Nyngan Solar Plant Biodiversity Offset Site

Annual Ecological Monitoring Report Year 6 – 2022

Final

February 28th, 2023

AGL

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Project Manager:	Matt Consterdine
Author:	Matt Consterdine
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Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Level 4, 12 Stewart Avenue
Newcastle West, NSW 2302
PO Box 2147
Dangar, NSW 2309
Australia
T +61 2 4979 2600
F +61 2 4979 2666
www.jacobs.com

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Executive Summary

Background

In 2014, AGL Energy Limited (AGL) constructed the Nyngan Solar Plant, a solar photovoltaic (PV) plant with a nominal capacity of up to 106 megawatts (MW) at Nyngan in central west New South Wales (NSW). The project was approved by the then NSW Department of Planning and Infrastructure (DP&I) on 15 July 2013.

The approval included the Minister's Conditions of Approval (MCoA) of which included that an Offset Management Package be developed to offset the ecological values lost as a result of the project (MCoA C5). Additionally, the biodiversity offset site is required to be monitored for a period of up to 30 years to ensure that ecological values are maintained or improved, and the results reported annually to the NSW Department of Planning and Environment (DPE). Condition C5(b) specifically states that the biodiversity outcome to be achieved must 'improve or maintain' the biodiversity values of the site.

Six monitoring surveys have been conducted at the Nyngan Solar Plant Biodiversity Offset Site (the offset site); January 2018 (Year 1), January 2019 (Year 2), December 2019 (Year 3), November 2020 (Year 4), December 2021 (Year 5) and December 2022 (Year 6). This report outlines the results of the sixth annual monitoring survey of the offset site (conducted by Jacobs in December 2022). The first annual monitoring survey was conducted by Jacobs in January 2018, while the baseline study was recorded in the Biodiversity Offset Management Plan (BOMP) by NGH in 2014.

In addition, this report provides a condition assessment for the revegetation area at the Nyngan Solar Plant, which was required by the condition of approval B18 (October 2011). The revegetation area was to provide both visual screening along the southern boundary of the Solar Plant as well as future compensatory habitat for the Grey-crowned Babbler in the immediate area where habitat has been removed and where the species is known to occur and breed.

Offset site condition

The Year 6 ecological monitoring has shown some further improvement in the diversity and abundance of native plants and the overall condition of native vegetation on the offset site.

It is important to note that the conditions in Year 5 (2021) and Year 4 (2020) were considerably improved from the Year 3 and Year 2 periods when drought was prevalent and floristic diversity, cover and condition was very low when compared to the vegetation community benchmarks (DECC 2008). The results in this Year 6 monitoring period are now mostly within the benchmark condition scores for the vegetation communities and are approaching (or sometimes exceeding) baseline survey results recorded by NGH (2014). It is likely that vegetation is still recovering from the impacts of 2018 and 2019 drought conditions. The increases in average rainfall since 2020 (including three La Nina weather events) has initiated substantial recovery of vegetation, particularly in regard to native grass cover. The removal of grazing animals from the site has allowed for this recovery to continue.

The key results are summarised as follows:

- The condition of the Open White Cypress Pine Woodland community has remained stable during the last year, with improvements to native grass cover. Similarly, cover of native forbs was above the benchmark for this community and has increased since last year (particularly herbs such as Sticky Everlasting (*Xerochrysum viscosum*) and White Sunray (*Rhodanthe floribunda*)). However, as a result, smaller shrubs (particularly chenopods) occurring in the ground-layer have been replaced by the rapid growth of native grasses (particularly where grasses such as Box Grass (*Paspalidium constrictum*) and Spear-grass (*Austrostipa scabra*) form thick layers). The loss of some small chenopod species means that the overall species richness for the monitoring plots has decreased slightly this year. The dominance of native grasses is part of the natural succession of the ecosystem, and future decreases in rainfall may reverse this trend.

Once this occurs it is likely that chenopod species may reappear in the monitoring plots, which would increase the species richness counts again.

- Overall, the White Cypress Pine – Poplar Box Woodland community is in moderate condition and has improved on last year's values. It now exceeds a number of the benchmarks, especially 'native groundcover – other', and it has experienced an increase in native species diversity. Grass cover was substantially higher than previous years and well above the benchmark range and baseline levels. This is largely due to the recent abundance of native *Paspalidium constrictum* and *Panicum effusum* grass, likely responding to consecutive years of higher rainfall. 'Groundcover shrub- cover' has slightly decreased as a result of competition with native grasses however still remains within the benchmark range for the community. Recruitment of Eucalypt species remains low in these areas and may require more years of favourable weather conditions to allow for higher seed dispersal and germination.
- Stock proof fencing around the offset site was installed in early 2018 and is in good condition (following some repairs in 2021). During a contractor inspection (October 2022), it was identified that a small section of fence had been damaged. This was repaired by a contractor in late December 2022.
- Fauna habitats across the site are diverse and include fallen logs, standing dead trees (stags), hollow bearing trees and grass/forb groundcover. These habitats have generally been maintained in similar condition, with notable increases in the grass groundcover habitat.
- No Grey-crowned Babblers (listed as Vulnerable under *NSW Biodiversity Conservation Act* 2016) were observed within the offset site.
- Overall weed infestation across the offset site was low and targeted herbicide treatment appears to have been effective (particularly against Saffron thistle (*Carthamus lanatus*). Despite this, weed growth across the site has increased slightly since last year as a result of continued above average rainfall. This increase is likely attributable to an increase in Fleabane (*Conyza bonariensis*) which is a common weed of cropland and is widespread in NSW. Weed abundance is generally low to moderate and can be maintained by spot treatment (or other methods), as outlined in the management actions (Table 5.1). None of the weeds identified within the site are declared as state or regional priority weeds under the *Biosecurity Act 2015* or the Western Regional Strategic Weed Management Plan 2017-2022 (LLS 2017).

The management actions outlined in this report will further assist the natural regeneration of the site over the next twelve months.

Solar plant revegetation area condition

The estimated survival rate of the planted tubestock has remained the same as last year and many of these plants that survived the 2018/2019 drought conditions have shown considerable growth.

The diversity of native grasses and forbs observed has increased on the previous years, likely in response to greater than average rainfall in recent months. Furthermore, the percentage cover of native grasses and forbs has also increased, with the cover of native grasses showing over 50% increase since 2019. The cover of native shrubs in the ground layer has remained the same since last year, likely due to competition by native grass.

Fencing around the site is in good condition and will assist in excluding any livestock and some feral pests and as such further support the natural regeneration process.

Five Grey-crowned Babbler birds (listed as Vulnerable under *NSW Biodiversity Conservation Act* 2016) were reportedly observed in the middle of the western revegetation area on the 29/09/2022 (during an inspection by a contractor). However, none were observed here during the surveys for this monitoring report (December 2022). The revegetation area currently provides only marginal quality habitat for this target species. As the ground layer cover improves and planted shrub species and overstorey Eucalypts grow, habitat values may improve, however it is likely to take 5 to 10 years before the planted trees are a suitable height for nesting habitat.

1. Introduction

1.1 Background and study area

In 2014, AGL Energy Limited (AGL) constructed a solar photovoltaic (PV) plant (the Nyngan Solar Plant) with a nominal capacity of up to 106 megawatts (MW) at Nyngan in Central West New South Wales (NSW). The solar plant is located approximately 10 kilometres (km) to the west of the Nyngan township. The site is approximately 300 hectares (ha) in area with additional areas of land for linear easements for the connection of the project's electrical infrastructure to the Nyngan – Cobar 132 kilovolt (kV) transmission line. The location of the solar plant, access and transmission easements and offset site are shown in Figure 1.1.

The project was approved by the then Department of Planning and Infrastructure (DP&I) on the 15 July 2013. The Minister's Condition of Approval (MCoA) prescribed that an Offset Management Package be developed to offset the ecological values lost as a result of the project (McoA C5, detailed in Appendix B).

In addition to this condition of consent, the proponent also committed to the following mitigation measures relating to offsets within the Nyngan Solar Plant Submissions Report (NGH Environmental June 2013):

An Offset Plan would be developed with input from OEH and the CMA and according to the strategy provided in Appendix G of the Biodiversity Assessment (which included a proposed 1:5 offset ratio). It would be finalised prior to any construction impacts, as outlined in the Biodiversity Assessment. The objective of offsetting is to ensure that an overall 'maintain or improve' outcome is met for the project; where impacts cannot be avoided, or sufficiently minimised, the residual impact would be offset in perpetuity.

Prior to finalising the offset site boundaries, the proponent would validate the area impacted by construction to ensure that the actual, not estimated, impacted area is offset.

The offset site management actions and their outcomes are be reported annually to the NSW DPE for the duration of the project (up to 30 years) to demonstrate that a 'maintain or improve' outcome has been met. This monitoring period may vary, depending on the outcomes recorded across the site at each monitoring event, at the discretion of DPE.

AGL secured an offset site approximately 10 km southwest of the solar plant site. The offset site is in the north-western corner of Lot 30 in Deposited Plan 752879 and is approximately 50 ha in area (see Figure 1.1). As an additional compensatory measure, AGL also created a five-hectare revegetation area within the solar plant site to further mitigate the loss of habitat for the Grey-crowned Babbler (listed as Vulnerable under *NSW Biodiversity Conservation Act* 2016).

AGL are responsible for the ongoing management of the offset site and revegetation area.

1.2 Monitoring objectives

This report documents the results of the sixth annual ecological monitoring event for the offset site, as required under Condition of Approval (CoA) C5. The objective of the annual monitoring is to demonstrate an 'improve or maintain' outcome for the identified biodiversity offset values at the offset site and to identify any management/remedial actions required to achieve these outcomes.

Monitoring requires the collection of ecological data, consistent with the methodology described in the Biodiversity Offset Management Plan (BOMP) prepared by NGH Environmental (2014). The results are described and analysed with comparison to benchmark data, the baseline data from the BOMP (NGH 2014), and those of the first, second, third, fourth and fifth year ecological monitoring events (Jacobs) to determine if there have been any significant changes in the vegetation and habitat conditions that are not consistent with improving or maintaining the biodiversity values of the offset site.

In addition, an evaluation was undertaken of any required management actions and their effectiveness, as outlined in the BOMP (NGH 2014). The BioBanking Assessment Methodology (BBAM) (DECC 2009) also lists the standard management actions required to be undertaken at offset sites. This includes management of grazing for conservation, weed control, management of fire for conservation, management of human disturbance, retention of regrowth and remnant native vegetation, replanting or supplementary planting where natural regeneration will not be sufficient, retention of dead timber, erosion control and retention of rocks.

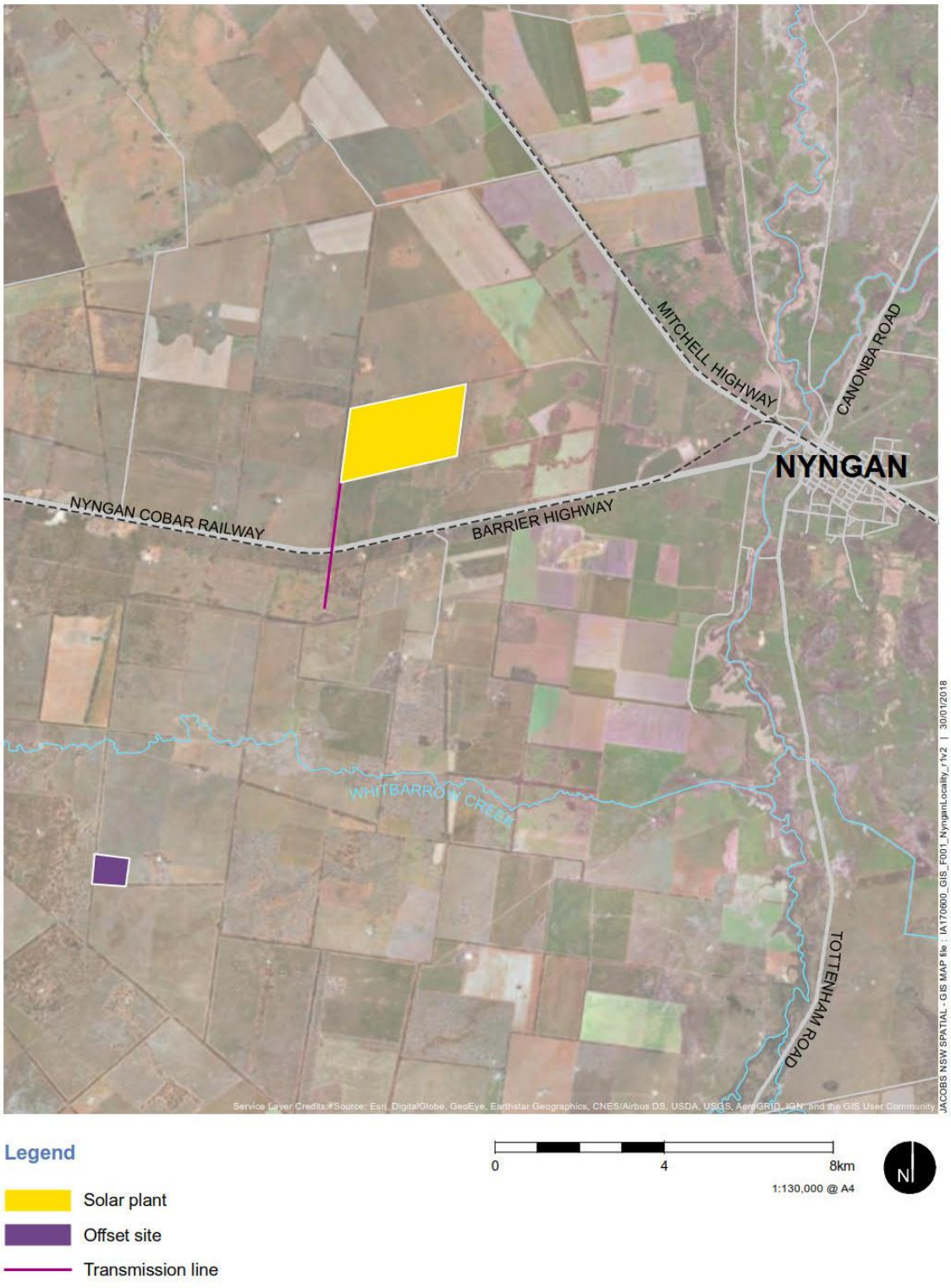

Figure 1.1 | Nyngan solar plant and offset site location

2. Monitoring method

2.1 Requirements

The monitoring method is consistent with the methodologies outlined in the BOMP (NGH 2014) and meets the requirements of the CoA C5, outlined in Appendix B. CoA C5(b) stipulates the requirement of the offset site to achieve an 'improved or maintained' outcome for the biodiversity values of the site. Improved or maintained outcomes for the biodiversity values of the offset site have been evaluated through the comparison of ecological monitoring data against the benchmark and baseline data for each surveyed vegetation community as well as the evaluation of weed infestation and fauna habitat. An overview of the monitoring method used for the offset site include:

- Vegetation condition assessment. Following the methodology used in the BOMP (NGH 2014), assessment was undertaken using the BioBanking Assessment Methodology (BBAM) (DECC 2009) to collect data on vegetation structure, cover and quality across transects and within plots. This data was then compared with the NGH (2014) baseline data and the benchmark data for each vegetation community type using the OEH Vegetation Benchmarks Database (DECC 2008). The BBAM has now been replaced with the Biodiversity Assessment Methodology 2020 (BAM) which no longer uses the Modified Braun Blanquet method to assess floristic cover and abundance. Given that this study originally used the BBAM (with Modified Braun Blanquet cover/abundance data), this method has been continued in order to enable comparison of vegetation condition between previous years including the baseline assessment. The vegetation condition for December 2022 (Year 6, this report) is compared with:
    - Benchmark data
    - Baseline study (included in the BOMP, NGH 2014)
    - Year 1 monitoring (Jacobs - November 2017)
    - Year 2 monitoring (Jacobs - January 2019)
    - Year 3 monitoring (Jacobs - December 2019)
    - Year 4 monitoring (Jacobs - November 2020)
    - Year 5 monitoring (Jacobs) – December 2021
- Habitat evaluation. Notes on fauna habitat were taken across the broader offset site while traversing the site to reach the monitoring plots. At each monitoring plot, detailed notes were also taken to report on habitat condition.
- Fencing evaluation. Fences were assessed through observation by driving and walking around the perimeter of the offset site, to assess general condition and identify any areas requiring maintenance.

The methodology for monitoring the revegetation area of the solar plant is described in section 2.2.4 and section 4.

2.2 Field survey

A field survey was undertaken by two Jacobs ecologists, Matt Consterdine and Emma Weatherstone on 14th December 2022 across the two vegetation types identified within the offset site (listed in Table 2.1 and shown on Figure 2.2).

The predominant vegetation within the offset site was described by NGH (2014) as Poplar Box – Gum-barked Coolabah-White Cypress Pine shrubby woodland (Veg ID 103) (Benson *et al.* 2006). NGH (2014) also notes some characteristics of White Cypress Pine – Polar Box woodland on footslopes and peneplains (ID 72), particularly regarding the dominance of White Cypress Pine (*Callitris glaucophylla*) and the presence of groundcover species. The Biometric benchmarks for these vegetation types are the same (DECC 2008). Difference in structure and species composition occur across the offset site, most likely due to past disturbance and land management, which have resulted in two main forms of the community being present (NGH 2014):

1) Open White Cypress Pine Woodland

2) White Cypress Pine Polar Box Woodland

Table 2.1 shows the area occupied by these vegetation types within the offset site and the monitoring plots sampled in each.

In addition, NGH (2014) describes a small area (0.66 ha) of vegetation dominated by Budda (*Eremophila mitchellii*), see Figure 2.2. The dominance of Budda in this area is considered most likely due to the removal of overstorey and mid-storey species by past landholders, thus eliminating competition, or other past disturbance such as a localised fire (NGH 2014). This area was described qualitatively and mapped by NGH (2014) but not surveyed in detail by NGH. This area is considered part of the Open White Cypress Pine Woodland. It does not constitute a different vegetation type and does not contain any annual monitoring sites.

Table 2.1 Vegetation types monitored within the offset site

Vegetation Type (DECC 2008)	PCT ID	**Area in offset site (ha)**	**Monitoring plots sampled by NGH (2014)**	**Monitoring plots sampled by Jacobs (2017-2020)**
Open White Cypress Pine Woodland	70	41.55	M01 & M02 (2 plots)	M01 & M02 (2 plots)
White Cypress Pine – Poplar Box Woodland	72	8.5	M03 & M04 (2 plots)	M03 & M04 (2 plots)

2.2.1 Vegetation condition assessment and establishment of monitoring plots

BioBanking plots were surveyed according to the BBAM (DECC 2009), as outlined in COA C5 (Appendix B) and in the BOMP (NGH 2014). Baseline surveys undertaken by NGH (2014) set up two monitoring plots per vegetation community. Jacobs (2021) have replicated their approach (see Table 2.1).

Floristic data was collected to enable comparison between baseline data and benchmarks recorded in the BOMP (NGH 2014). The four monitoring plots established by NGH (2014), were located at the site using recorded GPS coordinates. These plots were previously marked in the field using star pickets driven into the ground to facilitate future replication. Pickets were placed at the start and end of a 50 metre transect and their coordinates recorded. Start points were delineated with white spray paint sprayed on the top of the picket. A 20 x 20 metres quadrat required by the BBAM (DECC 2009) was conducted within an area bounded by the first 20 metres of the transect and extending 10 metres either side as shown in Figure 2.1. Photographs were taken at the start and end of each monitoring plot. The location of all vegetation types and monitoring plots are shown in Figure 2.2.

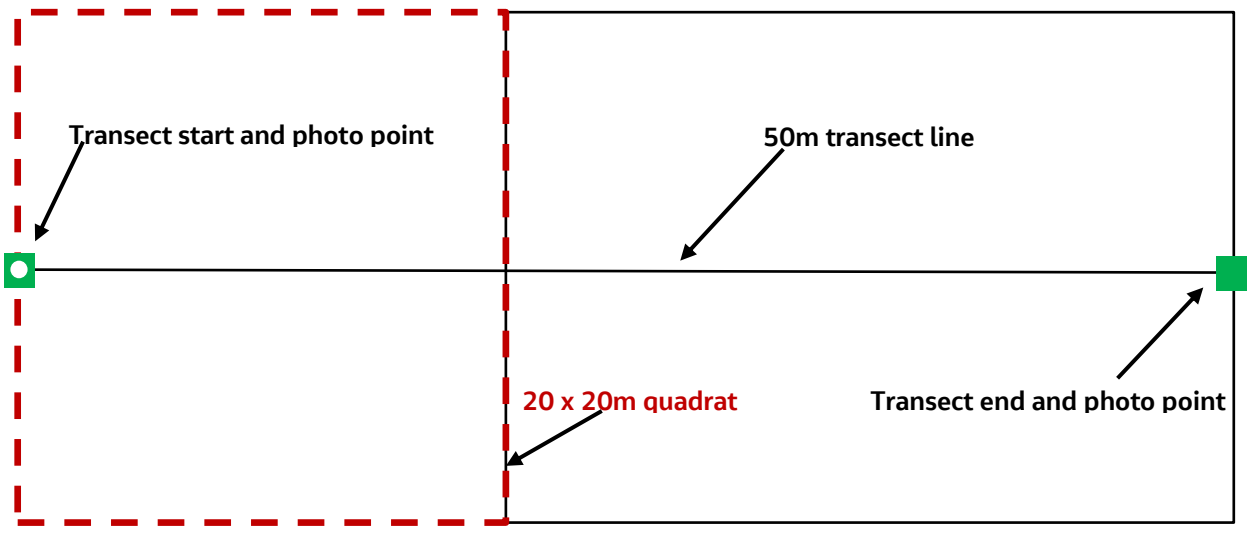

Figure 2.1: Monitoring plot layout

Data collected during each monitoring year has been collated into one electronic database using Microsoft Excel, along with the NGH (2014) baseline data and the benchmark data for each vegetation community to enable future analysis of data. Jacobs has used the Modified Braun Blanquet method (see Table 2.2) for recording floristic abundance data within each monitoring plot.

Table 2.2: Modified Braun Blanquet scale method used for the monitoring survey

Modified Braun Blanquet (plant cover abundance scale)	
1	1 to a few individuals present, less than 5% cover
2	Many individuals present, but still less than 5% cover
3	5-<20% cover
4	20-<50% cover
5	50-<75% cover
6	75-100% cover

Photographs of each monitoring plot are captured annually using regular photo points.

The coordinates for each monitoring plot are provided in Table 2.3 to enable repeat and consistent monitoring in the future.

Table 2.3: Coordinates for each of the monitoring plots

Plot Name	**Transect start**		**Transect end**	
	Easting*	**Northing***	**Easting***	**Northing***
M01	501365.4948	6498409.989	501388.4344	6498371.304
M02	501144.511	6498635.457	501106.7714	6498605.313
M03	500822.2086	6498302.868	500820.4033	6498254.1
M04	501271.0288	6498145.767	501221.3488	6498151.204

* Co-ordinates are in MGA zone 54 relative to the GDA94 datum

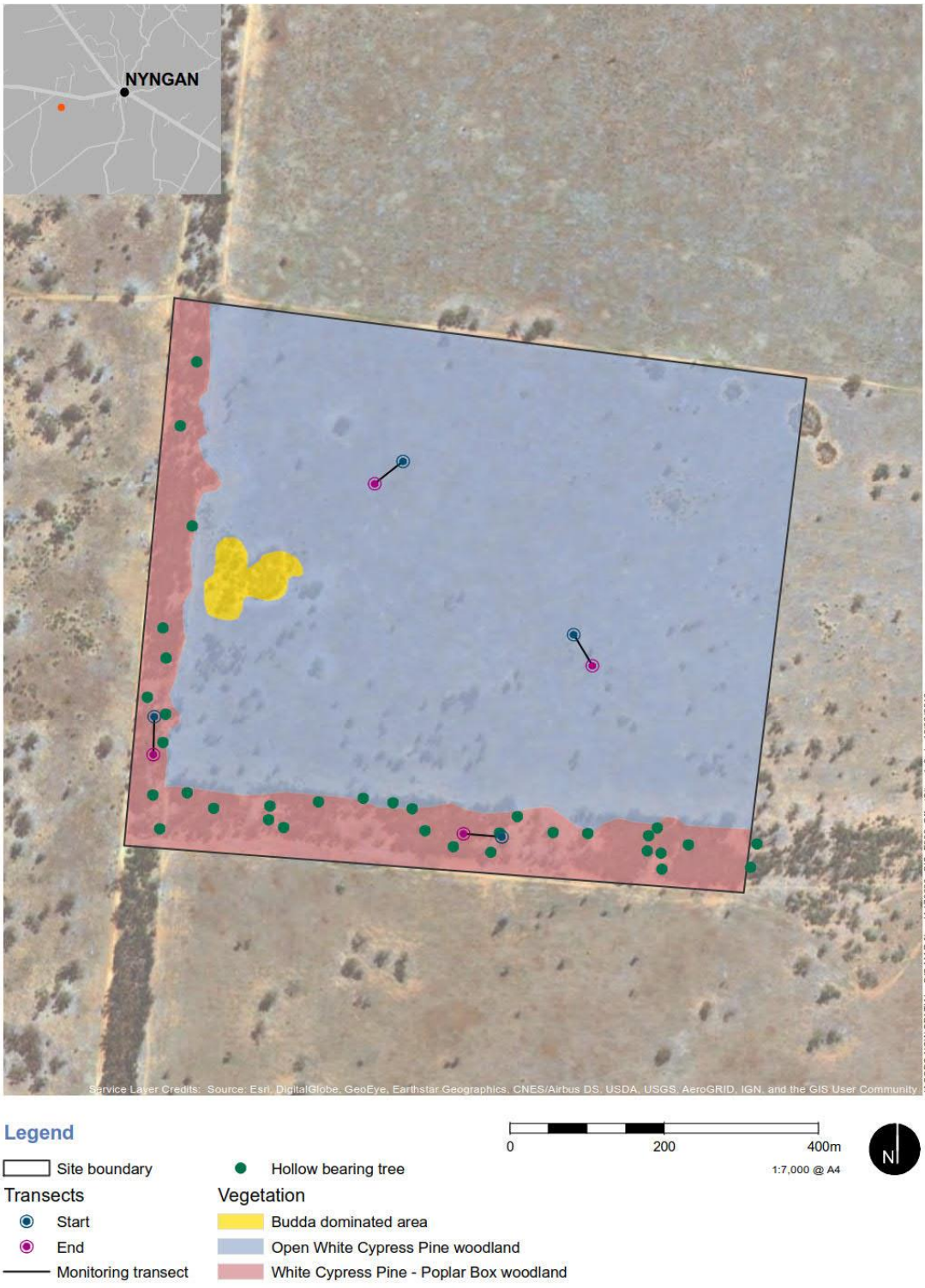

Figure 2.2 | Vegetation types, hollow bearing trees and monitoring plots within the Nyngan offset site

2.2.2 Habitat evaluation

General habitat notes were made for the entire offset site whilst detailed habitat notes were taken at each of the monitoring plot locations and included the presence of habitat trees, logs and opportunistic fauna observations. In addition to, the percentage cover of the following habitat features within the entire 50 x 20 metres monitoring plots were recorded:

- Tussock grasses
- Chenopod shrubs
- Mulga (or other overstorey species)
- Bare ground
- Cracking clay
- Rocks and logs.

