Final Report

Preliminary Ecological Assessment: Wongalea Battery Energy Storage System (BESS), Armidale, NSW

Prepared for

Eku Energy Australia

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Ecology and Heritage Partners Pty Ltd

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Ecology and Heritage Partners acknowledge the Traditional Owners of the country we live and work on, and we pay our respect to Elders past, present and emerging.

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1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by Eku Energy Australia to undertake a Preliminary Ecological Assessment at the proposed Wongalea Battery Energy Storage System (BESS), NSW (the Project).

We understand that Eku Energy requires ecological consultancy services to support the Scoping phase and the Environmental Impact Statement (EIS) application, in order to facilitate the development of a utility scale Battery Energy Storage System (referred to as the Wongalea BESS).

Wongalea BESS will have a capacity up to 300-Megawatts/1200-Megawatt Hours (4-hour storage duration), and has a proposed Development Footprint of approximately six hectares, plus a transmission connection to the Armidale Terminal Station. The Project will also include construction of associated infrastructure such as inverters, an on-site substation, a transmission cable connection to the Transgrid Armidale Substation, and will involve works associated with access point and tracks, operations and maintenance building, security fencing, fire protection equipment, earthworks and landscape planting. Connection to the National Energy Market (NEM) will be via a 132-kilovolt cable from the on-site substation to the Armidale Substation. There are 2 nearby BESS development projects; the Armidale BESS (GMR Energy) and the Eathorpe Battery (Neoen), that are also intending to connect to the Armidale Terminal Station.

The estimated capital investment value of the project is greater than $30 million, and as such, it is considered a State Significant Development (SSD) and will require an EIS to be prepared and lodged with the Department of Planning, Housing and Infrastructure (DPHI). As an initial step, a Scoping Report / Request for SEARs is required to be submitted to DPHI as part of the SSD application.

The purpose of this assessment was to identify the extent and type of native vegetation present within the study area and to determine the likely presence of significant flora and fauna species and/or ecological communities. This report presents the results of the assessment and discusses the potential ecological and legislative implications associated with the proposed action. The siting, design and development footprint of the BESS and transmission route will be guided by the results of the flora and fauna analysis, in order to minimise impacts to biodiversity values.

1.2 Study Area

The study area includes the entire proposed Development Site, which encompasses both the proposed BESS Development Footprint of approximately 18 hectares, and a transmission connection to the Armidale Terminal Station located 500 metres south, across Grafton Road (Figure 1).

The study area includes the properties located at:

- BESS development:
    - 475 Grafton Road, Armidale (1//DP777437, 19//DP112693)
    - 495 Grafton Road, Armidale (2//DP777437)

- Transmission connection:
    - 452 Grafton Road, Armidale (1//DP999496, 8//DP112694, 1//DP1013556)

The study area is located within the Northern Tablelands; five kilometres east of the Armidale township and 780 kilometres north of Sydney (approximately halfway between Sydney and Brisbane). The main portion of study area (i.e. north of Grafton Road) is bound by the Commissioners Waters River to the north-east, Grafton Road (Waterfall Way) to the south, and rural agricultural land to the north and west, whilst the smaller portion of the study area (i.e. the Armidale Substation) is bound by Grafton Road to the north, Eathorpe Road to the east, and rural land to the east and south. The Site of Abattoir 'Wongalea' and a dwelling occupied by farm works are located within the BESS site, approximately 390 metres north of the development area.

Within the surrounding landscape, the Armidale Regional Council Wastewater Treatment Plant exists one kilometre to the north-west, the New England Model Aircraft Club exists one kilometre to the west, whilst to the east is Commissioners Waters, rural land and dwellings, and to the south and south-west is Armidale Substation, Grafton Road, and two proposed BESS projects (Armidale East BESS and Neoen's Eathorpe Battery). Yina Nature Reserve lies approximately 3 kilometres north-east, and Imbota Nature Reserve lies approximately 3.6 kilometres south-east of the study area.

Three dwellings exist within 500 metres of the BESS Development Area, including:

- 475 Grafton Road – approximately 390 metres from the Development Area (this dwelling is associated with the development and will remain habitable when the project is operational);
- 402 Grafton Road – approximately 670 metres from the Development Area; and,
- 89 Eathorpe Road – approximately 850 metres from the Development Area.

Consistent with the broader landscape area, much of the study area comprises cleared naturalised grasslands, remnant tree patches and scattered trees. Historic and current land use appears to be predominantly agricultural (i.e. livestock grazing). Commissioners Waters River runs along the north-west boundary, whilst several farm dams are scattered throughout the study area and three minor drainage lines branch off Commissioners Waters River and intersect the north-west and southern portions of the study area. Tilbuster Ponds and Dumaresq Creek lie approximately 750 metres north-west of the study area.

According to the NSW Government's central resource for Sharing and Enabling Environmental Data (SEED) Portal (NSW Government 2025a), the study area is located within the New England Tablelands bioregion, Armidale Regional Council municipality and the Northern Tablelands Local Land Service (LLS).

1.3 Indicative Design

The Project includes the development of a utility-scale battery energy storage system (BESS) north-east of the existing Armidale Substation in Northern NSW. The proposed BESS will have a capacity up to 300-Megawatts/1200-Megawatt Hours (4-hour storage duration), with associated infrastructure including inverters, an on-site substation, a transmission cable connection to the Transgrid Armidale Substation, and associated works including access point and tracks, operations and maintenance building, security fencing, fire protection equipment, earthworks and landscape planting. Connection to the National Energy Market (NEM) will be via a 132kV cable from the on-site substation to the Armidale Substation.

The primary and secondary works components can be broadly described as:

- BESS compounds (batteries, inverters and transformer units)
- On-site substation/transformer
- Transmission connection infrastructure consisting of a 132kV cable connecting to Armidale Substation.
- Operation & maintenance building – inclusive of control room
- Construction laydown area (temporary)
- Retention basin
- Asset protection zone

The proposed development footprint is estimated to be approximately six hectares, plus a transmission connection to the Armidale Terminal Station. The final project footprint (i.e. the maximum disturbance area) will be determined once development plans have been finalised and a Biodiversity Development Assessment Report (BDAR) has been undertaken to confirm biodiversity present on-site.

1.4 NSW and Commonwealth Bilateral Agreement

The Commonwealth and NSW government entered an assessment Bilateral Agreement on 26 February 2015, under Section 45 of the EPBC Act. This Bilateral Agreement enables NSW to conduct a single environmental assessment process that is endorsed by the Commonwealth, allowing proponents to prepare a single set of assessment documentation for both the Commonwealth and State approval purposes. When the assessment process is complete, NSW provides a report to the Australian Government assessing the likely impacts on MNES listed under the EPBC Act.

The Commonwealth and NSW subsequently entered into an Amending Agreement on 24 March 2020, which endorses the NSW Biodiversity Offsets Scheme. Offsets are required under the EPBC Act for any significant adverse impacts on MNES. This Bilateral Agreement applies to all NSW projects that require EPBC Act approval, resulting in streamlined benefits for any projects using the NSW Biodiversity Offsets Scheme.

If the proposed works are to proceed, a Biodiversity Development Assessment Report (BDAR) will be prepared for this project in accordance with the Biodiversity Assessment Method (BAM), to assess the biodiversity related impacts associated with the proposed action.

2 METHODS

2.1 Desktop Assessment

Relevant literature, online-resources and databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The NSW Government Sharing and Enabling Environmental Data (SEED) Portal (NSW Government 2025a), NSW State Vegetation Type Map (STVM) – Edition C2.0M2.0 (DPE 2023) and Restore Trees NSW (formerly 'Trees Near Me') application (NSW DCCEEW 2025a) for:
    - Modelled data for location risk, important habitat mapping, native vegetation patches, scattered trees and habitat for rare or threatened species; and,
    - The extent of historic and current Plant Community Types (PCTs).
- The NSW Department of Planning, Industry & Environment (DPIE) Native Vegetation Integrity Benchmarks (DPIE 2019), and NSW Department of Planning and Environment (DPE) BioNet Plant Community Type data spreadsheet (DPE 2022) for descriptions of PCTs within the relevant bioregion;
- The Threatened Biodiversity Profile Data Collection accessed via the BioNet Threatened Biodiversity Web Service (NSW DCCEEW 2025c) or the NSW Office of Environment and Heritage (OEH) Search for Threatened Species website (OEH 2025), for threatened species found in New England Tablelands Bioregion, and vegetation classes associated with these species;
- The Atlas of Living Australia (ALA 2025), NSW Department of Planning and Environment (DPE) BioNet Atlas (NSW DCCEEW 2025d) and eBird Atlas (eBird 2025) for previously documented flora and fauna records within the project locality;
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) protected under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (DCCEEW 2025a);
- Relevant listings under the NSW Biodiversity Conservation Act 2016 (No. 63), including the latest Threatened (Schedules 1, 2 and 3) and Protected (Schedules 5 and 6) Lists (NSW Government 2025b);
- NSW Department of Primary Industries (DPI) Fisheries NSW Spatial Data Portal (DPI 2025a);
- DCCEEW Interactive Flying-fox Web Viewer for National Flying-fox monitoring data (DCCEEW 2025b);
- DPIE eSpade 2.2 spatial viewer system for soil profile and soil map information (DPIE 2025);
- The Department of Planning, Housing and Infrastructure (DPHI) online NSW Planning Portal Spatial Viewer map (DPHI 2025) to ascertain current zoning and environmental overlays in the study area;
- Environmental Impact Statement (EIS) and EPBC Act Project Referral Application and Approval Portals (DCCEEW 2025d);
- DCCEEW Biodiversity Values Map and Threshold Tool, to determine if proposed development or clearing is likely to activate the Biodiversity Offset Scheme (NSW DCCEEW 2025e);

- The Commonwealth Species Profile and Threats (SPRAT) Database (DCCEEW 2025c) for nationally threatened species' descriptions, habitat and distribution data; and,
- Aerial photography of the study area.

2.2 Site Assessment

A high-level site assessment was undertaken by a qualified botanist between 4 and 6 February 2025 to ground-truth the results of the Desktop Assessment and identify areas of ecological sensitivity and constraints. The study area was walked, with the overall condition of vegetation and habitats noted (i.e. areas of high-quality native vegetation, significant wetlands, potential presence of State and nationally significant flora and fauna).

2.3 Clearing of Native Vegetation

Within NSW there are several Acts, Regulations and Statutory Instruments that protect and regulate the clearing of native vegetation, including the *Biodiversity Conservation Act 2016*; *Biodiversity Conservation Regulation 2017*; *Local Land Services Act 2013*; *Local Land Services Regulation 2014*; State Environmental Planning Policy (Biodiversity and Conservation) 2021; and Land Management (Native Vegetation) Code 2018. Acts such as the *Environmental Planning and Assessment Act 1979* and the *Rural Fires Act 1997* also regulate whether vegetation may be removed as part of any development consent. In addition, the *Water Management Act 2000* also regulates the clearing of vegetation in the vicinity of identified watercourses.

The Land Management and Biodiversity Conservation Framework provides a structure for managing the clearing of native vegetation in New South Wales. Legislation under this framework is administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), Local Land Services (LLS) and the NSW Biodiversity Conservation Trust (BCT).

2.4 Assessment Qualifications and Limitations

This report has been written based on the quality and extent of the ecological values and habitat considered to be present or absent at the time of the desktop and/or field assessments being undertaken.

The 'snapshot' nature of this initial site assessment meant that migratory, transitory or uncommon fauna species may have been absent from typically occupied habitats at the time of the field assessment. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent.

Given the presence of cattle and electrified fences across certain sections of the study area, some of the vegetation was observed and assessed from varying distances. This was particularly true for the assessment of Commissioners Water River, along which an intensely electrified fence lined the vast extent of the waterbody and restricted observer access. A large herd of cattle were present in the northern paddocks, restricting access to the northern drainage line.

A comprehensive list of all terrestrial flora and fauna present within the study area was not undertaken as this was not the objective of the assessment. Additionally, this assessment did not include any targeted surveys to confirm the presence or absence of significant species and/or communities within the study area. Rather a list of commonly observed species was recorded to assist in determining the broader biodiversity values present within the study area.

Eucalypt species present in the study area were not in a period of flowering, nor were there any buds or fruit present on the trees on the ground below. Due to this, the identification of eucalypts in the study area was undertaken based on bark, form, and previously commonly observed species in the nearby vicinity, along with commonly occurring species in PCT descriptors. Therefore, the listed eucalypt species from the site assessment can only be used as a guide of the potential species present and not as a definitive list.

Ecological values identified within the study area were recorded using a hand-held GPS or tablet with an accuracy of +/-3 metres. This level of accuracy is considered to provide an accurate assessment of the ecological values present within the study area; however, this data should not be used for detailed surveying purposes.

The terrestrial flora and fauna data collected during the field assessment and information obtained from relevant desktop sources is considered to inform a high-level assessment of the ecological values present within the study area. Detailed site assessments including targeted flora and fauna assessments and Biodiversity Assessment Method (BAM) accredited assessments are required to confirm the ecological values recorded during field assessments undertaken to inform this report.

3 RESULTS

3.1 Summary of Biodiversity Values

Key landscape features and a summary of biodiversity values within the study area are summarised below (Table 1).

Table 1. Summary of landscape features and biodiversity values within the study area.

Landscape Feature	Summary Notes
IBRA Bioregion **IBRA Sub-region**	New England Tablelands Bioregion Armidale Plateau (NET04) Sub-region
Land use and history of disturbance	Most areas within the study area have been subject to extensive clearing for agricultural purposes including cropping and modified pastures for livestock grazing. Small vegetation patches are present across the study area. These include intact and remnant vegetation, and riparian vegetation associated with old creek beds.
Vegetation	The study area is characterised by a mix of small to medium patches of disturbed and intact grasslands and woodlands, and improved pasture. Based on the results of the site assessment, native vegetation in the study area is representative of: - Three vegetation formations - Four vegetation classes - Four Plant Community Types (PCTs) No PCTs were observed to likely meet thresholds for EPBC Act-listed Threatened Ecological Communities (TECs).
Threatened Species	Based on the small patches of native vegetation identified during the site assessment, observations during the site assessment, and/or the recent BioNet records within proximity to the study area, there is potentially suitable habitat and therefore a moderate to high likelihood for four nationally significant and four State significant flora species (Table 4), and for 10 nationally significant and 11 State significant and/or migratory fauna species (Table 5; Table 8) occurring within the study area.
Areas of Geological Significance	The on-site assessment did not detect the presence of any karsts, caves, crevices, cliffs or other areas of geological significance within the study area.
Areas of Outstanding Biodiversity Value (AOBV)	According to DCCEEW's Biodiversity Values Map and Threshold Tool (DCCEEW 2025d), there is one patch of Biodiversity Value mapped (i.e. purple) within the study area (Plate 17). This includes Biodiverse Riparian Land associated with Commissioners Waters River, which runs along the north-east border of the study area.
Aquatic Habitat	The study area comprises one large river (i.e. Commissioners Waters) along the north-east boundary, in addition to a few minor drainage lines and farm dams throughout the site (see 'Current Wetlands' mapped in Figure 2). Commissioners Waters River, farm dams, the western wetland (i.e. PCT 3944) and the northern drainage line were observed to contain varying amounts of water, whilst the two southern drainage lines were dry at the time of assessment. Indirect impacts and sensitive creek crossing designs will be considered as part of the Environmental Impact Statement (EIS) process.

Landscape Feature	Summary Notes
Habitat Values	The study area consists of small, disjunct patches of remnant woodland which provides limited refuge, foraging, and nesting habitat for fauna in an otherwise open landscape. Grassland habitat throughout the study area is important for avian and mammal species, including the EPBC Act-listed Diamond Firetail and Spotted-tailed Quoll. Many trees throughout the study area were observed to be mature and hollow-bearing, which provides important shelter for many species of arboreal fauna, potentially including threatened avifauna such as the BC Act listed Turquoise Parrot, Barking Owl or Yellow-bellied Sheathtail-bat. The Commissioners Waters River within the study area likely provides aquatic and riparian habitat for a diverse range of flora and fauna species. This natural waterbody may be occupied by threatened frogs such as the Glandular Frog. Artificial dams and drainage lines are present across the landscape and provide an important water resource for various terrestrial and aquatic fauna.

3.2 Vegetation Condition

The study area predominantly comprised small, disjunct patches of native vegetation, in addition to scattered native trees throughout the site. The remainder of the study area comprised introduced and planted vegetation, present as pasture grass, windrows and ornamental gardens around dwellings.

3.2.1 Patches of Native Vegetation

According to the SEED Portal (NSW Government 2025a) and confirmed by Ecology and Heritage Partners' rapid site assessment, native vegetation in the study area is representative of four PCTs: New England Hills Stringybark-Box Woodland (PCT 3359), New England Ribbon Gum Grassy Forest (PCT 3344), New England Tableland Carex Fens (PCT 3944) and Western New England Panic-Wiregrass Grassland (PCT 3723) (Table 2). This includes three PCTs associated with Threatened Ecological Communities (TECs). The rapid site assessment confirmed that the presence of PCTs on-site is generally inconsistent with the modelled extent native vegetation mapping (DPE 2023). The modelled PCTs existed in a highly modified state, often only exhibiting a greatly reduced and sparse array of canopy species over introduced vegetation and pasture grasses, or entirely no indicator species present.

The presence and extent of modelled extant PCT mapping is shown in Table 2 and Figure 2.

Table 2. Presence and modelled extent of PCTs in the study area

NSW State Vegetation Type			Associated TECs	Indicative Extent (ha) (Figure 2)
Formation	**Class**	**Plant Community Type (PCT)**		
Grassy Woodlands	New England Grassy Woodlands	**PCT 3359:** New England Hills Stringybark-Box Woodland	White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland	2.74
	Tableland Clay Grassy Woodlands	**PCT 3344:** New England Ribbon Gum Grassy Forest	White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland	0.11

NSW State Vegetation Type			Associated TECs	Indicative Extent (ha) (Figure 2)
Formation	Class	Plant Community Type (PCT)		
			New England Peppermint (*Eucalyptus nova-angelica*) Grassy Woodland	
Freshwater Wetlands	Montane Bogs and Fens	**PCT 3944:** New England Tableland Carex Fens	White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland	0.07
Dry Sclerophyll Forests (Shrubby sub-formation)	Northern Tableland Dry Sclerophyll Forests	**PCT 3723:** Western New England Panic-Wiregrass Grassland	N/A	1.43

The below sections are a high-level description of the PCTs observed to be present during the ground-truthing assessment, including descriptions of the primary structure and condition of each observed PCT.

