













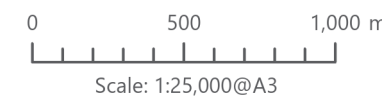
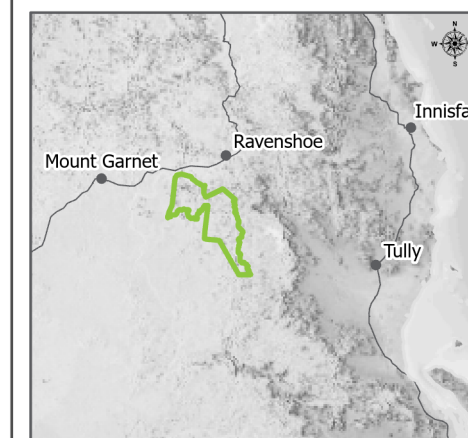


Chalumbin Wind Farm
Regional Ecosystems in the Project Area

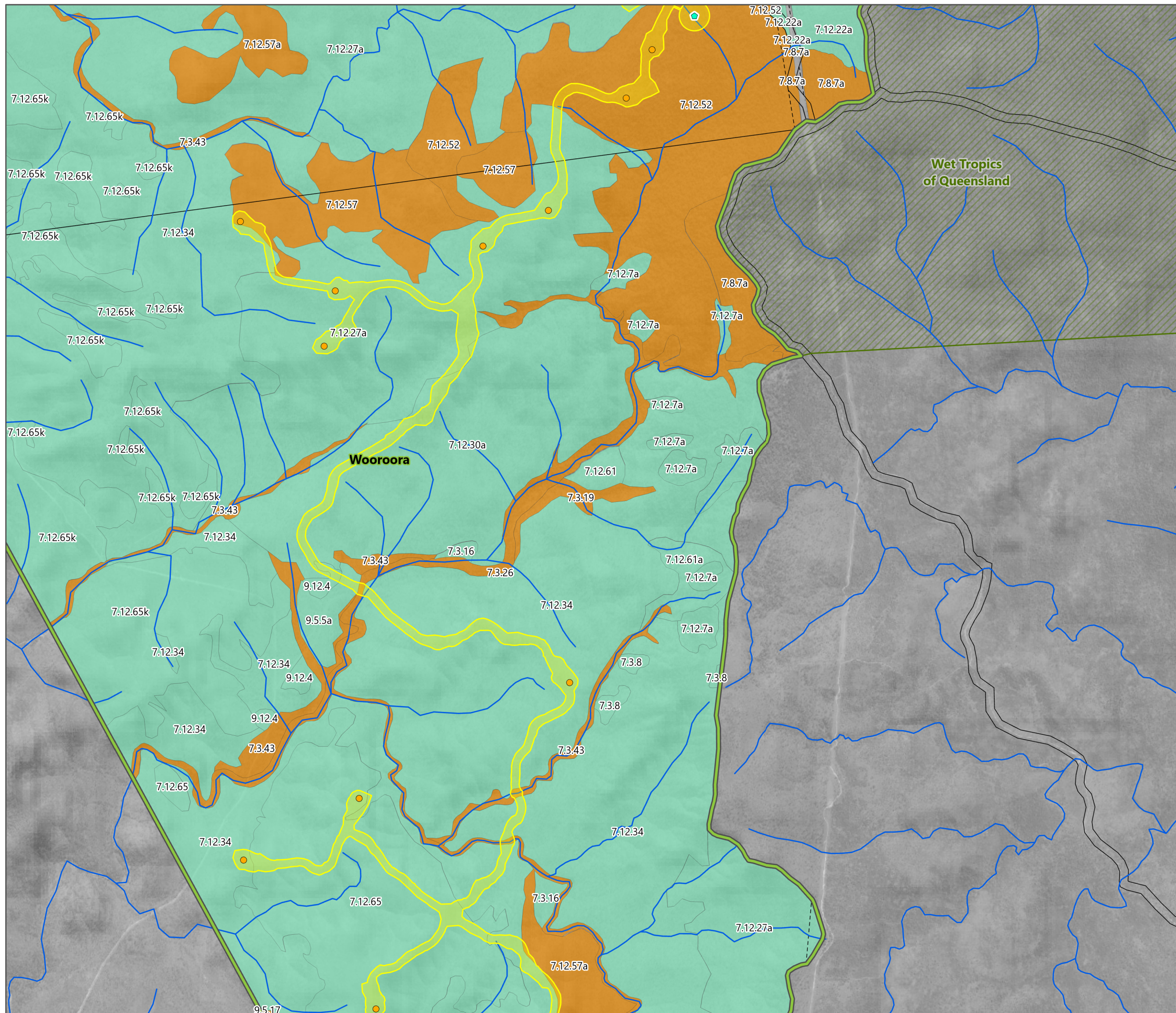
Figure 3.1 Sheet 7 of 8

-  Project Area Boundary
-  Study Area
-  Turbine
-  Met-mast
- Clearance Envelope
 -  Stage 1
 -  Stage 2
- Regional Ecosystem Mapping (Attexo 2021)
 -  Remnant vegetation containing endangered regional ecosystem
 -  Remnant vegetation containing of concern regional ecosystem
 -  Remnant vegetation containing least concern regional ecosystem
 -  Non Remnant
 -  Watercourse
 -  WTQ Boundary
 -  Lot Boundary
 -  Easement

Date: 17/10/2022 Author: TOD
Project: EPU-004 Reviewed: NOD

















Data Source(s):
Digital Cadastral Database - Department of Resources (2022)
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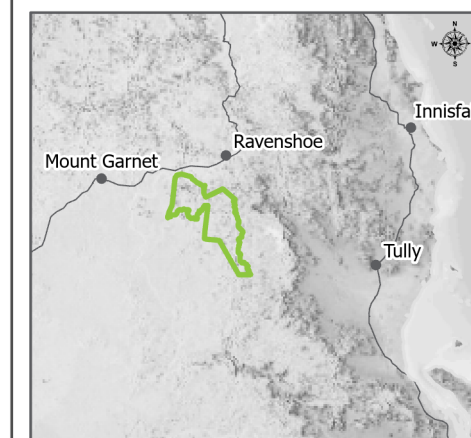
Chalumbin Wind Farm
Regional Ecosystems in the Project Area

Figure 3.1 Sheet 8 of 8

-  Project Area Boundary
-  Study Area
-  Turbine
-  Met-mast
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- Regional Ecosystem Mapping (Attexo 2021)**
-  Remnant vegetation containing endangered regional ecosystem
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Date: 17/10/2022
Project: EPU-004

