Sarah Ng

From: Anthony Tavella on behalf of DPE PS ePlanning Exhibitions Mailbox
Sent: Monday, 12 October 2020 9:27 AM
To: DPE PS Biodiversity Mailbox
Subject: FW: Webform submission from: Draft Cumberland Plain Conservation Plan
Attachments: 10-ecology-report---ffa.pdf

From: noreply@feedback.planningportal.nsw.gov.au <noreply@feedback.planningportal.nsw.gov.au>
Sent: Friday, 9 October 2020 9:52 PM
To: DPE PS ePlanning Exhibitions Mailbox <eplanning.exhibitions@planning.nsw.gov.au>
Subject: Webform submission from: Draft Cumberland Plain Conservation Plan

Submitted on Fri, 09/10/2020 - 21:45
Submitted by: Anonymous
Submitted values are:
Submission Type:I am making a personal submission
First Name: [redacted]
Last Name: [redacted]
Name Withheld: Yes
Email: [redacted]
Suburb/Town & Postcode: Menangle Park
Submission file:
10-ecology-report---ffa.pdf

Submission: Dear Sir/ Madam RE: Submission Cumberland Plain Conservation Plan This Submission has been written by [redacted] Menangle Park (the site). The site is situated between [redacted] It has a length of approx. [redacted] meters and averages approx. [redacted] meters wide. With access only via [redacted] The site is currently used for rural, agricultural and pastoral uses including the grazing of cattle. The site is predominantly vacant grassland, patches of planted vegetation and scattered trees. Attached you will find a Flora and Fauna report by Eco Logical Australia. Which has been prepared for the purpose of a Development Application for the site. I am an environmentally friendly property owner. As shown within the attached report, I don't believe it will serve any purpose by the Department imposing an extra zone(E2) on my property. Kind regards A[redacted]

URL: https://pp.planningportal.nsw.gov.au/draftplans/exhibition/draft-cumberland-plain-conservation-plan

[redacted] Menangle Park - Flora and Fauna Assessment

Mosca Pserras Architects

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Template 2.8.1

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Executive Summary

Eco Logical Australia Pty Ltd (ELA) has been engaged by Mosca Pserras Architects (MPA) to prepare a Flora and Fauna Assessment (FFA) for a proposed service station and garden centre at [redacted] Menangle Park [redacted] The study area is located between [redacted] Menangle Park.

This FFA will support a development application to Campbelltown Council for the proposed service station and garden centre. The proposed works require consent from Campbelltown Council under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The study area has been historically disturbed by vegetation clearance and grazing and is currently comprised of open pasture with small patches of native vegetation, patches of planted vegetation and scattered paddock trees. Notably, Lot [redacted] is also currently used for the storage of road barriers and contains several large warehouses and paved areas. Field survey confirmed the presence of the plant community type (PCT) 849 *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion* (OEH 2013). This PCT was present in three condition zones including moderate (zone 1), derived native grassland (DNG) (zone 2) and poor (zone 3).

None of the vegetation in the study area met the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) definition of 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest', listed as critically endangered, as the patch size within the study area was too small to meet the condition thresholds under the EPBC Act. As such, the vegetation present is not listed as a threatened ecological community under the EPBC Act. However, the patches identified as PCT 849 conforms to the critically endangered ecological community (CEEC) 'Cumberland Plain Woodland in the Sydney Basin Bioregion' under the NSW *Biodiversity Conservation Act 2016* (BC Act). No threatened flora species listed under these Acts were recorded during the site inspections and none are considered likely to occur.

The proposed development of the study area is approximately 3.11 ha in area and will require the removal of approximately 0.09 ha of native vegetation comprising PCT 849 in varying condition from poor (0.002 ha) to DNG (0.064 ha) and Planted Native Vegetation (0.024 ha). Hollow bearing trees were identified onsite however none of these trees are to be removed or significantly disturbed by the proposed works. The study area does not contain any other important fauna habitat features including sandstone rock outcrops, sandstone crevices, nests or dreys.

The development footprint was not observed to contain foraging or roosting habitat for threatened fauna species listed under the BC Act and/or EPBC Act. The development footprint did however contain Cumberland Plain Woodland, specifically as a DNG, which is listed as a CEEC under the BC Act.

An impact assessment for Cumberland Plain Woodland concluded that the proposed development would not have a significant impact on the CEEC . The expected impact from the loss of 0.065 ha of Cumberland Plain Woodland in a degraded condition is not significant given the extent of similar vegetation types within the locality.

Mitigation measures proposed include:

- The preparation and implementation of a Weed Eradication Management Plan (WEMP) to specifically target any Weeds of National Significance (WoNS) or Priority Weeds listed under the *Biosecurity Act 2015*
- Vegetation clearance and disturbance must be confined to the proposed development footprint
- Areas of native vegetation outside of the impact area will be no-go areas for people and machinery and will be clearly delineated with tree protection measures in place
- Erosion and sediment control measures will be established before work begins and maintained throughout the duration of the works until the site has been stabilised to prevent off-site transport of eroded sediments
- Any soil stockpiles are to be limited to cleared areas in the exotic grassland and are to be managed in an appropriate manner to prevent dust, erosion and sediment runoff
- The use of native species should be utilised in any landscape plantings. These species should resemble those that are a part of the Cumberland Plain Woodland Community.

1. Introduction

Eco Logical Australia Pty Ltd (ELA) has been engaged by Mosca Pserras Architects (MPA) to prepare a Flora and Fauna Assessment (FFA) for a proposed service station and garden centre at Menangle Road, Menangle Park (Lots [redacted] This FFA has been prepared to assess potential impacts to flora and fauna associated with the proposed development.

1.1 Study area

The study area for the proposed development is located on Lots [redacted] Menangle Park (Figure 1). The study site is zoned RU6 – Transition under the Campbelltown Local Environment Plan (LEP) 2015. A small portion of the south eastern corner of Lot [redacted] is also mapped as Terrestrial Biodiversity under Clause 7.2 of the Campbelltown LEP 2015. However, this area will not be impacted by the proposed works and as such, Clause 7.2 of the Campbelltown LEP does not apply to this assessment.

Lot [redacted] of the study area currently contains one large building and two small buildings and the land surrounding these buildings is used for the storage of roadwork equipment including traffic bollards. Lot [redacted] and [redacted] do not currently contain any structures. The majority of the study area has likely been previously cleared for agricultural purposes and is currently dominated by exotic grass species including *Cynodon dactylon* (Couch Grass) which is a common species used to improve pastures for cattle grazing.

The locality is largely cleared, likely for agricultural purposes and contains highly developed areas to the east, including the suburbs of Rosemeadow and Glen Alpine. The study area is located between the Hume Motorway and Menangle Road and does not provide a wildlife corridor between vegetated areas within the locality (Figure 1).

Within this report, 'study area' refers to the entire area located in Lot [redacted] and 'development footprint' refers to the areas directly impacted by the proposal.

1.2 Scope of works

The total land size of the study area is approximately 9.3 ha, of which approximately 3.1 ha will be cleared and levelled to facilitate the proposed development (Figure 2). The majority of the proposed works will be undertaken in the footprint of the existing development and within exotic grassland.