New England Grassy Woodlands – New England Hills Stringbark-Box Woodland (PCT 3359)

Primarily occurring in an agricultural landscape associated with shallower soils or steeper slopes, New England Hills Stringybark-Box Woodland (PCT 3359) is characterised by an open tall sclerophyll forest with a midstory of soft and dry leaved species over a dense grassy ground layer, at elevations of 910 meters or above on a variety of substrates in a cold, dry environment. A widespread PCT that occurs on the rises and slopes of the low hills of the New England Tableland. The sparse mid story includes small trees and shrubs, most often Wattles (i.e. Fern-leaved Wattle *Acacia filicifolia* and Lightwood *Acacia implexa*) and Peach Heath *Lissanthe strigosa,* with Rosemary Cassinia *Cassinia quinquefaria* commonly occurring. The dense ground layer is characterised of forbs and graminoids with some hardy ferns and twiners (DPE 2022).

PCT 3359 was the dominant plant community type throughout the study area and occurred in the central portion of the study area (Figure 2) in very poor condition. The canopy layer was very sparse and mainly constituted as scattered trees. The scattered canopy consisted of Yellow Box *Eucalyptus melliodora*, Blakely's Red Gum *Eucalyptus blakeyi*, Broad-leaved Stringybark *Eucalyptus calignosa*, But-But *Eucalyptus bridgesiana* and Rough-barked Apple *Angophora floribunda*, with majority of trees exhibiting poor health and decay (Plate 1). Much of the understory was dominated by introduced species such as Sweet Vernal-grass *Anthoxanthum odoratum*, and Yorkshire Fog *Holcus lanatus* while Winged Everlasting Daisy *Ammobium alatum* and Bamboo Spear-grass *Austrostipa verticillata* were scattered through the pasture grasses. Winged Everlasting Daisy occurred in high volume in areas scattered around the study area, irregularly corresponding to any modelled mapping. The ground layer was mostly absent of native vegetation, likely due to the high cover of competitive exotic pasture grasses, although some patches had a rich diversity of herbs and twiners such as Variable Glycine *Glycine tabacina,* Shade/Grassland Wood-sorrel *Oxalis exilis/perennans,* and Tall Bluebell *Wahlenbergia stricta* (Plate 2). Several patches of PCT 3359 have been reduced in extent in Figure 2 as an indicative indicator of native vegetation coverage, as none as present in the areas.

Some areas of the modelled mapping contained no native vegetation and were entirely comprised of stands of Common Hawthorn *Crataegus monogyna.* Among the Hawthorn, an understory was comprised of Whitetip Nightshade *Solanum chenopodiodes*, Small Flower Mallow *Malva parviflora*, and Spleen Amaranth *Amaranthus hybridus.* In several of these areas that had been mapped there were stags that would have once contributed to the native canopy indicative of the PCT.

Plate 1. PCT 3359 poor health canopy tree surrounded by disturbed understory (Ecology and Heritage Partners Pty Ltd 04/02/2025).

Plate 2. Scattered Winged Everlasting Daisy and Tall Bluebell (Ecology and Heritage Partners Pty Ltd 05/02/2025).

Tableland Clay Grassy Woodlands – New England Ribbon Gum Grassy Forest (PCT 3344)

New England Ribbon Gum Grassy Forest (PCT 3344) is characterised by a scattered open sclerophyll tall forest, with a midstory comprised of soft-leaved shrubs over a danse grassy round cover. This PCT occupies a widespread area on undulating terrain in cold, moist environments at elevations above 930 meters. The ground layer, varying from dense to mid-dense, is comprised mainly of forbs and grasses, with some twiners present (DPE 2022).

PCT 3344 occupied a small area of the study area on the southern boundary and was adjacent to a patch of PCT 3359. The canopy was comprised of two Eucalypt species, Yellow Box and New England Peppermint *Eucalyptus nova-anglica,* in moderate health that bordered both PCTs. The shrub layer was absent with a ground layer dominated by high weed biomass (Plate 3). The sparse native vegetation ground layer consisted of a few Crane's Bill Geranium *Geranium solanderi*, Common Everlasting *Chrysocephalum apiculatum*, and Winged Everlasting Daisy among a high volume of Yorkshire Fog and Sweet Vernal-grass. PCT modelled mapping was correct as key indicator species were present, however the lack of native vegetation cover present resulted in an overall low-quality patch.

Next to the modelled mapping of PCT 3344 was an area of high-quality derived grassland which contained a high diversity of species and very little weed coverage. Common Everlasting was present in high volumes among Kangaroo Grass *Themeda triandra* and Grey Tussock-grass *Poa sieberianna*. Scattered among these species was Slender Trick-trefoil *Desmondium varicans*, Cranes Bill Geranium, and Tall Bluebell (Plate 4). There was no modelled PCT mapping covering this area but based on the high percentage cover of native vegetation and low weed cover, this was an area of high quality.

Plate 3. High weed biomass ground layer in PCT 3344 (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Plate 4. Tall Bluebell in high quality patch next to modelled PCT3344 vegetation (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Montane Bogs and Fens – New England Tableland Carex Fens (PCT 3944)

New England Tableland Carex Fens (PCT 3944) is characterised by low to tall, dense sedgelands of semi-permanent wetlands on valley floors receiving 700-1450 millimetres mean annual rainfall at elevations of 600-1400 meters. This wetland PCT occurs where soil is semi-permanently waterlogged from slow draining watercourses. Almost always present with high cover, the tall rhizomatous Fen Sedge *Carex gaudichaudiana* is often interspersed with other grasses and tufted sedges, shrubs and trees are generally absent, although plots may sometimes include overhanging individual from drier edge habitat (DPE 2022).

Two patches of PCT 3944 were modelled to occur within the study area, both on the southern border, one east and one west respectively. The modelled patch in the east of the study area contained no native and was heavily modified (Plate 5). This patch has been removed from figure two as an indicative guide to the extent of native present in this modelled PCT. This area was highly disturbed and had evidence of cattle once walking through the area (i.e. pugging and compacted soils present). Native trees were present as a planted windrow of Kurrajong *Brachychiton populneus* over an understory of Sweet Vernal-grass and Turnip *Brassica* sp.

The modelled patch in the west was of a moderate quality with a diverse range of species present among Tall Sedge *Carex appressa*, Knob Sedge *Carex inversa*, and Rush *Juncus* sp. among the sedges were several herbs and forb such as Centella *Centella* sp., Soft Crane's-Bill *Geranium potentilliodes*, and Slender Trick-trefoil (Plate 6). A high biomass of Wild Carrot *Daucus carota* and Purple-top *Verbena incompta* was present. Curly Dock *Rumex crispus* was present in the areas that were inundated at the time of assessment.

Plate 5. Heavily modified are of modelled PCT 3944 in the north-east of study area (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Plate 6. Slender Trick-trefoil present in western patch of modelled PCT 3944 (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Northern Tableland Dry Sclerophyll Forests - Western New England Panic-Wiregrass Grassland (PCT 3723)

Western New England Panic-Wiregrass Grassland (PCT 3723) is characterized by a tall grassland with a mid-dense ground layer occupying a variety of substrates in warm dry environments and annual rainfall below 800 millimeters. Typically comprised of forbs, grasses, hardy ferns, twiners, and sedges. At some locations scattered trees and shrubs can be present (DPE 2022).

PCT 3723 mainly occurred along the edge of Commissioners Waters River and had low diversity of native vegetation and a high cover of weeds. The two patches in the northeast had a sparse canopy cover of poor health Blakely's Red Gum and evidence of a recruitment cohort, which does not correspond to PCT 3722 description, as it is a grassland. These two patches had a very low-quality ground layer with a low cover of native vegetation and high cover of pasture grasses, along with evidence of grazing. The patch in the south of the study area was in line with the descriptor as it contained Hairy Panic *Pannicum effu*sum, a key indicator species, although it was low volume and Narrow Rock-fern *Cheilanthes sieberi* subsp. *seiberi* was absent. Windmill Grass *Chloris truncata* and Shade Wood-sorrel were scattered throughout a high biomass of Cocksfoot *Dactylis glomerata*, Paspalum *Paspalum dilatatum* and Flaxleaf Fleabane *Erigeron bonariensis* (Plate 7; Plate 8). Several areas of modelled PCT 3723 on the northern boundary in Figure 2 have been reduced as an indicative guide of the extent of native vegetation. This is to show that upon preliminary assessment, these areas contained no native vegetation. No other common native ground layer species outlined in the PCT descriptor were present along with the low native species cover indicates a low quality of patch.

Plate 7. Low quality patch of PCT 3723 (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Plate 8. Heavily modified and disturbed patch of PCT 3723 (Ecology and Heritage Partners Pty Ltd 05/02/2024).

3.2.2 Introduced and Planted Vegetation

Areas not supporting native vegetation had a high cover (>90%) of exotic agricultural species, many of which were direct-seeded for use as pasture/cropping. Scattered native grasses were generally also present in these areas. Ornamental plantings were also present around dwellings (e.g. White Poplar *Populus alba*). Scattered throughout the study area were large stands of Common Hawthorn.

Non-native areas associated with scattered dams were dominated by Wild Carrot and Vervain. Scattered throughout the study area was Spear Thistle *Cirsium vulgare*

Weed of National Significance (WoNS) Blackberry *Rubus fruticosus* spp. agg. was isolated to the southeast of the study area (CFISS 2025) (Plate 9). Blackberry is also declared a 'State Priority Weed' and 'Region Priority Weed' according to the Northern Tablelands Regional Strategic WMP.

'Additional species of concern' listed in the Regional Strategic WMP were also recorded in the study area, including African Love-grass *Eragrostis curvula*, Cocksfoot, Paspalum, Hawthorn *Crataegus monogyna*, St John's Wort *Hypericum perforatum* subsp. *veronense*, Sweet Vernal-grass, and Ox-eye daisy *Leucanthemum vulgare* (Plate 10). These species have a high to very high weed risk, but the feasibility of coordinated control in the region is considered negligible or low. As such, these weeds have not been considered a priority in the Northern Tablelands but are still subject to the general biosecurity duty and should be controlled by land managers as a private benefit.

Plate 9. Blackberry present in south of study area (Ecology and Heritage Partners Pty Ltd 04/02/2024).

Plate 10. Stand of Hawthorn, common among the study area (Ecology and Heritage Partners Pty Ltd 05/02/2024).

3.3 Fauna Habitat

The six main stratified broad fauna habitats recorded within the study area are described below.

3.3.1 Native and Introduced Grassland Habitat

Several areas within the south of the study area consisted of paddocks which contained improved exotic pastures with scattered native grasses, likely to be used as a foraging resource by common generalist bird species which are tolerant of modified open areas.

High quality, species-diverse native grassland occurred as a small patch on the southern boundary of the study area (next to PCT patch 3344 in Figure 2), while 1.43 hectares of low-quality Western New England Panic-Wiregrass Grassland occurred along Commissioners Waters River as two patches in the northeast and one patch in the south (see PCT 3723 in Figure 2). Habitat attributes of these native grassland areas are suitable for an array of native fauna, including snakes, lizards and grassland birds, such as the nationally significant Diamond Firetail *Stagonopleura guttata* and state significant Flame Robin *Petroica phoenicea*. Native mammals (e.g. macropods, rodents and dasyurids) are also likely to forage across these areas, such as the nationally significant Spotted-tailed Quoll *Dasyurus maculatus*, in addition to diurnal and nocturnal raptors such as the state significant Spotted Harrier *Circus assimilis*. Some of these areas had embedded and loose rocks, which may provide sheltering habitat for small mammals and reptiles.

A mob of Eastern Grey Kangaroo *Macropus giganteus* were observed foraging in grassland areas.

3.3.2 Woodland, Grassy Forest and Scattered Tree Habitats

Woodland patches occurred throughout the study area, comprising up to approximately 2.85 hectares of Stringybark-Box Woodland and Ribbon Gum Grassy Forest (see PCT patches 3359 and 3344 in Figure 2).

These woodland patches comprised the main, central portion of the study area, and were generally in very poor condition with a sparse canopy layer, weedy understorey, absence of shrub layer and mostly comprised

scattered trees. Nevertheless, these low-quality woodland patches may provide an important resource for arboreal fauna. Flowering eucalypts are likely to be utilised as a foraging resource for state and nationally threatened avifauna such as Black-chinned Honeyeater *Melithreptus gularis gularis* and Grey-headed Flying-fox *Pteropus poliocephalus.* Koala *Phascolarctos cinereus* may also forage in eucalypt species in the study area. Many of the eucalypts were mature and hollow-bearing, providing an array of small, medium, large and very large hollows, bark fissures and crevices. These are likely to be used for shelter and nesting by a range of hollow-dependent parrots, microbats, possums, gliders and owls, such as the EPBC Act-listed Brown Treecreeper *Climacteris picumnus victoriae*, and BC Act listed Little Lorikeet *Glossopsitta pusilla*, Turquoise Parrot *Neophema pulchella*, Barking Owl *Ninox connivens*, and Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*.

Scattered trees provide habitat for more mobile fauna species, vantage points and nesting areas for nocturnal and diurnal raptors such as the state significant Little Eagle *Hieraaetus morphnoides*, Square-tailed Kite *Lophoictinia isura*, as well as steppingstones for fauna moving through the study area, enhancing landscape permeability for native fauna.

3.3.3 Planted Vegetation Habitat

Planted vegetation was located throughout the study area as improved pastures (see grassy areas in Figure 2 which aren't covered by PCT mapping), windrows (e.g. Kurrajong) or as ornamental plantings around dwellings (e.g. White Poplar *Populus alba*). These areas provide foraging, roosting and nesting habitat for mobile generalist fauna including locally common birds and microbats.

3.3.4 Natural and Constructed Waterbodies

Commissioners Waters River exists along the north-east border of the study area, whilst several dams and minor drainage lines are scattered within and around the study area (see waterbodies mapped blue in Figure 2). Commissioners Waters River and the scattered farm dams were observed to contain water, whilst the minor drainage lines were observed to be mostly dry at the time of assessment, with only one drainage line further north observed to contain any water.

Due to agricultural activity and livestock presence throughout much of the study area, many of the creeks and waterbodies were observed to have been subject to ungulate pugging in the riparian zone and the waterbody themselves, which occurs when the penetration of animal hooves remoulds the soil's surface into a series of holes and mounds. This process can destroy a soil's structure by removing large soil pores and can kill plants or push propagules further down the soil profile, and can cause erosion to the banks, and increased turbidity levels within the waterbody.

Much of the grassland vegetation recorded within the study area was associated with Commissioners Waters River, in addition to some aquatic vegetation and scattered trees. The riverbanks of Commissioners Waters were considerably degraded in the north of the study area due to cattle pugging, with higher quality areas to the south and southeast where cattle have been excluded, allowing moderately dense grass cover on the river banks and growth of reeds and willows in areas just south of the study area. As such, the southern portion of this waterway may provide aquatic and riparian habitat for a range of common and threatened wetland bird species, amphibians and fish. Riparian habitat along this river is likely to be used by a range of avifauna, with raptors such as Square-tailed Kite and Little Eagle likely to forage within waterbodies and wetlands whilst

utilising adjacent tall trees as a hunting perch or for nesting purposes. Sections of Commissioners Waters with adequate fringing vegetation and in-stream rocks may support amphibians such as the nationally significant Peppered Tree Frog *Litoria piperata* and Glandular Frog *Litoria subglandulosa*. Australian White Ibis *Threskiornis moluccus*, Pacific Black Duck *Anas superciliosa*, Superb Fairywren *Malurus cyaneus* and Red-rumped Parrot *Psephotus haematonotus* were observed utilising habitat within or in proximity to this river.

Dams and other constructed waterbodies in the study area (see scattered blue circles and ovals in Figure 2) may provide a water resource to a range of common fauna species such as Eastern Grey Kangaroo, as well as suitable foraging for numerous common aquatic birds. These dams appeared to be highly impacted by livestock and comprised varying extents of fringing vegetation. Drainage lines and dams scattered across the study area comprised varying levels of aquatic vegetation and are likely to be seasonally inundated, whilst the small wetland present in the west was partially inundated at the time of surveys and supported a range of fringing grasses, sedges and rushes. These small wetlands and waterbodies had minimal emergent and fringing vegetation cover, and are therefore unlikely to support any significant shorebirds or cryptic waterbirds.

3.4 Significance Assessment

3.4.1 Threatened Flora

The NSW BioNet Atlas contains records of three nationally significant (i.e. under the EPBC Act) and 17 State significant (i.e. under the BC Act) flora species recorded within 10 kilometres (NSW DCCEEW 2025d; Appendix 1.2). The PMST nominated an additional 12 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 2025a; Appendix 1.2).

Based on the small, disjunct patches of native vegetation identified during the site assessment (Table 2), observations during the site assessment, and/or the recent BioNet records within the study area, there is potentially suitable habitat and therefore a moderate likelihood for four nationally significant and four State significant flora species occurring within the study area (see likelihood ranking key in Appendix 1.2). These are listed in Appendix 1.2, and in Table 3 below.

Table 3. Nationally and State Significant flora species with a Moderate likelihood of occurring within the study area (based on ALA and BioNet records, and suitable habitat observed during the site assessment).

Likelihood of Occurrence	
Nationally Significant	**State Significant**
Moderate Likelihood of Occurrence: • Bluegrass *Dichanthium setosum* • McKie's Stringybark *Eucalyptus mckieana* • Narrow-leaved Black Peppermint *Eucalyptus nicholii* • Hawkweed *Picris evae*	Moderate Likelihood of Occurrence: • Common Maidenhair *Adiantum aethiopicum* • Blotched Hyacinth-Orchid *Adiantum aethiopicum* • Tiger Orchid *Diuris sulphurea* • Common Billy-buttons *Craspedia variabilis*

The Biodiversity Assessment Method (BAM) requires targeted surveys to be completed when suitable habitat is identified for species credit species to inform the BDAR. These are species where presence cannot be reliably predicted through PCTs or habitat types, and their presence or absence on a site must be confirmed through field survey.

Targeted surveys are recommended for the following nationally and State significant flora species that have the potential to occur within the study area (Table 4).

Table 4. Significant flora species with potential to occur within or adjacent to the proposed Wongalea BESS (based on BioNet records and suitable habitat observed within the study area).

