	1	1	1	1	2	1	1		1			1
Lepidium bonariense		Exotic											ļ					ļ	1	1					
Leptochloa sp.	Marilla Dattan	+					4		<u> </u>				<u> </u>	<u> </u>		-			1	1					
Leptorhynchos panaetioides	Woolly Buttons						1	1	1		2	3	2	2		2	2	1							<u> </u>

													В	Burnt_201	3										
Species	Species	Notes	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46	46_2014	46_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic																							
Linaria sp.																									
Linum marginale	Native Flax											1				1	1								
Lolium rigidum	Wimmera Ryegrass	Exotic																							
Lolium sp.		Exotic																							
Lomandra confertifolia	Mat-rush																								
Lomandra filiformis	Wattle Mat-rush																								
Lomandra longifolia	Spiny-headed Mat-rush																								
Lomandra multiflora																									
Lycium ferocissimum	African Boxthorn	Exotic																							
Lythrum hyssopifolia	Hyssop Loosestrife																								
Maireana decalvans	Black Cotton Bush																								
Maireana enchylaenoides	Wingless Bluebush																								
Maireana microphylla	Small-leaf Bluebush																								
Malva sp.		Exotic																							
Malvastrum americanum	Spiked Malvastrum	Exotic		1			İ			1												1		İ	
Malvastrum coromandelianum	Prickly Malvastrum																								
Marrubium vulgare	White Horehound	Exotic																							
Medicago minima	Wooly Burr Medic	Exotic				2	4				3	4				3	3								4
Medicago polymorpha	Burr Medic	Exotic				3	2				3	3	2	2		3	1								3
Medicago sativa	Lucerne	Exotic								1			_								1	4			
Medicago sp.		Exotic	2							·												3			
Medicago truncatula	Barrel Medic	Exotic	 -													2									
Melilotus indicus	Hexham Scent	Exotic	2	2		3		2			3	1		1		2					1				
Melilotus sp.	TIOMINIT COOK	Exotic	 -	_				_				1		· ·		_									
Mentha satureioides	Creeping Mint	LXOUG																							+
Microlaena stipoides	Weeping Grass																								+
Misopates orontium	Lesser Snapdragon	Exotic										1													+
Murdannia graminea	Grass Lily	LXOUC										1													+
Nicotiana sp.	Olass Lily											1													+
Nyssanthes diffusa	Barbwire Weed											1													+
Opuntia stricta	Common Prickly Pear	Exotic	1									1		1											+
Oxalis exilis	Common Frickly Fear	LXOUC	1									1		1											+
Oxalis perennans			1									1		1											+
																		1							+
Oxalis sp. Panicum buncei					-			-				-		-				1					-		+
	Heim / Denie				-			-				-		-				1					-		+
Panicum effusum Panicum maximum	Hairy Panic	Exotic	 	+	-	-	-	2	1	2	-	 	2	3	-			4	-	2	-	-	-	 	+
		EXOLIC							'					3				4							+
Papaver sp. Panicum queenslandicum	Yadbila Grass		 	+	-	-	-	-	-	-	-	 	-	-	-				-	-	-	-	-	 	+
	raupiia Grass		 	+	-	-	-	-	-	-	-	 	-	-	-				-	-	-	-	-	 	+
Panicum sp.	Gargalos		 	+	-	-	-	-	-	-	-	 	-	-	-				-	-	-	-	-	 	+
Parsonsia eucalyptophylla Paspalidium jubiflorum	Gargaloo		1	1							1								1						+
	Warrego Grass		+	+		1	 		1	 	1	1		1	1			_	1	-	1			-	
Paspalidium sp.	Donalum	Fratic	+	+		1	 		1	 	1	1		1	1			2	1	-	1	2		2	2
Paspalum dilatatum	Paspalum	Exotic	1	1	1	1	<u> </u>	1	1	<u> </u>	1	1	1	1	1		1		4	1	1	<u> </u>	1	<u> </u>	+
Paspalum sp.		Exotic	-	-	1	_	_	1	1	<u> </u>	_	1	-	-	1		1		1	1	1	<u> </u>	1	<u> </u>	+
Petrorhagia nanteuilii	Company Core 5	Exotic	2	2	1	2	3	1	1	<u> </u>	2	1	2	2	1	2	1		1	1	1	<u> </u>	1	<u> </u>	+
Phalaris sp.	Canary Grass	Exotic	1	1			-		-			1	-	1			-			-	-			-	
Phyllanthus virgatus	Petty Spurge		1		-	1		-	ļ		1	1	<u> </u>		-		<u> </u>		1	-	<u> </u>		-		
Pimelea microcephala	Shrubby Rice-flower		1	1			_		1	<u> </u>		1	1	1			<u> </u>			ļ	1	<u> </u>		_	
Pimelea neo-anglica	Shrubby Rice-flower		1	1			ļ		1	ļ	1	1	1	1			<u> </u>			1	1	ļ		ļ	
Pimelea sp.			1	1		1	ļ		1	ļ	1	1		1	1				1			ļ		ļ	
Plantago debilis	=		1	1		1	ļ		1	ļ	1	1		1	1				1			ļ		ļ	
Plantago lanceolata	Lamb's Tongues	Exotic							ļ				ļ				<u> </u>				ļ				
Poa sieberiana	Snow Grass																		1						

													В	Burnt_201	3										
Species	Species	Notes	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46	46_2014	46_2015
Polycarpon tetraphyllum	Four-leaved Allseed	Exotic																							
Polygonum aviculare	Wireweed	Exotic																							1
Portulaca oleracea	Pigweed																								+
Rapistrum rugosum	Turnip Weed	Exotic										2				2	2				1	3		2	2
Rhodanthe anthemoides																_	_				<u> </u>			_	
Rostellularia adscendens																									<u> </u>
Rumex brownii	Swamp Dock																								+
Rumex crispus	Curled Dock	Exotic											1	1											+
Rumex sp.											1			-						1					+
Salsola australis											1					1					1			2	+
Schenkia spicata	Spike Centaury															<u>'</u>					· ·			_	+
Schkuhria pinnata	opine centaury	Exotic																		1					+
Sclerolaena birchii	Galvanised Burr	LAUTIC						1	1			1		1				2	2	1		2	1	2	3
Sclerolaeria birchii Sclerolaena diacantha	Grey Copperburr	+			+			'	<u>'</u>	1		'	1	+ '	1	1				1	1	-	+ '		+ -
Sclerolaena muricata	Black Rolypoly												 	+				2							+
-																				-	-				
Sclerolaena muricata var. muricata Sclerolaena muricata var. villosa	Black Rolypoly								1	1				+	1	1				+	4			4	
·	Black Rolypoly																			-	1			1	2
Senecio quadridentatus	Cotton Fireweed	+	2	1			1		1	2	2		2	2			1	_	2	1	1	1	1		1
Setaria incrassata	Purple Pigeon Grass	Exotic	3				2	3		-		2					2	3		1					1
Setaria sp.		Exotic											2								2				<u> </u>
Sida corrugata	Corrugated Sida																		1				1	1	
Sida cunninghamii	Ridged Sida																				1				
Sida rhombifolia	Paddy's Lucerne	Exotic																							
Sida sp.																					1				
Sida spinosa		Exotic																1		2	1	2			
Sida subspicata																									
Silybum marianum		Exotic																							
Sisymbrium irio	London Rocket	Exotic																						1	
Sisymbrium officinale	Hedge Mustard	Exotic		1		2	2						1					2							
Sisymbrium orientale	Indian Hedge Mustard	Exotic	1						1		2	1				1	2		1		2	2		2	1
Sisymbrium sp.		Exotic																							
Solanum esuriale	Quena																								
Solanum nigrum	Black-berry Nightshade	Exotic				2						1				2	1								
Solanum parvifolium																									
Solanum sp.																									
Sonchus asper subsp. glaucescens		Exotic																							
Sonchus oleraceus	Common Sowthistle	Exotic	2	1		1	1	2	1		1		2	2		2	1	2			1			1	
Sorghum halepense	Johnson Grass	Exotic												†											1
Spergularia sp.		Exotic												†											1
Sporobolus caroli														1											1
Sporobolus creber	Slender Rat's Tail Grass													1											1
Stachys arvensis	Stagger Weed	Exotic												<u> </u>											<u> </u>
Stackhousia viminea	Slender Stackhousia													1						1	1				+
Swainsona galegifolia	Smooth Darling-pea								 	 				+	 	 			1	+	1				+
Themeda australis	Kangaroo Grass													+						1					+
Tragopogon porrifolius	Oyster Plant	Exotic			+				-	-				+	-	-				1	1	1	1		+
Tragus australianus	Small Burgrass	LXUIL			+				-	-				+	-	-				1	1	1	1		+
Trianthema sp.	Omaii Duryrass	+			+				1	1			1	+	1	1			1	1	1	1	1		+
Trifolium angustifolium	Narrow-leaved Clover	Evotio			+ +		1						-	1								1	1		+
		Exotic	_		+ +		1	_	_	<u> </u>				-	<u> </u>			_	-	1	-		1	_	+
Trifolium arvense	Haresfoot Clover	Exotic	2	2		2	2	2	2		2	2	2	2		2		2	2	1	3	2		3	+
Trifolium campestre	Hop Clover	Exotic		1	-	2	2	2	1		2	2	2	1		2		2	2	1	1	1	1	2	1
Trifolium dubium	Yellow Suckling Clover	Exotic							<u> </u>			2	-	1	<u> </u>	3				1				_	1
Trifolium glomeratum	Clustered Clover	Exotic					1		ļ	ļ	3	2		1	ļ	ļ		1	1	1	2			2	
Trifolium repens	White Clover	Exotic																	ļ						<u> </u>
Triptilodiscus pygmaeus																									

													В	urnt_201	3										
Species	Species	Notes	21_2011	21_2012	21_2013	21_2014	21_2015	22_2011	22_2012	22_2013	22_2014	22_2015	23_2011	23_2012	23_2013	23_2014	23_2015	30_2011	30_2012	30_2013	30_2014	30_2015	46	46_2014	46_2015
Urochloa panicoides	Urochloa Grass	Exotic																							
Verbascum thapsus	Great Mullein	Exotic																							
Verbascum virgatum	Twiggy Mullein	Exotic																							
Verbena bonariensis	Purpletop	Exotic																							
Verbena gaudichaudii																		1	1			1			
Verbesina encelioides		Exotic																							
Vicia sp.		Exotic																							
Vittadinia cuneata	Fuzzweed					1	1				1	1					2	1		1					
Vittadinia disecta	Dissected New Holland Daisy																								
Vittadinia muelleri													1	2											
Vittadinia sp.								2					1												
Vulpia sp.																									
Wahlenbergia communis	Tufted Bluebell		1	1				2		1	1							2		1					
Wahlenbergia gracilis	Sprawling Bluebell																								
Wahlenbergia luteola																									
Walwhalleya proluta																									
Xanthium occidentale	Noogoora Burr	Exotic																							
Xanthium spinosum	Bathurst Burr	Exotic																							
Xerochrysum bracteatum	Golden Everlasting																				2	2		1	
Xerochrysum viscosum	Sticky Everlasting																	1							
Zornia dyctiocarpa	Zornia																								
Total number of species			15	13	3	21	20	17	18	6	31	23	24	17	2	26	18	35	24	7	32	20	5	27	13

Table 19: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood_06a for 2011 - 2015 monitoring periods

Abutilon oxycarpum Abutilon sp. Acacia deanei (seedling) Acacia decora (seedling) Acacia salicina (seedling) Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Bis Anagallis arvensis Arenaria leptoclados Aristida leptopoda Wr Aristida sp.	traggly Lantern-bush freen Wattle //estern Silver Wattle ooba esser Joyweed ishop's-weed carlet Pimpernel //hite Speargrass urple Wire-grass hreeawn Speargrass wining Woodruff	Exotic Exotic Exotic Exotic Exotic	24_2011	1 24_2012	1 1 24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
Abutilon oxycarpum Abutilon sp. Acacia deanei (seedling) Acacia decora (seedling) Acacia salicina (seedling) Acacia salicina (seedling) Co Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Bis Anagallis arvensis Arenaria leptoclados Aristida personata Aristida sp. Aristida vagans Thi	traggly Lantern-bush ireen Wattle //estern Silver Wattle ooba esser Joyweed ishop's-weed carlet Pimpernel //hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic Exotic Exotic Exotic		24 ₋	1 2 2 2	24_					25_	
Abutilon sp. Acacia deanei (seedling) Acacia decora (seedling) Acacia salicina (seedling) Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida personata Aristida sp. Aristida vagans Greedling) We accia seedling) Co. Alternanthera denticulata Les Alternanthera sp. A Ammi majus Bis Aragallis arvensis Sca Arenaria leptoclados Thistida personata Aristida personata Thistida vagans	reen Wattle Vestern Silver Wattle ooba esser Joyweed ishop's-weed carlet Pimpernel Vhite Speargrass urple Wire-grass	Exotic Exotic		1		2						
Acacia deanei (seedling) Acacia decora (seedling) Acacia salicina (seedling) Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida personata Aristida sp. Aristida vagans Greading) We acacia deanei (seedling) Cod Roll Aira sp. Bis Scattara denticulata Alternanthera sp. A Ammi majus Bis Aragallis arvensis Scattara denticulata Aristida leptopoda What aristida personata Aristida vagans	/estern Silver Wattle ooba esser Joyweed ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic Exotic		1		2						
Acacia decora (seedling) Acacia salicina (seedling) Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida personata Aristida sp. Aristida vagans Thi	/estern Silver Wattle ooba esser Joyweed ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic Exotic		1		2						
Acacia decora (seedling) Acacia salicina (seedling) Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida personata Aristida sp. Aristida vagans We	esser Joyweed ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass	Exotic Exotic			1	2						
Acacia salicina (seedling) Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida leptopoda Aristida personata Aristida sp. Aristida vagans Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Control Airatida sp. Thiratida sp.	esser Joyweed ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic Exotic				2						
Aira sp. Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida leptopoda Aristida personata Aristida sp. Aristida vagans Thi	ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic Exotic				2						
Alternanthera denticulata Alternanthera sp. A Ammi majus Anagallis arvensis Arenaria leptoclados Aristida leptopoda Aristida personata Aristida sp. Aristida vagans The	ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic				2						
Alternanthera sp. A Ammi majus Bis Anagallis arvensis Arenaria leptoclados Aristida leptopoda Wharistida personata Aristida sp. Aristida vagans Thi	ishop's-weed carlet Pimpernel /hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic				2						
Ammi majus Bis Anagallis arvensis Sca Arenaria leptoclados Aristida leptopoda Wh Aristida personata Pui Aristida sp. Aristida vagans Thi	/hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic				2						
Anagallis arvensis Arenaria leptoclados Aristida leptopoda Aristida personata Pui Aristida sp. Aristida vagans Thi	/hite Speargrass urple Wire-grass hreeawn Speargrass	Exotic				2						
Arenaria leptoclados Aristida leptopoda Wristida personata Pui Aristida sp. Aristida vagans Thi	/hite Speargrass urple Wire-grass hreeawn Speargrass						1	2		2	2	2
Aristida leptopoda Wh Aristida personata Pui Aristida sp. Aristida vagans Thi	urple Wire-grass hreeawn Speargrass						· · · · · · · · · · · · · · · · · · ·	_			_	
Aristida personata Pui Aristida sp. Aristida vagans Thi	urple Wire-grass hreeawn Speargrass											
Aristida sp. Aristida vagans Thi	hreeawn Speargrass			2								
Aristida vagans Thi				_					+			
		1										
	wining Woodruff											-
	nion Weed	Exotic										
· ·	/ild Aster	Exotic						2	2			
	/ild Astel	EXOLIC					1	2	2			
Atriplex muelleri	ra aning Calthumb						ı					
	reeping Saltbush											
	/allaby Grass						2					
Austrodanthonia racemosa												
Austrodanthonia racemosa var. obtusata												
Austrodanthonia sp.			2	2	2							
· · · · · ·	lains Grass											
	tout Bamboo Grass					_						
	peargrass			2	2	2	2					
Austrostipa sp.												
	lender Bamboo Grass											
	/ild Oats	Exotic										
Avena sp.		Exotic										
	obblers Pegs	Exotic										
	reater Beggar's Ticks	Exotic					2					2
	arvine											
Boerhavia sp.												
	orest Blue Grass											
·	ed Grass			2		2						
	ed Grass											
Bothriochloa sp.												
	urrajong											
Brachyscome ciliaris Val	ariable Daisy											
	rairie Grass	Exotic						1	2		2	
Bromus molliformis Soi	oft Brome	Exotic		2	2	2	3				2	2
Bromus sp.		Exotic										
	lue Trumpet											
Bryophyllum delagoense Mo	lother-of-millions	Exotic										
	ative Leek											
Calandrinia sp.												
Callitris glaucophylla												,
	ellow Burr-daisy											
Carex breviculmis	,											
Carex inversa											2	

Carthamus lanatus Centaurea melitensis Centaurea solstitialis Centaurea sp. Centaurium erythraea	Species Saffron Thistle Maltese Cockspur St Barnaby's Thistle	Notes Exotic Exotic	24_2011	24_2012	2013	_2014	_2015	ood_06a 11 00d_06a	2012	2013	2014	015
Carthamus lanatus Centaurea melitensis Centaurea solstitialis Centaurea sp.	Saffron Thistle Maltese Cockspur St Barnaby's Thistle	Exotic Exotic		24_201		201	201	201	5	5	20	01
Centaurea melitensis Centaurea solstitialis Centaurea sp.	Maltese Cockspur St Barnaby's Thistle	Exotic			24	24_	24_3	25_2	25_2	25_2	25_2	25_2015
Centaurea solstitialis Centaurea sp.	St Barnaby's Thistle		•					1	1	2	2	2
Centaurea sp.	St Barnaby's Thistle			2	2	2	2		2	2	3	3
		Exotic										
		Exotic										
	Common Centaury	Exotic							1			
Centaurium sp.		Exotic	1					2				
Chamaesyce sp.												
Cheilanthes distans	Bristly Cloak Fern											
Cheilanthes sieberi												
Chenopodium desertorum												
Chenopodium pumilio	Small Crumbweed											
Chloris gayana	Rhodes Grass	Exotic	4	5	4	4	3	5	5	4	4	3
Chloris pectinata	Comb Chloris											
Chloris truncata	Windmill Grass											
Chloris ventricosa	Plump Windmill Grass											
Chondrilla juncea	Skeleton Weed	Exotic										
Chrysocephalum apiculatum	Yellow Buttons											
Cichorium intybus		Exotic										
Cirsium vulgare	Spear Thistle	Exotic					2			1	1	2
Convolvulus graminetinus	· ·				1				1	1		
Conyza bonariensis	Flaxleaf Fleabane	Exotic	2					2	2		2	1
Conyza parva		Exotic										
Conyza sp.		Exotic										
Cotula australis	Common Cotula											
Cyclospermum leptophyllum	Slender Celery	Exotic	2					2		1	2	1
Cymbopogon refractus	Barbed Wire Grass											
Cynodon dactylon	Couch							2		1		
Cyperus concinnus												
Cyperus fulvus	Sticky Sedge											
Cyperus gracilis	Slender Flat-sedge											
Cyperus rotundus	Nutgrass	Exotic										
Datura ferox		Exotic										
Daucus glochidiatus	Native Carrot							1				
Desmodium brachypodum	Large Tick-trefoil											
Desmodium varians	Slender Tick-trefoil											
Dianella revoluta	Blueberry Lily											
Dianella sp.												
Dichanthium sericeum	Queensland Bluegrass							1				
Dichelachne micrantha	Shorthair Plumegrass											
Dichondra repens	Kidney Weed											
Dichondra sp. A					1	1						
Dichopogon fimbriatus	Nodding Chocolate Lily											
Digitaria brownii	Cotton Panic Grass											
Digitaria divaricatissima	Umbrella Grass		1									
Digitaria sanguinalis	Crab Grass	Exotic										
Digitaria sp.												
Echinochloa crus-galli	Barnyard Grass	Exotic										
Echinochloa sp.												
Echium plantagineum	Patterson's Curse	Exotic									1	
Eclipta platyglossa												
Einadia hastata	Berry Saltbush											
Einadia nutans	Climbing Saltbush		1	1		1						
Einadia polygonoides					1			1				
Einadia trigonos	Fishweed											
Elymus scaber				2								

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			~	2	ო	4			2	က	4	ro
Species	Species	Notes	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
Enchylaena tomentosa	Ruby Saltbush											
Enneapogon nigricans												
Enneapogon sp.						1						
Enteropogon acicularis												
Enteropogon sp.												
Eragrostis alveiformis												
Eragrostis brownii	Brown's Lovegrass											
Eragrostis elongata	Clustered Lovegrass											
Eragrostis lacunaria	Bristly Love-grass											
Eragrostis leptostachya	Paddock Lovegrass		2									
Eragrostis parviflora	Weeping Lovegrass											
Eragrostis setifolia	Bristly Love-grass											
Eragrostis sp.												
Eremophila debilis	Winter Apple											
Eriochloa pseudoacrotricha	Early Spring Grass		3					3			-	
Eriochloa sp.	Di Oi I I''											
Erodium crinitum	Blue Storksbill											
Euchiton sp.												
Euchiton sphaericus	O'll - D t											
Eulalia aurea	Silky Browntop											
Evolvulus alsinoides var. decumbens	Comment Friend and the											
Fimbristylis dichotoma	Coloria							4				
Galenia pubescens Geijera parviflora	Galenia	Exotic						1				
Geranium solanderi	Native Geranium											
Glossogyne tannensis	Native Geranium											
Glycine clandestina								1				
Glycine tabacina								<u>'</u>				
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic										
Gomphocarpus sp.	Namew leaved Cotton Bush	Exotic										
Gomphrena celosioides	Gomphrena Weed	Exotic										
Gonocarpus elatus	- Compinional Freed											
Goodenia cycloptera												
Goodenia fascicularis												
Goodenia glabra												
Goodenia pinnatifida												
Gypsophila tubulosa	Annual Chalkwort			1								
Haloragis heterophylla	Rough Raspwort											
Hedypnois rhagadioloides subsp. cretica	Cretan Weed	Exotic				2						
Helianthus sp.	Sunflower	Exotic										
Hibiscus trionum												
Hordeum sp.	Barley Grass	Exotic										
Hyparrhenia hirta	Coolatai Grass	Exotic										
Hypochaeris microcephala	White Flatweed	Exotic										
Hypochaeris radicata	Flatweed	Exotic								1		
Jasminum suavissimum												
Juncus sp.												
Juncus usitatus	Pinrush											
Lachnagrostis filiformis	Blown Grass								1			
Lactuca saligna	Willow-leaved Lettuce	Exotic	2	1				2	2	2	1	
Lactuca serriola	Prickly Lettuce	Exotic	2		1	2		2	2	1	2	2
Lepidium africanum		Exotic	2	1	1			1		1		
Lepidium bonariense		Exotic				<u> </u>	1	<u> </u>		<u> </u>	 	
Leptochloa sp.			_		_		_					_
Leptorhynchos panaetioides	Woolly Buttons		2		2	1	2	1			1	2

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			Ξ	2	8	4		_	2	5	4	15
Species	Species	Notes	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic										
Linaria sp.												
Linum marginale	Native Flax											
Lolium rigidum	Wimmera Ryegrass	Exotic							3			
Lolium sp.		Exotic						1			3	1
Lomandra confertifolia	Mat-rush											
Lomandra filiformis	Wattle Mat-rush											
Lomandra longifolia	Spiny-headed Mat-rush											
Lomandra multiflora												
Lycium ferocissimum	African Boxthorn	Exotic										
Lythrum hyssopifolia	Hyssop Loosestrife											
Maireana decalvans	Black Cotton Bush											
Maireana enchylaenoides	Wingless Bluebush											
Maireana microphylla	Small-leaf Bluebush											
Malva sp.		Exotic										
Malvastrum americanum	Spiked Malvastrum	Exotic										
Malvastrum coromandelianum	Prickly Malvastrum											
Marrubium vulgare	White Horehound	Exotic										
Medicago minima	Wooly Burr Medic	Exotic			2		3			2		3
Medicago polymorpha	Burr Medic	Exotic	2		2		2			2	2	
Medicago sativa	Lucerne	Exotic										1
Medicago sp.		Exotic		2							2	
Medicago truncatula	Barrel Medic	Exotic										
Melilotus indicus	Hexham Scent	Exotic						1			1	2
Melilotus sp.		Exotic										
Mentha satureioides	Creeping Mint											
Microlaena stipoides	Weeping Grass											
Misopates orontium	Lesser Snapdragon	Exotic										
Murdannia graminea	Grass Lily											
Nicotiana sp.												
Nyssanthes diffusa	Barbwire Weed											
Opuntia stricta	Common Prickly Pear	Exotic										
Oxalis exilis					1					1		
Oxalis perennans												
Oxalis sp.												
Panicum buncei								1				
Panicum effusum	Hairy Panic											
Panicum maximum		Exotic	3		2				2			
Papaver sp.												
Panicum queenslandicum	Yadbila Grass											
Panicum sp.												
Parsonsia eucalyptophylla	Gargaloo											
Paspalidium jubiflorum	Warrego Grass											
Paspalidium sp.			2		2	2						
Paspalum dilatatum	Paspalum	Exotic										
Paspalum sp.		Exotic										
Petrorhagia nanteuilii		Exotic	2	2		2					1	2
Phalaris sp.	Canary Grass	Exotic										
Phyllanthus virgatus	Petty Spurge											
Pimelea microcephala	Shrubby Rice-flower											
Pimelea neo-anglica	Shrubby Rice-flower											
Pimelea sp.	-											
Plantago debilis							1					
Plantago lanceolata	Lamb's Tongues	Exotic										
Poa sieberiana	Snow Grass											
	1	1	1	1	1	1	1	1	1	1	1	

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Species	Species	Notes	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
Polycarpon tetraphyllum	Four-leaved Allseed	Exotic										
Polygonum aviculare	Wireweed	Exotic						1				
Portulaca oleracea	Pigweed		1	1	2							
Rapistrum rugosum	Turnip Weed	Exotic		1	1	2	3			2	2	3
Rhodanthe anthemoides	·						1					
Rostellularia adscendens												
Rumex brownii	Swamp Dock											1
Rumex crispus	Curled Dock	Exotic										
Rumex sp.												
Salsola australis												
Schenkia spicata	Spike Centaury											
Schkuhria pinnata		Exotic										
Sclerolaena birchii	Galvanised Burr		1	2	2	1	2	1	1		2	
Sclerolaena diacantha	Grey Copperburr											
Sclerolaena muricata	Black Rolypoly			2				2	2			
Sclerolaena muricata var. muricata	Black Rolypoly											
Sclerolaena muricata var. villosa	Black Rolypoly				2	2	2			2	1	2
Senecio quadridentatus	Cotton Fireweed		1	2	2	2	1	1	2	2	2	1
Setaria incrassata	Purple Pigeon Grass	Exotic	3	_	1			3	_	_	_	
Setaria sp.	- Tarper i gran anda	Exotic		3	•	1		-				
Sida corrugata	Corrugated Sida		1			· ·						
Sida cunninghamii	Ridged Sida											
Sida rhombifolia	Paddy's Lucerne	Exotic										
Sida sp.	1 dddy 5 Eddernie	Exotio										
Sida spinosa		Exotic	1					1		2		2
Sida subspicata		Exotio										
Silybum marianum		Exotic										
Sisymbrium irio	London Rocket	Exotic										
Sisymbrium officinale	Hedge Mustard	Exotic				2					1	
Sisymbrium orientale	Indian Hedge Mustard	Exotic			2		2		1		'	1
Sisymbrium sp.	malan riedge Wastard	Exotic							'			'
Solanum esuriale	Quena	Exotio										
Solanum nigrum	Black-berry Nightshade	Exotic								1		
Solanum parvifolium	Diack-berry Nightshade	LXOUC								'		
Solanum sp.												
Sonchus asper subsp. glaucescens		Exotic									1	
Sonchus oleraceus	Common Sowthistle	Exotic		2		1	2	2	2		1	
Sorghum halepense	Johnson Grass	Exotic				1					1	
Spergularia sp.	Johnson Grass	Exotic	+							+		
Sporobolus caroli		LAUG	2									
Sporobolus caroli Sporobolus creber	Slender Rat's Tail Grass							1				
Stachys arvensis	Stagger Weed	Exotic						1				
Stackhousia viminea	Slender Stackhousia	LAUTIC										
Swainsona galegifolia	Smooth Darling-pea											
Themeda australis	Kangaroo Grass											
Tragopogon porrifolius	Oyster Plant	Exotic	+	1						+		
Tragus australianus	Small Burgrass	LAUTIC										
Trianthema sp.	Omaii Bulgiass				1							
Trifolium angustifolium	Narrow-leaved Clover	Exotic	+	1	•	1				+		
Trifolium arvense	Haresfoot Clover	Exotic	1	2		3	2	2	2	2	2	1
Trifolium campestre	Hop Clover	Exotic	 		2	2	3	2	2	2	2	2
Trifolium dubium	Yellow Suckling Clover	Exotic	+	2	+	3	3		2			
	Clustered Clover	Exotic	2			3		2		2	2	
Trifolium glomeratum Trifolium repens	White Clover	Exotic										
	VALIILE CIOVEI	LAUTE										
Triptilodiscus pygmaeus				<u> </u>		1						l

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Species	Species	Notes	24_2011	24_2012	24_2013	24_2014	24_2015	25_2011	25_2012	25_2013	25_2014	25_2015
Urochloa panicoides	Urochloa Grass	Exotic										
Verbascum thapsus	Great Mullein	Exotic										
Verbascum virgatum	Twiggy Mullein	Exotic										
Verbena bonariensis	Purpletop	Exotic					1					
Verbena gaudichaudii					1					1	1	
Verbesina encelioides		Exotic										
Vicia sp.		Exotic										
Vittadinia cuneata	Fuzzweed			2	2	2	2					1
Vittadinia disecta	Dissected New Holland Daisy											
Vittadinia muelleri											1	
Vittadinia sp.			2					2				
Vulpia sp.							1					
Wahlenbergia communis	Tufted Bluebell							1		1		
Wahlenbergia gracilis	Sprawling Bluebell										1	
Wahlenbergia luteola												
Walwhalleya proluta												
Xanthium occidentale	Noogoora Burr	Exotic										
Xanthium spinosum	Bathurst Burr	Exotic										
Xerochrysum bracteatum	Golden Everlasting		1	1		1	1				1	
Xerochrysum viscosum	Sticky Everlasting											
Zornia dyctiocarpa	Zornia											
Total number of species			28	26	29	27	27	34	21	25	33	25

Table 20: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood_05a for 2011 - 2015 monitoring periods (plot 48 established in 2013)

Specimen														٧	Vood_05a	a										
Administration of the control of the	Species	Species	Notes										27_2015	28_2011		28_2013			29_2011	29_2012	29_2013	29_2014	29_2015	48_2013		48_2015
Accoss description Market Methods	Abutilon oxycarpum	Straggly Lantern-bush																								
Assessment leading Mealer November William Mealer William Mealer Will	Abutilon sp.																									
Accordinating (and one)	Acacia deanei (seedling)	Green Wattle																								
Martin	Acacia decora (seedling)	Western Silver Wattle																								
Ambertone contendades Ambertone of the Ambertone contendades Contended	Acacia salicina (seedling)	Cooba																						1		
Absence seque A more reques Seque	Aira sp.		Exotic																							
Americanism Control Progress Control C	Alternanthera denticulata	Lesser Joyweed																								
Againe servenes	Alternanthera sp. A																				1					
America Septicipation White Springropses White Springropses White Springropses Perpla Wind grass Another Springropses Perpla Wind grass Another Springropses The control of the co	Ammi majus	Bishop's-weed	Exotic		1				2											1						1
Amonte in properties	Anagallis arvensis	Scarlet Pimpernel	Exotic		2		2			2	2	2		2							2			1	2	2
Administrational Purple Wine-grained Wine Springerings 1		·	Exotic																				2			
Massel proposer and Muse Wire Proposer		White Speargrass																								
Anamonia vag. The casen Speargrass The cas					3	2			3	2	1	2	2		3	2	2	3		3		3	2	3	3	3
Additional programs Asserting Mine Specimens Sheepings Sheepings Sheeping											3	2	-	1		2			1							
Administration of the control of the		Threeawn Speargrass																								
Appendes parameters Toming Woodself Early Composed Early Com		- modami opdangrado																								
Approximation Ministry Ministr		Twining Woodruff																								
Alter Muchalus Wild Asier		_	Exotic																							
Applese ambiendescale Creeping Salblash Mulley Grass Mull					1					1				1	1											-
Applies ambedeata		Wild Aster	LXOUC		'					'				- '	'											-
Autorelation in bounta Walley Gress Walley Gres		Crooping Salthush											<u> </u>	<u> </u>				-								
Autorisophinam ancenosa we not show in a control of the control of								2													2					
Asstractivith and accomose were obtained as a part of the section		Wallaby Grass								-	-							1					2			
Austrachtmania sp. Austra																		1								
Austrostipe arisiglumis				0	_	2	2		_							2			_	2		2		2		
Austrostips remoissime Speargrass Spearg		Disires Occasion		2	2	2	2		2	2				1		2	2		2	2		2		2		
Austroscips acadha																										
Austrostipa syn-childret Sender Bamboo Grass Lexic Avena fatura Wild Cals Exotic Cobbier Pega Exotic Sender Beggar's Ticks Exotic Sender Beggar's Ticks Exotic Sender Beggar's Ticks Exotic Sender Beggar's Ticks Exotic Sender Beggar's Ticks Sen				_						_							'									<u> </u>
Austroatique et elliptical Sender Bamboo Grass		Speargrass		3	3	3	3	3	3	3	3		3	3		2	3	2	3			3	3		3	3
Avena datule Av															2				_	2	2					
Avena sp. Avena sp. Cobbler Pegs Exotic State Exotic State Exotic State Sta																			2							<u> </u>
Bidens pilosa Cobbiers Pegs Exotic		Wild Oats																			1	_				
Bickens subaltermans Greater Beggar's Ticks Exotic 2 Image: Control of the contr					1	1		1								1			1	1		2	1	1		
Boerhavia dominii																										
Bothicocho blackhii Forest Blue Grass See			Exotic		2								1	2	2	2		1		2		1			1	1
Bothriochloa bladhii Forest Blue Grass C C C C C C C C C		Tarvine																								
Bothriochloa decipiens Red Grass Red																		1								
Bothriochloa macra Red Grass Gra																										
Bothriochloa sp. Surface Surfa		<u> </u>		2	4		3		2	4		3			4		3			3		2			3	
Brachychiton populneus Kurrajong Company		Red Grass				3										3								3		
Brachyscome ciliaris Variable Daisy Image: Control of Same of	*							2			3		2					3			3					2
Bromus catherticus Prairie Grass Exotic Soft Brome Soft Brome Exotic Soft Brome Soft Brome Exotic Soft Brome Soft Brome Soft Brome Soft Brome Exotic Soft Brome Soft Brome Soft Brome Exotic Soft Brome Soft Brome Soft Brome Soft Brome Soft Brome Soft Brome Soft Brome Exotic Soft Brome S	Brachychiton populneus																									
Bromus molliformis Soft Brome Exotic Soft Brome Exotic Soft Brome Exotic Soft Brome Soft Brome Exotic Soft Brome Soft Brome Exotic Soft Brome So	Brachyscome ciliaris	Variable Daisy																								
Brown Sp. Exotic State	Bromus catharticus	Prairie Grass																								
Brunniella australis Blue Trumpet Image: Control of the control of th	Bromus molliformis	Soft Brome					2										2	2							2	2
Bryophyllum delagoense Mother-of-millions Exotic Image: Control of the properties	Bromus sp.		Exotic			1						2						1	1							
Bulbine bulbosa Native Leek Image: Control of the property of the pro	Brunoniella australis	Blue Trumpet																								
Bulbine bulbosa Native Leek Image: Color of the colo	Bryophyllum delagoense	Mother-of-millions	Exotic																							
Calandrinia sp. Calandrinia sp. Image: Control of the control of the																										
Callitris glaucophylla Callotis lappulacea Yellow Burr-daisy 1 2																										
Calotis lappulacea Yellow Burr-daisy 1 2						1					1															
Carex breviculmis 2		Yellow Burr-daisv				1	1			2	1			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 2				2				 	†					-				-	<u> </u>					
	Carex inversa			1	1	† <u> </u>	1	1		1	†				1	1	1	1	2	1	1	2	2	<u> </u>		1

													V	Vood_05a	a										
Species	Species	Notes	26_2011	26_2012	26_2013	26_2014	26_2015	27_2011	27_2012	27_2013	27_2014	7_2015	28_2011	28_2012	28_2013	28_2014	28_2015	29_2011	29_2012	29_2013	29_2014	29_2015	48_2013	48_2014	48_2015
	0.55	F .:										27						2		7		7			
Carthamus lanatus	Saffron Thistle	Exotic	2	1	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	4	2	2	2
Centaurea melitensis	Maltese Cockspur	Exotic	2	1	1	2	3				2	3			2	3	3	2	2	2	3	4	2		3
Centaurea solstitialis	St Barnaby's Thistle	Exotic																							<u> </u>
Centaurea sp.	0	Exotic																							
Centaurium erythraea	Common Centaury	Exotic																							
Centaurium sp.		Exotic																							
Chamaesyce sp.								1		-						-		1							<u> </u>
Cheilanthes distans	Bristly Cloak Fern																								<u> </u>
Cheilanthes sieberi																								1	
Chenopodium desertorum																									<u> </u>
Chenopodium pumilio	Small Crumbweed																								
Chloris gayana	Rhodes Grass	Exotic														1			1					1	
Chloris pectinata	Comb Chloris																								
Chloris truncata	Windmill Grass		1	2								1						2							
Chloris ventricosa	Plump Windmill Grass		2	2							1							2	2	2	2			1	
Chondrilla juncea	Skeleton Weed	Exotic	1	2	1	1		1	2	1															
Chrysocephalum apiculatum	Yellow Buttons																								
Cichorium intybus	Chichory	Exotic										1													
Cirsium vulgare	Spear Thistle	Exotic																							
Convolvulus graminetinus			2	1	2	2	1	1	1	1				1	1			1	1		1		1		
Conyza bonariensis	Flaxleaf Fleabane	Exotic	2	2		1													1						
Conyza parva		Exotic																							
Conyza sp.		Exotic																							
Cotula australis	Common Cotula																								
Cyclospermum leptophyllum	Slender Celery	Exotic	2										2											1	
Cymbopogon refractus	Barbed Wire Grass	2,01.0	_										_			1									
Cynodon dactylon	Couch															<u> </u>									
Cyperus concinnus	Geden																								
Cyperus fulvus	Sticky Sedge		1					1					1	1				1							
Cyperus ruivus Cyperus gracilis	Slender Flat-sedge		'					'					'	'				'							
		Exotic																							
Cyperus rotundus	Nutgrass																								
Datura ferox	Native Count	Exotic												4											
Daucus glochidiatus	Native Carrot													1											<u> </u>
Desmodium brachypodum	Large Tick-trefoil									-						-									<u> </u>
Desmodium varians	Slender Tick-trefoil																								
Dianella revoluta	Blueberry Lily																								<u> </u>
Dianella sp.																									
Dichanthium sericeum	Queensland Bluegrass		3		2			3					3	2				2							
Dichelachne micrantha	Shorthair Plumegrass																								
Dichondra repens	Kidney Weed																								
Dichondra sp. A																	2	2	2				1		
Dichopogon fimbriatus	Nodding Chocolate Lily																								
Digitaria brownii	Cotton Panic Grass							1																	
Digitaria divaricatissima	Umbrella Grass												2		2			2				1			1
Digitaria sanguinalis	Crab Grass	Exotic																							
Digitaria sp.																									
Echinochloa crus-galli	Barnyard Grass	Exotic																							
Echinochloa sp.										1						1			1	1					
Echium plantagineum	Patterson's Curse	Exotic	1		1	2	2	1	1	2		1		1	2	2	2	1							
Eclipta platyglossa			<u> </u>				_	•	1	- -		† ·		<u> </u>		- -									
Einadia hastata	Berry Saltbush								<u> </u>			<u> </u>	<u> </u>									1			
Einadia nutans	Climbing Saltbush																			-		•	1		
Einadia polygonoides	Olimbing Gallbush		2				1	2	1	1		1		1	1	1			1	1		1	1		
Einadia trigonos	Fishweed						'		<u> </u>	'		'		+ '	<u>'</u>	- ' -			 '	<u> </u>		1			
	i istiweeu																1								
Elymus scaber					<u> </u>				<u> </u>	L						L	1		L	L				<u> </u>	<u> </u>

													٧	Vood_05a	1										
Species	Species	Notes	26_2011	26_2012	26_2013	26_2014	26_2015	27_2011	27_2012	27_2013	27_2014	27_2015	28_2011	28_2012	28_2013	28_2014	28_2015	29_2011	29_2012	29_2013	29_2014	29_2015	48_2013	48_2014	48_2015
Enchylaena tomentosa	Ruby Saltbush																								
Enneapogon nigricans	,											2					1								1
Enneapogon sp.			1					2			1					1							2		1
Enteropogon acicularis				1	2										2		1	1		2					1
Enteropogon sp.																									1
Eragrostis alveiformis																									1
Eragrostis brownii	Brown's Lovegrass																								1
Eragrostis elongata	Clustered Lovegrass																								1
Eragrostis lacunaria	Bristly Love-grass																								1
Eragrostis leptostachya	Paddock Lovegrass		2																						+
Eragrostis parviflora	Weeping Lovegrass																								1
Eragrostis setifolia	Bristly Love-grass																								+
Eragrostis sp.	Ziledy Zeve grace																								+
Eremophila debilis	Winter Apple	1	1	1	1		1	1	1	1	1	1	1	1		1			1						+-
Eriochloa pseudoacrotricha	Early Spring Grass	1	† · ·	<u> </u>	1		1	1	 	† •	'	 	1	† •		•		1	<u> </u>						+-
Eriochloa sp.	_any opining order	1						- '-	<u> </u>		<u> </u>		 '					'		1	1				+-
Erodium crinitum	Blue Storksbill	1							<u> </u>		<u> </u>					2				 	1				+-
Euchiton sp.	Didd Otorrobiii																								+-
Euchiton sphaericus																									+
Eulalia aurea	Silky Browntop																								+
Evolvulus alsinoides var. decumbens	Sliky Browntop																								+
Fimbristylis dichotoma	Common Fringo codgo																								+
	Colonia	Cyatia																							+
Galenia pubescens	Galenia	Exotic																							+
Geijera parviflora	Native Committee																								+
Geranium solanderi	Native Geranium																								+
Glossogyne tannensis													0		4	4					4		4		+
Glycine clandestina			2			1			4				2		1	1	1	4		1	1		1		+_
Glycine tabacina	10 " 5 1			1					1									1		1	1	2			1
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic																							
Gomphocarpus sp.		Exotic																							
Gomphrena celosioides	Gomphrena Weed	Exotic																							
Gonocarpus elatus																									
Goodenia cycloptera																									
Goodenia fascicularis																									
Goodenia glabra																									
Goodenia pinnatifida																									
Gypsophila tubulosa	Annual Chalkwort																								
Haloragis heterophylla	Rough Raspwort		1		2								2												
Hedypnois rhagadioloides subsp. cretica	Cretan Weed	Exotic			2		3				2	2				2				2	<u> </u>	2		2	2
Helianthus sp.	Sunflower	Exotic																							
Hibiscus trionum		1																							<u> </u>
Hordeum sp.	Barley Grass	Exotic																							<u> </u>
Hyparrhenia hirta	Coolatai Grass	Exotic																							
Hypochaeris microcephala	White Flatweed	Exotic																							
Hypochaeris radicata	Flatweed	Exotic																							
Jasminum suavissimum																									
Juncus sp.																									
Juncus usitatus	Pinrush																								
Lachnagrostis filiformis	Blown Grass			1																					
Lactuca saligna	Willow-leaved Lettuce	Exotic	1	1					1					1					1						
Lactuca serriola	Prickly Lettuce	Exotic	2	1										1				1							
Lepidium africanum		Exotic	1	1				2	1		1		1		1	2	2	1	1	1	1				1
Lepidium bonariense		Exotic																							†
	+		1		1																				†
Leptochloa sp.																									