2.2.3 Fencing evaluation

Fences were inspected for any required maintenance issues whilst driving around the perimeter of the offset site and whilst traversing the site by foot during monitoring plot surveys.

2.2.4 Grazing pressure

Grazing pressure is determined by visual inspections for fauna.

2.2.5 Solar plant revegetation area - assessment

The revegetation area within the solar plant site was assessed by a count of planted species to determine approximate percentage survival rates and for weed infestation. A general plant species list was created for the area and any management actions listed.

Photographs of each monitoring plot are captured annually using regular photo points.

2.2.6 Climatic conditions

Nyngan is a typically dry, semi-arid area that experiences low annual rainfall. Following very dry years of 2018 and 2019, the last three years have had many months of above average rainfall due to repeat La Nina events. Significant rainfall events occurred in 2021 (February, March and November) and 2022 (April, May, August and October). Recent rainfall has resulted in continued improved conditions for plant growth, as observed during the Year 6 survey (see Figure 2.3 below).

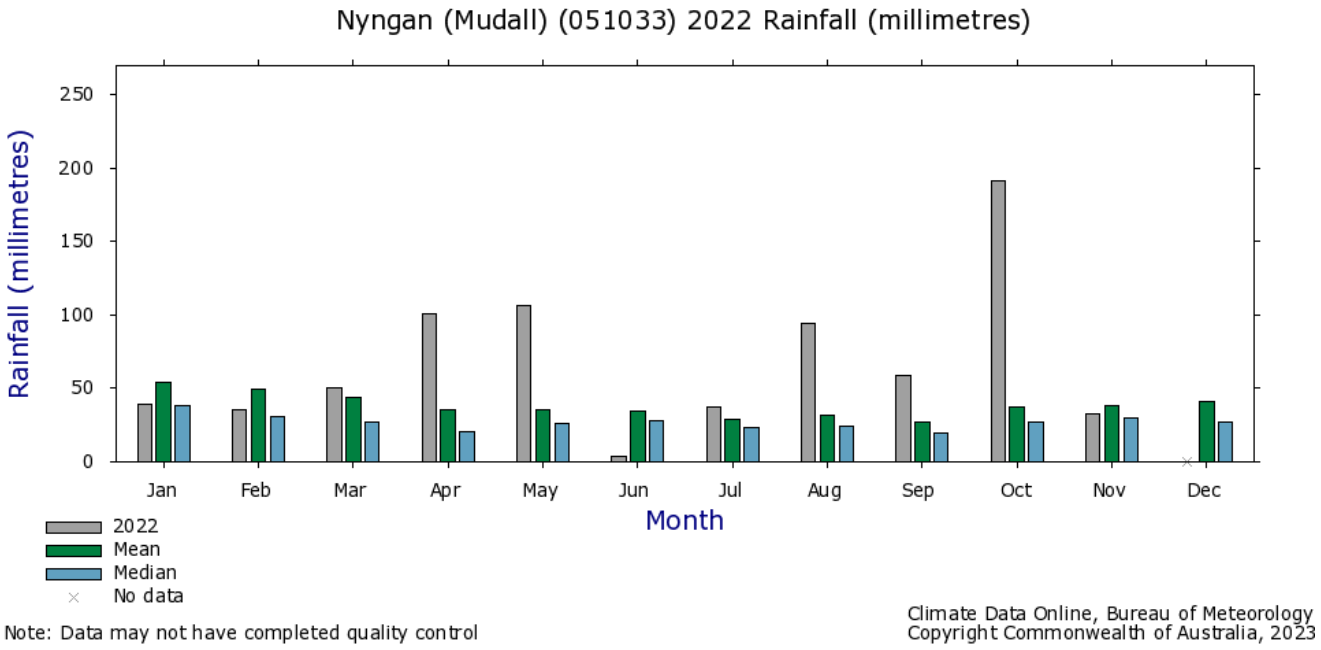

Figure 2.3: Rainfall preceding Year 6 (2022) monitoring (source: Australian Bureau of Meteorology)

3. Monitoring results

3.1 Plot data descriptions and benchmark comparisons

The data and description of the monitoring results for each surveyed vegetation community are listed below. Photographs taken at the start and end of each monitoring plot are also provided in sections 3 and 4. A species list specific to the 20m x 20m monitoring plot within the larger transect area is provided in Appendix A.

3.1.1 Open White Cypress Pine Woodland

The Open White Cypress Pine Woodland community is the dominant vegetation type within the offset site (approximately 41.55 hectares). The overstorey is sparse and comprised of scattered patches of White Cypress Pine (*Callitris glaucophylla*) with the occasional mature Poplar Box (*Eucalyptus populnea* subsp. *bimbil*). The mid-storey is also very sparse and mostly comprised of regenerating White Cypress Pine. Isolated Wilga (*Geijera parvifolia*) and Budda (*Eremophila mitchellii*) individuals also occur.

The ground cover comprises of a high diversity of forbs and grasses. Dominant species include: Hairy Panic (*Panicum effusum*), Speargrass (*Austrostipa scabra* subsp. *Scabra*), Sticky Everlasting (*Xerochrysum viscosum*), Box Grass (*Paspalidium constrictum*) and Curly Windmill Grass (*Enteropogon acicularis).* Native White Sunray (*Rhodanthe floribunda*) was a newly recorded species on the site and was quite dense in some areas (including in M02 and M01 monitoring plots). Exotic species Fleabane (*Conyza bonariensis*) was recorded frequently and had increased from previous monitoring periods (due to recent above average rainfall).

The monitoring plot data along with the benchmarks for this vegetation type (DECC 2008) are shown in Tables 3.1 and 3.2. Plates 1 to 4 show the photo assessment points, during Year 5 and Year 6 surveys, for plots M01 and M02. Species richness (the number of native species, shown in Table 3.1 as 'Native Spp. #') was above the benchmark for the community across both plots and higher than last year, but still lower than the baseline recorded by NGH (2014). Overstorey and mid-storey are within the benchmark ranges and continue to increase from the NGH (2014) baseline data. This increase is attributed to new foliage growth on existing trees and shrubs (as opposed to new plants reaching the mid and canopy stratums). Native grass cover was above the benchmark for this community and has increased again after the considerable increases observed in 2020 and 2021 (following drought). Similarly, other groundcover vegetation cover was above the benchmark for this community and has increased since last year (particularly herbs such as *Xerochrysum viscosum* and *Rhodanthe floribunda*). The increase in grass and other groundcover is evident when comparing the photo monitoring points between Year 5 and Year 6 surveys (see Plates1 to 4). The increase groundcover vegetation is most likely due to another year with above average rainfall conditions.

Groundcover shrub cover was within the benchmark and was equal to the baseline (NGH 2014) for M02 and slightly above the baseline (NGH 2014) for M01. There were slight increases in groundcover shrub cover for M01 compared to last year, although the cover in M02 decreased slightly (likely due to dominance of native grasses this year). As per previous surveys, no hollow bearing trees (HBTs) were recorded in these plots and fallen timber remained below benchmark levels. Fallen timber has increased in Plot M01 since the 2014 baseline survey.

Overall, the Open White Cypress Pine Woodland community remains in moderate condition. This year has seen a slight decrease in species richness due to likely competition from native grasses (which have now replaced some smaller herbs and chenopod species). The dominance of native grasses is part of the natural succession of the ecosystem, and future decreases in rainfall may reverse this trend. The increased regeneration of overstorey species such as White Cypress Pine is further evident since last year and likely to continue over time. The health and condition of native plants has also visibly improved since last year and can be seen in Plates 1 to 4. With the continued absence of non-native grazing animals, improvement in this community is likely (particularly if favourable weather conditions continue). Recruitment of Eucalypt species remains low in these areas and may require more years of favourable weather conditions to allow for higher seed dispersal and germination. It is possible the severe drought years of 2018 and 2019 continue to influence the regeneration of eucalypts in the locality.

Plate 1. Open White Cypress Pine Woodland – Plot M01 Year 5 (2021)

Plate 2. Open White Cypress Pine Woodland – Plot M01 Year 6 (2022)

Plate 3. Open White Cypress Pine Woodland – Plot M02 Year 5 (2021)

Plate 4. Open White Cypress Pine Woodland – Plot M02 Year 6 (2022)

Table 3.1: Benchmark and monitoring plot data comparison for Open White Cypress Pine Woodland Plot M01

	Native Spp. #	Native Cover				Native Groundcover						HBTs	Logs
		Overstorey		Mid-storey		Grasses		Shrubs		Other			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Benchmark	15	3%	22%	0%	30%	5%	30%	2%	10%	2%	30%	0.1	20
Baseline (NGH 2014)	28	0%		0%		58%		4%		24%		0	5
Yr 1 M01	30	0%		0%		44%		0%		34%		0	1
Yr 2 M01	26	1%		1%		22%		0%		16%		0	15
Yr 3 M01	17	1%		1%		2%		1%		5%		0	10
Yr 4 M01	25	3%		1%		40%		3%		8%		0	10
Yr 5 M01	29	4%		2%		45%		4%		10%		0	10
Yr 6 M01	23	6%		3%		65%		5%		15%		0	10

Table 3.2: Benchmark and monitoring plot data comparison for Open White Cypress Pine Woodland M02

	Native Spp. #	Native Cover				Native Groundcover						HBTs	Logs
		Overstorey		Mid-storey		Grasses		Shrubs		Other			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Benchmark	15	3%	22%	0%	30%	5%	30%	2%	10%	2%	30%	0.1	20
Baseline (NGH 2014)	29	0%		0%		50%		2%		30%		0	17
Yr 1 M02	30	3%		0%		44%		0%		46%		0	1
Yr 2 M02	23	3%		<1%		22%		0%		10%		0	14
Yr 3 M02	16	3%		1%		3%		2%		3%		0	15
Yr 4 M02	21	5%		3%		40%		2%		20%		0	15
Yr 5 M02	28	6%		4%		57%		3%		25%		0	15
Yr 6 M02	21	7%		5%		65%		2%		30%		0	15

3.1.2 White Cypress Pine – Poplar Box Woodland

The White Cypress Pine – Poplar Box Woodland community is restricted to linear strips approximately 45 to 75 metres wide along the western and southern boundaries of the offset site and occupies approximately 8.5 hectares (see Figure 2.2). The overstorey is dominated by White Cypress Pine (*Callitris glaucophylla*) with mature Poplar Box (*Eucalyptus populnea*) scattered throughout. In more open areas, Poplar Box is dominant. Gum-barked Coolabah (*Eucalyptus intertexta*) is also present to a lesser extent occurring as occasional individuals. Dense White Cypress Pine recruits form a distinct small tree layer across much of the area. The mid-storey shrub layer is generally sparse and restricted to occasional individuals of Budda, Berrigan (*Eremophila longifolia*) and Sticky Hopbush (*Dodonaea viscosa* subsp. *mucronata*). Climbing saltbush (*Einadia nutans* subsp. *nutans*) is a common low shrub along with Galvanised Burr (*Sclerolaena birchii*) and Eastern Cottonbush (*Maireana microphylla*). The ground cover is patchy and dominated by species such as Mulga Mitchell Grass (*Thyridolepis mitchelliana*), Curly Windmill Grass (*Enteropogon acicularis*), Blue Trumpet (*Brunoniella australis*) and Ridged Sida (*Sida cunninghamiana*). This year also showed an increase of native Sticky Everlasting (*Xerochrysum viscosum*) and native grasses; *Paspalidium constrictum* and *Panicum effusum*. Exotic species Fleabane (*Conyza bonariensis*) was recorded frequently and had increased from previous monitoring periods (due to recent above average rainfall).

The monitoring plot data, along with the benchmarks for this vegetation type (DECC 2008), are shown in Tables 3.3 and 3.4. Plates 5 to 8 show the photo assessment points, during Year 5 and Year 6 surveys, for plots M03 and M04. Species richness (which is the number of native species, shown in Table 3.3 as 'Native Spp. #') remains above the benchmark for this community and above the baseline scores (NGH 2014) in both plots. Overstorey cover is above the benchmark range and slightly higher than last year. Mid-storey cover is within the benchmark range and slightly higher than last year. Overstorey and mid-storey scores are also above baseline cover scores. The increase in these layers is attributed mainly to new foliage growth on existing trees. The recruitment of new trees is still low following drought years of 2018 and 2019. Grass cover was substantially higher than previous years and well above the benchmark range and baseline levels. This is largely due to the recent abundance of

native *Paspalidium constrictum* and *Panicum effusum* grass, likely responding to consecutive years of higher rainfall. Groundcover shrub cover has slightly decreased as a result of competition with native grasses however still remains within the benchmark range for the community. Other native ground cover such as forbs has also decreased slightly from last year as growth of native grass has displaced herbs and chenopods. The dominance of native grasses is part of the natural succession of the ecosystem, and future decreases in rainfall may reverse this trend. Other native ground cover scores still exceed the benchmark range and baseline values, in both plots, for this community. Groundcover (particularly grasses) increase is evident when comparing the photo monitoring points from the Year 5 survey with the current survey (Plates 5 to 8). The increase in groundcover vegetation is most likely due to consecutive years of above average rainfall. Whilst HBTs occur within the wider area of this community, none were recorded in the monitoring plots, which is below the benchmark and baseline (NGH 2014) for this community. The values for fallen timber in the monitoring plots were like last year, higher than the benchmark and similar to the baseline (NGH 2014).

