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10 July 2020

Daniel Nay
Development Manager, NSW/ACT, Communities
Lendlease
Level 2, 88 Phillip Street
Parramatta NSW 2150 Australia
Email: daniel.nay@lendlease.com.au

Dear Dan,

Re: 16 Chapman St, Werrington – 7 Part Test Assessment of Significance of impacts to Cumberland Plain Woodland (Niche ref. #5111)

As requested, we have undertaken an assessment of the significance of potential impacts to Cumberland Plain Woodland (CPW), a critically endangered ecological community (CEEC) listed under the *Biodiversity Conservation Act 2016* (BC Act) and former *Threatened Species Conservation Act 1995 (*TSC Act*)*, in relation to the proposed development of 16 Chapman Street Werrington NSW (the 'Site').

Pursuant to the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* (BC Regs 2017), the Site occurs within a Western Sydney Interim Designated Area and therefore, the former planning provisions apply (former section 5A of the *Environmental Planning and Assessment Act 1979* and *Threatened Species Conservation Act 1995*). As such, a 7-Part Test was undertaken to assess the significance of the impacts to CPW associated with the Project.

As discussed, we have assessed impacts to CPW based on the following:

- Assuming the CPW within the E2 Environmental Conservation zone located adjacent to the Site is adequately protected due to the intent of the ecological conservation zoning.
- The retention and long-term protection of 1.6 hectares of CPW within the E2 conservation zone and RE1 open space area.

The result of the assessment indicates that the Project is unlikely to have a significant impact on the CEEC. In this instance, an SIS would not be required.

I trust that the information and supporting figures presented in this letter report provide the information you require.

Yours sincerely,

[redacted]

Amanda Griffith
Ecologist
Niche Environment and Heritage
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1. Background

Penrith City Council (PCC) have requested that a new biodiversity assessment be completed to accompany the proposed modification of an existing Development Application (DA) that was previously approved by PCC on 12 February 2016 (DA14/0627). The assessment is being undertaken in relation to a proposed residential and commercial development at 16 Chapman Street, Werrington (hereafter referred to as the Site), referred to as the South Werrington Urban Village, as identified in the PCC Development Control Plan (DCP) (PCC 2014) (the Project). The Site and project boundary are shown in Figure 1.

This report summarises results of the previous ecological assessments and details the results of an updated assessment of impacts to the Threatened Ecological Community (TEC), Cumberland Plain Woodland (CPW) at the Site. CPW is listed as a Critically Endangered Ecological Community (CEEC) under the NSW *Biodiversity Conservation Act* 2016 (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.1 Brief Site description

The site is located in a relatively built-up urban area and lies adjacent to the University of Western Sydney's Werrington campus, the Cobham Juvenile Detention Centre, Wollemi College, residential housing and the Blue Mountains Railway Line to the north.

The site is currently undeveloped. It is variously zoned RE1 – public recreation, E2 – environmental conservation, R1 – general residential, R4 – high density residential and IN2 – light industrial.

The site is located on the western floodplain of Claremont Creek and is relatively flat.

Most of the site has been cleared of its native vegetation and is dominated by exotic grasses that have been slashed or mown, as detailed above. Remnant native vegetation at the site is CPW in two condition categories; moderate condition and derived native shrubland. This is due to the fact that they have been subject to varying levels of disturbance including clearing and weed invasion. The exotic weed species African Olive is a particular problem throughout the site.

1.2 Previous ecological assessments - summary

The previous ecological impact assessment (Ambecol 2014) submitted as part of the approved DA identified and mapped areas of remnant vegetation at the Site as CPW. The vegetation at the Site was identified as *Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest,* a Critically Endangered Ecological Community (CEEC) as listed under the Commonwealth *Environment* EPBC Act and also the CEEC *Cumberland Plain Woodland in the Sydney Basin Bioregion* as listed under the former NSW *Threatened Species Conservation Act 1995* (TSC Act) and current BC Act.

The previous flora and fauna assessment (Ambecol 2014) assessed the impacts to a total of 4.8 hectares of CPW at the Site. This included the removal of 2.5 hectares of CPW and the retention/modification of 2.3 hectares within a dedicated reserve and other open space areas. An assessment of the significance of this impact was undertaken according to relevant NSW legislation (7-Part Test under the TSC Act). Ambecol (2014) concluded that the proposed development was unlikely to significantly impact on the status of CPW or its habitats. The justification for this conclusion included the retention of some areas of CPW within the Project, the removal of a relatively small proportion of CPW compared to that present across the

Cumberland Plain and Penrith LGA, and that the Site was considered to represent/contribute a negligible proportion of the total gene pool of CPW and that its removal would not impact on the genetic diversity of the local occurrences of the community. No other State or Commonwealth threatened biodiversity were considered likely to be significantly impacted by the Project.

An assessment of the significance of impacts to CPW according to the Commonwealth impact assessment guidelines (DoE 2013) was not undertaken by Ambecol (2014). Similarly a Referral to the Commonwealth Minister for the Environment for consideration of impacts to CPW was not made.

Lendlease recently engaged Eco Logical Australia to undertake a Due Diligence Biodiversity and Bushfire Assessment of the Site (Eco Logical Australia 2018). Native vegetation at the Site was mapped as Cumberland Plain Woodland; Plant Community Type (PCT) 849; *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion*. It was present in two condition categories: moderate condition and derived native shrubland. The vegetation in moderate condition was determined to constitute the CEEC as listed under the EBPC Act.

A description of the flora and fauna of the Project area is provided below.

1.2.1 Vegetation

A detailed Flora and Fauna assessment of the Project area has been previously undertaken (Ambecol 2014). A floristic assessment of the vegetation at the site was undertaken by Eco Logical Australia (2018) and also Niche (this assessment) more recently to verify vegetation communities present on the site. Eco Logical (2018) conducted floristic assessment of the site following the NSW Biodiversity Assessment Method (BAM). The current assessment conducted floristic assessment of the vegetation communities at the site through collection of BioBanking and also BAM data (see section 2 for details).

The majority of the site has been historically cleared of vegetation and consists of open grassland dominated by exotic species. A few patches of remnant and re-growth native vegetation, Cumberland Plain Woodland (CPW), occur across the site. The CPW at the site occurs in a number of distinct, loosely connected patches running from the north-west and through the central and southern portion of the site. The patches are surrounded in the south, east and west by cleared exotic grassland. The CPW in the north-west of the site is continuous with CPW habitat (8.7 hectares) adjacent to the site. This patch of CPW is located on land owned by the University of Western Sydney. The CPW in the north-west of the site and that which is continuous with it to the west of the site is located within land zoned as E2 Environmental Conservation.