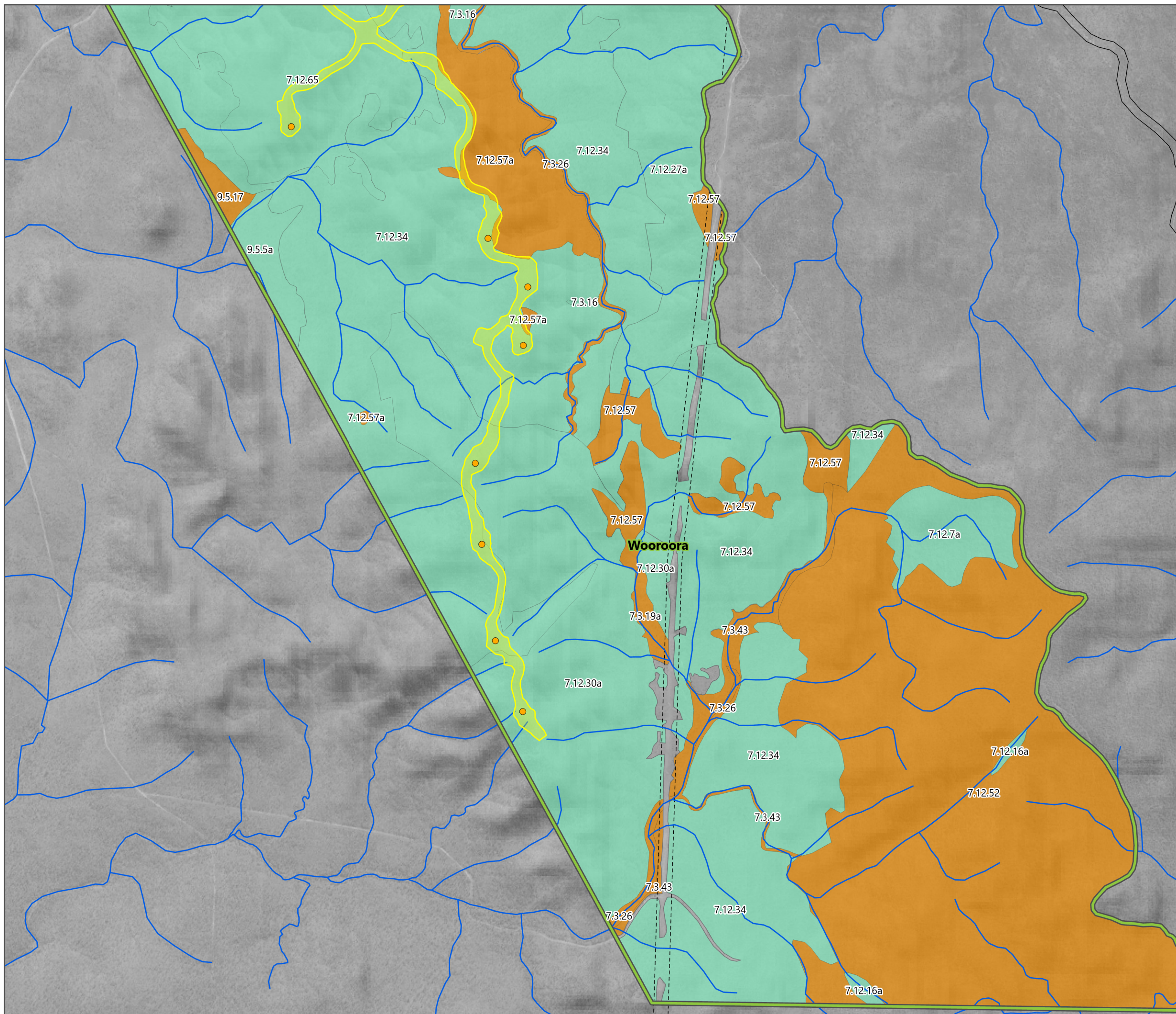
Author: TOD
Reviewed: NOD



0 500 1,000 m

Scale: 1:25,000@A3

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Field surveys confirmed the presence of four broad vegetation communities within the Project footprint, with their structural components and key characteristics described in **Table 3.2**. Patches of simple notophyll vine forest within the Project area will all be avoided by the Project footprint.

Table 3.2 Vegetation Communities in the Project Footprint

Vegetation Community	Description	Relevant RE
Open eucalypt woodland	Generally occur on igneous hills and/or granite or rhyolite uplands. These communities generally comprise scattered eucalypts and bloodwoods including white mahogany (<i>Eucalyptus portuensis</i>), Queensland stringybark (<i>E. reducta</i>), red mahogany (<i>E. resinifera</i>) and/or pink bloodwood (<i>Corymbia citriodora</i>). The understorey comprises shrubs and grasses including <i>Xanthorrhoea johnsonii</i> , <i>Grevillea spp.</i> , <i>Acacia spp.</i> and Kangaroo Grass (<i>Themeda triandra</i>) whilst trees range in heights from 2-30 m and canopy cover of 20-50 %. In most instances these communities support hollow-bearing trees.	9.12.2, 9.12.4, 9.5.5a, 7.3.8a, 7.3.43, 7.8.7a, 7.12.27ac, 7.12.29a, 7.12.30a, 7.12.34, 7.12.52, 7.12.57, 7.8.18 and 7.8.10
Riparian zones	These communities primarily consist of eucalypt woodlands on alluvium with occasional small sections of dry rainforest type communities fringing ephemeral drainage and creek lines. These communities typically consist of large forest red gums (<i>Eucalyptus tereticornis</i>) with sub-dominance of river she-oak (<i>Casuarina cunninghamiana</i>) and/or poplar gum (<i>E. platyphylla</i>). Canopy and mid-storey is fairly low with trees <20 m tall and shrubs 1-4 m.	9.3.15, 9.3.16, 7.3.26 and 7.3.43
Rocky pavement	Rocky pavement are characteristic of granite and rhyolite rock outcrop and associated with the dry western areas, often with shrublands to closed forests with vegetation communities dominated by <i>Acacia spp.</i> and/or <i>Lophostemon spp.</i> and/or <i>Allocasuarina spp.</i> and/or <i>Eucalyptus spp.</i>	7.12.65 and 7.12.66
Non-remnant vegetation	Primarily in proximity to the homesteads or agricultural infrastructure such as cattle yards and mostly consists of active grazing land with only pasture grasses remaining.	n/a

3.2 Threatened Flora Species

Protected plant trigger mapping (maintained by the Queensland Government) extends across parts of the Project footprint and identifies high-risk areas where EVNT plants are present or are likely to be present as shown in **Figure 3-2**. A number of specific protected plants surveys were undertaken in accordance with the *Flora Survey Guidelines – Protected Plants* (DES 2020) at discrete locations within high-risk trigger areas as part of the broader ecological surveys to support the Project and associated wind monitoring campaign. These areas relate to threatened flora associated with 'rocky pavement shrub complex' habitat which predominantly occurs on ridgelines within the Project area. GPS coordinates of detected species were recorded, a direct count (or estimate in high-density populations) was taken, population extent mapped, and specimens collected for verification by the Queensland Herbarium.

3.2.1 EVNT Flora

Field surveys and verification by the Queensland Herbarium confirmed the presence of five EVNT flora species within the Project area, as described below. The locations of these threatened flora observations are mapped in **Figure 3-3**.



3.2.1.1 *Prostanthera clotteniana*

Prostanthera clotteniana is listed as Critically Endangered under the EPBC Act and Endangered under the NC Act. Nine records were observed in the Project area, all within RE 7.12.65. Eight sites were within an area of approximately 130 ha on the Wooroora property, to the south of the existing powerline at altitudes between 780-790 m asl whilst one site was to the north of the existing powerline on the Wooroora property at 790 m asl.

3.2.1.2 *Triplarina nitichaga*

Triplarina nitichaga is listed as Vulnerable under the EPBC Act and NC Act. Eight records were observed, all within RE 7.12.65 in the northwest of the Glen Gordon property, in the area known as Arthur's Seat at altitudes of 840-875 m asl. Arthur's Seat is one of two previously documented populations of the species (DEWHA 2008a).

3.2.1.3 *Homoranthus porteri*

Homoranthus porteri is listed as Vulnerable under the EPBC Act and NC Act. The species was recorded 30 times during the various vegetation surveys across the Project area, all within RE 7.12.65. Records were observed in the northwest of Glen Gordon in the area of Arthur's Seat at altitudes of 830-860 m asl., on an adjacent ridgeline to the east of this area at an altitude of 920 m asl., and an area south and north of the existing powerline in the Wooroora property where *Prostanthera clotteniana* records occur. Extensive protected plant surveys were conducted along the ridgelines to the east of Arthur's Seat in the Project area, with individuals occurring in discrete pockets on the rocky pavements.