													V	Vood_05a	a										
Species	Species	Notes	26_2011	26_2012	26_2013	26_2014	26_2015	27_2011	27_2012	27_2013	27_2014	27_2015	28_2011	28_2012	28_2013	28_2014	28_2015	29_2011	29_2012	29_2013	29_2014	29_2015	48_2013	48_2014	48_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic																						1	
Linaria sp.																									
Linum marginale	Native Flax		1	1	1	1	2		2														1		1
Lolium rigidum	Wimmera Ryegrass	Exotic		1					2										2						
Lolium sp.	7 0	Exotic	1				2				2	2					1						2		2
Lomandra confertifolia	Mat-rush																								
Lomandra filiformis	Wattle Mat-rush																								
Lomandra longifolia	Spiny-headed Mat-rush																								
Lomandra multiflora	-																								1
Lycium ferocissimum	African Boxthorn	Exotic																1							
Lythrum hyssopifolia	Hyssop Loosestrife																				1				
Maireana decalvans	Black Cotton Bush																								
Maireana enchylaenoides	Wingless Bluebush																								1
Maireana microphylla	Small-leaf Bluebush		1	1	2	1	1											2	2	3	1	2	1		
Malva sp.	Official Ical Diacodoff	Exotic	+ '	+ '-		 '	+ '-			-					-						'		- ' -		
Malvastrum americanum	Spiked Malvastrum	Exotic		+				1		 					 			1				1			
Malvastrum coromandelianum	· · · · · · · · · · · · · · · · · · ·	EXOLIC						'										1				- 1			-
	Prickly Malvastrum	Exotic	1	1			1	1		-	1		1		-			-	1			1	1		-
Marrubium vulgare	White Horehound				2	_	4	_			2	2	2				2				1	2	4	2	<u> </u>
Medicago minima	Wooly Burr Medic	Exotic		2	2	3	4	2		_	3	3	2			2	3	2		_	_	3	1	3	3
Medicago polymorpha	Burr Medic	Exotic	2	2	2	3	2		2	2	2	2	1			3	2	2		2	3	2	2	3	2
Medicago sativa	Lucerne	Exotic	-		1													1							
Medicago sp.		Exotic													2										<u> </u>
Medicago truncatula	Barrel Medic	Exotic													2						1		2		
Melilotus indicus	Hexham Scent	Exotic														2									<u> </u>
Melilotus sp.		Exotic																							<u> </u>
Mentha satureioides	Creeping Mint																								<u> </u>
Microlaena stipoides	Weeping Grass																								
Misopates orontium	Lesser Snapdragon	Exotic		1									1					2				2		1	2
Murdannia graminea	Grass Lily																								
Nicotiana sp.																									
Nyssanthes diffusa	Barbwire Weed																								
Opuntia stricta	Common Prickly Pear	Exotic							1		1	1													
Oxalis exilis																									
Oxalis perennans																									
Oxalis sp.			1										1					1							
Panicum buncei																									
Panicum effusum	Hairy Panic		2					2					2					2							
Panicum maximum		Exotic																							
Papaver sp.																									
Panicum queenslandicum	Yadbila Grass		1	1				1		1	1		1		1			<u> </u>	1		1	1	1		
Panicum sp.			1	1				1		1	1		1		1			<u> </u>	1		1	1	1		
Parsonsia eucalyptophylla	Gargaloo		1	1				1		1	1		1		1			1	1		1	1	1		
Paspalidium jubiflorum	Warrego Grass																				1				
Paspalidium sp.	<u> </u>																1	3		2	1	2	2		
Paspalum dilatatum	Paspalum	Exotic		1														<u> </u>		† <u>-</u>	1	 	 		†
Paspalum sp.		Exotic	1	1																	1				
Petrorhagia nanteuilii		Exotic	2	2	2	2	3	2	2	2	2	3	2	2		3	3	2	2		1	3	2	2	3
Phalaris sp.	Canary Grass	Exotic	 	 			<u> </u>	-			-	<u> </u>	 		1				 			<u> </u>	 		
Phyllanthus virgatus	Petty Spurge	LAUGO	+	+						-					-			2							
Pimelea microcephala	Shrubby Rice-flower		1	+	1	1	1	1	1	1	1		1		1				1	1	1	1	1		-
•	Shrubby Rice-flower Shrubby Rice-flower		1	+	 	1			1					1				-		 					1
Pimelea neo-anglica	Siliubby Rice-llower		1	+		1	4	1		 	1		1		 			 	1	-	1	1	1		
Pimelea sp.			1	1	-	1	1	1	1	<u> </u>	1	1	1	1	<u> </u>					-	1	1	1		1
Plantago debilis	Levelle T		1	1	1	-			1					-				1	2	1	1				1
Plantago lanceolata	Lamb's Tongues	Exotic	1	-	-	ļ	1	1	<u> </u>		1	-	1	<u> </u>					1	-		1	1		
Poa sieberiana	Snow Grass									<u> </u>					<u> </u>										<u>1</u>

Tragopogon porrifolius Oyster Plant Exotic Image: square plant p														V	Vood_05a	<u> </u>										
Mysteric growth Myster M	Species	Species	Notes		26_2012		26_2014			27_2012	27_2013	27_2014	27_2015						29_2011	29_2012	29_2013	29_2014				48_2015
Proposed Proposed	Polycarpon tetraphyllum	Four-leaved Allseed	Exotic																							
Progression Secure Secure Secure Secure Secure Secure S	Polygonum aviculare	Wireweed	Exotic																							
Missenson confessional Search Carlos Search	Portulaca oleracea	Pigweed									1															
Recommendation and embressions	Rapistrum rugosum	Turnip Weed	Exotic								1	3	2					2		1	1					
Amontonomy Control C	Rhodanthe anthemoides																									
Remore space Cared Dook Car	Rostellularia adscendens																									
Remote pi Subside accordance Spice Certainary S	Rumex brownii	Swamp Dock			1					1		1	1							1						1
Secretary Space Certains Space Cer	Rumex crispus	-	Exotic																							
Section Sect																										
Selection primete Color							1					1					1									1
Selection primete Color	Schenkia spicata	Spike Centaury																								
Ses-ensense brown of the Ses-ensense brown of the Ses-ensense brown of the Ses-ensense arrangement of the Ses-ensense arrang		, ,	Exotic						1																	
Secondarian Campan	Galvanised Burr					1	2	1	1			2	1		1	2	2	1	1	2	1	2			2	
Selectioner marcation with marcatic selection from marcation selection selection from marcation selection selection from marcation selection selec			+				1	<u> </u>	<u> </u>	<u> </u>	1	<u> </u>	<u> </u>	<u> </u>		<u> </u>	_	_	<u> </u>	<u> </u>	 	<u> </u>	<u> </u>	<u> </u>		-
Selectional municipal year information and selectic hologopy											†	<u> </u>							1							
Selection of multised sour Miles Black Rights Selection Se			+						1		†	<u> </u>	2	1		1		1	<u> </u>		1		1	1		1
Series of Question infrastructure 3 3 2			+		1		1		1	1	†	1	† -	1	1	1		<u> </u>	<u> </u>	1	<u> </u>		1	1		<u> </u>
Season Season Purple Preport Grantase Ecolor Ecol				3	3	2						<u>'</u>		3	3	- '	2		1		1					-
State Supplied Congregated Side State			Evotic	3	3									3	3				'		'					
Style Consumer Con		1 diple i igeon Grass	_																							
Region R	<u>.</u>	Correspond Side	LXUIIC									1								1	2					+
See substitution Padoy's Luceme											-	-								<u>'</u>						<u> </u>
Skits Skit			E C .																							
Side subspicio Side		Paddy's Lucerne	EXOTIC																							
Sets Sets																					1					
Substantum marianum			Exotic	2		2	2	2	2	2	2	2	2	2	2	2	2	2			1	1		2		2
Symbrium incoming Landon Rocket Excilic																										<u> </u>
Signaturum officinate			_																							<u> </u>
Signification Indian Hedge Mustard Exotic 1 2 3 2 3			-																							<u> </u>
Symbolium Symbolium Simbolium Symbolium Symbolium Simbolium Symbolium		_									2															
Solarum esuriale		Indian Hedge Mustard	_	1	2	1	2	3					2	2		2	2	2		1	2	1	2		2	2
Solanum nigrum Black-berry Nightshade Exotic Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium Solanum parvifolium parvifolium parvifolium Solanum parvifolium par			Exotic																2							
Solanum parviolium Solanum sp. Solanum						1			1				1	1					1		2			1		
Solanum sp. Solanum sp. Exolic Solanum sp. Exolic Solanum sp. Exolic Solanum sp. Exolic Solanum sp. Solanu		Black-berry Nightshade	Exotic																							
Sonchus asper subsp. glaucescens Exotic Ex	·																									
Sonchus oleraceus Common Sowthiste Exotic 2 1 1 2 1 1 2 1 1 2 1 1																										
Sorghum halepense	Sonchus asper subsp. glaucescens		Exotic																							
Spergularia sp. Spergularia sp. Spergularia sp. Spergularia sp. Spergularia sp. Spergularia sp. Spergularia sp. Stender Rat's Tail Grass Stagger Weed Exotic Stender Stackhousia Stagger Weed Exotic Stender Stackhousia Stagger Weed Exotic Stender Stackhousia Stender Stackho	Sonchus oleraceus	Common Sowthistle	Exotic	2				1	2			1	1	2												
Sporobolus caroli	Sorghum halepense	Johnson Grass	Exotic																							
Sporobolius creber Slender Rat's Tail Grass Facility Facility Stackhousia Stager Weed Exotic Stackhousia Stager Weed Exotic Stackhousia Stackhousia Stackhousia Stackhousia Stackhousia Stackhousia Smooth Darling-pea Smooth Dar	Spergularia sp.		Exotic																							
Stackhouse Stagger Weed Stagger Weed Stagger Weed Stackhouse Stagger Weed Stackhouse Stagger Weed Stagger We	Sporobolus caroli												1													
Stackhousia Slender Stackhousia Slender Stackhousia Stackh	Sporobolus creber	Slender Rat's Tail Grass												1												
Swainsona galegifolia Smooth Darling-pea Image: Control of the contro	Stachys arvensis	Stagger Weed	Exotic					2																		
Themeda australis Kangaroo Grass 2 1 1 1 1 1 2 3 1 2 Tragopogon porrifolius Oyster Plant Exotic 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1 2 1 1 2	Stackhousia viminea	Slender Stackhousia																								
Themeda australis Kangaroo Grass 2 1 1 1 1 1 2 3 1 2 Tragopogon porrifolius Oyster Plant Exotic 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1 2 1 1 2	Swainsona galegifolia	Smooth Darling-pea																								
Tragopogon porrifolius Oyster Plant Exotic Image: square plant p					2															3				3	1	2
Tragus australianus Small Burgrass Image: Control of the problem of t		_	Exotic								1															
Trianthema sp. Narrow-leaved Clover Exotic 2 2 1 1 2 1 2											1															
Trifolium angustifolium Narrow-leaved Clover Exotic 2 2 1 1 2 1 2 2 2 3 3 2			1								1															
Trifolium arvense Haresfoot Clover Exotic 2		Narrow-leaved Clover	Exotic	2	2	1		1	2		†	<u> </u>	1	2	2											
Trifolium campestre Hop Clover Exotic 2 2 2 2 2 1			_			<u> </u>	3	† · ·		2	2	<u> </u>				<u> </u>	3	3	<u> </u>			3	1	2	2	2
Trifolium dubium Yellow Suckling Clover Exotic Image: Cloud of the control of the con			_	+				2			-	 							 							
Trifolium glomeratum Clustered Clover Exotic 1		-									+	-												- ' -		_
Trifolium repens White Clover Exotic							1				+	-														
							'		 		+	 				 			 					 		
	Triptilodiscus pygmaeus	vville Glovei	LXULIC	 	1	 	-	 		 	-		 	-	-					 	 	 	-			

													V	Nood_05	а										
Species	Species	Notes	26_2011	26_2012	26_2013	26_2014	26_2015	27_2011	27_2012	27_2013	27_2014	27_2015	28_2011	28_2012	28_2013	28_2014	28_2015	29_2011	29_2012	29_2013	29_2014	29_2015	48_2013	48_2014	48_2015
Urochloa panicoides	Urochloa Grass	Exotic																							
Verbascum thapsus	Great Mullein	Exotic																							
Verbascum virgatum	Twiggy Mullein	Exotic						1																	
Verbena bonariensis	Purpletop	Exotic																							
Verbena gaudichaudii			2	1				1					1	1				2	1	1		1	1		
Verbesina encelioides		Exotic																							
Vicia sp.		Exotic																							
Vittadinia cuneata	Fuzzweed			1	2		2				2	2		2	2				1	1	1	1			
Vittadinia disecta	Dissected New Holland Daisy												1												
Vittadinia muelleri																									
Vittadinia sp.								2					2					1							
Vulpia sp.							2												2						
Wahlenbergia communis	Tufted Bluebell		2	1					2	1	1		2	1	1			2				1	1		
Wahlenbergia gracilis	Sprawling Bluebell																								
Wahlenbergia luteola																									
Walwhalleya proluta																									
Xanthium occidentale	Noogoora Burr	Exotic																							
Xanthium spinosum	Bathurst Burr	Exotic																							
Xerochrysum bracteatum	Golden Everlasting										1	1	1				1				1				
Xerochrysum viscosum	Sticky Everlasting																	1							
Zornia dyctiocarpa	Zornia																								
Total number of species	•		40	41	29	27	27	33	28	18	28	32	38	27	27	29	31	46	37	31	26	25	28	21	28

Table 21: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood_04 for 2011 - 2015 monitoring periods

															Wood_0	4											
Species	Species	Notes	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_2011	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
Abutilon oxycarpum	Straggly Lantern-bush																										
Abutilon sp.			1		1																						
Acacia deanei (seedling)	Green Wattle																										
Acacia decora(seedling)	Western Silver Wattle																										
Acacia salicina (seedling)	Cooba																										
Aira sp.		Exotic																									
Alternanthera denticulata	Lesser Joyweed																										
Alternanthera sp. A																											
Ammi majus	Bishop's-weed	Exotic						1										2	1		1						
Anagallis arvensis	Scarlet Pimpernel	Exotic	2	2	2	2	2		2	2			2	2		2	2		2	2	2		2			2	
Arenaria leptoclados		Exotic																									
Aristida leptopoda	White Speargrass								1		1										1						
Aristida personata	Purple Wire-grass		3	3	3	2	2	3	3	3	2	3	3	3	3	3	3	2	3	2	3		2	3	3	3	3
Aristida sp.	T diplo TTIIO glado			<u> </u>							1	Ŭ	<u> </u>		Ŭ	Ŭ				_							
Aristida vagans	Threeawn Speargrass										·		1														
Arthropodium sp.	Timedami opedigided		1				1										1				1						-
Asperula cunninghamii	Twining Woodruff		<u> </u>		-		 '						+		-	-	<u> </u>		-		 '						
Asphodelus fistulosus	Onion Weed	Exotic											 											2			
Aster subulatus	Wild Aster	Exotic											1														
Atriplex muelleri	Wild Astel	LXUIC											1														
Atriplex semibaccata	Creeping Saltbush												 														
Austrodanthonia bipartita	Wallaby Grass																										
Austrodanthonia racemosa	Wallaby Grass						3															1					
Austrodanthonia racemosa var. obtusata							3															'					
			1							2	2		-					- 1	1		2						
Austrodanthonia sp.	Plains Grass		1								2		-					1	-		2						
Austrostipa aristiglumis	1												+														
Austrostipa ramosissima	Stout Bamboo Grass		2		2	2			2	2			+		_	_	2		2	2	1	2					
Austrostina scabra	Speargrass		3	2	3	3	2	3	2	3		2	+	2	3	2	3	3	3	3	3	3					
Austrostipa sp.	Claradas Darahas Crass			2	2								1						2	2							
Austrostipa verticillata	Slender Bamboo Grass		2															2									
Avena fatua	Wild Oats	Exotic					_																				
Avena sp.		Exotic	2			2	1						-														
Bidens pilosa	Cobblers Pegs	Exotic							.				-												1		<u> </u>
Bidens subalternans	Greater Beggar's Ticks	Exotic	2	2		2	2		1				-				1	1	2			2		2		2	1
Boerhavia dominii	Tarvine												-	1													<u> </u>
Boerhavia sp.				1	-				2			-	1		1	-	1		-					1			1
Bothriochloa bladhii	Forest Blue Grass																										
Bothriochloa decipiens	Red Grass		4	4		3		3	4		3		3	3		3		2	3		3		3	3		3	<u> </u>
Bothriochloa macra	Red Grass				_		_										_								_		<u> </u>
Bothriochloa sp.					3		3			3		3			3		3			3					3		2
Brachychiton populneus	Kurrajong																										<u> </u>
Brachyscome ciliaris	Variable Daisy																										<u> </u>
Bromus catharticus	Prairie Grass	Exotic			ļ			ļ					ļ	ļ	ļ	ļ			ļ			ļ					
Bromus molliformis	Soft Brome	Exotic				1							1									1			2		2
Bromus sp.		Exotic											1														
Brunoniella australis	Blue Trumpet												1														<u> </u>
Bryophyllum delagoense	Mother-of-millions	Exotic																									
Bulbine bulbosa	Native Leek																	-									
Calandrinia sp.																											
Callitris glaucophylla																											
Calotis lappulacea	Yellow Burr-daisy				2								1	2				1	1								
Carex breviculmis																											
Carex inversa			1	2			1		1			2		1				2	2	1	2	2					1

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			_	7	က	4	5	_	7	က	4	2	_				2	_	7	ю	4	2	_	7	က	4	Ω.
Species	Species	Notes	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_2011	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
Carthamus lanatus	Saffron Thistle	Exotic			2	2	2	2	2	2	2	2	1			2	2		2		2	1		1	2	2	3
Centaurea melitensis	Maltese Cockspur	Exotic	2		2	3	3	2	2	2	3	3	2	2	2	3	2				2	3	2	2	2	2	3
Centaurea solstitialis	St Barnaby's Thistle	Exotic																									
Centaurea sp.	,	Exotic																									
Centaurium erythraea	Common Centaury	Exotic																						1			
Centaurium sp.		Exotic											2														
Chamaesyce sp.																	1					1			1		
Cheilanthes distans	Bristly Cloak Fern														1												
Cheilanthes sieberi			1																					1	1		1
Chenopodium desertorum															1												
Chenopodium pumilio	Small Crumbweed																										
Chloris gayana	Rhodes Grass	Exotic						2	3	3	2	1		2					1	2			2	2	1	2	
Chloris pectinata	Comb Chloris	=//01/0						_		<u> </u>				_					•	_							
Chloris truncata	Windmill Grass		1			1					1		1	<u> </u>	1		1	2					2		1	1	1
Chloris ventricosa	Plump Windmill Grass		1			1					1		<u> </u>	<u> </u>	1		1	1					3	3	2	3	2
Chondrilla juncea	Skeleton Weed	Exotic	2	2	1	1					1			<u> </u>	1		1	† '	2				† Ť	 	 ~	<u> </u>	-
Chrysocephalum apiculatum	Yellow Buttons	Ελοιίο	_	_	<u> </u>									1													
Cichorium intybus	1 Onow Duttorio	Exotic	1			1					+			<u> </u>	1	+	1						+		-		+
Cirsium vulgare	Spear Thistle	Exotic								-	-					+							-				-
Convolvulus graminetinus	Opear Thistic	LXOUC	1	1		1	1			-	-		1	1		+		2	1			1	2	1	1		1
Conyza bonariensis	Flaxleaf Fleabane	Exotic	1	2		'	<u>'</u>		1	1			'	'					'			!	1	2	'		 '
Conyza parva	i laxieal i leaballe	Exotic	'				1		1	1				-									<u> </u>				<u> </u>
Conyza parva Conyza sp.		Exotic							'																		1
	Common Cotula	EXOUC								-	-					-							-		-		
Cotula australis		Exotic		1				1		-	-					-		2					2	2	-		
Cyclospermum leptophyllum	Slender Celery	EXOUC		2	2	1		1		2	2					2		2		1				2			
Cymbopogon refractus	Barbed Wire Grass				2	1				2	2					2				1				2			1
Cynodon dactylon	Couch									+																	1
Cyperus concinnus	Official Condens									+								4					1				1
Cyperus fulvus	Sticky Sedge									1	1							1					1		4		1
Cyperus gracilis	Slender Flat-sedge	F								1	1							1					1		1		1
Cyperus rotundus	Nutgrass	Exotic								1	1										ļ		1				1
Datura ferox	Netter Oracet	Exotic	—							1	1		_								1		1				1
Daucus glochidiatus	Native Carrot		1										1			2											
Desmodium brachypodum	Large Tick-trefoil									-	-												-				<u> </u>
Desmodium varians	Slender Tick-trefoil		1							-	-												-				<u> </u>
Dianella revoluta	Blueberry Lily									-	-												-				<u> </u>
Dianella sp.	0 1 15:										1		_														<u> </u>
Dichanthium sericeum	Queensland Bluegrass							3			1		3					2	1				3				<u> </u>
Dichelachne micrantha	Shorthair Plumegrass		2																								
Dichondra repens	Kidney Weed											ļ .					ļ .										ļ
Dichondra sp. A			2	1		ļ						1		ļ	ļ		1	2	2	1				1	2	2	1
Dichopogon fimbriatus	Nodding Chocolate Lily		ļ	1		ļ								ļ	ļ		ļ										
Digitaria brownii	Cotton Panic Grass		1	1		1		1			1			ļ	1		1	1		1	1		_			1	<u> </u>
Digitaria divaricatissima	Umbrella Grass			ļ									1	ļ									2				2
Digitaria sanguinalis	Crab Grass	Exotic									1												1				ļ
Digitaria sp.											1												1	2			ļ
Echinochloa crus-galli	Barnyard Grass	Exotic									1												1				ļ
Echinochloa sp.																											<u> </u>
Echium plantagineum	Patterson's Curse	Exotic				1	1							ļ	ļ		1									1	2
Eclipta platyglossa																											
Einadia hastata	Berry Saltbush						1										1					1					
Einadia nutans	Climbing Saltbush																										
Einadia polygonoides			1				1							1								1		1	1		
Einadia trigonos	Fishweed												1					1					1			1	
Elymus scaber													1				2		1								
	•	•	•		•	•	•			•		•	•	•	•	•				•	•					•	-

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Species	Species	Notes	2011	_2012	_2013	_2014	_2015	_2011	2012	2013	_2014	_2015		2012	2013	_2014	_2015	_2011	_2012	2013	2014	_2015	_2011	_2012	113	_2014	115
	5,555.65		31_2(31_2(31_2(31_2(31_2(32_2(32_2(32_2(32_2(32_2(33_2(33_2(33_2(33_2(33_2(34_2(34_2(34_2(34_20	34_2(35_2(35_2(35_2013	35_2(35_2015
Enchylaena tomentosa	Ruby Saltbush																										
Enneapogon nigricans						1	2							1			2										
Enneapogon sp.								1		1		1	2		2	1				1							
Enteropogon acicularis																		1		1		2		1	2		
Enteropogon sp.																											
Eragrostis alveiformis																											
Eragrostis brownii	Brown's Lovegrass																										
Eragrostis elongata	Clustered Lovegrass																										
Eragrostis lacunaria	Bristly Love-grass																										
Eragrostis leptostachya	Paddock Lovegrass							1																			
Eragrostis parviflora	Weeping Lovegrass																										
Eragrostis setifolia	Bristly Love-grass																										
Eragrostis sp.	, ,																										
Eremophila debilis	Winter Apple	1		1				1		1	1	1		İ					1								
Eriochloa pseudoacrotricha	Early Spring Grass	1		1				1				1		İ					1				1				
Eriochloa sp.	<u>.</u>	1		1				1				1		İ					1								
Erodium crinitum	Blue Storksbill	†		1			1	1				1		<u> </u>		1			1		3						1
Euchiton sp.													1														
Euchiton sphaericus																											
Eulalia aurea	Silky Browntop																		2					2			
Evolvulus alsinoides var. decumbens	, , , , , , , , , , , , , , , , , , , ,																										
Fimbristylis dichotoma	Common Fringe-sedge																										<u> </u>
Galenia pubescens	Galenia	Exotic																									+
Geijera parviflora						1																					
Geranium solanderi	Native Geranium																										+
Glossogyne tannensis													1	1													
Glycine clandestina				1		1		2	1		1		2	1	1	1	1	1		1			2	1	1		
Glycine tabacina			2	1		-		2	1	2	1	1	2	1	1	1	1	1		•			1				
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic													-								-				
Gomphocarpus sp.	Trainer isarea estan Basi	Exotic																									
Gomphrena celosioides	Gomphrena Weed	Exotic																									
Gonocarpus elatus	Compiniona 1100a	2/101.10																									
Goodenia cycloptera																											
Goodenia fascicularis																											
Goodenia glabra																											
Goodenia pinnatifida																											
Gypsophila tubulosa	Annual Chalkwort																										
Haloragis heterophylla	Rough Raspwort	+	2	+				2				<u> </u>	1	<u> </u>				2	2				2				+
Hedypnois rhagadioloides subsp. cretica	Cretan Weed	Exotic	-	†			2	† -			2	2	<u> </u>	<u> </u>		1	2				2			1	1		
Helianthus sp.	Sunflower	Exotic		+				+			1	- -		<u> </u>			-		<u> </u>		<u> </u>		1			1	
Hibiscus trionum				†				†			1	<u> </u>	1	<u> </u>		1			<u> </u>				1	1	1	<u> </u>	
Hordeum sp.	Barley Grass	Exotic		†				†				<u> </u>	1	<u> </u>		1			<u> </u>					1	1		
Hyparrhenia hirta	Coolatai Grass	Exotic		†				†				<u> </u>	1	<u> </u>		1			<u> </u>					1	1		
Hypochaeris microcephala	White Flatweed	Exotic		+				+				<u> </u>		<u> </u>					<u> </u>					1			+
Hypochaeris radicata	Flatweed	Exotic		+				+				<u> </u>		<u> </u>					<u> </u>					<u> </u>			+
Jasminum suavissimum		LAGGIG		+				+		-		-		-					-								+
Juncus sp.		+		+				+				<u> </u>		<u> </u>					<u> </u>					1			+
Juncus usitatus	Pinrush	+		+				+				<u> </u>		<u> </u>					<u> </u>					<u> </u>			+
Lachnagrostis filiformis	Blown Grass	+		+				+		-		-		-					-								+
Lactuca saligna	Willow-leaved Lettuce	Exotic		1				+		-		-		1					1								
Lactuca sarigria Lactuca serriola	Prickly Lettuce	Exotic	2	1				+				 	1	1				1	- '				2	1			+
Lepidium africanum	1 HOMY LORIGO	Exotic		+ '-	1		1	1			1	 	2	 '				'	 			1	2	<u> </u>	1		1
Lepidium amcanum Lepidium bonariense		Exotic		1	- '		 '	1			1	 		 					 			'			- '		
Leptochloa sp.		LXULIC		+			1	+				-		-					-								+
	Woolly Buttons	+		 			1	 	-	-		<u> </u>	1	<u> </u>					<u> </u>		-			-	-	-	
Leptorhynchos panaetioides	Woolly Buttons	1		1]	1			1	<u>I</u>	1	I .	j				I .	j	I	<u> </u>	<u>l</u>				<u> </u>

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			_	2	2	4	5	_	2	2	4	2	_	2	က္	4	2	_	2	2	4	2	_	2	3	4	2
Species	Species	Notes	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_201	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic																									
Linaria sp.																											
Linum marginale	Native Flax		1	1		2	2																				
Lolium rigidum	Wimmera Ryegrass	Exotic										2															1
Lolium sp.	, ,	Exotic															1										
Lomandra confertifolia	Mat-rush																										
Lomandra filiformis	Wattle Mat-rush																										+
Lomandra longifolia	Spiny-headed Mat-rush																										1
Lomandra multiflora	-																										1
Lycium ferocissimum	African Boxthorn	Exotic																									1
Lythrum hyssopifolia	Hyssop Loosestrife	ZXOUG																									
Maireana decalvans	Black Cotton Bush																										+
Maireana enchylaenoides	Wingless Bluebush																										+
Maireana microphylla	Small-leaf Bluebush								1	1			1	1		1	1										+
Malva sp.	Giriali-lear Bidebasii	Exotic		1			1		<u>'</u>	<u>'</u>			'	'		'	'				2						+
Malvastrum americanum	Spiked Malvastrum	Exotic		1			1										1						1				+
Malvastrum coromandelianum	Prickly Malvastrum	LXOUC					<u>'</u>										'						'				+
	-	Cyatia					-												1			-	-		-		+
Marrubium vulgare	White Horehound	Exotic					1	1				2							1			2					
Medicago minima	Wooly Burr Medic	Exotic		1			1	1	_			3	2	4	0	2	3			2		3			-	_	3
Medicago polymorpha	Burr Medic	Exotic				2		2	2	2	3	2		1	2	2	2				2	3			2	2	3
Medicago sativa	Lucerne	Exotic		1			1	1	2		1		1	1	1												
Medicago sp.		Exotic																									
Medicago truncatula	Barrel Medic	Exotic						1																			
Melilotus indicus	Hexham Scent	Exotic						1	2		2	1						1	1								
Melilotus sp.		Exotic																									
Mentha satureioides	Creeping Mint																										
Microlaena stipoides	Weeping Grass																										
Misopates orontium	Lesser Snapdragon	Exotic	2		1		2	2			1	2	2			2	2	1			2		2			2	2
Murdannia graminea	Grass Lily																										
Nicotiana sp.																											
Nyssanthes diffusa	Barbwire Weed																										
Opuntia stricta	Common Prickly Pear	Exotic																				1					
Oxalis exilis																											
Oxalis perennans																											
Oxalis sp.			1										1					2					1				
Panicum buncei																											1
Panicum effusum	Hairy Panic																										1
Panicum maximum	-	Exotic																									
Papaver sp.																						2					
Panicum queenslandicum	Yadbila Grass																	2									
Panicum sp.																											1
Parsonsia eucalyptophylla	Gargaloo																										1
Paspalidium jubiflorum	Warrego Grass			1			1			1			<u> </u>			<u> </u>	<u> </u>	<u> </u>									†
Paspalidium sp.			2								2						1	2	2	3	2	3	2				1
Paspalum dilatatum	Paspalum	Exotic		+	-	1	+	 		1		-	†	 	 	1	 '			 	 	+ -	+		+	-	+
Paspalum sp.	. acpaidin	Exotic					1	 		+				 	 	1	1	1							1		+
Petrorhagia nanteuilii		Exotic	2	2	2	2	2	2		2	2	3		 	2	2	3	2	2		3	2		2	2	2	3
Phalaris sp.	Canary Grass	Exotic		1			+ -					3		 						1	3	+ -			+ -		+ -
Phyllanthus virgatus	Petty Spurge	LXUIIC	1	+ '		1	1	-		+			 	-	-	-	-	 		1	1				1		+
			1	 		 	 		-	-	-	-				-	-		-	1	 	-	-	 	+		+
Pimelea microcephala	Shrubby Rice-flower		1	+		1	+	-	-					-	-	-	-			1	1			 	1		+
Pimelea neo-anglica	Shrubby Rice-flower			1		 	-	-		1	1			-	-	-	-			1	 				1		+
Pimelea sp.				1		1	1	-							-					-	1				1		
Plantago debilis	1		1	1		 	 							1						-	 				1		_
Plantago lanceolata	Lamb's Tongues	Exotic	<u> </u>	ļ	_	_	1	ļ		1	1		1	ļ	ļ	ļ	ļ	ļ	_	1	1				1		
Poa sieberiana	Snow Grass		3	2	2	2							<u> </u>			<u> </u>	<u> </u>	1	2								

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Species	Species	Notes	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_2011	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
Polycarpon tetraphyllum	Four-leaved Allseed	Exotic											1			;2		1									
Polygonum aviculare	Wireweed	Exotic																1							1		
Portulaca oleracea	Pigweed																										
Rapistrum rugosum	Turnip Weed	Exotic			1	2	2			1		2			1		1		2	2	2	2			1	2	2
Rhodanthe anthemoides							1																				
Rostellularia adscendens																											
Rumex brownii	Swamp Dock			1														1	1	1				1			
Rumex crispus	Curled Dock	Exotic																									
Rumex sp.																											
Salsola australis																					1						
Schenkia spicata	Spike Centaury																										
Schkuhria pinnata		Exotic										1															
Sclerolaena birchii	Galvanised Burr																						1	1	1	1	1
Sclerolaena diacantha	Grey Copperburr		1					1		1		1			1		1					1	1	1		1	
Sclerolaena muricata	Black Rolypoly		1					1		1		1			1		1						1	1		1	
Sclerolaena muricata var. muricata	Black Rolypoly																										2
Sclerolaena muricata var. villosa	Black Rolypoly																										
Senecio quadridentatus	Cotton Fireweed		2	3	2	1			2				2	3	1	1	1		2	2		1	3	3	2	1	1
Setaria incrassata	Purple Pigeon Grass	Exotic	† -		_	-							_		i i		·			_		<u> </u>	<u> </u>	<u> </u>	_	<u> </u>	
Setaria sp.	r ai più i igeoir e iace	Exotic																									
Sida corrugata	Corrugated Sida		1	2	2	1	1		1	1	1	1			2			1					1	1	1	1	
Sida cunninghamii	Ridged Sida		<u> </u>	1	_	•			·	<u> </u>		<u> </u>			- -			·					1	<u> </u>	<u> </u>	1	
Sida rhombifolia	Paddy's Lucerne	Exotic	-	<u> </u>																		-	-	-		-	
Sida sp.	1 addy 3 Edderne	LXOUG	-																			-	-	-		-	
Sida spinosa		Exotic	2	1	2	2	2	2	1			2						2		2	2	2	2	-	2	2	2
Sida subspicata		LXOUG		'					'	1														+			1
· · · · · · · · · · · · · · · · · · ·		Exotic	 							1												+	+	+		+	'
Silybum marianum Sisymbrium irio	London Rocket	Exotic	 							1												1	+	+		+	
Sisymbrium officinale	Hedge Mustard	Exotic	-	2							2			1		2		2				+ '-	2	2		2	
Sisymbrium orientale	Indian Hedge Mustard	Exotic	 			2	2		2	1	2	2	2	'		1	1	3			2	2	2	1	2	2	2
Sisymbrium sp.	indian riedge Mustard	Exotic	1					1		1						'	- '	3						+ '			
Solanum esuriale	Quena	LXOUG	+ '					1		1												+	1	1	2	+	
Solanum nigrum	Black-berry Nightshade	Exotic	1					- '		+ '												+	+ '	+ '		+	
Solanum parvifolium	Diack-berry Nightshade	LXOUG	+ '							1												+	+	+		 	
Solanum sp.		+	1							1		-			-							1	1	1		1	
Sonchus asper subsp. glaucescens		Exotic	1							1		-			-							1	1	1		1	
Sonchus oleraceus	Common Sowthistle	Exotic	1			1		2	1	1	2	-	2		-		1				1	1	2	1		1	
Sorghum halepense	Johnson Grass	Exotic	+	1		-			'	+		-			1		- ' -				- '	+ '	+ -	+ '	-	+	+
Spergularia sp.	Johnson Grass	Exotic	1							1		-			-							1	1	1		1	
Sporobolus caroli		LXUIIC	+	1				-		+		-			1		-						+	+	-	+	+
Sporobolus creber	Slender Rat's Tail Grass		+	1				-		+		-			1		1						+	+	-	+	+
Stachys arvensis	Stagger Weed	Exotic	1	1		2	1	1		+		2			1		1					1	+	+	-	2	2
Stachys arvensis Stackhousia viminea	Stagger weed Slender Stackhousia	_XOUC	+ '	1			 '	1		+					1		1					+ '	+	+	-	 	 '
Swainsona galegifolia	Smooth Darling-pea	-	1	1	2	1	1	<u> </u>		 	1	<u> </u>	2	2	2	1	1		-	-	-		 	 	-	 	-
Themeda australis	Kangaroo Grass	-	+ '-	- '	2		1	<u> </u>		 	1	<u> </u>	3	3	2	2	3		-	-	-		 	1	-	 	-
Tragopogon porrifolius	Oyster Plant	Exotic	 	1	-	-	1	<u> </u>		 	1	<u> </u>	3	3			3		-	-	-		 	+ '-	-	 	-
		CXOTIC	 	1	-	-	1	<u> </u>		 	1	<u> </u>			<u> </u>	1	<u> </u>		-	-	-		 	 	-	 	-
Tragus australianus	Small Burgrass	-	 	1	-	-	1	<u> </u>		 	1	<u> </u>			<u> </u>	1	<u> </u>		-	-	-		 	 	-	 	-
Trianthema sp.	Narrow-leaved Clover	Exotic	+					-		+		-			-		-						+	+	-	1	1
Trifolium angustifolium			1	1		2			0	-		 		_				_	_		_		<u> </u>	<u> </u>	-		1
Trifolium arvense	Haresfoot Clover	Exotic	-	-	2	2	2	2	2	2	2	-	2	2	2	2	2	2	2	1	2		2	2	2	2	3
Trifolium campestre	Hop Clover	Exotic	2	2	2	2	1	2		 	2	<u> </u>	2		<u> </u>	1	<u> </u>	2	-		1		1	1	-	2	
Trifolium dubium	Yellow Suckling Clover	Exotic	 	-		_	-	<u> </u>		 	-	<u> </u>	-		<u> </u>	-	<u> </u>		2				 	 		-	
Trifolium glomeratum	Clustered Clover	Exotic	 	-		2	-	<u> </u>		 	-	<u> </u>	-		<u> </u>	-	<u> </u>				1		 	 	1	2	
Trifolium repens	White Clover	Exotic	1					.		1		_	<u> </u>		_		.				<u> </u>	1	1	1	<u> </u>	1	
Triptilodiscus pygmaeus																							<u> </u>	<u> </u>		<u> </u>	

														,	Wood_0	4											
Species	Species	Notes	31_2011	31_2012	31_2013	31_2014	31_2015	32_2011	32_2012	32_2013	32_2014	32_2015	33_2011	33_2012	33_2013	33_2014	33_2015	34_2011	34_2012	34_2013	34_2014	34_2015	35_2011	35_2012	35_2013	35_2014	35_2015
Urochloa panicoides	Urochloa Grass	Exotic																									
Verbascum thapsus	Great Mullein	Exotic	1																								
Verbascum virgatum	Twiggy Mullein	Exotic		1																							
Verbena bonariensis	Purpletop	Exotic																									
Verbena gaudichaudii			2	1			1	2															2	1	2		
Verbesina encelioides		Exotic																						2			
Vicia sp.		Exotic																									
Vittadinia cuneata	Fuzzweed										1			1		1			1	1	1						
Vittadinia disecta	Dissected New Holland Daisy																										
Vittadinia muelleri			2										1														
Vittadinia sp.								1					2					2					2				
Vulpia sp.																											
Wahlenbergia communis	Tufted Bluebell		2	2	1		1	2		1		1	2	2	1		1	2		1					1		
Wahlenbergia gracilis	Sprawling Bluebell																										
Wahlenbergia luteola																		1									
Walwhalleya proluta																											
Xanthium occidentale	Noogoora Burr	Exotic																									
Xanthium spinosum	Bathurst Burr	Exotic																									
Xerochrysum bracteatum	Golden Everlasting					1	1																1	1			
Xerochrysum viscosum	Sticky Everlasting		2																								
Zornia dyctiocarpa	Zornia																										
Total number of species			46	31	23	31	34	30	24	20	27	25	39	29	20	24	35	43	31	20	29	26	37	39	31	26	30

Table 22: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood Control 2 for 2011 - 2015 monitoring periods

