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IMPACT FOOTPRINT ASSESSMENT OF TRACK ESTABLISMENT ON FLAT ROCKS WIND FARM, KOJONUP WA.

Introduction

Mattiske Consulting Pty Ltd (MCPL) was commissioned June 2022 by Moonies Hill Energy Pty Ltd to undertake additional targeted survey of the proposed alignment of the tracks in areas where there were stands of trees or isolated trees within the proposed access track alignments within the facilities. The numbers for the respective photos align with the Figures 1a and 1b as attached.

Objective

The objective of this survey was to undertake a targeted survey of the proposed wind turbine cable alignment areas where it interfaces with road verges or vegetation and to prepare a report summarising the findings.

Regional Context

The Flat Rocks Wind Farm survey area is located within the Southern Jarrah Forest subregion within 5km of the border of the Avon Wheatbelt region. The Southern Jarrah Forest subregion is characterised by Jarrah forest on duricrusted plateaus and loam soils of valleys, with Marri-Wandoo woodlands on laterite-free soils (Beard 1990). Typical vegetation of the Avon Wheatbelt region includes scrub-heath on sandplains, *Acacia-Casuarina* thickets on ironstone gravels, woodlands of *Eucalyptus loxophleba*, *Eucalyptus salmonophloia* and *Eucalyptus wandoo* on varying soil types (Beard 1990). The proximity of Moonies Hill Wind Farm to the border of the Avon Wheatbelt region indicates that characteristics of both regions are likely to be present in the survey area.

Mattiske Consulting Pty Ltd was commissioned in September 2010 by Moonies Hill Energy to undertake a flora and vegetation survey of the proposed wider Flat Rocks Wind Farm. In April 2016, Mattiske Consulting Pty Ltd was commissioned by the Moonies Hill Energy to undertake a review of the flora, vegetation and fauna values on the proposed Flat Rocks Wind Farm location, and update findings from the 2010 assessment. The prepared reports MHE1001/113/2010 and MHE1601/10/16 are available. The following supplements more recent review of the track alignments through the road verges and planted stands of trees and a few localised isolated trees and areas of remnant vegetation. Every effort was made to avoid any stands of native trees and to minimize the impacts on the tree locations.

One Threatened Ecological Community is recorded to occur in the Flat Rocks Wind Farm. This is Eucalyptus Woodlands of the Western Australian Wheatbelt Critically Endangered Threatened Ecological Community (TEC) and Priority 3 (iii) Protected Ecological Community (PEC) (DBCA 2021c and DBCA 2021d)

The WA Wheatbelt Woodlands ecological community is a woodland in which the trees typically are spaced and the canopy is relatively open. The understorey is highly variable in structure and composition. There can be localised variation in vegetation structure as a consequence of disturbance, for instance fire, or change in site characteristics that allows for gaps in tree canopy cover, a higher density of trees e.g. dense sapling regrowth, or change in the nature of the understorey (DAWE 2015). The minimum patch size of woodland required is 2 hectares with a condition rating of Pristine/Excellent/Very good (DAWE 2015).

It is intended that the condition thresholds will exclude degraded patches from any requirement for protection, for instance:

- isolated paddock trees on farms;
- small or narrow stands of trees that serve as windbreaks or shelterbelts on farms and other properties; or
- roadside and other woodland remnants that are too small and narrow, or where the tree canopy has become too patchy and discontinuous (effectively <10% cover), or the understorey has lost considerable elements of its native structure and diversity (DAWE 2015).

Methods

A targeted field assessment of the flora and vegetation of the proposed alignment of the tracks through the road verges and planted stands of trees and a few localised areas of remnant vegetation. Every effort was made to avoid any stands of native trees and to minimize the impacts on the tree locations. The recent assessment was undertaken by Dr Libby Mattiske on 25th June 2022. Dr Mattiske holds a valid collection licence to collect flora for scientific purposes, issued under the Biodiversity Conservation Act 2016.

The geographic locations of the proposed alignments through areas of native trees on roadsides, planted trees and remnant vegetation are summarized on Figures 1a and 1b, and in the series of Photographs in Appendix A by reference to the details associated with each photograph. At each location discussions were held with the Flat Rocks team about means to minimize the clearing of trees and any native vegetation. The summary of these findings are provided in the following Table 1.

Results

The results for each location are summarized against the photographs as taken with associated text (Table 1 in following pages). In general terms there only a few locations where a few trees will require removal. Every effort was made to reduce the need to remove trees.

The sites can be subdivided into the following groups:

- 1. Sites which are in already cleared areas and hence as in agricultural areas do not require a clearing permit. In these areas the vegetation is completely degraded. These were summarized in the earlier report by Mattiske Consulting Pty Ltd (January 2022)
- 2. Sites which have isolated paddock trees that are exempt from clearing permits. In these areas the vegetation is completely degraded.
 - Sites 8, 9, 13, 16, 19, 22, 25, 28, 36, 37, 43, 44, 48
- 3. Sites which have isolated trees for structures that are exempt from clearing permits. In these areas the vegetation is completely degraded.
 - Sites 24, 38, 47
- 4. Sites which are located on narrow road degraded verges (generally less than 2m wide).
 - Sites 21, 33, 34, 35
- 5. Sites which are located in rehabilitated patches in the agricultural areas where a few planted trees may be required to be removed or pruned. In these areas the vegetation is degraded.
 - Sites 7, 17, north of 23, 39, 40, 41
- Sites where it may require a few trees in old stock routes or road reserves that have been fenced will be crossed and as a result some trees may need to be removed. The vegetation in these areas are degraded.
 - Sites 23, 12, 17, 27, 29
- 7. Sites which will require several trees near a watercourse to be pruned or removed to widen access if needed. The vegetation in this area is completely degraded.
 - Site 60

In the majority of the area the understorey is dominated by introduced grasses and herbs as a result of previous agricultural activities. The main exemption relates to the few patches of planted trees in rehabilitation areas or through the fenced old stock routes and road reserves.