The site supports 6.6 hectares of CPW. The CPW at the site is present in two condition categories: moderate condition (5.9 hectares) and derived native shrubland form (0.69 hectares) (Eco Logical 2018 and current assessment). As described by Eco Logical (2018), the community in moderate condition contains a canopy of *Eucalyptus tereticornis* (Red Gum) and *Eucalyptus moluccana* (Grey Box). The mid-storey includes *Bursaria spinosa* (Native Blackthorn), *Melaleuca styphelioides* and *Leucopogon juniperinus* (Prickly Beard-heath). The groundlayer was generally low in diversity but was dominated by native grasses and a few forbs including, *Aristida vagans, Microlaena stipoides* var. *stipoides*, *Dichondra repens, Rytidosperma* sp., *Themeda triandra*, *Dillwynia sieberi* and *Lomandra filiformis*. Patches in moderate condition also contain

exotic species such as *Olea europaea* subsp. *cuspidata* (African Olive), *Eragrostis curvula* (African Lovegrass), *Sida rhombifolia* (Paddy's Lucerne) and *Lycium ferocissimum* (African Boxthorn).

The community in the derived native shrubland condition is in a highly modified state. It does not have any canopy species at all. Where shrubs were present, they contained only a low cover of those species typical of the community. Shrubs in these patches included *Acacia elongata, Bursaria spinosa* and *Dillwynia sieberi*. Ground cover species were a mix of native and exotics including *Aristida vagans, Themeda triandra, Centella asiatica, Eragrostis curvula* and *Ehrharta erecta*.

The vegetation at the site aligns to the Plant Community Type (PCT), as defined by the NSW BioNet Vegetation Classification System: *Cumberland Plain Woodland – PCT 849; Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion.*

All of the CPW at the site meets the condition thresholds for identification as the CEEC under the NSW *Biodiversity Conservation Act 2016* (BC Act) (Ambecol 2014 and current assessment). The majority of the CPW at the site (5.9 hectares) meets the identification guidelines provided in DoE (2010) Cumberland Plain Shale Woodlands and Shale- Gravel Transition Forest Policy Statement in relation to quality and condition, due to the following: native trees occupy greater than 10% cover; the patch is greater than 0.5 hectares; and of the perennial groundcover present, >30% is made up of native species. As such, the site supports 5.9 hectares of the CEEC Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest as listed under the EPBC Act. The small patches of vegetation in the central portion of the site that were dominated by *Acacia elongata* and *Bursaria spinosa* (the derived native shrubland form)(see attached Figure 2) do not meet the EPBC listing criteria as the native trees do not occupy greater than 10% cover (see section 2).

1.2.2 Flora

Ambecol (2014) undertook 12 floristic plots at the site; eight within patches of native vegetation and four within open grassland. They recorded a total of 52 species of plants across the site; 44 percent of which were native, the remainder being exotic, cosmopolitan or naturalised species. In the current assessment, Niche recently conducted five floristic plots within areas of native vegetation at the Site; a total of 59 plant species were recorded of which about 70 per cent were native.

Four threatened flora species listed under the EPBC Act and/or BC Act were identified in database searches as having the potential to occur (Ambecol 2014): *Marsdenia viridiflora* ssp. *viridiflora* in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool & Penrith LGAs; *Eucalyptus benthamii*; *Grevillea juniperina* var. *juniperina* and *Pimelea spicata*. Of these, only *Pimelea spicata* and *Eucalyptus benthamii* are listed as MNES under the EPBC Act. None of these species or populations were detected or considered likely to occur on the site (Ambecol 2014).

Further targeted survey for five threatened flora species listed under the EPBC Act were also conducted (Niche 2020c). Species included:

- Spiked Rice-flower (*Pimelea spicata*) - Critically Endangered
- *Allocasuarina glareicola* - Endangered
- Downy Wattle (Acacia pubescens) - Vulnerable
- *Micromyrtus minutifolia* - Vulnerable

- Pultenaea parviflora – Vulnerable.

A desktop assessment (including an assessment of the likelihood of occurrence) and targeted searches at the site were undertaken (Niche 2020c).

Targeted searches of the site were carried out by two ecologists on 2 March 2020. Searches were conducted along parallel transects (10 m apart) within all areas of remnant CPW at the site.

None of the five threatened species listed above were recorded at the site.

Note, *Pimelea spicata* is relatively conspicuous and may be detected and identified at any time of the year. However, in order to maximise the likelihood of detection of the species, surveys were timed to occur during the most likely flowering period. *Pimelea spicata* may flower at any time of the year, however, it is most likely to flower during the summer months, likely associated with rainfall (NSW Office of the Environment and Heritage Threatened Species Database, Spiked Rice-flower Profile https://www.environment.nsw.gov.au/ThreatenedSpeciesApp/profile.aspx?id=10632). Surveys were conducted approximately three weeks after heavy rainfall within the Sydney catchment (total of 261.6 millimetres over seven days, recorded at Shayne's Park, South Creek Road (Station 067081), located approximately 4.5 kilometres from the site, Australian Government Bureau of Meteorology 2020); maximising the likelihood of flowering and detection of the species. The remaining four flora species are relatively conspicuous (one tree and three shrubs), so that whilst they may not have been flowering during the survey, it is considered that they would have been be detected on site if present.

Given the species have not been recorded at the site during past and present surveys, undertaken over numerous years and seasons, it is considered that Spiked Rice-flower, *Allocasuarina glareicola,* Downy Wattle, *Micromyrtus minutifolia,* and *Pultenaea parviflora* are not present and would not be impacted by the Project.

1.2.3 Fauna

Fauna surveys undertaken at the site as part of the Flora and Fauna Assessment (Ambecol 2014) included diurnal surveys for birds, reptiles and amphibians as well as nocturnal surveys for microbats, mammals, birds and frogs using songmetres and Anabats to record fauna calls. Assessment of fauna habitat at the site was also undertaken. The results are summarised below.