													Wo	ood Cont	rol 2											
			7 2	က	4	5	_	2	3	4	5	-	2	က	4	5	_	2	3	4	5	_	7	9	4	2
Species	Species	Notes	36_2011	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
Abutilon oxycarpum	Straggly Lantern-bush																									
Abutilon sp.								1					1	1	1				1							
Acacia deanei (seedling)	Green Wattle																									
Acacia decora(seedling)	Western Silver Wattle													1												
Acacia salicina (seedling)	Cooba																									
Aira sp.		Exotic																								
Alternanthera denticulata	Lesser Joyweed						1																			
Alternanthera sp. A																										
Ammi majus	Bishop's-weed	Exotic										1	1													
Anagallis arvensis	Scarlet Pimpernel	Exotic	2		1	2					2	2	2		2	2				2						2
Arenaria leptoclados	·	Exotic								1	2															
Aristida leptopoda	White Speargrass																									
Aristida personata	Purple Wire-grass		2 2	3	2	2	3	3	3	3	3		3	3	2	2	3	3	3	3	3	4	3	3	3	4
Aristida sp.	3																									
Aristida vagans	Threeawn Speargrass		1									1														
Arthropodium sp.	1,113								1		1					1				1					1	1
Asperula cunninghamii	Twining Woodruff					1			•		<u> </u>	2	1			•									•	-
Asphodelus fistulosus	Onion Weed	Exotic				1						_														
Aster subulatus	Wild Aster	Exotic																								
Atriplex muelleri	vviid / total	LXOUG																								
Atriplex semibaccata	Creeping Saltbush																									
Austrodanthonia bipartita	Wallaby Grass																									
Austrodanthonia racemosa	Wallaby Class																1									
Austrodanthonia racemosa var. obtusata			2							1							'									\vdash
Austrodanthonia sp.				1			1			•		1					1			2						\vdash
Austrostipa aristiglumis	Plains Grass			'			'					'					'									
Austrostipa ramosissima	Stout Bamboo Grass																									
Austrostipa scabra	Speargrass Speargrass		3 3	2	2	3	3	3	2	2		3	3	2	3	3	3	3	2	2	3	3	3	3	3	3
	Speargrass		3 3				3	1				3	3		3	3	3	3			3	3	3		3	
Austrostipa sp. Austrostipa verticillata	Slender Bamboo Grass						4	'																		
Avena fatua	Wild Oats	Exotic					-																			
	Wild Oats	Exotic																								
Avena sp.	Cabblera Daga	Exotic																								
Bidens pilosa	Cobblers Pegs Greater Beggar's Ticks		4				1																			
Bidens subalternans		Exotic	1				1					2													1	
Boerhavia dominii	Tarvine		4				1					1	0									1	4		1	-
Boerhavia sp.	Face I Black Occurs		1				1					1	2				1					1	1	1		-
Bothriochloa bladhii	Forest Blue Grass		1 0	-	-	1	 	-	-	_	-	-	_			-				_		-	-	-		
Bothriochloa decipiens	Red Grass		1 3	-	3		1	-	<u> </u>	2	<u> </u>	2	3			<u> </u>		4		3		1	3			-
Bothriochloa macra	Red Grass			+	1		1	-			<u> </u>										_	1		_		
Bothriochloa sp.	17			3			ļ	ļ	1		ļ			3		2			3		2	1		3		2
Brachychiton populneus	Kurrajong						ļ	ļ	ļ		ļ					ļ						1		ļ		
Brachyscome ciliaris	Variable Daisy			1	1		1	ļ	ļ		ļ					ļ						1				
Bromus catharticus	Prairie Grass	Exotic		1	1		1	ļ	ļ		ļ					ļ						1				
Bromus molliformis	Soft Brome	Exotic			1	1		ļ	ļ		ļ	1				ļ						1	1	ļ		
Bromus sp.		Exotic		1	1		_		ļ	_	_		1			ļ										
Brunoniella australis	Blue Trumpet		2	1	1		2			2	2	1					2	1	1		2	2	1			1
Bryophyllum delagoense	Mother-of-millions	Exotic			1																					
Bulbine bulbosa	Native Leek				1			ļ	ļ	1	ļ					ļ				1	1		1		2	1
Calandrinia sp.					1																					
Callitris glaucophylla															1											
Calotis lappulacea	Yellow Burr-daisy		2				2	1				2		2			2							1		
Carex breviculmis									<u> </u>																	
Carex inversa							1														Ĺ	2				
				_			_	_			_						_	_			_			_	_	

														Wo	ood Cont	trol 2											
Species	Species	Notes	_2011	_2012	_2013	36_2014	36_2015	_2011	_2012	_2013	2014	_2015	38_2011	38_2012	_2013	_2014	_2015	39_2011	_2012	_2013	39_2014	_2015	40_2011	40_2012	40_2013	40_2014	40_2015
			36	36_	36_	36	36	37_	37_	37_	37_	37_	38	38	38	38	38	39	39	39	39	39	40	40	40	40	04
Carthamus lanatus	Saffron Thistle	Exotic																									
Centaurea melitensis	Maltese Cockspur	Exotic																									2
Centaurea solstitialis	St Barnaby's Thistle	Exotic																									
Centaurea sp.		Exotic																									
Centaurium erythraea	Common Centaury	Exotic																									
Centaurium sp.		Exotic																									
Chamaesyce sp.													1	1			1	1		1			1	1	1		
Cheilanthes distans	Bristly Cloak Fern																	1						2		2	1
Cheilanthes sieberi								2															2				
Chenopodium desertorum																											
Chenopodium pumilio	Small Crumbweed												2														
Chloris gayana	Rhodes Grass	Exotic																									
Chloris pectinata	Comb Chloris																							2			
Chloris truncata	Windmill Grass																						2				
Chloris ventricosa	Plump Windmill Grass														2								2	2	2		
Chondrilla juncea	Skeleton Weed	Exotic																									
Chrysocephalum apiculatum	Yellow Buttons		2	1		1	2	2																1			1
Cichorium intybus		Exotic																									
Cirsium vulgare	Spear Thistle	Exotic																									
Convolvulus graminetinus																							1			1	
Conyza bonariensis	Flaxleaf Fleabane	Exotic											1														
Conyza parva		Exotic																									
Conyza sp.		Exotic																									
Cotula australis	Common Cotula																										
Cyclospermum leptophyllum	Slender Celery	Exotic																									
Cymbopogon refractus	Barbed Wire Grass		2		1	2	2			2			2		2												
Cynodon dactylon	Couch																										
Cyperus concinnus																											
Cyperus fulvus	Sticky Sedge		2					1					2					2									
Cyperus gracilis	Slender Flat-sedge		2	1	2			2		1			2		1			2		1							
Cyperus rotundus	Nutgrass	Exotic																									
Datura ferox		Exotic																									
Daucus glochidiatus	Native Carrot																							1			
Desmodium brachypodum	Large Tick-trefoil					1							2			1											
Desmodium varians	Slender Tick-trefoil		2															1									
Dianella revoluta	Blueberry Lily																			1							
Dianella sp.																			1								
Dichanthium sericeum	Queensland Bluegrass																						2				
Dichelachne micrantha	Shorthair Plumegrass																	1									
Dichondra repens	Kidney Weed																						1				
Dichondra sp. A								2									2										2
Dichopogon fimbriatus	Nodding Chocolate Lily					1																2					
Digitaria brownii	Cotton Panic Grass																						1				
Digitaria divaricatissima	Umbrella Grass																						2				1
Digitaria sanguinalis	Crab Grass	Exotic		1																							
Digitaria sp.																											1
Echinochloa crus-galli	Barnyard Grass	Exotic											1						ļ								1
Echinochloa sp.																			ļ								1
Echium plantagineum	Patterson's Curse	Exotic					1												ļ								1
Eclipta platyglossa																			ļ								1
Einadia hastata	Berry Saltbush			1			1							1													
Einadia nutans	Climbing Saltbush		1																								1
Einadia polygonoides							2					2			1		2		ļ		1	2				1	1
Einadia trigonos	Fishweed												1				1		ļ			2	1				1
Elymus scaber																											
	· · · · · · · · · · · · · · · · · · ·																										

														Wo	od Cont	trol 2											
			_	2	2	4	5	_	2	2	4	2	_	2	2	4	2	_	2	3	4	2	_	2	2	4	2
Species	Species	Notes	36_2011	36_2012	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
Enchylaena tomentosa	Ruby Saltbush																										
Enneapogon nigricans														2								2					
Enneapogon sp.			2					1							2			3		1	1						
Enteropogon acicularis					1				2	1	1			2				1	2		2		1	2		2	
Enteropogon sp.																											
Eragrostis alveiformis																							1				
Eragrostis brownii	Brown's Lovegrass																										
Eragrostis elongata	Clustered Lovegrass																										
Eragrostis lacunaria	Bristly Love-grass						2					1		2	1												
Eragrostis leptostachya	Paddock Lovegrass						_	1	2		1	•															
Eragrostis parviflora	Weeping Lovegrass										•																
Eragrostis setifolia	Bristly Love-grass		1										1										1				
-	Bristly Love-grass		'										'										'				
Eragrostis sp. Eremophila debilis	Winter Apple	+	2	1	2	2	2	2		1	2	2	1	2	1	;	1		2	2	1	1	1	1	1	2	1
				!						'			'			,	Į.				!	'	'	'	'		<u>'</u>
Eriochloa pseudoacrotricha Eriochloa sp.	Early Spring Grass			<u> </u>		-					<u> </u>									-	 	-	 			1	
·	Dive Sterieshill																									1	-
Erodium crinitum	Blue Storksbill				-	1														1	-		-	1	1	1	
Euchiton sp.																											
Euchiton sphaericus																											
Eulalia aurea	Silky Browntop																						2				
Evolvulus alsinoides var. decumbens														1				1									
Fimbristylis dichotoma	Common Fringe-sedge		1															2					2				
Galenia pubescens	Galenia	Exotic											1	1	2	2	2										
Geijera parviflora																											
Geranium solanderi	Native Geranium																										
Glossogyne tannensis			1					1					2					1					1				
Glycine clandestina			11	1				1	2			1		1				1									
Glycine tabacina			2				2	2				1	2	1			1	2			1		1				
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic																									
Gomphocarpus sp.		Exotic																									
Gomphrena celosioides	Gomphrena Weed	Exotic																					2	1			
Gonocarpus elatus																											
Goodenia cycloptera							2										1										
Goodenia fascicularis																											
Goodenia glabra			1					2					2					1									
Goodenia pinnatifida															1												
Gypsophila tubulosa	Annual Chalkwort																										
Haloragis heterophylla	Rough Raspwort			1														2						1		1	
Hedypnois rhagadioloides subsp. cretica		Exotic																						1		1	2
Helianthus sp.	Sunflower	Exotic																			1					1	
Hibiscus trionum		1																			1		<u> </u>			1	
Hordeum sp.	Barley Grass	Exotic																			1		<u> </u>			1	
Hyparrhenia hirta	Coolatai Grass	Exotic																			<u> </u>		<u> </u>			1	
Hypochaeris microcephala	White Flatweed	Exotic				<u> </u>	1									1				<u> </u>	1		1			†	
Hypochaeris radicata	Flatweed	Exotic		<u> </u>		 	 '			-	<u> </u>				-	'			1	 	1	1	1			+	
Jasminum suavissimum		LACTIO	1	1	1	2				1	2	1								 	1		1				
Juncus sp.			'	 '	'					<u> </u>		<u> </u>								 	1		1				
Juncus usitatus	Pinrush					 	1					<u> </u>							1	 	-		-	1	1	+	
Lachnagrostis filiformis	Blown Grass																						-	1	1	+	
	Willow-leaved Lettuce	Exotic		-			1				-				-				1		-	-	-	1	1	 	
Lactura saligna						-							1			+ -				-	-			1		1	
Lactuca serriola	Prickly Lettuce	Exotic	4		-	1					1	_	1	4		1				-	-	-	-	1	-	<u> </u>	
Lepidium africanum		Exotic	1	1		-	2					2		1			2			-		1	1	1	1	2	1
Lepidium bonariense	-	Exotic																			ļ			ļ	-	1	
Leptochloa sp.	=					ļ														ļ				ļ	1	1	
Leptorhynchos panaetioides	Woolly Buttons			<u> </u>							<u> </u>										<u> </u>		<u> </u>				

														Wo	ood Cont	trol 2											
Overthe	0	Neter	-	12	13	4	15	11	12	13	4	15	17	12	13	4	15		12	13	4	15	-	12	13	4	15
Species	Species	Notes	36_2011	36_2012	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic	1																								
Linaria sp.							1										1										
Linum marginale	Native Flax																		1		1	1		1			
Lolium rigidum	Wimmera Ryegrass	Exotic																									
Lolium sp.		Exotic																									
Lomandra confertifolia	Mat-rush								1					2										2			
Lomandra filiformis	Wattle Mat-rush		1		1	1				1		1							1	2		1			2		
Lomandra longifolia	Spiny-headed Mat-rush																						1				
Lomandra multiflora				1			1	2					1			1					1			1		1	1
Lycium ferocissimum	African Boxthorn	Exotic																									
Lythrum hyssopifolia	Hyssop Loosestrife																										
Maireana decalvans	Black Cotton Bush																										
Maireana enchylaenoides	Wingless Bluebush						1	1	1		1	2												1	1	1	1
Maireana microphylla	Small-leaf Bluebush			+	1	 	 '	1	1	1	1	1	 		-	1			†	1	1	1	1	1	2	2	2
Malva sp.	Giridii Todi Bidobusti	Exotic		+	1			'	-	 '	 '	- '-	 			1				- ' -		<u>'</u>	 '	<u> </u>		+-	+ -
Malvastrum americanum	Spiked Malvastrum	Exotic		+	-	 				1		 	1			'		1		 	1		-	1	1	1	+
		EXOLIC											'					- '									
Malvastrum coromandelianum	Prickly Malvastrum	Exotic		+	-	-						-	-							-			-			1	+
Marrubium vulgare	White Horehound	_											_														
Medicago minima	Wooly Burr Medic	Exotic					2						2				3										2
Medicago polymorpha	Burr Medic	Exotic										-	1				1			-							
Medicago sativa	Lucerne	Exotic																									
Medicago sp.		Exotic																								2	
Medicago truncatula	Barrel Medic	Exotic																									
Melilotus indicus	Hexham Scent	Exotic																									
Melilotus sp.		Exotic																									
Mentha satureioides	Creeping Mint																										
Microlaena stipoides	Weeping Grass							2																			
Misopates orontium	Lesser Snapdragon	Exotic	2			2	2				2	2	2		1	2	1				1	1		1		2	1
Murdannia graminea	Grass Lily																										
Nicotiana sp.																											
Nyssanthes diffusa	Barbwire Weed																										
Opuntia stricta	Common Prickly Pear	Exotic				1	1				1	1															
Oxalis exilis																	1					1					
Oxalis perennans																											
Oxalis sp.			1					2					1					1									
Panicum buncei								_										•									
Panicum effusum	Hairy Panic		2	+	1			1				<u> </u>	1	1				2				1	2			1	+
Panicum maximum	riding Famo	Exotic		+	1	 							<u> </u>							 							+
		LAULIC		+	-	 				1		 	 							 	1		-	1	1	1	+
Papaver sp. Panicum queenslandicum	Yadbila Grass			+	 	-					 	-	-						 	-	1		 	1	1		+
	i auniia Grass			+	-	-						-	-							-			-			1	+
Panicum sp.	Correles			+	-	1		4		1	-	1	 						-	1	1		-	1	1	1	+-
Parsonsia eucalyptophylla	Gargaloo			+	-	1		1		1	1	1	<u> </u>	1	1	1			1	1	1	1	-	1	1	-	+
Paspalidium jubiflorum	Warrego Grass		-		<u> </u>					ļ		<u> </u>	<u> </u>	<u> </u>		_			-		<u> </u>	<u> </u>	ļ	1	1	1	
Paspalidium sp.			2	+	1	!		2			2	2	1	2		2		2	ļ	2	2	2	<u> </u>	1	1		
Paspalum dilatatum	Paspalum	Exotic			ļ	ļ				1	ļ	ļ	ļ							ļ	1		ļ	1	1	1	+
Paspalum sp.		Exotic				ļ														ļ	ļ			ļ	ļ	1	
Petrorhagia nanteuilii		Exotic		2		2	2							2	1	2	2				<u> </u>			<u> </u>	<u> </u>	1	
Phalaris sp.	Canary Grass	Exotic		1																							
Phyllanthus virgatus	Petty Spurge		2					2					2					1			1			1	1		
Pimelea microcephala	Shrubby Rice-flower																										
Pimelea neo-anglica	Shrubby Rice-flower																										
Pimelea sp.																	1					1					
Plantago debilis												2		1				1		1		1					2
Plantago lanceolata	Lamb's Tongues	Exotic																									
Poa sieberiana	Snow Grass		1	1	1	1		1		İ	1	1	1						1	1			1				
	• • • • • • • • • • • • • • • • • • • •		1	1	1	1	1			1	1	1	1		·	1 1			1	1	1	·	1		1		

														Wo	od Cont	rol 2											
Species	Species	Notes	36_2011	36_2012	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
Polycarpon tetraphyllum	Four-leaved Allseed	Exotic					2																				
Polygonum aviculare	Wireweed	Exotic																									
Portulaca oleracea	Pigweed																										
Rapistrum rugosum	Turnip Weed	Exotic																									
Rhodanthe anthemoides	·										1						1										2
Rostellularia adscendens			2	2	2		2	1		2	1	2	2		2	1	2	2		2	2	2	1				2
Rumex brownii	Swamp Dock							1																			1
Rumex crispus	Curled Dock	Exotic																									1
Rumex sp.																											†
Salsola australis																											†
Schenkia spicata	Spike Centaury																										+
Schkuhria pinnata	- Spine Contains	Exotic					1																				1
Sclerolaena birchii	Galvanised Burr	LXOUG										1			1	1	1	1			1	2	2	2	1	2	2
Sclerolaena diacantha	Grey Copperburr	+		+			+					- '-	1		- '-	- '-	 '	'			- ' -				- '-	_	+-
Sclerolaena muricata	Black Rolypoly	+		+			+						1									1		-	-		+
Sclerolaena muricata var. muricata	Black Rolypoly						-																				+
Sclerolaena muricata var. rituricata Sclerolaena muricata var. villosa	Black Rolypoly Black Rolypoly	+	1	1	1		+	-		1		 									 	-	1	 	 		+
Senecio quadridentatus						1	-						1								1	1		1			+
Setaria incrassata	Cotton Fireweed Purple Pigeon Grass	Ftia				I	-						- '									<u> </u>		-			+
	Purple Pigeon Grass	Exotic					+																				+
Setaria sp.	0 1 10:1	Exotic				4	-																			4	
Sida corrugata	Corrugated Sida		2		1	1	1			2			1	1	2		1	1		1		1	2	1	1	1	1
Sida cunninghamii	Ridged Sida		1				-	2		1	1	1	-	1	1	1	2										1
Sida rhombifolia	Paddy's Lucerne	Exotic					1														-			-	-		
Sida sp.			1				1																				
Sida spinosa		Exotic																					1				<u> </u>
Sida subspicata																		1									
Silybum marianum		Exotic																									
Sisymbrium irio	London Rocket	Exotic														1											
Sisymbrium officinale	Hedge Mustard	Exotic											1														
Sisymbrium orientale	Indian Hedge Mustard	Exotic				1	1					1				2	2				2						
Sisymbrium sp.		Exotic																									
Solanum esuriale	Quena							1					1					2					2			1	
Solanum nigrum	Black-berry Nightshade	Exotic											2														
Solanum parvifolium						2					2																
Solanum sp.																											
Sonchus asper subsp. glaucescens		Exotic																									
Sonchus oleraceus	Common Sowthistle	Exotic										2	1										1				
Sorghum halepense	Johnson Grass	Exotic																									
Spergularia sp.		Exotic																									
Sporobolus caroli																											
Sporobolus creber	Slender Rat's Tail Grass				2								1							2					2		
Stachys arvensis	Stagger Weed	Exotic																									
Stackhousia viminea	Slender Stackhousia		1			1		1					2	1			1	1					2			1	
Swainsona galegifolia	Smooth Darling-pea																										†
Themeda australis	Kangaroo Grass																										+
Tragopogon porrifolius	Oyster Plant	Exotic					1																				1
Tragus australianus	Small Burgrass						†				1		1		1				1	1		1		<u> </u>	<u> </u>		+
Trianthema sp.	Silian Bargiado		 				1					<u> </u>									<u> </u>			 	 		+
Trifolium angustifolium	Narrow-leaved Clover	Exotic		+			+	1				 	1								 	1		 	 		+
Trifolium arvense	Haresfoot Clover	Exotic	1	+	1	1	2	1		1	1	1	1	1	1	2	1		1	1	2	1	1	1	1		+
Trifolium campestre	Hop Clover	Exotic	1	+	1	'	2	1		1	1	1	1	1	1		1		1	1		1	1	1	1		+
				-			 _	-				-	1								-	-		-	-		+
Trifolium dubium	Yellow Suckling Clover	Exotic	1	1	1		-	 		1		1	1	-			-				1	-	1	 	 		+
Trifolium glomeratum	Clustered Clover	Exotic	1	1	1		1	-		1	1	1	1	1	1	1	1		1	1	1	-	1	<u> </u>	<u> </u>		+
Trifolium repens	White Clover	Exotic		1			<u> </u>	_	<u> </u>		1	<u> </u>	1	_	1	-	<u> </u>		1	1	ļ	_		ļ	ļ		
Triptilodiscus pygmaeus]																		2	

														Wo	od Cont	rol 2											
Species	Species	Notes	36_2011	36_2012	36_2013	36_2014	36_2015	37_2011	37_2012	37_2013	37_2014	37_2015	38_2011	38_2012	38_2013	38_2014	38_2015	39_2011	39_2012	39_2013	39_2014	39_2015	40_2011	40_2012	40_2013	40_2014	40_2015
Urochloa panicoides	Urochloa Grass	Exotic											2														
Verbascum thapsus	Great Mullein	Exotic																									
Verbascum virgatum	Twiggy Mullein	Exotic																									
Verbena bonariensis	Purpletop	Exotic																									
Verbena gaudichaudii								1															1	1	1		
Verbesina encelioides		Exotic																									
Vicia sp.		Exotic																									
Vittadinia cuneata	Fuzzweed																							2	1	1	
Vittadinia disecta	Dissected New Holland Daisy																										
Vittadinia muelleri																											
Vittadinia sp.								2															2				
Vulpia sp.																											2
Wahlenbergia communis	Tufted Bluebell												2					2					2				
Wahlenbergia gracilis	Sprawling Bluebell		1										1														
Wahlenbergia luteola																											
Walwhalleya proluta								2			1																
Xanthium occidentale	Noogoora Burr	Exotic											1														
Xanthium spinosum	Bathurst Burr	Exotic											1	1													
Xerochrysum bracteatum	Golden Everlasting			1		2	1				2	1		1		1	1	1			1	1	2	2			2
Xerochrysum viscosum	Sticky Everlasting																				1					2	
Zornia dyctiocarpa	Zornia		1										2														
Total number of species			40	15	15	22	30	40	11	14	22	26	51	28	20	21	29	36	9	17	23	24	40	27	17	25	28

Table 23: Groundcover species cover scores in 20 x 50 m Woodland Plots located in Wood Control 1 for 2011 - 2015 monitoring periods

Species	Species	Notes	7	2	က	4	2	_		_ ~											_						
		Notes	41_201	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Abutilon oxycarpum	Straggly Lantern-bush																										1
Abutilon sp.					1																						
Acacia deanei (seedling)	Green Wattle																										
Acacia decora (seedling)	Western Silver Wattle																										
Acacia salicina (seedling)	Cooba																										
Aira sp.		Exotic																									
Alternanthera denticulata	Lesser Joyweed																						1				
Alternanthera sp. A																											1
Ammi majus	Bishop's-weed	Exotic										2															
Anagallis arvensis	Scarlet Pimpernel	Exotic					2		1	2	2					2	2		1		2	2		2		2	2
Arenaria leptoclados		Exotic																						+			+
Aristida leptopoda	White Speargrass																							+			+
Aristida personata	Purple Wire-grass			3	3	3	3	4	4	4	3	3	4	4	4	3	3	3	4	3	3	3		2	2	3	3
Aristida sp.				†	<u> </u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>			<u> </u>	<u> </u>	-				-				1			Ť	
Aristida vagans	Threeawn Speargrass			1	<u> </u>																		1				+
Arthropodium sp.	osa opodigidoo			1	<u> </u>	<u> </u>															1		1	1			2
Asperula cunninghamii	Twining Woodruff			+	<u> </u>		1														-		+	+	 		+
Asphodelus fistulosus	Onion Weed	Exotic																						 	 		+
Aster subulatus	Wild Aster	Exotic																						 	 		+
Atriplex muelleri	Wild Aster	LXOUG																						 	 		+
Atriplex semibaccata	Creeping Saltbush																							 			+
Austrodanthonia bipartita	Wallaby Grass			1	-	1	2										1						1	 	 		+-
Austrodanthonia racemosa	Wallaby Glass			1	-	1	2										'					2	2	 	 		2
Austrodanthonia racemosa var. obtusa	nto.			1	-	1															1			 	 		+
	nia		1		1	2															'			 			+
Austroating arieticlumia	Plains Grass		'		'																			 			+
Austrostipa aristiglumis																								 			+
Austrostina analys	Stout Bamboo Grass		4		2				4		2	2		_	0	2	2		2	0	2	2		\vdash			+
Austrostipa scabra	Speargrass		4	3			3		1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	3	3		+
Austrostipa sp.	Clauder Develop Creek		_	1					2		2								2	2	_		-	3	2		₩
Austrostipa verticillata	Slender Bamboo Grass		2								2							2			2		3	<u> </u> !	↓	2	┿
Avena fatua	Wild Oats	Exotic																						<u> </u>			┿
Avena sp.		Exotic																						<u> </u>			┿
Bidens pilosa	Cobblers Pegs	Exotic								1														<u> </u>			┿
Bidens subalternans	Greater Beggar's Ticks	Exotic			-			1	2								1						2	2	<u> </u>	2	
Boerhavia dominii	Tarvine					1				1					1									<u> </u> !	<u> </u>		
Boerhavia sp.			1				1	1					1				1	1						<u> </u> !	<u> </u>		
Bothriochloa bladhii	Forest Blue Grass												ļ			_					_			<u> </u> !	<u> </u>		
Bothriochloa decipiens	Red Grass			2	ļ	3		3	3	2			3	3		3		2			2		1	3		3	
Bothriochloa macra	Red Grass			1	3	ļ									3				3	2			1	<u> </u>			
Bothriochloa sp.				ļ			2					3					3					2	ļ	<u> </u>	3		2
Brachychiton populneus	Kurrajong						<u> </u>																	 '	<u> </u>		4
Brachyscome ciliaris	Variable Daisy			<u> </u>																			<u> </u>	<u> </u>	<u> </u>		<u> </u>
Bromus catharticus	Prairie Grass	Exotic		1																			1	<u> </u>	<u> </u>		1
Bromus molliformis	Soft Brome	Exotic			ļ		ļ																	2	<u> </u>		<u> </u>
Bromus sp.		Exotic			ļ		ļ																	<u> </u>	<u> </u>		<u> </u>
Brunoniella australis	Blue Trumpet		1		2	1										2	2	1		1							
Bryophyllum delagoense	Mother-of-millions	Exotic																									
Bulbine bulbosa	Native Leek																										
Calandrinia sp.																											
Callitris glaucophylla																											
	Yellow Burr-daisy		2	2	1			1	2	1			2	2	2	1	1	2	1	2					1		1
Calotis lappulacea			_	. –					_	1 -						-											$\overline{}$
Calotis lappulacea Carex breviculmis			_	_	-			1																ļ i			

														Wo	od Cont	trol 1											
Species	Species	Notes	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Carthamus lanatus	Saffron Thistle	Exotic								1	1	2															2
Centaurea melitensis	Maltese Cockspur	Exotic		1			2		1	1	1	1									1	2		1	2	2	3
Centaurea solstitialis	St Barnaby's Thistle	Exotic																								1	
Centaurea sp.		Exotic																									
Centaurium erythraea	Common Centaury	Exotic																									
Centaurium sp.		Exotic																									
Chamaesyce sp.													1		1		1										
Cheilanthes distans	Bristly Cloak Fern																										
Cheilanthes sieberi			1										2	1		2		1			2		1				
Chenopodium desertorum																											
Chenopodium pumilio	Small Crumbweed																										
Chloris gayana	Rhodes Grass	Exotic				2																					
Chloris pectinata	Comb Chloris																										1
Chloris truncata	Windmill Grass							2																	<u> </u>		+
Chloris ventricosa	Plump Windmill Grass		3	3	1	2		2	2	2	1							3	1	1	1		1	3	2		+
Chondrilla juncea	Skeleton Weed	Exotic			•	_		_												<u> </u>	<u> </u>			-		1	+
Chrysocephalum apiculatum	Yellow Buttons	LXOUC								-															+	'	+
Cichorium intybus	T CHOW Buttons	Exotic								+						+									+		+
Cirsium vulgare	Spear Thistle	Exotic								1						1									+		+
Convolvulus graminetinus	Spear Thistie	LXUIC								1			1			1									+		+
	Flaxleaf Fleabane	Exotic						1					1	1													+
Conyza bonariensis	Flaxieal Fleaballe	Exotic						'					'	'													+
Conyza parva		Exotic	2							-															₩		+
Conyza sp.	Common Catula	EXOUC								-															₩		+
Cotula australis	Common Cotula	T ti a						_	2	+						+											+
Cyclospermum leptophyllum	Slender Celery	Exotic						2	2	1	2					1					2						
Cymbopogon refractus	Barbed Wire Grass								1	+						+									2		+
Cynodon dactylon	Couch									+						+											+
Cyperus concinnus	Official Control							4		+					4	1											+
Cyperus fulvus	Sticky Sedge		_					1		1	1		2		1	1		-					2		1		
Cyperus gracilis	Slender Flat-sedge	E C .	2					1		1					1			2		2			2		1		+
Cyperus rotundus	Nutgrass	Exotic																									
Datura ferox	N. C. A	Exotic																									
Daucus glochidiatus	Native Carrot								1	—											2				₩		
Desmodium brachypodum	Large Tick-trefoil									1								1			1		1		—		
Desmodium varians	Slender Tick-trefoil									-	1			1	1			2									
Dianella revoluta	Blueberry Lily									-															—		
Dianella sp.				-				<u> </u>		1	1					<u> </u>									₩		
Dichanthium sericeum	Queensland Bluegrass					ļ		1		1	1					<u> </u>				ļ	ļ		ļ	1			
Dichelachne micrantha	Shorthair Plumegrass							1		1	1									ļ	ļ			1	—		
Dichondra repens	Kidney Weed				_				_		1 -	_			_				_	<u> </u>	ļ				—		
Dichondra sp. A			1		2		1	2	2	2	2	2			2			3	2	1	ļ	1	2	2	—		<u> </u>
Dichopogon fimbriatus	Nodding Chocolate Lily							1			1					<u> </u>		1					1	1	—		1
Digitaria brownii	Cotton Panic Grass			1		ļ				1			ļ	ļ									ļ		_	ļ	
Digitaria divaricatissima	Umbrella Grass			1				ļ			1													ļ			
Digitaria sanguinalis	Crab Grass	Exotic		<u> </u>		<u> </u>				1													<u> </u>				
Digitaria sp.				<u> </u>		<u> </u>				1													<u> </u>				
Echinochloa crus-galli	Barnyard Grass	Exotic		<u> </u>		<u> </u>				1													<u> </u>				
Echinochloa sp.				1																							
Echium plantagineum	Patterson's Curse	Exotic		1		ļ	ļ	ļ		1			ļ	ļ						ļ	ļ		ļ		<u> </u>	ļ	2
Eclipta platyglossa				1							1														<u> </u>		
Einadia hastata	Berry Saltbush			1		2	1										1				2	2			<u> </u>	2	1
Einadia nutans	Climbing Saltbush																										
Einadia polygonoides				1			1	1														2					1
Einadia trigonos	Fishweed		2	2			1			1		2	1										2				1
Elymus scaber																			2	1	2	2	1	2	1	2	3

														Wo	od Cont	rol 1											
Species	Species	Notes	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Enchylaena tomentosa	Ruby Saltbush																										
Enneapogon nigricans				1			2									2	1									1	1
Enneapogon sp.													2					1									
Enteropogon acicularis			1	2	1	2	2				1			2	1	2			2		2		1		2		
Enteropogon sp.																											
Eragrostis alveiformis																											1
Eragrostis brownii	Brown's Lovegrass		1																								
Eragrostis elongata	Clustered Lovegrass																						1				1
Eragrostis lacunaria	Bristly Love-grass					1																					1
Eragrostis leptostachya	Paddock Lovegrass												1														+
Eragrostis parviflora	Weeping Lovegrass																										+
Eragrostis setifolia	Bristly Love-grass																										+
Eragrostis sp.	Bristly Leve grass																										+
Eremophila debilis	Winter Apple	+	2	2	2	2	2	2	1	2	1	2		<u> </u>	2	<u> </u>	1	2	2	2	2	2		<u> </u>	2	2	1
Eriochloa pseudoacrotricha	Early Spring Grass	+	+-	 					- '-	- 	'			-		-	- ' -	1						-			+ -
Eriochloa sp.	Larry Opining Orass	+	+	+										 	 	 		'		 				 	1		+
Erodium crinitum	Blue Storksbill	+		1	1	-	1	 						 	 	 				 	 	-		 	'		+
Euchiton sp.	Dide Storksbill																										+
Euchiton sphaericus																											+
Eulalia aurea	Silky Browntop																						3	1			+
	Sliky Browntop	1	1										1		1								3	'			+
Evolvulus alsinoides var. decumbens	Carrera Frince and a	1	1										1		1									1			+
Fimbristylis dichotoma	Common Fringe-sedge	- "																					2	1			+
Galenia pubescens	Galenia	Exotic																									+
Geijera parviflora	N. C.																										+
Geranium solanderi	Native Geranium							1						.	-	-				-	-			-			
Glossogyne tannensis													2	1	-	-				-				-			
Glycine clandestina			1					1					2	1	-	-		1		-	1	<u> </u>		-			
Glycine tabacina		<u> </u>	1				1	2					2		-	-	1			-	-	1		-	1	_	
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Exotic												1												2	+
Gomphocarpus sp.		Exotic											1														+
Gomphrena celosioides	Gomphrena Weed	Exotic																									
Gonocarpus elatus																											<u> </u>
Goodenia cycloptera																											<u> </u>
Goodenia fascicularis																											
Goodenia glabra													2		2	1	2	1				1					\bot
Goodenia pinnatifida																											\bot
Gypsophila tubulosa	Annual Chalkwort																										
Haloragis heterophylla	Rough Raspwort	1		1				2	2	1			2	2	2	1	2	1		ļ			2	1			
Hedypnois rhagadioloides subsp. cretica	Cretan Weed	Exotic																								2	
Helianthus sp.	Sunflower	Exotic																									
Hibiscus trionum																											
Hordeum sp.	Barley Grass	Exotic																									
Hyparrhenia hirta	Coolatai Grass	Exotic		<u> </u>																							<u></u>
Hypochaeris microcephala	White Flatweed	Exotic						1	Ĺ							1	1	1									
Hypochaeris radicata	Flatweed	Exotic																									
Jasminum suavissimum																											
Juncus sp.																											
Juncus usitatus	Pinrush																						1	1			
Lachnagrostis filiformis	Blown Grass			1					1					1													T
Lactuca saligna	Willow-leaved Lettuce	Exotic						1	1																		1
Lactuca serriola	Prickly Lettuce	Exotic							2									1			2						1
Lepidium africanum		Exotic	2	1	1	2	2	1		2	2			1	1	1		1		1	2	1	2	1		2	2
Lepidium bonariense		Exotic						1						1	1	1				1	1			1			1
Leptochloa sp.		1	1			1		1						1	1	1				1	1		1	1			1
Leptorhynchos panaetioides	Woolly Buttons	+	+	1	1	1	+	 	 	 	1	1	1	+	+	1	 	l	l	 	 	 	1	1		 	+

														Wo	od Cont	rol 1				_							
Species	Species	Notes	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Linaria pelisseriana	Pelisser's Toadflax	Exotic																									+
Linaria sp.																											
Linum marginale	Native Flax													1													
Lolium rigidum	Wimmera Ryegrass	Exotic																						1			
Lolium sp.	, ,	Exotic									2	2														2	
Lomandra confertifolia	Mat-rush										1																1
Lomandra filiformis	Wattle Mat-rush									1			†							2	†	2	†				+
Lomandra longifolia	Spiny-headed Mat-rush									· ·			1				1			1 -	1		1				+
Lomandra multiflora	Spirity Hoddod Mat Facili		1	2	1				1			1			1	1	<u>'</u>	1	2	1	1	2		1	1		1
Lycium ferocissimum	African Boxthorn	Exotic	- '-		- '				<u> </u>			<u>'</u>	-		- '	- '		<u>'</u>		<u>'</u>	+ '		-	'	<u>'</u>		+-
Lythrum hyssopifolia	Hyssop Loosestrife	LXOUC	-																				-				+
Maireana decalvans	Black Cotton Bush	+																									+
			1		1	1	2						1								1	1	-				+
Maireana enchylaenoides	Wingless Bluebush				1		2	4	1	1	4		1								1	+		2		_	+-
Maireana microphylla	Small-leaf Bluebush	F	1	2	1	2	2	1	1 1	1	1	-	1	1	1	1	1	<u> </u>	1	1	1	1	2	2	2	2	1
Malva sp.	On the d Made	Exotic	1				1	-	1	1		 	1	1			1	ļ	-	1	1		1		 		+
Malvastrum americanum	Spiked Malvastrum	Exotic	 		1		ļ		1	-	1	_	ļ	ļ	1		-			1	ļ	1	 _	1	ļ		+
Malvastrum coromandelianum	Prickly Malvastrum		1				1	ļ	1	1		ļ	1	1			1	ļ	ļ	1	1		2		ļ		
Marrubium vulgare	White Horehound	Exotic	1				1	ļ	1	1		ļ	1	1			ļ	ļ	ļ		1		1		ļ		
Medicago minima	Wooly Burr Medic	Exotic					2			ļ		2	<u> </u>				ļ				<u> </u>	2	1	1	ļ		3
Medicago polymorpha	Burr Medic	Exotic					2	2				1										1					
Medicago sativa	Lucerne	Exotic						1		1																	
Medicago sp.		Exotic																									
Medicago truncatula	Barrel Medic	Exotic																									
Melilotus indicus	Hexham Scent	Exotic																	1			3					
Melilotus sp.		Exotic																									
Mentha satureioides	Creeping Mint																						1				
Microlaena stipoides	Weeping Grass							2										2									1
Misopates orontium	Lesser Snapdragon	Exotic									1	2		1			2				2		2		1	2	2
Murdannia graminea	Grass Lily																										
Nicotiana sp.			1																				1				1
Nyssanthes diffusa	Barbwire Weed																										1
Opuntia stricta	Common Prickly Pear	Exotic	1	1								1	1	1	1	1	1								1	1	+
Oxalis exilis	Common Filency Four	2/10110								1										1						-	1
Oxalis perennans										· ·			1							<u> </u>	1		1				+ ·
Oxalis sp.			1										<u> </u>					1			-		1				+
Panicum buncei			'										 					<u>'</u>			 		+ '				+
Panicum effusum	Hairy Panic												1								1		1				+
	Tially FaillC	Evetic	1				1	1	 			-	+ '	1				-	-	1	+		+ '		-		+
Panicum maximum		Exotic	1					<u> </u>				-	1					-	-		1	1	1	1	-		+
Papaver sp.	Vadhil- C		1	1	1		1	1	1	1	1	-	1	1	1	1	1	<u> </u>	1	1	1	1	1	1	-		+
Panicum queenslandicum	Yadbila Grass		1				1	-	1	1		 	1	1			1	ļ	-	1	1		1		 		+
Panicum sp.			1		1		ļ		1	-	1	_	ļ	ļ	1		-			1	ļ	1	1	1	ļ		+
Parsonsia eucalyptophylla	Gargaloo		1					<u> </u>	1			<u> </u>	1					_	<u> </u>	1	1		1		<u> </u>		
Paspalidium jubiflorum	Warrego Grass		1				1	ļ	1	1		ļ	1	ļ			ļ	ļ	ļ	1	1		1		ļ		
Paspalidium sp.			2	2	2	2	3	1				<u> </u>	2					2			1	2	1		<u> </u>		2
Paspalum dilatatum	Paspalum	Exotic						ļ				ļ	1					ļ	ļ		1		1		ļ		
Paspalum sp.		Exotic											1								1		1				
Petrorhagia nanteuilii		Exotic							1		2	2										2	2	2		2	2
Phalaris sp.	Canary Grass	Exotic																									
Phyllanthus virgatus	Petty Spurge												2		1												
Pimelea microcephala	Shrubby Rice-flower																										
Pimelea neo-anglica	Shrubby Rice-flower																										1
Pimelea sp.			1					1				1	1					1	1		1		1		1		1
Plantago debilis								1				1	1		1			1	1	1	1	1	1	1			+
Plantago lanceolata	Lamb's Tongues	Exotic						<u> </u>				<u> </u>	1					<u> </u>	<u> </u>		† ·	† 	1		<u> </u>		+
		_,		+	!		_				!	1	 	_	!	1	1		ļ		.	1	3	 		1	2

														Wo	od Cont	rol 1											
Species	Species	Notes	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Polycarpon tetraphyllum	Four-leaved Allseed	Exotic																									
Polygonum aviculare	Wireweed	Exotic								1																	1
Portulaca oleracea	Pigweed																										1
Rapistrum rugosum	Turnip Weed	Exotic									2																1
Rhodanthe anthemoides	·																										1
Rostellularia adscendens					1	1	2							1				1					1				1
Rumex brownii	Swamp Dock		1				1	1		1								2		1			2		1	1	1
Rumex crispus	Curled Dock	Exotic																									1
Rumex sp.																											1
Salsola australis			1			1															1				\vdash		1
Schenkia spicata	Spike Centaury																							1			1
Schkuhria pinnata	opine comacily	Exotic								1															 		+
Sclerolaena birchii	Galvanised Burr	LXOUG	1	2		1	1																		 		+
Sclerolaena diacantha	Grey Copperburr		 '		1	 '	+			+	+				 				 		1	1	 		+	+	+
Sclerolaena muricata	Black Rolypoly	+		+			+			+	+				-				-			1			+	1	+
Sclerolaena muricata var. muricata	Black Rolypoly									-															+	-	+
Sclerolaena muricata var. villosa	Black Rolypoly									-															+	-	+
Senecio quadridentatus	Cotton Fireweed						1	2	2	1	2	1		2	-						1		1		+	1	+
		Exotic								'		1									1						+
Setaria incrassata	Purple Pigeon Grass									-															+		+
Setaria sp.	Community of Cide	Exotic	2	1		4	1	4		+			1	1	1	1	4	2	_	2	_	1	1				+
Sida corrugata	Corrugated Sida		2	1	2	1	1	1		1		4	ı	1	1	1	1	2	1	2	2	1	1		2		+
Sida cunninghamii	Ridged Sida	F 6.		1			1	1		1	1	1						1		1	1				₩	1	
Sida rhombifolia	Paddy's Lucerne	Exotic		1			1			1	1														₩	1	
Sida sp.				_				4										4									
Sida spinosa		Exotic		1				1		-								1						1	—		2
Sida subspicata																											
Silybum marianum	<u> </u>	Exotic			4	_																					
Sisymbrium irio	London Rocket	Exotic	1		1	1	2																				
Sisymbrium officinale	Hedge Mustard	Exotic		-						-															—		
Sisymbrium orientale	Indian Hedge Mustard	Exotic		-		2	2			-	2	2													—	2	
Sisymbrium sp.		Exotic								1	1				-								-				
Solanum esuriale	Quena				ļ .		<u> </u>			1	1				-								-				
Solanum nigrum	Black-berry Nightshade	Exotic	1		1	1	1			1		1															<u> </u>
Solanum parvifolium																											<u> </u>
Solanum sp.																											<u> </u>
Sonchus asper subsp. glaucescens		Exotic																									<u> </u>
Sonchus oleraceus	Common Sowthistle	Exotic	1					2	2	1	1	1									2		2				2
Sorghum halepense	Johnson Grass	Exotic																									<u> </u>
Spergularia sp.		Exotic																									<u> </u>
Sporobolus caroli										1																	<u> </u>
Sporobolus creber	Slender Rat's Tail Grass											1	1					1						2			
Stachys arvensis	Stagger Weed	Exotic																				1					
Stackhousia viminea	Slender Stackhousia							1				1			1	1		2	1				1				
Swainsona galegifolia	Smooth Darling-pea																										
Themeda australis	Kangaroo Grass								1														4	3	3	2	2
Tragopogon porrifolius	Oyster Plant	Exotic							1																		
Tragus australianus	Small Burgrass																										
Trianthema sp.																									<u> </u>		
Trifolium angustifolium	Narrow-leaved Clover	Exotic																									
Trifolium arvense	Haresfoot Clover	Exotic						2			2			1		2							2			3	1
Trifolium campestre	Hop Clover	Exotic					2	2			1						1	2				1				2	2
Trifolium dubium	Yellow Suckling Clover	Exotic				Ĺ											1										
Trifolium glomeratum	Clustered Clover	Exotic				Ĺ																				2	
Trifolium repens	White Clover	Exotic																									
Triptilodiscus pygmaeus		1		1	1						1		1	1		i i						ĺ					1

														Wo	ood Cont	rol 1											
Species	Species	Notes	41_2011	41_2012	41_2013	41_2014	41_2015	42_2011	42_2012	42_2013	42_2014	42_2015	43_2011	43_2012	43_2013	43_2014	43_2015	44_2011	44_2012	44_2013	44_2014	44_2015	45_2011	45_2012	45_2013	45_2014	45_2015
Urochloa panicoides	Urochloa Grass	Exotic																									
Verbascum thapsus	Great Mullein	Exotic																									1
Verbascum virgatum	Twiggy Mullein	Exotic																									
Verbena bonariensis	Purpletop	Exotic																									
Verbena gaudichaudii								1										1									1
Verbesina encelioides		Exotic																									1
Vicia sp.		Exotic																									1
Vittadinia cuneata	Fuzzweed		1	2		1				2						1		1	2	1							1
Vittadinia disecta	Dissected New Holland Daisy							2																			
Vittadinia muelleri																											1
Vittadinia sp.													1														1
<i>Vulpia</i> sp.																											2
Wahlenbergia communis	Tufted Bluebell		2	1		1		2	1				2	1		1		2	1	1	1		2				1
Wahlenbergia gracilis	Sprawling Bluebell																										1
Wahlenbergia luteola																											1
Walwhalleya proluta																											1
Xanthium occidentale	Noogoora Burr	Exotic																									1
Xanthium spinosum	Bathurst Burr	Exotic																									<u> </u>
Xerochrysum bracteatum	Golden Everlasting					2					1										1					1	1
Xerochrysum viscosum	Sticky Everlasting		2																				1				1
Zornia dyctiocarpa	Zornia																										
Total number of species			39	22	21	27	30	45	27	28	25	25	30	22	21	21	24	40	18	21	31	27	41	25	23	29	33

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 4. 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 4 and Figure 5. The remaining rehabilitated zones (Wood_06a, Wood_07c, Wood_10c and Burnt_13) have a high degree of variability through space and time (Figure 4).

