

8 February 2024

Our ref: 22WOL 1354

Department of Climate Change, Energy, the Environment and Water  
Commonwealth Environmental Water Office  
GPO Box 3090  
Canberra ACT 2601

Attention: Kimberley Glover

Dear Kimberley,

**EPBC 2012 / 6560 Lynwood Quarry Project, Marulan Response to Request for Information**

Eco Logical Australia Pty Ltd (ELA) was engaged by Holcim Australia to respond to the request for information issued by the then Commonwealth Department of Agriculture, Water and Environment (DAWE) regarding EPBC Act Approval 2012 / 6560 for the Lynwood Quarry Project in Marulan. ELA understands that the request for information was issued in response to concerns that the ongoing management of the retained White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland was not being completed.

The Department requested the following:

- completion of baseline surveys to determine the current condition of vegetation within the onsite offset
- completion of baseline surveys to determine the extent of the *Leucochrysum albicans* subsp. *tricolor* (Hoary Sunray) population within the onsite offset area
- assessment of baseline survey results against the calculations of the original offset site quality
- resubmission of the Offset Assessment Guide calculators with supporting evidence.

This letter describes the consultation conducted with the Department to date, the methods and results of baseline surveys and recommendations for the ongoing management of the onsite offsets. If you have any questions regarding the information presented in this letter, please contact me on [alexg@ecoaus.com.au](mailto:alexg@ecoaus.com.au) or 9259 3773.

Regards,



Alex Gorey  
Senior Ecologist and BAM Accredited Assessor

## Appendix A: Response detail and tables

### PROPOSED ASSESSMENT APPROACH AND CONSULTATION

To determine the current condition and changes from the initial Lynwood Quarry Rehabilitation and Landscape Management Plan (RLMP) (Umwelt 2018), the following surveys were completed:

- Rapid vegetation assessments
- Full Vegetation Integrity Plots consistent with the BAM
- Targeted surveys for Hoary sunrays

The results of these surveys were then used to assess the current condition of vegetation against the EPBC Act listing of each Vegetation community on site.

### BASELINE SURVEYS METHODS AND RESULTS

Vegetation surveys were completed across the onsite offset areas by two ELA ecologists; Alex Gorey and Melaina Chapman from 17 – 21 October 2022 and focused on the following:

- site walkover to broadly identify condition of the onsite offset areas and any significant management issues (erosion, clearing or weed invasion).
- full floristic 20 m x 50 m vegetation integrity plots consistent with the Biodiversity Assessment Method and using a modified Braun Blanquet Score
- parallel transects for Hoary Sunray.

#### *Full floristic plots*

A total of 11 full floristic plots were completed across the onsite offset areas (Figure 1). The number of plots completed per vegetation community was consistent with the requirements of the BAM as described in Table 2. Composition, structure and function data was collected consistent with the BAM. Additional cover data was collected consistent with the modified Braun Blanquet scores as described in Table 1. The modified Braun Blanquet scores were used because the original data collected used the Braun Blanquet method (noting this was mentioned in the Preliminary Documentation, however the original data was not located).

**Table 1: Biodiversity Assessment Method plot requirements and Braun Blanquet cover score requirements.**

Attribute	BAM Survey Requirement	Assessment area	Braun Blanquet requirement
Growth form	Growth form group for each species (Tree, shrub, grass and grass-like, forb, fern, other)	20 x 20 m plot	N/A
Species name	Scientific name, whether it is native or exotic	20 x 20 m plot	N/A
Cover	Estimate the foliage cover of each native and exotic species within the boundaries of the plot including all attached plant material, alive or dead, rooted in or overhanging the plot. Cover should be recorded: <ul style="list-style-type: none"> <li>• in decimals if less than 1% (e.g. 0.1, 0.2)</li> <li>• in whole numbers up to 5% (e.g. 1, 2, 3)</li> <li>• to the nearest 5% if &gt;5% cover (e.g. 5, 10, 15, 20, 25)</li> </ul>	20 x 20 m plot	0.1 = 1 – 10 individuals 0.5 = sparsely or very sparsely present; cover very small (<5%) 2 = Any no. of individuals covering 5-25% of the area 3 = Any no. of individuals covering 25 - 50% of the area

Attribute	BAM Survey Requirement	Assessment area	Braun Blanquet requirement
			4 = Any no. of individuals covering 50-75% of the area 5 = Any no. of individuals covering 75% of the area
Abundance rating	Count (when ≤10) or estimate (when >10) the number of individuals of each native and exotic species rooted within the plot. Record abundance as: <ul style="list-style-type: none"> <li>counts of 1, 2, 3...</li> <li>estimates of 10, 20, 30...</li> <li>100, 200, 300...</li> <li>1000, 2000, 3000...</li> </ul>	20 x 20 m plot	N/A
Function	Number of large trees Tree regeneration Tree stem size class Total length of fallen logs Litter cover High threat weed cover	20 x 50 m plot	N/A

The BAM full floristic plot data was entered into the BAM Calculator using case 00037483 version 61 as a Stewardship Agreement Site to obtain vegetation integrity scores for each zone in the onsite conservation area. The full floristic plot data is measured against the benchmark plot data for each PCT, which then generates the vegetation integrity score.

**Table 2: Full floristic PCTs completed across the onsite offset area**

Vegetation community	Associated PCT	Condition	No. of plots surveyed
Box Gum Woodland	PCT 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	CEEC	4
Box Gum Woodland	PCT 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Derived Native Grassland	3
Box Gum Woodland	PCT 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Regeneration	3
Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest	PCT 1093 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Rehabilitation	1

### Hoary Sunray

Parallel transects for Hoary Sunray were completed across the onsite offset areas (Figure 6). Transects were completed 10 m apart by Alex Gorey and Melaina Chapman and focused on areas where the species was previously identified. In areas where the species had not been previously identified, areas were surveyed opportunistically during the collection of the plot data.