The treed areas of the site offer the greatest value as habitat for native terrestrial fauna. The tree canopy has the potential of producing nectar and/or fruits for nectarivorous and frugivorous birds and bats, and arboreal mammals. The tree canopy also provides potential nesting sites for common native birds such as Honeyeaters, Pied Currawongs (*Strepera graculina*) and Australian Magpies (*Cracticus tibicen*). There are no tree hollows on the site that are large enough for use as roosting and breeding habitat and shelter by microchiropteran bats, hollow dependent birds (e.g. owls, cockatoos and parrots) or arboreal mammals (e.g. possums and gliders), lizards and frogs.

The cleared and open grass areas of the site provide potential foraging habitat for common ground-foraging bird species, such as Masked Lapwings (*Vanellus miles*), Sulphur-crested Cockatoos (*Cacatua galerita*), Galahs (*Eolophus roseicapilla*), Crested Pigeons (*Ocyphaps lophotes*), Magpie-larks (*Grallina cyanoleuca*), Australian Magpies and Australian Pipits (*Anthus novaeseelandiae*).

As a result of the extremely modified nature of the site and its relatively small size it has limited value as habitat for native fauna. Fourteen (14) fauna species (three reptile species, eight bird species and three mammal species) were recorded on the site on 2-3 December 2013. All of these species are woodland and urban-generalists and are very common and widespread throughout the locality and Sydney Basin Bioregion. Two of these species, the Spotted Turtle-Dove and Domestic Cat, are introduced species. No threatened fauna species were recorded on the site.

A total of 20 threatened fauna species were identified in database searches as having the potential to occur. Of these, 13 species were identified as having potential marginal habitat on the site. These included the Gang-gang Cockatoo (*Callocephalum fimbriatum*), Swift Parrot (*Lathamus discolor*), Varied Sittella (*Dapheonositta chrysoptera*), Scarlet Robin (Petroica boodang), Regent Honeyeater (*Anthochaera phrygia*), Diamond Firetail (*Stagonopleura guttata*), Grey-headed Flying-fox (Pteropus poliocephalus), Eastern Freetail-bat (*Mormopterus norfolkensis*), Large-eared Pied Bat (*Chalinolobus dwyeri*), Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Large-eared Mouse-eared Bat (*Myotis macropus*), Greater Broadnosed Bat (*Scoteanax ruepellii*) and the Cumberland Land Snail (*Meridolum corneovirens*).

An assessment of the significance of potential impacts of the proposal under the former NSW TSC Act (7 Part Tests) on these 13 species was undertaken. The assessment concluded that the proposed development would not significantly impact on the status of NSW threatened fauna or their habitats. Therefore, Species Impact Statements were not required for threatened fauna.

Commonwealth listed species - Matters of National Environmental Significance (MNES)

Of the fauna species with the potential to occur, four are listed as MNES: *Litoria aurea* (Green and Golden Bell Frog), *Lathamus discolor* (Swift Parrot), *Anthochaera Phrygia* (Regent Honeyeater), *Pteropus poliocephalus* (Grey- headed Flying-Fox).

There was no suitable habitat for the Green and Golden Bell Frog and thus it was considered highly unlikely to occur at the site or be impacted by the development.

One nationally vulnerable fauna species, the Grey-headed Flying-fox was considered to have the potential to use the treed areas of the site for foraging or roosting. Ambecol (2014) considered impacts to this species according to the following: under the EPBC Act, a nationally vulnerable species is significantly impacted on if a proposal is likely to:

- lead to a long-term decrease in the size of an important population of a species; or
- reduce the area of occupancy of an important population; or
- fragment an existing important population into two or more populations; or
- adversely affect habitat critical to the survival of a species; or
- disrupt the breeding cycle of an important population; or
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; or
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat; or
- interfere substantially with the recovery of a species.

There were no Grey-headed Flying-fox roosts on the site or in neighbouring properties. In the Sydney area, the favoured food trees of Grey-headed Flying-foxes include Swamp Mahogany (*Eucalytpus robusta*) and Old Man Banksia (*Banksia serrata*), but they will also eat the pollen and nectar of other species of Eucalyptus, Angophora and Corymbia. No favoured food trees will be removed from the site as part of the proposed development. Therefore, the proposed development was considered unlikely to impact on the local or national status of the Grey-headed Flying-fox or its habitats (Ambecol 2014).

Two nationally endangered fauna species, the Swift Parrot and Regent Honeyeater, were considered to potentially use the treed areas of the site for foraging or roosting. Ambecol (2014) considered impacts to this species according to the following: under the EPBC Act, a nationally endangered species is significantly impacted on if a proposal is likely to:

- lead to a long-term decrease in the size of a population; or
- reduce the area of occupancy of a species; or
- fragment an existing population into two or more populations; or
- adversely affect habitat critical to the survival of a species; or
- disrupt the breeding cycle of a population; or
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; or
- result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat; or
- interfere substantially with the recovery of a species.

Swift Parrots and Regent Honeyeaters were considered likely, at best, to be very occasional vagrants to the site and adjacent areas. It was considered that the removal of trees from the site would not limit resources available to Swift Parrots or Regent Honeyeaters. Therefore, it was considered that the proposed development would not negatively impact on the national status of these species, or their habitats.

Consideration of the potential presence of the Painted Honeyeater *(Grantiella picta),* which was not considered in the original Flora and Fauna Assessment (Ambecol 2014) has also been undertaken (Niche 2020c) It included a likelihood of occurrence assessment and an assessment of habitat at the site.

The Painted Honeyeater was not recorded at the site during previous bird surveys (Ambecol 2014) or the current survey at the site (Niche 2020c) The Niche (2020c) site inspection involved searches for potential foraging resources, Mistletoe, namely *Amyema* species, at the site. *Amyema pendula* was observed throughout the site within almost every mature Eucalypt tree present.

As described in the Threatened Species Profile for the Species (OEH 2020), the Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. The site does not occur within the key known breeding areas for the species and thus is unlikely to use the site for breeding purposes. However, it may use the site sporadically for foraging. Given its nomadic nature and the presence of potential food resources at the site, a conservative approach was taken towards its assessment and it was considered to have a moderate likelihood of occurrence. As such, an assessment of the significance of potential impacts to this species (as per the *Significant Impact Guidelines 1.1 – Matters of National*

Environmental Significance, Australian Government, Department of the Environment 2013) was undertaken.