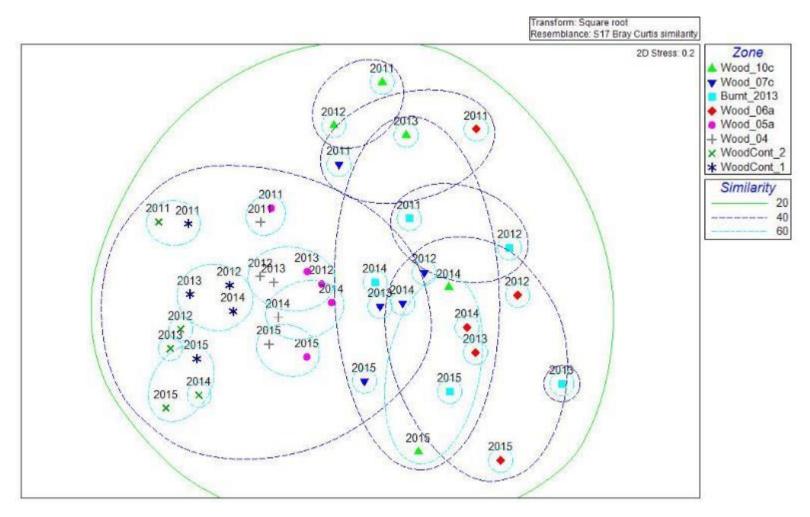


Figure 4: Cluster analysis Non-metric multi-dimensional scaling plot for native groundcover species abundance in Control and Rehabilitation zones for 2011 - 2015 monitoring periods

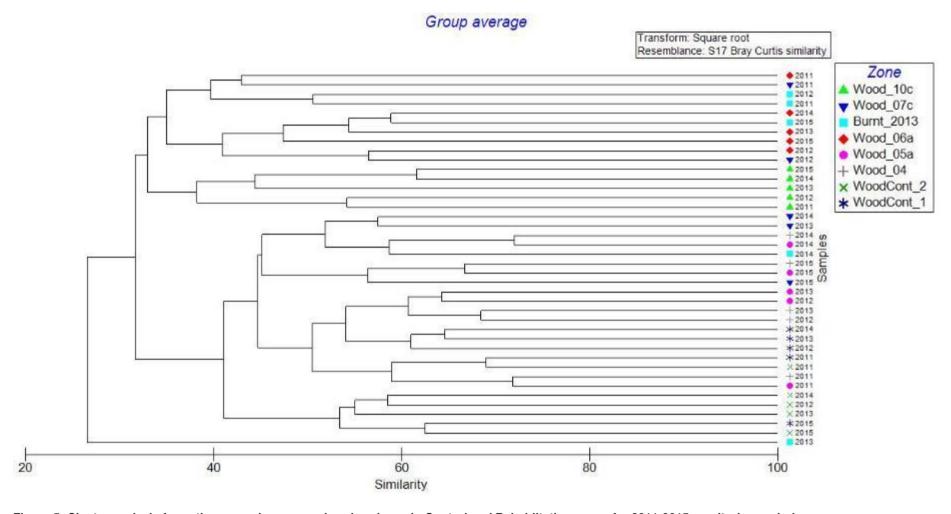


Figure 5: Cluster analysis for native groundcover species abundance in Control and Rehabiltation zones for 2011-2015 monitoring periods.

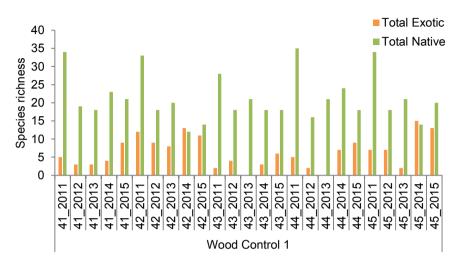


Figure 6: Groundcover species richness at Wood Control 1 (2011 - 2015)

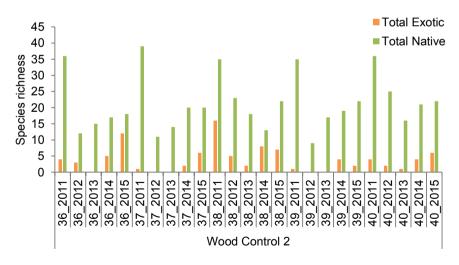


Figure 7: Groundcover species richness at Wood Control 2 (2011 - 2015)

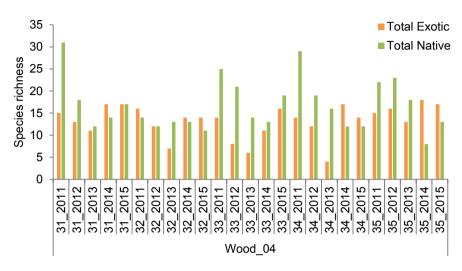


Figure 8: Groundcover species richness at Wood_04 (2011 - 2015)

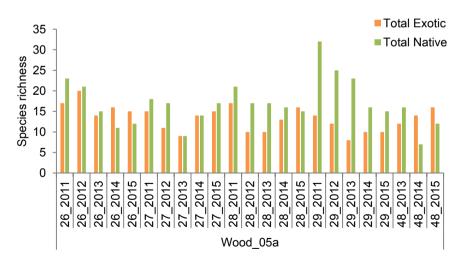


Figure 9: Groundcover species richness at Wood_05a (2011 - 2015)

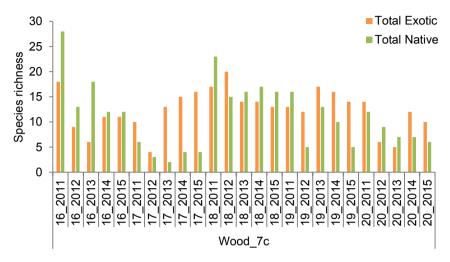


Figure 10: Groundcover species richness at Wood 07c (2011 - 2015)

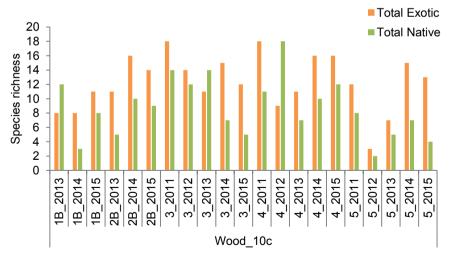


Figure 11: Groundcover species richness at Wood_10c (2011 - 2015))

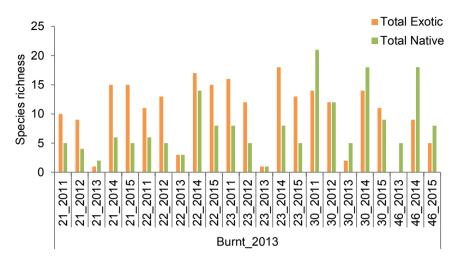


Figure 12: Groundcover species richness at Burnt_2013 (2011 - 2015)

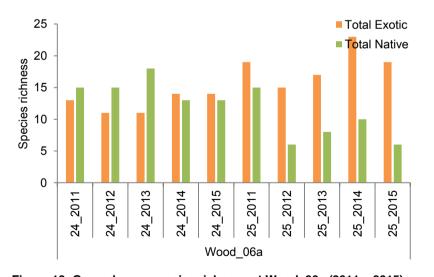


Figure 13: Groundcover species richness at Wood_06a (2011 - 2015)

3.7 Groundcover composition

Table 24: Groundcover composition for 2011 – 2015 monitoring periods

Tanadanant			Native s	species co			9 po.		species co	over (%)			Leaf	litter cove	er (%)			Crypto	ogam co	ver (%)			Bare	e ground	(%)		Rocks (%)				
Treatment	Plot	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
	1B	-	-	30	0	54	-	-	8	6	36	-	-	22	16	0	-	-	0	0	0	-	-	24	78	6	-	-	16	0	0
)c	2B	-	-	0	0	0	-	-	46	28	94	-	_	22	66	4	_	_	0	0	0	_	-	32	6	2	_	_	0	0	0
Wood_10c	3	20	12	22	26	32	23	46	12	10	60	23	30	34	60	4	0	0	0	0	0	34	12	26	4	4	0	0	6	0	0
Мос	4	10	4	6	2	0	38	56	38	18	82	23	22	22	66	6	0	0	0	0	0	29	18	32	14	12	0	0	2	0	0
	5	0	0	4	0	0	58	74	46	26	40	8	2	14	56	44	0	0	0	0	0	34	24	32	18	16	0	0	4	0	0
_	16	50	44	20	14	12	21	36	8	42	46	21	14	50	42	40	0	0	0	0	0	8	6	22	2	2	0	0	0	0	0
17c	17	0	0	0	0	0	54	84	46	44	48	2	6	34	36	26	0	0	0	0	0	44	10	20	20	26	0	0	0	0	0
Wood_07c	18	16	12	24	10	8	36	80	46	66	72	48	8	28	24	20	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Wo	19	10	0	4	10	6	58	80	38	52	58	16	16	38	30	30	0	0	0	0	0	16	4	20	8	6	0	0	0	0	0
	20	4	0	2	6	4	48	80	32	32	36	4	8	10	42	42	0	0	0	2	2	44	12	54	16	14	0	0	2	2	2
	21	0	0	0	0	0	54	78	6	40	72	30	18	50	54	18	0	0	36	0	0	16	4	8	6	10	0	0	0	0	0
_2013	22	0	0	0	2	2	54	39	8	30	88	30	61	38	62	8	0	0	0	0	0	16	0	54	6	2	0	0	0	0	0
urnt_2	23	4	2	0	0	0	68	96	12	48	82	26	2	40	46	10	0	0	0	0	0	2	0	40	6	8	0	0	8	0	0
Bur	30	8	0	0	2	0	70	92	14	58	66	22	8	28	34	30	0	0	56	0	0	0	0	2	6	4	0	0	0	0	0
	46	-	-	2	4	6	-	-	8	42	44	-	-	58	42	40	-	-	0	0	0	-	-	30	5	0	-	-	0	0	0
od_06 a	24	12	10	6	2	2	41	68	58	58	66	14	14	26	32	28	0	0	0	0	0	33	8	10	8	4	0	0	0	0	0
Wood _.	25	16	6	4	2	2	44	54	60	46	52	8	6	12	44	42	0	0	0	0	0	32	34	0	8	4	0	0	24	0	0
	26	33	48	34	8	8	14	40	30	16	76	43	10	30	70	14	0	0	0	0	0	10	2	6	6	2	0	0	0	0	0
.05	27	52	82	32	38	36	14	12	8	12	52	30	4	50	50	12	0	0	0	0	0	4	2	10	0	0	0	0	0	0	0
Wood_05	28	36	54	42	16	14	10	20	6	26	72	48	26	48	50	6	0	0	0	0	0	6	0	4	8	8	0	0	0	0	0
×	29	64	52	50	20	28	12	36	4	30	64	18	12	38	48	8	0	0	0	0	0	6	0	8	2	0	0	0	0	0	0
	48	-	-	40	38	14	-	-	22	14	74	-	-	38	48	10	-	-	0	0	0	-	-	0	0	2	-	-	0	0	0
	31	58	64	40	22	16	34	36	2	46	52	4	0	56	30	30	0	0	0	0	0	4	0	2	2	2	0	0	0	0	0
-04	32	53	50	40	22	28	31	16	0	28	64	10	24	46	50	6	0	0	0	0	0	6	10	14	0	2	0	0	0	0	0
Wood	33	48	58	40	44	46	14	16	4	10	32	28	12	52	42	18	0	0	0	0	0	10	14	4	4	4	0	0	0	0	0
>	34	47	50	46	24	22	24	42	10	28	32	27	8	42	46	44	0	0	0	0	0	2	0	2	2	2	0	0	0	0	0
	35	38	64	50	16	20	18	24	12	38	64	36	12	38	44	14	0	0	0	0	0	8	0	0	2	2	0	0	0	0	0
2	36	44	72	30	10	36	2	0	0	10	6	34	26	52	74	52	0	0	0	0	0	20	2	14	6	4	0	0	4	0	0
Control	37	22	40	26	8	12	0	0	2	0	0	58	60	46	74	80	2	0	0	0	0	18	0	26	18	8	0	0	0	0	0
) Po	38	26	40	26	2	28	6	8	6	6	34	12	46	42	78	32	0	0	0	0	0	56	6	24	14	6	0	0	2	0	0
Wood	39	48	74	28	20	24	2	0	0	4	4	40	22	44	70	60	0	4	10	4	2	10	0	14	2	10	0	0	4	0	0
	40	54	66	46	16	14	0	0	0	2	6	38	30	48	70	66	0	0	0	0	2	8	4	6	12	12	0	0	0	0	0
<u>-</u>	41	50	40	44	30	28	0	0	0	0	4	38	60	54	62	60	0	0	0	0	0	12	0	2	8	8	0	0	0	0	0
Control	42	43	70	64	16	16	6	0	0	6	12	41	26	36	72	66	0	0	0	0	0	10	4	0	6	6	0	0	0	0	0
od Cc	43	50	54	54	26	22	0	0	0	0	4	40	42	40	66	66	0	0	0	0	0	10	4	6	8	8	0	0	0	0	0
Wood	44	54	44	44	22	18	0	0	0	6	10	42	52	54	70	70	0	0	0	0	0	4	4	2	2	2	0	0	0	0	0
BA1 /!	45	72	84	62	28	24	2	0	0	16	22	26	16	34	54	52	0	0	0	0	0	0	0	4	2	2	0	0	0	0	0
Min (all si		0	0	0	0	0	0	0	0	0	0	2	0	10	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max (all s		72	84	64	44	54	70	96	60	66	94	58	61	58	78	80	2	4	56	4	2	56	34	54	78	26	0	0	24	2	2
Average (all	sites)	32	36	26	14	16	26	37	16	25	47	27	21	38	52	31	1	0	3	0	0	15	6	15	8	6	0	0	0	0	0

Table 25: Groundcover ANOVA results (note cells shaded orange indicate significant temporal change (p<0.05) within Wood_10c, Wood_06a and Burnt_2013; cells shaded green indicate significant (p>0.05) temporal change within zones)

Monitoring	Monitoring zone Wood_10c					Wood_07c					,	Wood_6a			Burnt 2013						
Monitoring	year	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Cover 6)	Mean	10.00	5.33	12.40	5.60	17.20	16.00	11.20	10.00	8.00	6.00	14.00 ^A	8.00 ^{AB}	5.00 ^B	2.00 ^B	2.00 ^B	3.00	0.50	0.40	1.60	1.60
ative Co (%)	Standard deviation	10.00	6.11	12.91	11.44	24.80	19.95	19.06	11.14	5.29	4.47	2.82	2.82	1.41	0.00	0.00	3.82	1.00	0.89	1.67	2.61
Z Z	P-value	0.77				0.82				0.00						0.45					
xotic cover (%)	Mean	39.67 ^{AB}	58.67 ^A	30.00 ^{AB}	17.60 ^A	62.40 ^B	43.40 ^{AB}	72.00 ^A	34.00 ^B	47.20 ^{AB}	52.00 ^{AB}	42.50	61.00	59.00	52.00	59.00	61.50 ^{AB}	76.25 ^A	9.60 ^C	43.60 ^B	70.40 ^{AB}
otic (%	Standard deviation	17.56	14.19	18.60	9.63	25.43	15.03	20.20	15.68	12.70	13.64	2.12	9.90	1.41	8.49	9.89	8.7	26.00	32.80	10.33	17.05
Ш	P-value	0.00			0.02				0.21					0.00							
er (%)	Mean	18.00 ^B	18.00 ^B	22.80 ^{AB}	52.80 ^A	11.6 ^B	18.2 ^{AB}	10.40 ^B	32.00 ^{AB}	34.00 ^A	31.60 ^{AB}	11.00	10.00	19.00	38.00	35.00	27.00 ^A	22.25 ^A	42.6 ^B	47.60 ^B	21.20 ^A
eaf litter	Standard deviation	8.66	14.42	7.15	21	18.24	18.47	4.34	14.7	7.82	9.32	4.24	5.66	9.9	8.48	9.89	3.83	26.66	11.54	10.80	13.61
Lea	P-value			0.01			0.02						0.05					0.04			
ground %)	Mean	32.33	18.00	29.20	24.00	80	22.40	6.40	23.60	9.20	9.60	32.50	24.00	5.00	8.00	4.00	8.50 ^{AB}	1.00 ^B	43.2 ^A	7.20 ^{AB}	4.8 ^B
re g (%	Standard deviation	2.88	6.00	3.90	30.72	5.83	20.51	4.75	18.84	8.67	10.62	0.70	18.39	7.07	0.00	0.00	8.70	2.00	11.37	2.68	4.15
Ba	P-value			0.22					0.19					0.08					0.01		

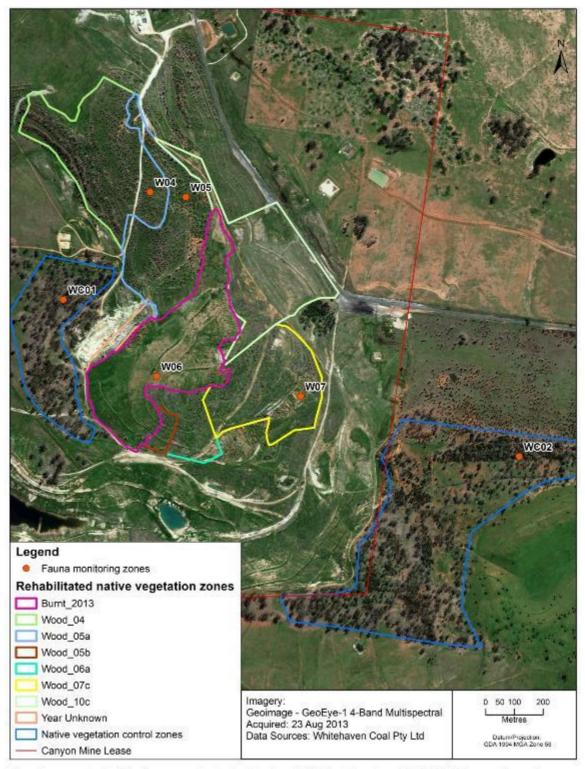
Common superscript indicates no significant difference in means (p>0.05).

Table 26: Groundcover ANOVA results (note cells shaded orange indicate significant temporal change (p<0.05) within Wood_05a, Control Wood 2 and Control Wood 1; cells shaded green indicate significant (p>0.05) temporal change within zones)

Monitoring	g zone		,	Wood_04			Wood_05a					C	ontrol Wood	12		Control Wood 1					
Monitoring	g year	2011	2012	2013	2014	2051	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Cover)	Mean	48.80 ^A	57.20 ^A	43.20 ^A	25.60 ^B	26.40 ^B	46.25 ^{AB}	59.00 ^A	39.50 ^{BC}	24.00 ^{BC}	20.00 ^C	38.80 ^{AB}	58.40 ^A	31.20 ^{BC}	11.20 ^C	22.80 ^{BC}	53.80 ^A	58.40 ^A	53.60 ^A	24.40 ^B	21.60 ^B
Native C (%)	Standard deviation	7.46	7.01	4.60	10.71	11.78	14.48	15.54	8.23	13.49	11.58	14.04	17.05	8.44	7.01	9.96	10.92	18.41	9.53	5.55	4.77
	P-value			0.00			0.00				0.00							0.00			
cover (%)	Mean	24.20 ^{CB}	26.80 ^{ABC}	5.60 ^C	30.00 ^{AB}	48.8A	12.50 ^B	27.00 ^B	12.00 ^B	19.60 ^B	67.60 ^A	2.00	1.60	1.60	4.40	10.00	1.60 ^B	0.00 ^B	0.00 ^B	5.60 ^{AB}	10.40 ^A
rtic cov	Standard deviation	8.44	11.8	5.18	13.49	16.1	1.91	13.22	12.11	7.92	9.84	2.45	3.58	2.07	3.85	13.64	2.61	0.00	0.00	6.54	7.40
Exotic	P-value			0.00			0.00				0.26					0.00					
r (%)	Mean	21.00 ^C	11.20 ^C	46.80 ^A	42.40 ^{AB}	22.40 ^{BC}	34.75 ^B	13.00 ^C	40.8 ^{AB}	53.2 ^A	10.00 ^C	36.40 ^A	36.80 ^A	46.40 ^A	73.20 ^B	58.00 ^{AB}	37.40 ^C	39.20 ^C	43.60 ^{BC}	64.80 ^A	62.80 ^{AB}
Leaf litter (%)	Standard deviation	13.42	8.67	7.29	7.54	14.86	13.5	9.31	8.19	9.44	3.16	16.46	15.85	3.85	3.35	17.78	6.54	18.14	9.74	7.15	7.01
	P-value			0.00					0.00					0.00					0.00		
ground (%)	Mean	6.00	4.80	4.40	2.00	2.40	6.50	1.00	5.60	3.20	2.40	22.40 ^A	2.40 ^B	16.80 ^{AB}	10.40 ^{AB}	8.00 ^{AB}	7.20	2.40	2.80	5.20	5.20
e grou	Standard deviation	3.16	6.72	5.55	1.41	0.89	2.52	1.15	3.85	3.63	3.29	19.46	2.61	8.2	13.00	3.16	5.02	2.19	2.28	3.03	3.03
Bar	P-value			0.54					0.11					0.04					0.17		

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

3 Fauna data



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Figure 14: Location of Fauna Monitoring Sites

Table 27: Bird species and associated feeding guilds recorded at W01 in 2011 - 2015 in Spring

				Reference Sites									
Species	Common Name	Guild	Notes	WC01									
	Common Name	Guila	110.00	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)				
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder											
Acanthiza apicalis	Inland Thornbill	Generalist - insects											
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects											
Acanthiza nana	Yellow Thornbill	Canopy feeder											
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects											
Accipiter fasciatus	Brown Goshawk	Bird of Prey			Х								
Anas gracilis	Grey Teal	Water Bird											
Anas superciliosa	Pacific Black Duck	Water Bird											
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects											
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous											
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder											
Aquila audax	Wedge-tailed Eagle	Bird of Prey											
Ardea pacifica	White-necked Heron	Ground forager - omnivorous											
Artamus superciliosus	White-browed Woodswallow	Generalist - insects											
Aythya australis	Hardhead	Water Bird											
Barnardius zonarius	Australian Ringneck	Generalist - plant based					X						
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based		X		X			1				
Cacatua sanguinea	Little Corella	Ground forager - plant based		X	X			X	2				
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects											
Chalcites basalis	Horsfield's Bronze- Cuckoo	Generalist - insects											
Chenonetta jubata	Australian Wood Duck	Water Bird		Х									
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act										
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects											
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects											
Coracina novaehollandiae	Black-faced Cuckoo- shrike	Generalist - insects						Х					
Corcorax melanoramphos	White-winged Chough	Ground forager - insects		Х		Х		Х	5				

				Reference Sites									
Species	Common Name	Guild	Notes	WC01									
Оровіса	Gommon reame	Guild	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)				
Corvus coronoides	Australian Raven	Generalist - carnivorous		Х			X						
Corvus mellori	Little Raven	Generalist - insects							1				
Corvus orru	Torresian Crow	Ground forager - omnivorous											
Coturnix ypsilophora	Brown Quail	Ground forager - plant based											
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous			Х		Х	Х	1				
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		X	Х	Х	X	Х	2				
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous		X	Х	Х	X	Х	2				
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous			Х	Х							
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder											
Egretta novaehollandiae	White-faced Heron	Water Bird		Х									
Elanus axillaris	Black-shouldered Kite	Bird of Prey			Х								
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects											
Eolophus roseicapillus	Galah	Ground forager - plant based		X	Х	X	X	X	7				
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects											
Eurystomus orientalis	Dollarbird	Aerial forager											
Falco berigora	Brown Falcon	Bird of Prey											
Falco cenchroides	Nankeen Kestrel	Bird of Prey		Х		X		Х					
Falco longipennis	Australian Hobby	Bird of Prey		Х		X							
Falco peregrinus	Peregrine Falcon	Bird of Prey											
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act		Х								
Fulica atra	Eurasian Coot	Water Bird											
Geopelia striata	Peaceful Dove	Ground forager - plant based											
Gerygone fusca	Western Gerygone	Canopy feeder											
Glossopsitta concinna	Musk Lorikeet	Canopy feeder		Х									
Grallina cyanoleuca	Magpie-lark	Ground forager - insects		Х	Х	Х		Х					
Haliastur sphenurus	Whistling Kite	Bird of Prey				Х							
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable – TSC Act	Х									
Hirundapus caudacutus	White-throated Needletail	Aerial forager											
Hirundo neoxena	Welcome Swallow	Generalist - insects											
Lalage sueurii	White-winged Triller	Aerial forager						_					
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder											

				Reference Sites									
Species	Common Name	Guild	Notes			W	C01						
				2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)				
Lichenostomus virescens	Singing Honeyeater	Generalist											
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects											
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects											
Manorina melanocephala	Noisy Miner	Generalist		Х	Х	Х	X	X	15				
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects											
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act					X					
Microeca fascinans	Jacky Winter	Ground forager - insects											
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based											
Myiagra inquieta	Restless Flycatcher	Generalist - insects											
Neochmia modesta	Plum-headed Finch	Ground forager - plant based											
Northiella haematogaster	Blue Bonnet	Ground forager - plant based											
Nymphicus hollandicus	Cockatiel	Ground forager - plant based		Х	Х	Х	Х	Х	1				
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Х	Х	Х	Х	Х	5				
Pachycephala pectoralis	Golden Whistler	Generalist - insects											
Pachycephala rufiventris	Rufous Whistler	Canopy feeder											
Pardalotus punctatus	Spotted Pardalote	Canopy feeder											
Pardalotus striatus	Striated Pardalote	Canopy feeder											
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous											
Petrochelidon ariel	Fairy Martin	Aerial forager											
Petrochelidon nigricans	Tree Martin	Aerial forager											
Petroica goodenovii	Red-capped Robin	Ground forager - insects											
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based											
Philemon corniculatus	Noisy Friarbird	Canopy feeder											
Platycercus eximius	Eastern Rosella	Generalist - plant based		Х	Х	Х	Х	Х	4				
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based											
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable – TSC Act	Х	Х	Х	Х	Х	10				
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based			Х	Х	Х	Х	2				
Rhipidura albiscapa	Grey Fantail	Generalist - insects											
Rhipidura leucophrys	Willie Wagtail	Aerial forager											

				Reference Sites										
Species	Common Name	Guild	Notes		WC01									
5,0000				2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)					
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder				Х		Х						
Smicrornis brevirostris	Weebill	Canopy feeder												
Struthidea cinerea	Apostlebird	Ground forager - omnivorous		Х		Х		Х	20					
Sturnus tristis	Common Myna	Generalist	Exotic											
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic				Х	Х	2					
Tachybaptus novaehollandiae	Australian Grebe	Water Bird												
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based												
Taeniopygia guttata	Zebra Finch	Ground forager - plant based												
Threskiornis spinicollis	Straw-necked Ibis	Water Bird												
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous												
Turdus merula	Common Blackbird	Ground forager - omnivorous												
Turnix varia	Painted Button-quail	Ground forager - omnivorous		Х										
Vanellis tricolor	Banded Lapwing	Ground forager - insects												
Vanellus miles	Masked Lapwing	Ground forager - insects												
Total number of specie	s	•	•	21	16	18	13	19	16					

Table 28: Bird species and associated feeding guilds recorded at W02 in 2011 - 2015 in Spring

					ſ	Reference Sites	i	
Species	Common Name	Guild	Notes			WC02		
				2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder			Х	Х	Х	2
Acanthiza apicalis	Inland Thornbill	Generalist - insects		Х	Х	Х	Х	4
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects			Х	Х	Х	8
Acanthiza nana	Yellow Thornbill	Canopy feeder		Х	Х	Х	Х	4
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects		Х	Х	Х		2
Accipiter fasciatus	Brown Goshawk	Bird of Prey			Х			
Anas gracilis	Grey Teal	Water Bird						
Anas superciliosa	Pacific Black Duck	Water Bird						
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects						
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous					Х	2
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder			Х			2
Aquila audax	Wedge-tailed Eagle	Bird of Prey			Х	Х		
Ardea pacifica	White-necked Heron	Ground forager - omnivorous						
Artamus superciliosus	White-browed Woodswallow	Generalist - insects		Х	Х		Х	
Aythya australis	Hardhead	Water Bird			Х			
Barnardius zonarius	Australian Ringneck	Generalist - plant based		Х	Х	Х	Х	2
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based			Х			1
Cacatua sanguinea	Little Corella	Ground forager - plant based			Х		Х	20
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects						
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects				Х		
Chenonetta jubata	Australian Wood Duck	Water Bird						
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act	Х	Х	Х	Х	4
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects			Х	Х		2
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects						
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects			Х	Х	Х	1
Corcorax melanoramphos	White-winged Chough	Ground forager - insects		Х	Х	Х	Х	14
Corvus coronoides	Australian Raven	Generalist - carnivorous		Х		Х	Х	3
Corvus mellori	Little Raven	Generalist - insects						
Corvus orru	Torresian Crow	Ground forager - omnivorous						
Coturnix ypsilophora	Brown Quail	Ground forager - plant based						
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous		Х	Х	Х	Х	1
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		Х	Х	Х	Х	10
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous			Х	Х		
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous		Х	Х	Х	Х	1

					F	Reference Sites		
Species	Common Name	Guild	Notes			WC02		
			_	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder		Х	X	` '	, ,	1
Egretta novaehollandiae	White-faced Heron	Water Bird						
Elanus axillaris	Black-shouldered Kite	Bird of Prey						
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects						
Eolophus roseicapillus	Galah	Ground forager - plant based		Х	Х	Х	Х	10
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects		Х	Х	Х	Х	1
Eurystomus orientalis	Dollarbird	Aerial forager						
Falco berigora	Brown Falcon	Bird of Prey						
Falco cenchroides	Nankeen Kestrel	Bird of Prey						
Falco longipennis	Australian Hobby	Bird of Prey			Х		Х	
Falco peregrinus	Peregrine Falcon	Bird of Prey						
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act					
Fulica atra	Eurasian Coot	Water Bird						
Geopelia striata	Peaceful Dove	Ground forager - plant based		Х		Х		
Gerygone fusca	Western Gerygone	Canopy feeder		Х	Х		Х	2
Glossopsitta concinna	Musk Lorikeet	Canopy feeder						
Grallina cyanoleuca	Magpie-lark	Ground forager - insects			Х	Х	Х	4
Haliastur sphenurus	Whistling Kite	Bird of Prey						
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act					
Hirundapus caudacutus	White-throated Needletail	Aerial forager						
Hirundo neoxena	Welcome Swallow	Generalist - insects						
Lalage sueurii	White-winged Triller	Aerial forager			Х		Х	2
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder		Х	Х	Х	Х	4
Lichenostomus virescens	Singing Honeyeater	Generalist				Х		
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects		Х	Х	Х	Х	8
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects						
Manorina melanocephala	Noisy Miner	Generalist		Х	Х	Х	Х	15
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects						
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act		Х		Х	3
Microeca fascinans	Jacky Winter	Ground forager - insects		Х	Х	Х	Х	2
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based						
Myiagra inquieta	Restless Flycatcher	Generalist - insects						1
Neochmia modesta	Plum-headed Finch	Ground forager - plant based						
Northiella haematogaster	Blue Bonnet	Ground forager - plant based			Х	Х	Х	3
Nymphicus hollandicus	Cockatiel	Ground forager - plant based			Х	Х		

					F	Reference Sites		
Species	Common Name	Guild	Notes			WC02		
				2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Х	Х	Х	Х	3
Pachycephala pectoralis	Golden Whistler	Generalist - insects						1
Pachycephala rufiventris	Rufous Whistler	Canopy feeder		Х	Х	Х	Х	6
Pardalotus punctatus	Spotted Pardalote	Canopy feeder		Х				
Pardalotus striatus	Striated Pardalote	Canopy feeder				Х	Х	1
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous						
Petrochelidon ariel	Fairy Martin	Aerial forager			Х			
Petrochelidon nigricans	Tree Martin	Aerial forager						
Petroica goodenovii	Red-capped Robin	Ground forager - insects		Х	Х	Х	Х	4
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based		Х	Х		Х	
Philemon corniculatus	Noisy Friarbird	Canopy feeder			Х	Х		
Platycercus eximius	Eastern Rosella	Generalist - plant based		Х	Х	Х	Х	4
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based			Х	Х		1
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act	Х	Х	Х	Х	8
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based			Х	Х	Х	5
Rhipidura albiscapa	Grey Fantail	Generalist - insects		Х	Х	Х	Х	2
Rhipidura leucophrys	Willie Wagtail	Aerial forager		Х	Х	Х	Х	6
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder						
Smicrornis brevirostris	Weebill	Canopy feeder		Х	Х	Х	Х	4
Struthidea cinerea	Apostlebird	Ground forager - omnivorous		Х	Х		Х	15
Sturnus tristis	Common Myna	Generalist	Exotic					
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic			Х		
Tachybaptus novaehollandiae	Australian Grebe	Water Bird						
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based			Х	Х	Х	4
Taeniopygia guttata	Zebra Finch	Ground forager - plant based						
Threskiornis spinicollis	Straw-necked Ibis	Water Bird						
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous						
Turdus merula	Common Blackbird	Ground forager - omnivorous						
Turnix varia	Painted Button-quail	Ground forager - omnivorous			Х			
Vanellis tricolor	Banded Lapwing	Ground forager - insects						
Vanellus miles	Masked Lapwing	Ground forager - insects						
Total number of species			1	31	51	42	40	45

Table 29: Bird species and associated feeding guilds recorded at W04 in 2011 - 2015 in Spring

						Rehabilit	ated Sites		
Species	Common Name	Guild	Notes			W	'04		
O P00.00		- Cama		2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder		Х	Х	Х	Х	Х	1
Acanthiza apicalis	Inland Thornbill	Generalist - insects							
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects		Х		Х	Х		2
Acanthiza nana	Yellow Thornbill	Canopy feeder							
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects							
Accipiter fasciatus	Brown Goshawk	Bird of Prey							
Anas gracilis	Grey Teal	Water Bird							
Anas superciliosa	Pacific Black Duck	Water Bird							
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects							
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous							
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder							
Aquila audax	Wedge-tailed Eagle	Bird of Prey							
Ardea pacifica	White-necked Heron	Ground forager - omnivorous							
Artamus superciliosus	White-browed Woodswallow	Generalist - insects							
Aythya australis	Hardhead	Water Bird							
Barnardius zonarius	Australian Ringneck	Generalist - plant based						Х	
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based							
Cacatua sanguinea	Little Corella	Ground forager - plant based							
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects							
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects							1
Chenonetta jubata	Australian Wood Duck	Water Bird							
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act						
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects		Х		Х	Х		
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects							
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects				Х	Х	Х	3
Corcorax melanoramphos	White-winged Chough	Ground forager - insects						Х	9
Corvus coronoides	Australian Raven	Generalist - carnivorous					Х	Х	1
Corvus mellori	Little Raven	Generalist - insects							
Corvus orru	Torresian Crow	Ground forager - omnivorous							
Coturnix ypsilophora	Brown Quail	Ground forager - plant based		Х		Х	х		

						Rehabilit	ated Sites		
Species	Common Name	Guild	Notes			W	/04		
<u> </u>	Sommon Hame	Guild	110100	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous					Х		3
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		Х	Х	Х	Х	Х	8
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous							
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous							
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder							
Egretta novaehollandiae	White-faced Heron	Water Bird							
Elanus axillaris	Black-shouldered Kite	Bird of Prey							
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects							
Eolophus roseicapillus	Galah	Ground forager - plant based							2
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects							
Eurystomus orientalis	Dollarbird	Aerial forager							
Falco berigora	Brown Falcon	Bird of Prey							
Falco cenchroides	Nankeen Kestrel	Bird of Prey						Х	
Falco longipennis	Australian Hobby	Bird of Prey							
Falco peregrinus	Peregrine Falcon	Bird of Prey							
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act						
Fulica atra	Eurasian Coot	Water Bird							
Geopelia striata	Peaceful Dove	Ground forager - plant based							
Gerygone fusca	Western Gerygone	Canopy feeder				Х		X	1
Glossopsitta concinna	Musk Lorikeet	Canopy feeder							
Grallina cyanoleuca	Magpie-lark	Ground forager - insects					Х		
Haliastur sphenurus	Whistling Kite	Bird of Prey							
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act						
Hirundapus caudacutus	White-throated Needletail	Aerial forager							
Hirundo neoxena	Welcome Swallow	Generalist - insects						Х	
Lalage sueurii	White-winged Triller	Aerial forager				Х		Х	6
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder							
Lichenostomus virescens	Singing Honeyeater	Generalist		Х	Х	Х	Х	Х	1
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects		Х	Х	Х	Х	Х	4
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		Х	Х	Х	Х	Х	6
Manorina melanocephala	Noisy Miner	Generalist						Х	
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects							
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act						
Microeca fascinans	Jacky Winter	Ground forager - insects							

						Rehabilit	ated Sites		
Species	Common Name	Guild	Notes			W	/04		
Sp00,00		Cuna	110.00	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based							
Myiagra inquieta	Restless Flycatcher	Generalist - insects							1
Neochmia modesta	Plum-headed Finch	Ground forager - plant based		Х					
Northiella haematogaster	Blue Bonnet	Ground forager - plant based							
Nymphicus hollandicus	Cockatiel	Ground forager - plant based							
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Х	Х	Х			2
Pachycephala pectoralis	Golden Whistler	Generalist - insects							
Pachycephala rufiventris	Rufous Whistler	Canopy feeder					Х	Х	1
Pardalotus punctatus	Spotted Pardalote	Canopy feeder							
Pardalotus striatus	Striated Pardalote	Canopy feeder					Χ		
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous							
Petrochelidon ariel	Fairy Martin	Aerial forager						Х	
Petrochelidon nigricans	Tree Martin	Aerial forager							
Petroica goodenovii	Red-capped Robin	Ground forager - insects							
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based							
Philemon corniculatus	Noisy Friarbird	Canopy feeder							
Platycercus eximius	Eastern Rosella	Generalist - plant based				Х			2
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based							
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act						7
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based							
Rhipidura albiscapa	Grey Fantail	Generalist - insects					Х		
Rhipidura leucophrys	Willie Wagtail	Aerial forager		Х	Х	Х	Х	Х	1
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder						Х	
Smicrornis brevirostris	Weebill	Canopy feeder			Х	Х	Х	Х	10
Struthidea cinerea	Apostlebird	Ground forager - omnivorous							
Sturnus tristis	Common Myna	Generalist	Exotic						
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic						
Tachybaptus novaehollandiae	Australian Grebe	Water Bird							
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based							

						Rehabilit	ated Sites				
Species	Common Name	Guild	Notes	W04							
opener.	Common realing	Guild	201	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)		
Taeniopygia guttata	Zebra Finch	Ground forager - plant based			Х			×	, ,		
Threskiornis spinicollis	Straw-necked Ibis	Water Bird									
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous									
Turdus merula	Common Blackbird	Ground forager - omnivorous									
Turnix varia	Painted Button-quail	Ground forager - omnivorous									
Vanellis tricolor	Banded Lapwing	Ground forager - insects									
Vanellus miles	Masked Lapwing	Ground forager - insects									
Total number of species				11	9	15	17	20	21		