None of the inspected sites occur within native vegetation that align with the Threatened Ecological Community (Eucalyptus Woodlands of the Western Australian Wheatbelt Critically Endangered Threatened Ecological Community (TEC)).

Discussion and Conclusion

No conservation flora species or ecological communities will be impacted by these activities. Whilst fauna activity was limited, the majority was related to the potential for occasional foraging by bird species.

Regulation 5 Item 19 states that Clearing of a tree on a property that is in an otherwise cleared area on the property and is more than 50 metres from any other native vegetation, being vegetation which does not, together with all other limited clearing carried out on the property in the financial year in which the clearing takes place, exceed five hectares (DWER 2019). None of the proposed track alignments meet this criteria and the areas supporting denser trees are largely road reserves or rehabilitation areas planted with a variety of species.

Dr Libby Mattiske

Mattiske Consulting Pty Ltd

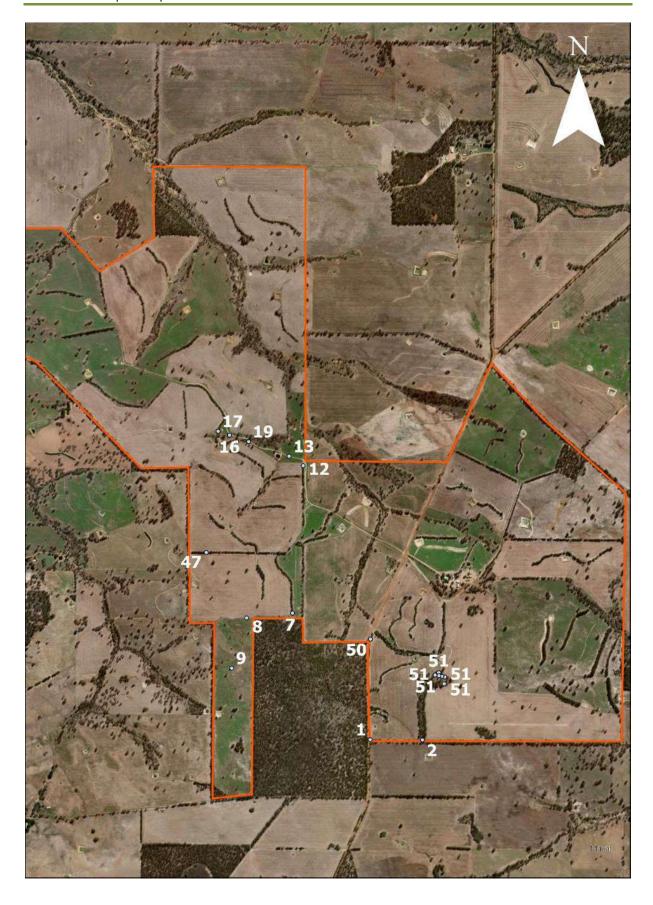


Figure 1a: Summary of Location References to align with the Photographs in Appendix A



Figure 1b: Summary of Location References to align with the Photographs in Appendix A

References

Beard, J.S. (1990)

Plant Life of Western Australia. Kangaroo Press, Kenthurst NSW.

Department of Agriculture Water and the Environment 2015

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt

https://www.awe.gov.au/sites/default/files/documents/guide-eucalypt-woodlands-wa-wheatbelt.pdf

Department of Agriculture, Water and the Environment (2021b)

EPBC Act List of Threatened Ecological Communities. Accessed 10th December 2021.

http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl

Department of Biodiversity, Conservation and Attractions (2021c)

List of Threatened Ecological Communities (TEC's) endorsed by the Minister for the Environment, 28th June 2018. Accessed 10th December 2021. https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/threatened_ecological_communities_endorsed_by_the_minister_for_the_environment_june_2018.pdf

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Priority Ecological Communities for Western Australia Version 31 (28th March 2021). Accessed 10th December 2021. https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Priority%20Ecological%20Communities%20list.pdf

Department of Water and Environmental Regulation (2019)

A guide to the exemptions and regulations for clearing native vegetation. Accessed 10th December 2021 < https://www.der.wa.gov.au/images/documents/your-environment/native-

vegetation/Guidelines/A%20 guide%20 to%20 the%20 exemptions%20 and%20 regulations%20 for%20 clearing%20 native%20 vegetation.pdf>

Mattiske Consulting Pty Ltd (2010)

Flora, Vegetation and Fauna assessment of the Flat Rocks Wind Farm survey area. Unpublished report prepared for Moonies Hill Energy Property Limited, November 2010.

Mattiske Consulting Pty Ltd (2016)

Flora, Vegetation and Fauna assessment of the Flat Rocks Wind Farm survey area. Unpublished report prepared for Moonies Hill Energy Property Limited, April 2016.