The outcome of the assessment indicated that the Project was unlikely to have a significant impact on the Painted Honeyeater for the following reasons:

- Lack of records of the species at the site or in close proximity to the site. There are no records for the Species at the site, or within 10 kilometres of the site. There are only four records within 30 km of the site, and these are more than 15 years old.
- The site does not occur within the key known breeding areas for the species and thus it is considered unlikely to use the site for breeding purposes.
- The relatively small, isolated patch of potential habitat at the site was considered unlikely to be critical to the survival of the species; especially as it occurs outside of its key areas of occupation.
- The Project will result in the removal of a relatively small (4.32 hectare) patch of potential foraging habitat only.
- About 1.55 hectares of remnant vegetation at the site (supporting canopy trees with Mistletoe present) will be retained and managed for its long-term conservation value.

Nationally Listed Migratory Species

Tree canopies on the site were considered to provide potential marginal foraging habitat for listed migratory species: Black-faced Monarch (*Monarcha melanopsis*), Satin Flycatcher (*Myiagra cyanoleuca*), Rufous Fantail (*Rhipidura rufifrons*), Swift Parrot (*Lathamus discolor*) and Regent Honeyeater (*Anthochaera phrygia*) (Ambecol 2014). However, these species were considered, at most, very occasional vagrants to the locality and that areas of potential habitat on the site would represent negligible amounts of habitat available to them. Therefore, it was considered that the proposed development would not significantly impact on the status of these species or their habitats.

Fork-tailed Swifts and White-throated Needletails may occasionally fly high over the site. It was considered that these latter species would not be impacted by the proposed development (Ambecol 2014).

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2. Current assessment

2.1 Vegetation validation

Niche undertook a vegetation assessment on 17 June 2019 to validate the vegetation occurring at the Site. This included a random meander throughout the Site and also targeted collection of floristic data within five plots across the Site. Floristic plot data was collected as per the Biodiversity Assessment Method (BAM) and BioBanking methodology (BBAM) to ensure the data would cover any potential further assessment requirements under NSW biodiversity legislation. The summarised floristic field data is provided in Appendix 1. Figure 1 shows validated vegetation mapping at the Site.

Our results concur with those of the previous assessments that the remnant native vegetation at the Site constitutes Cumberland Plain Woodland (PCT 849) in two condition states: a relatively intact community in moderate condition and a derived native shrubland form of the community. The vegetation patches in moderate condition met the EPBC listing criteria for the CEEC, as specified in the identification guidelines provided in DoE (2010) *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest Policy Statement*, due to the following:

1. Native trees occupy greater than 10% cover – as evident in plot data collected (Appendix 1).
2. The patch is greater than 0.5 hectares in size.
3. Of the perennial groundcover present, >30% is made up of native species – as evident in plot data collected (Appendix 1).

The smaller patches of vegetation in the central portion of the Site that are dominated by *Acacia elongata* and *Bursaria spinosa* (Figure 1) do not meet the EPBC listing criteria for the CEEC as the native trees do not occupy greater than 10% cover (see Appendix 1).

All CPW at the Site constitutes the CEEC under the BC Act as described in the NSW Threatened Species Scientific Committee Final Determination: Cumberland Plain Woodland in the Sydney Basin Bioregion Critically Endangered Ecological Community Listing (OEH 2010).

2.2 Impact assessment

A total of 6.6 hectares of CPW occurs across the Site. Figure 1 shows the area of each condition type at the Site and proposed development footprint. Table 1 details the area of CPW to be removed/retained at the Site.

The CPW at the Site occurs in a number of distinct, loosely connected patches running from the north-west and through the central and southern portion of the Site. The patches are surrounded in the south, east and west by cleared exotic grassland. The CPW in the north-west of the Site (within the designated reserve) is continuous with a linear patch of CPW habitat adjacent to the Site (OEH 2015, Figure 1) on land under the ownership and control of the University of Western Sydney, approximately 8.7 hectares in size. 7.5 hectares of this contiguous patch of CPW is zoned E2 Environmental Conservation; the tenure and security of the other 1.2 hectares (which appear as scattered patches of trees) on the southern side of the E2 zone is unknown. The CPW within the Site and continuous with the habitat to the west of the Site (about 15.3 hectares in total) is considered the local occurrence of CPW. As such, the Site supports about 43 per cent of the local occurrence of the community. Of the 6.6 hectares of BC Act listed CPW at the Site, approximately 0.7 hectares of the CPW is to be retained, managed and rehabilitated within a protected 1.2 hectare

reserve in the north of the Site (Figure 1). This area constitutes land zoned as E2 Environmental Protection (PCC 2014).

In addition to the 1.2 hectare reserve mentioned above, the Project includes a 1.8 hectare designated open space area in the central-northern portion of the Site. This area is zoned RE1 Public Recreation (PCC 2014). Approximately 1.1 hectares of CPW occurs in this area. In line with the aims and objectives of the DCP "*To conserve the biodiversity of the site by incorporating woodland areas into the open space system and protecting riparian corridors*" (PCC 2014), and also the principle of avoiding impacts to biodiversity, this area has been designed to maximise the area of CPW retained in this space, while minimising the potential for indirect impacts (i.e. fencing off areas of CPW, allowing passive use such as walking and bike riding along established paths only; signage educating the community about the value of the woodland, weed management and control and restoration planting where possible). This space includes a water detention basin (dry most of the time, but subject to short-term periods (about half a day) of inundation after rain), walking paths and some children's play areas. Approximately 0.2 hectares of CPW will be removed in this area and approximately 0.9 hectares of CPW in this area will be retained.

Two Asset Protection Zones (APZs) are also located along the eastern edges of the RE1 zone (5.5 metres wide) and the E2 Conservation zone (7 metres wide) where these areas interface with residential lots. These areas may be subject to vegetation removal in line with the requirement of Planning for Bushfire Protection (PBP 2019). This vegetation removal would likely be restricted to a few individual trees and/or regular slashing/mowing of the understorey. The potential removal/management of vegetation within the APZs is considered unlikely to substantially impact the extent and/or integrity of the community as the impacts would be limited and there would be no disturbance to the soil and/or soil seed bank.

A Vegetation Management Plan (Niche 2020a) has been developed to provide for the protection, conservation, management and rehabilitation/revegetation of retained CPW in the E2 conservation area and the RE1 recreation area. A Construction Environment Management Plan (CEMP) (Niche 2020b) has also been developed to ensure impacts to retained areas of CPW are avoided, mitigated and managed wherever possible. It also provides measures to minimise impacts to native flora and fauna at the site in general. Summary details of the VMP and CEMP are provided below.