This FFA is assessing the likely impacts of the proposed development, including clearance works and the minor excavation works required to create a levelled pad for the construction of the service station and garden centre. The proposed works require consent from Campbelltown Council under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.3 Description of Proposed Development

The proposed development involves the construction of a garden centre and service station and requires the following works to be undertaken within the development footprint:

- Earthworks will be required to reshape the proposed development footprint so the proposed buildings, carparks and driveways can be constructed
- landscaping will occur toward the northern most section of Lot[redacted] as well as tree plantings within the proposed carpark for the garden centre and around the proposed service centre

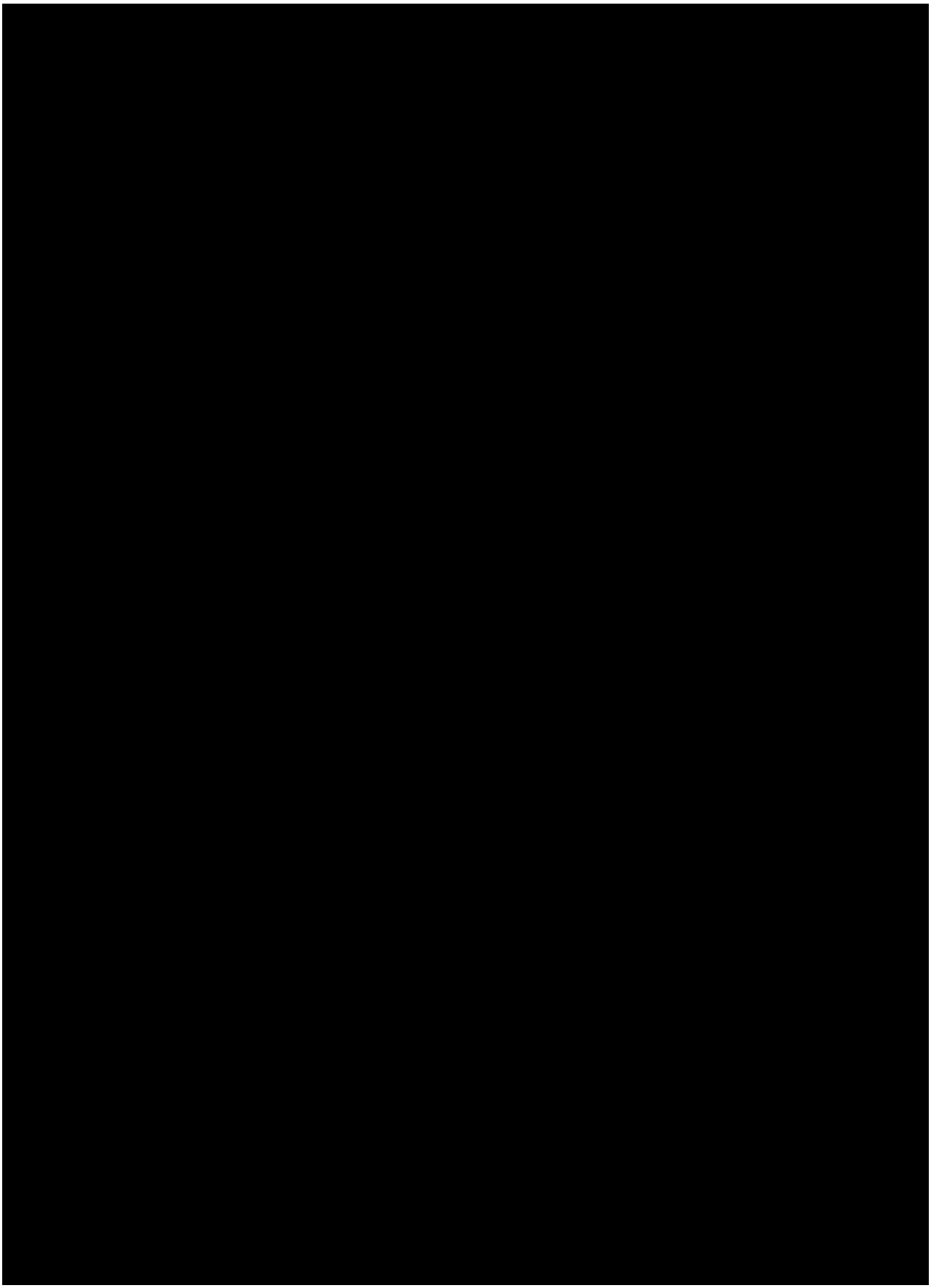

Figure 1: Site location

[redacted]

Figure 2: Proposed site plan

2. Legislative context

Table 1: Legislative context

Name	Relevance to the project
	Commonwealth
Environmental Protection and Biodiversity Conservation Act 1999	The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) aims to protect Matters of National Environmental Significance (MNES), including vegetation communities and species listed under the EPBC Act. If a development is likely to have a significant impact on MNES, it is likely to be considered a 'Controlled Action' by the Commonwealth and requires assessment and approval by the Commonwealth in order to proceed.
	State
Environmental Planning and Assessment Act 1979	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The proposed development is to be assessed under Part 4 of the EP&A Act. The Act provides the SEPPs, LEPs and Development Control Plans described below.
Biodiversity Conservation Act 2016	The BC Act 2016 outlines the assessment requirements to determine whether proposed development (Part 4 of the EP&A Act 1979) is likely to significantly affect threatened species or ecological communities, or their habitats under section 7.3, and whether the Biodiversity Offsets Scheme (BOS) will be triggered. There are three triggers for the BOS. These include: • Clearing more native vegetation than what is outlined in the clearing threshold (0.5 ha for the subject area) • Impacting any area mapped on the Biodiversity Values Map • Having a significant impact on a threatened flora or fauna species, or a threatened ecological community
Biosecurity Act 2015	The *Biosecurity Act 2015* (BS Act) primarily aims to prevent the spready of 'Priority Weeds'. These species pose a threat to native vegetation as they are very efficient at infesting an area and reducing the overall biodiversity. All priority weeds are considered to have, at a minimum, a general biosecurity duty which means that anyone who knows of these species has a duty to reduce their spread as far as reasonable possible. Several of these species were located onsite.
Fisheries Management Act 1994	The FM Act 1994 governs the management of fish and their habitat in NSW. The Schedules of the Act list key threatening processes and threatened species. The FM Act 1994 regulates the provision of permits required in relation to harm to protected marine vegetation (seagrass, macroalgae, mangroves and saltmarsh), dredging, reclamation or obstruction of fish passage on or adjacent to Key Fish Habitat (KFH). This includes direct and indirect impacts, whether temporary or permanent. No key fish habitat is located onsite.
Water Management Act 2000	The aim of the WM Act 2000 is to provide sustainable and integrated management of the state's water for the benefit for both present and future generations. If a local development under Part 4 of the EP&A Act 1979 is proposed on 'waterfront land', it is considered a Controlled Activity and requires an approval under s91 of the WM Act 2000. Waterfront land is defined as 40 m from the highest bank of any creek line. The development should be undertaken in accordance with the Natural Resource Access Regulator's (NRAR) 'Guidelines for Controlled Activities on Waterfront Land – Riparian Land (2018)'.