Species	Justification for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the study area	Survey Season (flowering period)	Recommendation
NATIONAL SIGNIFICANCE					
Bluegrass ***Dichanthium setosum***	There is a moderate likelihood of Bluegrass occurrence despite limited previous records. The study area is in the known distribution of three PCT's that are associated with this species, as well as containing species preferred habitat of grazed and disturbed pasture of woodland origin the study area also contained five species in high abundance, aside from Kangaroo Grass and Snow Grass, that are associated with Bluegrass.	Often found growing in moderately disturbed areas such as grassy roadside remnants, cleared woodlands, and highly disturbed pasture Study area contains some of the species' preferred habitat, including open grassy woodlands that have been disturbed and variously grazed. Associated species observed within the study area include Yellow box *Eucalyptus melliodora,* Manna Gum *Eucalyptus viminalis,* Kangaroo Grass *Themeda triandra,* Snow Grass *Poa sieberiana,* and Bluebells sp. *Wahlenbergia*.	3359, 3344, 3723	Flowers mostly in summer	Should be surveyed for during flowering season.
McKie's Stringybark ***Eucalyptus mckieana***	Study area supports species occurrence as it is in the known distribution of one PCT that is associated with this species. There were three associated species identified within the study area. During the site assessment, there was no evidence of flowering, fruit, or buds of any Eucalypt sp., and therefore not enough information to adequately identify all eucalypt species. Given the similarity of McKie's Stringybark to other Eucalypt sp. present, it cannot be ruled out from occurring within the study area and as such has a moderate likelihood of occurring I the study area.	Commonly found in woodland and grassy open forest on poor sandy loams. Associated species observed within the study area include Rough-barked Apple *Angophora floribunda, Blakely's Red-gum Eucalyptus blakelyi,* and But-But *Eucalyptus bridgersiana.*	3359	March-May	Should be surveyed for during flowering season.

Species	Justification for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the study area	Survey Season (flowering period)	Recommendation
Narrow-leaved Black Peppermint ***Eucalyptus nicholii***	Two known PCT's associated with this species occur within the study area, as well as multiple records of the species in the local vicinity. During the site assessment, there was no evidence of flowering, fruit, or buds of any Eucalypt sp., and therefore not enough information to adequately identify all eucalypt species. Given the similarity of Narrow-leaved Black Peppermint to other Eucalypt sp. present, it cannot be ruled out from occurring within the study area and as such has a moderate likelihood of occurring in the study area.	Typically grows in dry grassy woodland on slopes and rides of shallow soils. The species is widespread but sparsely distributed, occurring largely on roadside and private property. Can commonly recruit from seedlings, even in disturbed soils.	3359, 3344	Autumn	Should be surveyed for during flowering season.
Hawkweed ***Picris evae***	While there are no associated PCT's present in the study area, the study area still has potential habitat through its modified nature and paddocks. The lack of records in the local area could be due to its annual lifeform and reduced extent of time for observations. The study area also contained Yellow Box with a modified understory, and therefore this species has a moderate likelihood of occurrence in the study area.	All habitat from recent collections are from modified areas such as weedy vegetation paddocks. Main habitat is open eucalypt forest that includes Yellow Box.	Not associated with any PCTs in the study area.	Spring-Summer	Should be surveyed for during flowering season.
STATE SIGNIFICANCE					
Common Maidenhair ***Adiantum aethiopicum***	Only two records of this species exist in the local vicinity, with the newest observation from 2003. The study area is however within the species known distribution and both associated PCT's were observed in the study area, and there Common Maidenhair has a moderate likelihood of occurrence in the study area.	Widespread in damp open areas, often along creeks. Can form large colonies.	3359, 3344	N/A	N/A

Species	Justification for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the study area	Survey Season (flowering period)	Recommendation
Common Billy-buttons ***Craspedia variabilis***	Multiple records of this species exist in the nearby vicinity, however none of these records are more recent than 2010. While there is a limited number of previous records, two PCT's associated with the species occur within the study area. Due to the potential habitat, there is a moderate likelihood of occurrence of this species in the study area.	Occurs in woodland, grassland, and sclerophyll forest and is widespread.	3344, 3944	Early spring to early Summer	Should be surveyed for during flowering season.
Blotched Hyacinth-Orchid ***Dipodium punctatum***	Multiple records of this species exist in the local vicinity with some records from 2024 approximately four kilometres from the study area. The study area also contains two known PCT's associated with this species, therefore this species has a moderate likelihood of occurrence.	Grows in dry sclerophyll woodland to wet sclerophyll forest and derives nourishment from dead organic matter.	3359, 3344	Summer	Should be surveyed for during flowering season.
Tiger Orchid ***Diuris sulphurea***	There are no associated PCT's known to occur within the study area, however there are multiple records in the local vicinity with the closest records less than three kilometres away from 2024. This species grows in sclerophyll forest which is modelled to occur in the study area as well as study area being in known habitat distribution. Based on proximity of recent records and potential for suitable habitat to be present in study area, this species has a moderate likelihood of occurrence in the study area.	Widespread and grows in heath, sclerophyll forest, and open woodland.	Not associated with any PCTs in the study area.	September-December	Should be surveyed for during flowering season.

3.4.2 *Threatened Fauna*

The NSW BioNet Atlas contains records of 18 nationally significant and 20 State significant fauna species recorded within 10 kilometres (NSW DCCEEW 2025d; Appendix 2.1). The PMST nominated an additional 18 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 2025a) (Appendix 2.1).

Based on the suitable habitat identified during the site assessment and based on the study area being situated within the likely or known modelled distribution for each of these species, there is therefore a moderate to high likelihood for 10 nationally significant and 11 State significant fauna species occurring within the study area (see likelihood ranking key in Appendix 2.1). These are listed in Table 5 below.

Table 5. National and State Significant fauna species with a Moderate to High likelihood of occurring within the study area (based on BioNet records and suitable habitat observed within the study area).

Likelihood of Occurrence	
Nationally Significant	
High Likelihood of Occurrence: • Brown Treecreeper (eastern subspecies) *Climacteris picumnus victoriae* • Koala *Phascolarctos cinereus* • Grey-headed Flying-fox *Pteropus poliocephalus*	Moderate Likelihood of Occurrence: • South-eastern Hooded Robin *Melanodryas cucullata cucullate* • Fork-tailed Swift *Apus pacificus* • Swift Parrot *Lathamus discolor* • Glandular Frog *Litoria subglandulosa* • Diamond Firetail *Stagonopleura guttata* • White-throated Needletail *Hirundapus caudacutus* • Spotted-tailed Quoll *Dasyurus maculatus*
State Significant	
High Likelihood of Occurrence: • Dusky Woodswallow *Artamus cyanopterus cyanopterus* • Little Lorikeet *Glossopsitta pusilla* • Little Eagle *Hieraaetus morphnoides* • Square-tailed Kite *Lophoictinia isura* • Turquoise Parrot *Neophema pulchella* • Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	Moderate Likelihood of Occurrence: • Speckled Warbler *Chthonicola sagittata* • Spotted Harrier *Circus assimilis* • Black-chinned Honeyeater (eastern subspecies) *Melithreptus gularis gularis* • Flame Robin *Petroica phoenicea* • Barking Owl *Ninox connivens*

Based on the presence of suitable habitat and previous BioNet records immediately adjacent to the study area boundary (i.e. within 25 metres), there is a high likelihood of occurrence for nine nationally and State-listed species, with the likelihood rationale outlined in Table 6 and Table 7 below.

Table 6. Significant avian fauna species with a moderate to high likelihood of occurrence within the study area (based on BioNet records and suitable habitat recorded in the study area).

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the Study area	Survey Season / Timing	Recommendation
NATIONAL SIGNIFICANCE					
Brown Treecreeper (eastern subspecies) *Climacteris picumnus victoriae*	High likelihood of occurrence due to recent records within 5km (including one within 0.3km) and presence of suitable habitat (eucalypt woodland with open grassy understorey and hollow-bearing trees).	Found in eucalypt woodlands and dry open forest with open grassy understorey, and containing hollow-bearing trees for nesting.	3359, 3344, 3944, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
White-throated Needletail *Hirundapus caudacutus*	High likelihood of occurrence due to recent records within 5km and presence of suitable habitat (wooded areas/ open forest).	This species is almost exclusively aerial in Australia and occurs over most habitat types but is recorded most often above heathland and open forest, flying between trees or in clearings (below canopy), and is less commonly recorded above woodland and treeless grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.	3359, 3344, 3944, 3723	October to April	No targeted survey recommended
Diamond Firetail *Stagonopleura guttata*	High likelihood of occurrence due to recent records within 5km (including one within 0.3km) and presence of suitable habitat (grassy eucalypt woodland with Yellow Box, grasslands, riparian areas and lightly wooded farmland).	Found in grassy eucalypt woodlands and open forest, and often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland and other highly disturbed areas with no or limited native vegetation.	3359, 3344, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Swift Parrot *Lathamus discolor*	Moderate likelihood of occurrence due to recent records within 5km and	Relies on flowering and lerp-infested eucalypts, with one preferred species in the study area (Yellow Box). Sometimes	3359, 3344, 3723	April to August	No targeted survey recommended

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the Study area	Survey Season / Timing	Recommendation
	presence of suitable habitat (flowering eucalypts e.g. Yellow Box)	occupies highly disturbed areas with no or limited native vegetation (e.g. table drains, ploughed paddocks). May also sometimes occupy highly disturbed areas with no or limited native vegetation (e.g. ploughed paddocks). Breeding grounds in Tasmania.			
South-eastern Hooded Robin *Melanodryas cucullata cucullata*	Moderate likelihood of occurrence due to records within 5km and presence of suitable habitat (dry open forest and woodland with flowering Yellow Box).	Prefers lightly wooded country, usually open eucalypt woodland and acacia scrub.	3344, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Fork-tailed Swift *Apus pacificus*	Moderate likelihood of occurrence due to recent records within 5km and presence of limited suitable habitat (likely to aerially forage over open woodland, riparian woodland and treeless grassland, but unlikely to land or roost in study area)	Almost exclusively aerial and mostly occurring over inland plains, dry or open woodland, riparian woodland but also over treeless grassland.	*N/A	October to March	No targeted surveys recommended
STATE SIGNIFICANCE					
Dusky Woodswallow *Artamus cyanopterus cyanopterus*	High likelihood of occurrence due to numerous recent records within 5km (including one within 0.3km) and presence of suitable habitat (eucalypt woodland with open/sparse understorey and groundcover of grasses, sedges and fallen woody debris. Also occurs near rivers and disturbed areas with limited native vegetation).	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrubland, heathlands and farmland, usually at the edges of forest or woodland. Partially migratory, with some populations moving further north for winter.	3359, 3344, 3944, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the Study area	Survey Season / Timing	Recommendation
Barking Owl *Ninox connivens*	High likelihood of occurrence due to recent record within 5km and presence of suitable habitat (woodland and open forest, including fragmented remnants and partly cleared farmland. Nests in large hollow-bearing trees).	Woodland and open forest, fragmented remnants and partly cleared farmland. Flexible in habitat use, and hunting can extend to closed forest and more open areas. Sometimes breeds along timbered watercourses in heavily cleared habitats.	3359, 3344, 3723	December to June (i.e. outside nesting season)	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Little Lorikeet *Glossopsitta pusilla*	High likelihood of occurrence due to recent records within 5km and presence of suitable habitat (may forage in open eucalypt woodland with Yellow Box and nest in Eucalypt hollows, particularly riparian trees).	Forages primarily in the canopy of open eucalypt forests and woodland, including isolated flowering trees in open country. Riparian habitats are particularly used. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts often riparian)	3359, 3344, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Little Eagle *Hieraaetus morphnoides*	High likelihood of occurrence due to hundreds of recent records within 5km and presence of suitable habitat (riparian areas, open acacia and eucalypt woodland).	Occupies open eucalypt forest and woodland or Acacia and riparian woodlands. Requires tall living trees in a remnant patch for nesting. Species also known to occur in other waterbodies such as rivers, lakes, streams, and sometimes occupies highly disturbed areas with no or limited native vegetation (e.g. table drains, ploughed paddocks).	3359, 3944, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Square-tailed Kite *Lophoictinia isura*	High likelihood of occurrence due to recent records within 5km and presence of suitable habitat (dry, open woodlands and timbered watercourses).	Occupies dry woodlands and open forests, particularly along timbered watercourses. Species also known to occur in other waterbodies such as rivers, lakes, streams. Frequently resides along major west-flowing river systems. Summer-breeding migrant to south-east of NSW.	3359, 3344, 3944, 3723	April to August	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the Study area	Survey Season / Timing	Recommendation
Turquoise Parrot *Neophema pulchella*	High likelihood of occurrence due to recent records within 5km and presence of suitable habitat (open, grassy eucalypt woodland, clearings, creeks in farmland, tree hollows)	Species lives on the edges of open, grassy eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland, and nests in tree hollows.	Not associated with any PCTs in the study area.	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Speckled Warbler *Chthonicola sagittata*	Moderate likelihood of occurrence due to recent records within 5km (including one within 0.3km) and presence of suitable habitat (Eucalypt woodland).	Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies, with scattered native tussock grasses, sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	3359, 3944, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Spotted Harrier *Circus assimilis*	Moderate likelihood of occurrence due to records within 10km and presence of suitable habitat (native grassland and agricultural land).	Found most commonly in native grassland and grassy open woodland, but also occurs in agricultural land, foraging over open habitats including wetlands. Also known to occur in habitat associated with rivers, lakes and streams.	3359, 3344, 3944	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)
Black-chinned Honeyeater (eastern subspecies) *Melithreptus gularis gularis*	Moderate likelihood of occurrence due to record within 5km and presence of suitable habitat (dry, woodland with preferred eucalypt species such as Blakely's Red Gum and Yellow Box).	Occupies open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark, White Box, Inland Grey Box, Yellow Box, Blakely's Red Gum and Forest Red Gum. Tends to occur in the largest woodland patches in the landscape.	3359, 3344, 3723	All year	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the Study area	Survey Season / Timing	Recommendation
Flame Robin *Petroica phoenicea*	Moderate likelihood of occurrence due to record within 10km and presence of suitable habitat (open woodlands, pastures and native grasslands).	Requires tall moist eucalypt forests and woodlands for breeding, but study area may contain suitable open woodlands, pastures and native grasslands for the species to live in winter (when the species moves from uplands to lower, more open areas)	3359, 3344, 3944, 3723	June to August	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; removal of trees suitable for breeding outside of breeding season)

Note: *N/A = Associated PCTs not specified by NSW Government online resources for these species.

Table 7. Significant non-avian fauna species with a moderate to high likelihood of occurrence within or adjacent to the proposed Wongalea BESS (based on BioNet records and suitable habitat recorded in the study area).

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the study area	Survey Season / Timing	Recommendation
NATIONAL SIGNIFICANCE					
Spotted-tailed Quoll *Dasyurus maculatus*	Moderate likelihood of occurrence due to recent records within 5km and presence of suitable habitat (hollow-bearing trees, animal burrows and rocky areas in open forest, woodland, grassland and pastoral areas).	Occupy various habitats, including forests, woodlands, coastal heathlands and rainforests. They are sometimes seen in open country or on grazed areas and rocky outcrops. They make their dens in rock shelters, small caves, hollow logs and tree hollows. No limiting habitat present within the study area.	3359, 3344, 3944, 3723	All year	No targeted surveys recommended.
Koala *Phascolarctos cinereus*	High likelihood of occurrence due to hundreds of recent records within 5km and presence of suitable habitat (eucalypt trees in low-quality woodland patches).	Eucalypt forests and woodlands.	3359, 3344, 3723	Spring (dusk/dawn) and summer (daytime)	Core Koala habitat, as defined under the Koala SEPP 2021 (DPHI 2025b), is not present within the Development Area due to the isolated and fragmented nature of suitable habitat (i.e. eucalypts) within the Development Area. Therefore, no targeted surveys are recommended. Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; inspection of trees for the species prior to removal)
Grey-headed Flying-fox *Pteropus poliocephalus*	High likelihood of occurrence due to hundreds of recent records within 10km, presence of roosting camp less than 6km away, and presence of suitable foraging habitat (flowering/fruiting Eucalypts).	Occur in rainforests, tall sclerophyll forests and woodlands, heaths, swamps, urban gardens and cultivated fruit crops. Feed on the nectar and pollen of native trees (i.e. Eucalyptus, Melaleuca and Banksia). Roosting camps are generally located within 20km of a regular food source and are often in gullies, close to water, in vegetation with a dense canopy.	3359, 3344, 3723	Period of eucalypt Flowering (likely Spring to Autumn)	No targeted survey recommended due to absence of roost camp within the study area

Species	Rationale for Likelihood of Occurrence	Habitat Requirements	Associated PCTs in the study area	Survey Season / Timing	Recommendation
Glandular Frog *Litoria subglandulosa*	Moderate likelihood of occurrence due to recent records and presence of limited suitable habitat (well-vegetated rivers in dry eucalypt woodland, and highly disturbed areas with fringing riparian vegetation)	Found along streams in rainforest, moist and dry eucalypt forest or in subalpine swamps.	3344, 3944	October to December	Undertake targeted nocturnal searches (if impacts to Commissioners Waters River or wetland are proposed)
STATE SIGNIFICANCE					
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	High likelihood of occurrence due to records within 5km and presence of suitable habitat (tree hollows and mammal burrows suitable for nesting)	Roosts in tree hollows and buildings; and in treeless areas may utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees. Thought to migrate to southern Australian States in late summer and autumn.	3359	December to June	Ensure appropriate mitigation measures in place for the species (i.e. Construction Environmental Management Plan implemented; inspection of trees for the species prior to removal)

Note: *N/A = Associated PCTs not specified by NSW Government online resources for these species.

3.4.3 *Migratory Fauna*

Migratory species listed under international agreements being the Bonn Convention (Bonn), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) or Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) with potential to occur in the study area have been identified in Table 8. These species are listed as 'Migratory' under the EPBC Act, as required under Australia's bilateral migratory bird agreements with Japan, China and Korea. Species which primarily inhabit marine, pelagic and estuarine environments have been omitted from the assessment due to a lack of suitable habitat within the study area.

The NSW BioNet Atlas contains records of four migratory listed (i.e. under the EPBC Act) fauna species previously recorded within 10 kilometres of the study area (NSW DCCEEW 2025d) (Figure 5), whilst the PMST nominated an additional one listed migratory species which has not been previously recorded but have the potential to occur in the locality (DCCEEW 2025a).

Of these species, two have a moderate to high likelihood of occurring within the study area (Table 8).

Table 8. Migratory fauna species with a Moderate to High likelihood of occurring within the study area (based on BioNet records).