Overall, the White Cypress Pine – Poplar Box Woodland community is in moderate condition and has improved on last year's values. It now exceeds a number of the benchmarks, especially native groundcover - other, and it has experienced an increase in native species diversity. Recruitment of Eucalypt species remains low in these areas and may require more years of favourable weather conditions to allow for higher seed dispersal and germination. It is possible the severe drought years of 2018 and 2019 continue to influence the regeneration of eucalypts in the locality.

Table 3.3 Benchmark and monitoring plot data comparison for White Cypress Pine – Poplar Box Woodland – plot M03

	Native Spp. #	Native Cover				Native Groundcover						HBTs	Logs
		Overstorey		Mid-storey		Grasses		Shrubs		Other			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Benchmark	15	3%	22%	0%	30%	5%	30%	2%	10%	2%	30%	0.1	20
Baseline (NGH 2014)	24	29%		0%		32%		6%		10%		2	35
Yr 1 M03	31	39%		0%		18%		0%		56%		0	7
Yr 2 M03	12	32%		2%		0%		2%		18%		0	36
Yr 3 M03	4	30%		2%		0%		2%		7%		0	35
Yr 4 M03	21	32%		4%		10%		4%		45%		0	36
Yr 5 M03	29	34%		5%		48%		6%		55%		0	36
Yr 6 M03	32	36%		6%		58%		6%		40%		0	36

Table 3.4 Benchmark and monitoring plot data comparison for White Cypress Pine – Poplar Box Woodland – plot M04

	Native Spp. #	Native Cover				Native Groundcover						HBTs	Logs
		Overstorey		Mid-storey		Grasses		Shrubs		Other			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Benchmark	15	3%	22%	0%	30%	5%	30%	2%	10%	2%	30%	0.1	20
Baseline (NGH 2014)	21	22%		0%		18%		10%		6%		1	36
Yr 1 M04	36	28%		0%		8%		0%		28%		0	2
Yr 2 M04	19	25%		0%		2%		0%		8%		0	38
Yr 3 M04	7	25%		0%		0%		3%		5%		0	38
Yr 4 M04	24	27%		2%		15%		4%		50%		0	38
Yr 5 M04	25	29%		2%		38%		7%		58%		0	38
Yr 6 M04	29	30%		3%		48%		4%		46%		0	38

Plate 5. White Cypress Pine – Poplar Box Woodland - Plot M03 Year 5 (2021)

Plate 6. White Cypress Pine – Poplar Box Woodland - Plot M03 Year 6 (2022)

Plate 7. White Cypress Pine – Poplar Box Woodland - Plot M04 Year 5 (2021)

Plate 8. White Cypress Pine – Poplar Box Woodland - Plot M04 Year 6 (2022)

3.2 Monitoring survey results summary and discussion

The observed changes in the vegetation of the offset site are summarised and discussed below.

3.2.1 Native species richness

Native species richness (labelled Native Spp. # in tables above) has further increased in plots M03 and M04 and remains above benchmark levels for all plots (see Figure 3.1). Plots M01 and M02 recorded a slight decrease in species since last year because of increased competition from native grasses (which have responded well to consecutive years of above average rainfall). Several small chenopod and perennial herb species have likely been replaced by fast growing native grasses. The dominance of native grasses is part of the natural succession of the ecosystem, and future decreases in rainfall may reverse this trend. Overall, the groundcover grass and forb component of the vegetation seems to have been the most increased, with many previously recorded annual and short-lived perennial species reappearing, as well as some new species being recorded; Star Cudweed (*Euchiton sphaericus*), Native White Sunray (*Rhodanthe floribunda*) and Frosted Goosefoot (*Chenopodium desertorum*). Refer to Appendix A for the full list of native species in each plot.

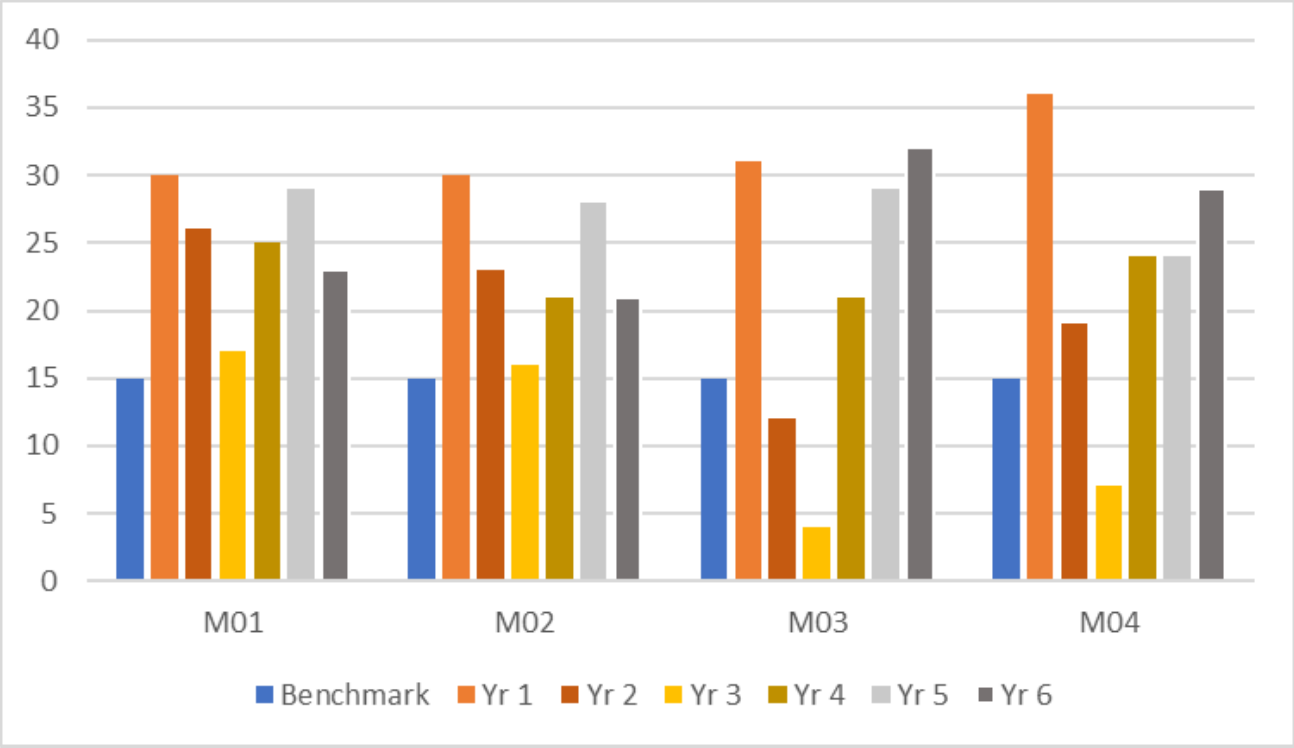

Figure 3.1: Changes in number of native species (species richness) assessed against benchmark levels

3.2.2 Cover of native and exotic vegetation

The cover scores for native vegetation have increased slightly for overstorey and midstorey categories in comparison with last year. This increase is primarily limited to new foliage growth on existing trees and shrubs. As a result of ongoing wet conditions, groundcover grasses demonstrated further substantial increases since Year 5, and remain far-higher than Years 2 and 3 (which were low-rainfall years). The significant cover of native grass has apparently increased competition for space, light and nutrients in the ground layer, and has resulted in slight decreases of groundcover-shrub and groundcover-other categories. Small chenopods and herbs have occasionally been replaced by grass tussocks. There has been a slight increase in the abundance of exotic species when compared to data from Year 5 (see Figure 3.2). This increase is likely to be attributable to growth of exotic Fleabane (*Conyza bonariensis*) resulting from long periods of above-average rainfall. However, the increase in

native grass cover is likely beneficial in suppressing / outcompeting some other weed species previously recorded here.

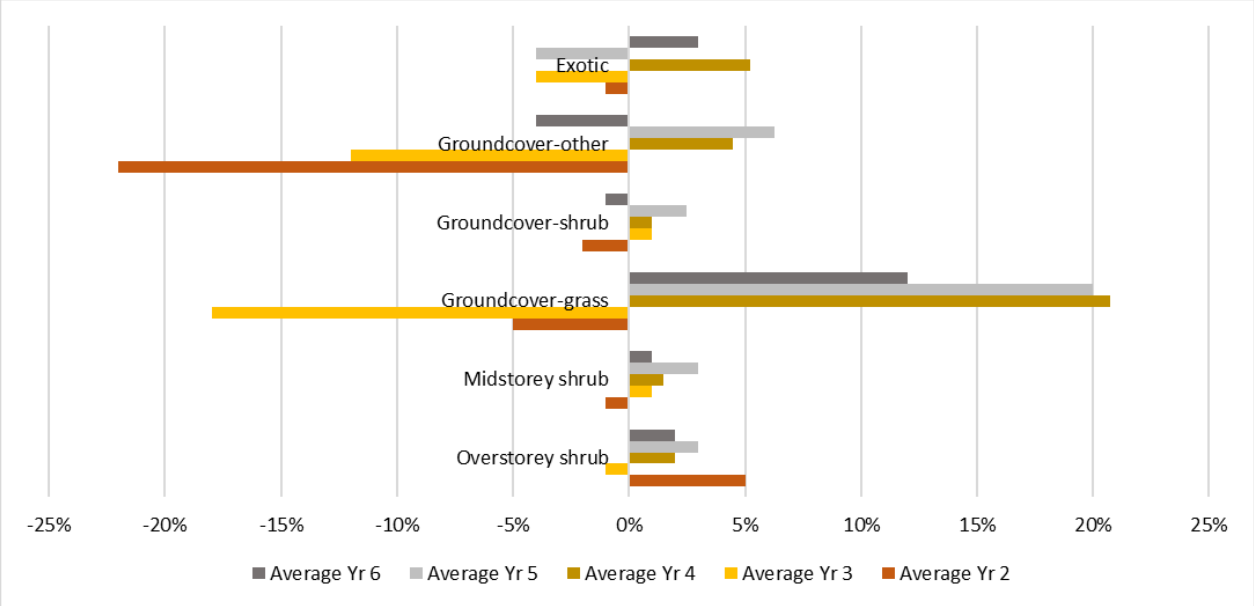

Figure 3.2: Changes in the cover of native and exotic vegetation

As explained above, a slight decrease of native groundcover-other cover for M03 and M04 this year is likely a result of competition with native grass species which have proliferated due to continued above average rainfall. Notably, the cover scores for this category still exceed the benchmark maximum for this vegetation community. Cover of forbs slightly increased this year in M01 and M02, and remain above benchmark range (see Figure 3.3).

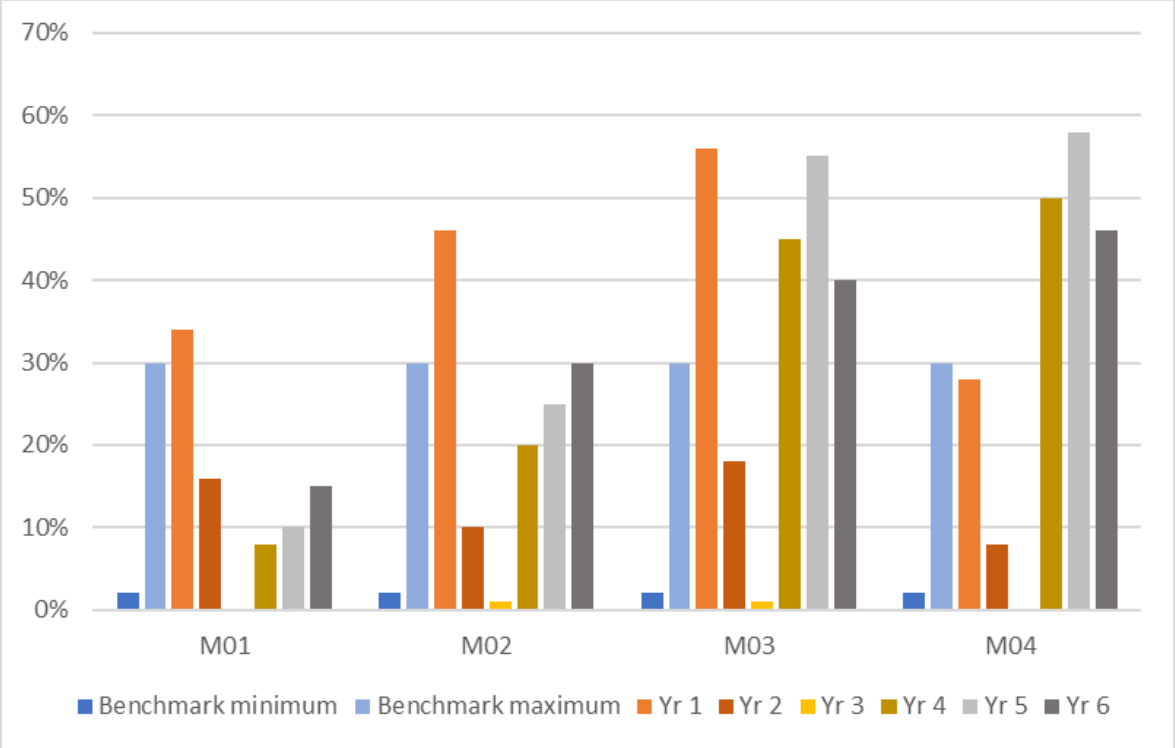

Figure 3.3: Native groundcover – other (percentage cover)

Figure 3.4 demonstrates the native groundcover-grass layer has continued to increase this year and exceeds the benchmark maximum in all monitoring plots. This pattern is attributable to another year of above-average rainfall in western NSW.