Name	Relevance to the project
	One third order stream was mapped onsite. During the field investigation it was noted that it had no formed banks or bed and therefore was unlikely to be natural watercourses thus not meeting the definition of a river in the WM Act 2000. A Controlled Activity Approval (CAA) will not be required for this development.
	Planning Instruments
State Environmental Planning Policy No 44 – Koala Habitat Protection (Koala Habitat Protection SEPP)	The study area is located within a Local Government Area (LGA) to which the Koala Habitat Protection SEPP applies. *Phascolarctos cinereus* (Koala) has been previously recorded within a 5 km radius of the study area. Under the current SEPP, the site could provide potential Koala habitat. However, since no feed trees will be removed, this site will continue to provide potential habitat for Koalas On the 1st March 2020, the current Koala Habitat Protection SEPP will be repealed, and a new Koala Habitat Protection SEPP will be enforced. This new SEPP provides a more comprehensive list of Koala feed tree species and provides a map which outlines areas that are subject to this new SEPP. When this SEPP is enforced, vegetation within Lot [redacted] and Lot [redacted] will be subject to this new SEPP. This vegetation may be considered Koala habitat. No feed tree species under the new SEPP are being removed. The proposed development may need to be revaluated once the new SEPP is enforced.
Campbelltown Local Environmental Plan 2015	The study area is zoned as RU6 (Transitional). A small section of the study area is mapped as Terrestrial Biodiversity under the Campbelltown Local Environmental Plan 2015 (LEP 2015).
Campbelltown (Sustainable City) Development Control Plan 2016	Under the Campbelltown (Sustainable City) Development Control Plan 2016, Vol.2, Part 8, (1.11.2), general objectives are outlined for Flora and Fauna conservation. These objectives include: • Improve biodiversity values, over time, throughout the Menangle Park precinct. • Maintain, through time, a 'no net loss' of native vegetation cover. • Ensure examples of vegetation communities found on site are included in the open space network (which includes the offset areas). • Conserve 'high value' ecological features in the open space network (and offset areas).

3. Methodology

3.1 Literature Review and Database Search

A review of readily available databases pertaining to the ecology and environmental features of the study area and surrounding locality, and existing vegetation mapping was conducted to identify records of threatened species, populations and ecological communities and their potential habitat. Databases and vegetation mapping that were reviewed included:

- BioNet Atlas (Atlas of NSW Wildlife) database search (5 km) for threatened species, populations and ecological communities listed under the BC Act (February 2020)
- EPBC Act Protected Matters Search Tool (PMST) (DoEE 2020) (5 km) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act (January 2020)
- Aerial mapping and existing vegetation mapping projects (OEH 2013) to assess the extent of vegetation, including mapped TECs listed under the BC Act and / or EPBC Act
- Campbelltown City Council LEP (2015) and DCP (2016)
- NSW Planning Portal.

Aerial photography (SIXmaps) of the study area and surrounds were also used to investigate the extent of vegetation cover and landscape features. In addition, relevant Geographic Information System (GIS) datasets (soil, geology, drainage) were reviewed.

Species searches from both BioNet and EPBC Act PMST were combined to produce a list of threatened species that may occur within the study area (Appendix A). Likelihood of occurrences for threatened species, endangered populations and ecological communities in the study area were then assessed based on location, date and number of database records, the likely presence or absence of suitable habitat on the study area, and knowledge of the species' ecology.

Five categories for the likelihood of occurrence of species are used in this report, defined as follows:

- "yes" = the species was or has been observed in the study area
- "likely" = a medium to high probability that a species uses the study area
- "potential" = suitable habitat for a species occurs in the study area, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the study area, and
- "no" = habitat in the study area and in its vicinity is unsuitable for the species.

Assessments for the likelihood of occurrence were made both prior to field survey and following field survey. The pre-survey assessments were performed to determine which species were targeted during field survey. The post-survey assessments determined the final likelihood of occurrence after observing the available habitat in the study area (Appendix A).

3.2 Field survey

A field survey was conducted on 4 February 2020 by ELA ecologists Griffin Taylor-Dalton and Karen Spicer. The field survey aimed to assess the following:

- Determine the area, extent and condition of any native vegetation communities
- Validate the vegetation communities
- Observe and record flora species present within the study area, with a focus on searching for those threatened flora species identified from database searches as potentially occurring
- Identify and record fauna habitat features including suitability of habitat for threatened fauna species
- Observe and record previous and current disturbance and threats, e.g. weeds
- Identify likely impacts of the proposed works upon flora and fauna habitat and identify mitigation and avoidance opportunities.

3.2.1 Vegetation communities

To assist in determining the extent and condition of the existing vegetation, a series of rapid assessments were conducted across the site. These rapid assessments involved gathering a list of flora species within each patch of vegetation. The species composition was then used to identify the plant community type (PCT) present. In addition to this, two vegetation plots were conducted using the Biodiversity Assessment Method (BAM) (OEH 2017). These BAM plots gave further clarification to the PCTs within the study area.

3.2.2 Fauna survey

Targeted Cumberland Plain Land Snail surveys were completed in the patches of vegetation identified as PCT 849, as this PCT forms part of the Cumberland Plain Woodland CEEC, which provides habitat for this species. Additionally, opportunistic fauna sightings were noted during the field survey.

The likelihood of threatened fauna species utilising the study area was determined through habitat assessment. The presence or absence of important habitat features (e.g. hollow-bearing trees, rock outcrops, significant logs and waterbodies) was recorded during traverses of the study area.

3.2.3 Survey limitations

With the exception of the Cumberland Plain Land Snail, targeted surveys for threatened flora and fauna, were not conducted during the field survey. Instead, a habitat assessment was undertaken to determine the suitability of the study area to provide threatened species habitat. Noting the habitat features present was considered sufficient to assist in determining whether any threatened species were likely to be present and inform the potential requirements for impact assessments, pre-clearance and clearance surveys prior to works commencing.

4. Results

4.1 Literature Review and Database Search

4.1.1 Vegetation mapping

A review of the available vegetation mapping (OEH 2013) revealed that no PCTs had been mapped within the study area. However, multiple PCTs have been mapped within the surrounding land (Figure 3). These PCTs include:

- PCT 830: Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion
- PCT 835: Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
- PCT 849: Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- PCT 850: Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion
- PCT 1395: Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion.

The PCTs listed above conform to the listings of several threatened ecological communities (TEC) listed under the BC Act and/or the EPBC Act. Table 2 lists the PCTs in proximity to the study area and the TECs they correspond to under the BC Act and EPBC Act.

Table 2: PCTs in proximity to the study area and associated threatened ecological communities

PCT Number	PCT Name	BC Act	EPBC Act
830	Forest Red Gum - Grey Box shrubby woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Moist Shale Woodland in the Sydney Basin Bioregion (endangered ecological community)	Moist Shale Woodland in the Sydney Basin Bioregion (critically endangered ecological community)
835	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (critically endangered ecological community)	Not listed but has been nominated for listing.
849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion (critically endangered ecological community)	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (critically endangered ecological community)
850	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion (critically endangered ecological community)	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (critically endangered ecological community)

PCT Number	PCT Name	BC Act	EPBC Act
1395	Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion	Shale Gravel Transition Forest in the Sydney Basin Bioregion (endangered ecological community)	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (critically endangered ecological community)

4.1.2 Threatened Species

The BioNet Atlas search returned 39 threatened fauna species and eight threatened flora species as occurring or having the potential to occur within a 5 km radius of the study area (Appendix A). No BioNet records of threatened flora or fauna occur within the study site (Figure 4 and Figure 5).

The desktop review identified six threatened flora species listed under the BC and/or EPBC Acts, which have been recorded within a 5 km radius of the study area (Figure 4). The closest record was *Pimelea spicata* (Spiked Rice-flower), which was recorded within 1 km of the study area.

Twenty-seven threatened fauna species listed under the BC Act and/or EPBC Act have been recorded within a 5 km radius of the study area (Figure 5). The closest records are of the *Ephippiorhynchus asiaticus* (Black-necked stork) and *Phascolarctos cinereus* (Koala) which were recorded within 200 m of the study area. No threatened fauna has been previously recorded within the study area (Figure 5).