When individuals were identified, a central location was marked using Field Maps on a smartphone and a stem count taken within a 5 m radius of the central location. Occasionally, notes describing the type of habitat and weed cover was also collected.

## Results

### *Full floristic vegetation integrity plots*

The vegetation integrity scores (VI scores) predicted by the BAM Calculator for the current condition of the onsite offset area are presented in Table 3 and the benchmark data for PCT 1330 and 1093 are shown in Table 5, Table 6 and Table 6. The Braun Blauquet scores were not used to assess overall community condition as the original plot data could not be located.

**Table 3: Vegetation Integrity Scores across the onsite conservation area**

PCT	Zone	Composition	Structure	Function	VI Score
1330	Regeneration	25.7	47.3	43.8	<b>37.6</b>
1330	CEEC	84.4	98.4	82	<b>88</b>
1330	DNG	65.6	40.4	34.5	<b>45</b>
1093	Regeneration	72.8	74.1	80.4	<b>75.7</b>

**Table 4: Benchmark composition data for PCT 1330 and PCT 1093**

PCT	Tree	Shrub	Grass	Forbs	Ferns	Other	Overall Score
1330	4	6	8	12	1	1	100
1093	5	9	7	11	1	2	100

**Table 5: Benchmark structure data for PCT 1330 and PCT 1093**

PCT	Tree	Shrub	Grass	Forbs	Ferns	Other	Overall Score
1330	42	2	28	8	0	0	100
1093	82	7	30	8	0	0	100

**Table 6: Benchmark function data for PCT 1330 and PCT 1093**

PCT	Large Trees	Hollows	Litter Cover	Fallen logs	Overall Score
1330	3	n/a	45	50	100
1093	3	n/a	74	85	100

The plot data was also assessed against the condition classes and thresholds for the EPBC Act listed community; *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Consistent with the Conservation Advice for the community, to meet the EPBC Act definition a patch must meet both the key diagnostic characteristics and the minimum condition thresholds (DCCEEW 2023). PCT 1330 CEEC and Regeneration both met the key diagnostic characteristics for listing under the EPBC Act as presented in Table 7. PCT 1330 DNG did not meet the EPBC Act definition because the groundcover on average was comprised of <50 % native species (Table 7).

**Table 7: Assessment of plot data against the Key diagnostic characteristics**

Key diagnostic characteristic (DCCEEW 2023)	Onsite conservation area
<p>The ecological community occurs in the following bioregions (IBRA, DoE 2012):</p> <p>Brigalow Belt South, Murray Darling Depression, Nandewar, New England Tableland, NSW North Coast, NSW South Western Slopes, Riverina, South Eastern Queensland, South East Corner, South East Coastal Plain, South Eastern Highlands, Southern Volcanic Plain, Sydney Basin and Victorian Midlands</p>	<p>Yes – the onsite conservation area is in the South Eastern Highlands</p>
<p>It has, or previously had, an overstorey dominated or co-dominated, on page 5 by:</p> <ul style="list-style-type: none"> <li>• <i>Eucalyptus albens</i> (white box) and/or <i>E. melliodora</i> (yellow box) and/or <i>E. blakelyi</i> (Blakely's red gum) (applicable across the entire range of the ecological community); or,</li> <li>• in the Nandewar bioregion (IBRA, DoE 2012), any of the above three species and/or <i>E. microcarpa</i> (western grey box) and/or <i>E. moluccana</i> (grey box, coastal grey box);</li> </ul>	<p>Yes – where present, the canopy was dominated by <i>E. blakelyi</i>, and <i>E. melliodora</i>. Where the community was presented in a derived form (DNG) there was evidence of canopy recruitment.</p>
<p>It has a predominantly native ground layer (&gt;50% native groundcover)</p>	<p>No – the native ground layer across the vegetation zones varied:</p> <ul style="list-style-type: none"> <li>• PCT 1330 CEEC: Total native groundcover = 56.1%</li> <li>• PCT 1330 DNG: Total native groundcover = 26.3%</li> <li>• PCT 1330 Regeneration: Total native groundcover = 50.1%</li> </ul> <p>PCT 1330 CEEC and Regeneration both contained &gt;50% native species on average and met the requirements for a predominantly native groundlayer.</p>
<p>Tussock grasses are conspicuous in the ground layer (except in some situations, such as under dense groves of shrubs or regenerating trees), usually with several native species from some the following genera: <i>Austrostipa</i>, <i>Bothriochloa</i>, <i>Chloris</i>, <i>Cymbopogon</i>, <i>Dichanthium</i>, <i>Microlaena</i>, <i>Poa</i>, <i>Themeda</i>, <i>Rytidosperma</i> or <i>Sorghum</i>.</p>	<p>Yes – the groundcover contained the following tussock species across all zones: <i>Austrostipa densiflora</i>, <i>Austrostipa rudis</i> subsp. <i>rudis</i>, <i>Microlaena stipoides</i> var. <i>stipoides</i>, <i>Poa sieberiana</i> var. <i>sieberiana</i> and <i>Themeda triandra</i></p>
<p>Amongst the grass tussocks and sometimes in swathes, a range of broad-leaved forbs and petaloid monocots (e.g. lilies sens. lat.) may be a major component of the plant diversity.</p>	<p>Yes - the groundcover contained the following across all zones (although in varying densities): <i>Caladenia carnea</i>, <i>Caladenia fuscata</i>, <i>Cymbonotus lawsonianus</i>, <i>Einadia nutans</i>, <i>Gonocarpus tetragynus</i>, <i>Goodenia hederacea</i>, <i>Hardenbergia violacea</i>, <i>Plantago debilis</i> and <i>Stypandra glauca</i></p>
<p>While shrubs may be dominant locally within areas of the ecological community, areas of native vegetation with a more continuous shrub layer, in which the average shrub cover of the whole patch is greater than 30%, is considered to be a shrubby woodland and so is not part of the listed ecological community. In assessing this, the effects of disturbance need to be considered, for example where heavy grazing may result in high densities of shrubs during a recovery phase (see section 2.2).</p>	<p>Yes - Zones 1330 CEEC and Regeneration did not exceed 30% shrub cover. The DNG zone contained approximately 60% native shrub cover, however the high shrub cover percentage is likely a result of the historic disturbance and clearing that has occurred. The high percentage is mostly derived from <i>Cassinia Sifton</i> which is known to colonise disturbed areas.</p>

