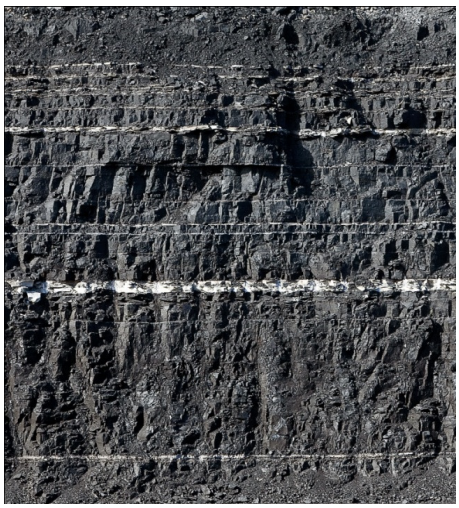

Regional Biodiversity Areas

Annual Report 2018

3 May 2019

Annual report for the period from January to December 2018, for activities described in the Management Plans for all regional Warkworth Mining Limited offsets including:

- Goulburn River Biodiversity Area
- Seven Oaks Biodiversity Area
- Bowditch Biodiversity Area
- Putty Biodiversity Area
- Condon View Biodiversity Area
- North Rothbury Biodiversity Area

Note: A portion of the Condon View Biodiversity Area is an offset for Hunter Valley Operations to satisfy conditions of the Commonwealth approval EPBC 2016-7640.
A portion of the Goulburn River Biodiversity Area is an offset for Hunter Valley Operations South Project Approval (PA 06_0261).

Table of Contents

1 INTRODUCTION

This annual report is a requirement of the Management Plans for all regional Warkworth Mining Limited offsets for the 2018 reporting period from 1 January through to 31 December 2018.

The annual report provides a summary of the key management activities completed across the biodiversity offsets located within the Goulburn River, Seven Oaks, Bowditch, Putty, Condon View and North Rothbury Biodiversity Areas (BAs).

The management plans describe the conservation management strategies and monitoring to achieve and measure improvement and protection of the offsets biodiversity values. It is a compliance requirement of the Commonwealth and NSW environmental approvals to implement the management plans.

The Regional Offset Management Plan (ROMP) was prepared to satisfy the consent requirements for the New South Wales (NSW) Hunter Valley Operations (HVO) South Project Approval (PA 06_0261) and the Warkworth Mine Commonwealth EPBC 2002/629 Approval. In November 2015, the NSW Warkworth Continuation Project Approval (SSD-6464) was granted providing both NSW and Commonwealth approval for the same disturbance area. Phase 2 of the EPBC2009/5081 action also commenced on 16 February 2016. In response to the granting of these new approvals, new Management Plans for the Bowditch and Goulburn River BA have been prepared to satisfy the Commonwealth approval EPBC2009/5081 and the NSW consent (SSD-6464), replacing the ROMP. On 10 October 2016 HVO was granted approval (EPBC2016/7604), The Condon View BA provides 168ha of suitable direct offset to be compliant with this approval. Management Plans have also been prepared and submitted for the new regional BAs: Seven Oaks, Putty, Condon View and North Rothbury.

The Biodiversity Offset Portal contains all the supporting documentation for this report, including photo point monitoring. Access to the portal is restricted, relevant regulators have been provided with login details; please contact Mount Thorley Warkworth should you require assistance.

2 LOCATION AND LANDHOLDER DETAILS

The locations of the regional BAs are shown in Figure 1, further details are provided in Table 1. The land is owned by Warkworth Mining Limited (WML). The Goulburn River and Condon View BAs are owned by Warkworth Mining Limited and have a portion of the total area designated as an offset for Hunter Valley Operations (HVO). Details of the Warkworth Offset and HVO Offset areas are in Table 2 and Figure 1, 2 and 3.

Table 1 Regional Biodiversity Areas

Biodiversity Area	Local Government Area	Land Owner	Area (ha)	Offset Area (ha)	Location
Goulburn River	Upper Hunter / Mid-Western	Warkworth Mining Limited	1,539	1,206	'The Rivers' 30km west of Merriwa, via Dulhunty Road, Comialla Road and Golden Hwy.
Bowditch	Muswellbrook	Warkworth Mining Limited	607	602	3km north of Sandy Hollow, 3450 Wybong Road, via Golden Hwy.
Seven Oaks	Mid-Western	Warkworth Mining Limited	521	519	35km west of Merriwa via Ulan Road, Summer Hill Road, Durridgerie Road and Smedes Road.
Condon View	Singleton	Warkworth Mining Limited	553	345	5km west of Putty via Box Tree Clearing Trail off Putty Valley Road.
Putty	Singleton	Warkworth Mining Limited	386	383	5km south of Putty via Box Gap Road.
North Rothbury	Cessnock	Warkworth Mining Limited	41	41	1km south of North Rothbury via Wine Country Drive.

Table 2 Goulburn River and Condon View Biodiversity Areas

Biodiversity Area	Land Owner	Area (ha)	Warkworth Offset Area (ha)	HVO Offset Area (ha)
Goulburn River	Warkworth Mining Limited	1,539	1,066	140
Condon View	Warkworth Mining Limited	553	345	168

YANCOAL 兖煤澳大利亚有限公司

Location of the Warkworth Mining Limited Biodiversity Areas

Annual Compliance Report

Figure 1

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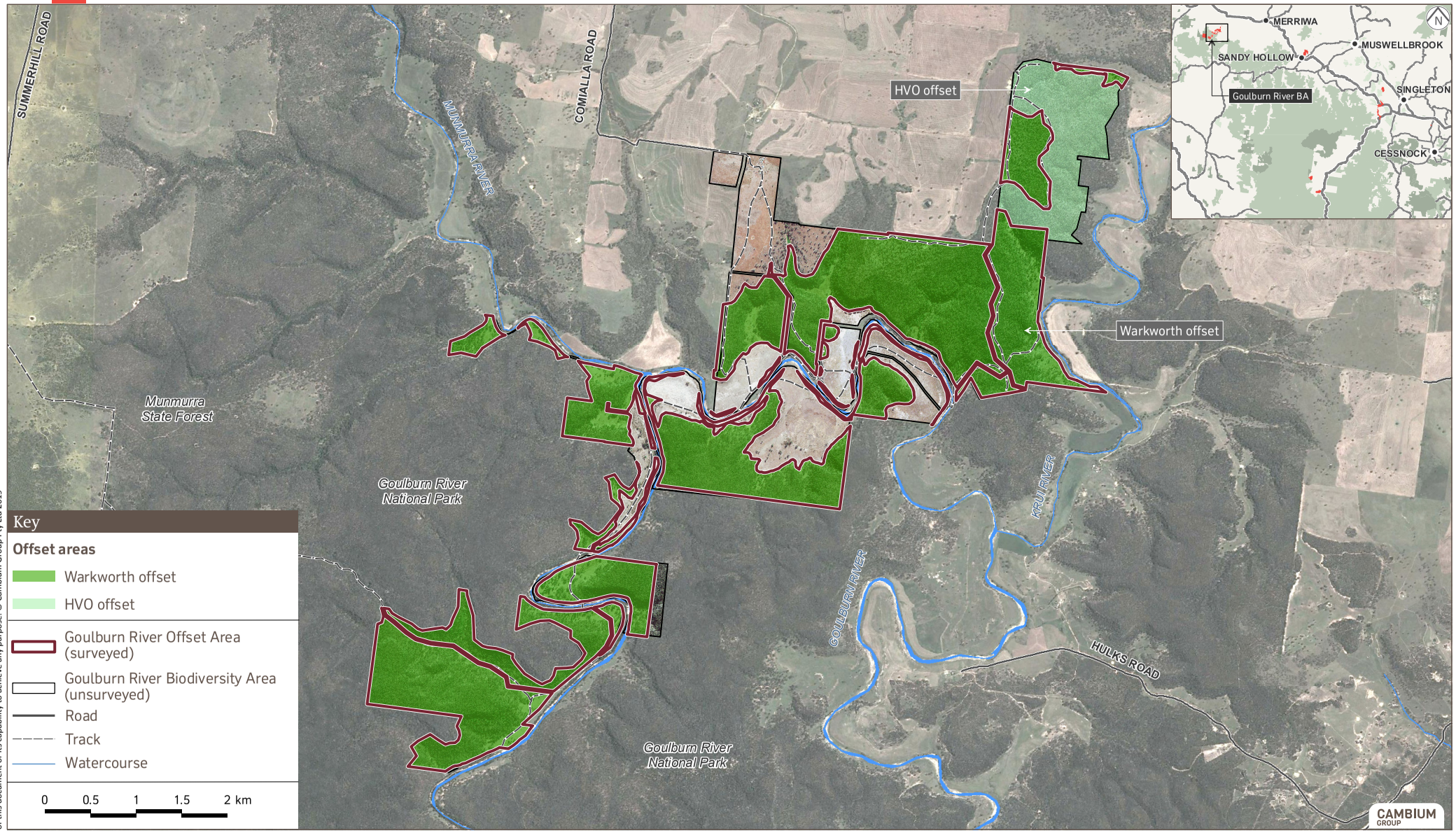
Offset areas at the Goulburn River Biodiversity Area

