26 June 2014

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ECOLOGICAL ASSESSMENT OF DUNHEVED PRECINCT HAUL ROAD EXTENSION WITHIN THE ST MARYS PROPERTY

Dear Glyn,

The purpose of this letter is to present the findings of the ecological assessment conducted by Cumberland Ecology to support Lend Lease's current Development Application (DA) for the proposed temporary haul road within the St Marys Property (SMP).

As you are aware, the proposed haul road will connect Links Road with the existing private east-west road (the East-West Road) between the Central Precinct and Ropes Crossing via the Dunheved Precinct.

An ecological assessment for the construction of the road within the Dunheved Precinct is not required as Cumberland Ecology previously prepared the Flora and Fauna Assessment for the Dunheved Precinct Environmental Impact Statement (EIS). The Dunheved Precinct was approved for development by Blacktown and Penrith Councils.

However the area for the proposed extent of the haul road between the northern boundary of the Dunheved Precinct and the East-West Road (hereafter referred to as the subject site) has not been previously assessed under any existing Ecological Assessments within the SMP and so warrants an ecological survey to support the DA.

Cumberland Ecology has now completed the requisite field inspection of the subject site. Our methods, results and conclusions have been explained in detail and are provided in **Appendix A** to this letter. A complete list of recorded flora species recorded within the subject site is provided in **Appendix B** and an Assessment of Significance is provided in **Appendix C**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact me on (02) 9868 1933.

Yours sincerely

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Appendix A

Ecological Assessment of Proposed Haul Road extension between Dunheved Precinct and existing east-west road in the St Marys Property

A.1 Introduction

Lend Lease is seeking development consent for the construction of a private temporary haul road (the haul road) that will traverse the Dunheved Precinct and extend from the north-eastern boundary of the Dunheved Precinct to connect with the existing east-west private road (the East-West Road) between the Central Precinct and Ropes Creek Precinct (now the suburb of Ropes Crossing). The purpose of the proposed haul road is to enable importation of fill material to the Central Precinct to facilitate the future construction of residential and employment lands within the Central Precinct.

A.2 Background

Cumberland Ecology has been engaged by Lend Lease to conduct an ecological assessment to support the Development Application (DA) for the construction of the haul road within the St. Marys Property (SMP).

The SMP was endorsed by the NSW Government for inclusion on the Urban Development Program (UDP) in 1993. As the SMP straddles the boundary between two local government areas (Blacktown and Penrith) the NSW Government decided that a regional environmental plan should be prepared for the site and the Regional Environmental Plan for St Marys (SREP 30) was gazetted in January, 2001. Under SREP 30 development areas are referred to as "precincts" and the SMP is subdivided into Eastern Precinct, Ropes Creek Precinct, Central Precinct, Western Precinct, Dunheved Precinct and Regional Park, Regional Open Space, Drainage Land and Roads (**Figure 1**).

Cumberland Ecology has been involved in the development process of the SMP since 2004 and has previously conducted a Flora and Fauna Assessment of the Dunheved Precinct as part of the Environmental Impact Statement (EIS) submitted for the Dunheved Precinct. As development approval has been granted for this precinct by both Blacktown and Penrith Councils, no further ecological assessments in relation to the current proposal are required for the areas within the Dunheved Precinct boundary.

However the proposed haul road extends beyond the north-western boundary of the Dunheved Precinct before connecting with the existing East-West Road (**Figure 2**). This area (hereafter referred to as the subject site) has not been previously assessed under any existing Ecological Assessments within the SMP.

The subject site occurs close to South Creek and is bordered by the Regional Park. The vegetation within the adjacent areas of the Regional Park is mapped as Alluvial Woodland which consists of a mosaic of two vegetation communities River-flat Eucalypt Forest (RFEF) and Swamp Oak Floodplain Forest (SOFF). Both RFEF and SOFF are listed as Endangered Ecological Communities (EECs) under the NSW *Threatened Species Conservation Act 1995* (TSC Act). Therefore an ecological assessment of the potential impacts to EECs and threatened species and vegetation communities from the development of the subject site is warranted.