**Table 8: Critically Endangered Ecological Community Status Comparison**

Description	BGWP (ha)	Umwelt 2022 (ha)	ELA 2023 (ha)	Difference (ha)
1330 White box, Yellow Box, Blakely's Red Gum Grassy woodland	19.61	22.94	45.28	22.34
1330 White box, Yellow Box, Blakely's Red Gum grassy woodland - Derived Native Grassland	8.34		30.78	30.78*
1330 White box, Yellow Box, Blakely's Red Gum grassy woodland - Regeneration	22.8			
Vegetation with no associated Threatened Ecological Community			109.19	109.19
Dams			0.62	0.62
<b>Total Area (ha) meeting EPBC condition</b>		<b>22.94</b>	<b>45.28</b>	<b>22.34</b>

\*Does not meet EPBC CEEC listing criteria

**Table 9: Plant Community Type (PCT) Extent Comparison**

Description	BGWP (ha)	Umwelt 2022 (ha)	ELA 2023 (ha)	Difference (ha) Umwelt – ELA	Difference (ha) BGWP – ELA
PCT 1330 Yellow-box – Blakely's Red Gum Grassy Woodland on the tablelands South Eastern Highlands Bioregion Moderate to Good DNG	8.34	3.49	30.78	27.29	22.44
PCT 1330 Yellow-box – Blakely's Red Gum Grassy Woodland on the tablelands South Eastern Highlands Bioregion Moderate to Good	19.61	23.44	25.06	1.62	5.45
PCT 1330 Yellow-box – Blakely's Red Gum Grassy Woodland on the tablelands South Eastern Highlands Bioregion - Low Condition Grassland	-	43.59	-	-43.59	
PCT 1330 Yellow-box – Blakely's Red Gum Grassy Woodland on the tablelands South Eastern Highlands Bioregion - Regeneration	22.8		20.23	20.23	-2.57
PCT 1093 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion Moderate to good		60.48	64.53	4.05	
PCT 1093 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion - Low Condition Grassland		53.46		-53.46	
PCT 1093 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion - DNG			44.66	44.66	
Dam		0.62	0.62	0	
<b>Totals</b>		<b>185.08</b>	<b>185.87</b>	<b>0.79</b>	<b>26.87</b>

## HOARY SUNRAY

Hoary Sunray was identified in the following vegetation zones:

- PCT 1330 CEEC
- PCT 1330 Regeneration
- PCT 1330 DNG
- PCT 1093.

Across the area surveyed (Figure 6), approximately 14,697 individuals were identified (Figure 7). The species appeared to prefer open areas with minimal canopy cover and minimal competition in the ground cover layer. The Preliminary Documentation provides an estimation of Hoary Sunray individuals across the action area and the surrounding landscape which included the onsite conservation area. However, there is no breakdown of the number of individuals identified across the approved development footprint, onsite conservation area and adjacent lands. Figure 7 shows the distribution of Hoary Sunray individuals identified in the 2022 surveys compared to the estimated extent in 2013. The comparison shows that the distribution of individuals has expanded. The number of individuals counted during survey indicates that a healthy population is present across the onsite conservation area.

## CONCLUSION

Following the completion of baseline surveys, the condition of vegetation across the onsite conservation lands was generally in good condition with evidence of natural recruitment in PCT 1330 DNG and PCT 1330 Regeneration.

The comparison between the Umwelt Box Gum woodland mapping and ELA CEEC condition mapping illustrated an increase of approximately 22.34 ha.

The comparison between the Umwelt Vegetation mapping and ELA vegetation mapping illustrated an increase of 25 ha within moderate to good condition PCT 1330 BGW, however the increase in PCT 1330 DNG could not be determined accurately due to the different classifications of vegetation types.

Combining the ELA recorded DNG and BGW regeneration areas provides an area of approximately 51 ha when compared to the Umwelt DNG moderate to good and Low condition grassland (approximately 47 ha) this illustrates that the total area of BGW has increased by approximately 4 ha.

The population of Hoary Sunray was widespread and contained a high number of individual stems.

The vegetation management works, despite being limited to fencing, stock and disturbance exclusion and initial weeding, has not negatively impacted the site. There were no signs of ongoing disturbance such as grazing, vegetation removal, sedimentation or erosion or rubbish dumping.

Based on the results of this survey the BGWMP and Lynwood Quarry Rehabilitation Landscape Management Plan should be updated to encompass the observed changes in this report and to determine the appropriate management actions for the onsite conservation land going forward.