Annual Compliance Report

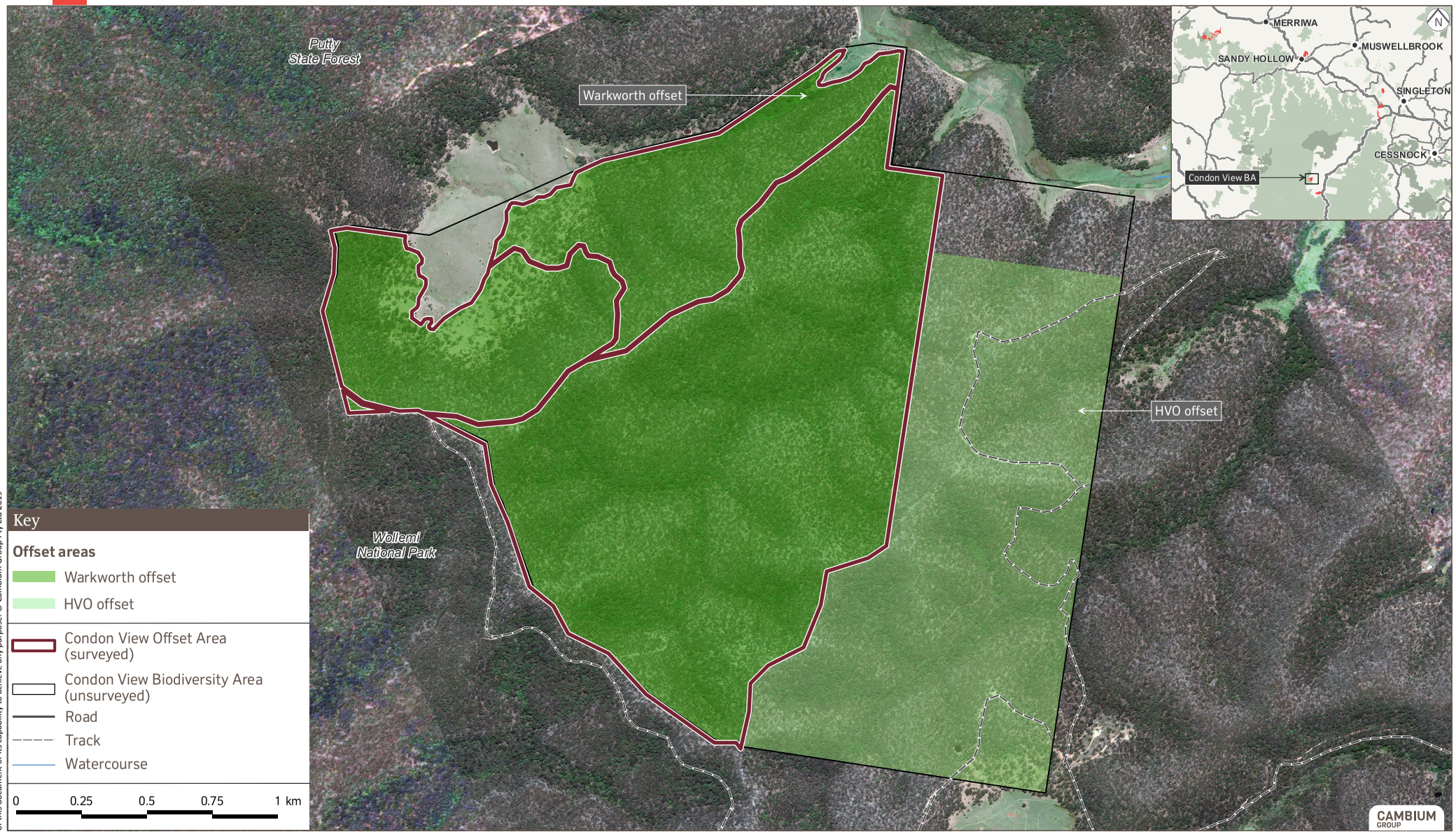
Figure 2



Offset areas at the Condon View Biodiversity Area

Annual Compliance Report

Figure 3



3 SUMMARY OF ACTIVITIES – 2018

Table 3 provides a summary of the activities undertaken during the reporting period (year 2) and the progress in attaining the Performance Criteria for the key Conservation Management Strategies in the management plans.

3.1 Summary of climatic conditions

Figure 4 shows the monthly actual rainfall compared to the long term average for the regional Biodiversity Areas for the reporting period. In 2018, rainfall was well below average in January, April, May and July. The Putty region received 517mm which was 84mm below the long term average. North Rothbury received 605mm, 2mm below the long term average. Sandy Hollow received 411mm which was 154mm below the long term average and the Merriwa region received 477mm, 110mm below the long term average.

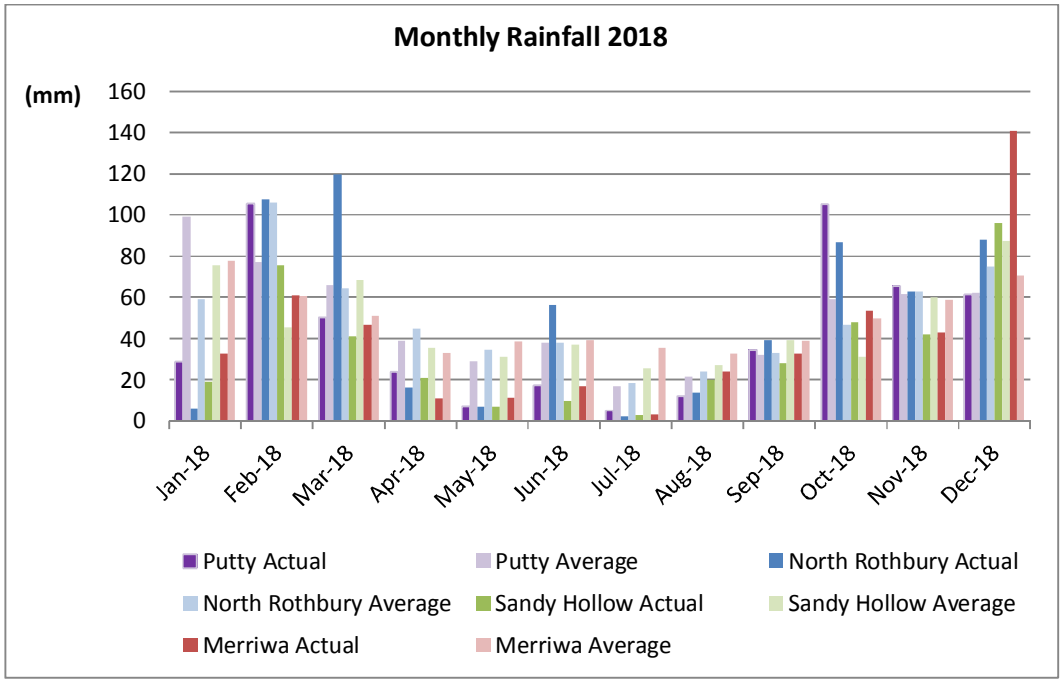


FIGURE 4 MONTHLY RAINFALL - 2018

Table 3 Summary of progress against Performance Criteria (PC)

