Our Ref: 4921AA_Rev1

30 November 2023

[redacted]

[redacted]

Wheatbelt Woodlands TEC Assessment Addendum

Background

1.1 Scope and objective

Cooperative Bulk Handling (CBH Group) commissioned 360 Environmental Pty Ltd, now SLR Group (SLR), to undertake a reconnaissance flora, fauna, and Black Cockatoo habitat survey for the proposed Kellerberrin Receival Facility Expansion. The Survey was conducted in October of 2021 within the town of Kellerberrin, in the Avon Wheatbelt bioregion of Western Australia, and encompasses approximately 28 ha. The proposed development footprint within the Survey Area includes existing roads and infrastructure.

The purpose of the survey was to identify key biological values within the Survey Area to support the Environmental Impact Assessment (EIA) process and approvals applications to develop the Project. Part of the survey included identifying potential occurrences of the EPBC-listed *Eucalypt woodlands of the Western Australian Wheatbelt* (Wheatbelt Woodlands); this required an assessment of patches of vegetation analogous to the TEC against the diagnostic criteria outlined in Table 3 of the '*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt' (Department of the Environment, 2015).

This addendum presents a re-assessment of those patches against the diagnostic criteria as an amendment to the assessment originally presented in the Kellerberrin Receival Facility Expansion Spring Biological Survey Report (360 Environmental, 2022).

Methods

Several patches of native/natural Eucalyptus-dominated vegetation were identified during the 2021 survey as analogous to the Wheatbelt Woodlands TEC. Each of these potential TEC patches were assessed against the diagnostic criteria and condition thresholds listed in Section 3.2 and Table 3 of the '*Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt*' using flora and fauna data from the 2021 survey. These diagnostic criteria and condition thresholds are summarised below in Table 1. Appendices A and B of the Approved Conservation Advice (Department of the Environment, 2015) contains supplementary information regarding key native species of the TEC, and Roadside Conservation Values (see Table 2) both of which were relevant to the re-assessment.

Further information was obtained from the '*Eucalypt Woodlands of the Western Australian Wheatbelt: a nationally protected ecological community*' (Department of the Environment, 2015; Commonwealth of Australia, 2016); this guidance contains information about roadside vegetation remnants that is relevant to the vegetation within the Kellerberrin survey area.

Table 1. Diagnostic Criteria of the Wheatbelt Woodland TEC

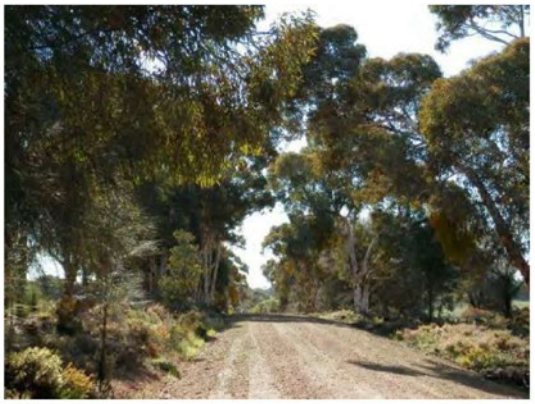
Criteria	Diagnostic Characteristics of the Eucalypt Woodlands of the Western Australian Wheatbelt TEC (Department of the Environment, 2015)
1	Be located within the Avon Wheatbelt (subregions AVW01 or AVW02), the Western Mallee subregion or Jarrah Forest – outlying patches in the eastern parts of the JAH01 Northern Jarrah forests and JAH02 Jarrah forests adjacent to the Avon Wheatbelt.
2	The structure of the Ecological community is a woodland in which crown cover of the tree canopy in a mature woodland is 10% – 40%.
3	Key species of the tree canopy is *Eucalyptus* [of which at least one is a key indicator species listed in the conservation advice, such as York gum (*Eucalyptus loxophleba* subsp. *loxophleba*), Salmon gum (*Eucalyptus salmonophloia*), Wandoo (*Eucalyptus wandoo*) or Kondinin Blackbutt (*Eucalyptus kondininensis*)].
4	A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs, as specified in Table A1 of Appendix A of the Approved Conservation Advice.
5	**Contra-indicators: The presence of the following features in the vegetation indicates that the ecological community is not likely to be present.** • A dominant presence of eucalypts with a mallee growth form. However, mallee species can occur as an understorey or minor canopy component of the ecological community, as noted in the diagnostic features, above • A dominant presence of non-eucalypt species in the tree canopy, for instance Acacia acuminata (jam) or Allocasuarina huegeliana (rock sheoak). However, these non-eucalypt species can be present as an understorey or minor canopy component of the ecological community. • Shrublands or herblands in which the tree canopy layer is very sparse to absent, either naturally or maintained so through long-term disturbance. Native vegetation where a tree canopy was formerly present is often referred to as 'derived' or 'secondary' vegetation. These sites would fall below the 10 per cent