# Appendix B: Site maps

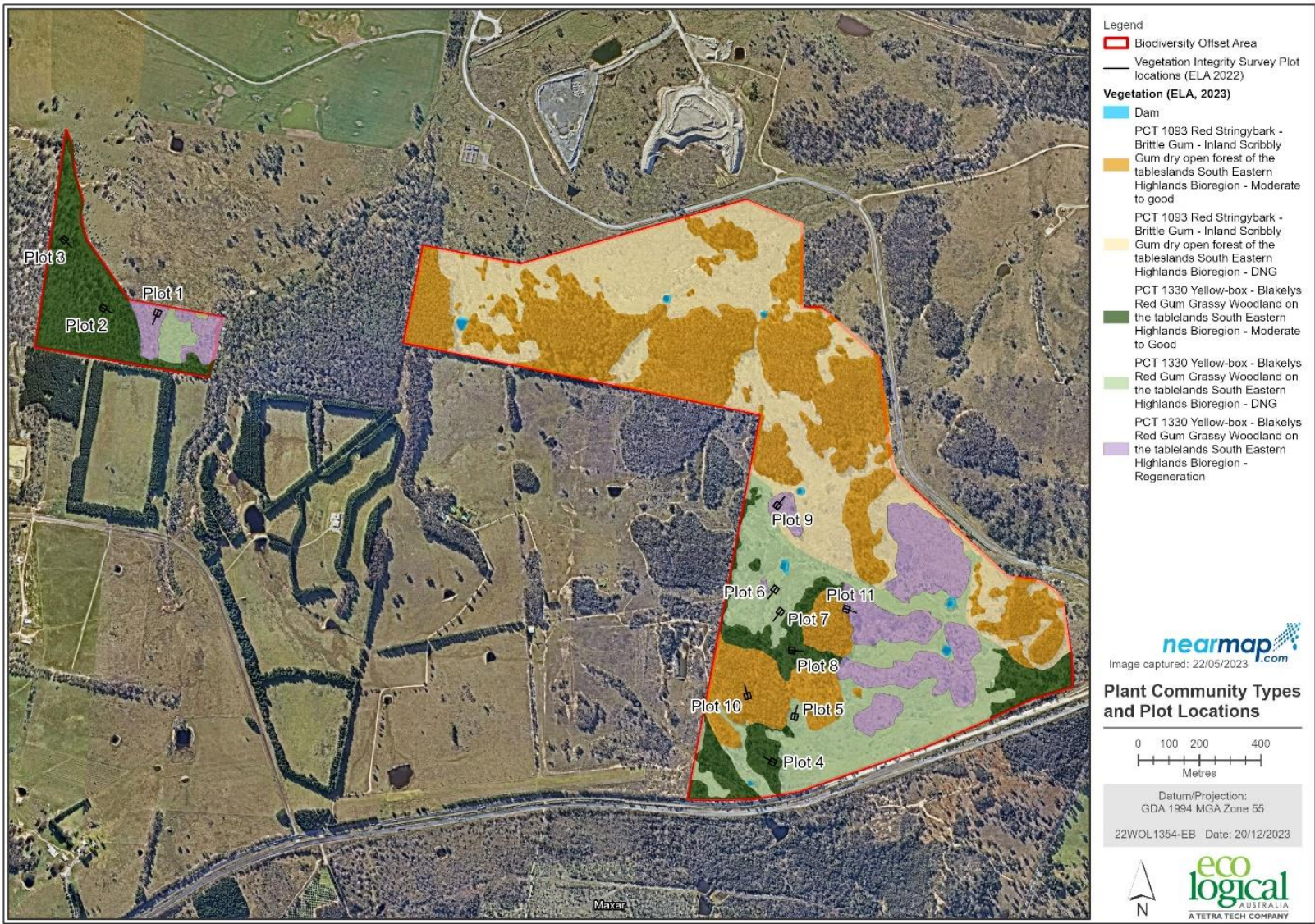


Figure 1: BAM Plot locations