3.2.1.4 *Dodonaea uncinata*










Dodonaea uncinata is listed as Near Threatened under the NC Act and was confirmed present within the Project area. The species was observed 12 times all within RE 7.12.65 and the same area south and north of the existing powerline in the Wooroora property where *Prostanthera clotteniana* records occur.

3.2.1.5 *Coleus amoenus*

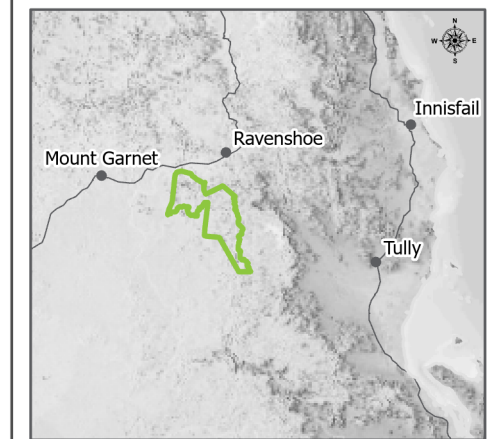
Coleus amoenus is listed as Vulnerable under the NC Act and was confirmed present within the Project area. The species was recorded 41 times during field surveys. Records were observed in the northwest of Glen Gordon east of the area of Arthur's Seat, and distributed throughout the Wooroora property but mostly concentrated in the area north and south of the existing powerline. Associated REs in both Wooroora and Glen Gordon where *Coleus amoenus* was found include RE 7.12.65, 7.12.52, 7.12.66 and 7.12.34.