Criteria	Diagnostic Characteristics of the Eucalypt Woodlands of the Western Australian Wheatbelt TEC (Department of the Environment, 2015)
	minimum canopy cover threshold for a woodland, noted in the diagnostic features, above. • Woodlands that have the same key eucalypt species but occur in adjacent bioregions • Woodlands dominated by eucalypts that are restricted to granite outcrops and rocky rises, for instance *Eucalyptus caesia*.
6a	The vegetation type meets one of the following condition thresholds **(non-roadside patches only)**: • Category A: Patch corresponding to Very Good/Excellent/Pristine condition, and has: - mature trees absent or present; - weed species comprising <30% of total understorey vegetation cover; - an area of ≥2 ha. • Category B: Patch corresponding to Good condition and retains important habitat features), and has: - at least five mature trees per 0.5 ha present; - weed species comprising 30-50% of total understorey vegetation cover; - an area of ≥2 ha. • Category C: Patch corresponding to a Good condition, and has - less than 5 trees per 0.5 ha; - weed species comprise 30-50 % of total vegetation cover; - an area of ≥5 ha. • Category D: Patch corresponds to a Degraded to Good condition but retains important habitat features, and has: - at least 5 mature trees per 0.5 ha; - weeds species comprising 50-70 % of total understorey vegetation cover - an area of ≥5 ha.
6b	Condition thresholds (area relates to **roadside patches**) The vegetation type meets one of the following condition thresholds: • Category A: Patch corresponding to a High RCV condition^, and has: - mature trees absent or present; - weed species comprising <30% of total understorey vegetation cover; - a minimum patch width of ≥5m. • Category B: Patch corresponding to a Medium-High RCV condition^, and retains important habitat features), and has: - at least five mature trees per 0.5 ha present; - weed species comprising 30-50% of total understorey vegetation cover; - a minimum patch width of ≥5m. • Category C: Patch corresponding to a Medium-High RCV condition^, and has - less than 5 trees per 0.5 ha; - weed species comprise 30-50 % of total vegetation cover; - a minimum patch width of ≥5m.

Criteria	Diagnostic Characteristics of the Eucalypt Woodlands of the Western Australian Wheatbelt TEC (Department of the Environment, 2015)
	• Category D: Patch corresponds to a Medium-Low to Medium-High RCV condition^ BUT retains important habitat features, and has: - at least 5 mature trees per 0.5 ha; - weeds species comprising 50-70 % of total understorey vegetation cover - a minimum patch width of ≥5m.

^This condition rating is derived from Table B4b of Appendix B to the Approved Conservation Advice, shown in Table 2 below (Department of the Environment, 2015)

Table 2. Roadside Conservation Value (RCV) categories, as applied to roadside vegetation remnants across south-western Western Australia by the Roadside Conservation Committee of WA (with modifications to the assessment of weediness). (adapted from Table B4b, (Department of the Environment, 2015).

RCV category (score)	Native vegetation	No. of native plant species	Weediness[1]	Habitat value[2]	Example image[3]
High (9-12)	Natural structure intact with ground, shrub and tree layers. Native vegetation extent >70%.	Native flora diversity high, with 20+ species.	Few weeds, <30% of total plant cover.	High value as corridor with multiple habitat features.	
Medium - High (7-8)	Structure generally intact with one layer disturbed or absent. Native vegetation extent 50-70%.	Native flora diversity medium - high with 6-19 species.	Few to half weeds, 30-50% of total plant cover.	Medium to high value as corridor and some habitat features.	

RCV category (score)	Native vegetation	No. of native plant species	Weediness[1]	Habitat value[2]	Example image[3]
Medium – Low (5-6)	Structure disturbed with one or more layers absent. Native vegetation extent 30-50%.	Native flora diversity low with 0-5 species.	Half to mostly weeds, 50-70% of total plant cover.	Low to medium value as corridor and few habitat features.	
Low (0-4)	Generally narrow and disturbed, two or more layers absent. Native vegetation extent <30%.	Native flora diversity low with 0-5 species.	Mostly weeds, accounting for >70% of total plant cover, or ground layer entirely of exotic plants.	Low value as corridor and no significant habitat values.	

Results and Discussion

The DBCA TEC database search results indicate that the vegetation at the eastern end of the Survey Area adjacent to Mather Road (Patch 3, Figure 1) constitutes the Wheatbelt Woodlands TEC and its associated 200 m buffer. The flora and fauna survey from 2021 recorded the presence of large, mature salmon Gums over an understorey that was largely dominated by weedy grasses such as *Avena* sp. and *Lolium* sp. and low in native diversity, mainly chenopods (e.g. *Rhagodia drummondii*).