Conservation Actions	Year 1 to Year 4 (2018 is Year 2)	Year 5 to Year 10	Completion Criteria	Actions 2019
ACTIVE RESTORATION				
Goulburn River BA Yellow Box – Grey Box – Red Gum grassy woodland (21.5ha) and River Oak riparian woodland (24.2ha)				
PC	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*		*Planting achieves above 70% survival.*	
Activity / Progress	Seed collection was undertaken at the Goulburn River BA in 2018.			Collect seed and propagate plants. Undertake survival assessments. Undertake planting of 21.5ha of Yellow Box – Grey Box – Red Gum grassy woodland and 24.2ha of River Oak riparian woodland in the Goulburn River BA.
All Regional BAs				
PC	*Review monitoring data to identify areas that require re-planting.* *If re-planting is identified, develop a re-establishment plan and implement within 12 months*			
Activity / Progress	No re-planting identified from ecological monitoring results/recommendations.			
PASSIVE RESTORATION				
Weed control and monitoring				
PC	*At least two weed control events each year for species listed in Table 14 of Management Plans and other weeds recorded from monitoring activities.* *Complete Rapid Condition Assessment and Property Inspections.*	*At least one weed control event each year for species listed in Table 14 of Management Plans and other weeds recorded from monitoring activities.* *Complete Rapid Condition Assessment and Property Inspections.*	*Ecological monitoring data indicates a trajectory for reduction in exotic plant cover over three consecutive assessments.*	

Conservation Actions	Year 1 to Year 4 (2018 is Year 2)	Year 5 to Year 10	Completion Criteria	Actions 2019
Activity / Progress	Weed contractor engaged to undertake weed control activities in Autumn and Spring 2018 across all Regional BAs to control noxious species and stop weeds spreading into previously un-infested areas. In2018 weed control targeted the following species: Blackberry (*Rubus fruticosus*), Bridal creeper *(Asparagus asparagoides),* Caltrop or cat heads (*Tribulus terrestris*), Fireweed *(Scenecio madagascariensis)* , Green cestrum *(Cestrum parqui),* Lamb's ear *(Stachys byzantine),* Lamb's tongue or Mullein (*Verbascum thapsus*), Lavender scallops (*Bryophyllum fedtschenkoi),* Narrow leaf cotton bush (*Gomphocarpus fructicosus),* Prickly pear (*Opuntia stricta*), Scotch thistle (*Onopordum acanthium),* Stinging nettle (*Urtica dioica*), Tiger pear (*Optunia aurantiaca),* Variegated thistle *(Silybum marianum),* and Willow *(Salix spp).* Rapid Condition Assessment and Property Inspections were completed in 2018.			Control noxious species and stop weeds spreading into previously un-infested areas. Undertake Rapid Condition Assessment. Undertake Property Inspections.
Pest control and monitoring				
PC	*At least two control events each year for species listed in Management Plans, and any other species recorded from monitoring activities.* *All actions recorded in the Annual Report.* *Active participation in programme coordinated by HLLS, this may include local control actions.* *Complete Rapid Condition Assessment and Property Inspections.*	*At least one control event each year for species listed in Management Plans, and any other species recorded from monitoring activities.* *All actions recorded in the Annual Report.* *Active participation in programme coordinated by HLLS, this may include local control actions.* *Complete Rapid Condition Assessment and Property Inspections.*	*No observed vertebrate pest or damage.* *Ecological monitoring demonstrates a trajectory to benchmark values for all attributes measured over three consecutive assessments (the average of all plots).*	

Conservation Actions	Year 1 to Year 4 (2018 is Year 2)	Year 5 to Year 10	Completion Criteria	Actions 2019
Activity / Progress	In 2018 a vertebrate pest contractors engaged to undertake programmes across all Regional BAs. Two 1080 ground baiting programmes targeting wild dogs and foxes were undertaken in autumn and spring. Aerial baiting was undertaken by LLS/Hunter Valley Combined Wild Dog Association across the Goulburn River BA in November to support the 1080 ground baiting programme. An aerial shoot was also undertaken by LLS over the Goulburn River BA area in November targeting feral pigs, wild dogs, deer and goats. A Noisy Miner ground shoot was undertaken at the Goulburn River BA in August to assist the survivability of the Regent Honeyeater: 365 Noisy Miners controlled under NPWS Section 120/121. Participation in HLLS Wild Dog Association programme. Shooting for other vertebrate pests was undertaken across the BAs. Rapid Condition Assessment and Property Inspections were completed in 2018.			Participate in HLLS Aerial Baiting/shooting programmes. Participate in HLLS Wild Dog Association programme. Undertake shooting, baiting and trapping programmes. Undertake a control programme for noisy miners in the Regent Honeyeater breeding area at GRBA Undertake Rapid Condition Assessment. Undertake Property Inspections.
Grazing				
PC	*Grazing is conducted in accordance with the Management Plan.* *Boundary fences maintained.* *Complete Rapid Condition Assessment and Property Inspections.*			
Activity / Progress	Cattle excluded from all BAs. Rapid Condition Assessment and Property Inspections were completed in 2018.			Undertake Rapid Condition Assessment. Undertake Property Inspections.

Conservation Actions	Year 1 to Year 4 (2018 is Year 2)	Year 5 to Year 10	Completion Criteria	Actions 2019
Regional BA Bushfire Management Plan (BFMP) and monitoring				
PC	*Actions implemented.* *Review and revise if required.* *Complete Rapid Condition Assessment and Property Inspections*	*Actions implemented.* *Review and revise if required.* *Complete Rapid Condition Assessment and Property Inspections.* *Completed ecological fire management plan.*	*All required actions of BFMP have been implemented.* *BFMP has been reviewed annually and revised if required.*	
Activity / Progress	BFMP reviewed. Rapid Condition Assessment and Property Inspections were completed in 2018.			Review BFMP.
Erosion monitoring inspections and reports				
PC	*Complete Rapid Condition Assessment and Property Inspections*			
Activity / Progress	No significant erosion issues identified during monitoring.			Undertake Rapid Condition Assessment. Undertake Property Inspections.
Dam conversion and rehabilitation and monitoring				
PC	*Prepare dam conversion plan.* *Dam conversion complete and rehabilitation has stabilised the site.* *Property inspections.*	*Observed natural flow regime and no erosion.* *Property inspections.*	*All works completed.*	
Activity / Progress	Property inspections undertaken in 2018.			Prepare a dam conversion plan. Undertake Property Inspections.
Natural Regeneration and monitoring				
PC	*Annual weed control, vertebrate pest and fire management actions implemented as per management plans.* *Complete Rapid Condition Assessment and Property Inspections.*		*Ecological monitoring demonstrates a trajectory to benchmark values for all attributes measured over three consecutive assessments (the average of all plots).*	

Conservation Actions	Year 1 to Year 4 (2018 is Year 2)	Year 5 to Year 10	Completion Criteria	Actions 2019
Activity / Progress	Rapid Condition Assessment and Property Inspections undertaken in 2018. Actions implemented as per management plans – see above.			Implement actions as per Management plans. Undertake Rapid Condition Assessment. Undertake Property Inspections.
Controlled Activities				
PC	*No reported incidents of prohibited actions undertaken Yancoal, contractors, consultants or other agents of Yancoal.* *Any clearing of vegetation reported in Annual Report.* *Signage and locks (where required) maintained.* *Complete risk assessment for any recreation activities.* *All occupants of residents compliant with requirements of the MP.* *No Cultural Heritage sites knowingly disturbed and any protective barricading maintained.* *Damaged and unwanted fences removed.* *All Property Inspections completed.*			
Activity / Progress	No reported incidents of prohibited actions undertaken in 2018. Regular property inspections were undertaken in 2018.			Undertake Property Inspections.

4 MONITORING ACTIVITIES

The following table provides a summary of the monitoring activities undertaken as detailed in the management plans. Monitoring reports and results are available on the Biodiversity Offset Portal.

Table 4 Monitoring Activity Summary

Monitoring	2018	Date/s	Completed by
Bird Assemblage	X	September 2018, next due July – August 2020	Niche Environment and Heritage
Habitat Restoration	X	September – November 2018, next due September – November 2020	Niche Environment and Heritage
Rapid Condition Assessment	X	September – November 2018, next due September – November 2019	Advisor – Land Management
Property Inspection	X	April/November 2018, next due April/November 2019	Rural and Environmental Management

4.1 Bird assemblages monitoring 2018

A total of 125 species of birds were recorded throughout the eight Biodiversity Areas (BAs) in early spring 2018. An additional nine bird species were recorded during this monitoring period compared with the 2016 surveys which in turn recorded more species than the 2014 baseline survey (on a reduced number of BAs). Twelve threatened species were recorded, however, the Regent Honeyeater and Swift Parrot (target species) were not detected during the surveys. All eight BAs were considered to provide potential habitat for both the Regent Honeyeater and Swift Parrot, though at the time of surveying there was minimal flowering of feeding resources except at the Condon View, Putty and North Rothbury BAs.