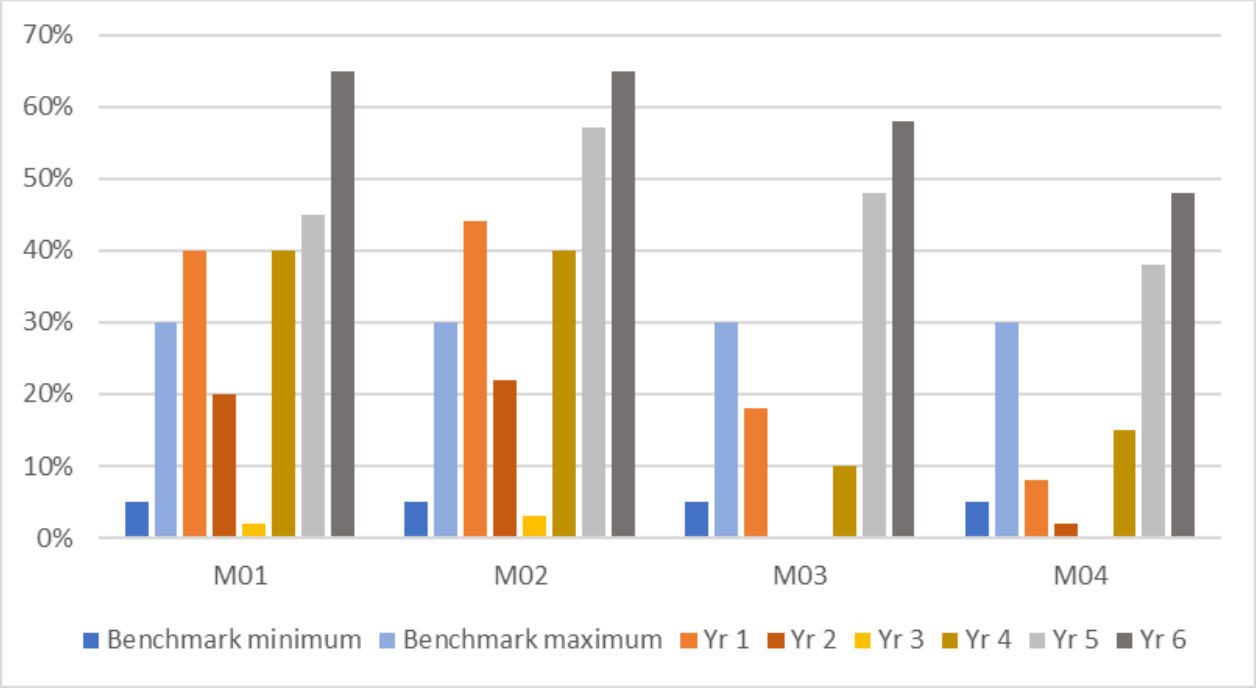

Figure 3.4: Native groundcover - grass (percentage cover)

In relation to native groundcover-shrubs (Figure 3.5), the benchmark levels were met for all of M01, M02, M03, M04 despite some decreased cover recorded in M02 and M04 plots this year. Smaller shrubs occurring in the ground-layer have been replaced by recent further growth of native grasses (whereas larger shrubs are likely to persist). This was mostly evident in M04 which was found to have dense *Paspalidium constrictum* and *Austrostipa scabra* in the ground layer.

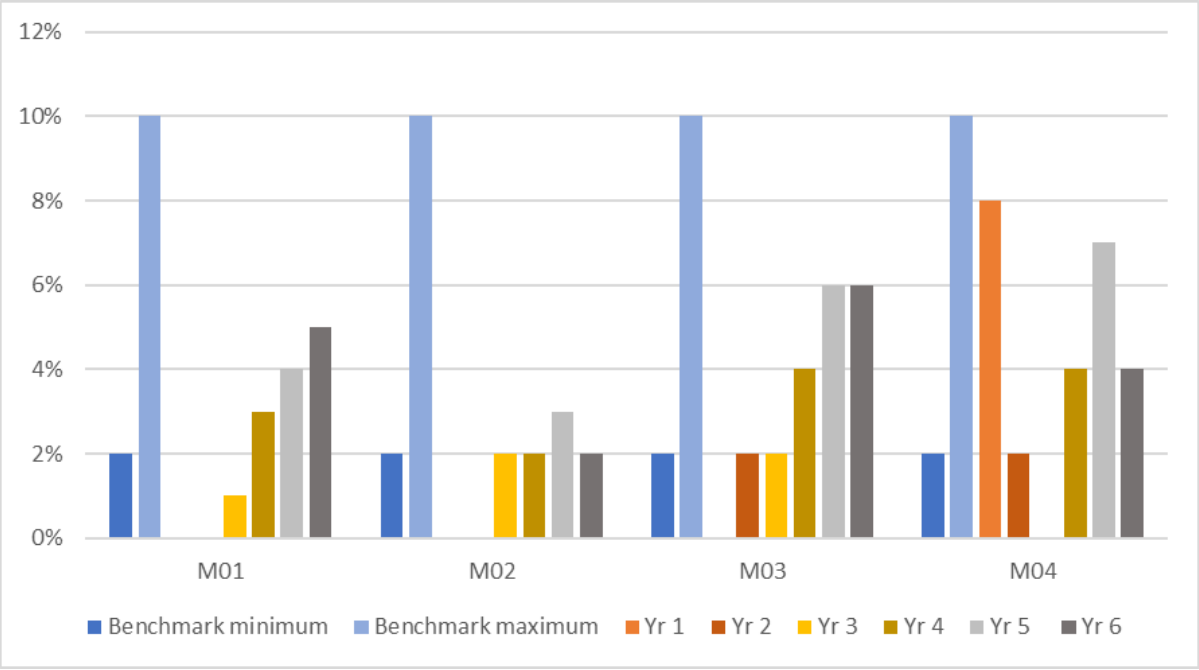

Figure 3.5: Native Groundcover – shrubs (percentage cover)

3.2.3 Discussion

Observed recovery in species richness and native vegetation cover at the offset site is the result of above average rainfall throughout 2020, 2021 and 2022 (following drought conditions in 2018 and 2019). Grazing pressure on grasses and herbs by kangaroos and feral pests has also been reduced by the exclusion fencing surrounding the offset site. Due to these factors, the Year 5 (2021) ecological monitoring results showed significant increases in native grass and shrub covers. This year (Year 6) shows similar diversity and cover values with some improvements to species richness and densities scores, however, some minor decreases were also recorded.

The Year 6 ecological monitoring has shown an improvement in the diversity of native plants in the White Cypress Pine – Poplar Box Woodland community, with some new native species recorded for the first time on site (including Star Cudweed (*Euchiton sphaericus*), White Sunray (*Rhodanthe floribunda*) and Frosted Goosefoot (*Chenopodium desertorum*)). However, the covers of shrubs, forbs and chenopods has been slightly reduced this year as a result of competition from native grass species (which have increased in dominance as a result of continued above-average rainfall). These conditions have also resulted in a minor increase in weeds, particularly Fleabane (*Conyza bonariensis*). The diversity of native plants in the Open White Cypress Pine Woodland community has decreased slightly, also due to dominance by native grasses. This is natural succession, and a return to lower rainfall may allow some species to return once grass thins out again. Annual and short-lived perennial groundcover species are likely to naturally fluctuate in abundance, as a response to climatic conditions and competition, and are likely to persist on the site in the form of a soil-stored seedbank during unfavourable conditions.

The native grass cover scores in 2022 are exceeding the benchmark scores for both vegetation communities, as well as the baseline study scores. Similarly, cover scores of native forbs and herbs in White Cypress Pine – Poplar Box Woodland and Open White Cypress Pine Woodland communities are within or above the benchmark scores. The slight increases in overstorey and mid-storey cover scores are attributed to further foliage growth of existing trees and tall shrubs – as opposed to growth of new trees. White Cypress Pines appear to be regenerating well across the offset site (with noticeable growth in the last 12 months). Recruitment of new Eucalypts remains low in these areas and may require more years of favourable weather conditions to allow for higher seed dispersal and germination. It is possible the drought years of 2018 and 2019 have impacted the regeneration of Eucalypts in the locality.

The overall condition of native vegetation on the offset site has been maintained since last year, with some improvements to diversity and cover. This is likely to be caused primarily by increased rainfall events as well as lower levels of grazing by herbivores.

3.3 Weeds, disturbance and pests

Despite a minor (3%) increase of weed cover recorded in plots, weed infestation across the offset site remains low. The main weed species identified within monitoring plots was Fleabane (*Conyza bonariensis*), which has increased this year due to continued above-average rainfall. This rainfall has also allowed for further growth of native grasses which may be acting to suppress other weeds. This grass growth, along with the (2021) spraying of Saffron Thistle (*Carthamus lanatus*) has greatly reduced the abundance of this species. None of the weeds identified within the site are declared as state or regional priority weeds under the *Biosecurity Act 2015* or the Western Regional Strategic Weed Management Plan 2017-2022 (LLS 2017).

As noted in previous monitoring reports, historic clearing (prior to AGL acquiring the offset site) was evident across the offset site, with several stumps and stags remaining.

No new damage or other signs of recent goat and sheep activity was observed in the Year 6 monitoring. No pigs were observed in the offset area during inspection or the survey for this report. Predation, habitat degradation, competition and diseases transmission by feral pigs is listed as a 'key threatening process' under Schedule 4 of the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). A threat abatement plan exists for this process (DEH 2005) and has two broad goals:

- To protect nationally listed threatened species and ecological communities from predation, habitat degradation, competition and disease transmission by feral pigs; and
- To prevent further species and ecological communities from becoming nationally threatened or extinct due to predation, habitat degradation, competition and disease transmission by feral pigs (DEH 2005).

The plan outlines the environmental impacts caused by feral pigs, control techniques and the roles and responsibilities of landowners, communities and authorities in managing the pest. Table 5.1 offset site management measures in the BOMP (NGH 2014) list the exclusion of feral pigs as a management action. If pigs are found on the site in future, they should be managed through trapping in the first instance, as recommended by the Central West Local Land Services (Mr G Grahame 2018, pers. comm., 30 January).

3.4 Fauna Habitats

Habitat within the offset site comprises of fallen logs, standing dead trees (stags), hollow bearing trees and grassy/forb groundcover (see Plates 9 to12). The higher density woodland areas along the southern and western boundaries of the offset site are abundant in fallen timber and the overstorey provides nesting and roosting habitat for a range of woodland birds. Mature Poplar Box and Gum-barked Coolabah trees provide hollows of various sizes as mapped by NGH (2014). Tree hollows provide potential habitat for a wide range of bats, woodland birds, owls and arboreal mammals such as gliders. Increased grass cover this year is beneficial for reptiles, small mammals and foraging birds.

Searches were undertaken for Grey-crowned Babbler nests whilst undertaking monitoring of plots M03 and M04 within the White Cypress Pine – Polar Box Woodland community and whilst traversing the offset site. No nests were observed. No Grey-crowned Babblers were observed within the offset site. As described by NGH (2014) the presence of the aggressive Noisy Miner within the White Cypress Pine – Polar Box Woodland areas and less commonly in the Open White Cypress Pine Woodland community may be a significant factor in the absence of this species.

The greater area across the centre of the offset site contains scattered trees with a grassy/forb groundcover. Scattered fallen timber and small stags also provide habitat in this area. Numerous common species of woodland birds were observed foraging within the grassy groundcover and perching on small trees and stags. Emus were observed within the site in 2021.

Overall, the habitats within the offset site appeared to be consistent with those described by NGH (2014). The installation of fencing approximately five years prior to the Year 6 ecological monitoring survey is likely to be effective in excluding animal pests and other herbivores from the offset site, which will assist in the natural regeneration of the site and hence improve the vegetative habitats.

Plate 9. Hollow logs provide suitable habitat for reptiles and ground mammals

Plate 10. Multiple large hollow-bearing trees occur in the southern and western areas of the site

Plate 11. Woodland areas contain habitat features such as wood debris and hollow logs

Plate 12. Open grass habitat with regrowth Cypress pine.

3.5 Grazing Pressure

The offset site has been fenced for approximately five years by the time of this monitoring survey. Kangaroos were not observed within the site this year, and there was also no evidence of pest species activity. Grazing pressure is considered to be low.

3.6 Fence maintenance

Stock proof fences, approximately 1200 mm high, were installed around the entire perimeter of the offset site in January 2018. The fences appeared well maintained and in near new condition. Fencing comprises of a ring lock style, (and originally included) a single strand of barbed wire along the top (see Plate 13).

The top barbed-wire strand of the fencing was removed in 2019 as recommended by Jacobs (2019, Year 2 Survey) to minimize the risk of kangaroo entrapment and mortality. No kangaroo carcasses were observed entangled in the boundary fences in the Year 6 survey.

Gaps under the fence identified in the Year 3 survey were repaired / filled in 2020, as per previous recommendations. Any future animal diggings are to be filled in as soon as possible to prevent entry of animal pests and other herbivores.

Plate 13. Ring-lock fencing along the southern boundary of the offset site. This style of fencing surrounds the entire perimeter of the offset site.

3.7 Actions implemented since the Year 5 monitoring survey

Since the Year 5 monitoring survey, AGL has implemented the following actions at the offset site (with engagement of Tikkara Pastoral Co):

- Site inspection was conducted on 2nd October 2022, checking the following:
  - boundary fence condition
  - presence of grazing animals
  - presence of kangaroos.
- Spot spraying of weeds between 30th September and 4th October 2022. Non-native species targeted included Spiny Emex (*Rumex* spinosus), Smooth Mustard (*Sisymbrium erysimoides*), Common Heliotrope (*Heliotropium europaeum*), Saffron Thistle (*Carthamus lanatus*), Onion weed (*Asphodelus fistu*losus), Scotch thistle (*Onopordum acanthium*), and Paterson's curse (*Echium plantagineum*). As with the Revegetation Area the timing of management actions was perfect for control of most of the species targeted. Almost the entire population of Smooth Mustard was confined to the Southern firebreak of the Offset whilst the Saffron thistle was predominately scattered over the site.
- A small section of damaged fence (observed during a contractor site inspection) was repaired in late December 2022.