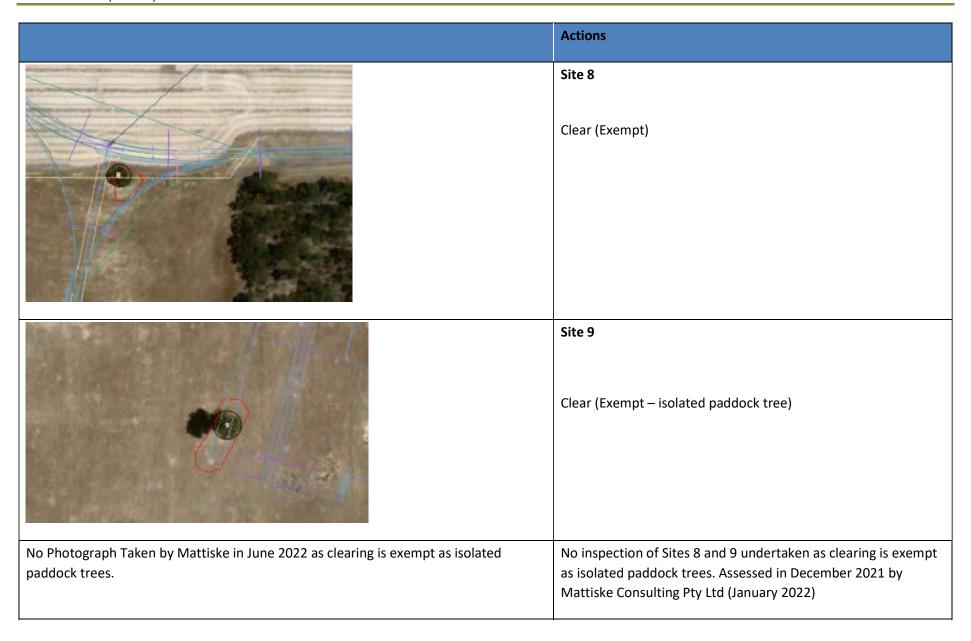
Mattiske Consulting Pty Ltd (2022)

Flora, Vegetation and Fauna assessment of the Flat Rocks Wind Farm survey area. Unpublished report prepared for Moonies Hill Energy Property Limited January 2022.

Western Australian Herbarium 1998-2021, *FloraBase – the Western Australian Flora,* Department of Parks and Wildlife. Available from: https://florabase.dpaw.wa.gov.au. 10 Dec. 21.

Table 1: Clearing sites identified by Umwelt and Enel Green Power and Photographs with assessments by Mattiske June 2022

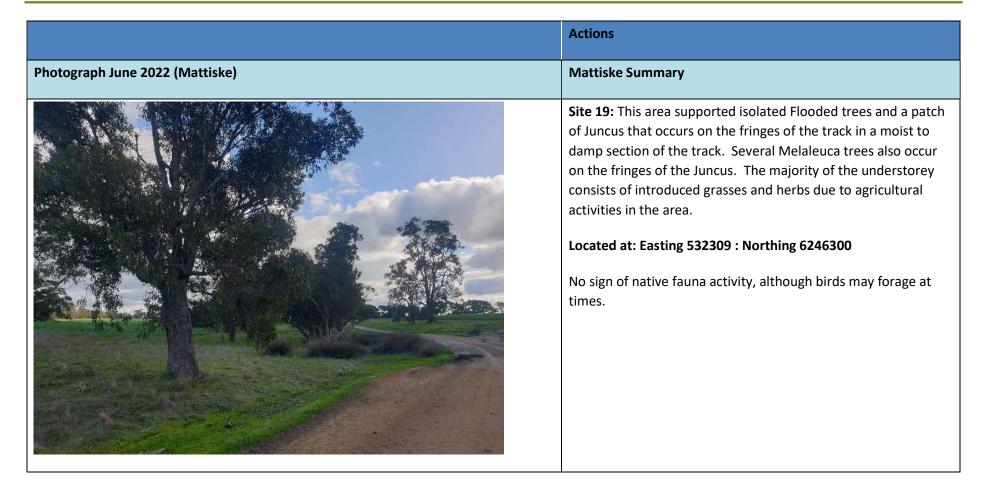
	Site 7
	Clear (permit required)
Photograph June 2022 (Mattiske)	Mattiske Summary
	Site 7: This area supported a series of planted trees and as such
	only several planted trees will be impacted by widening the
	access track to the left of the trees in the photograph.
	Located at: Easting 532399 : Northing 6244887
	Looking west to northwest over corner of a strip of planted
	trees of Eucalyptus species (including Eucalyptus rudis and
	Eucalyptus wandoo), planted shrubs and introduced grasses and
1000000000000000000000000000000000000	herbs. These trees are surrounded by paddocks that have been
	actively used for agricultural purposes.
	No sign of native fauna activity, although birds may forage at
	times.



	Actions
	Site 13 Clear (Exempt – isolated paddock tree)
Photograph June 2022 (Mattiske)	Mattiske Summary
No Photograph Taken by Mattiske in June 2022 as clearing is exempt as isolated paddock trees.	No inspection of Site 13 undertaken as clearing is exempt as isolated paddock trees (see isolated tree in paddock beyond fence next to track). Assessed in December 2021 (Mattske Consulting Pty Ltd January 2022). Located at: Easting 532354: Northing 6246175