Grazing pressure at Bowditch and Goulburn River BAs appear to have been addressed in accordance with the Offset Management Plan (OMP), however, recent rainfall deficits mean that the vegetation in those BAs still shows the signs of heavy grazing pressure. Replanting of Yellow Box in Management Zone D at Goulburn River would further improve the habitat potential for both the Regent Honeyeater and Swift Parrot. Active restoration is also recommended at Seven Oaks BA to speed-up rehabilitation of some patches of derived native grassland where low diversity has been consistently recorded due to simplified vegetation structure. Ongoing feral animal control is recommended, as outlined in the OMPs. Rabbits, foxes and pigs were the most commonly detected feral animals throughout the BAs.

The bird census design used in this study has the advantages that each site is located in such a way that it can be treated as independent for statistical purposes. The 2018 survey added a 50-metre radius sub-plot and counts for all bird species rather than just threatened and aggressive species. These two features will improve the data for future time series comparisons. However, there is no capacity within the data for assessing the power to detect change over time as there is no replication across all sites to determine variability. To determine variability, at least three replicates per site would be needed. The benefits of being able to determine the data power would be the capacity to apply statistical testing to aspects of the data. When we see massive change in bird population

composition we would then be able to see if the result is just a function of chance or a function of real change.

The following are the recommendations and discussion summaries.

Goulburn River BA
Goulburn River BA supported the highest diversity of birds of any of the BAs surveyed in this study. The BA has the widest array of habitats. Recent management of the BA has focused on controlling Noisy Miners (with some apparent success). Bird diversity was highest on one site where the Noisy Miners were no longer detected. Monitoring of these sites should continue and if Noisy Miner numbers climb, similar control actions should be considered again.

Noisy Miners may become less of a problem if the riparian vegetation could be increased to expand those woodland patches and reduce the amount of woodland edge in relation to the patch volume. Planting adjacent to the riparian vegetation, it should be possible for trees to grow rapidly and reduce the edge effects in this important Regent Honeyeater habitat.

Seven Oaks BA
The Seven Oaks BA has large areas of cleared land. Some of those areas are showing little sign of recovering woody vegetation. Other areas that were also cleared have regenerated with a strong shrub-layer of *Cassinia.* While the shrub layer lacks floristic diversity, it provides structure lacking on the open grassy sites. As a result, a threatened species, the Hooded Robin is able to find food and shelter on this BA. While these shrubby areas are supporting this threatened species, any actions to increase the floristic diversity of the vegetation should be weighed against the risk of causing the habitat quality to decline for Hooded Robin.

Bowditch BA
The 2018 survey of Bowditch found that bird diversity on the creek flats was generally poor. It is not possible to determine if this is a long-term trend or simply the effect of an extended dry period. The continued presence of Noisy Miners as a substantial portion of the bird population on a couple of sites indicates that there may be ongoing problems with threatened woodland birds utilising that part of the BA.

Putty BA
The Putty BA appears to be regenerating well under the passive management system. The diversity of trees and shrubs support the kind of bird diversity expected in this environment. It can be expected that the list of birds present here will expand with each additional survey.

Condon View BA
Condon View BA has few serious management issues. However, the growth of Blackberry on the creek flats will need to be monitored. Cattle were present on the creek flats during the bird surveys. These will be impacting on regeneration of trees and shrubs in that environment.

North Rothbury BA
North Rothbury BA has a diverse vegetation structure and supports a similarly diverse array of birds. While there was not much tree flowering occurring on site during the surveys, Spotted Gums seemed to have recently flowered and Broadleaf Ironbark was in

bud about to flower. There were a number of nectar foraging birds present but in low numbers. The main management issue for this BA will be to remain vigilant for weed invasion from the surrounding disturbed landscape.

Because the numbers of large hollows in trees is low, application of nest boxes in this BA may help to increase the use of the BA by hollow nesting birds.

4.2 Habitat restoration monitoring 2018

This habitat restoration study completes the third monitoring event and second post baseline for Goulburn River and Bowditch BAs and the second monitoring event and first post baseline for all the other Regional BAs.

The findings of this monitoring report support implementation of management activities, including passive and active restoration strategies, as outlined in the OMPs, to meet the conservation objectives.

The conclusion and recommendations from the 2018 habitat restoration monitoring report were:

Goulburn River BA

- Weed management should continue in the regenerating woodland to prevent exotics from increasing during favourable years.
- Analysis of the results for the grasslands and riparian vegetation in Goulburn River indicated intensive management would be needed to assist in native regeneration. Natural regeneration in these areas is considered unlikely to occur given the very low native species diversity.
- Management should continue in the grassland and riparian areas, and include intensive weed management (spraying), followed by planting or direct seeding of local native species.

Seven Oaks BA

- Trends show an increase in regenerating canopy species and canopy cover, however they remain sparse. It is considered likely that canopy species will continue to regenerate over time given the nearby seed source (mature eucalypts). Native grasses, shrubs and other continue to be well represented in the ground stratum. These results continue to indicate good regenerative capacity.
- The reduction in exotic species cover indicates that weed management practices are effective. Management intervention involving ongoing weed management should be undertaken to prevent weed incursions impacting on vegetation within or near benchmark condition.

Bowditch BA

- Analysis of the results indicates a decrease in exotic cover. Management intervention involving on-going weed management should be undertaken to prevent weed incursions impacting on vegetation within or near benchmark condition.

- Trends show an increase in native canopy cover and number of native trees, indicating good regenerative capacity. A decrease in native species diversity is likely to be a result of climate and seasonal variability, rather than an actual decrease.

Putty BA

- Analysis of the results indicates a decrease in exotic cover. Management intervention involving on-going weed management should be undertaken to prevent weed incursions impacting on vegetation within or near benchmark condition.
- Trends show an increase in native species diversity and native canopy cover and number of native trees, indicating good regenerative capacity.

Condon View BA

- The regenerating woodlands continue to show potential for high regenerative capacity with implementation of passive restoration techniques (e.g. weed and feral animal control, excluding grazing or strategic grazing where appropriate, infrastructure management).
- The grasslands generally have a limited capacity to regenerate naturally and active revegetation (such as planting) will be required to restore these areas.

North Rothbury BA

- Exotic species cover is consistently low. Management intervention involving ongoing weed management should be undertaken to prevent weed incursions impacting on vegetation within or near benchmark condition.
- Regenerating canopy species are abundant throughout monitoring plots in both woodland types and native grasses are common in the ground stratum, indicating good regenerative capacity.

Habitat restoration monitoring involves the measurement of 27 key variables every two years to track change in vegetation and habitat condition. The monitoring aims to demonstrate the regeneration trajectory of the grassland area and the improvement in woodland condition, by collecting data from a series of Transition (grassland) and Reference (woodland) sites. Analysis of this data set will demonstrate the trajectory of the transition sites to the reference site and towards the benchmark description for the vegetation community.

As additional data are collected from subsequent monitoring events, statistical analyses will be conducted incorporating temporal variation (i.e. changes over time) in vegetation condition to assess the magnitude and direction of change in vegetation communities. Statistical analysis was limited to temporal comparisons between the baseline and the present survey (Year) for transition and reference sites (Treatment) for each community (where there were three or more sites). Comparison of site values with benchmark values is intended to provide a broader context for interpreting the restoration pathway and the trajectory of change as management measures are implemented

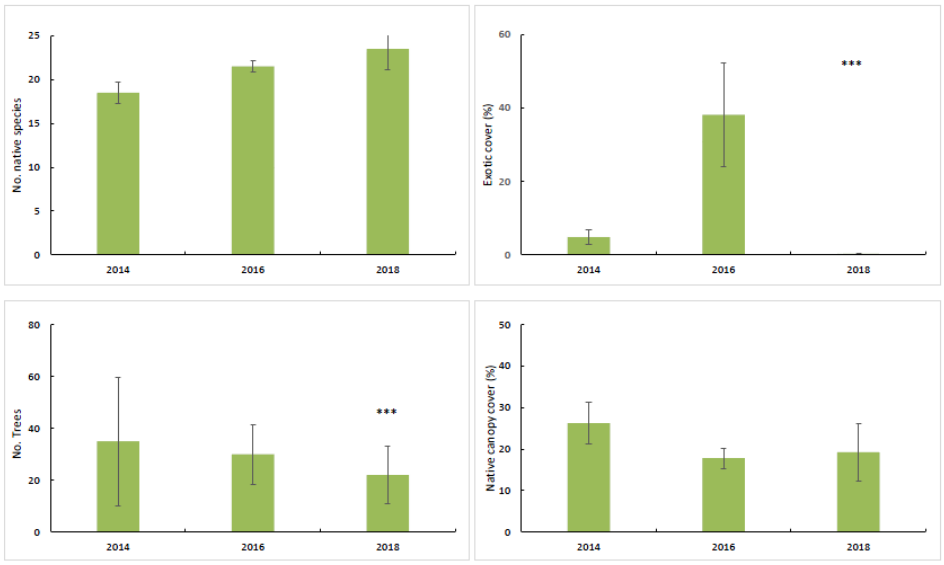
The following sections present summary data for comparison of the 2016 to 2018 monitoring data and the benchmark descriptions for the vegetation community.