3.8 Recommended future management actions

The following management actions are recommended for the offset site.

- Monitoring and spot-spraying of re-emerging weeds in early spring 2023. Saffron Thistle (*Carthamus lanatus*) should be monitored as this species can rapidly dominate cleared areas. Monitoring of newly increased Fleabane (*Conyza bonariensis*) should also be undertaken however this weed is resistant to most herbicides and may become less problematic once rainfall averages decrease.
- Ongoing fence monitoring and repair of any damage observed.
- In alignment with the DPE (formally NSW DPIE) AEMR-4 recommendations (dated 19 March 2021), a fauna and weeds check(s) (separate to the annual monitoring survey) will be conducted during the year.

4. Solar Plant revegetation area

4.1 Overview and monitoring methodology

It was a condition of approval (COA B18, October 2011) for the Nyngan Solar Plant that visual screening be provided along the southern boundary of the solar plant site to reduce visual impacts. As per section 6 of the OMP, the provision of visual screening was to be incorporated with habitat restoration of approximately five hectares of land at the solar plant site as an additional compensatory environmental measure. In the long-term, this is expected to provide additional habitat for the Grey-crowned Babbler (Vulnerable under *NSW Biodiversity Conservation Act* 2016) in the immediate area where habitat has been removed and where the species is known to occur and breed.

A Landscape Plan was prepared for the revegetation area by First Solar (2013) and planting of the revegetation area was undertaken in accordance with this plan. Measures, additional to the Landscape Plan, that have the objective of enhancing habitat for the Grey-crowned Babbler were outlined in the BOMP (NGH 2014) and include:

- Where possible, tubestock and seed used for revegetation would be of local provenance.
- Stock would be excluded from the revegetation area for the life of the solar plant.
- Groundcover revegetation would be conducted focusing on establishing a grassy understorey suitable for foraging by the Grey-crowned Babbler. It is proposed to utilise grass species that are known to occur on the site and are considered suitable for revegetation as outlined in Table 6-2 of the BOMP (NGH 2014).
- Larger logs that are cleared from other activities within the development site would be placed within the revegetation area to provide additional habitat features.
- Ongoing weed control within the revegetation area would be carried out as described for the development site in the project Operational Environmental Management Plan.

The revegetation area at the solar plant (see Figure 4.1) is divided into two areas, the eastern and western revegetation areas (see Plates 15 and 16), by a patch of remnant vegetation retained within the site. Revegetation occurred in July 2017, and each area has been fenced in its entirety. One monitoring transect (50m x 20m) was established within the larger, eastern revegetation area to identify any natural regeneration diversity and cover in the area. A species list specific to the 20m x 20m monitoring plot within the larger transect area is provided in Appendix A. An overall assessment was also undertaken for the revegetation area to estimate the survival rate of planted tubestock.

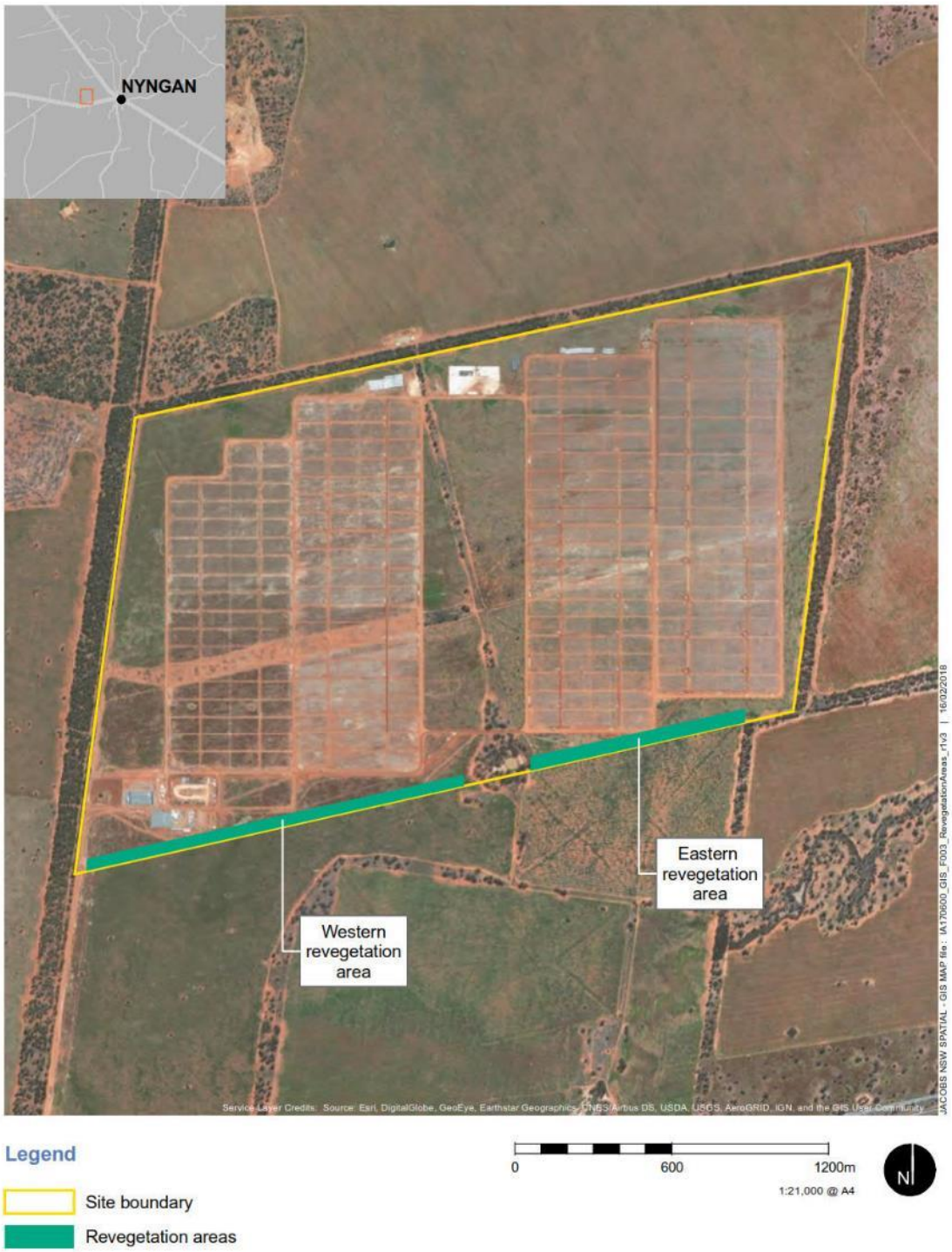

Figure 4.1 | Revegetation areas within the Nyngan solar plant site

Plate 15 Looking west along the western revegetation area Year 5 (2021)

Plate 16 Looking west along the western revegetation area Year 6 (2022)

4.2 Revegetation area condition assessment

Monitoring of the revegetation area within the solar plant site was undertaken on 15 December 2022. The results of the assessment are provided in the following sections along with recommended management actions. Management actions are also outlined in Table 5.1, Section 5.

4.2.1 Vegetation monitoring

Continuation of favourable weather conditions has meant that the decline in cover of native vegetation recorded during the drought (2018-2019) continues to be reversed. The loss of planted trees from the revegetation area due to drought means that the vegetation cover is still low, however the plants that have survived appear to be in good health and have grown considerably in the last year. Cover of native grasses and forbs has increased again this year (see Plate 16). Cover of native shrubs remains the same as last year. Species richness across the monitoring plot increased from 10 species to 16 species in 2020, and 16 to 27 species in 2021 – showing that natural regeneration is occurring with favourable climatic conditions. A slight decrease in species richness has been recorded in the monitoring plot this year due to the dominance and competition of native grasses (back to 24 species recorded). A significant increase in cover of native grass is attributed to recent abundance of Box Grass (*Paspalidium constrictum*), Curly Windmill Grass (*Enteropogon acicularis*) and Speargrass (*Austrostipa scabra* subsp. *Scabra*). Whilst shrubs and groundcover-other (forbs) vegetation cover is still low and near the minimum benchmarks for the desired vegetation community, there has been further growth of existing plants since 2021 (see Figure 4.2).

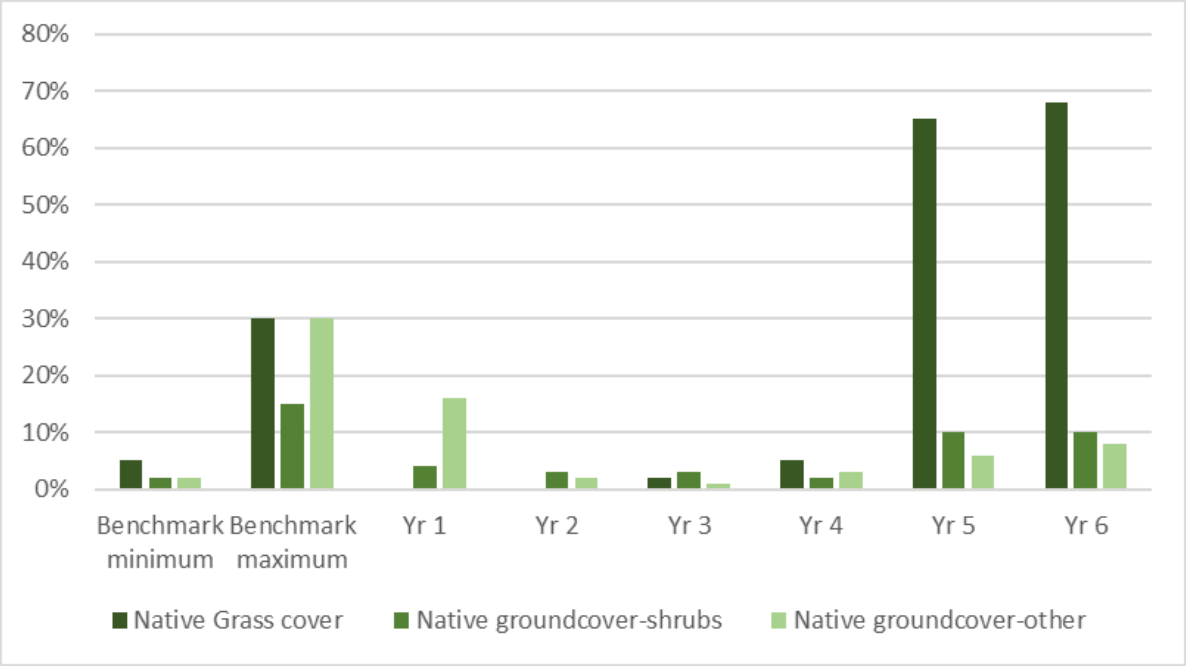

Figure 4.2 Changes in vegetation cover (%) of groundcover types - Revegetation Area

4.2.2 Tubestock survival rate

Tubestock was planted within the revegetation area in July 2017. Following 2018-2019 drought conditions, the estimated survival of tubestock was 10%. There appears to be no further losses of tubestock this year compared to last year's survey. Approximately 50 *Acacia spp.* shrubs, 62 *Eucalyptus spp*. small trees and 20 *Atriplex spp.* large shrubs still remain (along with small numbers of Sweet Bursaria (*Bursaria spinosa*) and Kurrajong (*Brachychiton populneus*)). Some of these specimens have put on significant growth in the past two years (see Plate 17). Substantial growth since last year was noted in some species such as *Acacia* spp. and this can be attributed to the months of above average rainfall in 2021 and 2022. Smaller chenopod shrubs are also becoming established in the revegetaion area however these were not part of original tubestock plantings.

Plate 17. Planted *Brachychiton, Eucalyptus and Acacia* trees within the revegetation area (Year 6)

4.2.3 Natural regeneration

A significant amount of natural regeneration occurring within the ground layer of the revegetation area was observed in the Year 1 monitoring. With the subsequent dry conditions (2018, 2019) many of the species that were previously apparent were not detected during the Year 2 survey. Year 3 survey found a further decline in species with only ten native species identified within a 20m x 20m plot.

Year 4 (2020) saw a rebound in species richness and cover, with many species appearing that were not present in the previous two years. Further increases in species richness and cover scores have occurred in 2021, however a slight decline in species richness is noted this year (Year 6) which is attributed to competition between native grasses and small chenopod species (native grass growth has increased due to continued higher rainfall). This decrease is part of natural ecosystem succession, and it is probable that a return to drier conditions would reverse the decline in chenopod species (as grass becomes less dominant). A full species list and cover abundance score using the modified Braun Blanquet scale are provided in Appendix A. The increased diversity and number of native plants naturally regenerating within the ground layer of the revegetation area since last year can be attributed to improved rainfall conditions.

4.2.4 Fencing

Fences were installed around the entirety of the revegetation area in March 2017 and remain in good condition.

4.2.5 Weed infestation

Weed infestation within the revegetation area was low to moderate. There were six species present; Saffron Thistle (*Carthamus lanatus*), Fleabane (*Conyza bonariensis*), Common Sowthistle (*Sonchus oleraceus,* Bitter Melon (*Citrullus colocynthis*), Cutleaf Medic (*Medicago laciniata var. laciniata*) and Oat (*Avena* sp). *Carthamus lanatus* remains widespread in surrounding areas of the Solar Farm.

4.2.6 Habitat evaluation

The revegetation area currently provides marginal quality habitat for the Grey-crowned Babbler (listed as Vulnerable under *NSW Biodiversity Conservation Act* 2016). As the ground layer cover improves and planted shrub species and overstorey Eucalypts grow this may improve. It is likely to take 5 -10 years before the overstorey is a suitable height for nesting habitat. The bare ground and emerging groundcover may provide some areas of open foraging habitat for birds. Five Grey-crowned Babbler birds were observed in the middle of the western revegetation area on the 29/09/2022 (during inspection by contractor).