Migratory Fauna - Likelihood of Occurrence	
High Likelihood of Occurrence:	**Moderate Likelihood of Occurrence:**
• White-throated Needletail *Hirundapus caudacutus*	• Fork-tailed Swift *Apus pacificus*

The study area is unlikely to be classed as 'important habitat' as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DoE 2013), in that it is unlikely to contain:

- Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species;
- Habitat utilised by a migratory species which is at the limit of the species range; or,
- Habitat within an area where the species is declining.

3.4.4 *Threatened Ecological Communities*

According to the Protected Matters Search Tool (PMST), three Threatened Ecological Communities (TECs) listed as Endangered or Critically Endangered under the EPBC Act are predicted to occur within 10 kilometres of the study area (DCCEEW 2025a):

- Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau (South Eastern Highlands Bioregion);
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland; and,
- New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands.

The latter two of these TECs are associated with PCTs observed within the study area (i.e. PCT 3359, 3344 and 3944), as presented in Table 2. As such, the EPBC Act-listed Critically Endangered 'White Box-Yellow Box-

Blakely's Red Gum Grassy Woodland and Derived Native Grassland' and Critically Endangered 'New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands' both have the potential to occur based on their association with PCTs within the study area (Table 2; Figure 2).

During the site assessment, vegetation within the study area was not observed to be consistent with the condition thresholds for these three TECs, as vegetation quality was overall very low.

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland is considered unlikely to be present, as while there was Yellow Box and Blakely's Red Gum within the study area, the understory of these areas did not contain a native ground layer where the perennial vegetation was made up of 50% native species. Nor did an area qualify as a patch which contained five or more trees in which the gap between the canopy was no greater than 75 meters. The vegetation did also not meet any of the thresholds for the condition classes for a patch of this TEC.

New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands is unlikely to be considered present as no specimens of New England Peppermint were observed, although while it may have potential to occur due to limitations of identification, no species with its bark characteristics were observed as more than 50% of eucalypt species observed during the site assessment. No species that area known to co-dominate the canopy in this TEC were present, and neither was a species-rich ground layer of herbs and grasses present.

Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau (South Eastern Highlands Bioregion) is not associated with any of the known PCT's that occur within the study area. This TEC is considered unlikely to be present as the condition thresholds for species presence and coverage were not met.

3.4.5 Ramsar Wetlands

Ramsar wetlands are recognised as internationally important wetlands under the Ramsar Convention 1971 and are recognised as matters of NES under the EPBC Act. They are known to support migratory shorebirds, which rely on these intertidal wetlands in Australia as non-breeding stopovers. Migratory shorebirds must build sufficient energy reserves, in order to travel long distances back to breeding grounds often in the northern hemisphere.

The impact area is not listed under the Ramsar Convention or in 'A Dictionary of Important Wetlands in Australia'. A search using the EPBC Act Protected Matters Search Tool (PMST) (DCCEEW 2025a) has identified that the nearest Wetlands of International Importance (Ramsar) is the Little Llangothlin Nature Reserve Ramsar site, which exists approximately 48 kilometres north of the study area.

Due to its proximity to this Ramsar site, the nature of the proposed works and limited amount of suitable habitat for waterbird and migratory species within the study area, the proposed development is unlikely to have a significant impact to any Ramsar wetlands.

3.5 Ecological Sensitivity

The results of the desktop and field assessments inform an assessment of ecological sensitivity within the study area. Areas of ecological sensitivity within the study area have been classified as areas of high, moderate and low sensitivity.

- High sensitivity areas: EPBC Act-listed TECs and large wetland areas within the study area;

- Moderate sensitivity areas: All remnant native vegetation areas that are not also an EPBC-Act TEC; and,
- Low-sensitivity areas: Modified areas including cropped land and planted vegetation.

Ecological sensitivity mapping is intended to inform the avoidance of ecological impacts during the design stage of the project. Where possible, the proposed infrastructure footprint should avoid high sensitivity areas, minimise impacts to moderate sensitivity areas, and locate in low sensitivity areas.

3.5.1 High Sensitivity Areas

No areas of high sensitivity were observed in the study area during the site assessment.

3.5.2 Moderate Sensitivity Areas

Areas of moderate sensitivity comprise PCTs that don't meet the condition thresholds for a nationally significant ecological community. Very little of the study area comprised moderate sensitivity areas. Most areas that had been modelled as PCT 3359, 3944, and 3344 contained moderate sensitivity, along with all scattered native trees present in the study area.

3.5.3 Low Sensitivity Areas

Most of the study area would be considered low sensitivity and there is a history of cattle grazing and cropping in the study area. Areas that did not support remnant native trees contained non-indigenous vegetation and planted vegetation. These areas also contained several weeds of regional concern as well as WoNS. The area modelled as PCT 3723 in the south of the study area would be an area of low sensitivity based on the lack of native vegetation.

3.6 Biodiversity Offsets

The Biodiversity Offsets Scheme provides a mechanism to avoid, minimise and offset the impacts of a range of developments, land clearing and other activities in NSW. Under this scheme, impacts to native vegetation and habitat are offset with gains in biodiversity at stewardship sites, with the aim of delivering no net loss to biodiversity (which is calculated using the Biodiversity Assessment Method). Proposed impacts will generate biodiversity credit obligations, and biodiversity credits are created at biodiversity stewardship sites. Credit obligations must generally be met before the impact on biodiversity occurs.

The Biodiversity Conservation Regulation 2017 sets out threshold levels for when the Biodiversity Offsets Scheme will be triggered. The threshold has two elements:

- Whether the amount of native vegetation being cleared exceeds an area threshold, or
- Whether the impacts occur on an area mapped on the Biodiversity Values Map published by the Environment Agency Head.

If clearing and other impacts exceeds either trigger, the Biodiversity Offset Scheme applies to the proposed development, including biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017.

The area threshold varies depending on the minimum lot size, or actual lot size (where there is no minimum lot size provided for the relevant land under the Armidale Regional Local Environment Plan 2012). The

Wongalea BESS is proposed to be developed in an area of approximately six hectares, and vegetation clearing may exceed the corresponding 'Area Clearing Threshold' of one hectare or more under the Biodiversity Offset Scheme for a lot size between 40 hectares and 1,000 hectares.

According to NSW DCCEEW's Biodiversity Values Map and Threshold Tool (NSW DCCEEW 2025e), the entirety of Commissioners Waters River is mapped as 'Biodiverse Riparian Land' (i.e. purple) within the Wongalea BESS study area vicinity (Plate 17). However, the proposed Development Area does not intersect with the Commissioners Waters River.

The Biodiversity Offsets Scheme applies to state significant development (SSD) and state significant infrastructure (SSI) projects, unless the Secretary of the NSW DCCEEW determines that the Proposal is not likely to have a significant impact.

Given that the proposed Wongalea BESS is an SSD and there are recorded biodiversity values within the study area, the Biodiversity Offset Scheme applies to the proposed development. As such, the Biodiversity Assessment Method (BAM) will need to be applied, and a Biodiversity Development Assessment Report (BDAR) will need to be prepared and submitted to the Department of Planning, Housing and Infrastructure (DPHI) as part of the Development Application (DA) in order to determine credit obligations as a result of the proposed action.

3.6.1 Amendment of Biodiversity Conservation Act 2016

It is noted that *Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Act 2024 No 96* was passed by NSW Parliament on 21 November 2024. Once in place, this Amendment Act will significantly change the *BC Act* to reform the NSW Biodiversity Offsets Scheme and is likely to have implications for the offset requirements of the proposed Wongalea BESS.

Plate 17. NSW DCCEEW mapping of High Biodiversity Value Areas across the study area location (NSW DCCEEW 2025e).

4 POTENTIAL IMPACTS

The project footprint will be finalised with reference to the findings of this assessment to avoid and minimise impacts on ecological values where possible. Likely impacts associated with the project footprint of the proposed Wongalea BESS are discussed in the following sections.

4.1 Construction Related Impacts

In the absence of suitable mitigation measures, construction-related impacts are likely to include:

- The introduction and spread of weeds and soil pathogens due to on-site activities;
- Disturbance to wildlife from increased human activity and noise during construction; and,
- Indirect impacts on adjacent areas if construction activities, erosion and drainage are not appropriately managed.

The study area is located within a slightly undulating agricultural landscape with Commissioners Waters River along the north-east border and interspersing ephemeral drainage lines. Several patches of native vegetation and scattered native trees were recorded within the study area, including several plant community types which have the potential to support numerous nationally significant flora and fauna species.

The construction footprint has not been finalised and targeted surveys have not yet been undertaken to determine presence of MNES. As such, specific impacts to EPBC Act species and communities as a result of the proposed BESS are currently unknown. Nonetheless, it is expected that there will be some impacts to native vegetation, primarily because of the construction of the proposed BESS compounds, on-site substation/transformer, transmission connection infrastructure and associated temporary construction laydown area.

Targeted surveys are required to confirm the presence and extent of BC Act and EPBC Act-listed flora species within the study area. There is potential for works to directly or indirectly impact significant species' habitat observed within the study area, which is estimated to include:

- Western New England Panic-Wiregrass Grassland (PCT 3723), which provides potential habitat for significant grassland species such as Diamond Firetail, Flame Robin, Spotted-tailed Quoll, Spotted Harrier, Bluegrass or Common Billy-buttons;
- New England Hills Stringybark-Box Woodland (PCT 3359) and New England Ribbon Gum Grassy Forest (PCT 3344), which provides potential habitat for nationally significant woodland species such as Swift parrot, Regent Honeyeater, Black-chinned Honeyeater, Grey-headed Flying-fox, Koala, Brown Treecreeper, Little Lorikeet, Turquoise Parrot, Barking Owl, Masked Owl *Tyto novaehollandiae*, Yellow-bellied Sheathtail-bat, Little Eagle, Square-tailed Kite, Common Maidenhair, Bluegrass, *Dipodium punctatum*, McKie's Stringybark or Narrow-leaved Black Peppermint;
- New England Tableland Carex Fens (PCT 3944), in addition to Commissioners Water River, several drainage lines and dams, which are likely to support nationally threatened species such as Peppered Tree Frog, Glandular Frog, Bluegrass, *Dipodium punctatum*, Narrow-leaved Black Peppermint, Common Maidenhair or Common Billy-buttons.

The preparation of a Construction Environment Management Plan will further avoid and mitigate potential impacts by ensuring the protection of retained vegetation and/or habitat prior to, and during construction, as well as control the spread of weeds and pathogens.

4.2 Cumulative Biodiversity Impacts

The largest impact to biodiversity in the locality and encompassing bioregion is likely to have stemmed from increased European settlement around the 1940s and the subsequent land clearance for agriculture. By 2000, intensive vegetation clearing for agriculture (grazing and cultivation) resulted in the removal of approximately 60% of the native tree cover across the New England Tablelands bioregion. The main ongoing threats to the ecological values within this bioregion associated with human activities include intensified land use, incremental clearance of vegetation for various purposes (e.g. grazing, cropping, rural residential developments, infrastructure works), and impacts associated with fragmentation of native vegetation into small remnants.

The impacts from the project must be considered together with the biodiversity impacts that have resulted from historic and predicted future human disturbances.

In addition to cumulative impacts associated with construction of the Wongalea BESS, operational activities of the BESS have the potential to lead to incremental and cumulative impacts (e.g. barrier effects). There are nine nearby Renewable Energy projects operating or under development within the vicinity of the study area (Ecology and Heritage Partners Pty Ltd 2025), including six within 5.5 kilometres of the site (DCCEEW 2025d):

- Armidale BESS (Amendment Report being prepared) – located immediately adjacent to the south-east;
- Eathorpe BESS (SEARs issued, preparing EIS) – located 0.2 kilometres south;
- Armidale Solar Farm (In operation) – located 2.7 kilometres south-west;
- Olive Grove Solar Farm (approved) – located 3.7 kilometres south-east;
- Oxley Solar Farm (approved) – located 5 kilometres east; and,
- Stringybark Solar Farm (approved) located 5.3 kilometres south-east.

Given the project's proximity to these BESS and Solar Farms, operation of the proposed Wongalea BESS has the potential to increase cumulative pressures within the broader landscape, particularly in relation to significant flora and fauna species and ecological communities. The development footprint comprises patches of native vegetation and significant species' habitat.

The Environmental Impact Statement (EIS) will consider cumulative impacts, which will include community consultation to understand community concerns and ensure the EIS addresses these concerns. A Cumulative Impact Assessment will be undertaken in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (DPIE 2022). The guideline includes a number of important steps, where the proponent must undertake preliminary scoping of the assessment, the Department must confirm the requirements, assessments must be completed as required and shared with the local community, with feedback and project alterations considered by the proponent if necessary.

4.3 The Impact of Climate Change

Climate change is likely to have an impact on the flora and fauna of the Study area. There has been recent speculation about the movement of wetlands south as the interior of Australia becomes increasingly arid. This conjecture is not supported by empirical data and it is likely that changes in Australia's climate will have unpredictable impacts on Australia's biodiversity, including birds (Pittock 2003). Changes that have already occurred as a result of the effect of climate change on birds include changes to distribution, phenology, morphology and physiology, behaviour, and abundance and population dynamics (Chambers *et al.* 2005).

As climate change is better understood it may be that renewable energy developments need to be mindful of the impacts of this phenomenon, however at present, this is not possible.

5 LEGISLATIVE AND POLICY IMPLICATIONS

5.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) likely to have a significant impact on Matters of National Environmental Significance (MNES), or those that are undertaken on Commonwealth Land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any MNES.

Should the development of the land require the removal of native vegetation, further on-ground assessments are required to determine the likelihood of significant impacts as a result of the proposed action, in particular, to EPBC Act-listed species and ecological communities. Potential MNES observed within the study area during the preliminary assessment includes habitat for four nationally significant flora (Table 4) and 10 nationally significant and/or migratory fauna species (Table 5; Table 8).

Given the highly modified nature of the site, the lack of connectivity with nearby higher-quality habitat (e.g. bushland to the east), and the proposed development footprint that will result in a removal of a small area of native vegetation, it is highly unlikely that the proposed development will significantly impact any MNES. However, significant impact assessments will be completed for all MNES that are impacted or likely to be impacted by the Project following completion of targeted surveys.

5.2 *Biodiversity Conservation Act 2016* (NSW)

The *Biodiversity Conservation Act* (BC Act), in conjunction with the *Biodiversity Conservation Regulation 2017* (BC Regulation), outlines the framework for assessment and approval of biodiversity impacts associated with a proposed development that requires permission under the *Environmental Planning and Assessment Act* (EP&A Act). The BC Act includes a Biodiversity Offsets Scheme (BOS) framework to avoid, minimise and offset impacts on biodiversity from proposed development and biodiversity clearing. If the BOS applies to a proposed development or activity that would be authorised by a planning approval, or proposed clearing that would be authorised by a vegetation clearing approval, then the proponent is required to prepare a BDAR which is to be submitted in support of the application for development approval. The BDAR uses the Biodiversity Assessment Method 2020 (BAM) established under these biodiversity reforms, to provide a methodology for determining the number and type of biodiversity credits required to offset biodiversity impacts. This assessment must be undertaken by a BAM Accredited Biodiversity Assessor. As the proposed Wongalea BESS is declared a State Significant Development (SSD), a BDAR must be prepared to identify and assess biodiversity impacts under the provisions of the BC Act and offset those impacts by retiring biodiversity credits, determined using the BAM, through the BOS.

Under the *BC Act 2016*, approval is not required for clearing of native vegetation on *Category 1 – exempt* land, except for:

- Clearing by a person that harms an animal, where the person knew the clearing would be likely to harm the animal; or,

- Clearing by a person that damages the habitat of an animal that is a threatened species or part of a threatened ecological community where the person knew the clearing was likely to damage the habitat.

Approval under the *BC Act 2016* is not required for native vegetation management, including clearing on *Category 2 – regulated land* that is:

- An allowable activity under the Local Land Services Act 2013;
- Authorised by the Land Management (Native Vegetation) Code 2018;
- Authorised by an approval from the Native Vegetation Panel, under the Local Land Services Act 2013;
- Authorised or required in relation to a set aside under the Local Land Services Act 201; or,
- An authorised Private Native Forestry (PNF) plan.

There is potentially suitable habitat within the study area for 10 fauna species and three flora species listed under the BC Act. Pending the outcome of targeted surveys for threatened species and communities, approval under the BC Act may be required. This will most likely require a biodiversity conservation licence obtained from NSW DCCEEW.

Given the development may impact a threatened species or their habitat, a threatened species licence (a class of biodiversity conservation licence under Part 2 of the BC Act) may be required.

5.2.1 Amendment of Biodiversity Conservation Act 2016

On 21 November 2024, the *Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Act 2024 No 96* was passed by NSW Parliament. Once in place, this Amendment Act will significantly amend the *BC Act* to reform the NSW Biodiversity Offsets Scheme, and will include consequential amendments to the *Biodiversity Conservation Regulation 2017* and the *State Environmental Planning Policy (Biodiversity and Conservation) 2021.* This Act will come into force on a date yet to be proclaimed (likely in 2025), and may have implications for the proposed Wongalea BESS.

5.3 *Environmental Planning and Assessment Act 1979* (NSW)

The EP&A Act establishes a framework which governs whether development is permitted or prohibited, and the processes under which obtaining approvals and conducting assessments for development is undertaken in NSW. It is supported by the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), which provides additional detail contains key provisions for the day-to-day operation of the NSW planning system.

All development falls into one of the following three categories:

1. Development that does not need consent;
2. Development that needs consent, and;
3. Development that is prohibited.

Under the *State Environmental Planning Policy (SEPP) (Planning Systems) 2021*, renewable energy projects may be classified as a SSD if the capital investment value of the project exceeds $30 million (or $10 million in a prescribed environmentally sensitive area of state significance). Alternatively, the Minister for Planning and

Public Spaces (the Minister) may declare specified development on specified land to be SSD. The Minister is generally the consent authority for SSD, however if a reportable political donation is disclosed, the local council objects to the SSD application, or if 50 objections are made during application exhibition, then the Independent Planning Commission will be the consent authority.

For approved SSD, additional consent is not required under certain legislation identified in Section 4.41 of the EP&A Act. These include:

- A permit under section 201, 205 or 219 of the *Fisheries Management Act 1994*,
- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*,
- An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*,
- A bush fire safety authority under section 100B of the *Rural Fires Act 1997*,
- A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*.

The estimated capital investment value of the proposed Wongalea BESS is greater than $30 million, and as such, the project is considered a SSD and will require an EIS to be prepared and lodged with the Department of Planning, Housing and Infrastructure (DPHI).