Chalumbin Wind Farm
Protected Plant Trigger Mapping
within Project Area

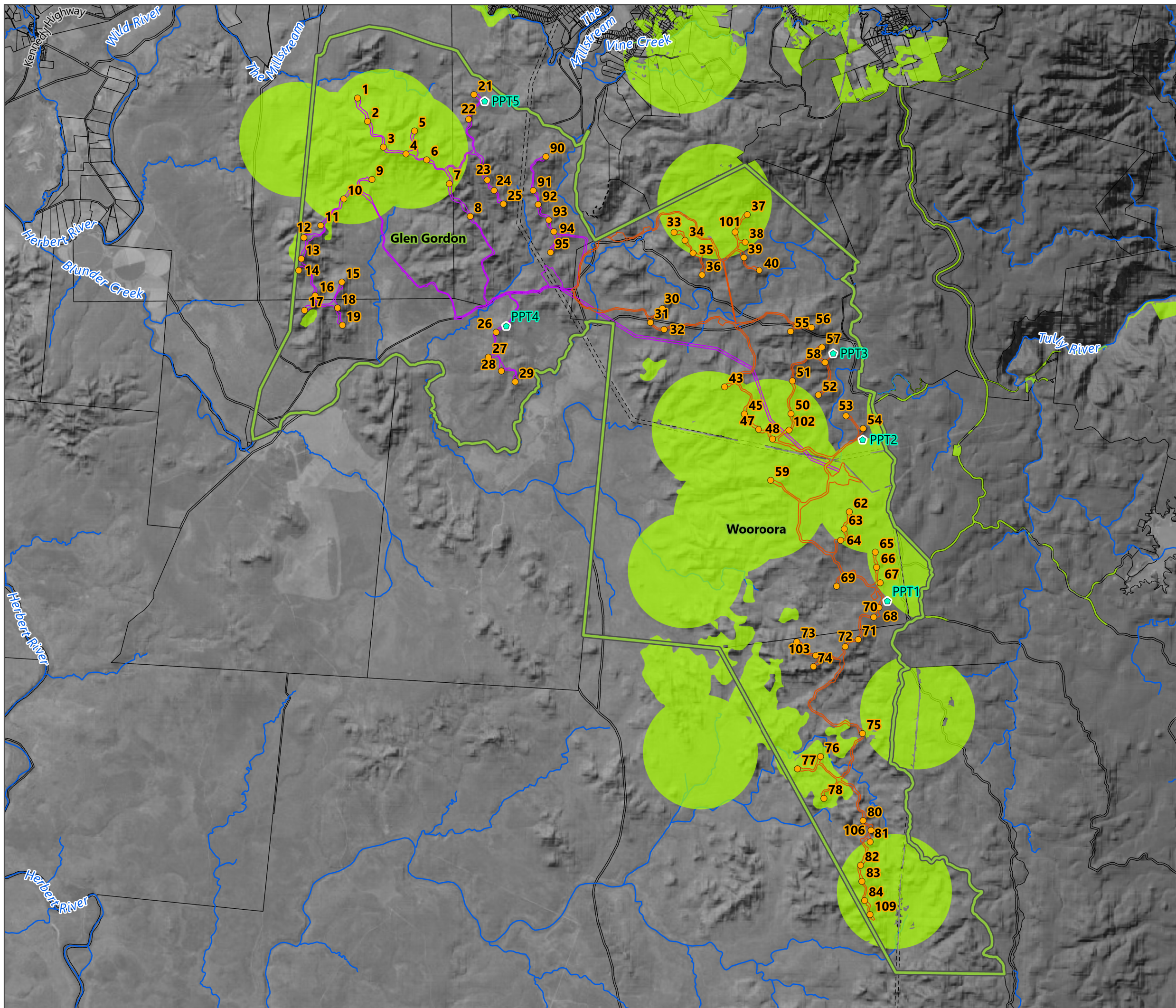
Figure 3.2

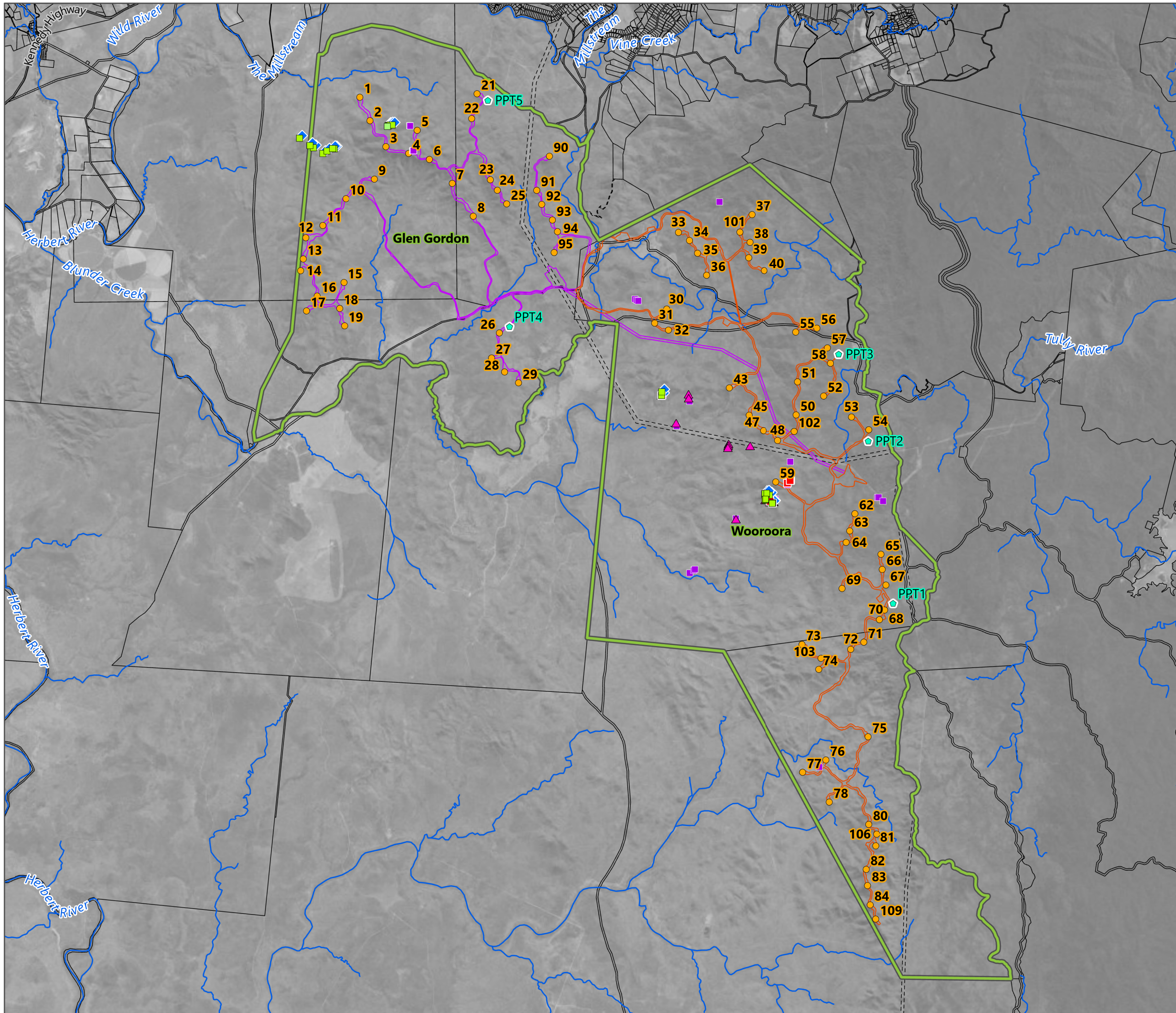
-  Project Area Boundary
-  Turbine
-  Met-mast
- Clearance Envelope**
-  Stage 1
-  Stage 2
-  Protected plants trigger map
-  Watercourse
-  Lot Boundary
-  Easement

Date: 17/10/2022 Author: TOD
Project: EPU-004 Reviewed: NOD



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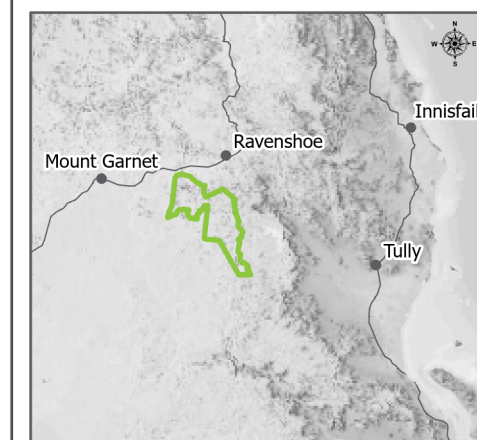
Chalumbin Wind Farm
 Threatened Flora Observations

Figure 3.3

- Project Area Boundary
- Turbine
- ◆ Met-mast
- Clearance Envelope**
- Stage 1
- Stage 2
- Homoranthus porteri Observation
- Prostanthera clotteniana Observation
- ◆ Triplarina nitchaga Observation
- ▲ Dodonaea uncinata Observation
- Coleus amoenus Observation
- Watercourse
- Lot Boundary
- Easement

Date: 17/10/2022
 Project: EPU-004

Author: TOD
 Reviewed: NOD



Scale: 1:125,000@A3

Data Source(s):
 Digital Cadastral Database - Department of Resources (2022)
 Earthstar Geographics, © State of Queensland (Department of Resources) 2022



3.3 Restricted and Prohibited Weed Species

Detailed weed mapping has not been undertaken within the Project area; however, field surveys did record the presence of *Lantana camara* (a category 3 weed under the *Biosecurity Act 2014* and a Weed of National Significance) along alluvial zones and in moist gullies.

Under the *Biosecurity Act 2014*, persons in possession of a Restricted Matter must not do the following:

- Category 3 – a person who has, or has a thing infested with, the Restricted Matter in the person's possession or under the person's control must not distribute or dispose of the restricted matter unless the distribution or disposal is carried out via the methods set out in the *Biosecurity Act 2014*.



4.0 Impacts and Risks

CWF will avoid impacts to native vegetation communities and EVNT flora species to the greatest extent practicable (refer to **Section 5.0**). Mitigation actions proposed in this VMP will follow sequential actions of avoiding, minimising and mitigating any potential impacts on native vegetation and will be applied at all stages of the Project. Where impacts cannot be avoided, mitigation and management measures will be implemented to reduce residual impacts to the lowest extent practicable. Detailed design and targeted field surveys will inform micro-siting of infrastructure to reduce the extent of clearing required for the Project. It is anticipated final design and results from additional surveys can reduce the extent of clearing described in this VMP.

4.1 Vegetation Communities

Throughout the construction phase, the Project has the potential to impact vegetation communities through:

- Loss of breeding, foraging and sheltering habitat and microhabitat features for native fauna such as tree hollows, coarse woody debris, complex rock fissures and outcrops, and leaf litter;
- Habitat fragmentation;
- Land degradation through increased erosion and sedimentation processes;
- Introduction and spread of pest flora and fauna;
- Altering natural fire regimes that can change the ecological function and structure of vegetation communities and be harmful for native fauna.

Approximately up to 1,049.6 ha of remnant vegetation is required to be cleared for the Project. **Table 4.1** provides the REs ground-truthed within the Project footprint and the total area that is required for clearing.

Table 4.1 GTRE Within the Project Footprint

RE Code	Description	Stage 1 (ha)	Stage 2 (ha)	Total (ha)
Of Concern				
7.3.26	<i>Casuarina cunninghamiana</i> woodland to open forest on alluvium fringing streams.	3.7	0.5	4.3
7.3.43	<i>Eucalyptus tereticornis</i> open forest to woodland on uplands on well-drained alluvium	3.5	0.1	3.6
7.12.52	<i>Eucalyptus resinifera</i> , <i>Corymbia intermedia</i> , <i>Allocasuarina littoralis</i> , <i>Syncarpia glomulifera</i> , <i>E. drepanophylla</i> +/- <i>E. reducta</i> woodland on granite and rhyolite in the dry to moist rainfall zone	117.6		117.6
7.12.57	Shrubland and low woodland mosaic with <i>Syncarpia glomulifera</i> , <i>Corymbia abergiana</i> , <i>Eucalyptus portuensis</i> , <i>Allocasuarina littoralis</i> and <i>Xanthorrhoea johnsonii</i> on uplands and highlands on granite.	4.4		4.4
7.12.57a	Shrubland and low woodland mosaic with <i>Syncarpia glomulifera</i> , <i>Corymbia abergiana</i> , <i>Eucalyptus portuensis</i> , <i>Allocasuarina littoralis</i> and <i>Xanthorrhoea johnsonii</i> . Uplands and highlands on granite and rhyolite, of the moist and dry rainfall zones.	23.9	0.7	24.6