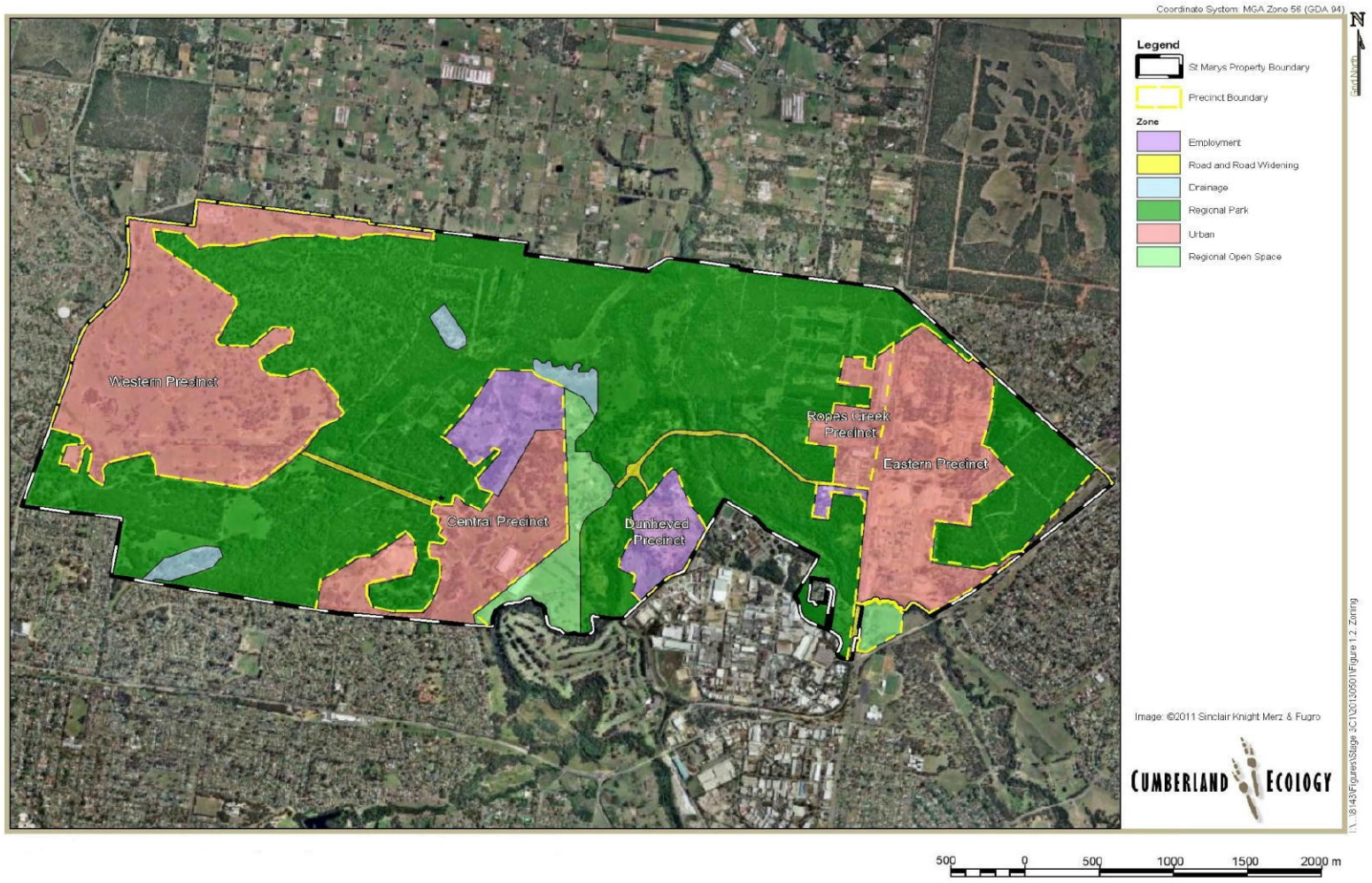

Figure 1 Zoning of the St Marys Property (SREP 30 Amendment 2)