[redacted]

Figure 3: Vegetation mapping by OEH (2013)

[redacted]

Figure 4: Threatened flora records within 5 km of the study area (OEH 2020)

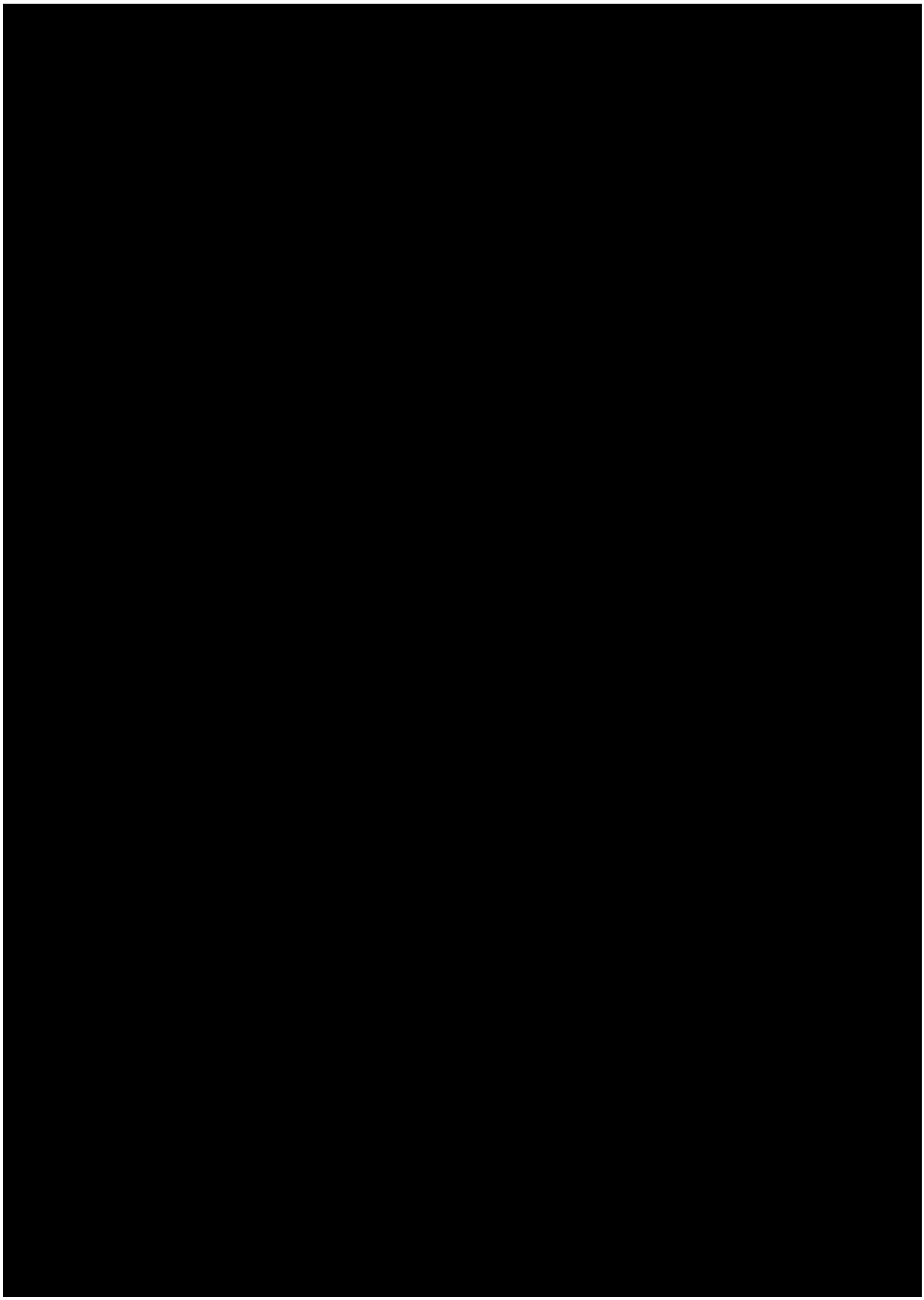

Figure 5: Threatened fauna records within 5 km of the study area (OEH 2020)

4.2 Field survey

4.2.1 Vegetation Validation

The field survey identified that the site contained PCT 849: *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion* in three different condition classes, and exotic grassland. As such, five vegetation zones were mapped within the study area (Figure 6). The vegetation zones present are listed below:

- Zone 1: PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (moderate) (Figure 7)
- Zone 2: PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (DNG) (Figure 8)
- Zone 3: PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (poor) (Figure 9)
- Zone 4: Planted Native Vegetation (Figure 10)
- Zone 5: Exotic Grassland (Figure 11)

A description of the above PCT's can be found in Section 4.2.1.1-4.2.1.4 below.

4.2.1.1 Zone 1 - 849: Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (moderate)

Zone 1 consisted of a small patch of PCT 849 in moderate condition within the central portion of the study area (Figure 6). This zone was dominated by native species in both the canopy and groundcover layers. The canopy consisted of *Eucalyptus moluccana* (Grey Box) which were all observed to be in a relatively similar mature age class (Figure 7).

Olea europaea subsp. cuspidata (African Olive) dominated the mid-storey, with a low layer of *Lycium ferocissimum* (African Boxthorn) present throughout this vegetation zone. Both species are considered priority weeds under the *Biosecurity Act 2015* (BS Act).

Einadia trigonos (Fishweed) and *Einadia polygonoides* (Saltbush) were the most abundant species in the ground layer. The exotic species *Chloris gayana* (Rhodes grass) was also present within the ground layer.

[redacted]

Figure 6: Vegetation mapping and plot locations

Figure 7: Vegetation zone 1 - PCT 849 in moderate condition

4.2.1.2 Zone 2 -Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (DNG)

Zone 2 was present in one small patch in the northern portion of the study area and was identified as PCT 849 Derived Native Grassland (DNG) (Figure 6). This patch of DNG was distinctive from the surrounding exotic grassland due to the presence of *Aristida ramosa* (Purple Wiregrass), which formed approximately 50% cover. This patch did not contain a canopy or midstorey layer and was in a degraded state due to the presence of exotic grasses comprising approximately 50% cover and past land use history (Figure 8).

4.2.1.3 Zone 3 -Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (poor)

Zone 3 consisted of several small isolated patches of PCT 849 in poor condition throughout the study area (Figure 6). These patches comprised a canopy dominated by *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark) (Figure 9) and consisted of no more than a dozen trees. Like the moderate condition patches of this PCT, the priority weeds *Olea europaea subsp. cuspidata* (African Olive) dominated the mid-story with occasional occurrences of *Lycium ferocissimum* (African Boxthorn) throughout. Generally, there were very few native species within the ground layer, with the exotic species *Cenchrus clandestinum* (Kikuyu), *Chloris gayana* (Rhodes Grass) and the priority weed *Nassella neesiana* (Chilean Needle Grass) comprising the majority of the groundcover. Occasionally native species such as *Einadia trigonos* (Fishweed) and *Einadia polygonoides* (Saltbush) could be found underneath the native canopy trees.

Figure 8: Vegetation zone 2 - PCT 849 DNG

Figure 9: Vegetation zone 3 - PCT 849 in poor condition

4.2.1.4 849: Zone 4 -Planted native vegetation

Zone 4 comprised a row of planted trees adjacent to the eastern boundary of the study area (Figure 6). The canopy species consisted of *Casuarina cunninghamiana* (River Oak) and *Melaleuca styphelioides* (Prickly-leaved Tea Tree). The midstorey layer was absent from this zone, likely as a result of the regular mowing (Figure 10). Within the ground layer, the most dominant species was the exotic grass and priority weed *Nassella neesiana* (Chilean Needle Grass), with the native species *Microlaena stipoides* (Weeping grass), *Dichondra repens* (Kidney weed) *Einadia trigonos* (Saltbush) and *Sida rhombifolia* (Paddy's Lucerne) also present throughout this vegetation zone.