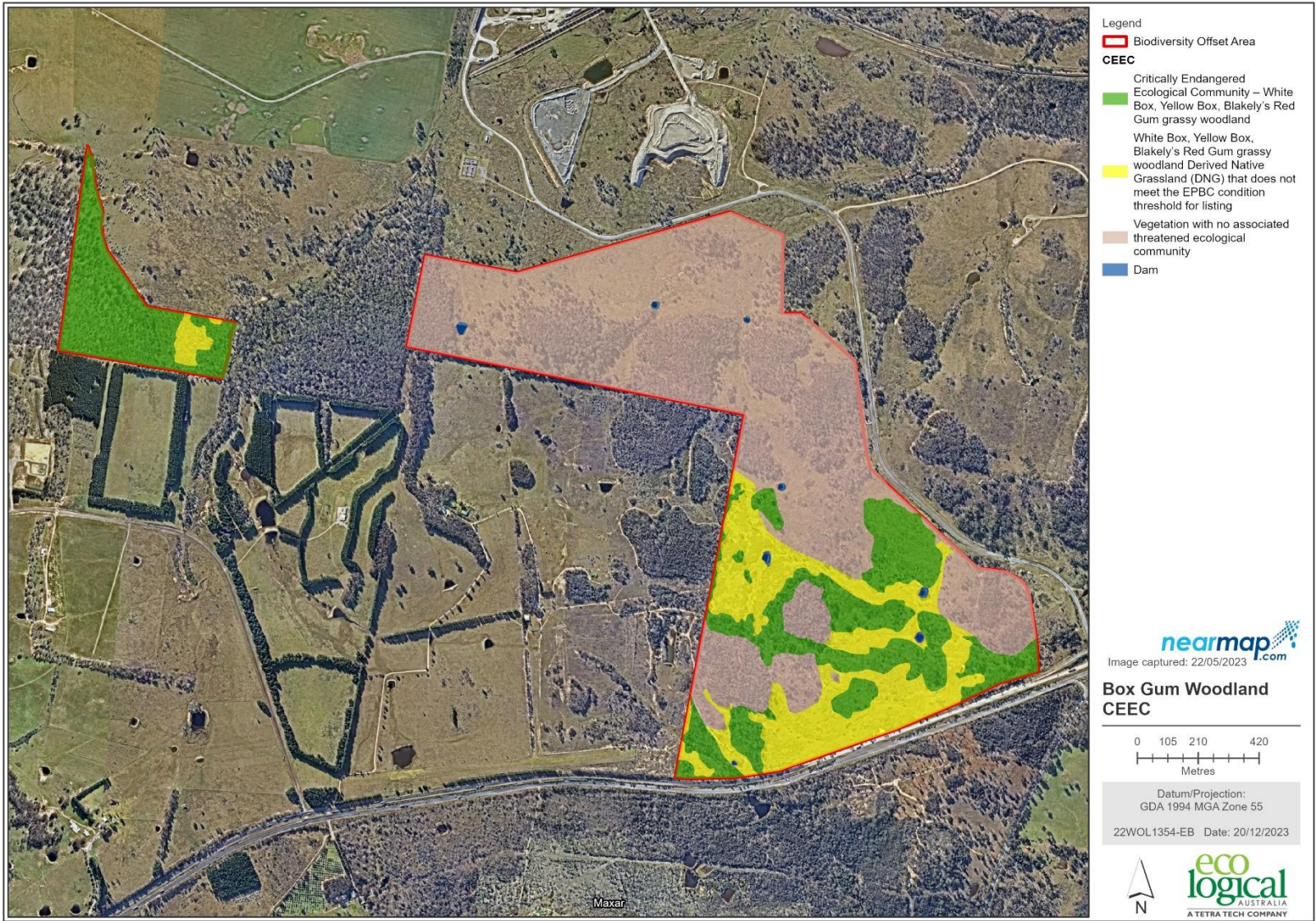
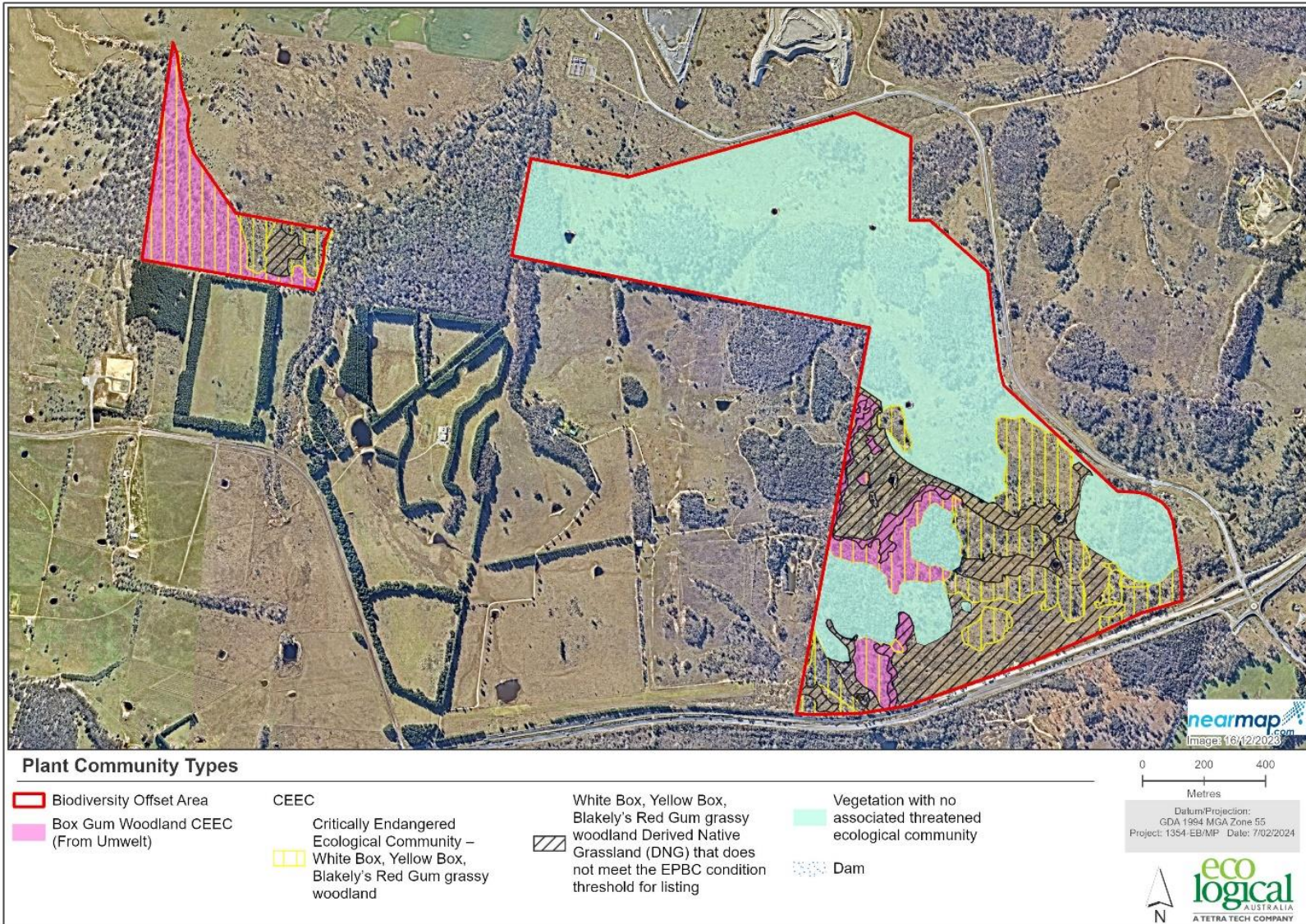