RE Code	Description	Stage 1 (ha)	Stage 2 (ha)	Total (ha)
7.12.66	<i>Lophostemon confertus</i> (brush box) low shrubland or low to medium closed forest. Exposed rocky slopes on granite and rhyolite.	0.6	22.5	23.1
Least Concern				
7.3.16	<i>Eucalyptus platyphylla</i> woodland to open forest on alluvial plains. Gently sloping to flat, moderately to poorly drained alluvial lowlands, foot slopes and piedmont fans.		1.1	1.1
7.12.27a	<i>Eucalyptus reducta</i> medium open forest and woodland. Uplands and highlands on shallow granitic and rhyolitic soils, of the moist rainfall zone.	135.7	14.6	150.2
7.12.27c	<i>Eucalyptus resinifera</i> and <i>Syncarpia glomulifera</i> open woodland. Uplands and highlands on shallow granitic and rhyolitic soils, of the moist rainfall zone.	76.6	34.3	110.9
7.12.29a	<i>Corymbia intermedia</i> , <i>Eucalyptus tereticornis</i> , <i>E. drepanophylla</i> open forest to low open forest and woodland with <i>Allocasuarina torulosa</i> , <i>A. littoralis</i> , <i>Lophostemon suaveolens</i> , <i>Acacia cincinnata</i> , <i>A. flavescens</i> , <i>Banksia aquilonia</i> and <i>Xanthorrhoea johnsonii</i> . Uplands, on granite and rhyolite.	11.7		11.7
7.12.30a	<i>Corymbia citriodora</i> , <i>Eucalyptus portuensis</i> , <i>C. intermedia</i> , <i>Syncarpia glomulifera</i> woodland to low woodland to open forest with <i>Callitris intratropica</i> , <i>Acacia calyculata</i> and <i>Xanthorrhoea johnsonii</i> . Uplands and highlands, of the moist and dry rainfall zones.	24.5	28.7	53.2
7.12.34	<i>Eucalyptus portuensis</i> and/or <i>E. drepanophylla</i> +/- <i>C. intermedia</i> +/- <i>C. citriodora</i> , +/- <i>E. granitica</i> open woodland to open forest on uplands on granite	166.6	28.4	195
7.12.65	Rock pavement or areas of skeletal soil on granite and rhyolite of dry western or southern areas +/- shrublands to closed forests of <i>Acacia</i> spp. and/or <i>Lophostemon suaveolens</i> and/or <i>Allocasuarina littoralis</i> and/or <i>Eucalyptus lockyeri</i> subsp. <i>exuta</i> .	22.4		22.4
7.12.65k	Granite and rhyolite rock outcrop, of dry western areas, associated with shrublands to closed forests of <i>Acacia</i> spp. and/or <i>Lophostemon</i> spp. and/or <i>Allocasuarina</i> spp. In the Mount Emerald area, shrubs may include <i>Acacia umbellata</i> , <i>Melaleuca borealis</i> , <i>Homoranthus porteri</i> , <i>Leptospermum neglectum</i> , <i>Melaleuca recurva</i> , <i>Melaleuca uxorum</i> , <i>Grevillea glossadenia</i> , <i>Corymbia abergiana</i> , <i>Eucalyptus lockyeri</i> , <i>Sannantha angusta</i> , <i>Pseudanthus ligulatus</i> subsp. <i>ligulatus</i> , <i>Acacia aulacocarpa</i> , <i>Leptospermum amboinense</i> , <i>Xanthorrhoea johnsonii</i> and <i>Jacksonia thesioides</i> . Ground-cover species may include <i>Borya septentrionalis</i> , <i>Lepidosperma laterale</i> , <i>Eriachne</i> spp., <i>Cleistochloa subjuncea</i> , <i>Boronia occidentalis</i> , <i>Cheilanthes</i> spp., <i>Coronidium newcastlianum</i> , <i>Schizachyrium</i> spp., <i>Tripogon loliiformis</i> , <i>Gonocarpus acanthocarpus</i> and <i>Eragrostis</i> spp. Dry western areas. Granite and rhyolite.		4.7	4.7



RE Code	Description	Stage 1 (ha)	Stage 2 (ha)	Total (ha)
9.3.15	Fringing woodland to open forest containing any combination of <i>Casuarina cunninghamiana</i> , <i>Eucalyptus tereticornis</i> and <i>E. platyphylla</i> +/- <i>Lophostemon suaveolens</i> +/- <i>Nauclea orientalis</i> +/- <i>Corymbia tessellaris</i> +/- <i>C. clarksoniana</i> . There is often a low sub-canopy layer which can include canopy species and <i>Ficus</i> spp. The open shrub layer contains juvenile canopy species and can include mesic species such as <i>Euroschinus falcatus</i> , <i>Acacia mangium</i> and <i>Syzygium</i> sp. The ground layer is medium to dense grassy and contains <i>Imperata cylindrica</i> , <i>Crotalaria</i> sp., <i>Heteropogon contortus</i> , <i>Cyperus</i> spp. and <i>Paspalum</i> spp. Occurs on stream banks and channels in areas of higher rainfall in the central east of the bioregion.		3.6	3.6
9.3.16	<i>Eucalyptus tereticornis</i> and/or <i>E. platyphylla</i> and/or <i>Corymbia clarksoniana</i> woodland on alluvial flats, levees and plains.		8.5	8.5
9.5.5a	Mixed woodland to open forest of <i>Eucalyptus crebra</i> (narrow-leaved ironbark), <i>Corymbia clarksoniana</i> (Clarkson's bloodwood) and <i>C. citriodora</i> subsp. <i>citriodora</i> (lemon-scented gum) +/- <i>E. portuensis</i> (white mahogany) with a generally open sub-canopy of canopy species +/- <i>Callitris intratropica</i> (cypress pine) and <i>Acacia</i> spp. The open shrub layer often contains juvenile canopy species, <i>Petalostigma pubescens</i> (quinine), <i>Acacia flavescens</i> (powder puff wattle) and other <i>Acacia</i> spp. <i>Themeda triandra</i> (kangaroo grass) is the dominant species in a dense grassy ground layer. Occurs on Tertiary plateaus and remnants.	0.9	7.2	8.1
9.12.2	<i>Eucalyptus portuensis</i> , <i>Corymbia citriodora</i> subsp. <i>citriodora</i> , <i>E. granitica</i> or <i>E. crebra</i> , <i>C. intermedia</i> or <i>C. clarksoniana</i> mixed woodland on steep hills and ranges on igneous hills close to Wet Tropics boundary	6.6	295.1	301.6
9.12.4	Low open woodland to woodland of <i>Eucalyptus shirleyi</i> +/- <i>Corymbia peltate</i> +/- <i>Callitris intratropica</i> . The mid layer varies from absent to a mid-dense sub-canopy and/or shrub layer and the ground layer is dense and grassy. Occurs predominantly on sandy shallow soils derived from igneous rocks on rolling low hills to hills.	0.9		0.9
Total		599.5	450.1	1,049.6

4.2 EVNT Flora

Field surveys identified five EVNT flora species within the Project area; *Homoranthus porteri*, *Prostanthera clotteniana*, *Triplarina nitchaga*, *Coleus amoenus* and *Dodonaea uncinata*. No direct or indirect impacts will occur to *Homoranthus porteri*, *Prostanthera clotteniana*, *Triplarina nitchaga* and *Dodonaea uncinata* as there are no individuals located within the Project footprint, and additional measures will be taken to ensure no indirect impacts occur to these populations. There is a known *Coleus amoenus* population located within the Project footprint near proposed WTG4 in the Glen Gordon property. Protected plant surveys undertaken in accordance with the NC Act requirements will determine the extent of the Project's proposed impacts on *Coleus amoenus*.