5.3.1 State Environmental Planning Policy

SEPPs can specify planning controls for certain areas and/or types of development, and can also identify the development assessment system that applies and the type of environmental assessment that is required. This SEPP pertains to the protection and preservation of biodiversity values in non-rural areas of the State, and is administered by local councils.

The *Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Act 2024 No 96* (yet to commence) will amend the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*, and may therefore have implications for the proposed Wongalea BESS.

5.4 *Local Land Services Act 2013* (NSW)

Clearing of native vegetation on rural land is legislated by the *Local Land Services Act 2013* (LLS Act). This is administered by Local Land Services (LLS), with NSW DCCEEW responsible for developing native vegetation regulatory mapping and compliance under the LLS Act. The LLS Act aims to ensure the proper management of natural resources in the social, economic and environmental interests of NSW, consistent with the principles of ecologically sustainable development. This includes regulation of native vegetation clearing.

Part 5A of the LLS Act sets out the ways in which the regulating of activities (in connection with land management) would occur and the areas of the State to which it would apply. Section 60A of Part 5A applies to rural areas, including land within the Wongalea BESS study area. However, Section 60O of the LLS Act excludes clearing that is authorised under other legislation and allows the clearing of native vegetation if the clearing was authorised by a State significant infrastructure approval under Division 5.2 of the EP&A Act. Clause 6.8(3) of the BC Act regulates that a BAM should exclude impacts of native vegetation clearing and loss of habitat on Category 1-Exempt Land (within the meaning of Part 5A of LLS Act).

On Category 1- Exempt Land, native vegetation can be cleared without approval from Local Land Services. Land may be designated as Category 1- Exempt Land if the Environment Agency Head reasonably believes that:

- The land was cleared of native vegetation as at 1 January 1990, or lawfully cleared between 1 January 1990 and 25 August 2017;
- The land contains low conservation value grasslands or groundcover;
- Native vegetation identified as regrowth in a Property Vegetation Plan (PVP) under the repealed Native Vegetation Act 2003 (only where the PVP specifies a regrowth date); or,
- Land bio-certified under the *Biodiversity Conservation Act 2016*.

All other rural lands that do not meet category 1 definition should be assessed under a BDAR.

Category 2 Land is divided into:

a. Category 2- Regulated Land, which is land that is not Vulnerable or Sensitive regulated land. You may need authorisation from LLS to clear native vegetation in this category. There are a range of allowable activities which can be carried out without needing authorisation;

b. Category 2- Vulnerable Regulated Land, which is land where clearing of native vegetation may be limited under the Land Management (Native Vegetation) Code 2018, and a limited range of allowable activities are permitted; and,

c. Category 2- Sensitive Regulated Land, which is land where clearing is not permitted under the Land Management Code (Native Vegetation) Code 2018, and a limited range of allowable activities is permitted.

A review of the Native Vegetation Regulatory Map (Regulatory Map) confirms that the study area is within the Northern Tablelands LLS region, and is mostly covered by large areas of Category 1- Exempt Land (draft), whilst Category 2 – vulnerable regulated land (in-force) exists along Commissioners Water River in the north-east, and small sections of Category 2 – regulated land (draft) are scattered throughout the southern half of the study area (Plate 18). This should be further explored as part of the Environmental Impact Statement (EIS) process.

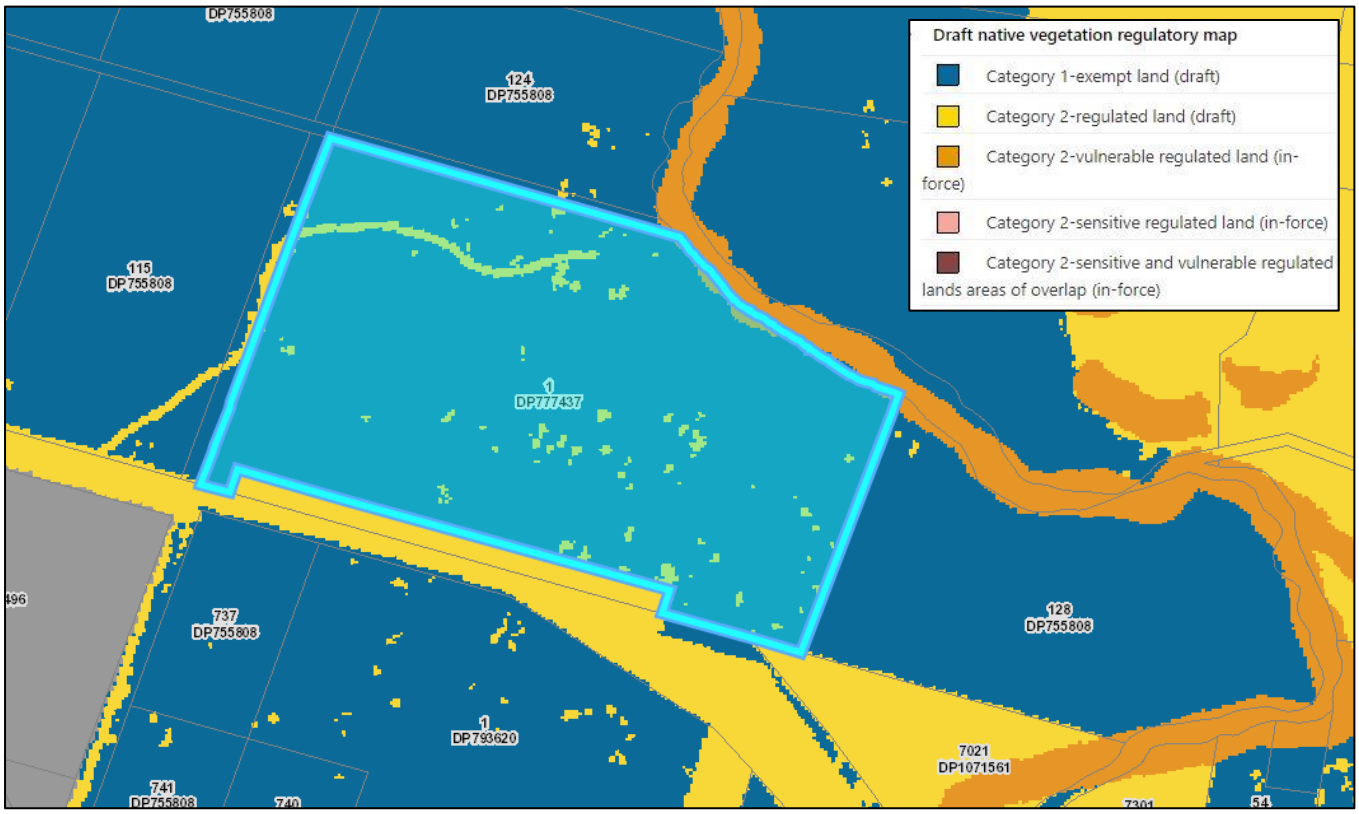

Plate 18. NSW DCCEEW draft Native Vegetation Regulatory Mapping across the study area (NSW DCCEEW 2025e).

5.5 *Biosecurity Act 2015* (NSW)

The *Biosecurity Act 2015* outlines risk-based management of biosecurity in NSW. It provides a statutory framework to protect the NSW economy, environment and community from the negative impact of pests, diseases and weeds. In NSW, all plants are regulated with a General Biosecurity Duty aimed to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

The general biosecurity duty applies to all weeds listed in Schedule 3 of the Biosecurity Act. Priority weeds have been identified in different Local Government Areas (LGA) due to the level of threat infestation they represent, some of the Weeds of National Significance (WoNS) are also listed as Primary Weeds in local government areas. Priority weeds for the Armidale region are listed in the Northern Tablelands Regional Strategic Weed Management Plan (Northern Tablelands Regional Strategic WMP).

34 non-indigenous/weed species were recorded during the site assessment. Of these, Blackberry is declared a 'State Priority Weed' and 'Regional Priority Weed' according to the Northern Tablelands Regional Strategic WMP. Blackberry is also listed as a WoNS.

Seven 'additional species of concern' listed in the Regional Strategic WMP were also recorded in the study area, including African Love-grass *Eragrostis curvula*, Cocksfoot, Paspalum *Paspalum dilatatum*, Hawthorn *Crataegus monogyna*, St John's Wort *Hypericum perforatum* subsp. *veronense*, Sweet Vernal-grass *Anthoxanthum odoratum*, and Ox-eye daisy *Leucanthemum vulgare*. These weeds are not considered a priority

in the Northern Tablelands, but are still subject to the general biosecurity duty and should be controlled by land managers as a private benefit.

There is also evidence (i.e. scats or burrows) that the study area is currently occupied by two pest fauna species listed as noxious within NSW (European Rabbit *Oryctolagus cuniculus* and Red Fox *Vulpes vulpes*). Competition and land degradation by feral Rabbits is listed as a key threatening process under the EPBC Act 1999 and BC Act 2016, and a national threat abatement plan has been prepared by NSW DCCEEW.

Listed noxious weeds and pests should be appropriately controlled throughout the study area, and a Weed and Pest Management Plan may be required. A strategic plan for each weed will be required at each site to define responsibilities and identify strategies and actions to control the weed species.

5.6 *Fisheries Management Act 1994* (NSW)

The *Fisheries Management Act 1994* (FM Act) is administered by the DPI (Fisheries) and aims to conserve, develop and share the fishery resources of the NSW for the benefit of present and future generations, and applies to all waterways within the study area.

Commissioners Waters River runs along the north-east border, whilst several minor drainage lines and farm dams are scattered throughout the study area. Several of these drainage lines were observed to be dry at the time of assessment and are likely inundated during wetter seasons of the year. These reserves and waterways likely provide aquatic habitat for numerous fish species.

One of the objectives of the FM Act is to conserve 'Key Fish Habitat' (KFH), which DPI-Fisheries has defined as aquatic habitats that are important to the sustainability of the recreational and commercial fishing industries, the maintenance of fish populations generally, and the survival and recovery of threatened aquatic species. According to Fisheries NSW Spatial Data Portal, Commissioners Waters River is considered Key Fish Habitat as part of the Northern Rivers Basin.

Part 7A of the FM Act stipulates that biological diversity of fish and aquatic vegetation must be conserved, particularly through the protection and promoted recovery of threatened aquatic species, populations, ecological communities and their critical habitats, and to promote ecologically sustainable development. If any action proposes to affect threatened species, populations and ecological communities of fish and aquatic vegetation, this must be properly assessed and appropriate measures implemented to mitigate these impacts. Specifically, assessments under the FM Act are required to assess potential impacts to areas mapped as Key Fish Habitat and/or indicative distributions of threatened freshwater species.

Schedule 6 of the FM Act also lists the following key threatening process that may be relevant to this Proposal and should be addressed within an Environmental Impact Statement (EIS):

- Degradation of native riparian vegetation along New South Wales water courses;
- Human-caused climate change; and,
- Removal of large woody debris from New South Wales Rivers and streams.

Any waterway crossings will need to consider an appropriately designed structure that does not obstruct fish passage and will be designed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management and the Policy and Guidelines for Fish Friendly Waterway Crossings.

A permit is required for any proposed dredging and reclamation works in Key Fish Habitat in accordance with section 201 of the FM Act (for example, construction of temporary crossings/sidetracks, bridges, creek diversions, excavating or reclaiming the bed or banks of any waterways), and under section 205 of the FM Act a permit is required to cut, remove, damage or destroy aquatic vegetation on public water land or an aquaculture lease (including foreshore). A permit is also required to temporarily or permanently block fish passage under section 219 of the FM Act (for example, bunding of waterways during bridge or sidetrack construction, use of silt fences across waterways and other similar works). However, if the proposed Wongalea BESS is declared as SSD under division 4.7 of the EP&A Act, a permit under Sections 201, 205 or 219 of the FM Act is not required, in accordance with section 4.41 of the EP&A Act.

Section 220ZZ of the FM Act lists the factors to be considered to determine the significance of impacts of an activity on threatened species, populations, ecological communities of fish and marine vegetation. If the proposal is likely to significantly impact on the threatened species, populations or ecological communities identified as likely to occur in the location of the proposal, then a BDAR or species impact statement (SIS) is required.

5.7 *National Parks and Wildlife Act 1974 (NSW)*

The management and protection of wildlife in NSW is principally provided for under the *National Parks and Wildlife Act 1974*. Wildlife provisions of this Act include taking protected animals from the wild, killing, dispersing or relocating protected animals for damage-mitigation, pest-control or human-protection purposes, and maintaining the welfare of protected fauna (including sick and injured animals and captive native wildlife).

The study area currently contains several waterbodies and small patches of woodland and grassland vegetation, which is likely to provide habitat for a range of aquatic and terrestrial species, including 10 nationally significant and/or migratory fauna species and 11 State significant fauna species (Table 5 and Table 8).

It is recommended that habitat (including waterbodies) be inspected by an ecologist if it is being impacted or decommissioned as part of the planning application process, to determine the likely presence of native fauna and ensure that fauna is translocated before the habitat is cleared.

Mitigation translocations (also known as salvage translocations) are undertaken to move organisms out of harm's way, usually from a development site. This may involve the movement of plants or animals from a development site to a location with largely intact habitat. Proponents seeking to undertake animal translocation must first gain approval from an animal ethics committee (AEC).

5.8 *Water Management Act 2000 (NSW)*

Commissioners Waters River exists along the north-east border of the study area. Several other unnamed drainage lines and dams are present across the study area.

A 'controlled activity approval' may be required from the Natural Resources Access Regulator for activities within 40 metres from the bank of any river, lake or estuary. Approvals are needed where the activity will cause more than minimal impact.

6 MITIGATION MEASURES

6.1 General Mitigation Measures

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area include:

- Minimise impacts to native vegetation and habitats through construction and micro-siting techniques, including locating BESS and associated infrastructure away from areas of high sensitivity, including wetlands, wooded areas, large trees and significant flora and fauna habitat areas. Retained areas of native vegetation should be fenced during construction;
- If indeed necessary, trees should be lopped or trimmed rather than removed. Similarly, buffers should be implemented around wetlands and soil disturbance and sedimentation within wetlands should be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
- Where possible, impact areas and access tracks should be formed along existing tracks and areas of existing disturbance;
- All contractors should be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Native vegetation (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- If any habitat trees or shrubs are proposed to be removed, this should be undertaken under the supervision of an appropriately qualified zoologist to salvage and relocate any displaced fauna. A Fauna Management Plan may be required to guide the salvage and relocation process;
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, Large Trees and/or wetlands;
- Removal of native vegetation should be undertaken outside the primary breeding period for birds (i.e. undertaken from January-June);
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with NSW Environment Protection Authority (EPA) guidelines to prevent offsite impacts to waterways and wetlands; and,
- As indigenous flora provides valuable habitat for indigenous fauna, it is recommended that any landscape plantings that are undertaken as part of the proposed works are conducted using indigenous species sourced from a local provenance, rather than exotic deciduous trees and shrubs.

7 SUMMARY

7.1 Planning Implications

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided below (Table 9).

Table 9. Further requirements associated with development of the study area.

Relevant Legislation	Implications	Further Action
Environment Protection and Biodiversity Conservation Act 1999	Should the development of the land require the removal of native vegetation, further on-ground assessments and preparation of an MNES report are required to determine the likelihood of significant impacts as a result of the proposed action, in particular, to EPBC Act species listed under the EPBC Act.	Submit MNES assessment to DCCEEW (does not require additional surveys). Subsequently conduct targeted surveys for four nationally significant flora species to inform the BDAR.
Biodiversity Conservation Act 2016	There is suitable habitat within the study area for three flora and 11 fauna species listed under the BC Act. Pending the outcome of targeted surveys for threatened species and communities, approval under the BC Act may be required. Given the development is likely to impact a declared area of outstanding biodiversity value, or impact a threatened species or their habitat, a threatened species licence (a class of biodiversity conservation licence under Part 2 of the BC Act) may be required.	Conduct targeted surveys for three flora species listed under the BC Act, to inform the BDAR.
Local Land Services Act 2013	Areas of Category 2-Regulated Land and Category 1-Exempt Land exist throughout the study area. This should be further explored as part of the Environmental Impact Statement (EIS) process.	Further investigate during EIS process.
Biosecurity Act 2015	Listed noxious weeds and pests should be appropriately controlled throughout the study area, and a Weed and Pest Management Plan may be required. A strategic plan for each weed will be required at each site to define responsibilities and identify strategies and actions to control the weed species.	Listed noxious weeds and pests should be appropriately controlled throughout the study area. Planning Permit conditions may include a requirement for a Weed and Pest Management Plan.
Fisheries Management Act 1994	DPI Fisheries should be consulted during the design stage if impacts to habitat are proposed and instream structures are therefore required to be managed to maintain fish passage.	Consult DPI Fisheries during design stage if aquatic habitat proposed to be impacted.
National Parks and Wildlife Act 1974	It is recommended that habitat (including waterbodies) be inspected by an ecologist if it is being impacted or decommissioned as part of the planning application process, to ensure that fauna is salvaged and translocated before the habitat is cleared. Any persons engaged to conduct salvage and translocation of terrestrial fauna species must hold a current approval from an animal ethics committee (AEC).	Engage an aquatic ecologist to assess waterbodies proposed for removal to determine the likely presence of native aquatic fauna. Ensure wildlife specialists hold a current Management Authorisation.

Relevant Legislation	Implications	Further Action
Water Management Act 2000	A 'controlled activity approval' may be required from the Natural Resources Access Regulator for activities within 40 metres from the bank of any river, lake or estuary. Approvals are needed where the activity will cause more than minimal impact.	Controlled activity approval may be required.

7.2 Next Steps

The following next steps are recommended as part of the planning application stage for the proposed development (i.e. EIS preparation):

- Conduct BAM-accredited BDAR assessment prior to lodgement of EIS;
- As part of BDAR preparation, conduct targeted surveys for threatened species with a moderate to high likelihood of occurrence and that have the potential to be significantly impacted by the proposed development, as discussed in Section 3.4, including:
    - Spring-summer flowering threatened flora in November-December, including for the EPBC Act-listed Bluegrass and Hawkweed, and BC Act-listed Common Bill-buttons, Tiger Orchid and Blotched Hyacinth-Orchid; and,
    - Autumn flowering threatened eucalypts in May, including for the EPBC Act-listed McKie's Stringybark and Narrow-leaved Black Peppermint.