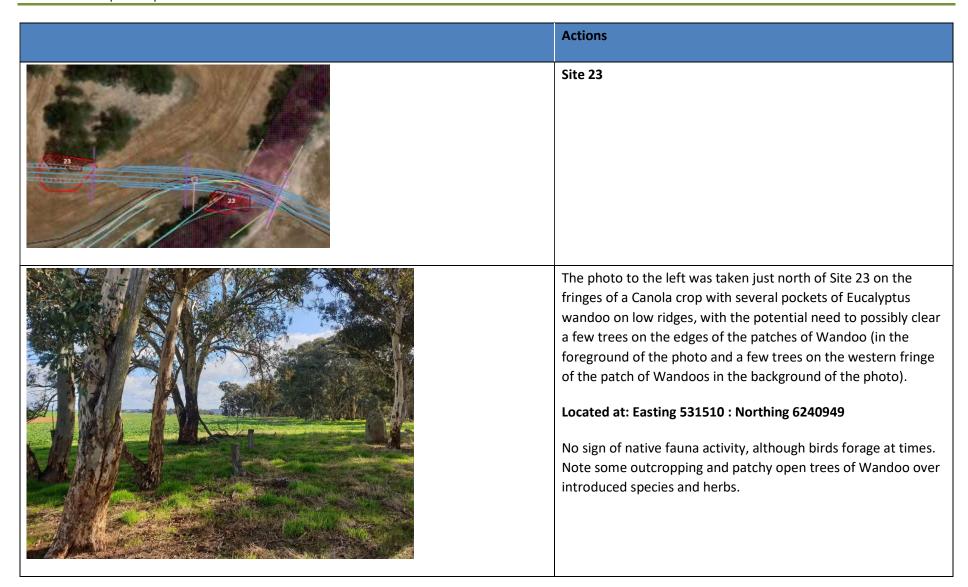
	Actions
	Site 16 & 17 Clear (permit required)
Photograph June 2022 (Mattiske)	Mattiske Summary
	Site 16: This area supported an isolated Marri (Corymbia calophylla) tree in a paddock and should be exempt from clearing application as isolated paddock tree. Located at: Easting 531879: Northing 6246358 No sign of native fauna activity, although birds may forage at times. No obvious hollow or nesting activity in the tree.

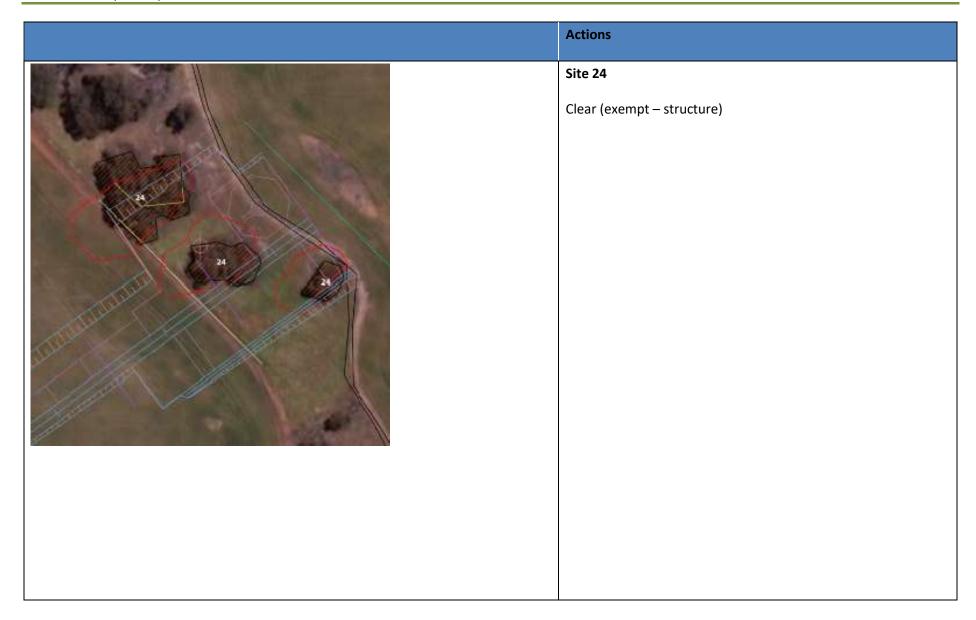
	Actions
Photograph June 2022 (Mattiske)	Mattiske Summary
	Site 17: This area supported an isolated Wandoo tree that has been planted on the edge of the paddock near the gate. This will only entail the removal of one planted tree. Located at: Easting 531793: Northing 6246373 Looking to planted Eucalyptus wandoo over introduced grasses and herbs in the paddocks that have been actively used for agricultural purposes. No sign of native fauna activity, although birds may forage at times.
	Site 19 Clear (permit required)