2.2.1 Vegetation Management Plan

The overall goal of the VMP is to provide details of the works and management actions required to maintain or improve the biodiversity values of the site over a maintenance period of two (2) years.

As stated in the VMP, disturbance is currently a significant issue on the site. The main disturbances are past land use including agriculture (i.e. farming), clearing of native vegetation, fragmentation, encroachment of weeds and degradation of the quality of remaining native vegetation remnants, unauthorised vehicle access and illegal dumping. The main areas affected by this disturbance are the boundaries adjacent to public roads, where tracks and rubbish have impacted on the vegetation condition. However, the overstorey vegetation is still present and showing good signs of regeneration. These areas would naturally regenerate following the removal of rubbish, strategic revegetation and prevention of unauthorised access.

The objectives of the VMP are:

- Establish the E2 Conservation Reserve and open space recreation area prior to the end of the maintenance period
- Restoration of Critically Endangered Remnant Community (CPW) vegetation
- Re-instate/maintain natural ecosystem functioning
- Rehabilitate any area of land disturbed by clearing or weed removal, using current bushland regeneration and vegetation management techniques, which compliments the existing vegetation on adjoining sites and wildlife habitat/corridors
- Improve habitat for native fauna including threatened species
- Implement a monitoring and review process
- Liaise with relevant local and state bodies
- Provide an educational resource for the local community.

The VMP has been prepared in accordance with National Standards For The Practice Of Ecological Restoration In Australia (second edition) by the Society for Ecological Restoration Australasia (SERA 2019). The Standards are applicable to any Australian ecosystem (whether terrestrial or aquatic) and any sector (whether private or public, mandatory or non-mandatory). They can be used by any person or organisation to help develop plans, contracts, consent conditions and closure criteria.

The VMP includes provisions to fence the E2 Conservation Zone to prohibit human and vehicular access. Similarly, it is proposed that the areas of retained CPW within the open space recreation area, as identified in Figure 3 of the VMP, would also be fenced to prohibit access by people and vehicles within the areas of CPW. Interpretive signage "*Cumberland Plain Woodland Conservation Area*" would be installed at a number of locations around both areas to inform the community about the presence and value CPW in the area.

These key measures, along with targeted and on-going weed control, revegetation works and rubbish removal as identified in the VMP, will ensure biodiversity values within the areas of retained CPW at the site will be, at the minimum maintained and at best improved.

The VMP includes tables outlining the required management actions, timing and frequency and performance indicators; a schedule, and costings for implementation.

2.2.2 Construction Environment Management Plan

The aim of the CEMP is to outline the measures to avoid and mitigate potential direct and indirect impacts on CPW in the on-site conservation areas (the E2 conservation zone and open space recreation area) as well as flora and fauna across the broader site, a result of construction activities. It includes protocols for minimising impacts to native fauna (such as pre-clearing protocols).

The CEMP includes:

- Identification of construction and conservation areas
- A description of potential environmental impacts and risks
- Approvals to be obtained prior to commencement
- Environmental management measures for each potential risk
- Environmental monitoring and corrective actions
- Environmental management roles and responsibilities
- Environmental training and induction requirements

- Environmental incident and emergency procedures
- Internal and external reporting arrangements
- Audit and review of the CEMP.

The CEMP addresses and provides mitigation/management actions for the following potential indirect impacts to retained areas of CPW from construction of the Project:

- Clearing of remnant vegetation beyond approved development footprint
- Weed dispersal and introduction throughout the Project area
- Erosion and sedimentation impacting areas of retained CPW
- Introduction of plant pathogens such as *Phytophthora cinnamomi* into the reserve areas
- Spread of litter and rubbish into reserve areas
- Construction dust inhibiting plant health and growth in reserve areas
- Increased access to/recreational use of reserve areas (post construction).

Key management actions to be implemented to mitigate/manage indirect impacts to CPW during and post-construction will be:

- Environmental inductions for all personnel working on site regarding the controls within the CEMP and value of the retained areas of CPW.
- Establishment of protection and exclusion fencing around whole VMP area (extending around the drip-line of trees located on the periphery of the conservation areas) prior to construction.
- Installation of permanent fencing to exclude people and vehicles.
- Installation of signage around the perimeter of the conservation areas identifying them as "Cumberland Plain Woodland – Conservation Area".
- Implementation of erosion and sediment control plan.
- Prior to entering and leaving the site, all vehicles and equipment involved in clearing and weed removal works must be cleaned to remove soil and plant material (Refer to Hygiene Protocol in CEMP).
- During vegetation clearing and weed removal, weed species will be stockpiled separately and disposed of at an appropriate waste disposal facility.
- An emergency spill kit to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
- Use of native species endemic to CPW within the landscape planting where possible.

The CEMP is adaptive to allow for implementation of appropriate contingency measures/corrective actions.

Impact to CPW

The Project will result in the removal of up to 5.0 hectares of BC Act listed CPW at the Site (Table 1): 0.7 hectares would be retained, protected and managed within the on-site E2 Conservation zone and 0.9 hectares would be retained, protected and managed within the 1.8 hectare RE1 recreation area.

Table 1: CPW across the Site

Status under State and Commonwealth legislation	Total CPW (ha)	To be retained in E2 reserve (ha)	To be retained in RE1 recreation area (ha)	To be removed (ha)
EPBC Act and BC Act listed CPW (moderate condition)	5.9	0.7	0.9	4.3
BC Act-only listed CPW (derived native shrubland)	0.7	0	0	0.7
Total	**6.6**	**0.7**	**0.9**	**5.0**

2.3 Assessment of Significance

Pursuant to the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* (BC Regs 2017), the Site occurs within a Western Sydney Interim Designated Area and therefore, the former planning provisions apply (former section 5A of the *Environmental Planning and Assessment Act 1979* and *Threatened Species Conservation Act 1995*). As such, a 7-Part Test was undertaken to assess the significance of the impacts associated with the Project (see section 3 for details).

Note in the BC Regs (Part 7, clause 27 (f)) it states that "*the application for development consent under Part 4 of the Environmental Planning and Assessment Act 1979 (or for the modification of such a development consent) is required to be made on or before 24 November 2019 (but only if any species impact statement that is to be submitted in connection with the application is submitted on or before 24 May 2020)".*

The assessment concluded that, assuming the CPW within the E2 Environmental Conservation zone located adjacent to the Site is adequately protected due to the intent of the ecological conservation zoning, and that areas of retained CPW within the RE1 open space area and E2 conservation zones are retained and managed for long-term conservation values, then the Project is unlikely to have a significant impact on the CEEC. In this instance, an SIS would not be required.