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FIGURES

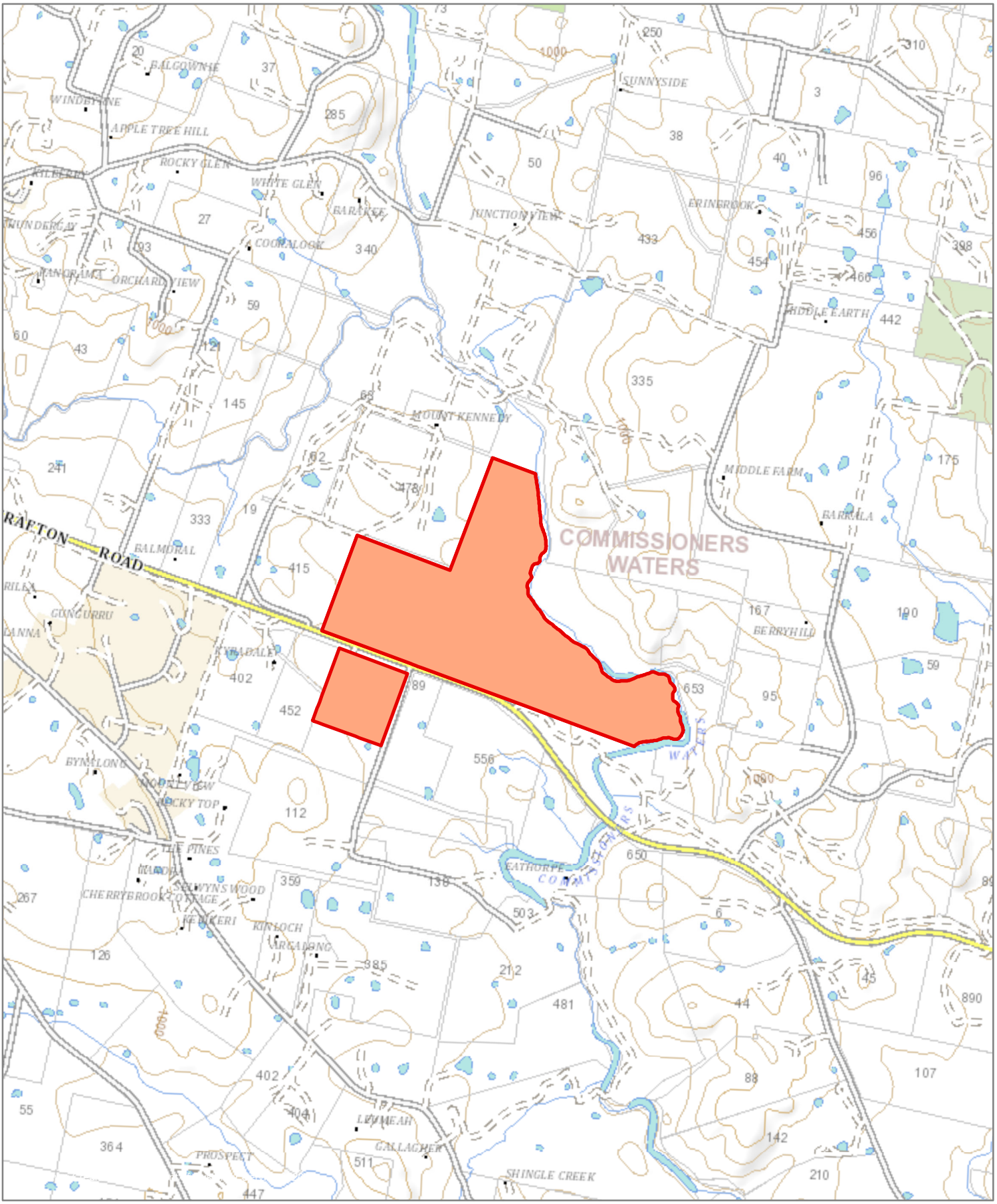

Figure 1

Location of the study area

Ecological Assessment for Wongalea Battery Energy Storage System (BESS)

Legend

Study Area

N

0 250 500

Meters

Map Scale: 1:30,000 @ A4
Coordinate System:
GDA2020 MGA Zone 55

ecology & heritage partners

Legend

- Study Area
- Project site
- Proposed BESS footprint
- BESS
- Switching station
- Temporary laydown area
- Workshop and control building
- Water tank
- Parking and internal roads
- Fence

Access and transmission options

- Access option 1
- Access option 2
- Access option 3
- Transmission option 1
- Transmission option 2

Indicative mapping of Plant Community Types (DPE-NSW 2023) (Based on modelled values, field verified 2025)

- New England Hills Stringybark-Box Woodland (PCT 3359)
- New England Ribbon Gum Grassy Forest (PCT 3344)
- New England Tableland Carex Fens (PCT 3944)
- Western New England Panic-Wiregrass Grassland (PCT 3723)

Figure 2 Overview

Ecological features

Ecological Assessment for Wongalea Battery Energy Storage System (BESS)

N

0 150 300

Meters

Map Scale: 1:10,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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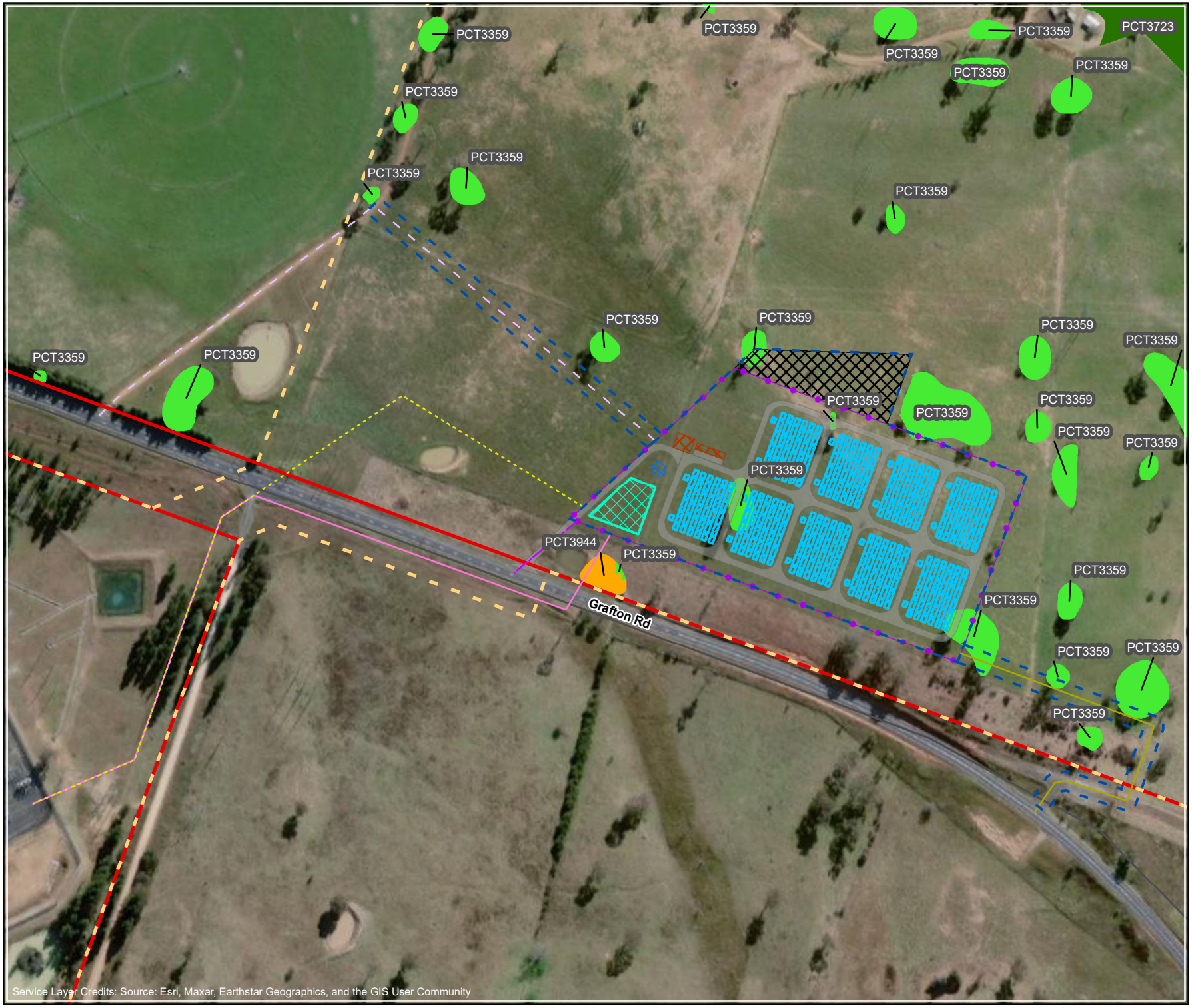

Legend

- Study Area
- Project site
- Proposed BESS footprint
- BESS
- Switching station
- Temporary laydown area
- Workshop and control building
- Water tank
- Parking and internal roads
- Fence

Access and transmission options

- Access option 1
- Access option 2
- Access option 3
- Transmission option 1
- Transmission option 2

Indicative mapping of Plant Community Types (DPE-NSW 2023) (Based on modelled values, field verified 2025)

- New England Hills Stringybark-Box Woodland (PCT 3359)
- New England Tableland Carex Fens (PCT 3944)
- Western New England Panic-Wiregrass Grassland (PCT 3723)

Figure 2a

Ecological features

Ecological Assessment for Wongalea Battery Energy Storage System (BESS)

N

0 60 120

Meters

Map Scale: 1:4,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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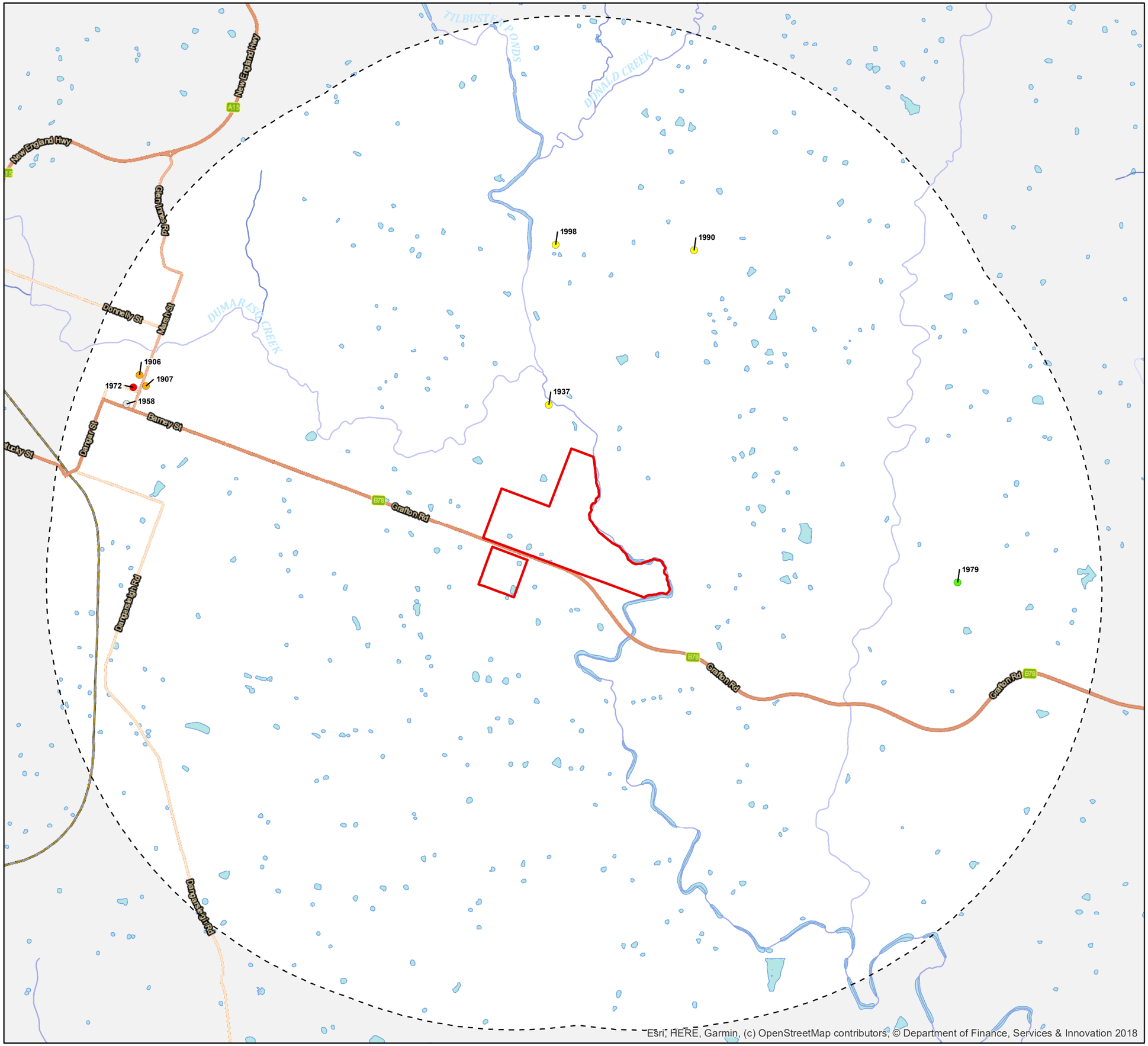


Legend

Study Area

Significant flora (Bionet 2025)

- Aromatic Peppercress
- Austral Toadflax
- Blackbutt Candlebark
- Bluegrass
- Narrow-leaved Black Peppermint

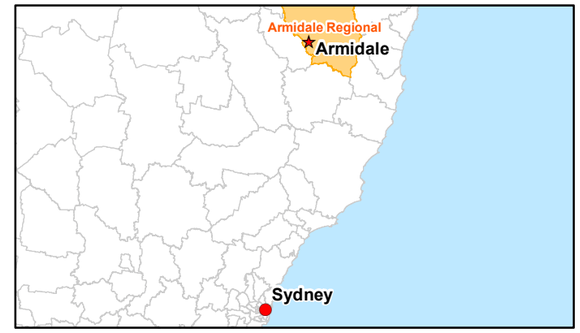


Figure 3

Bionet EPBC listed flora species sightings within 5km of the study area

Ecological Assessment for Wongalea Battery Energy Storage System (BESS)

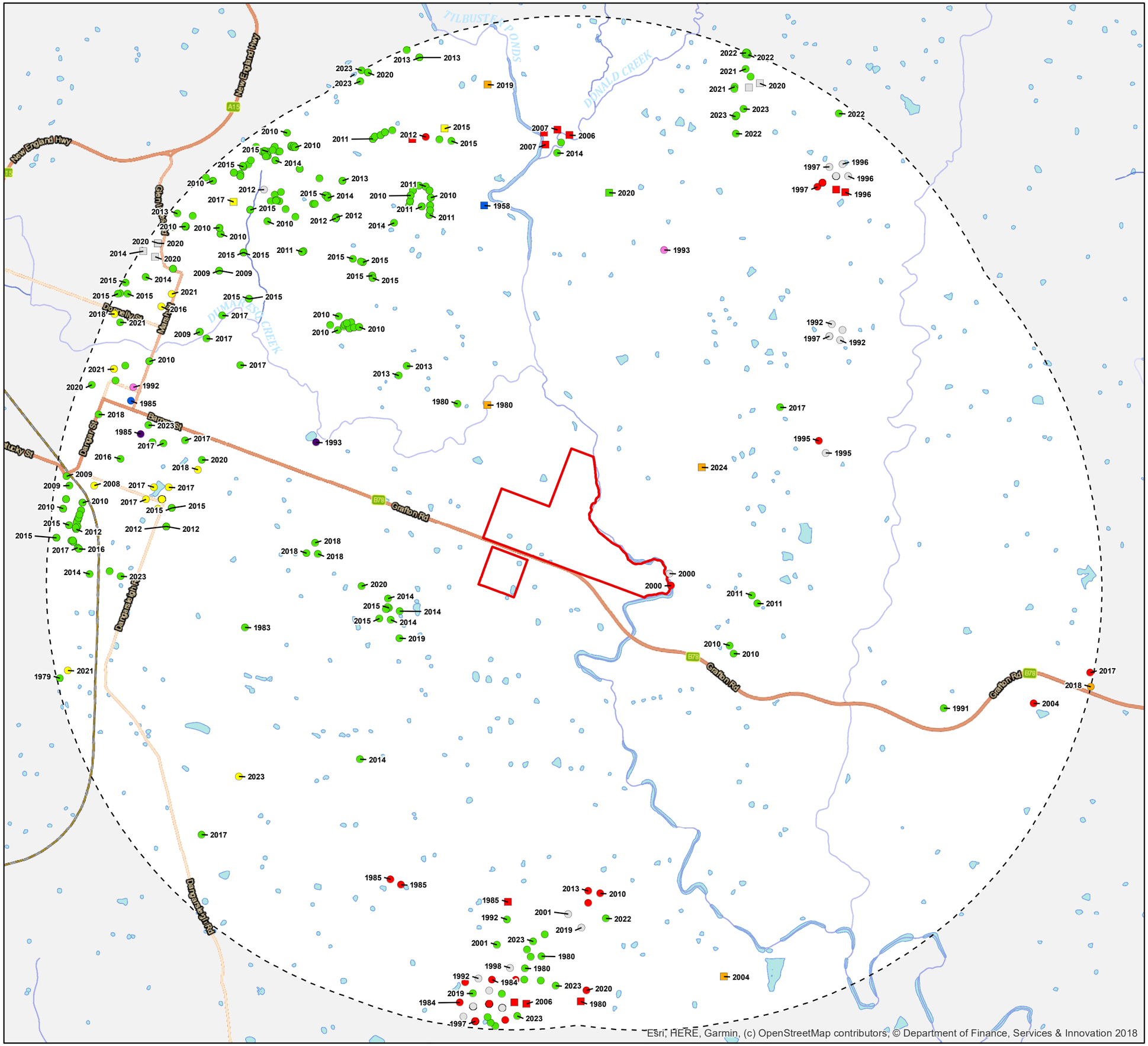
N

0 1 2

Kilometres

Map Scale: 1:42,000 @ A3
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners



Legend

- Study Area

Significant fauna (Bionet 2025)

- Brown Treecreeper (eastern subspecies)
- Diamond Firetail
- Fork-tailed Swift
- Grey-headed Flying-fox
- Koala
- Oriental Cuckoo
- Painted Honeyeater
- Regent Honeyeater
- South-eastern Glossy Black-Cockatoo
- South-eastern Hooded Robin
- Spotted-tailed Quoll
- Swift Parrot
- White-throated Needletail
- Yellow-spotted Tree Frog

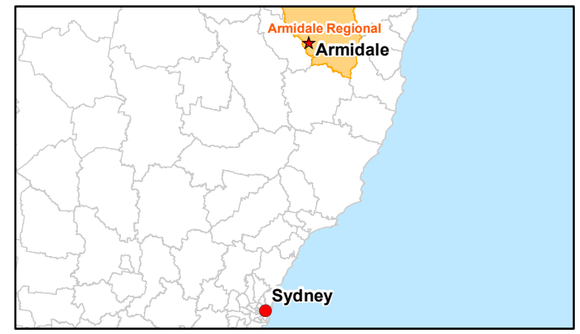


Figure 4

Bionet EPBC listed fauna species sightings within 5km of the study area

Ecological Assessment for Wongalea Battery Energy Storage System (BESS)

N

0 1 2

Kilometres

Map Scale: 1:42,000 @ A3
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

APPENDIX 1 FLORA

Appendix 1.1 Flora Results

Legend:

+ Naturally growing indigenous species that also occurs as planted indigenous vegetation to the study area
# Planted New South Wales (non-indigenous) and Australian species
W Weed of National Significance
w Additional species of concern

Table A1.1. Flora within the study area.

