Technical memorandum

To: Aoife Breathnach, Aurecon Australasia Pty Ltd

From: Natasha Rogers, Botanist

Date: 30 September 2025

Subject: Additional vegetation mapping of the Transmission and Wind Farm Proposed Development Footprint survey areas for the Marri Wind Farm Project

Background

Marri WF Pty Ltd as trustee for the Marri WF Unit Trust (the Proponent), a wholly owned subsidiary of Alinta Energy Pty Ltd (Alinta Energy), is seeking approval to develop Marri Wind Farm (the Proposal) located approximately 20 kilometres (km) south of the township of Dandaragan within the Shire of Dandaragan (Figure 1). The proposed Project involves the construction of a up to 550 MW wind farm in Dandaragan. The combined survey area is located in the Shire of Dandaragan and the South West botanical province as defined in EPA (2016).

The combined survey area consists of 2 survey areas; the Wind Farm Proposed Development Footprint and the Transmission survey area (Figure 1). The Transmission survey area was surveyed during the Phoenix (2025c) targeted survey. The Wind Farm Proposed Development Footprint has been surveyed by Phoenix during the:

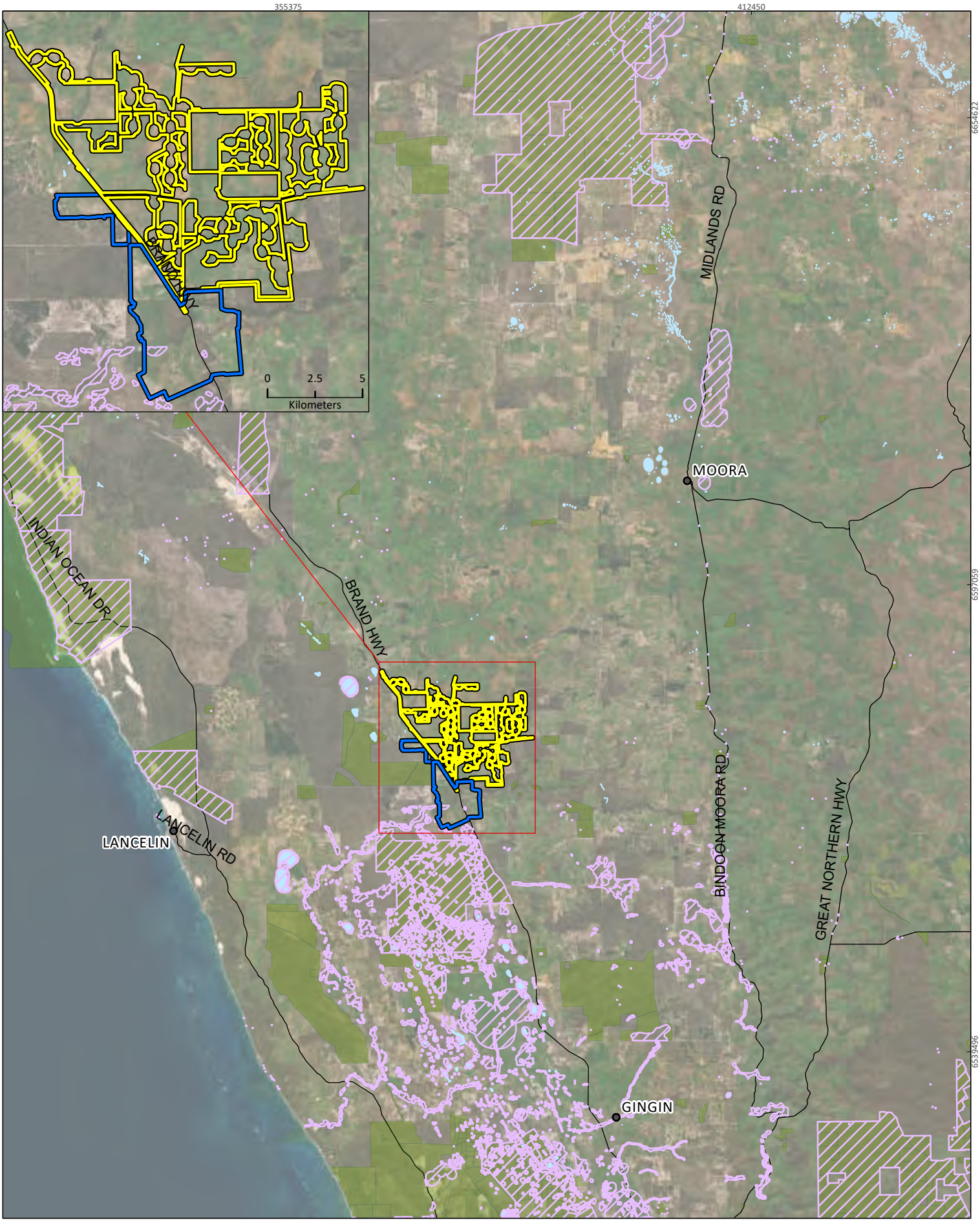
- September 2024, Desktop and Reconnaissance survey (Phoenix 2025a)
- February 2025, Targeted flora and vegetation survey (Phoenix 2025b)
- July 2025, Targeted flora and vegetation survey (Phoenix 2025c).