Table 30: Bird species and associated feeding guilds recorded at W05 in 2011 - 2015 in Spring

						Rehabilita	ated Sites		
Species	Common Name	Guild	Conservation status			W	05		
Species	Common Name	Guild	Conservation status	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder		Х	Х	X	X	X	1
Acanthiza apicalis	Inland Thornbill	Generalist - insects							
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects		Х		Х	Х	Х	3
Acanthiza nana	Yellow Thornbill	Canopy feeder							
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects							
Accipiter fasciatus	Brown Goshawk	Bird of Prey							
Anas gracilis	Grey Teal	Water Bird							
Anas superciliosa	Pacific Black Duck	Water Bird							
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects							
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous							
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder		Х			Х		
Aquila audax	Wedge-tailed Eagle	Bird of Prey							
Ardea pacifica	White-necked Heron	Ground forager - omnivorous							
Artamus superciliosus	White-browed Woodswallow	Generalist - insects							
Aythya australis	Hardhead	Water Bird							
Barnardius zonarius	Australian Ringneck	Generalist - plant based							
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based				Х			
Cacatua sanguinea	Little Corella	Ground forager - plant based		Х		Х			
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects							
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects					Х		
Chenonetta jubata	Australian Wood Duck	Water Bird							
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable – TSC Act						
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects		Х		Х	Х		
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects							
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects		Х		Х	Х	Х	
Corcorax melanoramphos	White-winged Chough	Ground forager - insects							
Corvus coronoides	Australian Raven	Generalist - carnivorous							1
Corvus mellori	Little Raven	Generalist - insects							
Corvus orru	Torresian Crow	Ground forager - omnivorous							
Coturnix ypsilophora	Brown Quail	Ground forager - plant based		Х		Х	Х		

						Rehabilit	ated Sites		
Species	Common Name	Guild	Conservation status			W	'05		
Ореспез	Common Name	Guild	Conscivation status	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous			Х		X	, ,	
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		Х	Х	Х	Х	Χ	6
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous							2
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous							
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder							
Egretta novaehollandiae	White-faced Heron	Water Bird							
Elanus axillaris	Black-shouldered Kite	Bird of Prey							
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects							
Eolophus roseicapillus	Galah	Ground forager - plant based							
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects							
Eurystomus orientalis	Dollarbird	Aerial forager							
Falco berigora	Brown Falcon	Bird of Prey							
Falco cenchroides	Nankeen Kestrel	Bird of Prey			Х			Х	
Falco longipennis	Australian Hobby	Bird of Prey							
Falco peregrinus	Peregrine Falcon	Bird of Prey							
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act						
Fulica atra	Eurasian Coot	Water Bird							
Geopelia striata	Peaceful Dove	Ground forager - plant based							
Gerygone fusca	Western Gerygone	Canopy feeder				Х			
Glossopsitta concinna	Musk Lorikeet	Canopy feeder							
Grallina cyanoleuca	Magpie-lark	Ground forager - insects							1
Haliastur sphenurus	Whistling Kite	Bird of Prey							
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act						
Hirundapus caudacutus	White-throated Needletail	Aerial forager							
Hirundo neoxena	Welcome Swallow	Generalist - insects							
Lalage sueurii	White-winged Triller	Aerial forager				Х		Х	
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder							
Lichenostomus virescens	Singing Honeyeater	Generalist		Х	Х	Х	Х	Х	2
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects		Х	Х	Х	Х		5
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		Х	Х	Х	Х	Х	4
Manorina melanocephala	Noisy Miner	Generalist						Х	
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects		Х					
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act						
Microeca fascinans	Jacky Winter	Ground forager - insects							

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					Rehabilitated Sites						
Species	Common Name	Guild	Conservation status			W	05				
Ореслез	Common varie	Guild	Conscivation states	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)		
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based				Ì					
Myiagra inquieta	Restless Flycatcher	Generalist - insects							1		
Neochmia modesta	Plum-headed Finch	Ground forager - plant based									
Northiella haematogaster	Blue Bonnet	Ground forager - plant based									
Nymphicus hollandicus	Cockatiel	Ground forager - plant based				Х					
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Х	Х	Х		×	3		
Pachycephala pectoralis	Golden Whistler	Generalist - insects							<u> </u>		
Pachycephala rufiventris	Rufous Whistler	Canopy feeder							1		
Pardalotus punctatus	Spotted Pardalote	Canopy feeder							<u> </u>		
Pardalotus striatus	Striated Pardalote	Canopy feeder				X					
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous									
Petrochelidon ariel	Fairy Martin	Aerial forager							I		
Petrochelidon nigricans	Tree Martin	Aerial forager									
Petroica goodenovii	Red-capped Robin	Ground forager - insects									
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based									
Philemon corniculatus	Noisy Friarbird	Canopy feeder									
Platycercus eximius	Eastern Rosella	Generalist - plant based			Х			Х			
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based									
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act								
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based						X			
Rhipidura albiscapa	Grey Fantail	Generalist - insects									
Rhipidura leucophrys	Willie Wagtail	Aerial forager		Х	Х	Х	Х	Х	2		
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder									
Smicrornis brevirostris	Weebill	Canopy feeder		Х	Х	Х	Х	Х	6		
Struthidea cinerea	Apostlebird	Ground forager - omnivorous									
Sturnus tristis	Common Myna	Generalist	Exotic								
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic								
Tachybaptus novaehollandiae	Australian Grebe	Water Bird									
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based									

						Rehabilit	ated Sites		
Species	Common Name	Guild	Conservation status			W	05		
5,2333				2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Taeniopygia guttata	Zebra Finch	Ground forager - plant based				Х		X	
Threskiornis spinicollis	Straw-necked Ibis	Water Bird							
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous							
Turdus merula	Common Blackbird	Ground forager - omnivorous					х		
Turnix varia	Painted Button-quail	Ground forager - omnivorous							
Vanellis tricolor	Banded Lapwing	Ground forager - insects							
Vanellus miles	Masked Lapwing	Ground forager - insects							
Total number of species	·	•	•	15	11	19	15	15	13

Table 31: Bird species and associated feeding guilds recorded at W06 in 2011 - 2015 in Spring

						Rehabilita	ated Sites		
Species	Common Name	Guild	Notes			W	06		
Opedies	Common Name	Guila	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder						Х	1
Acanthiza apicalis	Inland Thornbill	Generalist - insects							
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects							2
Acanthiza nana	Yellow Thornbill	Canopy feeder							
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects							
Accipiter fasciatus	Brown Goshawk	Bird of Prey					Х		
Anas gracilis	Grey Teal	Water Bird							
Anas superciliosa	Pacific Black Duck	Water Bird							
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects							1
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous							
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder							
Aquila audax	Wedge-tailed Eagle	Bird of Prey							
Ardea pacifica	White-necked Heron	Ground forager - omnivorous							
Artamus superciliosus	White-browed Woodswallow	Generalist - insects							
Aythya australis	Hardhead	Water Bird							
Barnardius zonarius	Australian Ringneck	Generalist - plant based							
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based							
Cacatua sanguinea	Little Corella	Ground forager - plant based				х		Х	
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects							
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects							
Chenonetta jubata	Australian Wood Duck	Water Bird							
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act						
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects							
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects		Х	Х	Х	Х		
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects					Х		1
Corcorax melanoramphos	White-winged Chough	Ground forager - insects							
Corvus coronoides	Australian Raven	Generalist - carnivorous							
Corvus mellori	Little Raven	Generalist - insects							
Corvus orru	Torresian Crow	Ground forager - omnivorous							
Coturnix ypsilophora	Brown Quail	Ground forager - plant based		Х	Х				

						Rehabilita	ated Sites		
Species	Common Name	Guild	Notes			W	06		
Species	Common Name	Guilu	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous		Х		,	X	,	,
Cracticus tibicen	Australian Magpie	Generalist - carnivorous				Х	Х	Х	20
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous							
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous							
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder							
Egretta novaehollandiae	White-faced Heron	Water Bird							
Elanus axillaris	Black-shouldered Kite	Bird of Prey		Х	Х	Х	Х		
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects							
Eolophus roseicapillus	Galah	Ground forager - plant based				Х	Х		1
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects							
Eurystomus orientalis	Dollarbird	Aerial forager							
Falco berigora	Brown Falcon	Bird of Prey							
Falco cenchroides	Nankeen Kestrel	Bird of Prey		Х			Х	Х	1
Falco longipennis	Australian Hobby	Bird of Prey		Х	Х				
Falco peregrinus	Peregrine Falcon	Bird of Prey		Х					
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act						
Fulica atra	Eurasian Coot	Water Bird							
Geopelia striata	Peaceful Dove	Ground forager - plant based							
Gerygone fusca	Western Gerygone	Canopy feeder							
Glossopsitta concinna	Musk Lorikeet	Canopy feeder							
Grallina cyanoleuca	Magpie-lark	Ground forager - insects				Х			2
Haliastur sphenurus	Whistling Kite	Bird of Prey							
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act						
Hirundapus caudacutus	White-throated Needletail	Aerial forager		Х					
Hirundo neoxena	Welcome Swallow	Generalist - insects							
Lalage sueurii	White-winged Triller	Aerial forager							
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder							
Lichenostomus virescens	Singing Honeyeater	Generalist				Х		Х	
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects				Х	Х	Х	3
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		Х	Х	Х	Х	Х	2
Manorina melanocephala	Noisy Miner	Generalist							
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects		Х	Х		Х		
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act						
Microeca fascinans	Jacky Winter	Ground forager - insects							

				Rehabilitated Sites						
Species	Common Name	Guild	Notes			W	/06			
Оресіез	Common Name	Guild	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)	
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based				, ,	` ' '	, ,		
Myiagra inquieta	Restless Flycatcher	Generalist - insects							1	
Neochmia modesta	Plum-headed Finch	Ground forager - plant based								
Northiella haematogaster	Blue Bonnet	Ground forager - plant based								
Nymphicus hollandicus	Cockatiel	Ground forager - plant based								
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based							2	
Pachycephala pectoralis	Golden Whistler	Generalist - insects								
Pachycephala rufiventris	Rufous Whistler	Canopy feeder								
Pardalotus punctatus	Spotted Pardalote	Canopy feeder								
Pardalotus striatus	Striated Pardalote	Canopy feeder								
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous								
Petrochelidon ariel	Fairy Martin	Aerial forager				Х		Х		
Petrochelidon nigricans	Tree Martin	Aerial forager				Х				
Petroica goodenovii	Red-capped Robin	Ground forager - insects								
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based								
Philemon corniculatus	Noisy Friarbird	Canopy feeder								
Platycercus eximius	Eastern Rosella	Generalist - plant based								
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based								
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TCS Act							
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based								
Rhipidura albiscapa	Grey Fantail	Generalist - insects								
Rhipidura leucophrys	Willie Wagtail	Aerial forager					Х			
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder								
Smicrornis brevirostris	Weebill	Canopy feeder						Х	6	
Struthidea cinerea	Apostlebird	Ground forager - omnivorous								
Sturnus tristis	Common Myna	Generalist	Exotic							
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic	Х						
Tachybaptus novaehollandiae	Australian Grebe	Water Bird								
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based								

						Rehabilit	ated Sites					
Species	Common Name	Guild	Notes		W06							
.,				2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)			
Taeniopygia guttata	Zebra Finch	Ground forager - plant based				Х						
Threskiornis spinicollis	Straw-necked Ibis	Water Bird										
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous										
Turdus merula	Common Blackbird	Ground forager - omnivorous										
Turnix varia	Painted Button-quail	Ground forager - omnivorous										
Vanellis tricolor	Banded Lapwing	Ground forager - insects										
Vanellus miles	Masked Lapwing	Ground forager - insects										
Total number of species				11	6	12	12	9	13			

Table 32: Bird species and associated feeding guilds recorded at W07 in 2011 - 2015 in Spring

						Rehabilita	ated Sites		
Species	Common Name	Guild	Notes			W	'07		
Ореспез	Common Name	Guild	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder				Х		Х	1
Acanthiza apicalis	Inland Thornbill	Generalist - insects							
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects							
Acanthiza nana	Yellow Thornbill	Canopy feeder							
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects							
Accipiter fasciatus	Brown Goshawk	Bird of Prey							
Anas gracilis	Grey Teal	Water Bird							
Anas superciliosa	Pacific Black Duck	Water Bird							
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects						Х	
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous							
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder							
Aquila audax	Wedge-tailed Eagle	Bird of Prey							
Ardea pacifica	White-necked Heron	Ground forager - omnivorous							
Artamus superciliosus	White-browed Woodswallow	Generalist - insects							
Aythya australis	Hardhead	Water Bird							
Barnardius zonarius	Australian Ringneck	Generalist - plant based							
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based							
Cacatua sanguinea	Little Corella	Ground forager - plant based						Х	
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects							
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects					Х		
Chenonetta jubata	Australian Wood Duck	Water Bird							
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act						
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects							
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects		Χ		Х	Х		
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects						Х	
Corcorax melanoramphos	White-winged Chough	Ground forager - insects							
Corvus coronoides	Australian Raven	Generalist - carnivorous							
Corvus mellori	Little Raven	Generalist - insects							
Corvus orru	Torresian Crow	Ground forager - omnivorous							
Coturnix ypsilophora	Brown Quail	Ground forager - plant based		Х	Х	Х			

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						Rehabilita	ated Sites		
Species	Common Name	Guild	Notes			W	07		
Ореспез	Common Name	Guild	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous						X	` ′
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		Χ			Х		20
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous							
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous							
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder							
Egretta novaehollandiae	White-faced Heron	Water Bird							
Elanus axillaris	Black-shouldered Kite	Bird of Prey			Х		Х		
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects							
Eolophus roseicapillus	Galah	Ground forager - plant based							
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects							
Eurystomus orientalis	Dollarbird	Aerial forager							
Falco berigora	Brown Falcon	Bird of Prey							
Falco cenchroides	Nankeen Kestrel	Bird of Prey		Χ	Х	Х	Х		
Falco longipennis	Australian Hobby	Bird of Prey				Х			
Falco peregrinus	Peregrine Falcon	Bird of Prey							
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act						
Fulica atra	Eurasian Coot	Water Bird							
Geopelia striata	Peaceful Dove	Ground forager - plant based							
Gerygone fusca	Western Gerygone	Canopy feeder							
Glossopsitta concinna	Musk Lorikeet	Canopy feeder							
Grallina cyanoleuca	Magpie-lark	Ground forager - insects							2
Haliastur sphenurus	Whistling Kite	Bird of Prey							
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act						
Hirundapus caudacutus	White-throated Needletail	Aerial forager							
Hirundo neoxena	Welcome Swallow	Generalist - insects							
Lalage sueurii	White-winged Triller	Aerial forager							
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder							
Lichenostomus virescens	Singing Honeyeater	Generalist							1
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects			Х		Х	Х	2
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		Х	Х	Х	Х	Х	5
Manorina melanocephala	Noisy Miner	Generalist							-
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects		Х					
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act						
Microeca fascinans	Jacky Winter	Ground forager - insects							

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						Rehabilita	ated Sites		
Species	Common Name	Guild	Notes			W	07		
Оресіез	Common Name	Guild	Notes	2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based							1
Myiagra inquieta	Restless Flycatcher	Generalist - insects							
Neochmia modesta	Plum-headed Finch	Ground forager - plant based							
Northiella haematogaster	Blue Bonnet	Ground forager - plant based							
Nymphicus hollandicus	Cockatiel	Ground forager - plant based							
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based							4
Pachycephala pectoralis	Golden Whistler	Generalist - insects							
Pachycephala rufiventris	Rufous Whistler	Canopy feeder							
Pardalotus punctatus	Spotted Pardalote	Canopy feeder							
Pardalotus striatus	Striated Pardalote	Canopy feeder							
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous							
Petrochelidon ariel	Fairy Martin	Aerial forager							
Petrochelidon nigricans	Tree Martin	Aerial forager							
Petroica goodenovii	Red-capped Robin	Ground forager - insects							
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based							
Philemon corniculatus	Noisy Friarbird	Canopy feeder							
Platycercus eximius	Eastern Rosella	Generalist - plant based							
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based							
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act						
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based							3
Rhipidura albiscapa	Grey Fantail	Generalist - insects							
Rhipidura leucophrys	Willie Wagtail	Aerial forager					Х		
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder							
Smicrornis brevirostris	Weebill	Canopy feeder				Х	Х		2
Struthidea cinerea	Apostlebird	Ground forager - omnivorous							
Sturnus tristis	Common Myna	Generalist	Exotic						
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic						
Tachybaptus novaehollandiae	Australian Grebe	Water Bird							
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based							

						Rehabilita	ated Sites				
Species	Common Name	Guild	Notes		W07						
5,23.22				2011	2012	2013 (Oct)	2013 (Sept)	2014 (Nov)	2015 (Oct)		
Taeniopygia guttata	Zebra Finch	Ground forager - plant based			Х	Х		X			
Threskiornis spinicollis	Straw-necked Ibis	Water Bird									
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous									
Turdus merula	Common Blackbird	Ground forager - omnivorous									
Turnix varia	Painted Button-quail	Ground forager - omnivorous									
Vanellis tricolor	Banded Lapwing	Ground forager - insects									
Vanellus miles	Masked Lapwing	Ground forager - insects									
Total number of species				6	6	8	9	8	10		

Table 33: Bird species and associated feeding guilds recorded opportunistically in 2011 - 2015 in Spring

Species	Common Name	Guild	Notes	Opportunistic						
Species	Common Name	Guild	Notes	2012	2013 (Oct)	2014 (Nov)	2013 (Sept)	2015 (Oct)		
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder								
Acanthiza apicalis	Inland Thornbill	Generalist - insects								
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects								
Acanthiza nana	Yellow Thornbill	Canopy feeder								
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects								
Accipiter fasciatus	Brown Goshawk	Bird of Prey				х				
Anas gracilis	Grey Teal	Water Bird		Х						
Anas superciliosa	Pacific Black Duck	Water Bird		Х	х		х			
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects			х		х			
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous								
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder								
Aquila audax	Wedge-tailed Eagle	Bird of Prey		Х						
Ardea pacifica	White-necked Heron	Ground forager - omnivorous				х		Х		
Artamus superciliosus	White-browed Woodswallow	Generalist - insects								
Aythya australis	Hardhead	Water Bird		Х						
Barnardius zonarius	Australian Ringneck	Generalist - plant based								
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based		Х			х			
Cacatua sanguinea	Little Corella	Ground forager - plant based					х			
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects								
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects								
Chenonetta jubata	Australian Wood Duck	Water Bird								
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act							
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects								
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects								
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects								
Corcorax melanoramphos	White-winged Chough	Ground forager - insects								
Corvus coronoides	Australian Raven	Generalist - carnivorous								
Corvus mellori	Little Raven	Generalist - insects				х				
Corvus orru	Torresian Crow	Ground forager - omnivorous						Х		
Coturnix ypsilophora	Brown Quail	Ground forager - plant based								
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous								
Cracticus tibicen	Australian Magpie	Generalist - carnivorous								
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous								
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous								
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder								

Cnasica	Commercial Names	C!.4	Notes	Opportunistic						
Species	Common Name	Guild	Notes	2012	2013 (Oct)	2014 (Nov)	2013 (Sept)	2015 (Oct)		
Egretta novaehollandiae	White-faced Heron	Water Bird		Х		х				
Elanus axillaris	Black-shouldered Kite	Bird of Prey								
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects				х				
Eolophus roseicapillus	Galah	Ground forager - plant based								
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects								
Eurystomus orientalis	Dollarbird	Aerial forager								
Falco berigora	Brown Falcon	Bird of Prey								
Falco cenchroides	Nankeen Kestrel	Bird of Prey								
Falco longipennis	Australian Hobby	Bird of Prey								
Falco peregrinus	Peregrine Falcon	Bird of Prey								
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act							
Fulica atra	Eurasian Coot	Water Bird			Х		Х			
Geopelia striata	Peaceful Dove	Ground forager - plant based								
Gerygone fusca	Western Gerygone	Canopy feeder								
Glossopsitta concinna	Musk Lorikeet	Canopy feeder				Х	Х			
Grallina cyanoleuca	Magpie-lark	Ground forager - insects								
Haliastur sphenurus	Whistling Kite	Bird of Prey					Х	Х		
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act							
Hirundapus caudacutus	White-throated Needletail	Aerial forager								
Hirundo neoxena	Welcome Swallow	Generalist - insects								
Lalage sueurii	White-winged Triller	Aerial forager								
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder								
Lichenostomus virescens	Singing Honeyeater	Generalist								
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects								
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects								
Manorina melanocephala	Noisy Miner	Generalist								
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects								
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act							
Microeca fascinans	Jacky Winter	Ground forager - insects								
Mirafra javanica	Horsfield's Bushlark	Generalist - plant based								
Myiagra inquieta	Restless Flycatcher	Generalist - insects								
Neochmia modesta	Plum-headed Finch	Ground forager - plant based								
Northiella haematogaster	Blue Bonnet	Ground forager - plant based								
Nymphicus hollandicus	Cockatiel	Ground forager - plant based								
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based								
Pachycephala pectoralis	Golden Whistler	Generalist - insects								
Pachycephala rufiventris	Rufous Whistler	Canopy feeder								

Chanian	Common Name	Guild	Notes	Орр				
Species	Common Name	Guild	notes	2012	2013 (Oct)	2014 (Nov)	2013 (Sept)	2015 (Oct)
Pardalotus punctatus	Spotted Pardalote	Canopy feeder						
Pardalotus striatus	Striated Pardalote	Canopy feeder						
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous						Х
Petrochelidon ariel	Fairy Martin	Aerial forager						
Petrochelidon nigricans	Tree Martin	Aerial forager						
Petroica goodenovii	Red-capped Robin	Ground forager - insects						
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based						
Philemon corniculatus	Noisy Friarbird	Canopy feeder						Х
Platycercus eximius	Eastern Rosella	Generalist - plant based						
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based						
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act					
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based						
Rhipidura albiscapa	Grey Fantail	Generalist - insects						
Rhipidura leucophrys	Willie Wagtail	Aerial forager						
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder						
Smicrornis brevirostris	Weebill	Canopy feeder						
Struthidea cinerea	Apostlebird	Ground forager - omnivorous						
Sturnus tristis	Common Myna	Generalist	Exotic					Х
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic		Х			
Tachybaptus novaehollandiae	Australian Grebe	Water Bird		Х			Х	
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based						
Taeniopygia guttata	Zebra Finch	Ground forager - plant based						
Threskiornis spinicollis	Straw-necked Ibis	Water Bird		Х				Х
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous						
Turdus merula	Common Blackbird	Ground forager - omnivorous						
Turnix varia	Painted Button-quail	Ground forager - omnivorous						
Vanellis tricolor	Banded Lapwing	Ground forager - insects					Х	Х
Vanellus miles	Masked Lapwing	Ground forager - insects						Х
Total number of species	-	•		8	4	6	9	9

Table 34: Bird species and associated feeding guilds recorded at sites WC02 and WC01 in 2011 - 2015 in Winter

				Reference sites					
Species	Common Name	Guild	Notes	W	C01	W	002		
Special				2014 (Aug)	2015 (Jul)	2014 (Aug)	2015 (Aug)		
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder				Χ	2		
Acanthiza apicalis	Inland Thornbill	Generalist - insects				Х	1		
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects				Х	12		
Acanthiza nana	Yellow Thornbill	Canopy feeder					4		
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects				Х	2		
Accipiter fasciatus	Brown Goshawk	Bird of Prey							
Anas gracilis	Grey Teal	Water Bird							
Anas superciliosa	Pacific Black Duck	Water Bird							
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects							
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous							
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder							
Aquila audax	Wedge-tailed Eagle	Bird of Prey							
Ardea pacifica	White-necked Heron	Ground forager - omnivorous							
Artamus superciliosus	White-browed Woodswallow	Generalist - insects							
Aythya australis	Hardhead	Water Bird							
Barnardius zonarius	Australian Ringneck	Generalist - plant based				Х	2		
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based		Х					
Cacatua sanguinea	Little Corella	Ground forager - plant based							
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects				Х			
Cacomantis pallidus	Pallid Cuckoo	Generalist - insects					2		
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects					2		
Chenonetta jubata	Australian Wood Duck	Water Bird		Х	2	Х	1		
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act			Х	4		
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects				Х			
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects							
Coracina maxima	Ground Cuckoo-shrike	Ground forager - omnivorous					2		

					Reference	ce sites	
Species	Common Name	Guild	Notes	W	/C01	WC	002
Сробос	Sommon rading	Gama	110.00	2014 (Aug)	2015 (Jul)	2014 (Aug)	2015 (Aug)
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects		Χ	1	Χ	4
Corcorax melanoramphos	White-winged Chough	Ground forager - insects		Х	15	Х	
Corvus coronoides	Australian Raven	Generalist - carnivorous		Χ	1	Χ	2
Corvus mellori	Little Raven	Generalist - insects					
Corvus orru	Torresian Crow	Ground forager - omnivorous					
Coturnix ypsilophora	Brown Quail	Ground forager - plant based					
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous		Х	2	Х	1
Cracticus tibicen	Australian Magpie	Generalist - carnivorous			2		3
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous		Х	2		
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous				Х	
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder					
Egretta novaehollandiae	White-faced Heron	Water Bird					
Elanus axillaris	Black-shouldered Kite	Bird of Prey					
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects					
Eolophus roseicapillus	Galah	Ground forager - plant based		Х	7	Х	2
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects				Х	2
Eurystomus orientalis	Dollarbird	Aerial forager					
Falco berigora	Brown Falcon	Bird of Prey					
Falco cenchroides	Nankeen Kestrel	Bird of Prey					
Falco longipennis	Australian Hobby	Bird of Prey		Х		Х	1
Falco peregrinus	Peregrine Falcon	Bird of Prey					
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act				1
Fulica atra	Eurasian Coot	Water Bird					
Geopelia striata	Peaceful Dove	Ground forager - plant based					
Gerygone fusca	Western Gerygone	Canopy feeder				Χ	
Glossopsitta concinna	Musk Lorikeet	Canopy feeder			2		
Grallina cyanoleuca	Magpie-lark	Ground forager - insects		Х		Х	1

					Reference	ce sites	
Species	Common Name	Guild	Notes	W	/C01	W	002
Срозис		- Cana		X 20 X X 1 X 4	2014 (Aug)	2015 (Aug)	
Haliastur sphenurus	Whistling Kite	Bird of Prey					
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act				
Hirundapus caudacutus	White-throated Needletail	Aerial forager					
Hirundo neoxena	Welcome Swallow	Generalist - insects					
Lalage sueurii	White-winged Triller	Aerial forager				Х	
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder				Х	8
Lichenostomus virescens	Singing Honeyeater	Generalist					
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects				Х	8
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects					
Manorina flavigula	Yellow-throated Miner	Generalist					10
Manorina melanocephala	Noisy Miner	Generalist		Х	20	Х	8
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects					
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act			Х	3
Microeca fascinans	Jacky Winter	Ground forager - insects				Х	2
Myiagra inquieta	Restless Flycatcher	Generalist - insects					1
Neochmia modesta	Plum-headed Finch	Ground forager - plant based					
Northiella haematogaster	Blue Bonnet	Ground forager - plant based		Х		Х	2
Nymphicus hollandicus	Cockatiel	Ground forager - plant based		Х	1	Х	
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Х	4	Х	
Pachycephala pectoralis	Golden Whistler	Generalist - insects				Х	1
Pachycephala rufiventris	Rufous Whistler	Canopy feeder				Х	
Pardalotus punctatus	Spotted Pardalote	Canopy feeder				Х	5
Pardalotus striatus	Striated Pardalote	Canopy feeder		Х			
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous					
Petrochelidon ariel	Fairy Martin	Aerial forager					
Petrochelidon nigricans	Tree Martin	Aerial forager					
Petroica boodang	Scarlet Robin	Ground forager - insects					

					Reference	ce sites	
Species	Common Name	Guild	Notes	W	'C01	WC	02
Сресос		55	7,000	2014 (Aug)	2015 (Jul)	Ce sites WC 2014 (Aug) X X X X X X X X X X X X X	2015 (Aug)
Petroica goodenovii	Red-capped Robin	Ground forager - insects				Х	2
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based				Х	
Philemon corniculatus	Noisy Friarbird	Canopy feeder				Х	
Platycercus eximius	Eastern Rosella	Generalist - plant based		Х	7	Х	1
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based				Х	
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act	Х	17		
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based			2	Х	2
Rhipidura albiscapa	Grey Fantail	Generalist - insects				Х	
Rhipidura leucophrys	Willie Wagtail	Aerial forager				Х	
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder					
Smicrornis brevirostris	Weebill	Canopy feeder				Х	6
Struthidea cinerea	Apostlebird	Ground forager - omnivorous		Х	10	Х	10
Sturnus tristis	Common Myna	Generalist	Exotic			Х	
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic	Х	1	Х	1
Tachybaptus novaehollandiae	Australian Grebe	Water Bird					
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based				Х	10
Taeniopygia guttata	Zebra Finch	Ground forager - plant based					
Threskiornis spinicollis	Straw-necked Ibis	Water Bird					
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous					
Turdus merula	Common Blackbird	Ground forager - omnivorous					
Turnix varia	Painted Button-quail	Ground forager - omnivorous					
Vanellis tricolor	Banded Lapwing	Ground forager - insects					
Total number of species		•		19	17	44	37

Table 35: Bird species and associated feeding guilds recorded at sites WC02 and WC01 in 2011 - 2015 in Winter

					Rehabilita	ted Sites	
Species	Common Name	Guild	Notes	W	/04	٧	/05
				2014 (Aug)	2015 (Jul)	2014 (Aug)	2015 (Jul)
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder		Χ	2	Χ	1
Acanthiza apicalis	Inland Thornbill	Generalist - insects					
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects		Χ	8	Χ	10
Acanthiza nana	Yellow Thornbill	Canopy feeder					
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects					
Accipiter fasciatus	Brown Goshawk	Bird of Prey					
Anas gracilis	Grey Teal	Water Bird					
Anas superciliosa	Pacific Black Duck	Water Bird					
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects					
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous					
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder					
Aquila audax	Wedge-tailed Eagle	Bird of Prey					
Ardea pacifica	White-necked Heron	Ground forager - omnivorous					
Artamus superciliosus	White-browed Woodswallow	Generalist - insects					
Aythya australis	Hardhead	Water Bird					
Barnardius zonarius	Australian Ringneck	Generalist - plant based		Х		Χ	2
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based					
Cacatua sanguinea	Little Corella	Ground forager - plant based					
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects		Х			
Cacomantis pallidus	Pallid Cuckoo	Generalist - insects					
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects					
Chenonetta jubata	Australian Wood Duck	Water Bird					
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act				
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects					
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects					
Coracina maxima	Ground Cuckoo-shrike	Ground forager - omnivorous					
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects					
Corcorax melanoramphos	White-winged Chough	Ground forager - insects					
Corvus coronoides	Australian Raven	Generalist - carnivorous				Χ	

					Rehabilita	ted Sites	
Species	Common Name	Guild	Notes	٧	V04	V	V05
				2014 (Aug)	2015 (Jul)	2014 (Aug)	2015 (Jul)
Corvus mellori	Little Raven	Generalist - insects					
Corvus orru	Torresian Crow	Ground forager - omnivorous					
Coturnix ypsilophora	Brown Quail	Ground forager - plant based		Χ			
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous				Χ	1
Cracticus tibicen	Australian Magpie	Generalist - carnivorous					
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous					
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous					
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder					
Egretta novaehollandiae	White-faced Heron	Water Bird					
Elanus axillaris	Black-shouldered Kite	Bird of Prey		Χ	1		1
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects					
Eolophus roseicapillus	Galah	Ground forager - plant based		Χ		Χ	
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects					
Eurystomus orientalis	Dollarbird	Aerial forager					
Falco berigora	Brown Falcon	Bird of Prey					
Falco cenchroides	Nankeen Kestrel	Bird of Prey		Χ			
Falco longipennis	Australian Hobby	Bird of Prey					
Falco peregrinus	Peregrine Falcon	Bird of Prey					
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act				
Fulica atra	Eurasian Coot	Water Bird					
Geopelia striata	Peaceful Dove	Ground forager - plant based					
Gerygone fusca	Western Gerygone	Canopy feeder		Χ			1
Glossopsitta concinna	Musk Lorikeet	Canopy feeder					
Grallina cyanoleuca	Magpie-lark	Ground forager - insects		Χ			
Haliastur sphenurus	Whistling Kite	Bird of Prey					
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act				
Hirundapus caudacutus	White-throated Needletail	Aerial forager					
Hirundo neoxena	Welcome Swallow	Generalist - insects					
Lalage sueurii	White-winged Triller	Aerial forager		Х		Х	
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder					
Lichenostomus virescens	Singing Honeyeater	Generalist		Χ	3	Χ	2

					Rehabilita	ted Sites	
Species	Common Name	Guild	Notes	V	/04	V	V05
				2014 (Aug)	2015 (Jul)	2014 (Aug)	2015 (Jul)
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects		Χ	5	Χ	3
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		Χ	5	Χ	5
Manorina flavigula	Yellow-throated Miner	Generalist					
Manorina melanocephala	Noisy Miner	Generalist			10		2
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects					
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act				
Microeca fascinans	Jacky Winter	Ground forager - insects					
Myiagra inquieta	Restless Flycatcher	Generalist - insects					
Neochmia modesta	Plum-headed Finch	Ground forager - plant based					
Northiella haematogaster	Blue Bonnet	Ground forager - plant based					
Nymphicus hollandicus	Cockatiel	Ground forager - plant based					
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Χ		Х	
Pachycephala pectoralis	Golden Whistler	Generalist - insects		Χ			
Pachycephala rufiventris	Rufous Whistler	Canopy feeder					
Pardalotus punctatus	Spotted Pardalote	Canopy feeder		Χ			
Pardalotus striatus	Striated Pardalote	Canopy feeder		Χ			
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous					
Petrochelidon ariel	Fairy Martin	Aerial forager					
Petrochelidon nigricans	Tree Martin	Aerial forager					
Petroica boodang	Scarlet Robin	Ground forager - insects					1
Petroica goodenovii	Red-capped Robin	Ground forager - insects					
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based					
Philemon corniculatus	Noisy Friarbird	Canopy feeder					
Platycercus eximius	Eastern Rosella	Generalist - plant based		Χ	2	Х	4
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based					
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act				
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based					
Rhipidura albiscapa	Grey Fantail	Generalist - insects			1		1
Rhipidura leucophrys	Willie Wagtail	Aerial forager			3		1
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder					
Smicrornis brevirostris	Weebill	Canopy feeder		Χ	4	Χ	4

					Rehabilita	ited Sites	
Species	Common Name	Guild	Notes	W	/04	W	/05
				2014 (Aug)	2015 (Jul)	2014 (Aug)	2015 (Jul)
Struthidea cinerea	Apostlebird	Ground forager - omnivorous					
Sturnus tristis	Common Myna	Generalist	Exotic				
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic				
Tachybaptus novaehollandiae	Australian Grebe	Water Bird					
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based					
Taeniopygia guttata	Zebra Finch	Ground forager - plant based		Х		Χ	
Threskiornis spinicollis	Straw-necked Ibis	Water Bird					
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous					
Turdus merula	Common Blackbird	Ground forager - omnivorous					
Turnix varia	Painted Button-quail	Ground forager - omnivorous					
Vanellis tricolor	Banded Lapwing	Ground forager - insects					
Total number of species				21	11	14	15

Table 36: Bird species and associated feeding guilds recorded at sites WC06, WC07 and opportunistically in 2014 and 2015 in Winter

					Rehabilit	ated Sites	3	0	4
Species	Common Name	Guild	Notes	W	′06	W	07	Oppor	tunistic
·				2014	2015	2014	2015	2014	2015
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder		Х		Х			
Acanthiza apicalis	Inland Thornbill	Generalist - insects							
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects							
Acanthiza nana	Yellow Thornbill	Canopy feeder							
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects							
Accipiter fasciatus	Brown Goshawk	Bird of Prey							
Anas gracilis	Grey Teal	Water Bird							
Anas superciliosa	Pacific Black Duck	Water Bird						Х	
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects		Х		Х			
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous							
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder							
Aquila audax	Wedge-tailed Eagle	Bird of Prey							
Ardea pacifica	White-necked Heron	Ground forager - omnivorous							
Artamus superciliosus	White-browed Woodswallow	Generalist - insects							
Aythya australis	Hardhead	Water Bird							
Barnardius zonarius	Australian Ringneck	Generalist - plant based							
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based							
Cacatua sanguinea	Little Corella	Ground forager - plant based							
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects							
Cacomantis pallidus	Pallid Cuckoo	Generalist - insects							
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects							
Chenonetta jubata	Australian Wood Duck	Water Bird							
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act						
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects							
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects							
Coracina maxima	Ground Cuckoo-shrike	Ground forager - omnivorous							
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects					3		
Corcorax melanoramphos	White-winged Chough	Ground forager - insects							
Corvus coronoides	Australian Raven	Generalist - carnivorous			4				
Corvus mellori	Little Raven	Generalist - insects						Х	Х
Corvus orru	Torresian Crow	Ground forager - omnivorous						Х	
Coturnix ypsilophora	Brown Quail	Ground forager - plant based			1	Х			

					Rehabilita	ated Sites	<u> </u>	0	4 ! - 4! -
Species	Common Name	Guild	Notes	W	06	W	07	Oppor	tunistic
				2014	2015	2014	2015	2014	2015
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous					4		
Cracticus tibicen	Australian Magpie	Generalist - carnivorous			15		20		
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous							
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous							
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder							
Egretta novaehollandiae	White-faced Heron	Water Bird						X	
Elanus axillaris	Black-shouldered Kite	Bird of Prey			1				
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects							
Eolophus roseicapillus	Galah	Ground forager - plant based		Х		Х			
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects							
Eurystomus orientalis	Dollarbird	Aerial forager							
Falco berigora	Brown Falcon	Bird of Prey							
Falco cenchroides	Nankeen Kestrel	Bird of Prey		Х	1				
Falco longipennis	Australian Hobby	Bird of Prey				Х			
Falco peregrinus	Peregrine Falcon	Bird of Prey							
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act	Х					
Fulica atra	Eurasian Coot	Water Bird							
Geopelia striata	Peaceful Dove	Ground forager - plant based							
Gerygone fusca	Western Gerygone	Canopy feeder							
Glossopsitta concinna	Musk Lorikeet	Canopy feeder						Х	
Grallina cyanoleuca	Magpie-lark	Ground forager - insects							
Haliastur sphenurus	Whistling Kite	Bird of Prey				Х			
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act						
Hirundapus caudacutus	White-throated Needletail	Aerial forager							
Hirundo neoxena	Welcome Swallow	Generalist - insects							
Lalage sueurii	White-winged Triller	Aerial forager							
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder							
Lichenostomus virescens	Singing Honeyeater	Generalist		Х		Х			
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects		Х	4		5		
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		Х	6	Х	2		
Manorina flavigula	Yellow-throated Miner	Generalist							
Manorina melanocephala	Noisy Miner	Generalist							
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects					_		

					Rehabilita	ated Sites	3	Onnor	tunistic
Species	Common Name	Guild	Notes	W	06	W	07	Оррог	lumsuc
				2014	2015	2014	2015	2014	2015
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act						
Microeca fascinans	Jacky Winter	Ground forager - insects							
Myiagra inquieta	Restless Flycatcher	Generalist - insects							
Neochmia modesta	Plum-headed Finch	Ground forager - plant based							
Northiella haematogaster	Blue Bonnet	Ground forager - plant based							
Nymphicus hollandicus	Cockatiel	Ground forager - plant based							
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		Х	1				
Pachycephala pectoralis	Golden Whistler	Generalist - insects							
Pachycephala rufiventris	Rufous Whistler	Canopy feeder							
Pardalotus punctatus	Spotted Pardalote	Canopy feeder							
Pardalotus striatus	Striated Pardalote	Canopy feeder							
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous						Х	
Petrochelidon ariel	Fairy Martin	Aerial forager							
Petrochelidon nigricans	Tree Martin	Aerial forager							
Petroica boodang	Scarlet Robin	Ground forager - insects							
Petroica goodenovii	Red-capped Robin	Ground forager - insects							
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based							
Philemon corniculatus	Noisy Friarbird	Canopy feeder							
Platycercus eximius	Eastern Rosella	Generalist - plant based							
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based							
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act						
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based			2				
Rhipidura albiscapa	Grey Fantail	Generalist - insects							
Rhipidura leucophrys	Willie Wagtail	Aerial forager			1				
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder							
Smicrornis brevirostris	Weebill	Canopy feeder		Х	2	Х			
Struthidea cinerea	Apostlebird	Ground forager - omnivorous							
Sturnus tristis	Common Myna	Generalist	Exotic						
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic						
Tachybaptus novaehollandiae	Australian Grebe	Water Bird							
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based							
Taeniopygia guttata	Zebra Finch	Ground forager - plant based				Х			
Threskiornis spinicollis	Straw-necked Ibis	Water Bird							

					Rehabilita	ated Sites	ted Sites		tunistic
Species	Common Name	Guild	Notes	W	06	W	07	Оррог	lullistic
				2014	2015	2014	2015	2014	2015
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous							
Turdus merula	Common Blackbird	Ground forager - omnivorous							
Turnix varia	Painted Button-quail	Ground forager - omnivorous							
Vanellis tricolor	Banded Lapwing	Ground forager - insects							
Total number of species				10	11	10	5	6	1

Table 37: Bird species and associated feeding guilds recorded at sites W01, W02, W04 and W05 in 2014 and 2015 in Autumn

				Referer	nce site	Rehabilit	ated sites
Species	Common Name	Guild	Notes	W01	W02	W04	W05
				20	15	W04	15
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder			1	2	1
Acanthiza apicalis	Inland Thornbill	Generalist - insects			3		
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects			8	10	10
Acanthiza nana	Yellow Thornbill	Canopy feeder			6		
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects			3		
Accipiter fasciatus	Brown Goshawk	Bird of Prey					
Anas gracilis	Grey Teal	Water Bird					
Anas superciliosa	Pacific Black Duck	Water Bird					
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects					
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous			2		
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder					
Aquila audax	Wedge-tailed Eagle	Bird of Prey					
Ardea pacifica	White-necked Heron	Ground forager - omnivorous					
Artamus superciliosus	White-browed Woodswallow	Generalist - insects					
Aythya australis	Hardhead	Water Bird					
Barnardius zonarius	Australian Ringneck	Generalist - plant based					
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based					
Cacatua sanguinea	Little Corella	Ground forager - plant based					
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects					
Cacomantis pallidus	Pallid Cuckoo	Generalist - insects				1	
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects					
Chenonetta jubata	Australian Wood Duck	Water Bird					
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act		2		
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects					
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects					
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects		4	2	6	1
Corcorax melanoramphos	White-winged Chough	Ground forager - insects		6	10	10	
Corvus coronoides	Australian Raven	Generalist - carnivorous		2	2	1	
Corvus mellori	Little Raven	Generalist - insects					
Corvus orru	Torresian Crow	Ground forager - omnivorous					