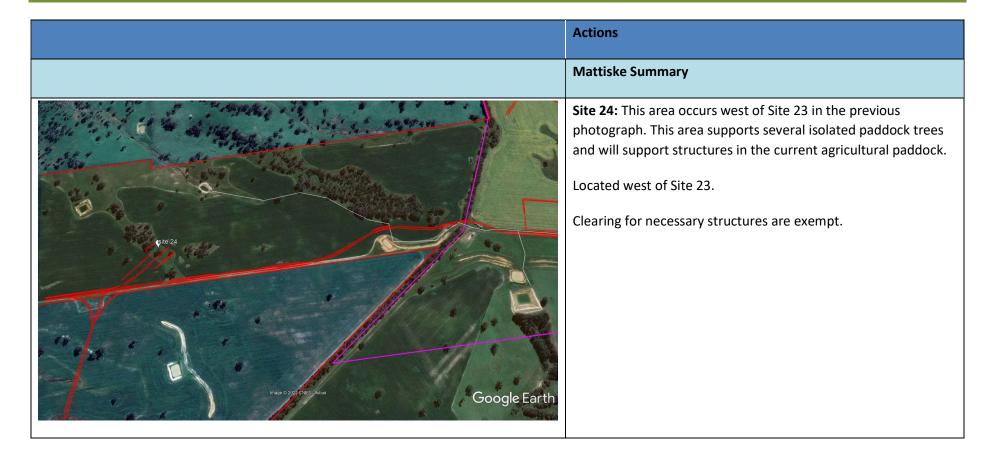


	Actions
	Site 21 & 22 21 – Clear (permit required) 22 – Clear (Exempt; structure or isolated paddock tree)
Photograph June 2022 (Mattiske)	Mattiske Summary
No Photograph Taken by Mattiske in June 2022 as clearing is exempt as isolated paddock trees.	No inspection of site 22 undertaken as tree occurs as paddock trees. See earlier assessment in December 2021 (Mattiske Consulting Pty Ltd, January 2022).
	Site 21: This area supports 3 Wandoo and 1 Jarrah tree on narrow road verge (<2m wide) over understorey of introduced grasses and herbs due to agricultural activities in the area. Trees relatively immature and some coppicing. Located at: Easting 532770: Northing 6240436 No sign of native fauna activity, although birds may forage at times.

Actions Site 23 Clear (permit required) Photograph June 2022 (Mattiske) **Mattiske Summary Site 23:** This area supports stands of Wandoo either side of the gate in the centre of the photograph. These trees occur on a historical stock route/road reserve that is fenced along most of the alignment. The access track is intended to pass through the area near the current gate and at the most the single Wandoo which occurs as a separated tree from the other trees may need to be removed. The following photos occur on the fringes of a Canola crop with several pockets of Eucalyptus wandoo on low ridges, with the potential need to possibly clear a few trees on the edges of the patches of Wandoo. Located at: Easting 531512: Northing 6240909 No sign of native fauna activity, although birds forage at times. And the stands of trees in the fenced off stock route provide shelter for smaller ground dwelling animals.