Figure 10: Vegetation zone 4 – Planted native vegetation

4.2.1.5 Zone 5 – Exotic Grassland

Zone 5 was present throughout the study area and was the dominant vegetation type within the study area (Figure 6). This vegetation zone exists as a low exotic grassland dominated by *Cenchrus clandestinus* (Kikuyu), *Chloris gayana* (Rhodes Grass), *Cynodon dactylon* (Couch), *Eragrostis curvula* (African Lovegrass), *Paspalum dilatatum* (Paspalum), *Verbena bonariensis* (Purpletop) and *Verbena rigida* (Veined Verbena) (Figure 11). There were isolated patches in this zone containing a shrub layer dominated by the priority weed *Olea europaea subsp. cuspidata* (African Olive).

Figure 11: **Vegetation zone 5 - exotic grassland**

4.2.2 EPBC Act Listing Criteria

Some of the vegetation within the study area was mapped as Grey Box - Forest Red Gum grassy woodland (PCT 849) (Figure 6). This PCT conforms to the TEC Cumberland Plain Woodland in the Sydney Basin Bioregion, which is listed as critically endangered under the BC Act. This TEC has potential to meet the definition of the critically endangered Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act depending on size and condition criteria.

This community does not meet the EPBC Act condition threshold as none of the mapped patches of PCT 849 are equal to or greater than 0.5 ha. As such, the vegetation present is not listed as a TEC under the EPBC Act.

4.2.3 Flora species

A total of 51 flora species were recorded within the study area, including 23 native and 28 exotic species (Appendix B). None of these species are listed under the BC Act or EPBC Act. Given the level of disturbance at the site and the level of survey undertaken, it is considered unlikely that the proposed works would impact upon any threatened flora species.

Senecio madagascariensis (Fireweed), *Olea europaea* subsp. cuspidata (African Olive), *Nassella neesiana* (Chilean needlegrass) and *Lycium ferocissimum* (African Boxthorn) were recorded within the study area and are listed as priority weeds under the Commonwealth *Biosecurity Act 2016*. These plants (with the exception of African Olive) are also listed as Weeds of National Significance (WoNS).

4.2.4 Fauna species and habitats

A summary of the fauna habitat values for study area is outlined in Table 3.

Table 3: Summary of fauna habitat values

Habitat Features	Fauna likely to utilise features	Occurrence
Remnant native vegetation	Birds, megachiropteran bats (fruit bats), arboreal mammals, reptiles	The study area is comprised of small patches of native forest that has been under-scrubbed and cleared in the past. However, some large remnant trees are present.
Hollow-bearing trees	Birds, microchiropteran bats (microbats) and arboreal mammals (gliders and possums)	The study area contains 10 hollow-bearing trees (HBT). However, none are to be removed or in any way impacted by the proposed development.
Stags	Birds, particularly birds of prey, reptiles, amphibians, micro bats	No stags were recorded.
Leaf litter	Reptiles, amphibians, invertebrates	Leaf litter was present in many of the small patches of native vegetation.
Coarse woody debris	Terrestrial mammals, reptiles, invertebrates	There was coarse woody debris located within the moderate and poor condition patches of CPW.
Watercourse	Amphibians, water birds, aquatic fauna	There was one mapped drainage line identified onsite however there were no formed banks or stream bed, therefore is was unlikely to be a natural watercourse.
Vegetative corridor	Birds, reptiles, arboreal and small mammals	The study area does not form a corridor between areas of native vegetation. However, mobile fauna species including microbats and birds may use habitat within the study area.

Based on previous BioNet Atlas records and habitat within the study area, there is potential foraging habitat for hollow-dependant microbats and *Pteropus poliocephalus* (Grey-headed Flying-fox). Ten hollow-bearing trees were also recorded in the study area (Figure 12). Among these trees, small, medium and large hollows were identified. These habitat trees provide potential habitat for threatened microbat species, as well as habitat for larger fauna species, such as gliders, possums, parrots and owls. This habitat will not be removed though will likely be impact by several indirect impacts. These factors include increased noise levels, increased ground disturbance and increased exotic species invasion.

The study area also contains Koala feed trees under State Environmental Planning Policy (SEPP) No 44—Koala Habitat Protection, including *Eucalyptus tereticornis* (Forest Red Gum). However, the site only contains a small number of these trees and they are located in isolated patches, all of which will be retained. During the field survey, no Koala scats or scratching's were observed. Additionally, the study area is highly degraded and located between The Hume Motorway and Menangle Road, both of which are busy and provide a substantial barrier to the dispersal of the species. As such, the study area is not

considered likely to be utilised by this species. Therefore, no additional assessment for this species is considered necessary.

Targeted surveys for *Meridolum corneovirens* (Cumberland Plain Land Snail) were conducted during the field survey. The targeted survey identified that the PCT did not contain the necessary habitat features for this species, including sufficient leaf litter, bark and coarse woody debris. Additionally, no Cumberland Plain Land Snails were found in the study area during the targeted surveys. As such, an impact assessment for the Cumberland Plain Land Snail was not considered necessary for this project.