Scientific Name	Common Name	Notes
INDIGENOUS SPECIES		
Acaena spp.	Sheep's Burr	-
Ammobium alatum	Winged Everlasting	-
Angophora floribunda	Rough-barked Apple	-
Austrostipa scabra	Rough Spear-grass	-
Austrostipa verticillata	Bamboo Spear-grass	-
Carex appressa	Tall Sedge	-
Carex inversa	Knob Sedge	-
Centella spp.	Centella	-
Chloris truncata	Windmill Grass	-
Chrysocephalum apiculatum s.l.	Common Everlasting	-
Convolvulus erubescens s.l.	Pink Bindweed	-
Desmodium varians	Slender Tick-trefoil	-
Dianella revoluta s.l.	Black-anther Flax-lily	-
Dichondra repens	Kidney-weed	-
Dysphania pumilio	Clammy Goosefoot	-
Einadia nutans	Nodding Saltbush	-
Eragrostis leptostachya	Paddock Love-grass	-
Eucalyptus blakelyi	Blakely's Red-gum	-
Eucalyptus bridgesiana s.l.	But-But	-
Eucalyptus calignosa	Broad-leaved Stringybark	-
Eucalyptus melliodora	Yellow Box	-
Eucalyptus spp.	Eucalypt	-
Euchiton sphaericus	Annual Cudweed	-
Geranium potentilloides	Soft Crane's-bill	-

Scientific Name	Common Name	Notes
Geranium solanderi s.l.	Austral Crane's-bill	-
Glycine tabacina s.l.	Variable Glycine	-
Hypericum gramineum	Small St John's Wort	-
Juncus spp.	Rush	-
Lythrum salicaria	Purple Loosestrife	-
Oxalis exilis/perennans	Shade/Grassland Wood-sorrel	-
Panicum effusum	Hairy Panic	-
Poa sieberiana	Grey Tussock-grass	-
Sporobolus creber	Western Rat-tail Grass	-
Sporobolus spp.	Rat-tail Grass	-
Themeda triandra	Kangaroo Grass	-
Wahlenbergia gracilis	Sprawling Bluebell	-
Wahlenbergia stricta subsp. *stricta*	Tall Bluebell	-
Xerochrysum bracteatum	Golden Everlasting	-
NON-INDIGENOUS OR INTRODUCED SPECIES		
Amaranthus hybridus	Spleen Amaranth	-
Anthoxanthum odoratum	Sweet Vernal-grass	w
Axonopus fissifolius	Carpet Grass	-
Brachychiton populneus subsp. *populneus*	Kurrajong	-
Brassica spp.	Turnip	-
Centaurium erythraea	Common Centaury	-
Chenopodium album	Fat Hen	-
Cirsium vulgare	Spear Thistle	-
Crataegus monogyna	Hawthorn	w
Cynodon dactylon	Couch	-
Cyperus eragrostis	Drain Flat-sedge	-
Dactylis glomerata	Cocksfoot	w
Daucus carota	Carrot	-
Echinochloa spp.	Barnyard Grass	-
Eragrostis curvula	African Love-grass	w
Erigeron bonariensis	Flaxleaf Fleabane	-
Holcus lanatus	Yorkshire Fog	-
Hypericum perforatum subsp. *veronense*	St John's Wort	w
Hypochaeris radicata	Flatweed	-
Lepidium africanum	Common Peppercress	-
Leucanthemum vulgare	Ox-eye Daisy	w

Scientific Name	Common Name	Notes
Malva parviflora	Small-flower Mallow	-
Paronychia brasiliana	Whitlow Wort	-
Paspalum dilatatum	Paspalum	-
Plantago lanceolata	Ribwort	-
Populus alba	White Poplar	-
Rubus fruticosus spp. *agg.*	Blackberry	W
Rumex crispus	Curled Dock	-
Setaria pumila	Pale Pigeon-grass	-
Solanum chenopodioides	Whitetip Nightshade	-
Trifolium arvense var. *arvense*	Hare's-foot Clover	-
Trifolium campestre var. *campestre*	Hop Clover	-
Trifolium repens var. *repens*	White Clover	-
Verbena incompta	Purple-top	-

Appendix 1.2 Significant Flora Species

Significant flora within 10 kilometres of the study area is provided in the Table A1.2.3 at the end of this section, with Tables A1.2.1 and A1.2.2 below providing the background context for the values in Table 1.2.3.

Table A1.2.1 Conservation status of each species for each Act/policy. The values in this table correspond to Columns 5 to 6 in Table A1.2.3.

EPBC Act (*Environment Protection and Biodiversity Conservation Act 1999*):		BC (*NSW Biodiversity Conservation Act 2016):*	
EX	Extinct		
CR	Critically endangered	ex	Extinct
EN	Endangered	cr	Critically endangered
VU	Vulnerable	en	Endangered
#	Listed on the Protected Matters Search Tool	vu	Vulnerable

Table A1.2.2 Likelihood of occurrence rankings: Habitat characteristics assessment of significant flora species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area to determine their likelihood of occurrence. The values in this table correspond to Column 7 in Table A1.2.3.

1	Known Occurrence	• Recorded within the study area recently (i.e. within ten years).
2	High Likelihood	• Previous records of the species in the local vicinity; and/or, • The study area contains areas of high-quality habitat.
3	Moderate Likelihood	• Limited previous records of the species in the local vicinity; and/or • The study area contains poor or limited habitat.
4	Low Likelihood	• Poor or limited habitat for the species, however other evidence (such as lack of records or environmental factors) indicates there is a very low likelihood of presence.
5	Unlikely	• No suitable habitat and/or outside the species range.

Table A1.2.3 Significant flora recorded within 10 kilometres of the study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
NATIONAL SIGNIFICANCE							
Arthraxon hispidus #	Hairy-joint Grass	-	-	VU	vu	4	Grows in or on the edges of rainforest and in wet eucalypt forest, near creeks and rivers. Limited suitable habitat present in study area. known to be associated with PCT 3944. PCT 3944 only occurs in very small patch in study area.
Bertya sp. *Clouds Creek (M.Fatemi 4)* #	Bertya sp. Clouds Creek (M.Fatemi 4) #	-	-	EN	en	5	Grows on steep rocky slopes in shallow soils. Typically occurring within low shrubland or heath vegetation. Not known to be associated with any PCT's that occur in study area. no suitable habitat present in study area.
Callistemon pungens #	Severn River Bottlebrush	-	-	VU	-	4	Habitat ranges from riparian habitat dominated by River Sheoak *Casuarina cunninghamiana* subsp. *cunninghamiana*, to rocky shrubland and woodland. Known to be associate with PCT 3359, although this PCT existing in a highly degraded state. Several recent records in local vicinity. Based on size of species and field assessment undertaken during flowering period, yet no species was found. It is unlikely to occur.
Cynanchum elegans #	White-flowered Wax Plant	-	-	EN	en	4	Usually grows on the edge of dry rainforest vegetation and is associated with littoral rainforest vegetation types. Not known to be associated with any PCT's occurring in the study area.
Dichanthium setosum	Bluegrass	6	2018	VU	vu	3	Often found growing in moderately disturbed areas such as grassy roadside remnants, cleared woodlands, and highly disturbed pasture. Known to be associated with PCT 3359, PCT 3344, and PCT 3723. PCT 3359 was most dominant in study area, although all PCT's occurred in a highly disturbed

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
							state. Several records in local vicinity with a single recent record.
Diuris eborensis #	Ebor Goat Orchid	-	-	EN	en	4	Commonly grows in sedge-swamp of the table lands, damp grassland, and grassy woodland. Known to be associated with PCT 3944, which occurs in a small patch in the study area. no records in the local vicinity. Known to flower in late half of spring and into early summer. Potential to have missed flowering period during site assessment.
Eucalyptus mckieana #	McKie's Stringybark	-	-	VU	vu	3	Found in grassy open forest or woodland on poor sandy loams. Flowers from March to May. Species known to be associated with PCT 3359, which was the dominant PCT in study area. Difficult to identify species during site assessment as was not flowering. Study area may contain correct soil type for species.
Eucalyptus nicholii	Narrow-leaved Black Peppermint	22	2005	VU	vu	3	Typically grows in dry grassy woodland on slopes and rides of shallow soils. Species known to be associated with PCT 3359 and PCT 3344. Multiple records in local vicinity. Often planted as urban trees, corridors, and windbreaks. Was not flowering during site assessment, therefore unable to be correctly identified.
Euphrasia arguta #	An Eyebright	-	-	CR	cr	5	Known to have an annual habitat with active growth occurring between Jan-April. Not known to be associated with any PCT's present in study area. no suitable habitat present in study area.
Grevillea beadleana #	Beadle's Grevillea	-	-	EN	en	4	Grows in open eucalypt forest and woodland with a shrubby understory. Not known to be associated with any PCT's occurring in study area. limited suitable habitat present in study area, all understory highly disturbed and no shrub layer present. Most likely no suitable habitat present in study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
Hakea fraseri #	Fraser's Hakea	-	-	VU	vu	5	Mostly occurs on steep and dry rocky slopes of river gorges. Can be found in open woodland on gorge rims. Not known to be associated with any PCT's occurring in the study area. no gorges present in study area.
Haloragis exalata subsp. *velutina* #	Tall Velvet Sea-berry	-	-	VU	vu	4	Grows in damp places near watercourses, may also occur in woodland on the rocky steep slopes of gorges. Species known to be associated with PCT 3359. Some suitable habitat present in study area along Commissioners Waters River and constructed waterbodies, although habitat is highly degraded.
Picris evae #	Hawkweed	-	-	VU	vu	3	All recent collections appear to come from modified habitat. Main habitat is open eucalypt forest. Species not known to be associated with any PCT's that occur in the study area. study area is weedy vegetation and paddocks.
Thesium australe	Austral Toadflax	3	1972	VU	vu	4	Occurs in grassland and grassy woodland away from the coast. Found in association with Kangaroo Grass. Several records in local vicinity, although no recent records. Species known to be associated with PCT 3359, PCT 3344, and PCT 3723. Limited areas of Kangaroo Grass present in study area, with no species found during site assessment. All other areas of study area are highly disturbed with limited native species present.
Vincetoxicum woollsii #	Cryptic Forest Twiner	-	-	EN	en	4	Species grows in moist eucalypt forest and moist sites in dry eucalypt forest. Species not known to be associated with any PCT's present in study area. Likely no suitable habitat in study area.
STATE SIGNIFICANCE							

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
Adiantum aethiopicum	Common Maidenhair	2	2003	-	P	3	Widespread in damp open areas, often along creeks. Can form large colonies. Associated with PCT's 3359 and 3344 Two records within 10km radius, only one recent record.
Caladenia carnea	Pink Fingers	1	1969	-	P	4	Occurs in a wide variety of habitats from shrubland to sclerophyll forest and woodland. Associated with PCT 3359 in the study area. All patches of PCT3359 were degraded, understory unlikely to support species. A single record within 10km radius, no recent records.
Caladenia testacea	Honey Caladenia	1	1969	-	P	5	Grows in sclerophyll Forest, heath, and woodland. A single record in the local vicinity, although not recent and from the Virtual Herbarium in Armidale. Not associated with any PCT's that occur within the study area.
Calochilus paludosus	Red Beard Orchid	1	1969	-	P	5	Grows in swampy areas with damp peaty soils. Associated with PCT 3359 in the study area. PCT exists in a modified degraded state in study area. A single record in the local vicinity from the Virtual Herbarium.
Craspedia variabilis	Common Billy-buttons	1	2010	-	P	3	Occurs in woodland, grassland, and sclerophyll forest and is widespread. Associated with PCT's 3344 and 3944 in the study area. Both PCT's exist in degraded state in the study area. Multiple records in the local vicinity, although no recent records.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
Dendrobium cucumerinum	Cucumber Orchid	3	2013	-	P	4	Grows almost exclusively on River Sheoak, although sometimes on other species or rocks. Not associated with any PCT's that occur in the study area. No Rive Sheoak observed during site assessment, therefore unlikely species will occur.
Dipodium punctatum	-	4	2023	-	P	3	Grows in dry sclerophyll woodland to wet sclerophyll forest. Associated with PCT's 3359 and 3344 in the study area. Multiple recent records in local vicinity, with some records from 2024 only several kilometres away.
Diuris punctata	Purple Donkey Orchid	1	2010	-	P	4	Grows in grassland, heath, and sclerophyll forest. Not associate with any PCT's in the study area. One records from within 3km to the study area from 2010. As there are no associated PCT's in the study area, it is unlikely that this species will occur.
Diuris punctata var. *punctata*	(blank)	1	1967	-	P	5	Grows in grassland, heath, and sclerophyll forest. Not associate with any PCT's in the study area. A single record from the Virtual; Herbarium.
Diuris sulphurea	Tiger Orchid	1	2010	-	P	3	Grows in sclerophyll forest and heath. Not associated with any PCT's in study area. Several records in local vicinity, one recent record from 2024 within 3km from study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
Microtis parviflora	Slender Onion Orchid	1	1967	-	P	5	Grows in wet places in damp grasslands, sclerophyll forest or bogs. Not associated with any PCT's in the study area. No recent records in the local vicinity. All records from Virtual Herbarium.
Prasophyllum elatum	Tall Leek Orchid	1	1969	-	P	5	Grows in scrub and forest, and rocky outcrops. Not associated with any PCT's present in study area. A single records from the Virtual Herbarium.
Pterostylis cycnocephala	Swan Greenhood	1	1967	-	P	5	Grows in sclerophyll forest and grasslands. Not associated with any PCT's in study area. A single records from the Virtual Herbarium in the local vicinity.
Pterostylis decurva	Summer Grasshood	2	2003	-	P	4	Grows on the moist slopes in sclerophyll forest. No associated with any PCT's in the study area. Limited previous records in local vicinity.
Pterostylis parviflora	Tiny Greenhood	2	2003	-	P	4	Grows in sclerophyll forest and heath. Associated with PCT 3359 in the study area. Recent record from 2003 was observed in Yina National Park/
Spiranthes australis	Ladies' Tresses	1	1978	-	P	4	Usually grows in marshy or boggy places. Associated with PCT's 3723, 3944, and 3344 in the study area. No recent records in the local vicinity. Some suitable habitat present along southern boundary of study area and along Commissioners Waters.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	Likely occurrence in study area	Rationale for likelihood of occurrence
Thelymitra ixioides var. *ixioides*	Dotted Sun Orchid	3	1975	-	P	4	Grows in sclerophyll forest and heath, widespread. Not associated with any PCT's present in the study area. No recent records in local vicinity paired with no associated PCT's in study area would mean it is unlikely to occur in study area.

Data Sources: Atlas of Living Australia (ALA 2025); BioNet Atlas (NSW DCCEEW 2025c); Protected Matters Search Tool (DCCEEW 2025a).

APPENDIX 2 FAUNA

Appendix 2.1 Significant Fauna Species

Significant fauna within 10 kilometres of the study area is provided in the Table A2.1.3 at the end of this section, with Tables A2.1.1 and A2.1.2 below providing the background context for the values in Table 2.1.3.

Table A2.1.1 Conservation status of each species for each Act/policy. The values in this table correspond to Columns 5 to 8 in Table A2.1.3.

EPBC (*Environment Protection and Biodiversity Conservation Act 1999*):				BC (*NSW Biodiversity Conservation Act 2016*):		FM (*NSW Fisheries Management Act 1994*):	
EX	Extinct	VU	Vulnerable	ex	Extinct	ex	Extinct
CR	Critically endangered	CD	Conservation Dependent	cr	Critically endangered	cr	Critically endangered
EN	Endangered	#	Listed on the PMST	en	Endangered	en	Endangered
M	Migratory			vu	Vulnerable	vu	Vulnerable
				cd	Conservation Dependent	cd	Conservation Dependent

Table A2.1.2 Likelihood of occurrence rankings: Habitat characteristics assessment of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area to determine their likelihood of occurrence. The values in this table correspond to Column 9 in Table A2.1.3.

1	Known Occurrence	• Recorded within the project area recently (i.e. within 10 years).
2	High Likelihood	• Likely resident in the study area based on site observations, database records, or expert advice; and/or, • Recent records (i.e. within five years) of the species in the local area (NSW DCCEEW 2025d); and/or, • The study area contains the species' preferred habitat.
3	Moderate Likelihood	• The species is likely to visit the study area regularly (i.e. at least seasonally); and/or, • Previous records of the species in the local area (NSW DCCEEW 2025d); and/or, • The study area contains some characteristics of the species' preferred habitat.
4	Low Likelihood	• The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or, • There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,

		• The study area contains few or no characteristics of the species' preferred habitat.
5	Unlikely	• No previous records of the species in the local area; and/or, • The species may fly over the study area when moving between areas of more suitable habitat; and/or, • Out of the species' range; and/or, • No suitable habitat present.