The Phoenix (2025a) desktop review found records of the *Banksia* Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC) within combined survey area. The field surveys were able to confirm records of the TEC in both the Wind Farm Proposed Development Footprint and Transmission survey areas.

Scope

The scope of the additional vegetation mapping of both survey areas for the Marri Wind Farm Project was to:

- Provide maps and spatial data of defined vegetation units and vegetation condition within the Wind Farm Proposed Development Footprint and portions of the Transmission survey area (areas mapped within the Phoenix (2025c) survey).
- Provide a brief technical memorandum outlining the methods and the results of the survey.



Alinta Energy
Marri Wind Farm Project

Project No	1738 var.01
Date	11/09/2025
Drawn by	MW
Map author	NR

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Kilometers

1:602,500 (at A4) GDA 1994 MGA Zone 50

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- Wind Farm Proposed Development Footprint
- Transmission survey area
- Lakes
- DBCA managed land
- Environmentally sensitive areas
- Roads

Figure 1

Project location and survey areas

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Methods

Vegetation mapping

Mapping was created utilising field data collected during previous Phoenix flora surveys (Phoenix 2025a, b, c). Subject to available data, all reasonable effort was taken to conduct mapping in accordance with methods of the EPA's *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016).

Vegetation type and condition boundaries were developed and digitised using Geographic Information System (GIS) software at a scale of 1:10,000 using publicly available ESRI aerial imagery. Local-scale vegetation units were described between the NVIS Level IV (sub-formation) and NVIS Level V (association) hierarchies as per EPA (2016) (subject to available data). Vegetation condition mapping will align with the Vegetation Condition Scale used for the South West and Interzone Botanical Provinces as per EPA (2016).

Non-vegetated units contain no vegetation data, and therefore no speculations can be made about the potential vegetation type. These units can be categorised as:

- Cleared areas – absent or near absent of native vegetation, such as roads, tracks, pastures.
- Water – standing water without observable flora species, these are separated into 'Natural water bodies' and 'Agricultural water bodies' in the spatial data.

Results

A total of 16 vegetation types were defined within the combined survey area (Table 1; Figure 2). The vegetation types can be typified by 5 broad groupings:

- Agricultural-related vegetation – Ag, Ag(Cc) and Pspp
- *Banksia* woodlands - BaXpHcMp
- *Eucalyptus*/ *Corymbia* dominated woodlands – CcJsHh, CcXd, EtJsCs, ErrMr and EaaGs
- *Acacia* shrublands - AsSpp
- Proteaceae/ Myrtacaeae dominated shrublands - XpLs, ChScLb, ChPbMp and BhSpp
- Dominant rushland/ sedgelands– JspLa and EcoCoMa.

The most common vegetation types were Ag, followed by Ag(Cc). The most common non-agricultural-related vegetation type was BaXpHcMp. The BaXpHcMp vegetation which is representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC, encompasses 435.17 ha (6.86% of the mapped area).

High value vegetation as defined in the Phoenix (2025c) encompasses a variety of vegetation types indicated within the spatial data.

Non-vegetated units were also mapped, Cleared areas encompassed 136.26 ha (2.15%) and water encompassed 0.93 ha (0.01%).