4.3 Invasive Flora

Clearing activities, unregulated vehicle movement and equipment sourced from regions beyond the Project area have the potential to introduce and spread weeds into currently unaffected areas within the Project area. *Lantana camara* is present along alluvial zones and in moist gullies within the Project footprint. Seeds and fruits have the potential to be spread by clearing activities and vehicle movement, whilst establishment into new areas is highly likely after heavy rainfall as several thousand seeds can be produced per square metre that can remain viable for several years. *Lantana camara* degrades habitat as it forms dense thickets that smother and kill native vegetation and inhibits fauna dispersal, whilst its thin, combustible canes can create hotter bushfires that alter native vegetation communities and pastures. The spread of weeds is also a risk during ongoing operational activities associated with the Project.

4.4 Land Degradation

Construction activities such as excavations and earthmoving associated with construction of the turbine pads and access roads have the potential to cause land degradation through erosion and sedimentation. This can lead to a reduction in water quality and changes to water flows. Accidental releases of hazardous materials such as fuels and oils from vehicles and machinery have the potential to lead to localised soil contamination and contamination of water resources, degrading aquatic habitat quality in the Project area. The volume of such substances being used and stored on site during operation will be significantly less than during construction, with a corresponding reduction in risk.

4.5 Bushfire

The increased presence of construction vehicles and personnel in the Project area may increase fire risk through the use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation. Changes in the natural fire regime may result in changes in the species composition and/or structure of the vegetation. There will be fewer Project vehicles on site during operation than during construction, with a corresponding reduced risk of bushfire.



5.0 Impact Avoidance, Management and Mitigation

5.1 Avoidance

Ecological surveys of the Project area commenced at an early stage during Project design, and as such the results of the surveys have been able to significantly inform the Project layout. Central to this process was ensuring that areas of higher ecological significance were avoided to the greatest practical extent, taking into consideration the challenging terrain and wind resource requirements. These avoidance measures are described in the Project EAR (Attexo 2021a) and the Public Environment Report.

5.2 Minimisation and Mitigation

Where impacts on native vegetation cannot be avoided during construction and operational Project stages, mitigation and management measures will be implemented to reduce residual impacts to the lowest extent practicable. To minimise impacts to vegetation communities and threatened flora in the Project footprint, management and mitigation actions have been proposed for the relevant Project stage and outlined in **Table 5.1**.

Table 5.1 Management and mitigation actions for vegetation clearing

Impact	Management/mitigation actions	Monitoring	Corrective actions
Construction Phase			
Habitat loss	<ul style="list-style-type: none"> Pre-clearance surveys by suitably qualified ecologist will be completed to: <ul style="list-style-type: none"> Identify EVNT flora within the Project footprint Identify EVNT flora within 100 m of the Project footprint Identify habitat features to be marked and inspected before clearing by Fauna Spotter/Catcher (i.e. tree hollows, complex rock fissures and cracks, fallen hollow logs) (more detail in the <i>Fauna Management Plan</i> (Attexo 2021b)) Clearly delineate clearing boundaries and 'no-go' zones with flagging tape or fluorescent marker to avoid unnecessary clearing and to ensure personnel and vehicle stay within the approved footprint <ul style="list-style-type: none"> Maps and GIS to be provided to contractors Construction compounds, temporary and permanent offices, workshops and amenities to be placed in existing cleared areas where practicable 	<ul style="list-style-type: none"> Inspection and monitoring of clearing activities and that clearing has been undertaken in approved boundaries Clearing will not commence unless the Fauna Spotter/Catcher is present on site Fauna Spotter/Catcher will monitor vegetation clearing to ensure no fauna are harmed and Sequential Clearing Method is implemented 	<ul style="list-style-type: none"> Inspect and repair damaged fencing; replace any flagging tape or respray fluorescent marker Where clearing has occurred outside of clearing boundary, this must be recorded and investigated Assessment of temporarily disturbed areas and revegetation implemented as required If any new threatened species, communities and associated habitat are identified, DES will be notified and consulted on any requirement for an additional permit or amendment to this Plan Fauna injuries or deaths as a result of clearing



Impact	Management/mitigation actions	Monitoring	Corrective actions
	<ul style="list-style-type: none"> ● Widths of access roads to be minimum extent where practicable ● All clearing activities will not commence unless a suitably qualified Fauna Spotter/Catcher is present, clearing will follow the Sequential Clearing Method (see Section 5.2.2) and the following measures employed: <ul style="list-style-type: none"> – Vegetation clearing will be limited to those areas required for earthworks and construction of the Project – Temporarily disturbed areas will be rehabilitated to pre-disturbance – Access roads will be aligned along approved or existing routes, tracks, firebreaks and cleared areas wherever practicable to minimise vegetation removal and loss of hollow-bearing trees, as well as to avoid additional disturbance through GBR wetland protected areas – Turbine locations will be micro-sited within the Project corridor, where conditions and wind resource allow, to take advantage of areas of lower ecological significance – Overhead transmission lines will be limited in width to that required for construction and required firebreaks 		<p>must be reported to DES and investigated (more detail in the <i>Fauna Management Plan</i> (Attexo 2021b))</p>
Habitat fragmentation	<ul style="list-style-type: none"> ● Access tracks will be limited to already existing and approved routes and tracks, firebreaks and cleared areas ● Temporary and permanent infrastructure to be placed in existing cleared areas ● Widths of access roads to be minimum extent where practicable, particularly watercourse crossings to maintain connectivity along riparian corridors ● Clearing activities to following Sequential Clearing Method, specifically: <ul style="list-style-type: none"> – Retaining habitat trees to form stepping stones for wildlife dispersal 	<ul style="list-style-type: none"> ● Inspection and monitoring of clearing activities and that clearing has been undertaken in approved boundaries ● Clearing will not commence unless the Fauna Spotter/Catcher is present on site ● Fauna Spotter/Catcher will monitor vegetation clearing to ensure no fauna are harmed and Sequential Clearing Method is implemented 	<ul style="list-style-type: none"> ● Inspect and repair damaged fencing; replace any flagging tape or respray fluorescent marker ● Where clearing has occurred outside of clearing boundary, this must be recorded and investigated ● Assessment of temporarily disturbed areas and revegetation implemented as required ● If any new threatened species, communities and associated habitat



Impact	Management/mitigation actions	Monitoring	Corrective actions
			<p>are identified, DES will be notified and consulted on any requirement for an additional permit or amendment to this Plan</p> <ul style="list-style-type: none"> • Fauna injuries or deaths as a result of clearing must be reported to DES and investigated (more detail in the FMP)
Land degradation	<ul style="list-style-type: none"> • A CEMP including a certified Erosion and Sediment Control Plan (ESCP) has been developed and describes erosion and sediment control measures to be implemented during clearing, such as: <ul style="list-style-type: none"> – Access tracks will be constructed in accordance with <i>Erosion control on property roads and tracks – managing runoff</i> (Queensland Government 2013) – Creek crossing locations will seek to take advantage of existing gaps in the riparian corridors as far as practicable. Work in these areas will take place in periods of no flow where the schedule permits – Constructed access tracks (i.e. culverts or splash through crossings) must be provided with a scour apron and cut off wall on the downstream side sufficient to prevent bed erosion • Equipment to be maintained to minimise risk of spill or leakage • Materials to be stored in bunded areas with a storage capacity of 110 % of the storage vessel. Floors and walls of bunding will be lined with impermeable material and must be adequately protected from rainfall and stormwater • Refuelling should not take place within 50 m of a watercourse • Spill control materials (i.e. booms, absorbents) will be maintained on site, commensurate with the types and volumes of materials in use, and in place where hazardous materials are stored or used 	<ul style="list-style-type: none"> • Daily dust suppression monitoring during clearing and construction • Daily weather observation monitoring during clearing and construction • Weekly erosion and sediment measure control checks to monitor performance and effectiveness • Quarterly monitoring of rehabilitation of temporary construction areas for a period of 12 months to monitor native vegetation regeneration progress, presence of weeds or other disturbance 	<ul style="list-style-type: none"> • If appropriate, cease works until weather passes to minimise sediment runoff and dust • Implement additional erosion and sediment control measures if existing controls are ineffective • Notify government bodies of any spills or leakages and implement management as required