It was also determined during the re-assessment that Patch 3 as shown in Figure 9 of the Report, in fact constituted two patches (now Patch 3 and Patch 4, Figure 1) due to the railway line that runs between these two areas of vegetation (such a barrier, as stated in Department of the Environment (2015), constitutes two separate patches). Table 10 of the Report has been updated below (Table 3) to include this amendment.

Table 3. Potential patches of the Wheatbelt Woodland TEC within the Survey Area

Patch	Location and details
1^	A patch of continuous *Eucalyptus*-dominated vegetation (which includes both endemic and non-endemic Eucalypts) is present at the western end of the Survey Area between the railway line and Leake Street.
2^	This patch occurs along Great Eastern Highway, approximately 750 m east of East Crossing Road.
3	This patch occurs at the eastern end of the Survey Area between the railway line and Mather Road and is divided into 2 smaller patches. Part of this patch was identified as the TEC by the DBCA database searches.
4	Close to Patch 4, between the railway and Great Eastern Highway, comprising *Eucalyptus loxophleba*

^These patches are shown in Figure 9 of the Kellerberrin Receival Facility Expansion Spring Biological Survey Report (360 Environmental, 2022).

The 200 metre buffer for the DBCA TEC in Patch 3 extends out over most of the rest of Patch 3 as well as encompassing part of the new Patch 4 (the thin wedge located between the railway and Great Eastern Highway) (see Figure 1).

Table 4 below provides the assessment of each patch against the diagnostic criteria. Roadside Conservation Value (RCV) categories, as detailed in Table 2 were included in the re-assessment. Of the patches originally considered analogous to the TEC and assessed against the diagnostic criteria, Patch 3 meets the criteria for the TEC, which correlates with the DBCA TEC results. Patch 4 was determined as not meeting the TEC criteria due to meeting one of the contra-indicators outlined in Table 1 (i.e. dominant presence of Eucalypts in mallee form).

Table 4. Patches assessed against the Wheatbelt Woodlands TEC key diagnostic criteria

Key Diagnostic characteristics for the ecological community	Patch #			
	1	2	3	4
1. The distribution of the ecological community is limited to these IBRA bioregions and subregions:				
Avon Wheatbelt - subregions AVW01 Merredin and AVW02 Katanning	✓	✓	✓	✓
or				
Mallee - MAL02 Western Mallee only;	-	-	-	-
or				
Eastern parts of JAF01 Northern Jarrah Forests and JAF02 Jarrah Forests adjacent to the Avon Wheatbelt	-	-	-	-
2.The structure of the ecological community is a woodland in which the minimum crown cover of the tree canopy in a mature woodland is 10%.				
>10%	✓	✓	✓	✓
<10%	-	-	-	-
3. The key species of the tree canopy are species of Eucalyptus as identified in Table 2a of the Approved Conservation Advice:				
Eucalyptus accedens	-	-	-	-

Eucalyptus aequioperta	-	-	-	-
Eucalyptus alipes	-	-	-	-
Eucalyptus astringens	-	-	-	-
Eucalyptus capillosa	-	-	-	-
Eucalyptus densa subsp. *densa*	-	-	-	-
Eucalyptus extensa	-	-	-	-
Eucalyptus falcata	-	-	-	-
Eucalyptus gardneri	-	-	-	-
Eucalyptus goniocarpa	-	-	-	-
Eucalyptus kondininensis	-	✓	-	-
Eucalyptus longicornis	-	-	-	-
Eucalyptus loxophleba subsp. *loxophleba*	-	-	✓	✓
Eucalyptus melanoxylon	-	-	-	-
Eucalyptus mimica subsp. *continens*	-	-	-	-
Eucalyptus mimica subsp. *mimica*	-	-	-	-

Eucalyptus myriadena	-	-	-	-
Eucalyptus occidentalis	-	-	-	-
Eucalyptus ornata	-	-	-	-
Eucalyptus recta	-	-	-	-
Eucalyptus rudis subsp. *rudis*	-	-	-	-
Eucalyptus salicola	-	-	-	-
Eucalyptus salmonophloia	-	-	✓	-
Eucalyptus salubris	-	-	-	-
Eucalyptus sargentii subsp. *sargentii*	-	-	-	-
Eucalyptus singularis	-	-	-	-
Eucalyptus spathulata subsp. *spathulata*	-	-	-	-
Eucalyptus spathulata subsp. *salina Salt*	-	-	-	-
Eucalyptus urna	-	-	-	-
Eucalyptus wandoo subsp. *pulverea*	-	-	-	-
Eucalyptus wandoo subsp. *wandoo*	-	-	-	-