Table 1 Vegetation types, description, and extent in the combined survey area

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
Ag	No	Agricultural land absent of native vegetation (inclusive of crops, infrastructure, minor vehicle tracks).	4,450.10 ha 70.12%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
Ag(Cc)	No	Agricultural land with low to mid isolated trees to open woodland of *Corymbia calophylla* (occasionally *Eucalyptus todtiana*), over low sparse to closed grassland of non-native crop or pasture species.	774.60 ha 12.20%	
Pspp	No	Plantings/plantation (non-remnant) composed of mid to tall open woodland to open forest variably of *Pinus* spp. and *Eucalyptus* spp., over low sparse to closed grassland of non-native crop/pasture/weed species.	30.60 ha 0.48%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
BaXpHcMp	Yes	Low open woodland to woodland of *Banksia attenuata*, *B. prionotes, B. menziesii,* over mid to tall sparse to open shrubland of *Xanthorrhoea preissii, Allocasuarina humilis, Calothamnus quadrifidus* subsp. *quadrifidus*, over low sparse shrubland to shrubland of *Hibbertia crassifolia, Eremaea pauciflora* var. *pauciflora, Stirlingia latifolia,* over low sparse to open sedgeland of *Mesomelaena pseudostygia, Lyginia imberbis.*	435.17 ha 6.86%	
CcJsHh	No	Low to mid open woodland to woodland of *Corymbia calophylla* occasionally with *Eucalyptus todtiana*, over mid to tall sparse to open shrubland variably of *Jacksonia sternbergiana, Xanthorrhoea preisii, Macrozamia fraseri,* over variably present low sparse to open shrubland of *Hibbertia crassifolia, Morelotia octandra, Mesomelaena preissii.*	304.46 ha 4.80%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
CcXd	No	Low to mid open woodland to woodland of *Corymbia calophylla,* over mid to tall open shrubland to shrubland of *Xanthorrhoea drummondii* and *Banksia carlinoides.*	23.11 ha 0.36%	
EtJsCs	No	Low sparse to open woodland of *Eucalyptus todtiana,* occasionally with scattered *Corymbia calophylla* and/or *Banksia* spp., over variable low to mid sparse to open shrubland of *Jacksonia sternbergiana, Calothamnus hirsutus, Allocasuarina humilis,* over low sparse sedgeland of *Chordifex sinuosus, Lyginia imberbis.*	81.79 ha 1.29%	