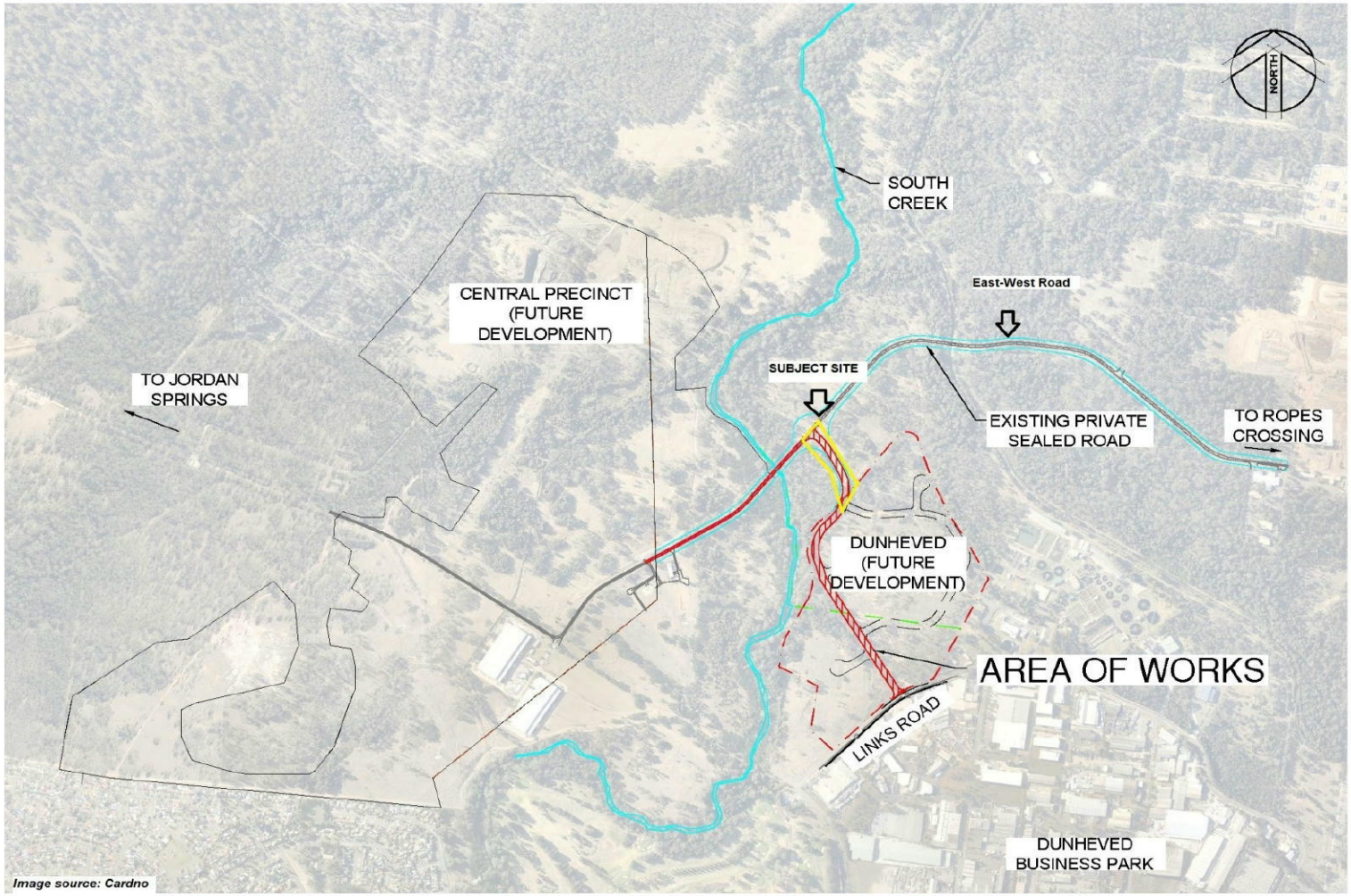

Figure 2 Location of Subject Site (yellow highlight)