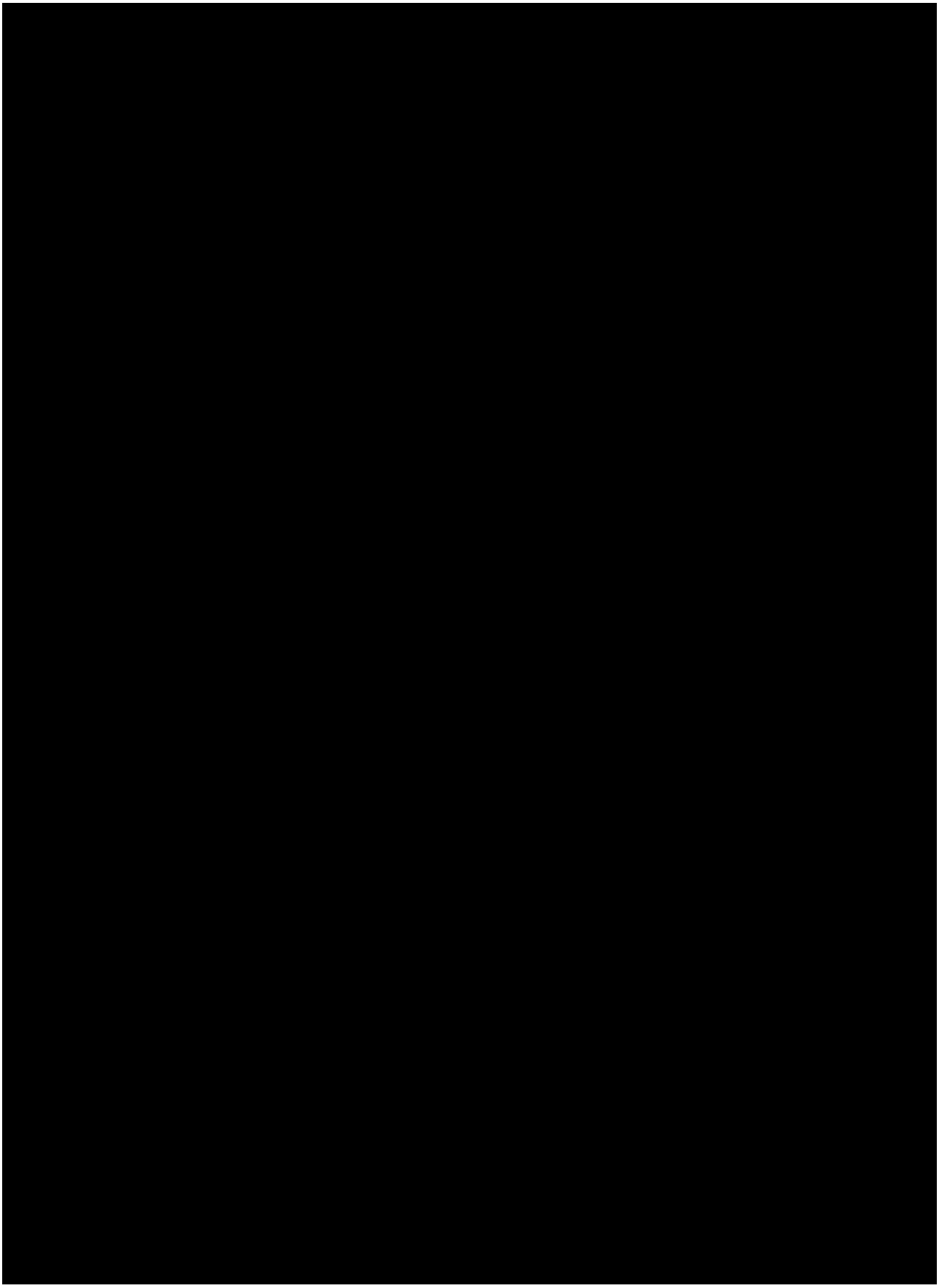

Figure 12: Hollow-bearing trees in the study area

5. Impact Assessment

5.1 Impacts

The ecological impacts expected to result from the proposed development are shown in Figure 13. The direct impacts as a result of the development footprint are provided in Table 4.

Table 4. Impacts of the development footprint

Veg Zone	PCT ID	PCT Name	Condition	Area (ha)
2	849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	DNG	0.064
3	849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Poor	0.002
4		Planted Native Vegetation		0.024
5		Exotic Grassland		1.909
		Existing Development		1.115
		Total		**3.114**

A Test of Significance has been completed for Cumberland Plain Woodland to address the impacts on this TEC resulting from the proposed development (Appendix C). The proposed development is unlikely to have a significant impact on this TEC, as the vegetation to be removed is 0.07 ha in area and is highly degraded.

Indirect impacts resulting from the proposed development have the potential to impact on the study area. These indirect impacts are likely to include:

- Increased noise levels due to increased machinery activity during development, and increased traffic after development
- increased disturbance to the ground due to earthworks and stockpiling of soil and construction materials
- increased potential for erosion and sedimentation due to exposed soil
- increased weed invasion due to movement of soil and the risk of importing new weeds from machinery and construction equipment.

5.2 Koala habitat protection SEPP44

As mentioned above, the study area contains one Koala feed tree (*Eucalyptus tereticornis)*, listed under the SEPP44. It is unlikely that the study area would be used by any Koalas as the vegetation is in a degraded condition and located alongside the Hume Motorway and Menangle Road, creating a barrier to the movement of koalas and other fauna species. Additionally, no Koala scats or scratching were identified during the field survey.

On the 1 March 2020, the current Koala habitat protection SEPP (SEPP 44) will be repealed, and an updated version will be enforced. This updated SEPP contains a much more comprehensive list of Koala

feed trees. This list of feed tree species will be used to assess what is and isn't considered to be Koala habitat. If an area is considered to be Koala habitat, a Koala Management Plan must be prepared. Once the new SEPP is enforced, the proposed development may need to be reviewed to ensure it conforms to the new SEPP.

[redacted]

Figure 13: Proposed impact area

6. Mitigation Measures and Recommendations

To minimise the potential impacts of the development footprint on the study area and improve environmental outcomes, the following recommendations for impact mitigation have been provided. These recommendations should form part of the conditions of consent.

The following measures place emphasis on enhancing the occurrence of Cumberland Plain Woodland TEC located and retained onsite.

- A Weed Eradication Management Plan (WEMP) should be prepared and implemented across the whole site prior to any major earth works. This plan should specifically target any Weeds of National Significance (WoNS) or priority weeds listed under the *Biosecurity Act 2015*. Target species include:
    - *Lycium ferocissimum* (African Boxthorn)
    - *Nassella neesiana* (Chilean Needle Grass)
    - *Olea europaea subsp. cuspidata* (African Olive)
    - *Rubus fruticosus* (Blackberry)
    - *Senecio madagascariensis* (Fireweed)
- Vegetation clearance and disturbance must be confined to the proposed development footprint (Figure 2).
- Areas of native vegetation outside of the impact area will be no-go areas for people and machinery and will be clearly delineated with tree protection measures in place.
- Erosion and sediment control measures will be established before work begins and maintained throughout the duration of the works until the site has been stabilised, to prevent off-site transport of eroded sediments.
- Any soil stockpiles are to be limited to cleared areas in the exotic grassland (Figure 6) and are to be managed in an appropriate manner to prevent dust, erosion and sediment runoff.
- The use of native species should be utilised in any landscape plantings. These species should resemble those that are a part of the Cumberland Plain Woodland TEC.

7. Conclusion

This flora and fauna report has been prepared to assess the impacts likely to result from the proposed development of the study area at Lot [redacted] and [redacted], Menangle Park. The proposed development is 3.11 ha in area and will result in the removal of approximately 0.07 ha of PCT 849 which conforms to the critically endangered *Cumberland Plain Woodland in the Sydney Basin Bioregion* under the BC Act, present in the study area in poor condition and as a DNG. Whilst this community is listed under the BC Act, it does not meet the condition criteria for *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* listed as a CEEC under the EPBC Act.

No threatened flora species were recorded during the field survey and none are considered likely to occur due to the disturbed nature of the vegetation within the study area. Targeted surveys for the threatened fauna species Cumberland Plain Land Snail were conducted however, these surveys did not identify any records of the species within the study area. Additionally, these surveys concluded that the habitat requirements for the Cumberland Plain Land Snail were not present in the study area. As such, it is considered unlikely that any threatened fauna species are likely to utilise the development footprint or be impacted by the proposed works.

8. References

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Appendix A Likelihood of occurrence

Table 5: Likelihood of occurrence and requirement of impact assessment for threatened fauna species and species of local conservation significance