Table 5 Goulburn River BA – Comparison of monitoring data with benchmark values

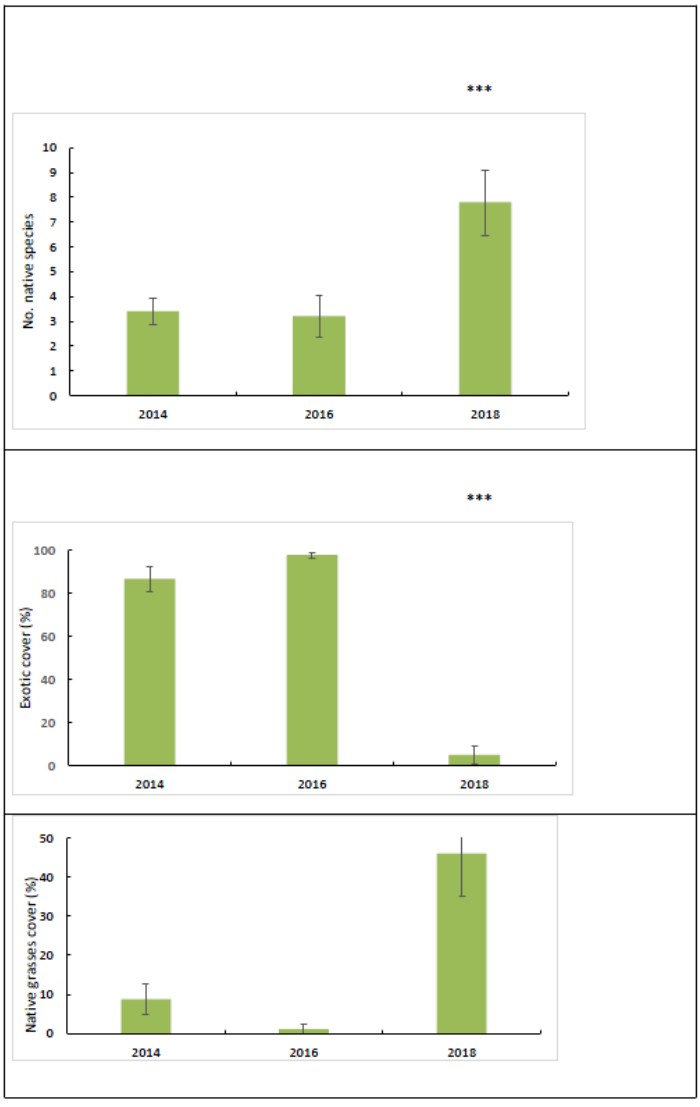
		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
HU714 Rough-barked Apple -Red Gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion										
Benchmark	min	25	10	2	20	2	5	<5	>30	>2
	max		50	15	60	10	40			
Regenerating woodland										
GRM1 (2018)		21	36.5	0	20	0	2.5	0	125	0
GRM2 (2018)		24	5	0	5	0.25	2.75	0	55.5	0
GRM3 (2018)		19	23	0	32	0	1	1	6	1
GRM5 (2018)		30	12.5	0	50	0	4.75	0.25	54.5	0
Average		*23.5*	*19.3*	*0.0*	*26.8*	*0.1*	*2.8*	*0.3*	*60.3*	*0.3*
GRM1 (2016)		22	16.83	0	23.75	0	13.75	65	54	2
GRM2 (2016)		20	11.83	12.5	35	1.75	30	15	63	0
GRM3 (2016)		23	23.83	1.25	18.75	0.5	27.5	60	6	2
GRM5 (2016)		21	18.83	0	22.5	22.5	10	12.5	17	0
Average		*21.5*	*17.83*	*3.44*	*25*	*6.19*	*20.31*	*38.13*	*35*	*1*
Grassland										
GRM6 (2018)		6	0	0	36.25	0	0.13	1.9	0	0
GRM7 (2018)		7	0	0	15	0	0.25	3	0	0
GRM8 (2018)		7	0	0	65	0	0	0	1.5	0
GRM9 (2018)		13	0	0	76.25	0	0.75	0.5	0	0
GRM10 (2018)		6	0.8	0	37.5	0	0.75	20	6	6
Average		*7.8*	*0.2*	*0.0*	*46.0*	*0.0*	*0.4*	*5.1*	*1.5*	*1.2*
GRM6 (2016)		3	0	0	6	0	0	93.25	0	0
GRM7 (2016)		4	0	0	0	0	0.5	98.5	0	0
GRM8 (2016)		6	0	0	0	0	0.5	98.75	0	0
GRM9 (2016)		2	0	0	0	0	1	99	0	0
GRM10 (2016)		1	0	0	0	0	0.25	100	0	0
Average		*3.2*	*0*	*0*	*1.2*	*0*	*0.45*	*97.9*	*0*	*0*
HU618 Slaty Box - Grey Gum shrubby woodland on foot-slopes of the upper Hunter Valley, Sydney Basin Bioregion										
Benchmark	min	25	20	10	5	5	5	<5	>66	>0.8
	max		50	60	15	10	15			
Regenerating woodland										
GRM4 (2018)		24	26	0	17.5	11.25	0.75	0	8	0
GRM4 (2016)		28	5.5	10	9.25	4	6.25	1	22.5	1
HU712 River Oak riparian grassy tall woodland of the western Hunter Valley (Brigalow Belt South Bioregion and Sydney Basin Bioregion)										
Benchmark	min	38	10	10	20	1	10	<5	>10	>0.1
	max		50	50	60	5	30			
Riparian										
GRM11 (2018)		16	5.5	0	63.8	0	0.6	1.75	0	0
GRM12 (2018)		11	20.2	0	31.3	0	0.5	20	0	0
Average		*13.5*	*12.8*	*0*	*47.5*	*0*	*0.6*	*10.9*	*0*	*0*
GRM11 (2016)		8	0	0	0	0	1	99	0	0
GRM12 (2016)		8	16.33	0	5	0	5	90	0	0
Average		*8*	*8.17*	*0*	*2.5*	*0*	*3*	*94.5*	*0*	*0*

0-10% or >200% of benchmark (>66% cover for EPC)
10-50% or 150-200% of benchmark (33-66% cover for EPC)
50-100% or 100-150% of benchmark (5-33% cover for EPC)
within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR Native plant species richness
NOS Native overstorey % cover
NMS Native midstorey % cover
NGCG Native ground cover (grass) % cover
NGCS Native ground cover (shrubs) % cover
NGCO Native ground cover (other) % cover
EPC Exotic plant cover % cover
Logs (m) Length of logs (m)
Hollows No. trees with hollows



Comparison of key attributes for regenerating woodland (HU714)