4.3 Actions implemented since the Year 5 monitoring survey

- Since the Year 5 monitoring survey, AGL has implemented the following actions at the revegetation area (with engagement of Tikkara Pastoral Co). A site inspection was conducted during September 2022, which checked the:
  - Boundary fence condition (i.e., no gaps or damage that can allow animals to enter the site)
  - Presence of pest animals
  - Presence of weeds
  - Presence of Grey-crowned Babbler birds.
- Spot spraying of weeds between the 29th September and 1st October 2022. Non-native species targeted included Spiny Emex (*Rumex spinosus*), Smooth Mustard (*Sisymbrium erysimoides*), Common Heliotrope (*Heliotropium europaeum*), Saffron Thistle (*Carthamus lanatus*), Onion weed (*Asphodelus fistulosus*), Scotch thistle (*Onopordum acanthium*), and Paterson's curse (*Echium plantagineum*). The timing of management actions was perfect for control of most of the species targeted especially Saffron thistle, Spiny Emex and Smooth mustard as they had not yet set seed. The Paterson's curse however had flowered and seed set had begun.

4.4 Recommended future management actions

The following management actions are recommended for the revegetation area within the solar plant. These actions are also included in Section 5 of this report.

- Replacement planting is recommended at a low rate (approximately 200 plants per revegetation area) and in clusters along the revegetation areas using the species of plants that were previously planted and have survived (see Table 4-1).
  - Supplementary planting is recommended to be undertaken when weather conditions are cooler (Autumn / Winter), preferably after average or higher monthly rainfall over several successive months. Intensive watering in of tubestock at the time of planting as well as subsequent watering following planting is required.
  - A suitably experienced contractor is required to advise on species and watering frequency.
  - Tree guards are required for all tubestock to protect plants against grazing and create a microclimate around the plant that assists in moisture retention and cooling. Carton guards are recommended over plastic guards because of their ability to more readily breakdown if lost in the surrounding environment and their ease of installation. Intensive watering is required at the time of planting and follow up watering at a rate inversely proportional to rainfall until plants to become established.

- Further to supplementary planting, it is recommended that brush matting be used with the revegetation area to assist the natural regeneration of native vegetation.
- Collection of native seed is to be undertaken by a qualified Bush Regeneration contractor and placed within the site on branches scattered along and around the original planting rip lines.
- Branches should be left with seed in-situ, allowing seeds to disperse naturally and lay dormant within the ground layer until favourable weather conditions activate germination. This process is to be undertaken after suitable withholding periods post targeted weed spraying.
- Targeted spot spraying of weeds is recommended in early spring 2023, to allow for continued improvement in the natural regeneration of the areas and greater growth in the surviving tubestock species.

Table 4-1 Recommended species for replacement planting at the revegetation area

Stratum	Suitable Species	Suggested planting density
Trees and tall shrubs	*Acacia excelsa* *Acacia melvillei* *Callitris glaucophylla* *Eremophila mitchellii* *Geijera parviflora* *Hakea tephrosperma* *Eucalyptus populnea* ssp. *bimbil*	Approximately 3m spacing in rows spaced a minimum of approximately 3m apart. Trees and tall shrubs would be alternated with shrubs and sub-shrubs.
Shrubs and sub-shrubs	*Dodonaea viscosa* subsp. *mucronata* *Eremophila longifolia* *Senna* form taxon *'zygophylla'*	

Note: The above species are a selection of the original planting list detailed in the 2013 Biodiversity Offset Management Plan by NGH Environmental. These species are usually tolerant of dry conditions and are likely to persist in the revegetation area or surrounding environment. Other species which were also planted in the revegetation area in 2017 such as Kurrajong (*Brachychiton populneus*), Deane's Wattle (*Acacia deanei*) and Old-man Saltbush (*Atriplex nummularia*) were found to have survived recent dry conditions and should be included in replanting if available.

In alignment with the DPE AEMR-4 recommendations (dated 19 March 2021), a fauna and weeds check(s) (separate to the annual monitoring survey) will be conducted during the year.

5. Management Actions

The management measures outlined in the BOMP (NGH 2014) are listed in Table 5.1 below. Additionally, Table 5.1 provides an evaluation of the need for each management action, based on observation during the monitoring works, the timing, and who is required to undertake the action. Management actions relate to the Nyngan Offset Site (Figure 2.2) and the Nyngan Solar Plant revegetation area (Figure 4.1). The targets for completion of management actions, and trigger points for when management action may be required are also detailed in Table 5.1.

Table 5.1 Management Actions for the Nyngan offset site and Nyngan Solar Plant revegetation area

(Note: In the first five columns, the original BOMP text is black, while text added since the original BOMP is blue)

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
Exclusion of stock	To prevent overgrazing and encourage regeneration of native vegetation. Target is zero stock within offset site and revegetation site.	Fence damage observation requires action.	Install stock proof fencing around the perimeter of the offset site. Maintain fencing.	At establishment of the offset site.	Fence installed around the offset site in 2018. Revegetation area is fenced off. Fence checked October 2022. Small section of damage fence on northern boundary was repaired in December 2022.	Yes	n/a	Fence check (mid 2023 preferable)

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
		Detection of >1 sheep/cow/ goat requires action.	Inspections of offset site and revegetation areas. Remove stock if required.	Ongoing Removal following observation of stock.	Refer to sections 3.7 and 4.3. Site inspections conducted.	Yes. No stock observed during October and December 2022 check.	No	Check for stock intrusion during 2023.
Weed control	To minimise the occurrence of weeds within the offset site particularly Weeds of National Significance (WoNS) and listed noxious weeds. Target is a decrease in percentage cover and species count of exotic species each monitoring period (however also influenced by rainfall).	Annual monitoring results to inform weed control requirements.	Survey to identify target locations for weed control. Weed control using appropriate methodologies considering target species and landscape context.	Ongoing as required.	Targeted weed spraying was conducted at the offset site and solar plant revegetation area in Sept/Oct 2022.	Yes	Yes	Spot-spraying of re-emerging weeds in early spring 2023. (In growth season, in suitable low wind conditions to prevent spray drift reaching other native species).

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
Exclusion of feral pigs and deer	To exclude feral pigs and deer. To improve natural regeneration of vegetation, prevent soil disturbance which may lead to erosion and to prevent potential harm to and competition with native fauna. Target is zero pigs / zero deer	Detection of one or more pigs / deer requires action.	Install and maintain preventative fencing suitable for the target species. Remove pigs and deer (by trapping or other means) if detected within the offset site.	Ongoing. Removal following observation of pigs or deer.	Refer to sections 3.7 and 4.3.	No pigs observed in the offset site.	Yes	Check for pest animals during 2023. Fence check and repair of any damage observed.
Feral Cat / wild dog / fox control	To minimise the presence of cats, wild dogs and foxes. To eliminate feral pests from within the site and improve opportunities for native fauna to inhabit the site. Target is zero foxes/ wild dogs / cats within offset site and revegetation site.	Detection of one or more cats / wild dogs / foxes requires action.	Monitor for presence of cats, dogs and foxes. Conduct baiting or trapping if cats, dogs or foxes are detected within the offset area. Where possible, coordinate baiting or trapping with adjacent landowners to maximise effects.	Ongoing . Removal following observation of exotic predators.	Refer to sections 3.7 and 4.3.	Yes	Not required at this stage	Check for pest animals during 2023.

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
Rabbit control	To minimise the risk of the Offset Site becoming a refuge for rabbits. To eliminate rabbits within the site and reduce grazing on native flora. Target is minimal rabbits (<10) within offset and revegetation sites.	Detection of >10 rabbits / hares (or a warren) requires action.	Monitor for presence of rabbits or warrens. Conduct baiting or controlled grazing to reduce the ability of the site to act as a refuge to rabbits. Where possible, coordinate baiting with adjacent landowners to maximise effects.	Consideration given to action on the basis of monitoring results.	Refer to sections 3.7 and 4.3.	Yes	Not required at this stage.	Check for pest animals during 2023.
Monitoring	To determine the effectiveness of management measure.	n/a	Conduct monitoring as detailed in Section 5.3 of the BOMP. Adapt management measures where required.	Annually	n/a	Yes	Annual Monitoring	n/a
Adapt measures to resident native fauna	To ensure that resident native fauna are not adversely impacted by management actions.	n/a	If resident native fauna may be impacted by management actions, adapt actions as required to address the risk of impact.	As required	n/a	n/a	n/a	n/a

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
Additional Management Measures								
Control of Noisy Miners	To reduce Noisy Miners within the offset site to decrease competition with other native woodland birds.	n/a	None required at this stage.	Not required at this stage	n/a	n/a	n/a	n/a
Monitoring plot survey Monitoring plot survey	Repeat monitoring plot surveys to evaluate the 'improve or maintain' outcome of biodiversity values at the site.	n/a	Repeat monitoring of all plots within the offset site.	Yes, annual monitoring required late 2023	This report.	Yes	Annual Monitoring	Time the monitoring survey to capture weed control efforts where possible.
Monitoring of revegetation area	Repeat monitoring plot survey to evaluate the condition of revegetation areas with regards to planting survival rates and natural regeneration diversity and cover.	n/a	Repeat monitoring of single plot within the eastern revegetation area.	Yes required late 2023	This report.	Yes	Annual Monitoring	Time the monitoring survey to capture weed control efforts where possible.
Supplementary planting of revegetation area	To enhance the native vegetation, cover in the revegetation areas	none	Supplementary planting of approximately 200 plants per	Yes required, when the weather is warm but not hot and following	During 2020-2021, AGL contacted numerous contractors to seek	No	Yes, if practicable	Planting to be conducted in 2023 when weather

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
Supplementary planting of revegetation area (cont.)	and replace plants lost.		revegetation area, using a mixture of *Eucalypt spp., Acacia spp.* and other hardy shrub species that were previously planted and have survived. Intensive watering in of tubestock at the time of planting as well as subsequent watering following planting is paramount. A qualified Bush Regeneration contractor is required to advise on watering frequency and as such a degree of flexibility should be allowed for in any quotation for these services.	several months of average or higher rainfall. Subject to suitable weather conditions in the locality.	their interest and capability for the planting and watering work. However, the remote location of the Nyngan Solar Farm and lack of suitable contractors means there are significant challenges in getting this measure implemented, particularly the ongoing watering required to keep the plants alive.			conditions are suitable.
Brush-matting of revegetation area	To enhance the natural regeneration of the revegetation area.	none	Collection of native seed from local provenance placed within the revegetation area	Yes, required in early spring 2023 after suitable withholding periods. Must be	None	No	Yes, if practicable	Plan to undertake this action in 2023 if better conditions arise, subject to

Management measure	Objective and performance criteria	Trigger point	Action	Timing	Actions undertaken by AGL	Target met this year?	Actions required in 2023	Adaptive measures / recommended actions for 2023 / Timing
			on branches scattered along the original planting rip lines. Branches should be left with seed in-situ, allowing seeds to disperse naturally and lay dormant within the ground layer until favourable weather conditions activate germination.	undertaken post targeted weed spraying.				local seed availability.
Fence modification	To prevent kangaroos and other native wildlife from being injured or killed by fences.	none	Monitoring should be undertaken to determine whether kangaroos and other animals continue to become entangled in fencing. Monitoring should also determine whether the modified fence continues to be effective in excluding large non-native herbivores.	Done	The perimeter fence has been modified to prevent entanglement.	Yes	Yes	Check the fencing during 2023.

Notes: If feral pigs are seen in the offset site, the recommended action in the first instance is trapping and use of firearm to kill any caught pigs. The specific process for the trapping procedure, killing of any caught pigs and disposal of carcasses are outlined on the NSW Department of Primary Industries (DPI) web page: https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/feral-pigs/feral-pig-control Central West Local Land Services have an office based at Nyngan and a trap readily available for loan to assist in this process. Liaison with the landowner to undertake this process is required.

6. Conclusions

As per the requirements of the MCoA for the Nyngan Solar Plant, the offset site is required to be monitored annually and the results reported to NSW DPE. Condition C5(b) specifically states that the biodiversity outcome to be achieved must 'improve or maintain' the biodiversity values of the offset site. This report outlines the results of the sixth ecological monitoring survey for the offset site since the baseline study recorded in the BOMP by NGH (2014).

In addition, this report provides a condition assessment for the revegetation area at the Nyngan Solar Plant, which was required by the condition of approval (CoA B18, October 2011). The revegetation area was to provide both visual screening along the southern boundary of the solar plant, as well as future compensatory habitat for the Grey-crowned Babbler in the immediate area where habitat has been removed and where the species is known to occur and breed.

6.1 Conditions at the offset site

The Year 6 monitoring results show maintained or improved conditions across the offset site with regards to native vegetation coverage and quality. Native vegetation was significantly impacted by drought in 2018 and 2019 and above average rainfall conditions since 2020 has stimulated the growth of many plant species, which were not seen in Year 2 and 3 monitoring surveys. As a result there has been further ecological succession in both vegetation communities in the offset site this year.

The condition of the Open White Cypress Pine Woodland community has remained stable during the last year, with improvements to native grass cover. Similarly, cover of native herbs and forbs was above the benchmark for this community and has increased since last year (particularly herbs such as Sticky Everlasting (*Xerochrysum viscosum*) and Native White Sunray *Rhodanthe floribunda*). However, as a result, smaller shrubs (particularly chenopods) occurring in the ground-layer have been replaced by rapid growth of native grasses (particularly where grasses such as Box Grass (*Paspalidium constrictum*) and Curly Windmill Grass (*Austrostipa scabra*) form thick layers). The loss of some small chenopod species means that the overall species richness for the monitoring plots has decreased slightly this year. The dominance of native grasses is a natural response to rainfall patterns, and future decreases in rainfall averages may reverse this trend. Once this occurs it is likely that chenopod species may reappear in the monitoring plots, which would increase the species richness counts again. White Cypress Pines appear to be regenerating well across the offset site (with many new trees now exceeding one metre in height).