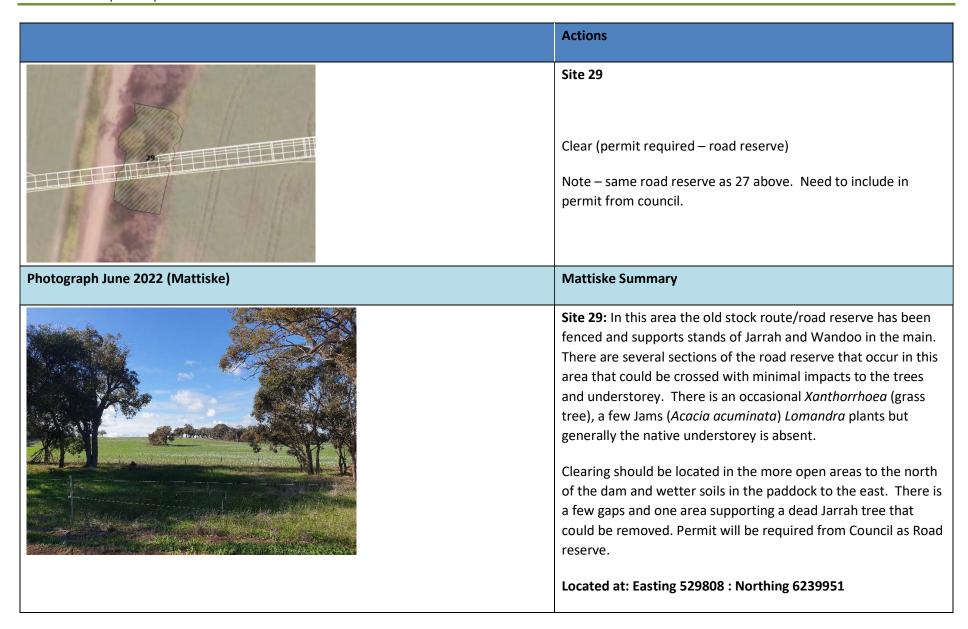


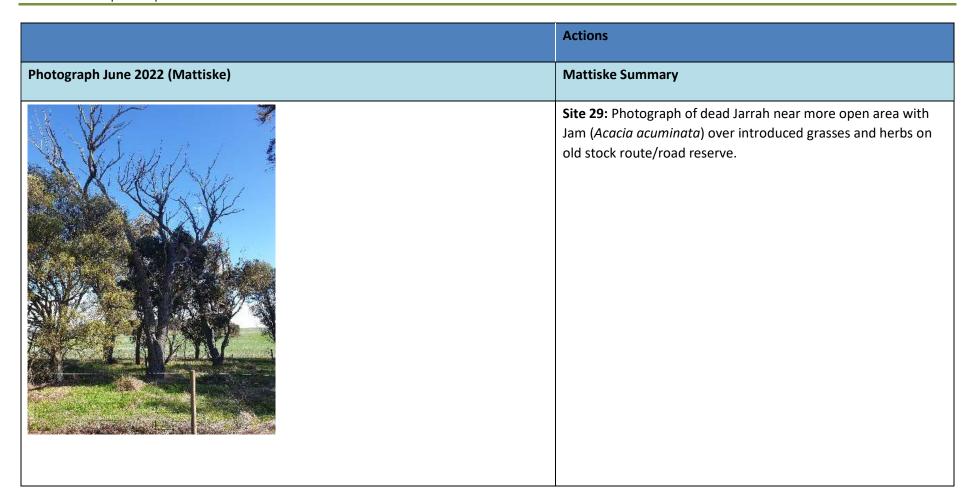


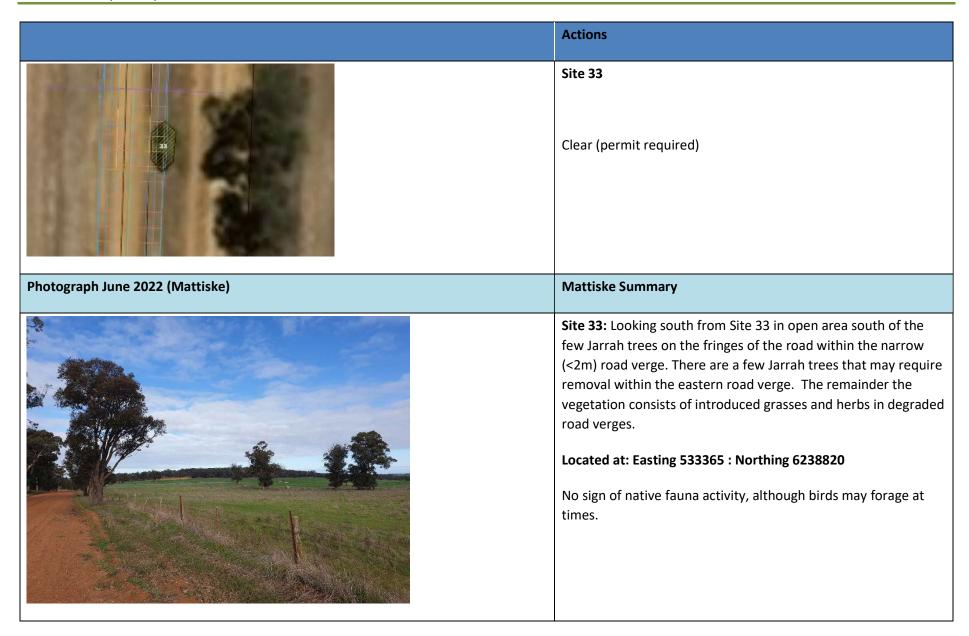


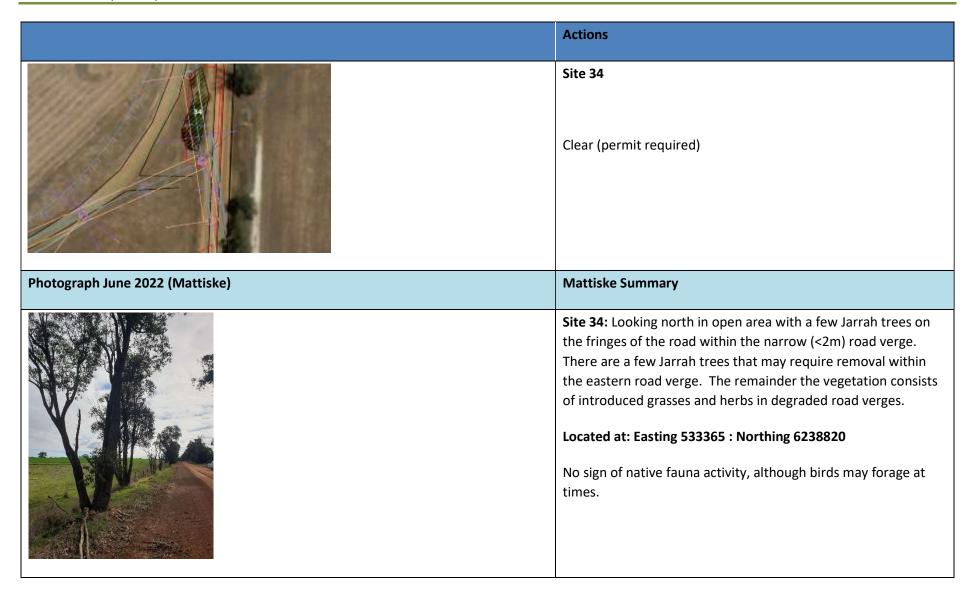
	Actions
	Site 25 Clear (Exempt – isolated paddock tree)
Photograph June 2022 (Mattiske)	Mattiske Summary
No photograph taken.	Site 25: This is an isolated paddock trees over introduced grasses and herbs in current agricultural paddock.
	Clearing is exempt for isolated paddock tree.

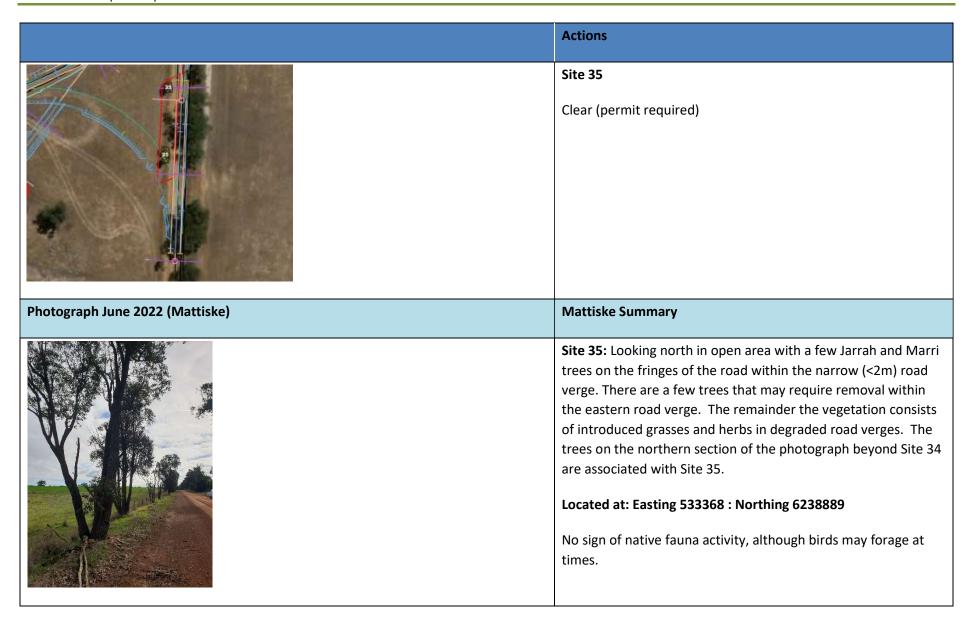
	Actions
	Site 27 & 28 28: Clear (exempt – isolated paddock tree) 27: Clear (Permit required – Road reserve) Note – 27 is a council road reserve, include in permit from council
Photograph June 2022 (Mattiske)	Mattiske Summary
No photograph taken.	Site 27 : occurs as narrow band of Wandoo trees with introduced grass and herb species in understorey. Degraded in condition, may provide some foraging by fauna occasionally.
	Site 28: This is an isolated paddock trees over introduced grasses and herbs in current agricultural paddock.
	Clearing is exempt for isolated paddock tree.
	Site 27: Permit will be required from Council as Road reserve.