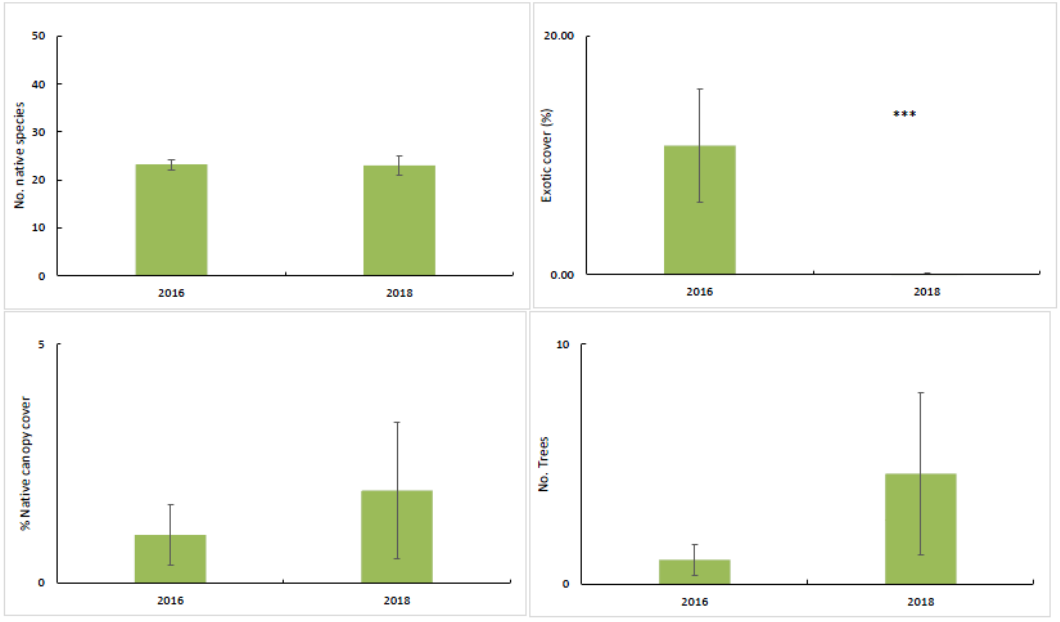
Comparison of key attributes for grasslands HU714

Table 6 Seven Oaks BA – Comparison of monitoring data with benchmark values

HU 875 Narrow-leaved Ironbark - Black Pine - Sifton Bush heathy open forest on sandstone ranges of the upper Hunter and Sydney Basin										
		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
Benchmark	min	25	20	10	5	5	5	0	66	0.8
	max		50	60	15	10	15			
SM1 (2018)		18	0	0	40	10	2.25	0	6	0
SM2 (2018)		24	0	0	35	42.5	1.25	0	0	0
SM3 (2018)		24	7.33	5	16.25	42.5	6.25	0	71	0
SM4 (2018)		19	2.33	0	3.5	85	1	0	17	0
SM5 (2018)		30	0.00	0	70	2	1.75	0.25	46	0
average (2018)		23	1.93	1	32.95	36.4	2.5	0.05	28	0
SM1 (2016)		21	0	37.5	5	2.5	21.25	21.25	0	0
SM2 (2016)		22	0	63.5	32.5	3.75	33.75	13.75	0	0
SM3 (2016)		23	2	67.5	40	37.5	10	1	0	0
SM4 (2016)		23	3	7	2.75	2.5	3.5	0.5	5	0
SM5 (2016)		27	0	5.5	26.25	2	65	17.5	0	0
average (2016)		*23.2*	*1*	*36.2*	*21.3*	*9.65*	*26.7*	*10.8*	*1*	*0*

0-10% or >200% of benchmark (>66% cover for EPC)
10-50% or 150-200% of benchmark (33-66% cover for EPC)
50-100% or 100-150% of benchmark (5-33% cover for EPC)
within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR	Native plant species richness	NGCO	Native ground cover (other) % cover
NOS	Native overstorey % cover	EPC	Exotic plant cover % cover
NMS	Native midstorey % cover	Logs (m)	Length of logs (m)
NGCG	Native ground cover (grass) % cover	Hollows	No. trees with hollows
NGCS	Native ground cover (shrubs) % cover		



Comparison of key attributes for regenerating woodland HU814

Mean (±SE) 2014, 2016 and 2018 quadrat data (n = 3). Statistically significant difference *** $p < 0.05$

Table 7 Bowditch BA - Comparison of monitoring data with benchmark values

		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
HU702 - Grey Gum – Narrow-leaved Ironbark Woodland										
Benchmark	**min**	**31**	**5**	**2**	**2**	**2**	**2**	**<5**	**>30**	**>2**
	max		**50**	**35**	**30**	**40**	**25**			
Regenerating woodland										
BM2 (2018)		28	27	0	10	6.25	2.5	0.25	20	0
BM4 (2018)		26	26.8	0	25	7	2	0.5	138	0
Average		27	26.9	0	17.5	6.63	2.25	0.375	79	0
BM2 (2016)		29	8.2	3	45	2	45	5	10	2
BM4 (2016)		36	14.73	12.5	70	3.75	12.5	10	130	0
Average		*32.5*	*11.47*	*7.75*	*57.5*	*2.88*	*28.75*	*7.5*	*70*	*1*
HU821 - Red Gum – Rough-barked Apple Woodland										
Benchmark	**min**	**35**	**25**	**11**	**5**	**5**	**5**	**<5**	**>73**	**>3**
	max		**40**	**50**	**45**	**30**	**20**			
Regenerating woodland										
BM1 (2018)		10	32	0	1	0	3.25	0	162	0
BM3 (2018)		24	19.3	1	12.5	30	0.5	0	81	0
BM5 (2018)		23	22.7	7.5	17.5	9.25	1.5	0	9	0
Average (2018)		19	24.67	2.83	10.33	13.08	1.75	0	84	0
BM1 (2016)		25	7.9	0	5	0	37.5	18.5	94.5	5
BM3 (2016)		46	5.5	62.5	55	17.25	13.75	11.25	64	1
BM5 (2016)		26	11.5	22.5	80	16.25	7.5	21.25	28	0
Average (2016)		*32.33*	*8.3*	*28.33*	*46.67*	*11.17*	*19.58*	*17*	*62.17*	*2*

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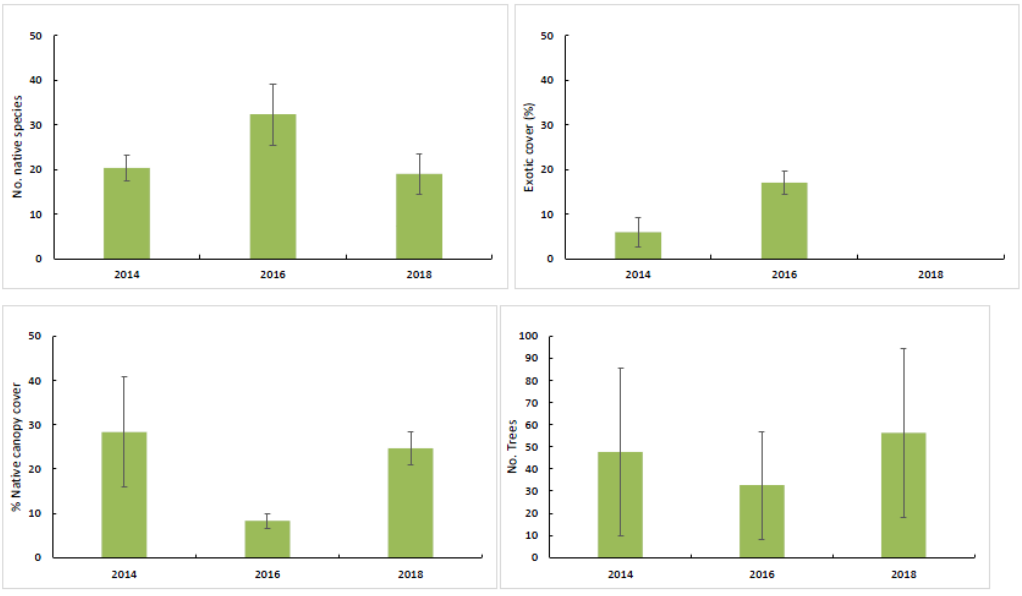
50-100% or 100-150% of benchmark (5-33% cover for EPC)
within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR	Native plant species richness	NGCO	Native ground cover (other) % cover
NOS	Native overstorey % cover	EPC	Exotic plant cover % cover
NMS	Native midstorey % cover	Logs (m)	Length of logs (m)
NGCG	Native ground cover (grass) % cover	Hollows	No. trees with hollows
NGCS	Native ground cover (shrubs) % cover		



Comparison of key attributes for regenerating woodland HU821

Mean (±SE) 2014, 2016 and 2018 quadrat data (n = 3). Statistically significant difference *** $p < 0.05$