2.4 Recommendations

The VMP and CEMP outline measures to be implemented before, during and after construction to ensure impacts to retained areas of CPW are avoided, minimised and managed wherever possible, to allow for the long-term persistence of the community at the Site.

3. Assessment of Significance - 7 Part Test

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Cumberland Plain Woodland (CPW)	
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	n/a
b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction	n/a
c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: 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, or 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	**Extent and composition** 6.6 hectares of CPW occurs within the Site. The CPW at the Site occurs in a number of distinct, loosely connected patches running from the north-west and through the central and southern portion of the Site. The patches are surrounded in the south, east and west by cleared exotic grassland. The CPW in the north-west of the Site (within the designated reserve) is continuous with a linear patch of CPW habitat adjacent to the Site (OEH 2015, Figure 1), approximately 8.7 hectares in size. 7.5 hectares of this contiguous patch of CPW is zoned E2 Environmental Conservation; the tenure and security of the other 1.2 hectares (which appear as scattered patches of trees) on the southern side of the E2 zone is unknown. The CPW within the Site and continuous with the habitat to the west of the Site (about 15.3 hectares in total) is considered the local occurrence of CPW in this instance. As such, the Site supports about 43 per cent of the local occurrence of the community. 0.7 hectares of CPW in the designated reserve will be retained, restored and expanded within the 1.2 hectare area as per the existing VMP (Niche 2020a). 0.9 hectares of CPW which currently occurs within the proposed 1.8 hectare central open space area of the Site will be retained and managed for conservation as described in the VMP (Niche 2020a) (approximately 0.2 hectares of CPW within the space would be removed/impacted). This area has been designed with the aim of retaining as much CPW as possible; maximising the area retained and minimising the potential for indirect impacts (i.e. fencing off areas of CPW, allowing passive use such as walking and bike riding along established paths only; signage educating the community about the value of the woodland). Two Asset Protection Zones (APZs) are also located along the eastern edges of the RE1 zone (5.5 metres wide) and the E2 Conservation zone (7 metres wide) where these areas interface with residential lots. These areas may be subject to vegetation removal/management in line with the requirement of Planning for Bushfire Protection (PBP 2019). This vegetation removal would likely be restricted to a few individual trees and/or regular slashing/mowing of the understorey. The Project would result in the removal of about 5.0 hectares of the community occurring in the southern half of the Site and within the open space area. The CPW in these patches is not connected to any other areas of CPW in the east, west or south.

Cumberland Plain Woodland (CPW)	
	This represents about 32 per cent of the local occurrence of the community. The potential removal/management of vegetation within the APZs is considered unlikely to substantially impact the extent and/or integrity of the community as the impacts would be limited there would be no disturbance to the soil and/or soil seed bank. As such the Project will result in the removal/modification of approximately 32 per cent of the local occurrence of the community. **Impact avoidance/mitigation** The 0.9 hectares of CPW to be retained within the 1.8 hectare open space area, may be subject to indirect impacts such as weed incursion, human disturbance and edge effects. The VMP has been developed to manage and mitigate potential indirect impacts to CPW (such as fencing the area, rubbish removal, regular weed removal and revegetation works) to ensure the long-term survival of the community in this area. A Construction Environmental Management Plan (CEMP) (Niche 2020b) has also been developed to ensure potential direct and indirect impacts to retained areas of CPW at the Site are avoided, mitigated and managed before, during and after construction. **Assessment** The action proposed is considered unlikely to have an adverse effect on either the extent or composition of CPW such that its local occurrence is placed at risk of extinction as: • 0.7 hectares of CPW, that adjoins a larger patch of CPW adjacent to the Site (currently zoned E2 Environmental Conservation), would be conserved, managed and expanded within a 1.2 hectare reserve in the north-west of the Site. • 0.9 hectares of CPW within the 1.8 hectare open space recreation area would be retained and managed for conservation value. • Implementation of the VMP (Niche 2020a) and CEMP (2020b) will ensure CPW in these areas are protected, conserved and managed in the long-term.
d) 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, and 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 iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	**Extent of impact on habitat** The local occurrence of CPW, as determined above, is approximately 15.3 hectares. Approximately 3,223 hectares of CPW is mapped as occurring within 10 kilometres of the Site (OEH 2015). However, this is likely to be an over-estimate as review of aerial imagery in relation to this mapping clearly indicates that some areas identified as supporting CPW are cleared/have been developed (e.g. patch of CPW to the west of the Western Sydney University Werrington Campus, adjacent to the western side of the Site). Approximately 5.0 hectares of CPW would be directly impacted by the Project. This constitutes about 32 per cent of the local occurrence of the community and 0.2 per cent of that mapped within the 10 kilometres of the Site. An additional 0.9 hectares (7 per cent) (within the proposed open space area) may be subject to some indirect impacts. However, 0.7 hectares would be retained, protected and managed within the 1.2 hectare reserve in the north of the Site. Similarly, approximately 0.9 hectares of CPW would be retained, protected and managed within the 1.8 hectare open space area as per the VMP. **Habitat fragmentation**