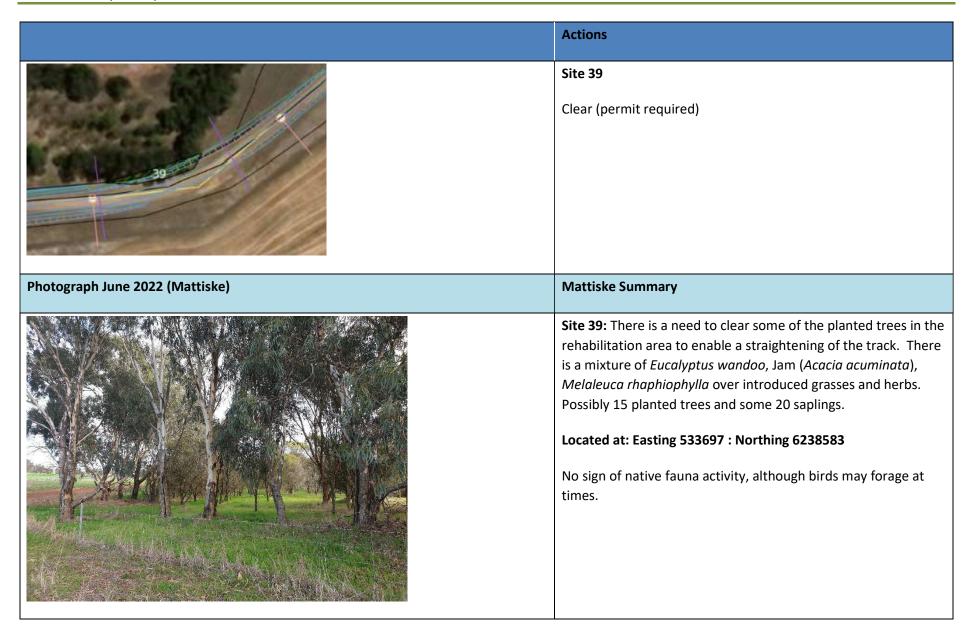




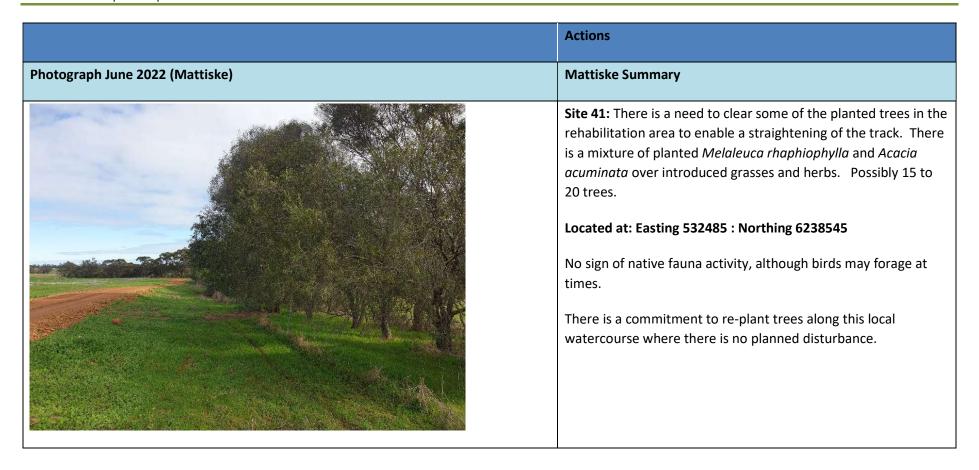
	Actions
	Site 36 Clear (permit required)
Photograph June 2022 (Mattiske)	Mattiske Summary
	Site 36: Looking west into a few isolated paddock trees over pasture. The trees occur as several isolated paddock trees and therefore should be exempt from clearing permits. It should be feasible to avoid these trees through as small design change. Located at: Easting 533300: Northing 6238820 No sign of native fauna activity, although birds may forage at times.