Impact	Management/mitigation actions	Monitoring	Corrective actions
	<ul style="list-style-type: none"> ● Spill control induction and training provided to all personnel ● Design on site infrastructure to ensure water flows are not impounded or concentrated ● No material or equipment to be stored across flow paths ● Waterway crossings to be designed in accordance with development requirements for waterway barrier works to ensure fish passage is not impeded ● Watercourse crossings must be designed to maintain flow and minimise the increase in flow volume or velocity ● Routine dust suppression during construction ● Temporary construction areas will be rehabilitated as soon as practicable following completion of construction 		
Bushfire	<ul style="list-style-type: none"> ● As part of the construction planning a certified Bushfire Management Plan will be prepared prior to any clearing activities and implemented on site ● For 'hot-work' activities, a risk assessment will be completed considering forecast weather, fire hazard ratings and site conditions ● Vehicles may not idle or be parked in areas of long grass ● Access tracks, fencelines and cleared overhead powerline easements will be regularly maintained and used as firebreaks within the Project area ● Smoking is prohibited on site ● Fuel loads across the Project area will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management 	<ul style="list-style-type: none"> ● Monthly assessment of fuel loads ● During construction phase and bushfire season, the fire danger status will be monitored daily through the Rural Fire Service website 	<ul style="list-style-type: none"> ● An Emergency Response Plan will be implemented should an uncontrolled fire event occur ● If fuel loads have increased following heavy rainfall, control methods will be implemented as required (i.e. weed control or cool burns) ● Prescribed burns are to be conducted based on present fuel load and ecosystem (Peeters and Butler 2014)
Introduction and spread of weeds	<ul style="list-style-type: none"> ● Pre-clearance surveys will be implemented to identify weeds, and large infestations will be treated to prior to clearing to minimise the spread of weed seed 	<ul style="list-style-type: none"> ● Record all weed species present in pre-clearance surveys, and confirm infested areas to be treated 	<ul style="list-style-type: none"> ● Increase Hygiene Control requirements if vehicles or equipment are found to introduce or spread new weeds



Impact	Management/mitigation actions	Monitoring	Corrective actions
	<ul style="list-style-type: none"> ● Weed mapping will be developed to identify localities of existing weeds within and adjacent to the Project area ● Hygiene Control (see section 5.1) will be implemented to reduce the spread of weed from infested sites ● Vehicle access restricted to existing roads and tracks ● Any materials required for restoration or road maintenance must be certified weed and disease free (i.e. Weed Hygiene Declaration) ● Use of herbicides to be applied by appropriately trained and qualified persons ● Weed management will occur across the Project site to ensure weed cover and abundance does not increase, particularly along edges of access roads and turbine pads 	<ul style="list-style-type: none"> ● Regular auditing of Hygiene Control implementation ● Weed Hygiene Declaration to be checked for all material brought onto site 	<ul style="list-style-type: none"> ● Increase weed control efforts where required (i.e. after heavy rainfall) or if current controls ineffective
<p>Loss of threatened flora – directly or indirectly (i.e. dust, sediment runoff)</p>	<ul style="list-style-type: none"> ● Pre-clearance surveys will record: <ul style="list-style-type: none"> – EVNT flora within the Project footprint – EVNT flora within 100 m of the Project footprint ● Any translocation of EVNT that occur within the Project footprint will occur under an approved Translocation Plan ● No clearing of EVNT flora is to occur without appropriate permits in place for their removal ● Cleared vegetation or soil is not be stockpiled within 100 m of EVNT flora outside the Project footprint and if required temporary exclusion fencing should be erected around EVNT to provide protection from further damage ● Vehicles and machinery to stay on designated access roads and laydowns to avoid impacting EVNT flora ● Erosion and sediment control measures are to be implemented to avoid runoff impacting on retained EVNT flora ● Dust mitigation measures to be implemented to ensure EVNT plants in 	<ul style="list-style-type: none"> ● Regular inspection and monitoring of erosion and sediment control measures to assess performance and that EVNT are not being impacted ● Inspect retained EVNT flora within 100 m of Project footprint are not impacted by dust, sediment or other indirect construction actions ● Monitoring and performance assessment of any translocated EVNT following approved translocation plan, as required 	<ul style="list-style-type: none"> ● Implement additional erosion and sediment control measures if existing measures ineffective in protecting EVNT ● Establish further exclusion zones if EVNT flora show signs of damage or poor survivorship ● Implement corrective actions provided in approved translocation plan as required



Impact	Management/mitigation actions	Monitoring	Corrective actions
	adjacent areas to access roads and earthworks are not impacted by dust deposition		
Operation Phase			
Land degradation	<ul style="list-style-type: none"> An Operational Environmental Management Plan (OEMP) will be developed and will include erosion and sediment controls to be implemented during the operations phase Temporary construction areas will be rehabilitated as soon as practicable following completion of construction Erosion and sediment control measures are to be implemented to avoid runoff impacting on retained EVNT flora Dust mitigation measures to be implemented to ensure dust deposition from earthworks and adjacent roads do not impact EVNT flora 	<ul style="list-style-type: none"> 6 monthly assessment of erosion and sediment loads 	<ul style="list-style-type: none"> Where erosion and sediment levels exceed acceptable limits, the incident will be recorded and investigated
Bushfire	<ul style="list-style-type: none"> Continue implementation of the Bushfire Management Plan Vehicles may not idle or park in areas of long grass Access tracks, fencelines and cleared overhead powerline easements will be regularly maintained and used as firebreaks within the Project area during construction and operation stages Smoking is prohibited on site Fuel loads across the Project area will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management 	<ul style="list-style-type: none"> Monthly assessment of fuel loads 	<ul style="list-style-type: none"> An Emergency Response Plan will be implemented should an uncontrolled fire event occur If fuel loads have increase following heavy rainfall, control methods will be implemented as required (i.e. weed control or cool burns) Prescribed burns are to be conducted based on present fuel load and regional ecosystem (Peeters and Butler 2014)
Introduction and spread of weeds	<ul style="list-style-type: none"> Hygiene Control (see Section 5.2.1) will be implemented to reduce the spread of weed from infested sites Vehicle access restricted to existing roads and tracks Any materials required for restoration or road maintenance must be certified weed and disease free (i.e. Weed Hygiene Declaration) 	<ul style="list-style-type: none"> Record all weed species present in pre-clearance surveys, and confirm infested areas to be treated Regular auditing of Hygiene Control implementation 	<ul style="list-style-type: none"> Increase Hygiene Control requirements if vehicles or equipment are found to introduce or spread new weeds Increase weed control efforts where required (i.e. after heavy rainfall) or if current controls ineffective



Impact	Management/mitigation actions	Monitoring	Corrective actions
	<ul style="list-style-type: none"> Use of herbicides to be applied by appropriately trained and qualified persons Weed management will occur across the Project site to ensure weed cover and abundance does not increase, particularly along edges of access roads and turbine pads 	<ul style="list-style-type: none"> Weed Hygiene Declaration to be checked for all material brought onto site 	
Loss of threatened flora – directly or indirectly (i.e. dust, sediment runoff)	<ul style="list-style-type: none"> Vehicles and machinery to stay on designated access roads and laydowns to avoid impacting EVNT flora Erosion and sediment control measures are to be implemented to avoid runoff impacting on retained EVNT flora Dust mitigation measures to be implemented to ensure EVNT plants in adjacent areas to access roads and earthworks are not impacted by dust deposition 	<ul style="list-style-type: none"> Regular inspection and monitoring of erosion and sediment control measures to assess performance and that EVNT are not being impacted Inspect retained EVNT flora within 100 m of Project footprint are not impacted by dust, sediment or other indirect construction actions Monitoring and performance assessment of any translocated EVNT following approved translocation plan, as required 	<ul style="list-style-type: none"> Implement additional erosion and sediment control measures if existing measures ineffective in protecting EVNT Establish further exclusion zones if EVNT flora show signs of damage or poor survivorship Implement corrective actions provided in approved translocation plan, as required

5.2.1 Hygiene Control

It is critical that new or existing weeds (such as *Lantana camara*) are not introduced and spread into unaffected areas, especially the transfer of weeds from the Project area into surrounding National Parks and properties. Invasive weeds are the primary focus for control measures; however, other pests and diseases may indirectly be introduced and spread therefore require hygiene procedures, as necessary.