Figure 2: EPBC ACT threshold map



**Figure 3: Critically Endangered Ecosystem Community status comparison mapping (umwelt 2022)**

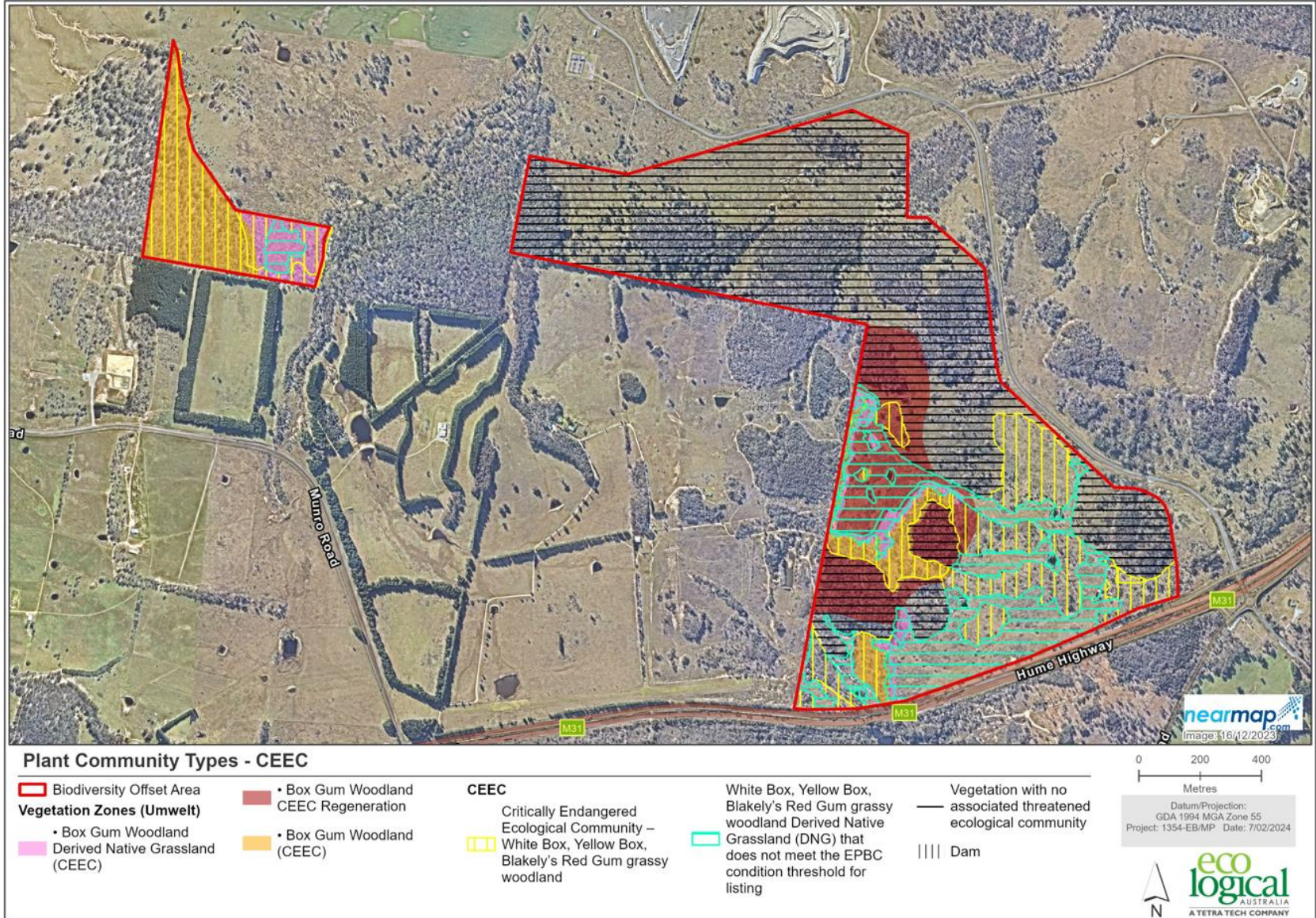


Figure 4: Critically Endangered Ecosystem Community status comparison mapping (BGWP)