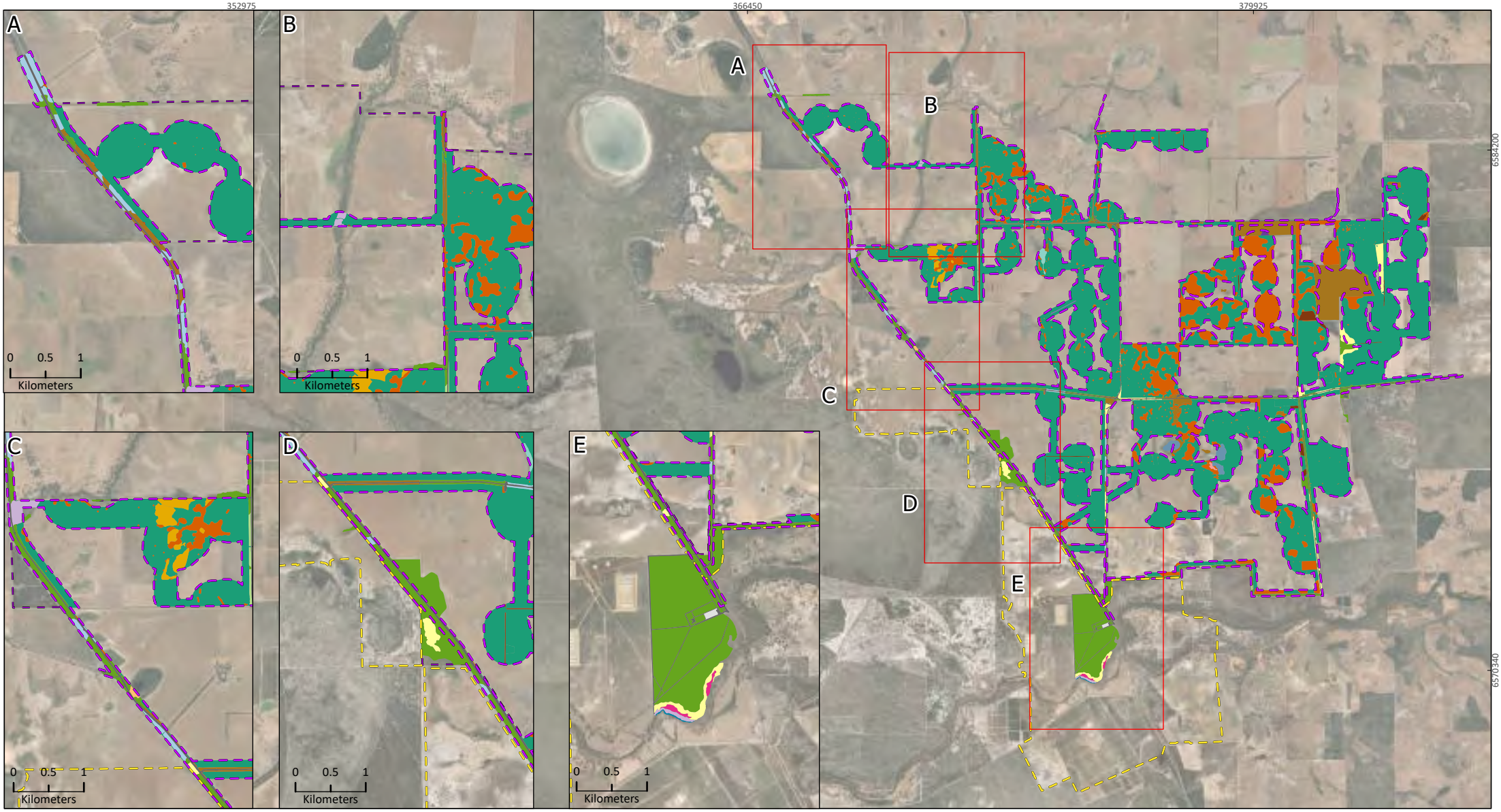
Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
ErrMr	No	Mid open woodland of Eucalyptus rudis subsp. rudis with occasional *Corymbia calophylla*, over tall sparse shrubland of *Melaleuca rhaphiophylla, Acacia* spp., over low sparse to closed grassland of non-native crop or pasture species.	13.11 ha 0.21%	
EaaGs	No	*Eucalyptus arachnea* subsp. *arachnea, E. wandoo* subsp. *wandoo*, over low isolated shrubs of *Gastrolobium spinosum, Hakea lissocarpha*, over low sparse grassland of non-native crop/pasture/weed species.	1.67 ha 0.03%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
AsSpp.	No	Tall open shrubland to shrubland of *Acacia saligna* and *Jacksonia sternbergiana*, over low sparse to closed grassland of non-native weed species.	3.76 ha 0.06%	
XpLs	No	Low shrubland of *Xanthorrhoea preissii, Calothambus hirsutus*, over low sparse to open forbland of *Lepidosperma squamatum, L. tenue, Desmocladus flexuosus.*	3.65 ha 0.06%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
ChScLb	No	Mid open shrubland of *Calothamnus hirsutus, Xanthorrhoea preissii,* over low open to closed heathland of *Styphelia conostephioides, Leucopogon oliganthus, Verticordia densiflora* var. *cespitosa,* over low sparse sedgeland of *Lyginia imberbis, Chordifex sinuosus* sedgeland.	9.68 ha 0.15%	
ChPbMp	No	Mid shrubland of *Calothamnus hirsutus, Gastrolobium calycinum,* occasional *Allocasuarina humilis,* over low sparse shrubland of *Petrophile brevifolia,* over low sparse sedgeland of *Mesomelaena pseudostygia* with non-native weed species.	40.06 ha 0.63%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
BhSpp	No	Mid to tall shrubland of *Banksia hewardiana, Xanthorrhoea preissii*, over low sparse to closed grassland of non-native crop/pasture/weed species.	23.19 ha 0.37%	
JspLa	No	Tall rushland of *Juncus* sp., *Typha domingensis, Gahnia* sp., over low sparse forbland of *Lobelia anceps, *Vellereophyton dealbatum, Cycnogeton lineare.*	10.33 ha 0.16%	

Vegetation type	Representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC	Vegetation description	Extent in combined survey area (ha) and % of mapped area	Representative photograph
EcoCoMa	No	Mid isolated trees of *Eucalyptus camaldulensis* subsp. *obtusa*, over low open woodland of *Casuarina obesa*, over sparse to open sedgeland of *Machaerina arthophylla.*	1.20 ha 0.02%	