				Referer	nce site	Rehabilit	ated sites
Species	Common Name	Guild	Notes	W01	W02	W04	W05
				20	15	20	15
Coturnix ypsilophora	Brown Quail	Ground forager - plant based					
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous		2	1	3	
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		6	5	2	3
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous		2	2		1
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous					
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder					
Egretta novaehollandiae	White-faced Heron	Water Bird					
Elanus axillaris	Black-shouldered Kite	Bird of Prey					
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects				2	
Eolophus roseicapillus	Galah	Ground forager - plant based		8	8		
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects			2		
Eurystomus orientalis	Dollarbird	Aerial forager					
Falco berigora	Brown Falcon	Bird of Prey					
Falco cenchroides	Nankeen Kestrel	Bird of Prey		1			2
Falco longipennis	Australian Hobby	Bird of Prey		1			1
Falco peregrinus	Peregrine Falcon	Bird of Prey				1	1
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act				
Fulica atra	Eurasian Coot	Water Bird					
Geopelia striata	Peaceful Dove	Ground forager - plant based			1		
Gerygone fusca	Western Gerygone	Canopy feeder					2
Glossopsitta concinna	Musk Lorikeet	Canopy feeder					
Grallina cyanoleuca	Magpie-lark	Ground forager - insects		2	2		
Haliastur sphenurus	Whistling Kite	Bird of Prey					
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act	1			
Hirundapus caudacutus	White-throated Needletail	Aerial forager					
Hirundo neoxena	Welcome Swallow	Generalist - insects					1
Lalage sueurii	White-winged Triller	Aerial forager					
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder			6		
Lichenostomus virescens	Singing Honeyeater	Generalist				2	3
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects			9	4	4
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects				12	8
Manorina melanocephala	Noisy Miner	Generalist		15	5	15	

				Referer	nce site	Rehabilit	ated sites
Species	Common Name	Guild	Notes	W01	W02	W04	W05
				20	15	20)15
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects					
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act				
Microeca fascinans	Jacky Winter	Ground forager - insects			2		
Milvus migrans	Black Kite	Generalist - carnivorous		1			
Myiagra inquieta	Restless Flycatcher	Generalist - insects			1		
Neochmia modesta	Plum-headed Finch	Ground forager - plant based					
Northiella haematogaster	Blue Bonnet	Ground forager - plant based			2		
Nymphicus hollandicus	Cockatiel	Ground forager - plant based		20	4		
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based		3	4	1	2
Pachycephala pectoralis	Golden Whistler	Generalist - insects					
Pachycephala rufiventris	Rufous Whistler	Canopy feeder			5	2	2
Pardalotus punctatus	Spotted Pardalote	Canopy feeder					
Pardalotus striatus	Striated Pardalote	Canopy feeder		3	5	4	
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous					
Petrochelidon ariel	Fairy Martin	Aerial forager					
Petrochelidon nigricans	Tree Martin	Aerial forager					
Petroica goodenovii	Red-capped Robin	Ground forager - insects			4		
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based					
Philemon corniculatus	Noisy Friarbird	Canopy feeder					
Platycercus eximius	Eastern Rosella	Generalist - plant based		5	8	3	
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based			2		
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act	5			
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based		15	15		
Rhipidura albiscapa	Grey Fantail	Generalist - insects			5	3	5
Rhipidura leucophrys	Willie Wagtail	Aerial forager			5	2	3
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder					
Smicrornis brevirostris	Weebill	Canopy feeder			8	6	6
Struthidea cinerea	Apostlebird	Ground forager - omnivorous			10		
Sturnus tristis	Common Myna	Generalist	Exotic				
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic	1			
Tachybaptus novaehollandiae	Australian Grebe	Water Bird					
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based			4		

				Reference	ce site	Rehabilitated sites				
Species	Common Name	Guild	Notes	W01	W02	W04	W05			
				201	5	20	15			
Taeniopygia guttata	Zebra Finch	Ground forager - plant based								
Threskiornis spinicollis	Straw-necked Ibis	Water Bird								
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous								
Turdus merula	Common Blackbird	Ground forager - omnivorous								
Turnix varia	Painted Button-quail	Ground forager - omnivorous		1						
Vanellis tricolor	Banded Lapwing	Ground forager - insects								
Vanellus miles	Masked Lapwing	Ground forager - insects								
Zosterops lateralis	Silvereye	Generalist			1					
Total number of species				21	37	21	18			

Table 38: Bird species and associated feeding guilds recorded at sites W06, W07 and opportunistically in 2015 in Autumn

				Rehabili	itated sites	
Species	Common Name	Guild	Notes	W06	W07	Opportunistic
				2	015	2015
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	Canopy feeder				
Acanthiza apicalis	Inland Thornbill	Generalist - insects				X
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Ground forager - insects				
Acanthiza nana	Yellow Thornbill	Canopy feeder				
Acanthiza Uropygialis	Chestnut-rumped Thornbill	Generalist - insects				
Accipiter fasciatus	Brown Goshawk	Bird of Prey				
Anas gracilis	Grey Teal	Water Bird				
Anas superciliosa	Pacific Black Duck	Water Bird				
Anthus novaeseelandiae	Australasian Pipit	Ground forager - insects			1	
Aphelocephala leucopsis	Southern Whiteface	Ground forager - omnivorous				
Aprosmictus erythropterus	Red-winged Parrot	Canopy feeder				
Aquila audax	Wedge-tailed Eagle	Bird of Prey				
Ardea pacifica	White-necked Heron	Ground forager - omnivorous				
Artamus superciliosus	White-browed Woodswallow	Generalist - insects				
Aythya australis	Hardhead	Water Bird				
Barnardius zonarius	Australian Ringneck	Generalist - plant based				
Cacatua galerita	Sulphur-crested Cockatoo	Generalist - plant based				
Cacatua sanguinea	Little Corella	Ground forager - plant based				
Cacomantis flabelliformis	Fan-tailed Cuckoo	Generalist - insects				
Cacomantis pallidus	Pallid Cuckoo	Generalist - insects				
Chalcites basalis	Horsfield's Bronze-Cuckoo	Generalist - insects				
Chenonetta jubata	Australian Wood Duck	Water Bird				
Chthonicola sagittata	Speckled Warbler	Ground forager - insects	Vulnerable - TSC Act			
Cincloramphus mathewsi	Rufous Songlark	Ground forager - insects				
Cisticola exilis	Golden-headed Cisticola	Ground forager - insects				
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Generalist - insects				
Corcorax melanoramphos	White-winged Chough	Ground forager - insects				
Corvus coronoides	Australian Raven	Generalist - carnivorous		2		
Corvus mellori	Little Raven	Generalist - insects				Х
Corvus orru	Torresian Crow	Ground forager - omnivorous				

				Rehabili	tated sites	
Species	Common Name	Guild	Notes	W06	W07	Opportunistic
				2	015	2015
Coturnix ypsilophora	Brown Quail	Ground forager - plant based		2		
Cracticus nigrogularis	Pied Butcherbird	Generalist - carnivorous		2	2	
Cracticus tibicen	Australian Magpie	Generalist - carnivorous		6	10	
Cracticus torquatus	Grey Butcherbird	Generalist - carnivorous				
Dacelo novaeguineae	Laughing Kookaburra	Generalist - carnivorous				
Dicaeum hirundinaceum	Mistletoebird	Canopy feeder				
Egretta novaehollandiae	White-faced Heron	Water Bird				
Elanus axillaris	Black-shouldered Kite	Bird of Prey				
Entomyzon cyanotis	Blue-faced Honeyeater	Generalist - insects				
Eolophus roseicapillus	Galah	Ground forager - plant based				
Eopsaltria australis	Eastern Yellow Robin	Generalist - insects				
Eurystomus orientalis	Dollarbird	Aerial forager				
Falco berigora	Brown Falcon	Bird of Prey				
Falco cenchroides	Nankeen Kestrel	Bird of Prey		1		
Falco longipennis	Australian Hobby	Bird of Prey				
Falco peregrinus	Peregrine Falcon	Bird of Prey				
Falco subniger	Black Falcon	Bird of Prey	Vulnerable - TSC Act			
Fulica atra	Eurasian Coot	Water Bird				
Geopelia striata	Peaceful Dove	Ground forager - plant based				
Gerygone fusca	Western Gerygone	Canopy feeder				
Glossopsitta concinna	Musk Lorikeet	Canopy feeder				Х
Grallina cyanoleuca	Magpie-lark	Ground forager - insects				
Haliastur sphenurus	Whistling Kite	Bird of Prey			1	
Hieraaetus morphnoides	Little Eagle	Bird of Prey	Vulnerable - TSC Act			X
Hirundapus caudacutus	White-throated Needletail	Aerial forager				
Hirundo neoxena	Welcome Swallow	Generalist - insects		1		
Lalage sueurii	White-winged Triller	Aerial forager				
Lichenostomus penicillatus	White-plumed Honeyeater	Canopy feeder				
Lichenostomus virescens	Singing Honeyeater	Generalist		1		
Malurus cyaneus	Superb Fairy-wren	Ground forager - insects		4	4	
Malurus leucopterus	White-winged Fairy-wren	Ground forager - insects		6		
Manorina melanocephala	Noisy Miner	Generalist				

				Rehabil	itated sites	
Species	Common Name	Guild	Notes	W06	W07	Opportunistic
				2	015	2015
Megalurus timoriensis	Tawny Grassbird	Ground forager - insects				
Melanodryas cucullata	Hooded Robin	Ground forager - insects	Vulnerable - TSC Act			
Microeca fascinans	Jacky Winter	Ground forager - insects				
Milvus migrans	Black Kite	Generalist - carnivorous				
Myiagra inquieta	Restless Flycatcher	Generalist - insects				
Neochmia modesta	Plum-headed Finch	Ground forager - plant based				
Northiella haematogaster	Blue Bonnet	Ground forager - plant based				
Nymphicus hollandicus	Cockatiel	Ground forager - plant based				
Ocyphaps lophotes	Crested Pigeon	Ground forager - plant based				
Pachycephala pectoralis	Golden Whistler	Generalist - insects				
Pachycephala rufiventris	Rufous Whistler	Canopy feeder				
Pardalotus punctatus	Spotted Pardalote	Canopy feeder				
Pardalotus striatus	Striated Pardalote	Canopy feeder				Х
Pelecanusconspicillatus	Australian Pelican	Generalist - carnivorous				Х
Petrochelidon ariel	Fairy Martin	Aerial forager				
Petrochelidon nigricans	Tree Martin	Aerial forager				
Petroica goodenovii	Red-capped Robin	Ground forager - insects				
Phaps chalcoptera	Common Bronzewing	Ground forager - plant based				
Philemon corniculatus	Noisy Friarbird	Canopy feeder				
Platycercus eximius	Eastern Rosella	Generalist - plant based				
Plectorhyncha lanceolata	Striped Honeyeater	Generalist - plant based				
Pomatostomus temporalis	Grey-crowned Babbler	Ground forager - insects	Vulnerable - TSC Act			
Psephotus haematonotus	Red-rumped Parrot	Ground forager - plant based				
Rhipidura albiscapa	Grey Fantail	Generalist - insects		2		
Rhipidura leucophrys	Willie Wagtail	Aerial forager			3	
Scythrops navaehollandiae	Channel-billed Cuckoo	Canopy feeder				
Smicrornis brevirostris	Weebill	Canopy feeder		2	6	
Struthidea cinerea	Apostlebird	Ground forager - omnivorous				
Sturnus tristis	Common Myna	Generalist	Exotic			
Sturnus vulgaris	Common Starling	Ground forager - omnivorous	Exotic			
Tachybaptus novaehollandiae	Australian Grebe	Water Bird				
Taeniopygia bichenovii	Double-barred Finch	Ground forager - plant based				

				Rehabili	tated sites	
Species	Common Name	Guild	Notes	W06	W07	Opportunistic
				20	015	2015
Taeniopygia guttata	Zebra Finch	Ground forager - plant based				
Threskiornis spinicollis	Straw-necked Ibis	Water Bird				
Todiramphus sanctus	Sacred Kingfisher	Generalist - carnivorous				
Turdus merula	Common Blackbird	Ground forager - omnivorous				
Turnix varia	Painted Button-quail	Ground forager - omnivorous				
Vanellis tricolor	Banded Lapwing	Ground forager - insects				
Vanellus miles	Masked Lapwing	Ground forager - insects				
Zosterops lateralis	Silvereye	Generalist				
Total number of species	·	·	<u>. </u>	11	7	6

167

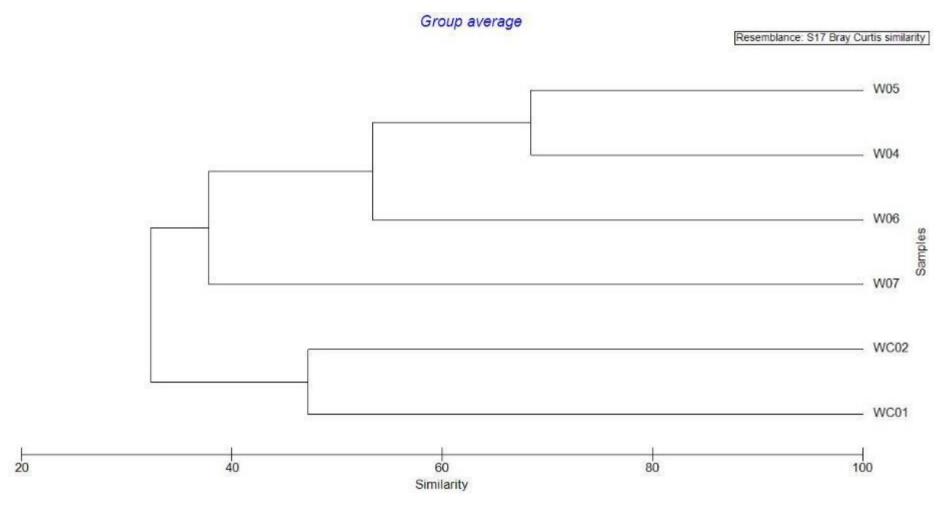


Figure 15: Cluster analysis of bird species recorded in all monitoring plots for the autumn monitoring period (2015)

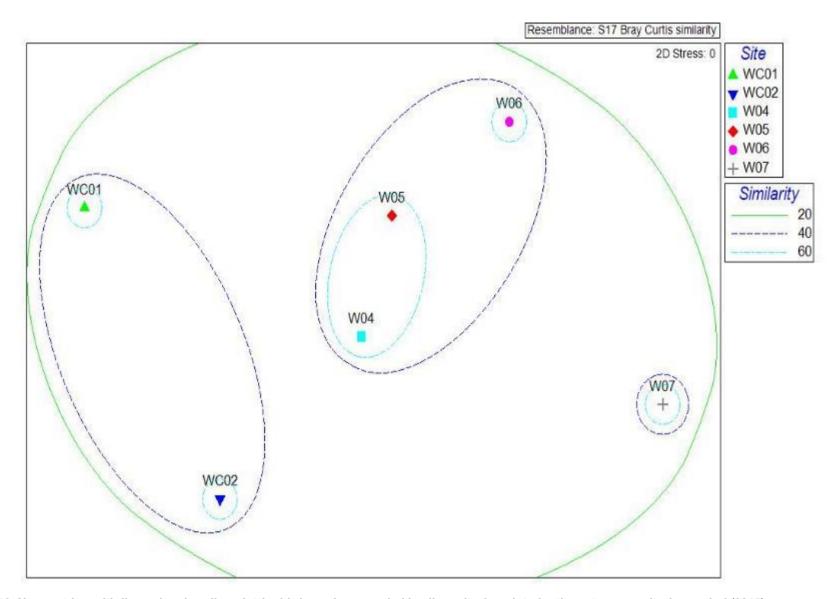


Figure 16: Non-metric multi-dimensional scaling plot for bird species recorded in all monitoring plots for the autumn monitoring period (2015)

169

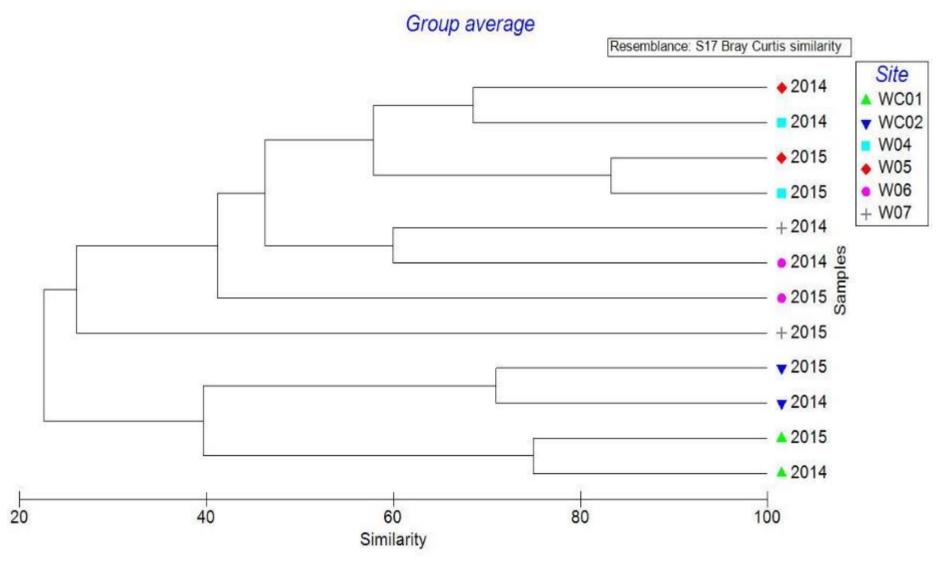


Figure 17: Cluster analysis of bird species recorded in all monitoring plots for the winter monitoring periods (2014 – 2015)

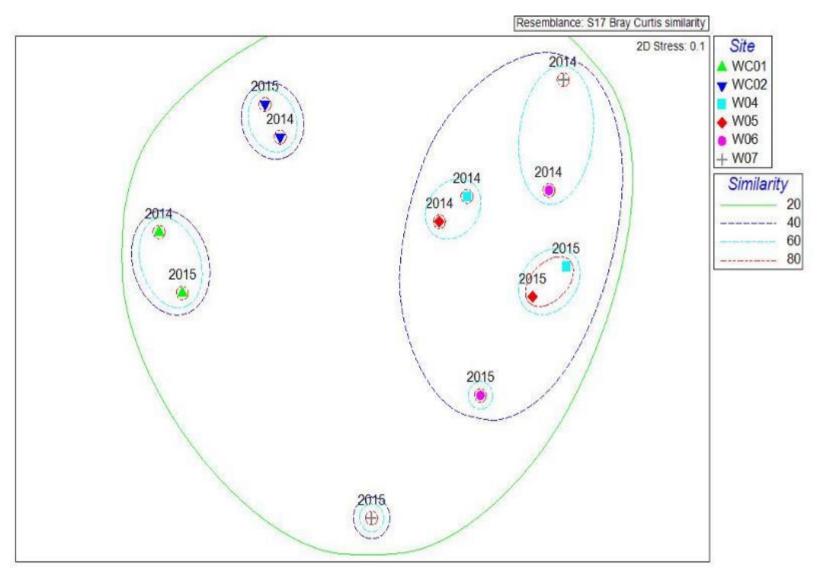


Figure 18: Non-metric multi-dimensional scaling plot for bird species recorded in all monitoring plots for the winter monitoring periods (2014 - 2015)

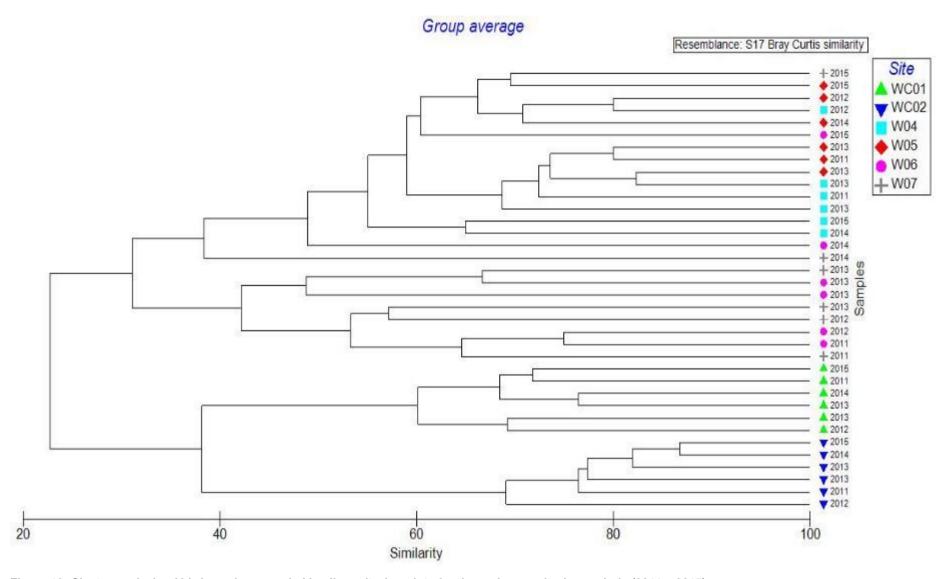


Figure 19: Cluster analysis of bird species recorded in all monitoring plots for the spring monitoring periods (2011 – 2015)

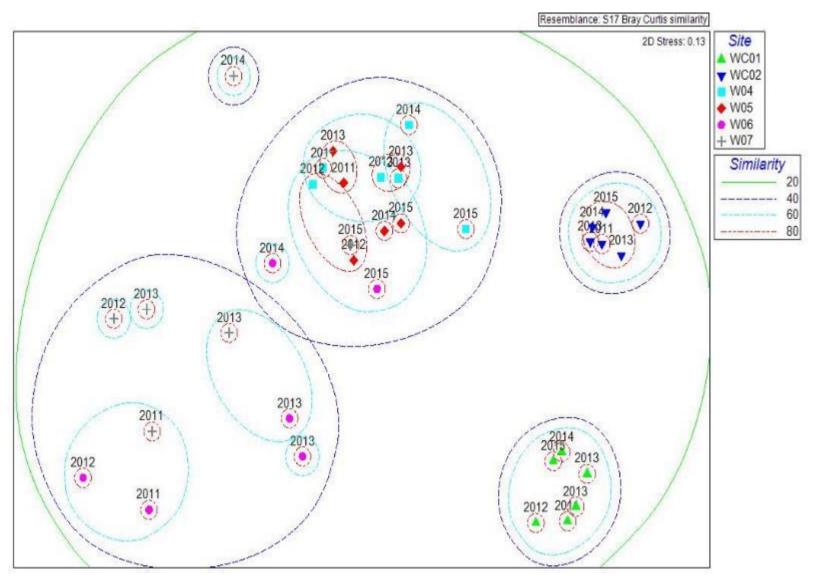


Figure 20: Non-metric multi-dimensional scaling plot for bird species recorded in all monitoring plots for the winter monitoring periods (2011 - 2015)

Table 39: Fauna species recorded within rehabilitated monitoring zones W04, W05 and W06 (2011 - 2015)

													F	leha	abili	tate	ed S	ites	3									
							W04	4								V05								1	NO	3		
Species	Common Name	Notes	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2015 (Apr)	2015 (Jul)	2015 (Oct)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2015 (Apr)	2015 (Jul)	2015 (Oct)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2015 (Apr)	2015 (Jul) 2015 (Oct)
AMPHIBIANS																												
Litoria caerulea	Green Tree-Frog											Х	Х															
Limnodynastes tasmaniensis	Spotted Grass-Frog																	Χ										
Litoria peronii	Peron's Tree-Frog																											
Total number of species			0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0 0
			F	REP	TIL	ES																						
Cryptoblepharus virgatus	Wall Skink					Х								Х	Х									Х				
Egernia striolata	Tree Skink					Х									Χ					2				Х				1
Morethia boulengeri	Boulenger's Skink					Х														2								3
Pogona barbata	Eastern Bearded Dragon																			Х								
Pseudechis porphyriacus	Red-bellied Black Snake																											
Total number of species			0	0	0	3	0	0	0	0	0	0	0	1	2	0	0	0	0	3	0	0	0	2	0	0	0	0 2
			N	1AN	/IMA	LS																						
Felis catus	Cat	Exotic																										
Lepus capensis	Hare	Exotic	Х				Х										Х			Х					Х			Х
Macropus giganteus	Eastern Grey Kangaroo		Χ	Х			Χ	Х	Х		Х	Χ	Х			Х	Χ	Χ	Χ	Х					Х	Х	Χ	ХХ
Macropus robustus	Common Wallaroo			Х				Х	Х	Х	Х	Х	Χ					Χ	Х	Х	Х	Х			Х	Х	Х	ХХ
Oryctolagus cuniculus	Rabbit	Exotic																		Х								
Phascolarctos cinereus	Koala	Vulnerable - TSC Act																										
Sus scrofa	Feral Pig	Exotic								Х										Х						Х		
Trichosurus vulpecula	Common Brushtail Possum																			Х								
Vulpes vulpes	Fox	Exotic		Χ																Х								
Wallabia bicolor	Swamp Wallaby																											
Total number of species			2	3	0	0	2	2	2	2	2	2	2	0	0	1	2	2	2	7	1	1	0	0	3	3	2	2 3

Table 40: Fauna species recorded within rehabilitated monitoring zone W07 and reference monitoring zones (2011 - 2015)

				F	Reh	abil	itati	on S	Site	s								F	Refe	erer	nce	Site	es						
						١	WO7	7							٧	/C0	1							\	NC)2			
Species	Common Name	Notes	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2015 (Apr)	2015 (Jul)	2015 (Oct)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2015 (Apr)	2015 (Jul)	2015 (Oct)	2011	2012	2013 (Sept)	2013 (Oct)	2014 (Aug)	2014 (Nov)	2015 (Apr)	2015 (Jul)	2015 (Oct)
AMPHIBIANS																													
Litoria caerulea	oria caerulea Green Tree-Frog																												
Limnodynastes tasmaniensis	Spotted Grass-Frog																												
Litoria peronii	Peron's Tree-Frog																				Х	Х	Х						
Total number of species			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
			- 1	REP	TIL	ES																							
Cryptoblepharus virgatus	Wall Skink											Х												Х					
Egernia striolata	Tree Skink					Χ					1	Χ								1	Х	Х							
Morethia boulengeri	Boulenger's Skink										4	Х								3									4
Pogona barbata	Eastern Bearded Dragon													Χ						Х		Ī							
Pseudechis porphyriacus	Red-bellied Black Snake														Χ							Ī							
Total number of species			0	0	0	1	0	0	0	0	2	3	0	1	1	0	0	0	0	3	1	1	0	1	0	0	0	0	1
			1	MAN	/IMA	ALS																							
Lepus capensis	Hare	Exotic						Х	Х		Х										Х								Х
Macropus giganteus	Eastern Grey Kangaroo		Х	Х					Х	Χ	Χ					Х	Х	Χ	Х		Х	Х			Х	Х	Χ	Х	Х
Macropus robustus	Common Wallaroo							Χ			Χ	Χ	Χ			Х				Х						Х	Χ	Х	Х
Oryctolagus cuniculus	Rabbit	Exotic										Χ				Χ	Х		Х	Х	Х	Х			Х	Х	Χ	Х	
Phascolarctos cinereus	Koala	Vulnerable - TSC Act											Х									Х							
Sus scrofa	Feral Pig	Exotic						Χ								Χ	Χ			Х					Х	Х			Χ
Vulpes vulpes	Fox	Exotic														Χ									Х	Х	Х		Χ
Wallabia bicolor	Swamp Wallaby												Χ					Х			Х					Х			
Total number of species			1	1	0	0	0	3	2	1	3	2	3	0	0	5	3	2	2	3	4	3	0	0	4	6	4	3	5









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APPENDIX 2 REHABILITATION MONITORING REPORT 2014



Canyon Coal Mine – Rehabilitation Monitoring Report Volume 1

Spring 2014

Prepared for Whitehaven Coal Mining Limited

20 March 2015







DOCUMENT TRACKING

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Reviewed by	Nathalie van der Veer
Approved by	Dr Paul Frazier
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Version Number	2
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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 reestablished.

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

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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	Туре	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).

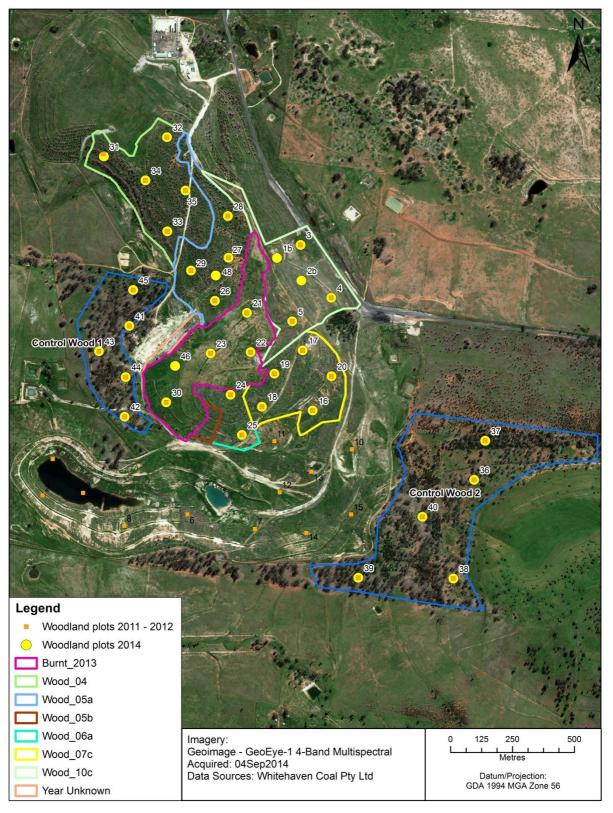
3.3 Survey dates

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)

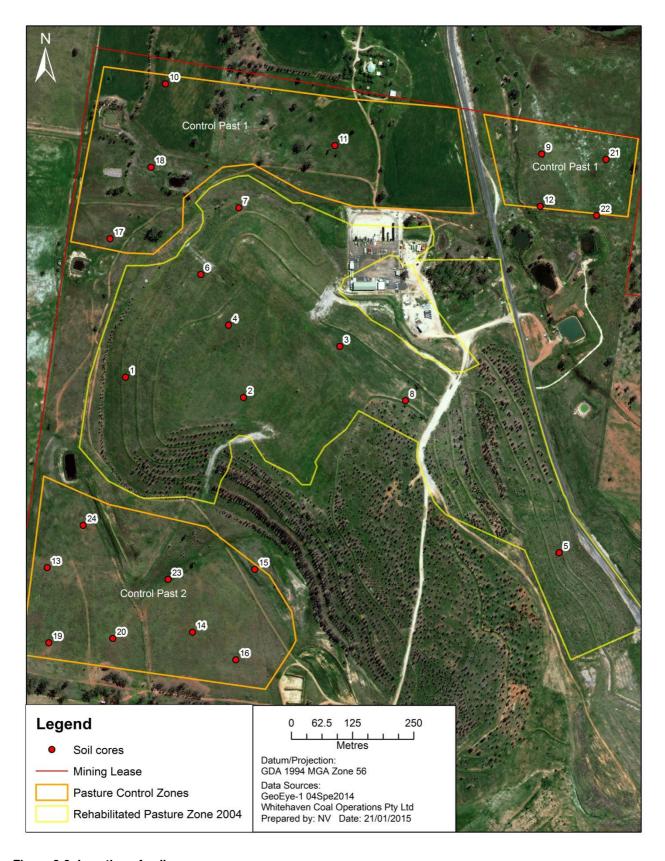


Figure 3-2: Location of soil cores

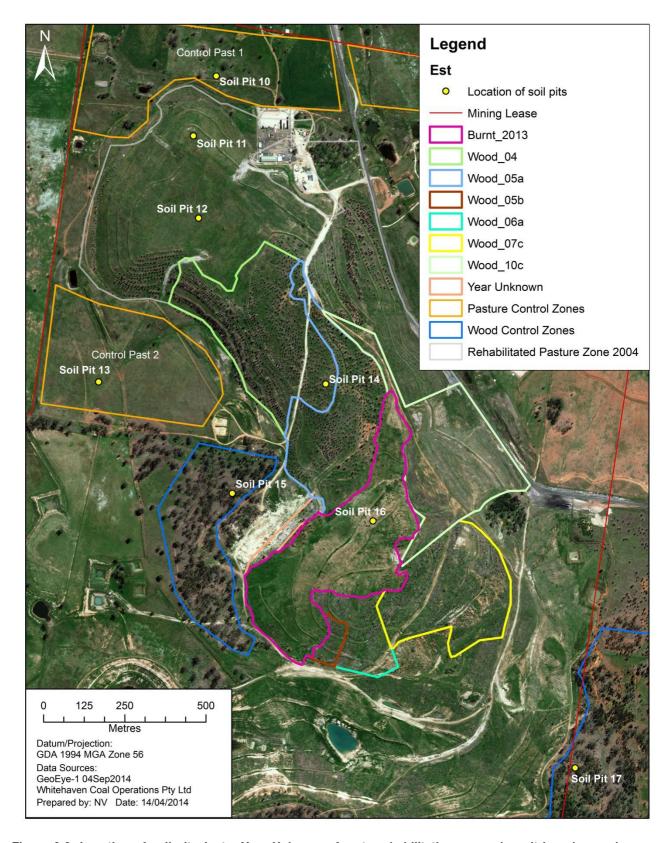


Figure 3-3: Location of soil pits (note: Year Unkown refers to rehabilitation zone where it is unknown in which year rehabilitation took place)

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.

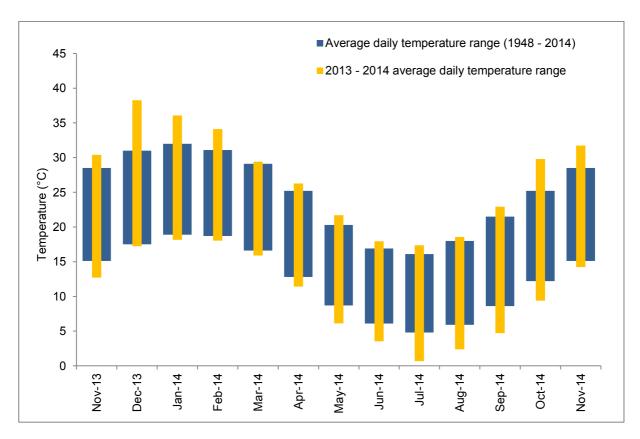


Figure 3-4: Historical average (Gunnedah Resource Centre 55024; BoM 2014) and recorded average daily temperature range (WHC weather station).

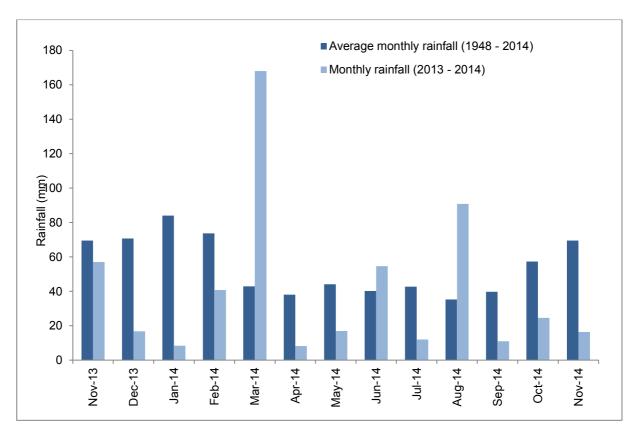


Figure 3-5: Historical average (Gunnedah Resource Centre 55024; BoM 2014) and recorded monthly rainfall (Whitehaven weather station).

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.

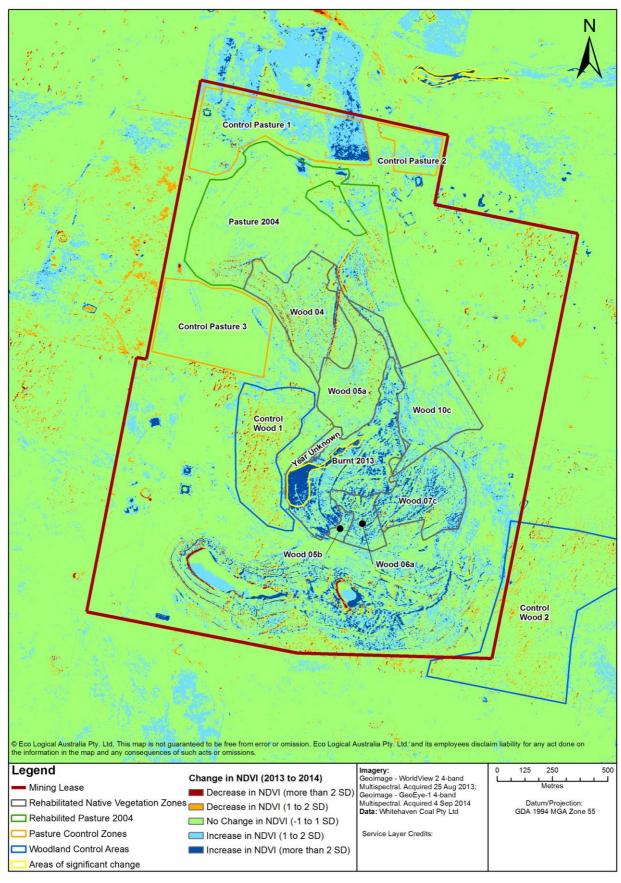


Figure 4-1: NDVI change detection analysis

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).

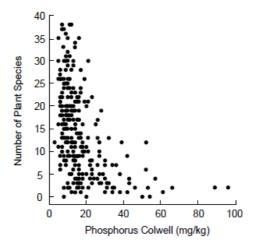


Figure 4-2: Decline in diversity of plants (as measured by number of species) as available soil phosphorus increases (Dorrough *et al.* 2008).

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), Vup*les 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.

6 References

Bureau of Meteorology (BoM). 2014. Daily Weather Observations, Gunnedah Resource Centre, Station 055024: http://www.bom.gov.au/climate/dwo/201111/html/IDCJDW2093.201111.shtml Dorrough, J., Stol, J. & McIntyre, S. 2008. 'Biodiversity in the Paddock: a Land Managers Guide.' Future Farm Industries CRC.

Eco Logical Australia (ELA). 2011. *Rehabilitation Monitoring Program for Canyon Coal Mine.* Prepared for Whitehaven Coal Mining Limited.

NSW Department of Primary Industries (DPI). 2012. *Noxious weed declarations – Noxious weed declarations for the Narrabri Shire Council:* http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed

Reid, G. & Dirou, J. 2004. How to interpret your soil test. Soil Health and Fertility NSW Department of Primary Industries: http://www.dpi.nsw.gov.au/agriculture/resources/soils/testing/interpret









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APPENDIX 3 ANNUAL BIOBANK REPORT 2016



Whitehaven Coal Mining Pty Ltd

ABN: 65 086 426 253

Biobank Site Annual Report 2015-2016



View from top of Kelvin Range to the south, Yarrari property

Biobanking agreement ID Number 43

Annual reporting template

			Biobank	Site Annual R	eport	
			Loc	cation details		
Biobanking agreeme	ent ID: 43			Name of lar	ndowner/s: Whitehaven Coa	I Mining Pty Limited
Reporting date: 29 th	July 2016			Property ad	dress: "Yarrari" & "Belah", V	Vean Road, Kelvin 2380
		Reco	rds of manag	gement actior	ns undertaken	
Action Reference Number Number Completion time and frequency Completed (Yes/No) Completed (Yes/No) Completed (Yes/No) Completed date/s Completion date/s Completion date/s Undertaken (including where undertaken (including reference to management zones), any variations and the reasons for variation).					Visual observations and other comments (including reasons for non completion)	
Management of grazing for conservation	1.1	Ongoing from commence ment date	Yes Ongoing	Ongoing	Grazing excluded from all areas of biobank during Year 4, except for introduction of stock to reduce bulk of Lovegrass prior to Spring.	Grazing excluded across the biobank with good groundcover % retained across the site as a consequence.
	1.2	Ongoing from first payment date (i.e. Year 1) until end of Year	Yes Ongoing	Ongoing	Stock grazing was used within fenced paddocks of MZ1.	As per 1.1
	1.3	Ongoing from first payment date	NA in this period	Ongoing	As per 1.1	As per 1.1

		1.4	Ongoing from commence ment date	Yes Ongoing	Ongoing	As per 1.1	As per 1.1
2.	Weed control	2.1	Ongoing from first payment date	Yes	Various	Weed spraying (including African Boxthorn, Noogoora Burr, Horehound and Bathurst Burr) as required, weather/season dependent.	Biobank site generally retains minor areas of weeds, with active management ongoing.
		2.2	Ongoing from first payment date	NA in this period	Ongoing	NA in this reporting period.	NA in this reporting period.
3.	Management of fire for conservation	3.1	Ongoing from commence ment date	Not yet required	Not yet required	Ecological burns not required during early years of active management.	Ecological burns not required under management plan at this stage.
		3.2	Ongoing from first payment date	Yes	Ongoing	NA in this reporting period.	NA in this reporting period.
		3.3	Ongoing from commence ment date	Yes	Ongoing	NA in this reporting period.	NA in this reporting period.
4.	Management of human disturbance	4.1	Ongoing from commence ment date	Yes Ongoing	Ongoing	The biobank site has generally been off-limits to the public, with only the property manager permitted on site.	No additional human disturbance has been undertaken on the site other than through general site management activities such as fence line repairs, track maintenance, and feral animal control.

		4.2	Ongoing from commence ment date	Ongoing	Ongoing	As per 4.1	As per 4.1
		4.4	Ongoing from commence ment date	Ongoing	Ongoing	As per 4.1	As per 4.1
		4.5	Ongoing from commence ment date	Ongoing	Ongoing	As per 4.1	As per 4.1
		4.6	Ongoing from commence ment date	Yes Ongoing	Ongoing	As per 4.1	As per 4.1
5.	Retention of native vegetation	5.1	Ongoing from commence ment date	Yes Ongoing	Ongoing	No vegetation removal during Year 4.	No activities have been undertaken on site that have resulted in vegetation removal.
		5.2	Ongoing from commence ment date	Ongoing	Ongoing	There have been no requirements to burn native vegetation under the fire management plan.	NA in this reporting period.
6.	Planting or seeding	6.1	Commence from first payment date	No – from Year 4 onwards	Commenced Planting in 2014-2015	No planting or seeding during Year 4.	Planting commenced in 2014-2015 of 9 plots with approximately 1180 trees planted.