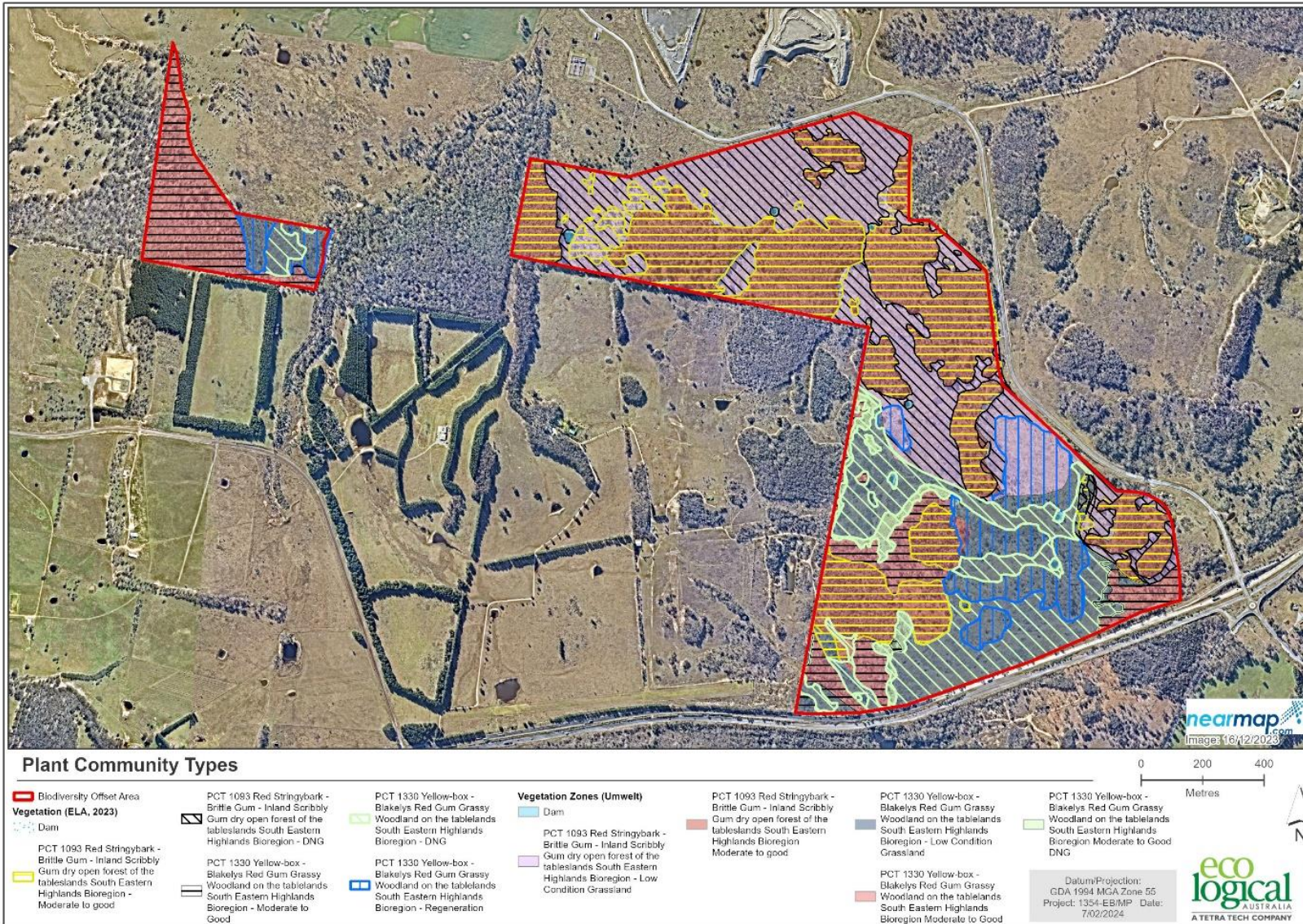
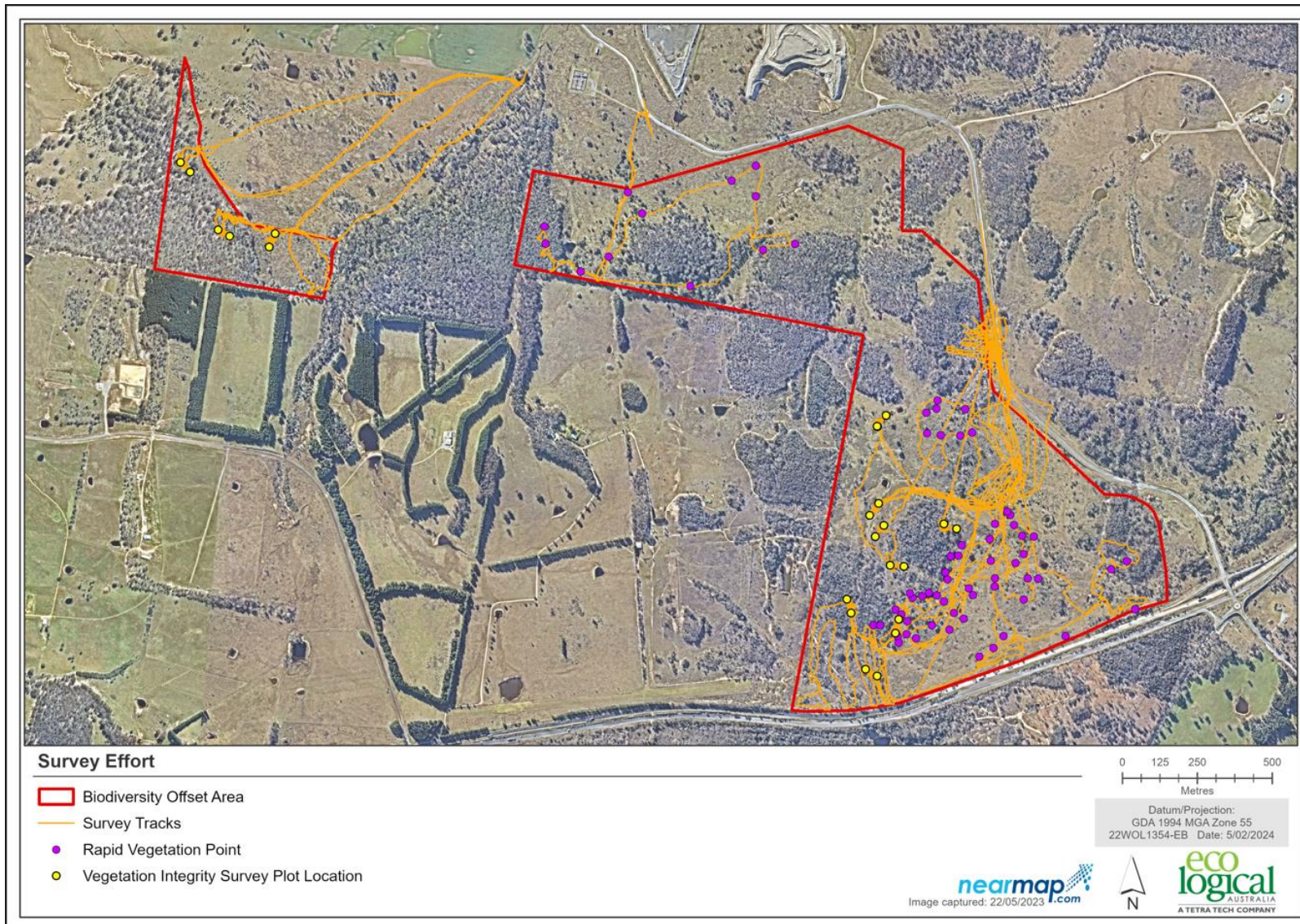