Cumberland Plain Woodland (CPW)	
	The CPW at the Site occurs in a number of distinct, loosely connected patches running from the north-west and through the central and southern portion of the Site. The patches are surrounded in the south, east and west by cleared exotic grassland. The CPW in the north-west of the Site is continuous with CPW habitat adjacent to the Site. The CPW in the designated reserve will be retained, restored and expanded within the 1.2 hectare area as per the VMP. The Project would result in the removal of about 5.0 hectares of the community occurring in the southern half of the Site and some indirect impacts to 0.9 hectares in the central portion of the Site. The CPW in these patches is not connected to any other areas of CPW in the east, west or south. **Importance of habitat to be impacted** The Site supports a remnant 6.6 hectare patch of CPW, the majority of which (5.9 hectares) meets the condition thresholds for listing under the EPBC Act. The EPBC Act Policy Statement 3.31 (DEWHA 2010) states that "About 70 per cent of the remaining ecological community occurs in patches that are less than five hectares. The retention of small patches that meet the condition thresholds is vital to the future of this ecological community, particularly where they link other patches in the broader landscape. Additional reconnection of these patches will be important to improve the extent and function of the ecological community in the future". Similarly, patch size is one of the key diagnostic features and condition thresholds for the community; a patch size of 5 hectares or greater is considered an important threshold for designation as the community. The CPW within the Site (6.6 hectares) is connected to a slightly larger patch (approximately 8.7 hectares) to the northwest of the Site. According to the definitions above, given its size, the fact that it meets the condition thresholds for listing as the EPBC Act community, and its connectivity to CPW in the locality, the CPW at the Site may be considered vital to the future of the ecological community and is likely to be valuable to the ongoing persistence of the community in the locality. The CPW at the Site currently allows for the persistence of a relatively good quality patch of CPW within the locality. The areas supporting the better quality habitat (moderate condition) support a diversity of native flora species within the ground, mid-level and upper strata of the community. The quality of the remaining 57 per cent of the CPW in the locality that occurs outside of the Site is unknown. Based on aerial imagery it appears to have an intact canopy, with likely greater than 10% cover. The majority of this patch (7.5 hectares/86 per cent) is currently zoned E2 Environmental Conservation. As such it may be assumed to be adequately protected due to the intent of the environmental conservation zoning. While 0.9 hectares of the community in the 1.8 hectare open space area will be retained and 0.7 hectares will be protected and managed within the reserve in the north-west of the Site, these will be subject to indirect impacts (human disturbance, edge effects, weed invasion, altered hydrology) which have the potential to adversely affect the quality, integrity and longevity of the CPW in this area. However, implementation of the VMPs to manage and mitigate indirect impacts will ensure the long-term survival and viability of the community in these areas.
e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	No critical habitat, as identified on the critical habitat register, is present within the Site or would be affected by the Project.

Cumberland Plain Woodland (CPW)	
f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan	The four key objectives of The Cumberland Plain Recovery Plan (DECCW 2011) and how the Project aligns with those are described below: • *To build a protected area network, comprising public and private lands, focused on the priority conservation lands.* The Project will conserve and manage 0.7 hectares of CPW within a 1.2 hectare reserve that is contiguous with CPW adjacent to the Site. An additional 0.9 hectares of CPW would be retained within an open space recreation area. • *To deliver best practice management for threatened species, populations and ecological communities across the Cumberland Plain, with a specific focus on the priority conservation lands and public lands where the primary management objectives are compatible with conservation*. The Site is not mapped as priority conservation land or public land. The CPW to be retained and restored at the Site within the 1.2 hectare reserve and also the 1.8 hectare open space area will be managed in accordance with the VMP developed for the site (Niche 2020a). • *To develop an understanding and enhanced awareness in the community of the Cumberland Plain's threatened biodiversity, the best practice standards for its management, and the recovery program.* Signage educating the community about the value of the woodland would be installed within the retained reserve and open space areas. • *To increase knowledge of the threats to the survival of the Cumberland Plain's threatened species, populations and ecological communities, and thereby improve capacity to manage these in a strategic and effective manner.* The Project will increase knowledge regarding threats to CPW through installation of signage regarding the value of the community at the Site. The Project satisfies three of the four objectives of the CPW Recovery Plan.

Cumberland Plain Woodland (CPW)	
g) Whether the action proposed constitutes or is part of a Key Threatening Process (KTP) or is likely to result in the operation of, or increase the impact of, a KTP	The Project has the potential to increase the impact of the following KTPs listed in NSW: • Clearing of native vegetation - Approximately 5.0 hectares of habitat would be directly impacted by the Project; a further 0.9 hectares may be indirectly impacted by the Project in the central open space area. • Loss of hollow-bearing trees • Loss of dead wood and dead trees • Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands – The Project would impact on surface flows over the Site. A water detention basin is proposed within the central open space area which will support remnant CPW. The basin will be dry most of the time, but subject to short-term periods (about half a day) of inundation after rain • Invasion of native plant communities by exotic perennial grasses – two of the exotic grasses mentioned in the KTP were recorded at the Site: *Eragrostis curvula* and *Nasella trichotoma.* These species are evident throughout the Site invading areas of CPW. The Project is not likely to exacerbate the occurrence of these grasses as they are already prevalent in the area, provided weed management is undertaken during clearing and post construction in accordance with the VMP and Construction Environmental Management Plan (CEMP) (Niche 2020b), to minimise introduction and spread of weed species. • Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata.* African Olive is a weed problem at the Site and is currently impacted on areas of habitat for CPW. The Project is not likely to exacerbate the African Olive invasion provided weed management is undertaken in accordance with the VMP and CEMP and weed management practices and erosion/sedimentation control measures (as detailed above) are implemented during construction as per the CEMP. • Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants – Escaped or dumped garden plants from nearby residences may impact on retained CPW at the Site. Management of these areas according to the VMP will include regular monitoring and management of weeds in these areas.
Conclusion	The local occurrence of CPW is considered unlikely to be significantly impacted by the Project due to the following: • 54 per cent of the local occurrence of the community (7.5 hectares off-site and 0.7 hectares on-site) occurs within the E2 Environmental Conservation Zone which should ensure the long-term protection and survival of the local occurrence of the community. • The retention, management and restoration of 1.6 hectares of CPW within the E2 Conservation zone and RE1 open space areas on the Site will ensure the long-term survival of this important patch of CPW in the locality.