6.3	Conduct the first survey 24 months after the completion of planting or seeding in each area of planting or seeding and then every 12 months thereafter.	As per 6.1	As per 6.1	As per 6.1	As per 6.1
6.4	As required; from the date that planting or seeding areas are established	As per 6.1	As per 6.1	As per 6.1	As per 6.1
6.5	As required (from commence ment date if relevant to prepare for future planting)	Ongoing	Ongoing	During 2015-2016, seed collection was undertaken on Yarrari & Belah.	In April 2016, seed was collected from White Box, Narrow-leaf Ironbark, Wilga, Rosewood, Belah and Senna.

		6.6	From the start of Year 4 until the end of Year 6. Enhanceme nt planting start of Year 7 until end of Year 10	As per 6.1	As per 6.1	As per 6.1	As per 6.1
7.	Retention of dead timber	7.1	Ongoing from commence ment date	Yes Ongoing	Ongoing	No dead timber removed during Year 4.	Dead timber is retained on site in accordance with the management plan.
		7.2	When required	Not yet required	Not yet required	NA in this reporting period.	NA in this reporting period.
8.	Erosion control	8.1	Commence from first payment date	No – not yet requirea	Ongoing	No active erosion identified during Year 4.	There have been no areas of active erosion identified as a cause of concern during this reporting period.
9.	Retention of rocks	9.1	Ongoing from commence ment date	Yes Ongoing	Ongoing	No rocks have been removed during Year 4.	Rocks retained on site in accordance with the management plan.
		9.2	When required	Not yet required	Not yet required	NA in this reporting period.	NA in this reporting period.
10.	Control of feral and over abundant native herbivores	10.1	Ongoing from first payment date	Yes	Ongoing	The resident property manager has undertaken feral animal control throughout the reporting period, removing 1,220 goats and approximately 70 rabbits from the property since 2008.	Feral animal control has been ongoing by the resident property manager.

		10.2	Ongoing from first payment date	NA in this reporting period.	Ongoing	NA in this reporting period.	NA in this reporting period.
11.	Vertebrate pest management	11.1	Ongoing from first payment date	Yes	Ongoing	The resident property manager has undertaken vertebrate pest management, removing 376 pigs and 40 foxes from the property since 2008 by opportunistic shooting and/or trapping. Baiting for foxes occurred during the reporting period.	Vertebrate pest control has been ongoing by the resident property manager.
		11.2	Ongoing from first payment date	NA in this reporting period.	Ongoing	NA in this reporting period.	NA in this reporting period.
12.	Nutrient control	12.1	Ongoing from commence ment	Yes Ongoing	Ongoing	No fertilisers were applied during Year 4.	Pesticides and herbicides may be applied to the Biobank in accordance with the management plan requirements.
13.	Control of exotic fish species	13.1	Not Applicable	Not Applicable	Not Applicable	Not Applicable.	Not Applicable
14.	Maintenance or reintroduction of natural flow regimes	14.1	Commence from first payment date	Yes Ongoing	Ongoing	Natural flow regimes maintained during Year 4.	All nominated dams on the bio bank site were filled and seeded in September 2014.

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Biobanking agreement

14.2	When required from date an artificial structure is removed	Yes Ongoing	Ongoing	A Japanese Millet cover crop was used following original earthworks in September 2014.	Further revegetation of former dam sites is planned to be combined/incorporated with the revegetation program for MZ1 and will involve a combination of native trees, shrubs and grasses commensurate with a White Box woodland.
14.3	Ongoing from commence ment	Yes Ongoing	Ongoing	NA in this reporting period.	NA in this reporting period.

ID Number 43

Biobanking agreement

Incident or event that has adverse effec	Incident or event that has adverse effect on biodiversity values on biobank site
Incident or event including adverse impacts (eg. natural events)	Action taken and proposed recommended actions
None.	Not required.
Records submitte	Records submitted with this report
ee Photographs taken at the photo points set in the biobanking agreement	sement
$^{\vee}$ Results of the inspections required to be conducted in item 1.3 $_{\odot}$	to be conducted in item 1.3 of Annexure D to the biobanking agreement
√ Results of any monitoring, inspections or surveys required in Annexures C and D to the biobanking agreement	nexures C and D to the biobanking agreement
Signature an	Signature and certification
I hereby declare that the information supplied in this report is accurate and complies with the reporting requirements under item 2 of	ate and complies with the reporting requirements under item 2 of
ule Allitexure D to the blobanking agreement. Note: If the land that forms the blobank site is owned by multiple persons, each la	eement. owned by multiple persons, each landowner must sign this annual report.
Signed Hauffler	Signed
Date 28 07 20 16	Date

Photo Points

Photo Point 1 E 240629 N 6593772 23/07/16 4:24pm
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From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 2 E240925 N6593562 24/07/16 4:40pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Biobanking agreement

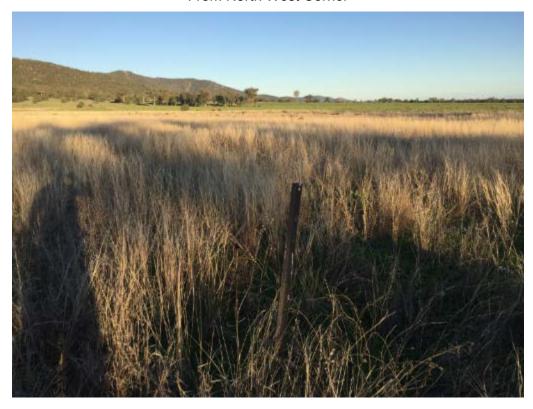
ID Number 43

Photo Point 4 E240439 N6592054 23/07/16 4:39pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 5 E240595 N6593324 23/07/16 4:29pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 8	E241170	N6594590	24/07/16	4:20pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 9	E241424	N6594095	24/07/16	2:26pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 10	E241780	N6591054	25/07/16	7:16am

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 11	E241101	N6591953	23/07/16	4:51pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 12	E241321	N6593399	23/07/16	5:33pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 14 E241172 N6593839 24/07/16 4:29pm



From North West Corner



From North East Corner



From South East Corner



Photo Point 15 E243373 N6594221 25/07/16 4:00pm



From North West Corner



From North East Corner



From South East Corner



Photo Point 17	E243026	N6593081	25/07/16	3:36pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 20	E241993	N6595399	24/07/16	2:43am

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 21 E241317 N6594719 24/07/16 4:11pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 22	E241476	N6595059	25/06/15	8:45am

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 23	E241304	N6595199	24/07/16	3:57pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 24	E241672	N6597031	24/07/16	3:28pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



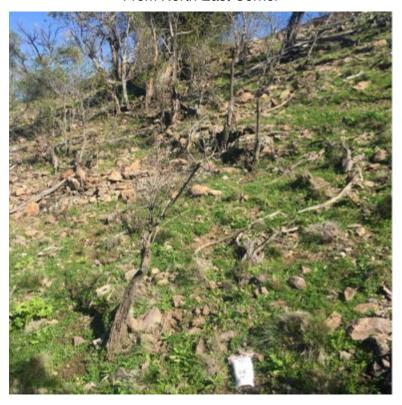
Photo Point 26 E241410 N6596513 26/07/16 11:48am



From North West Corner



From North East Corner



From South East Corner



Biobanking agreement

ID Number 43

Photo Point 27 E241465 N6591717 25/07/16 7:38am



From North West Corner



From North East Corner



From South East Corner



Photo Point 30	E241383	N6592453	25/07/16	7:48am

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 35	E241839	N6595941	24/07/16	2:54pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Photo Point 38	E242139	N6596965	24/07/16	3:16pm

From South West Corner



From North West Corner



From North East Corner



From South East Corner



Biobanking agreement

ID Number 43

Photo Point 40 E241161 N6595487 24/07/16 3:50pm



From North West Corner



From North East Corner



From South East Corner



Biodiversity Banking and Offsets Scheme

Biobanking agreement

ID Number 43

Photo Point 42 E240603 N6597014 24/07/16 3:31pm

Dam site that has been in-filled From South West Corner



From North West Corner



From North East Corner



From South East Corner

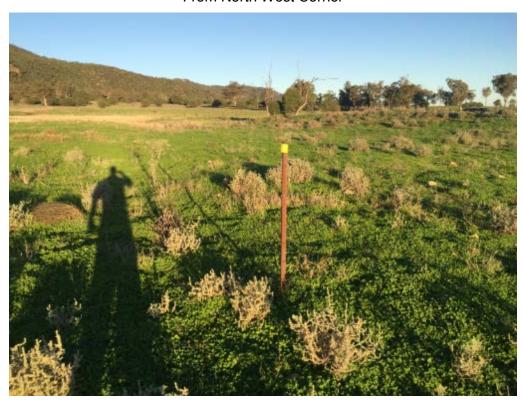


Photo Point 43 E240603 N6591987 23/07/16 4:44pm

From South West Corner



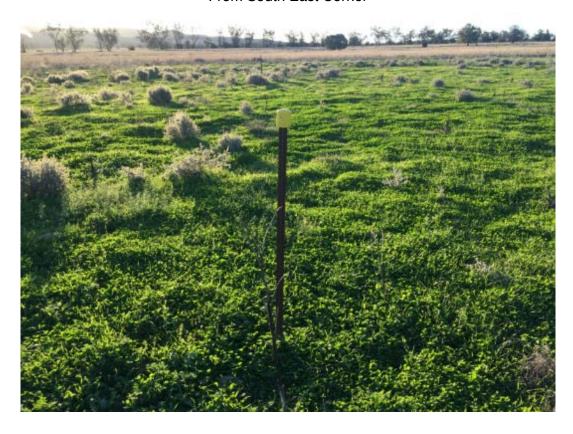
From North West Corner



From North East Corner



From South East Corner



BIOBANKING VERTEBRATE PEST MANAGEMENT ACTIVITIES FORM

		MANAGEMENT ACTIVITIES	S FORM
Date	Management Zone/s	Description and type of activity undertaken (This column must include details of the feral and overabundant herbivores targeted, control techniques applied and no. controlled.)	Observations & assessment of monitoring
2008-2015	1, 2 and 3	310 pigs removed from biobank through opportunistic trapping and shooting and 36 foxes removed by opportunistic shooting.	Pig numbers were very high when WHC acquired the property. General management by the property manager over this time has significantly reduced pig numbers.
July 2015	2 & 3	7 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
August 2015	2 & 3	15 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
September 2015	2 & 3	4 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
September to October 2015	1/2/3	44 fox baits laid. 12 baits were taken.	Fox numbers relatively low due to stock control on site and ongoing baiting.
October 2015	3	1 pig removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
October 2015	1 & 2	2 foxes removed by opportunistic shooting	Fox numbers relatively low due to stock control on site and ongoing baiting.
December 2015	2 & 3	7 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
April 2016	2 & 3	7 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
May 2016	2 & 3	19 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.
May 2016	1	2 foxes removed by opportunistic shooting	Fox numbers relatively low due to stock control on site and ongoing baiting.
June 2016	2 & 3	6 pigs removed by trapping and shooting	Pig numbers in decline, but there is still evidence of active pigs on site.

TIT	29-7-2016
Signature	Date

BIOBANKING VERTEBRATE PEST MONITORING ACTIVITIES FORM

		MONITORING ACTIVITIES FORM	
Date	Management Zone/s	Current level of impact on vegetation or native fauna (This column must record impact As Negligible, Minimal, Moderate or High)	Minor Variations (details/reasons)
18/1/16	1,2 & 3	Minimal - Pig numbers had generally been high within the biobank site, particularly as they have direct access to site from the adjoining Kelvin range, with thick scrub providing suitable habitat. Evidence of pig activity has been visible throughout the biobank for several years, however, the extent of ground disturbance by pigs is gradually decreasing as a consequence of the management measures in place and the removal of 376 pigs since 2008. Fox numbers have been relatively low as a consequence of no domestic stock held on the biobank site and continued 1080 baiting. There is no direct evidence of excessive fox numbers impacting on native fauna.	Opportunistic shooting and trapping of pigs and foxes wil continue to be undertaken across the biobank site to reduce potential impacts on native flora and fauna.

7.5.4	29-7-2016
Signature	Date

BIOBANKING FERAL ANIMAL AND OVERABUNDANT HERBIVORE MANAGEMENT ACTIVITIES FORM

A RECORD FOR THE STREET, STORY	The second second second	MANAGEMENT ACTIVITIES FO	
Date	Management Zone/s	Description and type of activity undertaken (This column must include details of the feral and overabundant herbivores targeted, control techniques applied and numbers controlled.)	Observations & assessment of monitoring
2008-2015	1,2 & 3	1,173 feral goats and 70 rabbits have been removed from site through both trapping and opportunistic shooting.	At commencement of ownership feral goat numbers were excessive, however ongoing management by the property manager has reduced this number substantially to now only occasional sightings. The removal of large numbers of goats will provide better opportunities fo native vegetation restoration.
July 2015	2 & 3	6 feral goats removed by trapping and opportunistic shooting.	Goat numbers have substantially reduced across the site and now only being infrequently sighted.
October 2015	1 & 2	41 feral goats removed by trapping and opportunistic shooting.	Goat numbers have substantially reduced across the site and now only being infrequently sighted.

174	29-7-2016	
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Signaturé	Date	

BIOBANKING FERAL ANIMAL AND OVERABUNDANT HERBIVORE MONITORING ACTIVITIES FORM

MONITORING ACTIVITIES FORM						
Date	Management Zone/s	Current level of impact on vegetation or native fauna (This column must record impact As Negligible, Minimal, Moderate or High)	Minor Variations (details/reasons)			
18/01/16	1	Negligible - No observable detrimental impact from overabundant herbivores on native vegetation or fauna. Gradual removal of goats has decreased pressure on native vegetation regeneration.	Removal of goats on an opportunistic basis will continue to enhance native vegetation regeneration opportunities. No evidence of excessive grazing by kangaroos.			
18/01/16	2	Negligible - No observable detrimental impact from overabundant herbivores on native vegetation or fauna. Gradual removal of goats has decreased pressure on native vegetation regeneration.	Removal of goats on an opportunistic basis will continue to enhance native vegetation regeneration opportunities. No evidence of excessive grazing by kangaroos.			
18/01/16	3	Negligible - No observable detrimental impact from overabundant herbivores on native vegetation or fauna. Gradual removal of goats has decreased pressure on native vegetation regeneration.	Removal of goats on an opportunistic basis will continue, however this can be difficult in this zone due to heavy vegetation cover and steep terrain.			

- /	
TIL	29-7-2016
Signature	Date

Biodiversity Banking and Offsets Scheme

Biobanking agreement

ID Number 43

REPORTING FORM - FIRE FOR CONSERVATION MANAGEMENT

Who: Trevor Jones, Property Manager

Date: 15th July 2015

MANAGEMENT ZONES	DATE	OBSERVATIONS AND ASSESSMENT OF MONITORING
All	21 st July 2016	During the Reporting Period burning for conservation purposes was not carried out within the Biobank site. It is not intended that burning for conservation purposes will be utilised for a substantial period (approximately 6 years). Monitoring for bushfire control will continue, and appropriate firebreaks maintained as much as possible in advance of the summer bushfire period.

TIG	29-7-2016
Signature	Date

BIOBANK SITE VISUAL INSPECTION PROFORMA – ANNUAL GROUNDCOVER %, AND CONDITION OF FENCING INSPECTION

Who: Trevor Jones, Property Manager

Date: 23rd/24th June 2016

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Percentage of Groundcover across Biobank Site	See all Photo Monitoring Point Photo's.	As per Photo Monitoring Points	Groundcover across the Biobank site would be at approximately 90%, with excellent grasscover across the site, comparative to the initial photo points in the Biobank Management Plan.	No action required.
Physical condition of fencing to determine if they can control the movement of stock, control human disturbance, control movement of overabundant native herbivores and control vertebrate pests	N/A	N/A	General maintenance is ongoing to maintain control of stock movements. As there is no fencing between the Biobank and adjoining Kelvin Aboriginal Area, it can be difficult to control movement of goats and pigs, however ongoing pest control will improve this aspect over time.	No action required.

TIX	29-7-2016
J., f. t.	
Signature	Date

BIOBANK SITE VISUAL INSPECTION PROFORMA – 6 MONTHLY HUMAN DISTURBANCE, EROSION AND WASTE INSPECTION

Who: Trevor Jones, Property Manager

Date: 16th July 2015

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Evidence of Disturbance	N/A	N/A	Biobank Site is in good condition with no evidence of active human disturbance present across the site.	No action required.
Evidence of Erosion	N/A	N/A	No evidence of active erosion occurring within the Biobank site requiring remediation activities.	No action required.
Evidence of Waste	N/A	N/A	No evidence of waste disposal occurring within the Biobank site.	No action required.

Who: Trevor Jones, Property Manager

Date: 18th January 2016

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Evidence of Disturbance	N/A	N/A	Biobank Site is in good condition with no evidence of active human disturbance present across the site.	No action required.
Evidence of Erosion	N/A	N/A	No evidence of active erosion occurring within the Biobank site requiring remediation activities.	No action required.
Evidence of Waste	N/A	N/A	No evidence of waste disposal occurring within the Biobank site.	No action required.

TIL	29-7-2016
Signature	Date

INSPECTION OUTCOMES (SECTION 1.3 OF ANNEXURE D)

BIOBANK SITE VISUAL INSPECTION PROFORMA - QUARTERLY STOCK ACCESS INSPECTION

Who: Trevor Jones, Property Manager

Date: 17th July 2015

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Evidence of Stock accessing the Biobank	N/A	N/A	No evidence of stock within Biobank site during this inspection.	No action required.

Who: Trevor Jones, Property Manager

Date: 30th October 2015

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Evidence of Stock accessing the Biobank	N/A	N/A	60 cows put on Lovegrass to reduce growth for Spring between 5 th September 2015 and 10 th December 2015.	No action required.

Who: Trevor Jones, Property Manager

Date: 18th January 2016

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Evidence of Stock accessing the Biobank	N/A	N/A	No evidence of stock within Biobank site during this inspection.	No action required.

Who: Trevor Jones, Property Manager

Date: 4th April 2016

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Evidence of Stock accessing the Biobank	N/A	N/A	12 sheep entered from northern boundary and were removed.	Fence repaired where sheep entered.

Signatura

29-7-2016

ure

Date

APPENDIX 4 SURFACE WATER MONITORING RESULTS

SURFACE WATER MONITORING

Sample No.	Date	Time	Sample Location	pH Field	pН	Conductivity Con	lectrical nductivity (µS/cm)	Total Suspended Solids (mg/L)	Hydoxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Antimony	Arsenic	Molybdenum	Selenium	Chloride	Sodium	Aluminium	Arseni c	fanganese	Iron	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Comments
ES0909246-001	24 June 2009	1125	WW8		8.42		4110	45										1					5	<10	Limit of Panasting (LOP) was raised for All and Crosse due to insufficient complex
ES0909246-002	24 June 2009	1140	WW9		6.77		135	114															43	<10	Limit of Reporting (LOR) was raised for Oil and Grease due to insufficient samples Limit of Reporting (LOR) was raised for Oil and Grease due to insufficient samples
ES1000714-001	15 January 2010	1250	WW9		6.82		204	38										1					20	<5	
ES1000714-002	15 January 2010	1320	WW11		6.77		76	69															5	<5	
ES1000714-003	15 January 2010	1340	WW12		6.5		132	72															9	<5	
ES1103395-001	16 February 2011	1200	VOID SMALL		8.33		264	19										1					2	<5	
	16 February 2011				8.19		346	14															3	<5	
ES1109073-001	2 May 2011		VOID UPPER		8.66		293	<5															4	<5	
ES1109073-002	2 May 2011	1330	LOWED		8.89		395	48															7	<5	
ES1117879-001	17 August 2011	1350	VOID UPPER	1 :	8.39		321	182	<1	3	114	117					17	58	0.29	0.004	0.056	0.17	5	<5	
ES1117879-002	17 August 2011	1410	VOID		8.52		451	22	<1	12	136	149					31	85	0.41	0.004	0.035	0.33	5	<5	
ES1110920-001	9 September 2011	900	WW 11		7.02		131	147															15	<5	
	9 September 2011		WW 12		6.58		52	282															10	<5	
	29 September 2011		WW 12		6.97		109	236															16	<5	
ES1121348-002 2	29 September 2011	1030	WW 11	1	7.09		58	412									<u> </u>	1	1			\vdash	7	<5	
ES1124941-001	14 November 2011	910	WW 12	1	7.45		84	60															16	<5	
	14 November 2011		WW 11		7.26		183	50															35	<5	
=0.0																									
ES1211262-001 ES1211262-002	8 May 2012 8 May 2012	920 940	VOID UPPER		8.48 7.98		242 376	13															3	<5 <5	
L01211202-002	0 May 2012	340	LOWER		7.30		370																,	~	
			VOID UPPER		8.39		315	20															3	<5	
ES1227199-002	15 November 2012	1230	LOWER		8.68		446	18															4	<5	
E01202202 001	13 February 2013	1130	VOID UPPER	9.58	9.33	324	330	12															5	<5	
ES1303393-001	13 February 2013		VOID OPPER		8.79		512	23															5	-<5	
	, , , , , , , , , , , , , , , , , , , ,				-																			7	
ES1310050-001	1 May 2013		UPPER VOID		9.68		353	17					<0.001	0.004	0.003	<0.01							6	<5	
ES1310050-002	1 May 2013	1150	VOID	8.78	8.63	523	553	97					<0.001	0.004	0.003	<0.01							7	<5	
ES1313688-001	13 June 2013	1001	WW1 R		7.08		48	74															14	<5	
ES1317466-001			UPPER VOID		8.56		601	9															6	<5	
ES1317466-002	5 August 2013	1100	VOID	8.97	9.1	341	348	11															8	6	
ES1323917-001	4 November 2013	1220	UPPER VOID	9.6	9.4	391	429	12	<1	88	117	205					17	71	0.42	0.005	0.017	0.31	8	<5	
		1200	UPPER VOID	8.8	8.54		776	23	<1	41	234	275					78	119	0.85	0.003	0.072	0.71	8	<5	
																							_		
	5 February 2014 5 February 2014		LOWER VOID	10.3 9.6	9.22		533 1070	25 33					<0.001	0.006	0.003	<0.01		1					9	<5 <5	
E31402413-002	3 Tebruary 2014	1200	VOID	3.0	0.74	330	1070	- 55					Q0.001	0.004	0.000	ζ0.01							,	~	
ES1409710-001	1 May 2014		UPPER VOID		8.74		496	<5	<1	32	202	234					26	90	0.71	0.005	0.075	0.45		<5	
ES1409710-002	1 May 2014	935	LOWER	9.4	8.54	1100	1150	<5	<1	26	287	313					165	184	0.25	0.005	0.074	0.18	5	<5	
ES1424402-001	5 November 2014	940	UPPER VOID	10.3	9.66	567	535	6					<0.001	0.004	0.003	<0.01	1		 	\vdash		\vdash	11	<5	
	5 November 2014	1015	LOWER VOID		8.83		1510	36					<0.001	0.004	0.003	<0.01		1	1			\vdash	9	<5	
ES1503935-001	17 February 2015	900	UPPER VOID	10.2	9.34		626	44					<0.001	0.005	0.003	<0.01	1	1					12	<5	
E51503935-002	17 February 2015	935	VOID	9.4	8.5	1800	1900	37			1		<0.001	0.006	0.005	<0.01	1	1	1	+		\vdash	11	7	
ES1521402-001	6 May 2015	1105	UPPER VOID	9.4	8.87	633	626	<5	<1	50	231	280					31	163	0.51	0.005	0.016	0.38	4	9	
ES1521402-002	6 May 2015	1135	LOWER	9.2	8.76	1870	1950	8	<1	71	275	346					425	425	0.53	0.004	0.037	0.42	<1	8	
E61500000 001	10 August 2015	1100	LIDDED VOID	9.8	0.12	617	622	12			 			-		-	1	1	1			\vdash	15	15	
ES1528268-001	12-August-2015 12-August-2015	1025	UPPER VOID	9.8			1870	12 46								1	 	1	 	-		++	15 5	15 9	
																		1					-	-	
	10 November 2015		UPPER VOID		9.3		692	12															14	25	
ES1535953-002	10 November 2015	1250	VOID	9.2	9	2180	2350	20			l		-	-	-	-	-	+	-	+		\vdash	10	15	
ES1602961-001	9 February 2016	1135	UPPER VOID	9.7	9.06	784	846	19									1	1	 				13	<5	
	9 February 2016		LOWER	9.5			2730	111															8	<5	

APPENDIX 5 GROUNDWATER MONITORING RESULTS

Site ID Date Time Ground - Stand - pH - Field - Field - Field - m (A. mbgl mbtoc Field Field - Field - m (A. m. (A	niniu Arsenic Boron (Ba) - m (Ba) - m (Ba) - m (Cd) - m (Cr) - (Co) - (Cu) - mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Iron (Fe) - Lead Mangane Nickel Seleniu m (V) - mg/L mg/L mg/L mg/L Mercury (Hg) - pH - Lab E	EC - Lab - Calcium μs/cm (Ca) - mg/L mg/L mg/L Major Cations Major Cations Total Cations - Chloride Sulfate (CI) - (SO4) - mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	ate Total Ionic Alltimorii a as Nitrate as NOX as Dissolve Comments
GW-1 16-Nov-05 1124 18.83 18.95 1590	AI) - (As) - mg/L (Ba) - m (Be) - m (Cd) - m (Cr) - (Co) - (Cu) - mg/L mg/L mg/L mg/L	mg/L mg/L mg/L mg/L mg/L mg/L - mg/L ing/L	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	y as y - mg/L meq/L (N) mg/L a solids CaCO3 - mg/L (N)
27-Feb-06 1133 18.75 18.88 25-May-06 1307 1630 2-Aug-06 1258 7-Nov-06 0947 1450				
7-Feb-07 0950 4-May-07 0840 1440 3-Jul-07 15-Aug-07				
10-Oct-07 1730 1480 15-Jan-08 0920 8-Apr-08 1040 1510				
9-Jul-08 1600 31-Oct-08 1015 1640 12-Jan-09 1700 17-Jun-09 1425 7.9 1690 14.1	0.003	0.32 0.017 0.002 0.017 0.01 0.317 <0.0001		<0.01
28-Aug-09 0955 8-Dec-09 1600 7.52 1690 32.6 <0.0 00-Jan-00 1305 7.86 1470 24.2 16-Aug-10 1250 7.66 1169 12.2		<0.05	1380 104 40 197 2 17.1 179 55.7 <1 <1 1260 82 30 140 2 12.6 84.8 22.5 <1 <1	
03-Nov-10 1250 Pump over bore 16-Feb-11 1320 Pump over bore 7.32 1048 27.2 <0.0 13-May-11 1250 Pump over bore 7.81 1300 17.6	01 0.001 <0.005 0.019	0.13 0.008 0.004 <0.001 0.364 <0.0001 7.47	966 78 30 142 2 12.6 73 20 <1 <1	493 493 12.3 1.12 <0.01 0.3 0.3 Sample from tap
31-Aug-11 1310 Pump over bore	.01 0.001 0.001 0.012	<0.05 <0.001 <0.001 0.306 <0.0001 7.89	1730 105 42 232 2 18.8 246 114 <1 <1	No pressure @ tap (no sample)
23-Aug-12 1250 Pump over bore 8.04 1070 17 <0.0			1160 85 31 158 2 13.7 79 24 <1	532 532 13.4 1.3 <0.01 <0.01 0.27 0.27 644 Tap next to Blanch's shed 489 489 12.4 2.16 <0.01 <0.01 0.29 0.29 732
22-Aug-13 1320 Pump over bore 8.12 1100 14 0.0 26-May-14 1210 Pump over bore 7.7 1160 16.1 08-Sep-14 1245 Pump over bore 7.7 1200 13.4 <0.0	02 0.002 0.05 0.172 <0.001 0.0003 0.001 <0.001 0.01 .01 0.003 <0.05	0.1 0.002 0.005 <0.001		500 500 12.9 1.73 0.03 727 460 460 12.1 0.44 0.04 <0.01
20-May-15 1215 Pump over bore 7.5 1186 16	02 0.002 0.05 0.214 <0.001 0.0006 0.005 <0.001 0.029 02 0.002 0.05 0.2 <0.001 0.0003 0.005 <0.001 0.009			557 557 14.1 2.29 0.06 <0.01
01-Dec-15 1245 Pump over bore 7.6 1163 25.7 18-Feb-16 1310 Pump over bore 7.3 1330 27.9 0.0 GW2 16-Nov-05 1130 19.48 20.22 1360 27-Feb-06 1142 19.44 20.18	02 0.002 <0.05 0.238 <0.001 0.001 0.004 <0.001 0.008	<0.05 0.002 <0.001 <0.001 0.02 0.733 <0.0001 7.51	1450 106 35 178 1 15.9 137 48 <1 <1	519 519 15.2 2.25 0.02 <0.01 0.38 0.38 908
25-May-06 1249 19.36 20.12 1310 2-Aug-06 1313 18.81 20.09 7-Nov-06 0955 19.35 20.08 1240				
7-Feb-07 1002 19.26 20.01 4-May-07 0850 19.26 20.00 1270 3-Jul-07 15-Aug-07 1510 19.27 20.01				
10-Oct-07 1735 19.16 19.91 1210 15-Jan-08 0935 19.29 20.04 8-Apr-08 1050 18.65 19.40 1220 9-Jul-08 1620 18.76 19.96				
31-Oct-08 1025 18.82 20.01 1110 12-Jan-09 1025 18.85 20.03 17-Jun-09 1455 19.22 19.9 7.9 1280 20 28-Aug-09 1000 19.17 19.87	0.002 0.149 <0.001 <0.0001 0.003 <0.001 0.007	<0.05 <0.001 0.03 0.005 <0.01 0.023 <0.0001	1160 89 27 156 4 13.5 75 10 <1 <1	551 551 13.3 0.69 <0.01 798
8-Dec-09 1530 20.29 20.99 6.99 1290 24 <0.0 04/May/10 1325 19.03 19.76 7.71 1389 24.1 16/Aug/10 1340 19.31 20.06 7.25 1223 20.2	.01 0.002		920 83 28 145 2 12.8 70.8 17 <1	
03/Nov/10 1315 19.08 19.83 16/Feb/11 1300 19.04 19.79 6.68 1073 26.3 0.1 13/May/11 1220 19.08 19.83 7.22 1180 20.5 31/Aug/11 1250 18.92 19.67 6.91 1050 22.2 0.1			1020 79 31 153 2 13.2 91 21 <1	
05/Dec/11 1520 19.33 20.08 7.04 1065 22.6 12/Mar/12 1300 18.85 19.6 8.16 1310 22.9 <0.0			1400 45 17 277 6 15.8 133 45 <1	
22/Nov/12 1305 18.78 19.53 7.38 1173 22.8 11/Mar/13 1500 18.75 19.5 7.08 1160 22.8 0.0 30/Jun/13 1310 18.73 19.48 7.43 1136 21.7	03 <0.001	0.63 <0.001 0.016 <0.001 0.02 0.19 <0.0001 7.7	1210 71 30 158 4 13 81 22 <1 <1 1220 79 30 155 7 13.3 83 23 <1 <1	495 495 12.6 1.36 0.02 <0.01 0.24 0.24 744 Blanch's windmill
26/May/14 1150 19.79 20.54 7.6 975 20.7 08/Sep/14 1230 19.95 20.7 7.1 1190 22.7 <0.0 12/Nov/14 1240 19.56 20.31 7.2 1203 22.3	.01 0.002 0.06 0.193 <0.001 <0.0001 0.004 <0.001 0.004	0.06 <0.001 0.008 <0.001 <0.01 0.02 0.019 <0.0001 7.55	1220 75 28 134 3 12 86 22 <1 <1	455 455 12 0.11 0.05 <0.01 0.3 0.3 620
26/May/15 0845 19.42 20.17 7.1 1173 21.2			1290 72 31 155 2 12.9 86 22 <1	
18-Feb-16 1250 19.15 19.9 7.1 1120 21.4 0.0 GW4 16-Nov-05 1103 21.57 21.93 3350 27-Feb-06 1127 21.53 21.92 25-May-06 1224 21.50 21.91 3320	04 0.003 <0.05 0.202 <0.001 <0.0001 0.003 <0.001 0.022	0.08 0.002 0.014 <0.001 <0.01 0.02 0.105 <0.0001 7.39	1250 87 29 155 5 13.6 75 24 <1 <1	499 499 12.6 3.85 0.06 <0.01 0.28 0.28 798
2-Aug-06 1241 21.43 21.86 7-Nov-06 1030 15.92 16.60 4550 7-Feb-07 0942 20.20 20.68				
4-May-07 0820 21.24 21.63 3110 3-Jul-07 15-Aug-07 1450 21.20 21.59 10-Oct-07 1746 21.14 21.54 3020				
15-Jan-08 1012 21.00 21.51 8-Apr-08 1105 21.58 22.06 3100 10-Jul-08 1000 20.98 21.50 31-Oct-08 0955 20.96 21.47 3310				
12-Jan-09 1000 20.94 21.43 18-Jun-09 1130 22.48 22.98 28-Aug-09 1040 20.95 21.33				Unable to access
23-Dec-09 1555 21.32 21.7 4-May-10 1250 pump over bore hole 16-Aug-10 1200 21.12 21.32 dmill over bore 3-Nov-10 1325 21.05 21.25 4-May-10 1200 21.12				No sample - pump blocking bore
16-Feb-11 850 21.3 21.5 dmill over bore 13-May-11 1150 21.53 21.73 dmill over bore 31-Aug-11 1150 31.22 31.42 dmill over bore 5-Dec-11 1210 20.86 21.06 dmill over bore				
12-Mar-12 1340 20.53 20.73 29-May-12 1330 20.53 20.73 dmill over bore 23-Aug-12 1315 20.4 20.6 22-Nov-12 1220 20.42 20.62 dmill over bore				
11-Mar-13 1220 20.49 20.69 30-May-13 1230 20.5 20.7 dmill over bore 26-May-14 1220 21.04 21.24 dmill over bore				
12-Nov-14 0900 21 21.2 dmill over bore 21-May-15 1150 19.57 19.77 26-Aug-15 1250 20.53 20.73 dmill over bore 1-Dec-15 1150 20.5 20.7 dmill over bore				
18-Feb-16 1200 20.44 20.64 dmill over bore GW5 16-Nov-05 1051 24.41 24.78 4770 27-Feb-06 1109 24.36 24.76 25-May-06 1207 24.38 24.78 4560				
2-Aug-06 1228 24.35 24.76 4500 2-Aug-06 1228 24.35 24.76 7-Nov-06 1044 21.40 21.80 3150 7-Feb-07 0932 24.29 24.67				