Figure 5: Plant Community Type comparison mapping



**Figure 6: Hoary sunray surveys tracks**

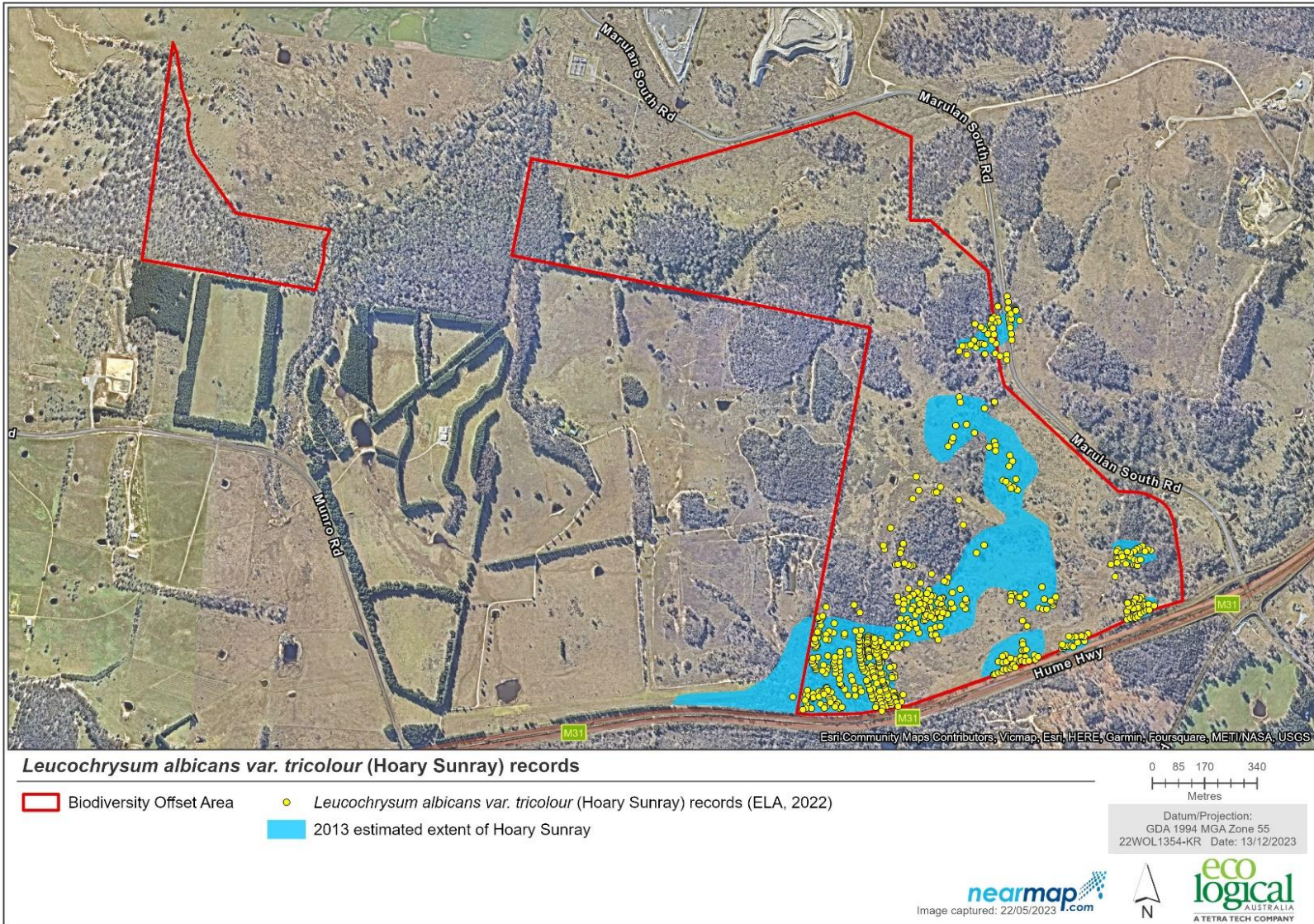


Figure 7: Hoary sunrays estimated extent vs. surveyed individuals