Table 8 Putty BA - Comparison of monitoring data with benchmark values

BVT HN553: Mountain Blue Gum - Thin-leaved Stringybark open forest on river flat alluvium in the Sydney Basin Bioregion										
		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
Benchmark	min	33	31.5	20.0	29.75	0.0	29.75	0.0	0.0	0
	max		46.5	40.0	37.75	10.0	37.75			
PM1 (2018)		17	18	2	81.25	2.25	2.75	4.75	0	0
PM2 (2018)		33	7	3.75	17.5	26.25	3.5	0	4	0
PM3 (2018)		32	38	7.75	23.75	4.25	1.5	0	74	0
PM4 (2018)		25	40	5	18.75	12.5	1	0.25	51	0
PM5 (2018)		27	46	0.25	57.5	0	3	5.5	35	0
average (2018)		*26.6*	*29.8*	*3.75*	*39.75*	*9.05*	*2.35*	*2.1*	*32.8*	*0*
PM1 (2016)		14	10	2.5	82.5	0	1.75	10.5	0	0
PM2 (2016)		24	1	35	37.5	7.5	5	8.75	0	0
PM3 (2016)		23	32	0.25	67.5	0.75	11	3.25	53	0
PM4 (2016)		28	41	10.5	67.5	6.75	5.5	2	19	0
PM5 (2016)		15	27	7.5	62.5	0	8	38.75	32	0
average (2016)		*20.8*	*22.2*	*11.15*	*63.5*	*3*	*6.25*	*12.65*	*20.8*	*0*

0-10% or >200% of benchmark (>66% cover for EPC)
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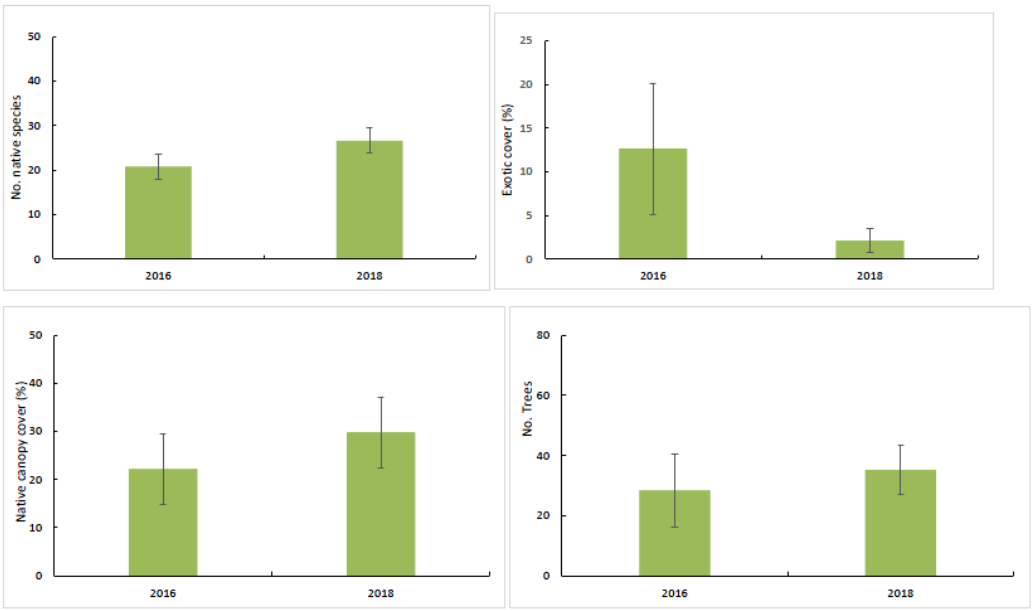
50-100% or 100-150% of benchmark (5-33% cover for EPC)
within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR	Native plant species richness
NOS	Native overstorey % cover
NMS	Native midstorey % cover
NGCG	Native ground cover (grass) % cover
NGCS	Native ground cover (shrubs) % cover
NGCO	Native ground cover (other) % cover
EPC	Exotic plant cover % cover
Logs (m)	Length of logs (m)
Hollows	No. trees with hollows



Comparison of key attributes for HN553

Mean (±SE) 2016 and 2018 quadrat data ($n = 5$). Statistically significant difference *** $p < 0.05$

Table 9 Condon View BA - Comparison of monitoring data with benchmark values

BVT HU578: Rough-barked Apple - red gum grassy woodland of the MacDonald River Valley on the Central Coast, Sydney Basin Bioregion										
		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
Benchmark	min	31	31.5	20.0	29.75	0.0	29.75	0.0	50.0	0
	max		46.5	40.0	37.75	10.0	37.75			
C M1 (2018)		25	42.8	5.8	17.5	0.8	1	0	58	0
C M2 (2018)		19	9	0.5	87.5	0.3	1.3	1	120	0
C M3 (2018)		29	26.8	0	73.8	0.3	1.3	0.3	86	0
C M4 (2018)		26	26.8	0	60	0	1.8	0.3	17	0
C M5 (2018)		23	13.5	4.3	57.5	0	32.5	0.8	39	0
Average		*24.4*	*23.8*	*2.1*	*59.3*	*0.3*	*7.6*	*0.5*	*64*	*0*
C M1 (2016)		31	17.0	5.5	65	2.0	2.0	0.0	54.0	0.0
C M2 (2016)		18	2.0	0.0	96.5	0.25	1.75	2.0	55.0	0.0
C M3 (2016)		18	13.0	0.0	98	0.0	7.0	9.5	40.0	0.0
C M4 (2016)		20	20.0	0.0	99	0.0	2.5	2.0	15.0	1.0
C M5 (2016)		19	7.0	6.25	86.25	3.5	5.0	20.0	17.0	0.0
Average		*21.2*	*11.8*	*2.35*	*88.95*	*1.15*	*3.65*	*6.7*	*36.2*	*0.2*

0-10% or >200% of benchmark (>66% cover for EPC)
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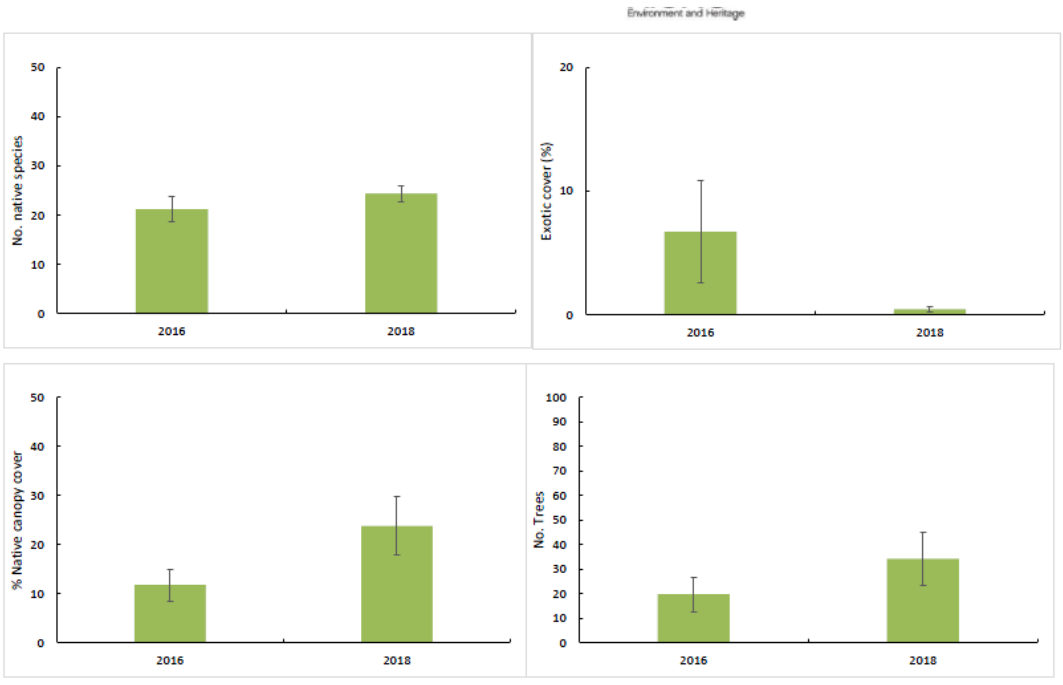
within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR	Native plant species richness
NOS	Native overstorey % cover
NMS	Native midstorey % cover
NGCG	Native ground cover (grass) % cover
NGCS	Native ground cover (shrubs) % cover
NGCO	Native ground cover (other) % cover
EPC	Exotic plant cover % cover
Logs (m)	Length of logs (m)
Hollows	No. trees with hollows