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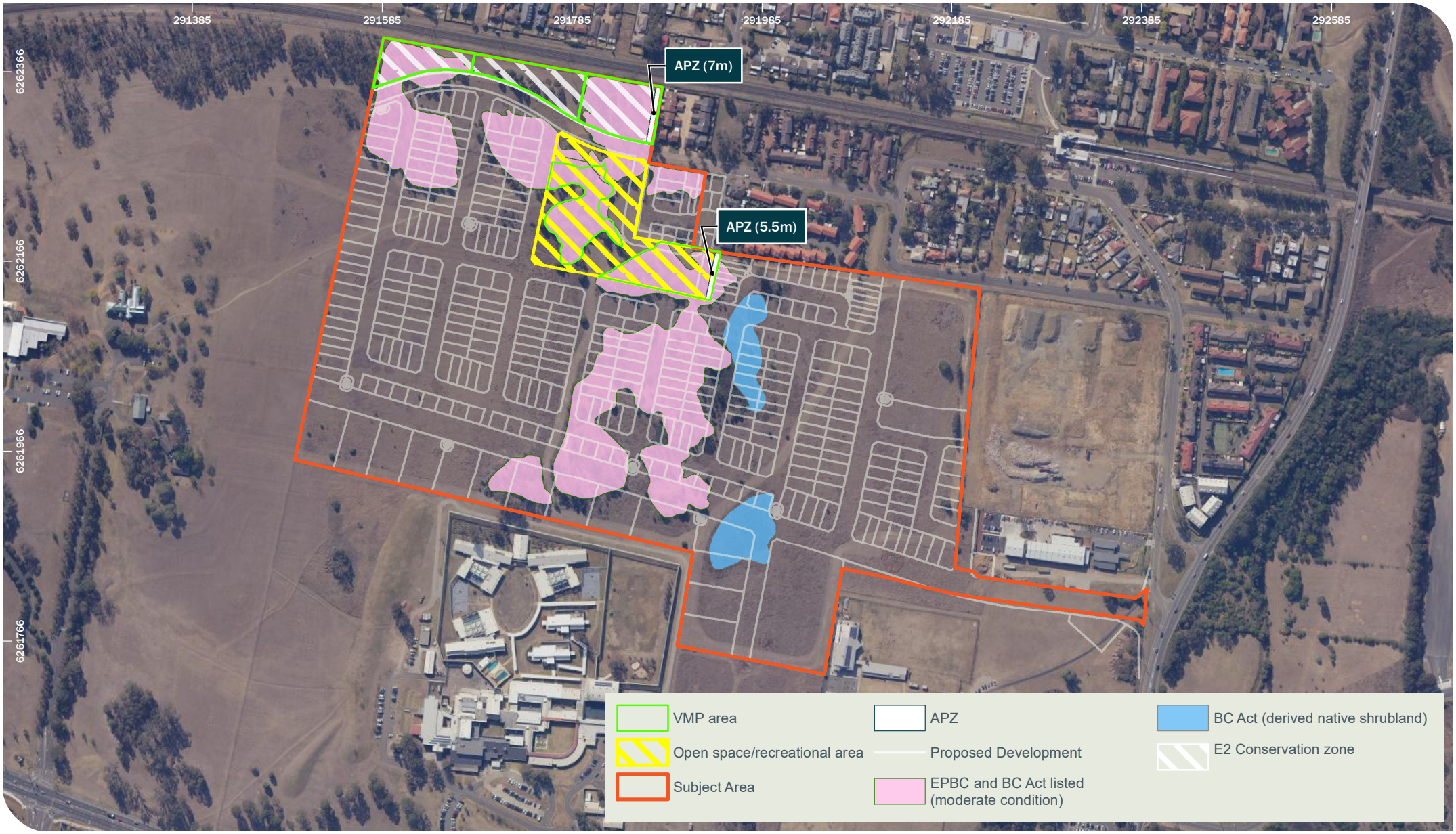
Figures



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GDA 1994 MGA Zone 56

Niche PM: Amanda Griffith
Niche Proj. #: 5111
Client: Lend Lease

BC Act listed Cumberland Plain Woodland at the Site
Lot 1 DP1226122 Werrington

Figure 1

Species per cent cover

Species	Plot number				
	5111lb01	5111lb02	5111lb03	5111lb04	5111lb05
Acacia elongata					15
Andropogon virginicus		2			
Araujia sericifera		0.5	1	2	
Araujia sericiflora	0.1				
Aristida ramosa	25	20	50	25	50
Aristida vagans	5		5		20
Aristida warburgii			10		
Asparagus aethiopicus		2			
Asparagus asparagoides	0.1				
Asperula conferta		0.5	2		
Axonopus fissifolius					15
Bidens pilosa	0.5		1	2	
Brunonia australis	1		0.5	0.5	
Bursaria spinosa	30	10	35		5
Centella asiatica			1		
Cheilanthes distans	0.5				0.5
Cheilanthes sieberi		0.5			
Cymbopogon refractus			5		
Cynodon dactylon			5		
Cyperus gracilis		0.5			
Cyperus imbecillis			5		
Dianella caerulea	0.5	1	1		
Dichelachne micrantha	10	10	10	5	
Dichondra repens	0.5	1	2	1	
Ehrharta erecta	5				
Einadia nutans				0.5	
Entolasia stricta		5	2		
Eragrostis brownii			1		1
Eragrostis curvula	10	5	5	15	
Eremophila debilis		0.1			
Eucalyptus moluccana	10	10		25	
Glycine tabacina	0.5	0.5		0.5	
Goodenia bellidifolia					0.5
Hakea sericea					10
Hypochaeris radicata					1

Species	Plot number				
	5111lb01	5111lb02	5111lb03	5111lb04	5111lb05
Juncus usitatus			0.1		
Kunzea ambigua					1
Ligustrum sinense		1		1	
Lomandra filiformis		0.5			
Melaleuca styphelioides	10		5	10	
Microlaena stipoides	10	5	5		
Nassella trichotoma			1		
Olea europaea		1			
Olea europaea subsp. africana	0.1				
Oxalis perennans	0.5	0.5	1	0.5	0.5
Paspalum dilatatum	5	5	25	5	5
Persicaria decipiens			2		
Plantago debilis				1	
Plantago lanceolata		2	1	1	
Pseuderanthemum variabile	0.1				
Pultenaea spp.					1
Rhytidosporum spp.	5	5	15	5	
Senecio madagascariensis		1	1	2	
Setaria gracilis	5	10	10	10	25
Sida rhombifolia	0.5	1			
Sporobolus creber			5	10	5
Thelymitra cyanea		0.2			
Themeda triandra	0.1	2			
Verbena bonariensis			1		
Wahlenbergia gracilis		0.5	1	0.5	

BioBanking floristic data

plot_name	nps	nos	nms	ngcg	ngcs	ngco	epc	nth	or	fl
5111lb01	17	5	15	66	4	12	20	1	1	9.5
5111lb02	19	15	10	60	2	6	10	0	1	10.5
5111lb03	25	0	20	40	2	4	60	0	1	2
5111lb04	12	3	10	28	2	6	30	0	1	16
5111lb05	12	0	1	56	10	2	16	0	1	0

Nps = native plant species richness; nos = native over-storey; nms = native mid-storey; ngcg = native ground cover grasses; ngcs = native ground cover shrubs; ngco = native ground cover other; epc = exotic plant cover; nth = no. trees with hollows; or = over-storey regeneration; fl = length of logs.