Overall, the White Cypress Pine – Poplar Box Woodland community is in moderate condition and has improved on last year's values. It now exceeds a number of the benchmarks, especially native groundcover - other, and it has experienced an increase in native species diversity. Grass cover was substantially higher than previous years and well above the benchmark range and baseline levels. This is largely due to the recent abundance of native grasses Box Grass (*Paspalidium constrictum*) and Hairy Panic (*Panicum effusum*), likely responding to consecutive years of higher rainfall. Groundcover shrub cover has slightly decreased as a result of competition with native grasses however still remains within the benchmark range for the community. Health of existing Eucalypt and Cypress Pine trees is good, with most showing new foliage growth this year (represented by slight increases in overstorey cover values). Recruitment of Eucalypt species remains low in these areas and may require more years of favourable weather conditions to allow for higher seed dispersal and germination.

Stock proof fencing around the offset site has been present since early 2018 and it is likely that with the fencing in place the biodiversity values of the offset site will improve through the exclusion of some feral pests and other herbivores, allowing further opportunities for natural regeneration to occur once suitable rainfall conditions persist. The fence is in good condition around the perimeter of the offset site although one small section was damaged beneath the wire* (*The fence was repaired by a contractor in late December 2022). Ongoing inspections and management actions need to be taken to prevent herbivores from accessing the site in the future. Kangaroos were present this year. During recent years, Kangaroo numbers appear to be low, and overgrazing is currently not a concern (particularly given the abundance of native grasses this year).

Fauna habitats across the offset site are in moderate to good condition and have been maintained, with an increase in grass and groundcover habitat due to recent wetter conditions. No Grey-crowned Babblers (Vulnerable under *NSW Biodiversity Conservation Act* 2016) were observed within the offset site.

Overall weed infestation across the offset site was low and targeted herbicide treatment in 2021 and 2022 appears to have been effective (particularly against Saffron thistle). Despite this, weed growth across the site has increased slightly since last year as a result of continued above average rainfall. This is likely attributable to an increase in Fleabane (*Conyza bonariensis*) which is a common weed of cropland and is widespread in NSW. None of the weeds identified within the site are declared as state or regional priority weeds under the Biosecurity Act 2015 or the Western Regional Strategic Weed Management Plan 2017-2022 (LLS 2017).

6.2 Conditions at the solar plant revegetation area

Overall, the solar plant revegetation area has maintained a similar plant survival rate since last year and condition of surviving plants has improved due to continued above average rainfall. Most original plantings appear to have put on significant foliage growth in the past 12 months. There has also been significant growth of native grasses and groundcovers due to recent favourable weather conditions. At the time of writing, favourable weather conditions are continuing and the proposed planting of more tubestock (to account for losses during 2018/2019) should be conducted when weather conditions are suitable.

Five Grey-crowned Babbler (Vulnerable under *NSW Biodiversity Conservation Act* 2016) birds were reportedly observed in the middle of the western revegetation area on the 29/09/2022 (during inspection by contractor). However, none were observed during the survey for this monitoring report (December 2022). The revegetation area currently provides marginal quality habitat for this target species. As the planted shrub species and overstorey Eucalypts grow, habitat values may improve, however it is likely to take 5 to 10 years before the planted trees reach suitable height and density. Gaps between tree patches will also require replanting to maintain linear corridors.

7. References

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Appendix A. Flora species list and opportunistic fauna list

Table A.1 Flora species list and 20m x 20m plot survey Modified Braun Blanquet scores

Family	Genus	Species	N or E	M01	M02	M03	M04	Reveg area
Asteraceae	*Carthamus*	*lanatus**	E		1			2
Asteraceae	*Conyza*	*bonariensis**	E	1		4	4	2
Asteraceae	*Lactuca*	*serriola f. serriola**	E			1	1	1
Asteraceae	*Sonchus*	*oleraceus**	E	1	1		1	1
Cucurbitaceae	*Citrullus*	*colocynthis**	E					1
Fabaceae - Faboideae	*Medicago*	*laciniata var. laciniata**	E					
Poaceae	*Avena*	*sp.**	E		1			1
Polygonaceae	*Emex*	*australis**	E					
Verbenaceae	*Glandularia*	*aristigera*	E					
Acanthaceae	*Brunoniella*	*australis*	N			2	1	
Acanthaceae	*Rostellularia*	*adscendens var. adscendens*	N			2	1	
Amaranthaceae	*Alternanthera*	*sp. A Flora of New South (M.Gray 5187)*	N					
Amaranthaceae	*Ptilotus*	*obovatus*	N	1		2	2	
Amaranthaceae	*Ptilotus*	*polystachyus*	N			2	2	
Apocynaceae	*Marsdenia*	*australis*	N				1	
Apocynaceae	*Parsonsia*	*eucalyptophylla*	N					
Apocynaceae	*Rhyncharrhena*	*linearis*	N					
Asteraceae	*Calotis*	*cuneifolia*	N					
Asteraceae	*Calotis*	*lappulacea*	N	3	3	1	3	3
Asteraceae	*Chrysocephalum*	*apiculatum*	N	3	1			
Asteraceae	*Euchiton*	*sphaericus*	N	1			1	1
Asteraceae	*Glossocardia*	*bidens*	N					
Asteraceae	*Rhodanthe*	*floribunda*	N	4	3	1		
Asteraceae	*Stuartina*	*muelleri*	N					
Asteraceae	*Vittadinia*	*dissecta var. hirta*	N	1				
Asteraceae	*Vittadinia*	*cuneata var. cuneata*	N	2	1	2		
Asteraceae	*Vittadinia*	*sulcata*	N		1	3	1	2
Asteraceae	*Vittadinia*	*gracilis*	N	2				
Asteraceae	*Xerochrysum*	*viscosum*	N	2	2	3	1	2

Family	Genus	Species	N or E	M01	M02	M03	M04	Reveg area
Boraginaceae	*Echium*	*lycopsis***	E					
Boraginaceae	*Heliotropium*	*europaeum**	E					
Campanulaceae	*Wahlenbergia*	*sp.*	N		1			
Campanulaceae	*Wahlenbergia*	*gracilis*	N	1	1	1	1	3
Chenopodiaceae	*Atriplex*	*sp.*	N			2		
Chenopodiaceae	*Chenopodium*	*desertorum*	N				1	2
Chenopodiaceae	*Dysphania*	*pumilio*	N					
Chenopodiaceae	*Einadia*	*nutans subsp. nutans*	N				3	
Chenopodiaceae	*Einadia*	*nutans subsp. linifolia*	N			3	4	2
Chenopodiaceae	*Enchylaena*	*tomentosa*	N			2	2	
Chenopodiaceae	*Maireana*	*villosa*	N					
Chenopodiaceae	*Maireana*	*microphylla*	N					
Chenopodiaceae	*Maireana*	*enchylaenoides*	N					
Chenopodiaceae	*Rhagodia*	*spinescens*	N				2	
Chenopodiaceae	*Salsola*	*australis*	N					
Chenopodiaceae	*Sclerolaena*	*birchii*	N			2	2	
Chenopodiaceae	*Sclerolaena*	*bicornis var. bicornis*	N			2	4	
Chenopodiaceae	*Sclerolaena*	*sp.*	N			2		
Convolvulaceae	*Convolvulus*	*recurvatus subsp. recurvatus*	N			1		1
Cupressaceae	*Callitris*	*glaucophylla*	N	2	3	4	3	
Euphorbiaceae	*Euphorbia*	*drummondii*	N					1
Fabaceae - Mimosoideae	*Acacia*	*deanei subsp. deanei*	N					2
Geraniaceae	*Erodium*	*crinitum*	N					
Goodeniaceae	*Goodenia*	*cycloptera*	N	2	1	1		
Lamiaceae	*Teucrium*	*racemosum*	N					
Lomandraceae	*Lomandra*	*effusa*	N					
Malvaceae	*Abutilon*	*oxycarpum*	N					1
Malvaceae	*Abutilon*	*halophilum*	N			2		1
Malvaceae	*Brachychiton*	*populneus subsp. trilobus*	N					
Malvaceae	*Sida*	*cunninghamii*	N	2	2	2	2	2
Malvaceae	*Sida*	*corrugata*	N		1	1	1	
Myrtaceae	*Eucalyptus*	*populnea subsp. bimbil*	N	2		2	3	

Family	Genus	Species	N or E	M01	M02	M03	M04	Reveg area
Nyctaginaceae	*Boerhavia*	*dominii*	N					
Oxalidaceae	*Oxalis*	*perennans*	N			1		1
Poaceae	*Aristida*	*jerichoensis var. subspinulifera*	N	4	3			
Poaceae	*Austrostipa*	*scabra subsp. scabra*	N	3	2	3	3	2
Poaceae	*Dichanthium*	*sericeum*	N					1
Poaceae	*Digitaria*	*brownii*	N					
Poaceae	*Digitaria*	*divaricatissima*	N					1
Poaceae	*Enneapogon*	*avenaceus*	N					2
Poaceae	*Enteropogon*	*acicularis*	N				1	4
Poaceae	*Panicum*	*decompositum*	N		3		2	
Poaceae	*Panicum*	*effusum*	N	3	4	3	1	2
Poaceae	*Paspalidium*	*constrictum*	N		2	4	4	4
Poaceae	*Sporobolus*	*contiguus*	N					
Poaceae	*Thyridolepis*	*mitchelliana*	N	2		1		
Poaceae	*Tragus*	*australianus*	N	2		1		
Polygonaceae	*Rumex*	*hypogaeus**	E				1	
Portulacaceae	*Portulaca*	*oleracea*	N					2
Proteaceae	*Hakea*	*tephrosperma*	N	2				
Pteridaceae	*Cheilanthes*	*sieberi subsp. sieberi*	N	1	1			
Rutaceae	*Geijera*	*parviflora*	N			1		
Sapindaceae	*Dodonaea*	*viscosa subsp. mucronata*	N			1	1	
Scrophulariaceae	*Eremophila*	*longifolia*	N	2	1		2	
Scrophulariaceae	*Eremophila*	*mitchellii*	N					
Solanaceae	*Solanum*	*ellipticum*	N					
Solanaceae	*Solanum*	*eremophilum*	N		1			2
Solanaceae	*Solanum*	*esuriale*	N	1	1	1		1
Zygophyllaceae	*Tribulus*	*micrococcus*	N					
Zygophyllaceae	*Tribulus*	*minutus*	N					

Key: N = Native, E = Exotic

* general weed, **state and regional weeds to be targeted (Biosecurity Act 2015)

Table A.2 Opportunistic fauna species list

Class	Species	Common Name	Sighting
Birds	*Eolophus roseicapilla*	Galah	Observed in the site
	Cacatua sanguinea	Little Corella	Observed in the site
	Psephotus haemotonotus	Red-rumped Parrot	Observed in the site
	Ptilotula penicillatus	White-plumed Honeyeater	Observed in the site
	Struthidea cinerea	Apostlebird	Observed in the site
	Cracticus tibicen	Australian Magpie	Observed in the site
	Dromaius novaehollandiae	Emu	Observed in the site

Appendix B. Condition of Approval (COA) C5

Biodiversity Offset Management Plan

C5. Following final design and prior to the commencement of construction, or as otherwise agreed to by the Director-General, the Proponent shall develop and submit a Biodiversity Offset Management Package for the approval of the Director-General. The package shall detail how the ecological values lost as a result of the Project will be offset. The Biodiversity Offset Management Package shall be developed in consultation with the OEH and shall (unless otherwise agreed by the Director-General) include, but not necessarily be limited to:

(a) an assessment of all native vegetation communities, threatened species habitat and Willyama Common land that will either be directly or indirectly impacted by the proposal;

(b) the objectives and biodiversity outcomes to be achieved (including 'improve or maintain' biodiversity values), and the adequacy of the proposed offset considered;

(c) the final suite of the biodiversity offset measures selected and secured including but not necessarily limited to;

  i) an offset proposal which is supported by a suitable metric method (such as the Biobanking Assessment Methodology);

  ii) details of the relative condition and values of communities on the offset site in comparison to those to be impacted, including all areas of native shrubland in moderate to good condition;

  iii) proposed management actions and expected gains;

(d) the monitoring requirements for compensatory habitat works and other biodiversity offset measures proposed to ensure the outcomes of the package are achieved, including:

  i) the monitoring of the condition of species and ecological communities at offset locations;

  ii) the methodology for the monitoring program(s), including the number and location of offset monitoring sites, and the sampling frequency at these sites;

  iii) provisions for the annual reporting of the monitoring results for a set period of time as determined in consultation with the OEH; and

(e) timing and responsibilities for the implementation of the provisions of the Package.

Land offsets shall be consistent with the *Principles for the use of Biodiversity Offsets in NSW* (NSW Office of Environment and Heritage, June 2011). Any land offset shall be enduring and be secured by a conservation mechanism which protects and manages the land in perpetuity. Where land offsets cannot solely achieve compensation for the loss of habitat, additional measures shall be provided to collectively deliver an improved or maintained biodiversity outcome for the region.

Where monitoring referred to in condition (d) indicates that biodiversity outcomes are not being achieved, remedial actions shall be undertaken to ensure that the objectives of the Biodiversity Offset Package are achieved.

Within one from approval from the Director-General the Proponent shall, in conjunction with the lessee of Western Lands Lease 14240, apply to the Crown Lands Division of the Department of Trade and Investment for a Change of Lease Purpose of Western Land Lease 14240 to appropriately record the biodiversity offset on title and within the lease conditions as a conservation area.