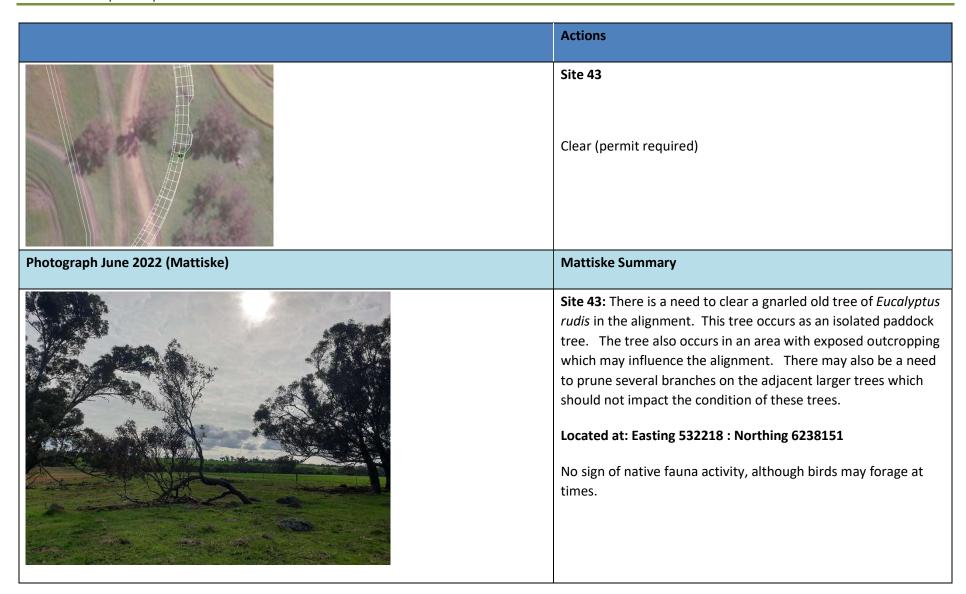
Site 37 Clear (exempt – structure and isolated paddock trees) Photograph June 2022 (Mattiske) No Photograph Taken by Mattiske in June 2022. No inspection undertaken as clearing is exempt for isolated paddock trees. See earlier assessment in December 2021 (Mattiske Consulting Pty Ltd, January 2022).		
		Actions
		Site 37
		Clear (exempt – structure and isolated paddock trees)
	Photograph June 2022 (Mattiske)	Mattiske Summary
	No Photograph Taken by Mattiske in June 2022.	No inspection undertaken as clearing is exempt for isolated paddock trees. See earlier assessment in December 2021 (Mattiske Consulting Pty Ltd, January 2022).

	Actions
	Site 38 Clear (exempt – structure)
Photograph June 2022 (Mattiske)	Mattiske Summary
No Photograph Taken by Mattiske in June 2022.	No inspection undertaken as clearing is exempt for isolated paddock trees and structures. See earlier assessment in December 2021 (Mattiske Consulting Pty Ltd, January 2022).



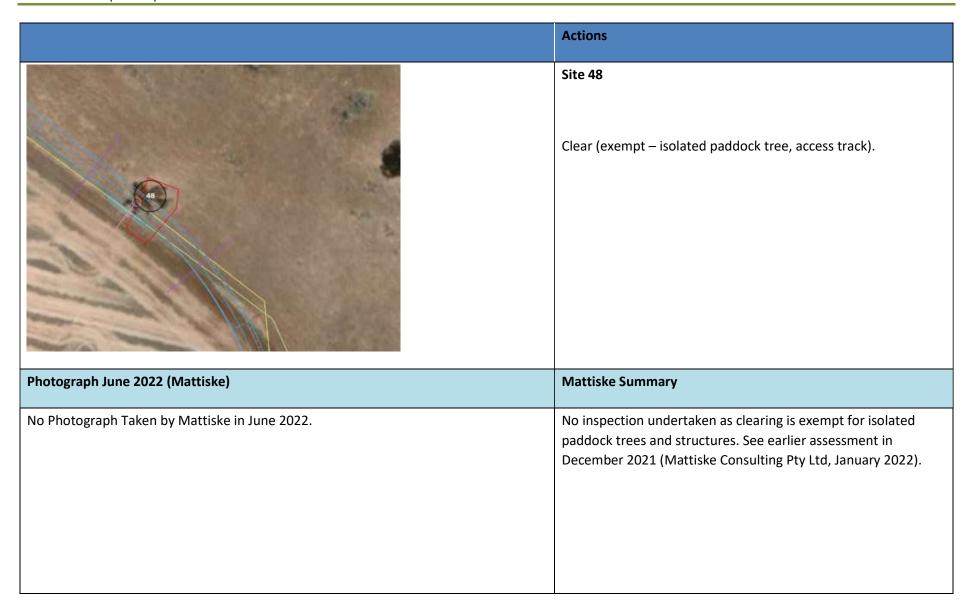






	Actions
	Site 44 Clear (exempt – isolated paddock tree).
Photograph June 2022 (Mattiske)	Mattiske Summary
No Photograph Taken by Mattiske in June 2022.	No inspection undertaken as clearing is exempt for isolated paddock trees and structures.
	See earlier assessment in December 2021 (Mattiske Consulting Pty Ltd, January 2022).

	Actions
	Clear (clearing permit exemption).
Photograph June 2022 (Mattiske)	Mattiske Summary
No Photograph taken by Mattiske in June 2022.	No inspection undertaken as clearing is exempt for structures.
	See earlier assessment in December 2021 (Mattiske Consulting Pty Ltd, January 2022).



	Actions
Photograph June 2022 (Mattiske)	Mattiske Summary
	Site 55/60 Ground-truth vegetation extent and determine need for clearing, as a cleared area is immediately to west.
Photograph June 2022 (Mattiske)	Mattiske Summary
	Site 55/60 The alignment occurs on the western side across the creek line. Only a couple of trees of <i>Eucalyptus rudis</i> and <i>Acacia acuminata</i> will require removal. The area is degraded and the understorey is dominated introduced grasses and herbs. Located at: Easting 528942: Northing 6236492 No sign of native fauna activity, although birds may forage at times.