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Marri Wind Farm Project

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Map author	NR

0 3.5 7
Kilometers

1:137,109 (at A4) GDA 1994 MGA Zone 50

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- Wind Farm Proposed Development Footprint
- Transmission survey area

Vegetation type

- Ag
- Ag(Cc)
- Ag(Cc)/Ag
- AsSpp
- BaXpHcMp
- BhSpp
- CcJsHh
- CcXd
- ChPbMp
- ChScLb
- EaaGs
- EcoCoMa
- ErrMr
- EtJsCs
- JspLa
- Pspp
- XpLs
- Water
- N/A
- Cleared

Figure 2a

Vegetation types recorded in the field surveys

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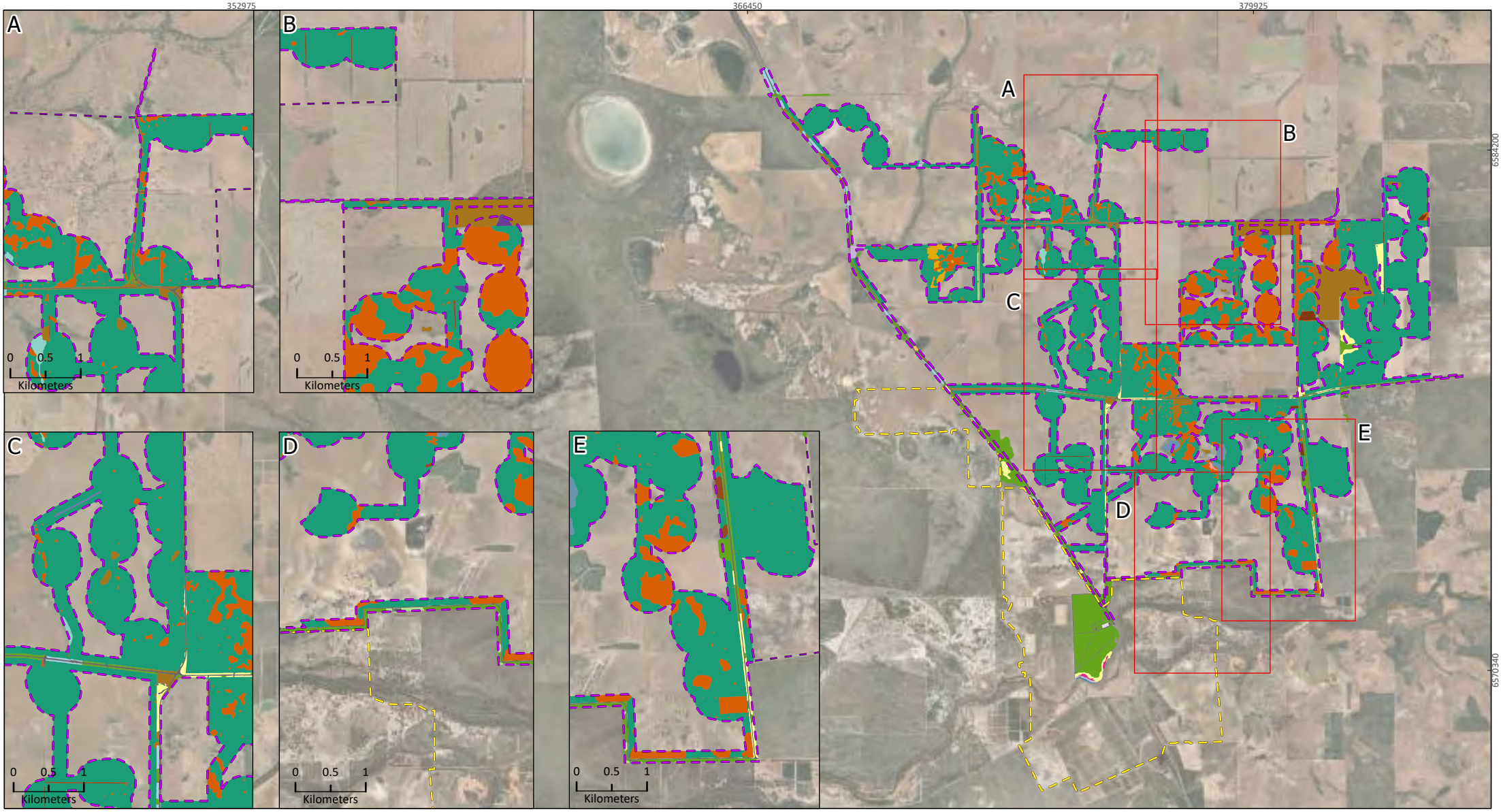