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Aves						
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of *Casuarina cunninghamiana* (River Oak).	No. No suitable habitat on or near the study area.	No
Artamus cyanopterus	Dusky Woodswallow	V	-	Woodlands and dry open sclerophyll forest, usually eucalypts and mallee associations. Also have recordings in shrub and heathlands and various modified habitats, including regenerating forests. In western NSW, this species is primarily associated with River Red Gum/ Black Box/ Coolabah open forest/woodland and associated with larger river/creek systems.	No. No suitable habitat on or near the study area.	No
Calidris acuminate	Sharp-tailed Sandpiper	-	M	Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	No. No suitable habitat on or near the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Calidris canutus	Red Knot	-	E, M	Intertidal mudflats, sandflats sheltered sandy beaches, estuaries, bays, inlets, lagoons, harbours, sandy ocean beaches, rock platforms, coral reefs, terrestrial saline wetlands near the coast, sewage ponds and saltworks. Rarely inland lakes or swamps.	No. No suitable habitat on or near the study area.	No
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	Forest and woodland, urban fringes.	Unlikely. Habitat onsite is marginal and degraded.	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	Open forest and woodlands of the coast and the Great Dividing Range where stands of Sheoak occur.	No. No suitable habitat on or near the study area.	No
Circus assimilis	Spotted Harrier	V	-	Grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	No. No suitable habitat on or near the study area.	No
Daphoenositta chrysoptera	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, mallee and Acacia woodland.	No. No suitable habitat on or near the study area.	No
Ephippiorhynchus asiaticus	Black-necked Stork	E	-	In NSW, floodplain wetlands of the major coastal rivers are key habitat. Also, minor floodplains, coastal sandplain wetlands and estuaries.	No. No suitable habitat on or near the study area.	No
Gallinago hardwickii	Latham's Snipe	-	M	Freshwater, saline or brackish wetlands up to 2,000 m above sea-	No. No suitable habitat on or near the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
				level; usually freshwater swamps, flooded grasslands or heathlands.		
Glossopsitta pusilla	Little Lorikeet	V	-	Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	Unlikely. marginal habitat in a degraded condition.	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	Unlikely. Marginal suitable habitat on or near the study area.	No
Hieraaetus morphnoides	Little Eagle	V	-	Open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW.	No. No suitable habitat on or near the study area.	No
Hirundapus caudacutus	White-throated Needletail	-	M	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	No. No suitable habitat on or near the study area.	No
Lathamus discolor	Swift Parrot	E1	CE	Box-ironbark forests and woodlands.	No. No suitable habitat on or near the study area.	No
Lophoictinia isura	Square-tailed Kite	V	-	Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	No. No suitable habitat on or near the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Ninox connivens	Barking Owl	V	-	Woodland and open forest, including fragmented remnants and partly cleared farmland, wetland and riverine forest.	No. No suitable habitat on or near the study area.	No
Ninox strenua	Powerful Owl	V	-	Woodland, open sclerophyll forest, tall open wet forest and rainforest.	No. No suitable habitat on or near the study area.	No
Petroica boodang	Scarlet Robin	V	-	Dry eucalypt forests and woodlands, and occasionally in mallee, wet forest, wetlands and tea-tree swamps.	No. No suitable habitat on or near the study area.	No
Pluvialis squatarola	Grey Plover	-	M	Mudflats, saltmarsh, tidal reefs and estuaries.	No. No suitable habitat on or near the study area.	No
Stagonopleura guttata	Diamond Firetail	V	-	Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	No. No suitable habitat on or near the study area.	No
Stictonetta naevosa	Freckled Duck	V		Freshwater swamps and creeks, lakes, reservoirs, farm dams and sewage ponds.	No. No suitable habitat on or near the study area.	No
Tyto novaehollandiae	Masked Owl	V	-	Dry eucalypt forests and woodlands from sea level to 1,100 m.	Unlikely. Habitat onsite is degraded. Additionally, there are no records within 5 km of the site.	No
Mammals (excluding bats)						

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Cercartetus nanus	Eastern Pygmy-possum	V	-	Rainforest, sclerophyll forest (including Box-Ironbark), woodland and heath.	No. No suitable habitat on or near the study area.	No
Petaurus norfolcensis	Squirrel Glider	V	-	Open forest, woodland and riverine forest habitats.	No. No suitable habitat on or near the study area.	No
Petauroides volans	Greater Glider population in the Eurobodalla local government area	E2	V	Eucalypt forests and woodlands.	No. This threatened population only exists in the Eurobodalla local government area.	No
Phascolarctos cinereus	Koala	V	V	Eucalypt woodlands and forests.	Unlikely. Few feed trees located onsite. Field survey found no scats or scratching's. It is likely that Menangle Road and the Hume Highway are also acting as barriers to their distribution.	No
Microbats and Mega Bats						
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel).	Unlikely, no caves, karts or culverts were located onsite.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
				Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years.		
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	Tall (greater than 20m) moist habitats. Generally, roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Potential, however, no hollow bearing trees are to be removed.	No
Kerivoula papuensis	Golden-tipped Bat	V	-	Rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Roost mainly in rainforest gullies on small first- and second-order streams in usually abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests modified with an access hole on the underside. Bats may also roost under thick moss on tree trunks, in tree hollows, dense foliage and epiphytes.	Potential, however, no hollow bearing trees are to be removed.	No
Miniopterus australis	Little Bentwing-bat	V	-	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Roosts in caves,	Potential, however, no hollow bearing trees are to be removed. No caves or culverts were identified onsite.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
				tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.		
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-	Rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Unlikely. No caves or culverts identified onsite.	No
Mormopterus norfolkensis	Eastern Freetail-bat	V	-	Dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Potential, however, no hollow bearing trees are to be removed	No
Myotis macropus	Southern Myotis	V	-	Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 200 m from a waterbody with pools larger than 3 m wide. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Unlikely. No significant water bodies were identified onsite. Additionally, no caves or culverts were identified onsite.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Potential foraging habitat, however, moderate condition vegetation is being retained.	No
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		Almost all habitats, including wet and dry sclerophyll forest, open woodland, open country, mallee, rainforests, heathland and waterbodies. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows	Potential, however, no hollow bearing trees are to be removed.	No
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Woodland, moist and dry eucalypt forest and rainforest. Although this species usually roosts in tree hollows, it has also been found in buildings.	Potential, however, no hollow bearing trees are to be removed.	No
Invertebrates						
Meridolum corneovirens	Cumberland Plain Land Snail	E	-	Primarily inhabits Cumberland Plain Woodland on the Cumberland Plain. Also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest. Lives under litter of bark, leaves and logs, or shelters in loose soil	Unlikely – The areas of potential habitat were searched however no shells or specimens were found.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
				around grass clumps. Occasionally shelters under rubbish		
Pommerhelix duralensis	Dural Land Snail		E	The Dural Land Snail is endemic to NSW and is confined to the northwest fringes of the Cumberland Plain. The snail has a strong preference for dry shale-influenced transitional landscapes. Associated with open eucalypt forests, particularly Shale-Sandstone Transition Forest and Sydney Turpentine – Ironbark Forest. Found under fallen logs, debris and in bark and leaf litter around the trunk of gum trees (particularly Eucalyptus punctata) or burrowing in loose soil around clumps of grass.	Unlikely. Habitat onsite does not conform with the habitat and distribution that this species is known to occur in.	No

^BC Act: E1 = Endangered, E2 = Endangered Population, E4 = Extinct, E4A = Critically Endangered, V = Vulnerable; EPBC Act: M = Migratory, E = Endangered, CE – Critically Endangered, Mar = Marine;
*species of local conservation significance under the UESAP

Table 6: Likelihood of occurrence and requirement of impact assessment for threatened flora species

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Callistemon linearifolius	Netted Bottle Brush	V	-	Dry sclerophyll forest.	Unlikely. Suitable habitat for the species not present within the study area.	No
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V	Heath and shrubby woodland to open forest on sandy or light clay soils usually over thin shales.	Unlikely. Suitable habitat for the species not present within the study area.	No
Persoonia hirsuta	Hairy Geebung	E1	E	Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	Unlikely. Suitable habitat for the species not present within the study area.	No
Pimelea spicata	Spiked Rice-flower	E1	E	Well-structured clay soils. *Eucalyptus moluccana* (Grey Box) communities and in areas of ironbark on the Cumberland Plain. Coast Banksia open woodland or coastal grassland in the Illawarra.”	Unlikely. Suitable habitat for the species not present within the study area.	No
Pomaderris brunnea	Brown Pomaderris	E1	V	Moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	Unlikely. Suitable habitat for the species not present within the study area.	No
Pterostylis saxicola	Sydney Plains Greenhood	E1	E	Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	Unlikely. Suitable habitat for the species not present within the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Pultenaea pedunculata	Matted Bush-pea	E1	-	Woodland, sclerophyll forest, road batters and coastal cliffs.	Unlikely. Suitable habitat for the species not present within the study area.	No
Thesium australe	Austral Toadflax	V	V	Grassland on coastal headlands or grassland and grassy woodland away from the coast.	Unlikely. Suitable habitat for the species not present within the study area.	No

^BC Act: E1 = Endangered, E2 = Endangered Population, E4 = Extinct, E4A = Critically Endangered, V = Vulnerable; EPBC Act: M = Migratory, E = Endangered, CE – Critically Endangered, Mar = Marine;
*species of local conservation significance under the UESAP