Table A2.1.3 Significant fauna recorded within 10 kilometres of the study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
NATIONAL SIGNIFICANCE								
Anomalopus mackayi #	Five-clawed Worm-skink	-	-	VU	en	-	4	No previous records. Study area outside known or predicted distribution. Not associated with any PCTs within the study area. May occur in grasslands, woodland and open paddocks with scattered trees (such as that in the study area), but prefers areas with deep cracking clay soils which were not observed.
Anthochaera phrygia	Regent Honeyeater	7	2018	CR	cr	-	4	Several records from less than 7 years ago, and one 1993 record within 2.5km of the study area. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344. Inhabits dry open forest and woodland, of which there were limited, low-quality patches in the study area with sparse tree cover. May occasionally visit to forage in flowering Yellow Box.
Aphelocephala leucopsis #	Southern Whiteface	-	-	VU	vu	-	4	No previous records. Study area within known distribution. Not associated with any PCTs within the study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Limited low-quality habitat within study area (i.e. open woodlands with understorey of grasses or shrubs, dominated by acacias or eucalypts).
Aprasia parapulchella #	Pink-tailed Worm-lizard	-	-	VU	vu	-	4	No previous records. Study area outside known or predicted distribution. Not associated with any PCTs within the study area, minimal low-quality habitat present (dominated by Kangaroo Grass), and partially-buried rocks.
Botaurus poiciloptilus #	Australasian Bittern	-	-	EN	en	-	4	No previous records. Study area outside known or predicted distribution. Associated with vegetation types within the study area: 3944. Very limited low-quality habitat, with a partially inundated wetland present in the west supporting minimal fringing vegetation (sedges and rushes).
Calidris acuminata #	Sharp-tailed Sandpiper	-	-	VU, M	-	-	4	No previous records. Study area within 'may occur' distribution (not 'likely to occur'). Very limited low-quality habitat, with a partially inundated wetland present in the west supporting minimal fringing vegetation (sedges and rushes).
Calidris ferruginea #	Curlew Sandpiper	-	-	CR	cr	-	5	No previous records. Study area outside known or predicted distribution (species mainly found in coastal areas in NSW). Not associated with any PCTs within the study are. Mainly coastal, but sometimes occurs in inland wetlands, of which there is limited availability in the study area.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	8	2020	VU	vu	-	4	Recent records from less than 5 years ago, including at least four 2020 records within 5km.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Associated with vegetation types within the study area: 3359, 3344, 3944, 3723. Open forest and woodlands exist in the study area, however no stands of Sheoak (the species' critical food source) occur.
Chalinolobus dwyeri #	Large-eared Pied Bat	-	-	EN	en	-	4	No previous records. Study area within predicted distribution (not 'known'). Associated with vegetation types within the study area: 3359, 3344, 3723. No nesting/roosting habitat present (i.e. caves, cliff crevices, old mines, Fairy Martin mud nests and concrete structures such as derelict buildings), but may visit dry open forest and woodland in the study area if nearby nesting/roosting habitat exists.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	130	2019	VU	vu	-	2	Numerous recent records, including one 2000 record immediately adjacent to the western border of the study area, one 2019 record within 4km, and over 15 records within 5km. Associated with vegetation types within the study area: 3359, 3344, 3944, 3723. Suitable low-quality habitat within the study area (i.e. eucalypt woodlands and dry open forest with open grassy understorey, and containing hollow-bearing trees for nesting).
Dasyurus maculatus	Spotted-tailed Quoll	14	2024	EN	vu	-	3	Several recent records within 5km, including one 2024 record within 2.5km, and a 2018 and 2019 record within 4.9km. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344, 3944, 3723.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Recorded across a range of habitat types, and may utilise open forest/woodland in the study area. May also utilise grassland or pastoral areas (adjacent to forested areas). May occasionally use hollow-bearing trees, animal burrows and rocky areas within the study area as den sites.
Erythrotriorchis radiatus #	Red Goshawk	-	-	EN	en	-	4	No previous records. Outside known or predicted distribution. Associated with vegetation types within the study area: 3359, 3344, 3944. Inhabits riparian habitat along watercourses and open forest/woodland, of which there were limited, low-quality patches in the study area with sparse tree cover. Often nests in tall trees within 1km of a watercourse or wetland.
Euastacus simplex #	Small Mountain Crayfish	-	-	EN	-	-	4	No previous records. Study area within the very restricted potential distribution of this species. May occupy burrows, logs or rocks along small-medium streams, both in vegetated areas (dry sclerophyll forest) and areas cleared for pasture.
Eulamprus kosciuskoi #	Alpine Water Skink	-	-	VU	-	-	5	No previous records. Study area just outside known or predicted distribution. Only found at isolated high elevation sites (above 1000 m and up to 2000 m)
Falco hypoleucos #	Grey Falcon	-	-	VU	vu	-	4	No previous records. Study area outside known or predicted distribution. Not associated with any PCTs within the study area. Limited suitable habitat (i.e. grassland, wooded watercourses and near wetlands of arid and semi-arid regions).

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
Gallinago hardwickii	Latham's Snipe	4	2020	VU, M	vu	-	4	Three records approx. 6km away, and most recently recorded less than 5 years ago. Study area within known distribution. Very limited low-quality habitat exists within the study area (i.e. Small freshwater wetland, dams and drainage lines with sparse fringing sedges and grasses).
Grantiella picta	Painted Honeyeater	2	1993	VU	vu	-	4	Only 2 records from over 32 years ago. Study area within known distribution. Associated with vegetation types within the study area: 3344, 3723 Study area does not contain Mistletoe (*Amyema* sp), which this specialist feeder depends on for fruits, nectar and insects.
Hirundapus caudacutus	White-throated Needletail	26	2020	VU, M	vu	-	2	Several records within 10km, including one 2020 record within 3km, and 17 records from 2017-19 approx. 5km away. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344, 3944, 3723 Likely to forage aerially over most habitat types, but most commonly above wooded areas/ open forest such as that in the study area.
Lathamus discolor	Swift Parrot	3	2017	CR	en	-	3	Three records within 10km, including one 2015 and one 2017 record within 5km of the study area. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344, 3723 Relies on flowering and lerp-infested eucalypts, with one preferred species in the study area (Yellow Box). Sometimes occupies highly disturbed areas with no or

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								limited native vegetation (e.g. table drains, ploughed paddocks).
Litoria castanea	Yellow-spotted Tree Frog	1	1958	CR	cr	-	4	One record from over 67 years ago. Study area within known distribution. Associated with vegetation types within the study area: PCT 3944 Small semi-permanent wetlands in study area unlikely to support this species which requires large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation.
Litoria piperata	Peppered Tree Frog	1	1984	VU	cr	-	4	One record from over 41 years ago. Study area within known distribution. Associated with vegetation types within the study area: PCT 3359, 3344, 3944 Found in streamside vegetation and under rocks and fallen timber along rocky streams. Rocky sections were present in Commissioners Waters River in the study area.
Litoria subglandulosa	Glandular Frog	1	2017	VU	vu	-	3	One record from 8 years ago. Study area within known distribution. Associated with vegetation types within the study area: PCT 3344, 3944 Limited preferred habitat (i.e. along streams and rivers in well-vegetated dry eucalypt woodland and forest), but also occurs in high disturbed areas provided there is fringing riparian vegetation.
Melanodryas cucullata cucullata	South-eastern Hooded Robin	20	2017	EN	en	-	3	Most records within 5km, including seven relatively recent 2006-08 records within 4-5km. Study area within known distribution.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Associated with vegetation types within the study area: PCT 3344, 3723 Study area contains suitable habitat (i.e. lightly wooded country or open eucalypt woodland with an open understorey, open grassy areas/clearings and a complex ground layer). They avoid woodlands with dense tree cover. While they can occur in patches as small as 2.9 ha, in agricultural landscapes they prefer larger patches greater than 10ha.
Neophema chrysostoma #	Blue-winged Parrot	-	-	VU	vu	-	4	No previous records. Study area outside known or predicted distribution. Not associated with any PCTs within the study area. Potential habitat in study area (i.e. grasslands and grassy woodlands near wetlands in semi-arid zone). Species also utilises altered environments such as paddocks.
Petaurus australis australis #	Yellow-bellied Glider (south-eastern)	-	-	VU	vu	-	5	No previous records. Study area within known distribution. Associated with vegetation types within the study area: PCT 3359, 3344 No suitable habitat (i.e. tall mature eucalypt forest), as wooded areas in study area are sparse and trees scattered.
Petrogale penicillata	Brush-tailed Rock-wallaby	6	2024	VU	en	-	4	Most recently recorded less than one year ago, but records all over 5km away (mostly restricted to areas of National Park to the south-east). Study area within known distribution. Associated with vegetation types within the study area: PCT 3359, 3344, 3944, 3723

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Although some embedded rocks were observed exists, no suitable habitat in the form of rocky escarpments, outcrops or cliffs were present.
Phascolarctos cinereus	Koala	790	2024	EN	en	-	2	Very high number of previous records, including recent records from less than one year ago and over 100 records within 5km.Five 2018-20 records within 2km. Study area within known distribution. Associated with vegetation types within the study area: PCT 3359, 3344, 3723 Likely to inhabit trees in low-quality eucalypt woodland patches of the study area.
Potorous tridactylus tridactylus #	Long-nosed Potoroo (northern)	-	-	VU	vu	-	5	No previous records. Study area outside known or predicted distribution. Associated with vegetation types within the study area: PCT 3344 Study area does not contain essential habitat characteristics (i.e. dry sclerophyll forests with dense understorey).
Pseudomys novaehollandiae #	New Holland Mouse	-	-	VU	-	-	5	No previous records. Study area within known distribution. Not associated with any PCTs within the study area. No suitable habitat (i.e. open heathlands, woodlands with a heathland understorey and vegetated sand dunes).
Pteropus poliocephalus	Grey-headed Flying-fox	447	2024	VU	vu	-	2	Hundreds of records within 10km, and 12 recent records within 5km (from 2016-23). Study area within known distribution. One Flying-fox roosting camp (of between 500-2,500 individuals) exists less than 6km to the west. Associated with vegetation types within the study area:

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Can travel up to 50km from the camp to forage in flowering/fruiting Eucalypts, such as that within the study area.
Rostratula australis #	Australian Painted Snipe	-	-	EN	en	-	4	No previous records. Study area within predicted distribution (not 'known'). Associated with vegetation types within the study area: PCT 3944. Very limited poor quality habitat (small wetland and dams with sparse cover of grasses, sedges and rushes).
Saltuarius moritzi #	Moritz's Leaf-tailed Gecko	-	-	EN	-	-	4	No previous records. Study area on edge of 'may occur' distribution (not 'likely to occur'). Limited potential habitat (i.e. mature hollow-bearing trees and wetter drainage lines in continuous dry sclerophyll forest), however trees too sparse to provide adequate forest.
Stagonopleura guttata	Diamond Firetail	57	2022	VU	vu	-	3	Numerous recent records, including one 2000 record immediately adjacent to eastern border of study area, and 17 other records within 5km. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344, 3723 Suitable low-quality habitat exists in the study area as grassy eucalypt woodland (with Box-Gum species), secondary grasslands, riparian areas and lightly wooded farmland.
Tringa nebularia #	Common Greenshank	-	-	EN	en	-	4	No previous records. Study area within 'may occur' distribution (outside 'likely to occur'). Found in a wide variety of inland wetlands such as the ephemeral wetland within the study area. Prefers muddy

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								wetland edges, with emergent/fringing vegetation (trees, short sedges, saltmarsh, mangroves, rushes).
Apus pacificus	Fork-tailed Swift	4	2020	M	-	-	3	Several recent records, with one 2018 record 5km away. Study area within likely distribution. Almost exclusively aerial and mostly occurring over inland plains, dry or open woodland, riparian woodland but also over treeless grassland such as that in the study area. Unlikely to land or roost in study area (mostly roost aerially).
Cuculus optatus	Oriental Cuckoo	1	1985	M	-	-	4	Only one record from over 40 years ago. Study area just outside likely distribution. Prefer humid habitats such as monsoon forest, wet eucalypt forest and river margins, and are unlikely to use low-quality dry woodland in study area.
STATE SIGNIFICANCE								
Artamus cyanopterus cyanopterus	Dusky Woodswallow	166	2024	-	vu	-	2	Numerous records within 5km of the study area, including records from less than one year ago. One record (from 2000) is immediately adjacent to the study area boundary. Associated with vegetation types within the study area: 3359, 3344, 3944, 3723 Low-quality habitat exists as dry, open eucalypt woodlands with an open or sparse understorey (e.g. acacias), and groundcover of grasses, sedges and fallen woody debris. The species sometimes occurs near rivers, streams, or highly disturbed areas with no or limited native vegetation (e.g. table drains, ploughed paddocks).
Burhinus grallarius	Bush Stone-curlew	1	2019	-	en	-	4	Only one record from 2019, less than 5km away. Study area within known distribution. Associated with PCTs in the study area: 3359, 3344, 3723

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Low-quality habitat exists as open woodland and farmland with a sparse grassy ground-layer and fallen timber. Fallen timber/logs are essential for this species' roosting and nesting, but was limited in the study area.
Chthonicola sagittata	Speckled Warbler	163	2024	-	vu	-	3	Numerous records within 5km of the study area, including records from less than one year ago. One record (from 2000) is immediately adjacent (within 25m) to the study area. Study area within known distribution. Associated with PCTs in the study area: 3359, 3944, 3723 Eucalypt woodland within the study area may provide suitable habitat, however these patches are disjunct and highly disturbed, and the species requires large, relatively undisturbed remnant patches to persist in an area.
Circus assimilis	Spotted Harrier	2	1987	-	vu	-	3	Only two records from over 38 years ago. Study area within known distribution. Associated with PCTs in the study area: 3359, 3344, 3944 May occur in native grassland areas of study area, within areas of agricultural land, foraging over open habitats and wetlands.
Daphoenositta chrysoptera	Varied Sittella	57	2024	-	vu	-	4	Numerous records within 10km, including 22 records within 5km and two very recent records from 2024. Unlikely to inhabit low-quality scattered woodland habitat in the study area, as the species inhabits Acacia woodland and eucalypt woodlands (with rough-barked trees, and mature smooth-barked gums with dead branches). Cleared agricultural land is potentially a barrier to movement.
Ephippiorhynchus asiaticus	Black-necked Stork	2	2003	-	en	-	4	Only two records from over 22 years ago. Study area within known distribution.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Study area does not contain species' key habitat of floodplain wetlands of major coastal rivers, or secondary habitat (i.e. minor floodplains, coastal sandplain wetlands and estuaries).
Falco subniger	Black Falcon	3	2013	-	vu	-	4	One record from 2013, the other two are from over 42 years ago. Study area within known distribution. Most likely to occur in agricultural or pastoral land. Hunts and nests along tree-lined watercourses and in healthy, riparian woodland remnants, which are limited in the study area.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	3	2010	-	vu	-	4	All 3 records approx. 5km away. Study area within known distribution. Study area contains eucalypt hollows, but species prefers moist habitats (with trees taller than 20m).
Glossopsitta pusilla	Little Lorikeet	12	2020	-	vu	-	2	Five records within 5km, and six records from less than 7 years ago. Study area within known distribution. Associated with PCTs in the study area: 3359, 3344, 3723 May forage in the canopy of low-quality open eucalypt woodland in the study area, and in the isolated flowering trees in open areas (e.g. Yellow Box). May nest in Eucalypt hollows, particularly riparian trees.
Hieraaetus morphnoides	Little Eagle	325	2024	-	vu	-	2	Hundreds of records within 10km, including 128 within 5km and 157 recorded less than 5 years ago (with 4 recorded in 2024). One record is immediately adjacent to study area boundary. Associated with PCTs in the study area: 3359, 3944, 3723 Likely to occupy riparian areas, open acacia and eucalypt woodland in study area. Known to occupy disturbed areas.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								Unlikely to use trees for nesting, as they are generally scattered (not in remnant patch).
Lophoictinia isura	Square-tailed Kite	28	2024	-	vu	-	2	Numerous records within 10km, including 17 within 5km and 17 recorded less than 5 years ago. Associated with PCTs in the study area: 3359, 3344, 3944, 3723 May utilise areas of low-quality dry, open woodlands and timbered watercourses within the study area.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	1	2001	-	vu	-	3	Only one record from 24 years ago. Study area on edge of distribution. Associated with PCTs in the study area: 3359, 3344, 3723 Low quality habitat exists in the study area as dry, woodland with preferred eucalypt species such as Blakely's Red Gum and Yellow Box.
Miniopterus orianae oceanensis	Large Bent-winged Bat	8	2022	-	vu	-	4	Two records within 5km and three records from less than 5 years ago. Study area within known distribution. No nesting/roosting habitat present (i.e. caves, derelict mines, storm-water tunnels, buildings and other man-made structures), and unlikely to visit study area for hunting (prefer forested areas).
Neophema pulchella	Turquoise Parrot	2	2022	-	vu	-	2	One 2022 record approx. 5km from study area. Study area within known distribution. Not associated with any PCTs within the study area. May occur in study area as the species lives on the edges of open, grassy eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland, and nests in tree hollows.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
Ninox connivens	Barking Owl	2	2018	-	vu	-	3	Two 2018 records approx. 5km from study area. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344, 3723 Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Hunting can extend to more open areas. Nests in large hollow-bearing trees, and sometimes breeds along timbered watercourses in heavily cleared habitats.
Ninox strenua	Powerful Owl	4	2017	-	vu	-	4	Three records approx. 5km from study area, recorded less than 9 years ago. Study area within known distribution. Requires large tracts of open or closed forest/ woodland habitat, and roosts in dense vegetation. Can sometimes occur in fragmented landscapes and open habitats during foraging activity.
Petaurus norfolcensis	Squirrel Glider	2	2022	-	vu	-	5	One 2022 record approx. 5km away, and one 1995 record less than 2km away. Study area within known distribution. Inhabits and nests in hollows within mature Box, Box-Ironbark woodlands and River Red Gum Forest, but study area woodland is sparse and lacks key habitat characteristic of mixed species stands with a shrub or Acacia midstory.
Petroica phoenicea	Flame Robin	1	2017	-	vu	-	3	Only one record from 8 years ago, within 5km of study area. Study area within known distribution. Associated with vegetation types within the study area: 3359, 3344, 3944, 3723 Requires tall moist eucalypt forests and woodlands for breeding, but study area may contain suitable open

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	BC	FM	Likely occurrence in study area	Rationale for likelihood of occurrence
								woodlands, pastures and native grasslands for the species to live in winter.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	2	2008	-	vu	-	2	Two records approx. 5km from study area, recorded over 17 years ago. Study area within known distribution. Associated with vegetation types within the study area: 3359 Study area contains suitable habitat in the form of tree hollows and mammal burrows potentially suitable for nesting. Only found in southern Australian states during the annual summer migration.
Tyto novaehollandiae	Masked Owl	23	2020	-	vu	-	4	Numerous records, all approx. 5km away and two recent records from less than 7 years ago. Associated with vegetation types within the study area: 3359, 3344, 3723 Lives in dry eucalypt forests and uses large tree hollows in moist eucalypt forested gullies for roosting, but often hunts along the edges of forests, including roadsides.

Data Sources: BioNet Atlas (NSW DCCEEW 2025d); Protected Matters Search Tool (DCCEEW 2025a).