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Wind Farm Proposed Development Footprint
Transmission survey area

Vegetation type

- Ag
- Ag(Cc)
- Ag(Cc)/Ag
- AsSpp
- BaXpHcMp
- BhSpp
- CcJsHh
- CcXd
- ChPbMp
- ChScLb
- EaaGs
- EcoCoMa
- ErrMr
- EtJsCs
- JspLa
- Pspp
- XpLs
- Water
- N/A
- Cleared

Figure 2b

Vegetation types recorded in the field surveys

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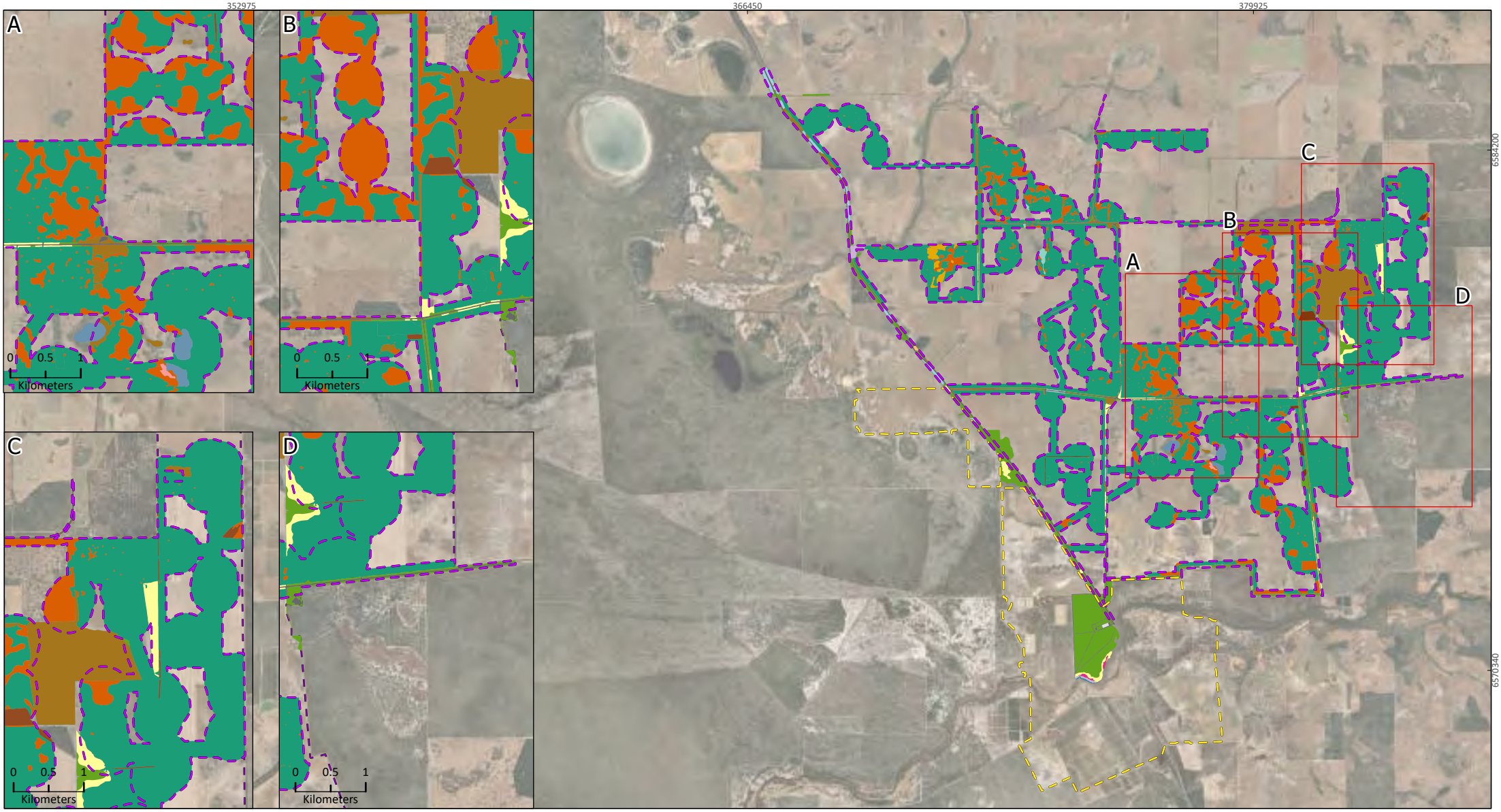