Strict weed hygiene strategies to avoid the spread of seeds from infested areas will include:

- All vehicles and machinery are to be washed down at an appropriate washdown facility regularly during works, especially when transferring between sites and when working in areas where weed infestations are known. A washdown bay will be provided on site and the location will be clearly identified for all personnel to use.
- All vehicles and machinery are to be certified weed free before commencing work on site (Weed Hygiene Declarations);
- All clothing, shoes and other equipment are to be cleaned regularly between activities, especially when leaving an area and starting work in a new area, and before leaving known weed infested areas;
- Soil, gravel or fill from infected areas should not be moved to uncontaminated areas, unless absolutely necessary;



- Appropriate waste disposal system: strategies or facilities to contain contaminated materials and disposal away from adjacent native vegetation and waterways; and
- Training and inductions are to be provided for contractors and workers about the importance of weed control, including a briefing on appropriate hygiene measures.

Decontamination practices will be routine for all personnel upon entering the site, when working within a known contaminated area within the site, and prior to exiting the contaminated area. To reduce the transfer of weed vegetation, seed, mud or soil material, the following decontamination procedure at washdown bays is recommended:

- Preparation for decontamination:
 - Position vehicle/equipment safely and ensure stability (i.e. brakes applied);
 - Remove excessive debris (i.e. mud, branches) for appropriate disposal using a dry cleaning method before wet where possible (e.g. scrape off mud before pressure hose applied); and
 - Detach removal items or parts and decontaminate individually.
- Decontamination of external surfaces:
 - Start top-down of vehicle or equipment;
 - Vehicles and equipment with moving parts (i.e. wheels, trays, buckets) will need to be removed to access all areas;
 - Wet decontamination procedure: apply disinfectant/detergent and leave for appropriate contact time (usually 10 minutes) then rinse with clean water; and
 - If other techniques e.g. heat, fumigation for tools, equipment and other things are required, ensure exposure requirements are met as required by disease/pest guidelines.
- Decontamination of internal surfaces (only necessary if internal surfaces are exposed to potential contamination while on site):
 - Protective covers (i.e. seat covers, dash covers) will be removed and cleaned or appropriately disposed of;
 - Remove solid materials with a vacuum, cloth or brush; and
 - Air filters will be removed, replaced and cleaned (technician may be required).
- Surfaces can be wiped or sprayed with 70% alcohol or another appropriate disinfectant.

5.2.2 Sequential Clearing Method

The suitably qualified ecologist on site will be made aware of any vegetation clearance and maintenance activities so that appropriate post-clearance rehabilitation and restoration can be undertaken and will be responsible for monitoring these activities. Damage to vegetation intended to be retained will be assessed by the suitably qualified ecologist on site, recorded in a non-conformance report and the appropriate management strategy for repair or revegetation implemented.

Where any clearing is required it will be done as part of sequential clearing as follows:



- 1.** Removal of understorey vegetation and smaller juvenile trees only. Juvenile trees are under 4 m in height or diameter at breast height (DBH) less than 31.5 cm at 1.3 m above the ground. No hollow-bearing trees are to be cleared during this stage.
- 2.** After 48 hours, the remaining larger trees including those with hollows can be cleared. Trees with small hollows will be cleared using the “slow drop” method. The tree be brought down slowly by the machine and mulch put underneath to soften the fall. The Fauna Spotter/Catcher will then complete an inspection to ensure no wildlife remain in the hollow. Where practicable, fauna will be caught and released into suitable habitat once clearing has stopped.
 - a.** If any fauna are injured they will be taken to the nearest local vet/wildlife carer for treatment.
- 3.** Clearing should be done in such a way that fauna are given the opportunity to disperse once clearing has commenced under their own volition. This will be done through:
 - a.** No habitat trees will be isolated (either singly or in groups);
 - b.** Dispersal corridors will be formed to link vegetation being cleared to adjacent areas of retained habitat (i.e. single row of trees no more than 30-40 m apart).
- 4.** Fell trees away from retained areas of vegetation where practicable. Where trees unavoidably fall into retained areas, leave in-situ to mimic natural tree fall and provide habitat for ground-dwelling fauna.
- 5.** Micro-habitats (i.e. hollow logs and branches, rocks) will be moved into adjacent habitat.



6.0 Compliance

6.1 Roles and Responsibilities

All personnel involved are responsible for working in accordance with this VMP and are required to identify potential environmental impacts and implement and maintain control measures, procedures, and constraints accordingly.

6.2 Adaptive Approach to Management

To maintain relevance and effectiveness, this VMP will require review and amendment throughout the life of the Project to ensure that measures within the document remain effective. It is recommended that this document be reviewed and updated as required, for example:

- If there is a modification of the Project schedule, design or construction methods;
- If performance criteria are not being met and additional measures are required to minimise impact to vegetation communities and EVNT flora; or
- If a legislative change or modification of best practice methods affects the currency of this document.

A compliance register will be developed to track how commitments are being achieved. this compliance register will include document tracking for all reporting required, along with how data and reporting is stored and disseminated.

6.3 Induction and Training

All personnel involved in the development and operational stages of the Project will undergo site induction training relating to biodiversity management issues within the Project area. Specifically, inductions must include:

- Objectives of this VMP and associated controls (i.e. hygiene control, sequential clearing method);
- Information and general descriptions provided about vegetation communities, EVNT flora, and Restricted Matter and WoNS weeds within the Project area;
- Restricted and 'no-go' areas;
- Procedures for responding to environmental incidents and emergencies;
- Environmental obligations for individuals and organisation; and
- Responsibilities for environmental monitoring and reporting.

6.4 Pre-start Briefing

All personnel will be briefed on environmental requirements daily prior to commencing activities, focusing on practical measures. Briefings will include the following:

- Changed environmental conditions;
- Vegetation clearing demarcations;



- EVNT flora or sensitive communities and their localities in or near the Project footprint; and
- Vehicle speed limits and access tracks.

6.5 Incident Management

An incident investigation procedure and reporting form will be developed by the construction contractor as part of the Project CEMP.

6.6 Emergency Response

An Emergency Response Plan will be developed as part of the Project CEMP and will include measures around emergencies directly related to vegetation.



7.0 References

Attexo Group Pty Ltd (Attexo). (2021a). Chalumbin Wind Farm Ecological Assessment Report (EAR). Prepared for Chalumbin Wind Farm Pty Ltd.

Attexo. (2021b). Chalumbin Wind Farm Fauna Management Plan. Prepared for Chalumbin Wind Farm Pty Ltd.

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