	0800	24.33 24.72																						<u> </u>	
		24.37 24.74																							
15-Jan-08 1	1000	24.26 24.66 24.33 24.69	4530																						
9-Jul-08 1	1450	24.38 24.78 24.36 24.73	4550																						
12-Jan-09 0	0940	24.32 24.70	4640		0.004 0.005	0.004 0.0004	0.004	0.04	0.000	0.440	0.000			4050 00	05	770 40	40.0	040		1100 1100	47.7	0.00		0710	
28-Aug-09 1	1030	24.19 24.64	7.3 4780			<0.001 0.0001		0.002 3.5				0.934 <0.000									47.7 0.89		0.10 0.24	2710	
4-May-10 1	1250		cabled over bore	28.5 <0.01	<0.001		<0.001	0.002 3.5	<0.001	0.204	0.003	0.066 <0.000	1 7.42	4320 4	91 8	978 16	50.7	663 95.4	<1 <1	1060 1060	47.5 3.2	0.06	0.19 0.24		Plate cabled tight over bore
	1350	23.83 24.13 Dry																							riate capied light over bore
13-May-11 1	1200	24.02 24.32 24.71 25.01																							Boxthorn over bore No sample pump over bore
5-Dec-11 1	1230	23.98 24.28 23.65 23.95																							
· · · · · · · · · · · · · · · · · · ·	1345	23.57 23.87																							Pump over bore. No sample
22-Nov-12 1	1245																								Pump over bore. No sample
30-May-13 1 26-May-14 1		24.05 24.35 22.79 23.09																							
21-May-15 1	1135	23.88 24.18	Pump over bore Pump over bore																						
1-Dec-15 1	1205	23.57 23.87	Pump over bore Pump over bore																						
	1203	25.66 26.12																							
	1332	25.59 26.05	4310																						
7-Feb-07 1	1017		4240																						
3-Jul-07		25.66 26.13 25.68 26.16	4250																						
10-Oct-07 1	1700	25.58 26.16 25.58 26.06 25.79 26.18	4270																						
8-Apr-08 1	1130	25.79 26.16 25.78 26.25 25.79 26.27	4320																						
31-Oct-08 1	1115	25.78 26.26 25.75 26.25	4350																						
18-Jun-09 28-Aug-09 1	1015	26.48 26.68 26.61 26.81		19.6	<0.001	0.046 <0.001		<0.001 0.008					0.101									41.4 4.88			2250
8-Dec-09 1 4-May-10 1	1610 : 1445 :	26.74 26.94 26.94 27.3	7.57 5210		<0.001 0.001	0.031 <0.001	<0.005 <0.0001 <0.001	<0.001 <0.001 0.004			0.021 0.003 0.032 0.003		<0.005 0.021	<0.0001 8.17 <0.0001								42.3 4.6 44.2 3.54		0.04 0.04	2680
16-Aug-10 1 3-Nov-10 1	1415 : 1240 :	27.13 27.48 27.19 27.54	8.14 4830	20.6																					
13-May-11 1	1330	27.25 27.6	7.84 4785				<0.005				0.03 0.00			<0.0001 7.93										0.16 0.2	
5-Dec-11 1	1140	27.39 27.74	8.02 4180	22.8 0.26 22.5 23.9 <0.01		0.063 <0.001	0.0001 <0.001 <0.005	<0.001 0.014			0.003 0.006													68.4 76.9	2460 Under tank stand (Box thorn)
29-May-12 1	1215	27.4 27.75	8.01 2220			0.034 <0.001		<0.001 0.02						<0.0001 8.06 <0.0001 8.04											Under tank stand
22-Nov-12 1	1145	27.32 27.67	7.87 2440	23.1 22.6 0.04				<0.001 0.022						<0.0001 8.04											Under tank stand (Box thorn)
30-May-13 1	1200	27.5 27.85	8.08 2970	22.1								3 <0.01 <0.01												0.01 0.03	1460
26-May-14 1	1120	27.63 27.98	8.2 2940	22.1								3 <0.01 <0.01												1.12 1.13	
24-Feb-15 1	1110	27.65 28		23.1 0.13								2 <0.01 <0.01													
26-Aug-15 1	1115	27.78 28.13	8.3 3640	20.9	<0.001 0.19	0.018 <0.001	<0.0001 <0.001	<0.001 0.002	2.73	<0.001	0.028 <0.00	01 <0.01 <0.01	0.037	<0.0001 8.23	3960	8 70	495	316 35.8	523 20	<1 <1	960 960	34.4 2.02	15.6 <0.01	<0.01 <0.01	2040
			8.4 3860 8.5 3720		<0.001 0.15	0.031 <0.001	<0.0001 <0.001	<0.001 0.033	4.39	0.003	0.04 <0.00	01 <0.01 <0.01	0.058	<0.0001 8.26	4060	8 75	5 523	301 37	747 2	<1 <1	864 864	38.4 1.81	23.9 0.02	<0.01 <0.01	2450
GW8 16-Nov-05 1 27-Feb-06 1	1215	19.82 20.47																							
25-May-06 1 2-Aug-06 1	1353	20.79 21.93																							
	1034	21.93 22.56	5640																						
	-		4090																						
	1643	22.10 22.71 22.16 22.74 22.45 23.04	4820																						
	1150	22.67 23.28	5490																						
30-Oct-08 1	1820		0.00																						
	0910 I :	23.10 23.71	6010																						
	1420	23.10 23.71 23.15 23.77 23.31 23.88			<0.001 1.01	<0.001	0.0001 <0.001	0.002 0.018	214	0.002	1.97 0.01	1 <0.01	1.38									54.6 4.17	1.34		3350
8-Dec-09 1 4-May-10 1	1420 : 1142 : 1405 :	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87	6.8 6120 6.62 6010 6.87 5940	20.9 27.3 <0.01 22.7			<0.001		103	<0.001	1.5 0.00	14		<0.0001 6.42	5100 2	252 98	630	10 48.4	1800 0.81	<1 <1	31 31	54.6 4.17 51.4 3.06 54 2.83	<0.01	0.04 0.04	3350 4560
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1	1420 : 1142 : 1405 : 1050 : 1120 : 1210 : :	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87 23.15 23.75 23.13 23.73	6.8 6120 6.62 6010	20.9 27.3 <0.01 22.7	<0.001		<0.001	<0.001	103	<0.001	1.5 0.00	14	0.07	<0.0001 6.42	5100 2	252 98	630	10 48.4	1800 0.81	<1 <1	31 31	51.4 3.06	<0.01	0.04 0.04	
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1	1420 :: 1142 :: 1405 :: 1050 :: 1120 :: 1210 :: 1145 :: 1110 ::	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87 23.15 23.75 23.13 23.73 Dry 22.78 23.38	6.8 6120 6.62 6010 6.87 5940 7.11 5750 6.75 5880	20.9 27.3 <0.01 22.7 20.5	<0.001 0.009 0.733	<0.001	<0.001 <0.0001 0.002	<0.001 0.004 0.047	103	<0.001	1.5 0.000 2.13 0.013	4 2 <0.01	0.07	<0.0001 6.42 <0.0001	5100 2 5620 2	252 98 235 107	630 7 691	10 48.4 17 51	1800 0.81 1850 0.94	<1	31 31 86 86	51.4 3.06 54 2.83	<0.01		4560
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 31-Aug-11 1 5-Dec-11 1	1420 : 1142 : 1405 : 1050 : 1120 : 1210 : 1145 : 1110 : 1040 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110 : 1110	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 23.38 22.45 23.05	6.8 6120 6.62 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9	<0.001 0.009 0.733 <0.001 0.505	<0.001	<0.001 <0.002 <0.0047 <0.001	<0.001 0.004 0.047 0.001 0.001	103 195	<0.001 0.002 0.006	1.5 0.00 2.13 0.01 1.04 0.00	2 <0.01	0.07 0.238 0.226	<0.0001 6.42 <0.0001 <0.0001 6.4	5100 2 5620 2 6180 1	252 98 235 107	630 7 691 0 790	10 48.4 17 51 17 52.6	1800 0.81 1850 0.94 1700 <1	4 4 4 4 4 4	31 31 86 86 68 68	51.4 3.06 54 2.83 49.3 3.21	<0.01 21 18.2 <0.01	0.07 0.07	
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 31-Aug-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1	1420 : : : : : : : : : : : : : : : : : : :	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.15 23.75 23.15 23.75 23.17 23.87 22.78 23.38 22.78 23.38 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 23.86	6.8 6120 6.62 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.36 1950	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9 23.4 <0.01 21	<0.001 0.009 0.733 <0.001 0.505 <0.001	<0.001	0.0001 0.002 0.0047 <0.001 0.005	0.001 0.017 0.006	103 195 133 <0.05	<0.001 0.002 0.006 <0.001	1.5 0.00 2.13 0.01: 1.04 0.00: 0.188 0.00	4 2 <0.01 5 <0.01	0.07 0.238 0.226 0.007	<0.0001 6.42 <0.0001 <0.0001 6.4 <0.0001 7.68	5100 2 5620 2 6180 1 2520	252 98 235 107 175 110 65 45	6 463	10 48.4 17 51 17 52.6 28 27.8	1800 0.81 1850 0.94 1700 <1 407 89	d d d d d d	31 31 86 86 68 68 692 692	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14	<0.01 21 18.2 <0.01 0.51	0.07 0.07 0.1 0.61	4560 3720 From windmill Wilga
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 31-Aug-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1	1420 : 1142 : 1405 : 1405 : 1050 : 11120 : 1110 : 1110 : 1110 : 11110 : 11145 : 1110 : 11145 : 11120 : 1110 : 11145 : 11120 : 11110 : 11100 : 11100 : 11100 : 11100 :	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 23.66 22.02 22.62 21.99 22.59	6.8 6120 6.62 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.28 1750 7.27 2820 7.24 3110	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9 23.4 <0.01 21.22.3 0.17 22.8	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219	<0.001 <0.001	0.0001 <0.001 <0.0001 0.002 0.0047 <0.001 <0.005 <0.0001 <0.001	0.001 0.017 0.006 0.044	103 195 133 -<0.05 29.6	<0.001 0.002 0.006 <0.001 (1.5 0.00 2.13 0.01; 1.04 0.00; 0.188 0.00 0.145 0.00;	4 2 <0.01 5 <0.01 4 2 <0.01	0.07 0.238 0.226 0.007	<0.0001 6.42 <0.0001 6.4 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64	5100 2 5620 2 6180 1 2520 (3260 3260 3260 3260 3260 3260 3260 3260	252 98 235 107 175 110 65 45 56 53	6 463 6 463 6 463	10 48.4 17 51 17 52.6 28 27.8 31 31.7	1800 0.81 1850 0.94 1700 <1 407 89 732 2	4 4 4 4 4 4 4 4 4 4 4 4	31 31 86 86 68 68 692 692 616 616	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1	18.2 <0.01 0.51 15.8 <0.01	0.07 0.07 0.1 0.61 <0.01 <0.01	3720 From windmill Wilga 1670 Windmill Wilgai
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 31-Aug-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1 11-Mar-13 1 30-May-13 1	1420 : 1142 : 1405 : 1050 : 1120 : 1145 : 1110 : 1130 : 1145 : 1110 : 1145 : 1110 : 1130 : 1145 : 1110 : 1130 : 1145 : 1110 : 11500 : 11500 : 1130 : 1130 : 1140 : 11500 : 1130 : 1130 : 11500 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1145 : 11500 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1130 : 1145 : 1145 : 11500 : 113	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.37 23.87 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 23.86 22.02 22.62 21.99 22.59 21.99 22.59 21.98 22.58 22.01 22.61	6.8 6120 6.82 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.36 1950 7.27 2820 7.24 3110 7.21 3420 7.3 3540	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9 23.4 <0.01 21 22.3 0.17 22.8 22.8 0.29 22.2	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243	<0.001 <0.001 <0.001	<0.001 <0.0001 0.002 0.0047 <0.001 <0.005 <0.0001 <0.001 <0.0001 <0.001	0.001 0.017 0.006 0.001 0.044 0.001 0.034	103 - 195 133 - 133 - 29.6 42.4	<001 0.002 0.006 <001 0.004 0.002 0.002	1.5 0.00 2.13 0.01 1.04 0.00 0.188 0.00 0.145 0.00 0.176 <0.00	4 2 <0.01 5 <0.01 4 2 <0.01 01 <0.01	0.07 0.238 0.226 0.007 0.164	<0.0001 6.42 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.53	5100 2 5620 2 6180 1 2520 3260 3750	252 98 235 107 175 110 65 45 56 53 52 58	630 7 691 0 790 6 463 8 545 8 575	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1	d d d <td>31 31 86 86 68 68 692 692 616 616 372 372</td> <td>51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04</td> <td>18.2 <0.01 18.2 <0.01 0.51 15.8 <0.01 14.4 <0.01</td> <td>0.07 0.07 0.1 0.61 <0.01 <0.01</td> <td>3720 From windmill Wilga 1670 Windmill Wilgai</td>	31 31 86 86 68 68 692 692 616 616 372 372	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04	18.2 <0.01 18.2 <0.01 0.51 15.8 <0.01 14.4 <0.01	0.07 0.07 0.1 0.61 <0.01 <0.01	3720 From windmill Wilga 1670 Windmill Wilgai
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1 11-Mar-13 1 30-May-13 1 22-Aug-13 1 22-Aug-14 1	1420 : 1142 : 1405 : 1050 : 1500 : 11105 : 11105 :	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 23.86 22.02 22.62 21.99 22.59 21.98 22.58 22.01 22.61 19 19.6 33.35 33.95	6.8 6120 6.62 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.26 1950 7.27 2820 7.24 3110 7.21 3420 7.3 3540 7.18 5290 6.9 5500	20.9 27.3 <0.01 22.7 20.5 21.3 22.7	<0.001	<0.001 <0.001 <0.001 <0.001 0.08 <0.001	0.0001	0.001 0.017 0.001 0.017 0.006 -0.001 0.034 -0.001 0.034	103 195 133 <0.05 29.6 42.4	<001 0.002 0.006 <001 0.004 0.002 0.003	1.5 0.00 2.13 0.01; 1.04 0.00; 0.188 0.00 0.145 0.00; 0.176 <0.00; 0.913 0.00;	4 2 <0.01 5 <0.01 4 2 <0.01	0.07 0.238 0.226 0.007 0.164 0.078	<0.0001 6.42 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.53 <0.0001 7.62	5100 2 5620 2 6180 1 2520 3 3260 3 6160 2	252 98 235 107 175 110 65 45 56 53 52 58 201 151	6 463 6 545 6 8 575 6 8 79	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188	d d d d d d d d d d d d d d d d d d d d d d d d	31 31 86 86 68 68 692 692 616 616 372 372 628 628	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12	<0.01 21	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1 11-Mar-13 1 30-May-13 1 22-Aug-13 1 26-May-14 1 8-Sep-14 1 12-Nov-14 1	1420 : 1142 : 1405 : 1050 : 1120 : 1145 : 1110 : 1130 : 1145 : 1110 : 11500 : 11500 : 11500 : 1105 : 1105 : 1105 : 1105 : 1105 : 1105 : 1105 : 11105 : 1130 : 1145 : 1135 : 1135	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.67 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 23.86 22.02 22.62 21.99 22.59 21.98 22.58 22.01 22.61 19 19.6 33.35 33.95 35.2 35.8 35.11 35.71 34.6 35.2	6.8 6120 6.82 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.27 2820 7.27 33540 7.18 5290 6.9 5580 6.9 5580 6.9 5580 6.9 55490	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9 23.4 <0.01 21 22.3 0.17 22.8 22.8 0.29 22.2 20.5 0.09 22.4 22.7 0.02 24.2 27.4 0.01	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243 <0.001 0.251 <0.001 0.192	<0.001 <0.001 <0.001 <0.001 0.08 <0.001 0.07 <0.001	<0.001 <0.001 <0.001 <0.005 <0.0001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001	0.001 0.047	103 195 133 -<0.05 29.6 42.4 13.6	<0.001 0.002 0.006 <0.001 0.004 0.002 0.003 <0.001	1.5 0.00 2.13 0.01; 1.04 0.00; 0.188 0.00 0.145 0.00; 0.176 <0.00 0.913 0.00; 0.024 <0.00	5 <0.01 4 2 <0.01 5 <0.01 4 0.01 3 <0.01 <0.01	0.07 0.238 0.226 0.007 0.164 0.078 0.992	<0.0001 6.42 <0.0001 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.53 <0.0001 7.62 <0.0001 7.46	5100 2 5620 2 6180 1 2520 9 3260 3 3750 6 6160 2 5850 2	252 98 235 107 175 110 65 45 56 53 52 58 201 151 215 143	630 7 691 0 790 6 463 8 545 8 575 1 879 3 774	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1 12 56.5	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188 1370 213	d d d d d d d d d d d d d d d d d d	31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12	<0.01 21	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1 11-Mar-13 1 30-May-13 1 22-Aug-13 1 26-May-14 1 8-Sep-14 1 12-Nov-14 1 24-Feb-15 1 21-May-15 7	1420 : 1142 : 1405 : 1405 : 1405 : 15	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.27 23.87 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 22.62 21.99 22.59 21.98 22.58 22.01 22.61 19 19.6 33.35 33.95 35.1 35.71 34.6 35.2 23.33 23.93 23.2 23.8	6.8 6120 6.82 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.27 2820 7.24 3110 7.21 3420 7.3 3540 7.18 5290 6.9 5580 7 5590 6.9 5580 7 5570	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9 23.4 <0.01 21 22.3 0.17 22.8 22.8 0.29 22.2 20.5 0.09 22.4 22.7 0.02 24.2 27.4 0.01 21.2 21.3 0.01	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243 <0.001 0.251 <0.001 0.192 <0.001	<0.001 <0.001 <0.001 <0.001 0.08 <0.001 0.07 <0.001 0.07 <0.001	<0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <	0.001 0.047	103 - 195 - 133 - 133 - 13.6 - 1.33 -	0.001 0.002 0.006 <0.001 0.004 0.002 0.003 <0.001 0.001	1.5 0.00 2.13 0.01 1.04 0.00 0.188 0.00 0.145 0.00 0.176 <0.00 0.013 0.00 0.024 <0.00 0.015 0.00	2 <0.01 2 <0.01 4 2 <0.01 01 <0.01 01 <0.01	0.07 0.238 0.226 0.007 0.164 0.078 0.992 0.041	<0.0001 6.42 <0.0001 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.53 <0.0001 7.62 <0.0001 7.46 <0.0001 7.18	5100 2 5620 2 6180 1 2520 3 3260 3 6160 2 5850 2 5770 2	252 98 235 107 175 110 65 45 56 53 52 58 201 151 215 143	630 7 691 0 790 6 463 6 545 6 575 1 879 3 774 1 869	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1 12 56.5 10 60.7	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188 1370 213 1260 216	d d d d d d d d d d d d d d d d d d d d d d d d d d	31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607 719 719	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42	<0.01 21	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960
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1.48 4</td><td>0.001 0.002 0.006 <0.001 0.004 0.002 0.003 (0.001 0.001 (0.001 (0.001)</td><td>1.5 0.00 2.13 0.01 1.04 0.00 0.188 0.00 0.145 0.00 0.176 <0.00 0.913 0.00 0.024 <0.00 0.015 0.00 0.024 <0.00</td><td> 4 2 <0.01 </td><td>0.07 0.238 0.226 0.007 0.164 0.078 0.992 0.041 0.06</td><td><0.0001 6.42 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.62 <0.0001 7.46 <0.0001 7.46 <0.0001 7.28</td><td>5100 2 5620 2 6180 1 2520 9 3260 3 3750 3 6160 2 5850 2 5770 2 6180 2</td><td>252 98 235 107 175 110 65 45 56 53 52 58 201 151 215 143 204 151</td><td>630 7 691 0 790 6 463 8 545 8 575 1 879 3 774 1 869 7 861</td><td>10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1 12 56.5 10 60.7 10 59.8</td><td>1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188 1370 213 1260 216 1060 242</td><td>d d d</td></t<> <td>31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607 719 719 724 724</td> <td>51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42 49.4 9.53</td> <td> <0.01 21 </td> <td>0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01 0.02 0.02</td> <td>4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960 3420</td>	6.8 6120 6.8 6120 6.62 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.27 2820 7.24 3110 7.21 3420 7.3 3540 7.18 5290 6.9 5580 7 5590 6.9 5490 6.9 5580 7 5570 7 5460 7.3 4990 7810	20.9 27.3 <0.01 22.7 20.5 21.3 22.7 0.34 22.9 23.4 <0.01 21.2 22.8 0.29 22.2 20.5 0.09 22.4 22.7 0.02 24.2 27.4 0.01 21.2 21.3 0.01 25.8 30.2 <0.01	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243 <0.001 0.251 <0.001 0.192 <0.001 0.178	<0.001 <0.001 <0.001 <0.001 <0.008 <0.001 <0.07 <0.001 <0.07 <0.001 <0.05 <0.001	<0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 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1700 <1 407 89 732 2 912 <1 1450 188 1370 213 1260 216 1060 242	d d d	31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607 719 719 724 724	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42 49.4 9.53	<0.01 21	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01 0.02 0.02	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960 3420
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 31-Aug-11 1 5-Dec-11 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1 11-Mar-13 1 22-Aug-13 1 22-Aug-13 1 22-Aug-13 1 22-Aug-13 1 24-Feb-15 1 21-May-15 1 24-Feb-15 1 21-May-15 1 26-Aug-15 7 1-Dec-15 1 8-Feb-16 1 GW9 16-Nov-05 1 27-Feb-06 1 25-May-06 1 7-Nov-06 1 7-Nov-06 1 7-Nov-06 1 7-Feb-07 1 4-May-07 1 15-Jan-08 1 8-Apr-08 1 10-Jul-08 0 31-Oct-08 1	1420	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.15 23.75 23.13 23.73 Dry 22.78 22.78 23.38 22.78 23.38 22.4 23 23.26 23.86 22.02 22.62 21.99 22.59 21.98 22.58 22.01 22.61 19 19.6 33.35 33.95 35.2 35.8 35.11 35.71 23.23 23.93 23.2 23.86 20.75 21.47 20.75 21.47 20.70 21.43 20.71 21.40 20.62 21.36 19.71 20.43 19.69 20.40 19.73 20.40 19.73 20.40 19.66	6.8 6120 6.82 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.36 1950 7.27 2820 7.24 3110 7.21 3420 7.3 3540 7.18 5290 6.9 5580 7 5570 7 5460 7.3 4990 7 11450 11930 112630	20.9 27.3 <0.01 22.7 20.5 21.3 22.7	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243 <0.001 0.251 <0.001 0.192 <0.001 0.178	<0.001 <0.001 <0.001 <0.001 0.08 <0.001 0.07 <0.001 0.06 <0.001 0.06 <0.001	<0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <	0.001 0.047	103 - 195 - 133 - 133 - 136 - 1.33 - 1.48 -	<001 0.002 0.006 <0.001 0.002 0.003 (0.001 (0.001 (0.001) (0.00	1.5 0.00 2.13 0.01 1.04 0.00 0.188 0.00 0.145 0.00 0.176 <0.00 0.024 <0.00 0.015 0.00 0.024 <0.00 0.011 0.00	4 2 <0.01 5 <0.01 4 2 <0.01 3 <0.01 <0.01 3 <0.01 <0.01 1 <0.01 <0.01 4 <0.01 <0.01 4 <0.01 <0.01	0.07 0.238 0.226 0.007 0.164 0.078 0.992 0.041 0.06	<0.0001 6.42 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.62 <0.0001 7.46 <0.0001 7.46 <0.0001 7.28	5100 2 5620 2 6180 1 2520 9 3260 3 3750 3 6160 2 5850 2 5770 2 6180 2	252 98 235 107 175 110 65 45 56 53 52 58 201 151 215 143 204 151	630 7 691 0 790 6 463 8 545 8 575 1 879 3 774 1 869 7 861	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1 12 56.5 10 60.7 10 59.8	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188 1370 213 1260 216 1060 242	d d d <td>31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607 719 719 724 724</td> <td>51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42 49.4 9.53</td> <td> <0.01 21 </td> <td>0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01 0.02 0.02</td> <td>4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960 3420</td>	31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607 719 719 724 724	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42 49.4 9.53	<0.01 21	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01 0.02 0.02	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960 3420
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 23-Aug-12 1 11-Mar-13 1 30-May-13 1 22-Nov-14 1 8-Sep-14 1 12-Nov-14 1 24-Feb-15 1 21-May-15 1 26-Aug-15 7 1-Dec-15 1 18-Feb-16 1 27-Feb-06 1 27-Feb-06 1 27-Feb-06 1 27-Feb-06 1 27-Feb-07 1 4-May-07 0 3-Jul-07 1 15-Aug-07 1 10-Oct-07 1 15-Jan-08 1 8-Apr-08 1 10-Jul-08 0 31-Oct-08 1 13-Jan-09 1 18-Jun-09 1	1420	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.15 23.75 23.15 23.73 Dry 22.78 23.38 22.78 22.78 23.38 22.78 23.38 22.45 23.05 22.4 23 23.26 22.62 21.99 22.59 21.98 22.58 22.01 22.61 19 19.6 33.35 33.95 35.2 35.8 35.11 35.71 34.6 35.2 23.33 23.93 23.2 23.8 34.97 35.57 20.75 21.47 20.70 21.43 20.71 21.40 20.62 21.36 19.71 20.41 19.63 20.44 19.66 20.	6.8 6120 6.82 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.36 1950 7.27 2820 7.24 3110 7.21 3420 7.18 5290 6.9 5580 7 5590 6.9 5580 7 5570 7 5460 7.3 4990 11450 11930 12630 12940 12790 6.6 10400	20.9 27.3 <0.01 22.7 20.5 21.3 22.7	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243 <0.001 0.251 <0.001 0.192 <0.001 0.178 <0.001 0.152	<0.001 <0.001 <0.001 <0.001 0.08 <0.001 0.07 <0.001 0.06 <0.001 0.06 <0.001	<0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <	 <0.001 0.004 0.0047 0.001 0.001 0.001 0.006 <0.001 0.034 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.003 	103	<001 0.002 0.006 <001 0.004 0.002 0.003 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	1.5 0.00 2.13 0.01 1.04 0.00 0.188 0.00 0.145 0.00 0.145 0.00 0.015 0.00 0.024 <0.00 0.011 0.00 12.3 0.01	4 2 <0.01 2 <0.01 4	0.07 0.238 0.226 0.007 0.164 0.078 0.992 0.041 0.06 0.052	<0.0001 6.42 <0.0001 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.62 <0.0001 7.46 <0.0001 7.18 <0.0001 7.68 <0.0001 7.68 <0.0001 7.68 <0.0001 7.68	5100 2 5620 2 6180 1 2520 3 3260 3 5850 2 5770 2 6180 2 5770 1 6180 2	252 98 235 107 175 110 65 45 56 53 52 58 201 151 215 143 204 151 201 147 469 148	3 630 7 691 0 790 6 463 8 545 8 575 1 879 3 774 1 869 7 861 4 825	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1 12 56.5 10 60.7 10 59.8 10 54.8	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188 1370 213 1260 216 1060 242 1260 235	d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d	31 31 86 86 68 68 692 692 616 616 372 372 628 628 607 607 719 719 724 724 456 456	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42 49.4 9.53 49.5 4.98	18.2 <0.01	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01 0.02 0.02 <0.01 <0.01	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960 3420
8-Dec-09 1 4-May-10 1 16-Aug-10 1 3-Nov-10 1 16-Feb-11 1 13-May-11 1 5-Dec-11 1 12-Mar-12 1 29-May-12 1 23-Aug-12 1 22-Nov-12 1 11-Mar-13 1 30-May-13 1 22-Aug-13 1 22-Aug-13 1 22-Aug-13 1 22-Aug-13 1 26-May-14 1 8-Sep-14 1 12-Nov-14 1 24-Feb-15 1 21-May-15 1 26-Aug-15 7 1-Dec-15 1 18-Feb-16 1 GW9 16-Nov-05 1 27-Feb-06 1 25-May-06 1 7-Nov-06 1 7-Feb-07 1 4-May-07 0 3-Jul-07 1 15-Aug-07 1 10-Oct-07 1 15-Jan-08 1 8-Apr-08 1 10-Jul-08 0 31-Oct-08 1 13-Jan-09 1 18-Jun-09 1 18-Jun-09 1 18-Jun-09 1 18-Jun-09 1 18-Dec-09 1	1420 1142 1142 1142 11405 11050 11120 11145 11110 11145 11110 11130 11145 11120 11145 11120 11145 11120 11145 11120 11145 11120 11145 11120 11145 11135 1040 1145 1135 1040 1145 1136 1140 1105 1140 1106 1140 1106 1140 1107 1140 1108 1140 1109 1140 1109 1140 1109 1140 1109 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 1140 1100 11500 11820 11215 11640 11205 11510 11510 11510	23.10 23.71 23.15 23.77 23.31 23.88 23.29 23.89 23.3 23.9 23.15 23.75 23.13 23.73 Dry 22.78 23.38 22.78 22.45 23.05 22.4 23 23.26 23.66 22.02 22.62 21.99 22.59 21.98 22.58 22.01 22.61 19 19.6 33.35 33.95 35.2 35.8 35.11 35.71 34.6 35.2 23.33 23.93 23.2 23.8 34.97 35.57 35.17 35.77 20.70 21.43 20.71 21.40 20.62 21.36 19.71 20.43 19.73 20.40 19.73 20.40 19.73 20.	6.8 6120 6.82 6010 6.87 5940 7.11 5750 6.75 5880 6.79 5120 6.81 4500 7.28 1750 7.36 1950 7.27 2820 7.24 3110 7.21 3420 7.18 5290 6.9 5580 7 5590 6.9 5580 7 5570 7 5460 7.3 4990 11450 11930 12630 12940 12790 6.6 10400	20.9 27.3 <0.01 22.7 20.5 21.3 22.7	<0.001 0.009 0.733 <0.001 0.505 <0.001 0.219 <0.001 0.243 <0.001 0.251 <0.001 0.192 <0.001 0.178 <0.001 0.152	<0.001 <0.001 <0.001 <0.001 0.08 <0.001 0.07 <0.001 0.05 <0.001 0.06 <0.001 <0.001	<0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <	 <0.001 0.004 0.0047 0.001 0.001 0.001 0.006 <0.001 0.034 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.003 	103	<001 0.002 0.006 <001 0.004 0.002 0.003 (001) 0.001 (001) 0.001 (001) 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	1.5 0.00 2.13 0.01 1.04 0.00 0.188 0.00 0.145 0.00 0.176 <0.00 0.024 <0.00 0.011 0.00 0.011 0.00 12.3 0.01	4 2 <0.01 5 <0.01 4	0.07 0.238 0.226 0.007 0.164 0.078 0.992 0.041 0.06 0.052	<0.0001 6.42 <0.0001 6.4 <0.0001 7.68 <0.0001 7.64 <0.0001 7.62 <0.0001 7.46 <0.0001 7.18 <0.0001 7.28 <0.0001 7.68	5100 2 5620 2 6180 1 2520 3 3260 2 5850 2 5770 2 6180 2 5540 1	252 98 235 107 175 110 65 45 56 53 52 58 201 151 215 143 204 151 1201 147 152 134 80 132	6 463 6 7 691 7 691 7 691 7 790 6 463 8 545 8 575 1 879 7 861 4 825 7 861 4 825	10 48.4 17 51 17 52.6 28 27.8 31 31.7 32 33.2 15 61.1 12 56.5 10 60.7 10 59.8 10 54.8 44 93 39 95.3	1800 0.81 1850 0.94 1700 <1 407 89 732 2 912 <1 1450 188 1370 213 1260 216 1060 242 1260 235 3530 <20 3570 1.17	d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d d	31 31 86 86 86 86 86 86 86 86 86 86 86 86 86	51.4 3.06 54 2.83 49.3 3.21 27.2 1.14 33 2.1 33.2 0.04 57.4 3.12 55.2 1.12 54.4 5.42 49.4 9.53 49.5 4.98	18.2 <0.01	0.07 0.07 0.1 0.61 <0.01 <0.01 0.1 0.1 0.04 0.04 0.01 0.01 0.02 0.02	4560 3720 From windmill Wilga 1670 Windmill Wilgai 1910 3160 3120 2960 3420 3460

		0915 19.33 0950 24.69																								No sample, black sludge
1	3-May-11	0920 21.37	22.02 6.7	7465 20.1 6110 19.7	1.69 <0.001	0.05	<0.001 <0.0001	0.003 0.002	0.022 43.1	0.003 2.91	0.01		<0.01 0.133 <0	0.0001 7.35	7420	32 104	1290	29	67 1760	380 <1	<1 288	288 63.3	2.81 13.4	<0.01 0.02	0.02 3690	Windmill-haul road
	5-Dec-11	0900 19.33	19.98 6.8	21.6				<0.001		<0.001 0.284						12 14								0.01 0.06		EC 199 - from surface floodwaters
	,			3410 19.8 4750 19.5	0.79 <0.001	0.028	<0.001 <0.0001	<0.001 <0.001	0.047 46.5	0.001 1.29	0.002		<0.01 0.117 <0	0.0001 7.75	5370	26 72	1020	15	52 1490	193 <1	<1 101	101 48.1	3.88 0.89	<0.01 <0.01	<0.01 2780	Windmill on haul road
1	1-Mar-13	1500 18.96	19.61 7.58		0.04 <0.001	0.016	<0.001 <0.0001	<0.001 <0.001	0.019 11	0.002 1.09	<0.001		<0.01 0.041 <0	0.0001 8.03	6930	28 83	1360	19	67.9 1850	254 <1	<1 325	325 64	2.94 2.42	<0.01 0.04	0.04 3710	Windmill on haul road
2	2-Aug-13	0900 18.65		6740 20.6 6710 19.4		0.06 <0.05	<0.001 0.0001	0.1 0.004	0.126 26.7	0.008 1.16	0.01	<0.01	0.01 0.229 <0	0.0001 8.01	7500	23 85	1400	23	69.6 2230	126 <1	<1 230	230 70.1	0.38 2.56		3630	
		0915 20.85				0.032 <0.05	<0.001 0.0002	<0.001 0.001	0.349 128	0.001 4.99	0.01	<0.01	<0.01 0.361 <0	0.0001 7.03	6890	75 110	1090	18	60.7 1430	569 <1	<1 384	384 59.9	0.65 1.23	<0.01 0.32	0.32 3360	
2	4-Feb-15	0900 19.55	20.2 6.9			0.029 <0.05	<0.001 <0.0001	0.001 <0.001	0.005 58.9	0.002 3.11	0.006	<0.01	<0.01 0.11 0	0002 7.26	6560	55 99	1260	16	66.1 1500	314 <1	<1 560	560 60	4.78 2.8	<0.01 0.03	0.03 3680	
2	6-Aug-15		20.2 7.1	6110 20 6020 19.4 5770 20.9		0.119 <0.05	<0.001 <0.0001	<0.001 <0.001	0.004 23.1	<0.001 1.6	0.001	<0.01	<0.01 0.047 <0	0.0001 7.72	6570	35 80	1130	18	57.9 1210	184 <1	<1 476	476 47.5	9.9 3.12	<0.01 0.01	0.01 3390	
GW10 1	6-Nov-05	1403 21.64 1055 21.48	22.29	6250 6500																						
2		1439 21.14		6060	<0.02 <0.001				0.17	<0.02				98	94	1220 12		1490	437		1060		0.01 0.3			
	7-Feb-07 1-May-07			6400	40.00				0.17	40.02						1220		. 100			1000		0.0.1			
	3-Jul-07 0-Oct-07		7.3	6670	0.05 0.001				0.24	0.02				94	90	1240 17		1520	17		1040		0.02 <0.			
	5-Jan-08 8-Apr-08	1400																								
3	10-Jul-08 80-Oct-08	1620	6.8	6800	<0.02 <0.001				0.02	0.01				95	91	1200 15		1600	4400		1100		<0.01 1.3			
1	2-Jan-09 8-Jun-09	1220		e 7110 15.6	<0.001	0.039 <0.001	<0.0001 0.001	<0.001 0.019	1.47 0.001	0.002 0.003	<0.01	0.01	<0.0001	6650 98	98	1360 13	72.7	1530	599 <1	<1 1080	1080 77.4	3.18 <0.0	1	4280		
	3-Dec-09		19.95 6.87		<0.01 <0.001		<0.005	0.029	<0.05 <0.001	0.001 0.004	2.21	0.025	<0.0001 7	6400 92	98	1380 12	73	1430	406 <1	<1 1030	1030 69.4	2.56	<0.01 1.12			
1	6-Aug-10	935 20.2	21 6.95	6950 23 6770 14.2		0.041 <0.001	<0.0001 <0.001	<0.001 0.032	0.3 0.001	0.009 0.004	<0.01	0.104	<0.0001	6690 102	98	1310 13	70.6	1520	410 <1	<1 1100	1100 /3.5	2 <0.1)	4480		
1	6-Feb-11		20.84 6.69	5600 26.5 6950 21.7	<0.01 <0.001		<0.005	0.077	0.11 0.003	0.016 0.01		0.285	<0.0001 6.96	6670 100	107	1330 14	72.2	1530	389 <1	<1 989	989 71	0.79	<0.01 0.6	0.6		
3	1-Aug-11	0920 20.68	21.48 6.8		0.05 0.002	0.04 <0.001	<0.0001 0.002	<0.001 0.181	3.98 0.079	0.004 0.013	<0.01	0.111	0.0005 7.36	7260 115	111	1410 13	76.5	1440	419 <1	<1 1040	1040 70.1	4.34 <0.0	1 <0.01 0.69	0.69 4100	ımp (running)	
1	2-Mar-12	1015 19.74 1000 19.74	20.54	20.1																						Pump not running
2	3/Aug/12	0940 19.56 0940 19.47	20.36																							Bore covered, no pressure Bore covered, no pressure
1	1/Mar/13	0935 19.46 1000 19.5	20.26																							
2	6/May/14 2/Nov/14	0920 19.37 1010 19.35	20.17 20.15 Pump o																							
2	6/Aug/15	0930 19.48	19.69 Pump of 20.28 Pump of	over bore																						
			20.11 Pump of 20.06 Pump of																							
	8-Apr-08	1405 18.33	18.65	3260																						
3		1635 18.25	18.56 9.5	3300	<0.02 <0.001				<0.01	16						31 0.012	530	10	1100	11.3		34		0.01 0.05		
1	8-Jun-09		18.42 9.4	3740 20.4	<0.001	0.026	<0.001 <0.0001	<0.001 <0.001	0.006 1.29	0.001 0.122	0.008		<0.01 0.255 <0	.0001	3560	32 18	678	10	32.9 1040	<10 <1	<1 68	68 30.6	3.63 4.14		1880	
	3-Dec-09		18.31 8.35		<0.01 <0.001		0.004 0.0004	<0.001		<0.001 0.165					3450	49 22	667	9	33.6 1090	0.62 <1	4 50	54 31.9	2.55	<0.01 <0.01		
1	6-Aug-10		18.21 9.31	4060 24.1 3830 19		0.04	<0.001 <0.0001	<0.001 <0.001	0.004 2.13	<0.001 0.205	0.001		<0.01 0.214 <0	7.0001	3750	55 24	122	11	36.4 1160	<0.50 <1	<1 61	61 33.8	3.62 4.6		2390	
1	6-Feb-11	1030 17.93	18.18 7.8	3300 25.7 3920 20.4	<0.01 <0.001			<0.001	0.002 0.23	<0.001 0.336	<0.001		0.035 <0	7.21	3790	66 30	675	10	35.3 1200	<1 <1	<1 51	51 35	0.5	<0.01 0.02	0.02	
3	1-Aug-11	0940 17.81	18.06 7.58		0.25 <0.001	0.072	<0.001 <0.0001	<0.001 <0.001	0.004 9.91	0.001 0.466	0.002		<0.01 0.277 <0	0.0001 7.34	4280	92 32	724	10	39 1240	2 <1	<1 42	42 35.9	4.15 5.64	<0.01 0.01	0.01 2430	Wind mill (white house)
1	2-Mar-12	1020 17.65	17.9 7.37		<0.01 <0.001			<0.001	0.001 <0.05	<0.001 0.656	0.002		0.034 <0	7.23	4140	108 34	683	10	38.2 1240	<1 <1	<1 32	32 35.6	3.43	<0.01 0.36	0.36	
2	3-Aug-12	0955 17.59	17.84 7.35		0.19 <0.001	0.096	<0.001 <0.0001	<0.001 <0.001	0.045 21.9	0.002 0.862	0.001		<0.01 0.714 <0	7.09	4260	142 37	685	10	40.2 1320	<1 <1	<1 30	30 37.8	3.01 8.4	<0.01 <0.01	<0.01 2570	
1	1-Mar-13	1500 17.49	17.74 7.21		0.04 <0.001	0.088	<0.001 <0.0001	<0.001 <0.001	0.027 27.6	0.002 0.854	<0.001		<0.01 0.961 <0	7.51	4600	141 38	712	11	41.4 1310	2 <1	<1 51	51 38	4.28 3.53	<0.01 0.09	0.09 2920	
				4280 19.6 4620 20.5		0.098 0.08	<0.001 0.0001	<0.001 <0.001	0.074 24.8	0.003 0.887	0.002	<0.01	<0.01 0.699 <0	7.33	4760	168 40	720	12	43.3 1350	2 <1	<1 50	50 39.1	5.07 2.67		2580	
1	2-Nov-14	1035 17.32	17.57 6.9	4780 21.6									<0.01 1.12 <0													
2	1-May-15	0945 17.24	17.49 7.1	4650 20.3									<0.01 0.49 <0													
	1-Dec-15	940 17.18	17.43 7.4	4810 21.4									<0.01 0.136 <0													
VNW221	7-Nov-06	0846 11.59	12.14	4580 22.4 10400	0.05 <0.001	0.124 0.07	<0.001 <0.0001	<0.001 <0.001	0.031 13.2	0.003 0.876	<0.001	<0.01	<0.01 0.164 <0	0.0001 6.45	5030	240 46	653	10	44.4 1390	<1 <1	<1 10	10 39.4	5.99 1.76	<0.01 <0.01	<0.01 3220	
P1 4	1-May-07	1045 11.67 0955 12.82		11010																						
1		1550 12.96 1625 12.40		11040																						
1	5-Jan-08	1625 12.40 1115 14.15 1510 14.25	14.84	13310																						
	10-Jul-08	0910 18.43			0.03 <0.01				<0.01	500				390	0.005	2300 31		<0.2	480		750		<0.01 0.47			
1		0835 22.00			30.01									333	5.555				×-							
2	8-Aug-09 3-Dec-09	1130	Dry Dry																							
1	1-May-10 6-Aug-10	10.15 10.55	Dry Dry																							
1	3-Nov-10 6-Feb-11	1155 1130	Dry Dry Dry																							
3	1-Aug-11	1020	23.72 Insuffici Insuffici	ent Water ent Water																						
1	5-Dec-11 2-Mar-12	1100	Dry Dry																							
2	9-May-12 3-Aug-12	1050	Dry Dry																							
1	2-Nov-12 1-Mar-13	1050	Dry Dry																							
2	0-May-13 6-May-14 2-Nov-14	1020	Dry Dry																							
2	2-Nov-14 1-May-15 6-Aug-15	1120	Dry Dry Dry																							
	1-Dec-15 8-Feb-16	1030	Dry Dry													+ +										
VNW223	7-Nov-06	0826 19.20 1053 18.59	20.01																							
P3 4		1010 18.10		6320																						
1	5-Aug-07	1605 19.53 1607 19.66		7560																						
1	5-Jan-08	1140 20.16 1330 20.64	20.95	9630																						
3	10-Jul-08 80-Oct-08	0850 22.76 1845 24.91	23.57 25.72 7.2		0.03 <0.001				<0.01	270						190 0.035	1600	19	3300	170		820		0.01 0.2		
1	8-Jun-09		23.11 ufficient w	vater to sam																						
2	8-Aug-09	1123 27.36	28.86																							

-		-	-	1			ı		-	_		_								1		_																			1	1				
8-Dec-		315 26.35					<0.01							.005						0.029							16			1640 1	-		2700	120	<1	<1	789		94.3			<0.01	0.19	0.19		
4-May-		55 25.05	25.83	7.46	9330	22		<0.001	0.317		< 0.001	<0.0	001 0.0	003 (0.018	0.013	2.22	0.019	0.34	0.024		0.01	0.04	< 0.000)1	96	550 17	9 2	62 1	1540 1	14 9	97.9	2920	149	<1	<1	876	876	103	2.54	<0.10			<u> </u>	6390	
16-Aug	10 10	025 24.28	25.03	7.46	8540	20.1																																						1'	1	
3-Nov-	10 1	125 23.9	24.65																																									1	í l	
16-Feb	11 1	115 23.39	24.14	6.88	7310	26.1	0.48	< 0.001					<0.	.005		0.008	0.28	0.001	0.037	0.004			0.06	<0.000	7.1	95	30 17	1 2	.68	1540 1	13 9	97.7	2970	165	<1	<1	698	698	101	1.78		0.02	0.47	0.48		
13-May	11 10	22.99	23.74	6.91	9875	20.8																																						<u> </u>		
1-Sep-	11 09	900 22.45	23.2	7.15	8775	21.7	19.1	0.004	0.41		< 0.001	0.00	0.0	027 (0.048	0.026	20.6	0.036	0.764	0.05		0.04	0.081	<0.000	7.87	7 116	600 18	3 2	75 1	1580 1	13	101	3410	174	<1	<1	562	562	111	4.84	< 0.10	< 0.01	0.39	0.39	5880	Needed small bail
5-Dec-	11 10	22.5	23.25	7.02	8630	22																																						·		
12-Mar	12 10	045 22.15					< 0.01	< 0.001					<0	.005		0.004	< 0.05	< 0.001	0.01	0.004			0.014	<0.000	7.68	8 97	40 18	0 2	72 1	1610 1	14	102	2990	275	<1	<1	709	709	104	1.22		< 0.01	0.49	0.49		
29-May		100 21.89			7550																																									
23-Aug		020 21.51		7.15	7210	22.2	12	0.002	0.345		< 0.001	<0.0	001 0.0	016 (0.018	0.028	13.5	0.019	0.309	0.022		0.03	0.151	<0.000	1 7.6	86	30 15	7 2	41 1	1370 1	11 8	87.5	2090	399	<1	<1	659	659	80.4	4.22	< 0.01	< 0.01	0.9	0.9	4790	
22-Nov		020 21.35	22.1	7.04	7710	22.8																																								Piezo on mine
11-Mar	13 15	500 21.31	22.06	7.17	7310	22.9	8.94	< 0.001	0.332		< 0.001	<0.0	001 0.0	013 (0.016	0.064	9.28	0.048	0.338	0.022		0.02	0.264	< 0.000	1 7.74	4 82	80 13	6 2	.06 1	1310 1	12	81	2190	189	<1	<1	796	796	81.6	0.38	0.14	<0.01	1.18	1.18	4710	
30-May	13 10	050 21.36		7.08	7560	21.8																																								
22-Aug		015 9.4	10.15	7.09	6790	20.5	1.27	0.001	0.171	0.09	< 0.001	0.00	001 0.0	002	0.003	0.074	2.77	0.014	0.099	0.006	<0.01	<0.0	1 0.258	<0.000	7.68	8 76	60 15	2 1	86 1	1220 1	12	76.3	2010	211	<1	<1	808	808	77.2	0.65	0.06				3570	
26-May		000 21.45	22.2	7.1	7350	21.3																																								
8-Sep-		015 21.45	_	7.1	8010		13.4	0.002	0.323	0.08	< 0.001	0.00	001 0.0	019 (0.032	0.037	14.8	0.037	0.531	0.032	< 0.01	0.03	0.213	<0.000	1 7.69	9 83	90 15	1 2	.09	1280 1	12	80.7	1920	154	<1	<1	797	797	73.3	4.81	0.04	<0.01	1.29	1.29	4160	-
12-Nov		100 21.44		7	8150				0.020											0.002			0.2.0																			10101				-
24-Feb		015 21.45		7.1	8380		0.19	< 0.001	0.21	0.08	< 0.001	<0.0	001 0.0	001 <	< 0.001	0.009	0.28	< 0.001	0.033	0.006	< 0.01	<0.0	1 0.155	<0.000	1 7.4	88	80 15	8 2	37 1	1510 1	10 9	93.3	2460	156	<1	<1	900	900	90.6	1.45	0.02	< 0.01	0.72	0.72		
21-May		020 21.63	_	7	8760		5.10	.5.001	3.2.	0.00	10.00	40.0				2.230		.5.001	2.000	2.000	.0.01	40.0	0.100	30.000	7												220	230	23.0	0	3.02	.0.01				
26-Aug		21.65	22.4	7.2	8910	19.7	2 24	<0.001	0.24	0.1	<0.001	<0.0	001 0	004	0.005	0.005	2 54	0.003	0.097	0.007	<0.01	<0.0	1 0.059	<0.000	1 7.53	3 99	160 16	4 2	43 1	1500 1	10	93 7	1920	198	<1	<1	859	859	75.4	10.8	0.2	<0.01	0.72	0.72	5690	-
1-Dec-		015 21.57	22.32	7.2	8990	22	2.27	\J.0.001	5.24	0.1	٦٥.00	20.0	0.0		0.000	0.000	2.54	0.000	0.007	0.007	٦٥.01	₹0.0	0.000	₹0.000	7.50	33	100		10	1000	,	00.7	1020	100	71	``	555	555	, 5.4	10.0	5.2	\0.01	5.72	0.72	5550	
18-Feb		015 21.57	22.32	7.3	8870	22.2	0.38	<0.001	0.237	0.08	<0.001	<0.0	001 <0	.001 (0.001	0.01	0.58	0.002	0.058	0.003	<0.01	<0.0°	1 0.05	<0.000	1 7 57	7 97	50 10	3 2	56 1	1540 1	11	98	2880	171	_1	~1	782	782	100	1 25	0.06	~ 0.01	0.46	0.46	6160	
10-1 60	10 10	710 21.00	22.0	1.2	0070	22.2	0.00	√ 0.001	0.201	0.00	₹0.00	₹0.0	VO.	.001	0.001	0.01	0.50	0.002	0.000	0.000	√ 0.01	₹0.0	0.05	√0.00€	7.57	, 31	50 18		.50	10-10		30	2000	171	` '	<u> </u>	102	102	100	1.25	0.00	√ 0.01	0.40	0.40	0100	