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Wind Farm Proposed Development Footprint
Transmission survey area

Vegetation type

- Ag
- Ag(Cc)
- Ag(Cc)/Ag
- AsSpp
- BaXpHcMp
- BhSpp
- CcJsHh
- CcXd
- ChPbMp
- ChScLb
- EaaGs
- EcoCoMa
- ErrMr
- EtJsCs
- JspLa
- Pspp
- XpLs
- Water
- N/A
- Cleared

Figure 2c

Vegetation types recorded in the field surveys

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Discussion

Limitations

The limitations of the vegetation and condition mapping

- Vegetation and condition mapping was produced from Reconnaissance and Targeted field surveys, rather than a Detailed survey. No quadrats were installed and vegetation analysis performed to confirm vegetation types approximating NVIS Level 5 resolution.
- Not all field survey were conducted within recommended seasons defined by the EPA (2016) Technical Guidance, and not all dominant flora species may be represented by mapping.
- Vegetation mapping within the Transmission survey area includes only areas visited during the field survey due to access limitation. Subsequently, some portions of the scope survey area are unmapped.

Recommendations

Dependent on the Project's final proposed footprint Native Vegetation Clearing Permits (NVCP) may be sought as part of the Project's development. Phoenix acknowledges the Proponent seeks to avoid or minimise impacts to remnant vegetation within the constraints of the Project's development requirements. As such, if NVCPs are sought Phoenix's recommends a tailored approach dependent upon environmental value of individual vegetation patches:

- Areas mapped as the vegetation type Ag(Cc) occupied by scattered remnant trees or small stands of trees were typically devoid of remnant understorey. Such areas are deemed highly unlikely to be habitat for conservation significant flora species and do not warrant further survey (from a flora/vegetation perspective) if NVCPs are sought.
- Remnant vegetation (mapped or unmapped) that still clearly have understorey have a lower likelihood of containing significant flora species. Partial clearing of such remnant patches is therefore unlikely to have an adverse impact on significant flora species. However, NVCPs sought within such areas may or may not require further targeted survey depending on scale and proportion of clearing within a patch.
- Vegetation mapped as locally significant (either as high value or as analogous to TEC) are best avoided where possible due a higher likelihood of NVCP conditions of additional targeted flora survey. Though not gazetted as TEC or Priority Ecological Communities, these remnants represent likely habitat for significant flora that are surveyable within the seasons recommended by the Technical Guidance EPA (2016).
- Vegetation type BaXpHcMp, confirmed and mapped as regionally significant (TEC) are best avoided, likely requiring similar NVCP conditions as for identified locally significant vegetation. Successful application for NVCPs within TEC may also require assessment of proportional impacts upon the TEC in the local region.
- NVCP's sought within unmapped areas of the Project are likely to require further survey to determine both vegetation type and presence of significant flora species.

Yours Sincerely,

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References

EPA. 2016. *Technical Guidance: Flora and vegetation surveys for Environmental Impact Assessment*. Environmental Protection Authority, Perth, WA. Available at: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf

Phoenix. 2025a. *Fatal flaws desktop assessment and reconnaissance survey for the Marri Wind Farm Project*. Phoenix Environmental Sciences, Osborne Park, WA. Prepared for Alinta Energy Pty Limited.

Phoenix. 2025b. *Targeted flora and vegetation survey for the Marri Wind Farm Project*. Phoenix Environmental Sciences, Osborne Park, WA. Prepared for Alinta Energy Pty Limited.

Phoenix. 2025c. *Targeted flora and vegetation survey of the Transmission and Wind Farm study areas for the Marri Wind Farm Project*. Phoenix Environmental Sciences, Osborne Park, WA. Prepared for Alinta Energy Pty Limited.