4. A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs, as specified in Table A1 of Appendix A of the Approved Conservation Advice.				
Species present as listed in Table A1?	-	-	✓	✓
Species absent as listed in Table A1?	✓	✓	-	-
5. Contra-indicators: The presence of the following features in the vegetation indicates that the ecological community is not likely to be present.				
A dominant presence of eucalypts with a mallee growth form. However, mallee species can occur as an understorey or minor canopy component of the ecological community, as noted in the diagnostic features, above	✓	×	×	✓
A dominant presence of non-eucalypt species in the tree canopy, for instance Acacia acuminata (jam) or Allocasuarina huegeliana (rock sheoak). However, these non-eucalypt species can be present as an understorey or minor canopy component of the ecological community.	×	×	×	×
Shrublands or herblands in which the tree canopy layer is very sparse to absent, either naturally or maintained so through long-term disturbance. Native vegetation where a tree canopy was formerly present is often referred to as 'derived' or 'secondary' vegetation. These sites would fall below the 10 per cent minimum canopy cover threshold for a woodland, noted in the diagnostic features, above.	×	×	×	×

Woodlands that have the same key eucalypt species but occur in adjacent bioregions	×	×	×	×
Woodlands dominated by eucalypts that are restricted to granite outcrops and rocky rises, for instance *Eucalyptus caesia*.	×	×	×	×
6. Condition Thresholds				
Category A:				
1. Patches likely to correspond to a condition of Pristine / Excellent / Very good (Keighery, 1994) or a High RCV (RCC, 2014).	-	-	-	-
2. Exotic plant species account for 0 to 30% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-
3. Mature trees (dbh >30cm) may be present or absent.	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-
Category B:				
1. Patches likely to correspond to a condition of Good (Keighery, 1994) or a Medium-High RCV (RCC, 2014) AND retains important habitat features.	-	-	-	-
2. Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy)	-	-	-	-
3. Mature trees are present with at least 5 trees per 0.5 ha.	-	-	-	-

4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-
Category C:				
1. Patches likely to correspond to a condition of Good (Keighery, 1994) or a Medium-High RCV (RCC, 2014).	-	-	-	-
2. Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	-	-	-	-
3. Mature trees either absent or less than 5 trees per 0.5 ha present.	-	-	-	-
4. Minimum patch width (Roadsides only): 5 metres or more.	-	-	-	-
Category D:				
1. Patches likely to correspond to a condition of Degraded to Good (Keighery, 1994) or a Medium-Low to Medium-High RCV (RCC, 2014) BUT retains important habitat features.	✓	✓	✓	✓
2. Exotic plant species account for more than 50 to 70% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	✓	✓	✓	✓
3. Mature trees are present with at least 5 trees per 0.5 ha.	x	✓	✓	x
4. Minimum patch width (Roadsides only): 5 metres or more.	✓	x	✓	✓
7. Outcome				
Criteria met for TEC status? (Yes/No)	**No**	No	**Yes**	No

Summary

Four patches of woodland potentially analogous to the Wheatbelt Woodland TEC, identified during the 2021 Flora, Fauna and BC survey, were re-assessed against the key diagnostic criteria and condition thresholds for the TEC. Patch 3 was considered to be meeting the key diagnostic criteria for TEC status and the condition threshold for Category D (Degraded-Good/Medium-Low). The presence of DBCA TEC woodland over this patch also contributed to the TEC assessment.

We trust this meets your requirements. Should you have any questions or require further action please do not hesitate to contact the undersigned, Grant Buller, on (08) 9388 8360. We look forward to hearing from you.

For and on behalf of SLR Consulting (formerly 360 Environmental Pty Ltd)

[redacted]

Enc:
Figure 1: Potential Wheatbelt Woodlands TEC and DBCA TECs

Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data, and analyses ('client's information') provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive, or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness, and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive, and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions, and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

References

Commonwealth of Australia (2016) Eucalypt Woodlands of the Western Australian Wheatbelt: a nationally protected ecological community. Available at: www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl.

Department of the Environment (2015) Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt. Canberra, Australia.

Department of the Environment (2015) Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Approved Conservation Advice-Appendices for the Eucalypt Woodlands of the Western Australian Wheatbelt. Available at: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/128-conservation-advice-appendices.pdf (Accessed: 1 December 2023).

Figures

Figure 1: Potential Wheatbelt Woodlands TEC and DBCA TECs

Legend

- Survey Area
- Eucalypt Woodlands of the Western Australian Wheatbelt

Potential TEC Occurrences

- Patch 3
- Patch 4

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

0 87.5 175 350 N

Metres

Scale: 1:10,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP

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PROJECT ID	DATE
4921	1/12/2023

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
ENVIRONMAPS	GB	GB	0

COOPERATIVE BULK HANDLING
Kellerberrin Receival Facility
Upgrade Spring Biological Surveys

Figure 1

Potential Wheatbelt Woodlands TEC Locations and DBCA TEC / 200 m Buffers