Comparison of key attributes for regenerating woodland (HU578)

Table 10 North Rothbury BA - Comparison of MZ1 monitoring data with benchmark values

BVT HU814 – Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter										
		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
Benchmark	min	38	15	4	30	3	10	0	10	1.2
	max		40	40	60	15	25			
RM1(2018)		29	7.17	1.75	22.50	2.25	10.00	0.00	10	0
RM4 (2018)		32	9.83	3.75	5.75	5.00	4.50	0.25	4	0
RM5 (2018)		39	7.17	4.25	22.50	8.00	7.50	0.00	9	0
Average (2018)		33.33	8.06	3.25	16.92	5.08	7.33	0.08	7.67	0
RM1(2016)		35	15	1.25	90	1.25	6.5	0	20	0
RM4 (2016)		35	25	0.75	60	4.25	4	0.25	10	0
RM5 (2016)		42	16	3	76.25	2	1	0	23	0
Average (2016)		*37.3*	*18.7*	*1.7*	*75.4*	*2.5*	*3.8*	*0.08*	*17.6*	*0*

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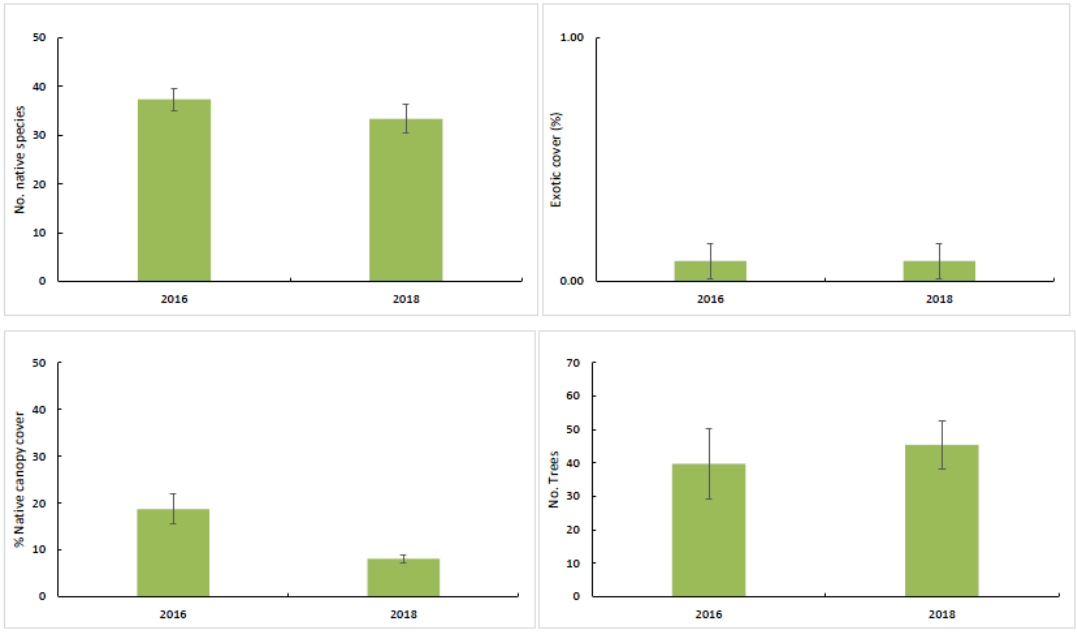
within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR	Native plant species richness	NGCO	Native ground cover (other) % cover
NOS	Native overstorey % cover	EPC	Exotic plant cover % cover
NMS	Native midstorey % cover	Logs (m)	Length of logs (m)
NGCG	Native ground cover (grass) % cover	Hollows	No. trees with hollows
NGCS	Native ground cover (shrubs) % cover		



Comparison of key attributes for regenerating woodland HU814

Mean (±SE) 2014, 2016 and 2018 quadrat data (n = 3). Statistically significant difference *** $p < 0.05$

Table 11 North Rothbury BA – Comparison of MZ2 monitoring data with benchmark values

BVT HU812 – Forest Red Gum grassy open forest on floodplains of the lower hunter										
		NPSR	NOS	NMS	NGCG	NGCS	NGCO	EPC	Logs (m)	Hollows
Benchmark	min	15	15	0	0	1	2	0	10	0.8
	max		65	50	90	15	90			
NM2 (2018)		40.00	5.00	0.00	33.75	2.00	13.75	0.25	10.00	0
NM3 (2018)		34.00	6.33	1.50	35.00	2.25	38.75	0.50	15.50	0
Average (2018)		37	5.67	0.75	34.38	2.13	26.25	0.38	12.75	0
NM2 (2016)		34	7	1.25	60	7.5	1	1	0	0
NM3 (2016)		32	10	2	82.5	6.25	6.25	1	11	0
Average (2016)		*33*	*8.5*	*1.6*	*71.25*	*6.9*	*3.6*	*1*	*5.5*	*0*

	0-10% or >200% of benchmark (>66% cover for EPC)
	10-50% or 150-200% of benchmark (33-66% cover for EPC)
	50-100% or 100-150% of benchmark (5-33% cover for EPC)
	within benchmark or > benchmark for NPSR, Hollows and Logs (0-5% cover for EPC)

NPSR	Native plant species richness
NOS	Native overstorey % cover
NMS	Native midstorey % cover
NGCG	Native ground cover (grass) % cover
NGCS	Native ground cover (shrubs) % cover
NGCO	Native ground cover (other) % cover
EPC	Exotic plant cover % cover
Logs (m)	Length of logs (m)
Hollows	No. trees with hollows

5 PROGRESS IN ATTAINING CONSERVATION OBJECTIVES AGAINST KEY PERFORMANCE INDICATORS

The primary conservation objectives for the Regional BAs are to:

- enhance landscape connectivity within the surrounding landscape;
- improve fauna movement and flora dispersal opportunities within the surrounding landscape;
- increased condition and area of suitable habitats for threatened fauna species within protected reserves, specifically for the Regent Honeyeater and Swift Parrot;
- provide refuge and habitat for local fauna populations and transient species, particularly threatened species; and
- enhance network of protected vegetation within the Hunter Valley.

Table 3 details the progress in attainment of the long-term conservation objectives. The baseline data presented is from the first monitoring completed in 2014. The Rapid Condition Assessment (RCA) monitoring results indicate that the vegetation and habitat health is being maintained in comparison to the baseline data Table 12 – Table 17.

Table 12 Goulburn River BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ2, MZ3, MZ4, MZ5 and MZ7)		Total area: 1,169ha RCA Average Health rating 19.1/20	Maintain or increase area, connectivity and habitat condition over 10 years	RCA Average health rating 2015 – 17/20 2016 – 17.1/20 2017 – 17.1/20 2018 - 18.1/20 Area and health maintained refer to Table 5.
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	improved habitat condition over 10 years	

Table 13 Bowditch BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ1, MZ2 and MZ4)		Total area: 602ha RCA Average Health rating 17.8/20	Observed and measured increase or maintained RCA scores over 10 years	RCA Average Health rating 2015 – 18/20 2016 – 18.4/20 2017 – 17.1/20 2018 – 17.7/20 Area and health maintained refer to Table 7.
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	

Table 14 Seven Oaks BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ3, MZ4 and MZ5)		Total area: 519ha RCA Average Health rating 17.6/20	Observe an increase in area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 18/20 2017 – 17.3/20 2018 – 17.6/20 Area and health maintained refer to Table 6.
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	

Table 15 Condon View BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ2 and MZ4)		Total area: 515ha RCA Average Health rating 19.1/20	Maintain or increase area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 20/20 2017 – 18.2/20 2018 – 18.6/20 Area and health maintained refer to Table 9.
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	

Table 16 Putty BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ2, MZ3 and MZ4)		Total area: 383ha RCA Average Health rating 17.4/20	Observe an increase in area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 17.3/20 2017 – 17.6/20 2018 – 17.8/20 Area and health maintained refer to Table 8.
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	

Table 17 North Rothbury BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ1 and MZ2)		Total area: 41ha RCA Average Health rating 18/20	Observe an increase in area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 18/20 2017 – 18.2/20 2018 – 19/20 Area and health maintained refer to Table 10 and 11.
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	