Appendix B Flora species recorded in the study area

Table 7: Flora species recorded in the study area

Family	Species	Common Name	Status	Priority Weed	WONS
Acanthaceae	*Brunoniella australis*	Blue Trumpet	N		
Apiaceae	*Cyclospermum leptophyllum*	Slender Celery	E		
	Foeniculum vulgare	Fennel	E		
Apocynaceae	*Araujia sericifera*	Moth Vine	E		
	Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	E		
Asteraceae	*Cirsium vulgare*	Spear Thistle	E		
	Conyza sp.	Fleabane	E		
	Hypochaeris radicata	Catsear	E		
	Senecio madagascariensis	Fireweed	E	Class 4	Yes
	Sonchus oleraceus	Common Sow-thistle	E		
Caryophyllaceae	*Paronychia brasiliana*	Chilean Whitlow Wort	E		
Casuarinaceae	*Casuarina cunninghamiana*	River Oak	N		
Chenopodiaceae	*Einadia polygonoides*		N		
	Einadia trigonos	Fishweed	N		
Convolvulaceae	*Dichondra repens*	Kidney Weed	N		
Cyperaceae	*Cyperus gracilis*	Slender Flat-sedge	N		
Fabaceae - Faboideae	*Desmodium rhytidophyllum*		N		
	Desmodium varians	Slender Tick-trefoil	N		
	Glycine clandestina	Twining Glycine	N		
Fabaceae - Mimosoideae	*Acacia parramattensis*	Parramatta Wattle	N		
Malvaceae	*Sida corrugata*	Corrugated Sida	N		
	Sida rhombifolia	Paddy's Lucerne	E		
	Malva parviflora	Mallow	E		
	Modiola caroliniana	Red-flowered Mallow	E		
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark	N		
	Eucalyptus moluccana	Grey Box	N		
	Eucalyptus tereticornis	Forest Red Gum	N		
	Melaleuca styphelioides	Prickly-leaved Tea Tree	N		
Oleaceae	*Olea europaea* subsp. *cuspidata*	African Olive	E	Class 4	
Oxalidaceae	*Oxalis perennans*		N		
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N		
Plantaginaceae	*Plantago lanceolata*	Plantain, Ribwort	E		
Poaceae	*Aristida ramosa*	Purple Wiregrass	N		
	Bothriochloa macra	Red Grass	N		
	Briza subaristata		E		
	Cenchrus clandestinus	Kikuyu	E		
	Chloris gayana	Rhodes Grass	E		

Family	Species	Common Name	Status	Priority Weed	WONS
	Cynodon dactylon	Couch, Bermuda Grass	E		
	Eragrostis curvula	African Lovegrass	E		
	Hyparrhenia hirta	Coolatai grass	E		
	Microlaena stipoides	Weeping Grass	N		
	Nassella neesiana	Chilean needlegrass	E	Yes	Yes
	Paspalum dilatatum	Paspalum	E		
	Setaria parviflora	Slender Pigeon Grass	E		
	Themeda triandra	Kangaroo Grass	N		
Portulacaceae	*Portulaca oleracea*	Pigweed	N		
Polygonaceae	*Rumex spp.*	Rambling Dock	E		
Rosaceae	*Rubus fruticosus*	Blackberry	E		
Solanaceae	*Lycium ferocissimum*	African Boxthorn	E	Class 4	Yes
Verbenaceae	*Verbena bonariensis*	Purpletop	E		
	Verbena rigida	Veined Verbena	E		

Appendix C Test of Significance

Cumberland Plain Woodland

Cumberland Plain Woodland (CPW) is listed as a Critically Endangered Ecological Community under Schedule 2 of the BC Act. Two forms of CPW have been identified in the NPWS vegetation mapping of the Cumberland Plain, these being Shale Hills Woodland and Shale Plains Woodland. Shale Hills Woodland occurs mainly on the elevated and sloping southern half of the Cumberland Plain and is the most widely distributed form of CPW (NPWS 2002).

The dominant canopy trees in CPW include *Eucalyptus moluccana* (Grey Box), *E. tereticornis* (Forest Red Gum) and *E. crebra* (Narrow-leaved Ironbark), although *Corymbia maculata* (Spotted Gum) and *E. eugenioides* (Thin-leaved Stringybark) may also occur. The community typically has a shrub layer dominated by *Bursaria spinosa* (Blackthorn), with other shrubs, such as *Acacia implexa, Indigofera australis* and *Dodonaea viscosa* subsp. *cuneata*, also present. The diverse understorey layer is similar for both forms of CPW. It is common to find grasses, such as *Themeda triandra* (Kangaroo Grass), *Microlaena stipoides* var. *stipoides* (Weeping Meadow Grass) in the community, as well as herbs, such as *Dichondra repens* (Kidney Weed), *Brunoniella australis* (Blue Trumpet) and *Desmodium varians* (NPWS 2002).

CPW was extensive across western Sydney before European settlement, covering about 125,000 hectares. In 2002 there was only 9 per cent of the original extent, with a further 14 per cent remaining as scattered trees across the landscape (NPWS 2002). CPW occurs in the Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly Local Government Areas.

Field survey confirmed the presence of CPW in varying conditions throughout the study area. Approximately 0.07 ha of CPW in varying condition would be removed as a result of the development footprint, containing few trees and no hollow-bearing trees.

Table 8: Patch size of condition classes of Cumberland Plain Woodland in the study area

Vegetation Community	Hectares
Cumberland Plain Woodland (DNG)	0.064
Cumberland Plain Woodland (poor)	0.002

a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Not applicable.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The proposed development would involve the removal of about 0.07 ha of CPW. This includes a section of poor condition CPW containing *Bursaria spinosa* with no canopy cover, and an area of DNG. As such,

the proposed clearing is likely to have a minor impact on the extent of the community and is unlikely to place the local occurrence of the community at risk of extinction. CPW that is being retained within the study area is in a moderate condition. This moderate condition vegetation has a higher ecological value than the areas that are being removed. This patch contains more native species within each strata layer within this vegetation zone, a lower abundance of exotic species and contains some habitat features.

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

The removal of 0.07 ha (0.002 ha of poor condition CPW and 0.064 ha of DNG) is unlikely to adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

c) in relation to the habitat of a threatened species, population or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the action proposed,

The proposed action would involve the removal of about 0.07 ha of CPW in varying conditions. This area of CPW represents a very minor portion of the community when compared to the extent of CPW within the locality.

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The vegetation to be removed does not form a corridor between nearby areas of habitat. It is already highly fragmented from other remnants within the locality. As such, the proposed works will not further fragment or isolate any areas of nearby habitat.

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

The loss of 0.07 ha represents a minor reduction in the extent of the community in the locality. Additionally, the CPW to be removed is degraded and contains no canopy species. As such, the vegetation to be removed is not considered important to the long-term survival of the ecological community in the locality.

d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed development would not directly or indirectly effect any declared area of outstanding biodiversity value identified by the Office of Environment and Heritage.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Two Key Threatening Processes (KTP) are relevant to this proposal with respect to the clearance of CPW. These include:

- Clearing of native vegetation
- Invasion of native plant communities by exotic perennial grasses

The removal of 0.07 ha of CPW in poor condition and as a DNG is not likely to significantly exacerbate the KTPs listed above.

Conclusion

The proposed development is not likely to result in a significant impact to CPW as:

- The amount of CPW to be removed (0.07 ha) represents a very small portion of the CPW within the locality
- The CPW to be removed is degraded
- No canopy species will be removed under the proposed works

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