A.3 Project Description

The current proposal seeks consent for the construction of a private temporary haul road that will traverse the Dunheved Precinct and extend from the north-eastern boundary of the Dunheved Precinct to connect with the East-West Road. The purpose of the proposed haul road is to enable importation of fill material to the Central Precinct to facilitate the future construction of residential and employment lands within the Central Precinct.

The proposed development consists of a number of sections which are outlined in detail in the Statement of Environment Effects (SEE) prepared by JBA Urban. The subject site which is the focus of this ecological assessment corresponds to the area referred to as Section 3 in the SEE and is zoned as Road and road widening under SREP 30 (**Figure 1**).

The proposed development within the subject site will entail clearing of vegetation and removal of les than 10 trees from within the subject site to enable construction of the haul road.

A.4 Methods

A.4.1 Review of Existing Information

Cumberland Ecology has been involved in the development process of the SMP since 2004; the information relating to the vegetation, flora and fauna of the SMP, in particular the Dunheved and Central Precincts was reviewed to gain an appreciation of the potential flora and fauna values within the subject site.

As part of this process, vegetation mapping from previous surveys conducted by Cumberland Ecology as well as vegetation mapping for the Cumberland Plain by the Office of Environment and Heritage (OEH) (then the Department of Environment, Climate Change and Water) (DECCW 2007) was reviewed.

A.4.2 Site Survey

Field surveys were conducted by a botanist and an ecologist on 24th June 2014 to verify existing background information and to identify key ecological issues or potential threatened species occurrences on site.

i. Flora Survey

The general flora survey involved undertaking a detailed meander survey within the subject site to ground-truth the occurrence and extent of vegetation. Photographs were taken to record condition of the vegetation. All plant species encountered were recorded and notes were made regarding whether plants were indigenous, planted or exotic. Searches for threatened flora species known to occur within the SMP, in particular near the Dunheved Precinct, such as *Grevillea juniperina ssp juniperina* were incorporated into the meander surveys conducted.

All vascular plants recorded were identified using keys and nomenclature provided in Harden (1990-1993). Where known, taxonomic and nomenclatural changes have been incorporated into the results, as derived from *PlantNET* (Botanic Gardens Trust 2014).

ii. Fauna Habitat Assessment

The fauna habitat assessment within the study area included consideration of important indicators of habitat condition and complexity including the occurrence of microhabitats such as tree hollows, fallen logs, bush rock and wetland areas such as creeks and soaks. Structural features considered included the nature and extent of the understorey and ground stratum and extent of canopy. Tree hollows were used as a general indication of habitat quality for arboreal fauna, hollow dwelling birds and bats. Tree hollows observed during surveys were noted and the general vegetation condition and tree maturity was used to predict whether trees on site were likely to contain hollows. Opportunistic observations of fauna were also noted and recorded.

A.5 Results

A.5.1 Desktop Assessments

Assessment of existing vegetation mapping for the Cumberland Plain (DECCW 2007) determined that the area between the Dunheved Precinct and the East-West Road is mapped as a mosiac of Shale-Plains Woodland, Alluvial Woodland, Freshwater Wetlands and Cleared areas.

The subject site has been mapped as a Cleared area while the surrounding Regional Park areas have been mapped as Alluvial Woodland. Ground-truthing surveys by Cumberland Ecology in the Central Precinct determined that areas along South Creek mapped as Alluvial Woodland (DECCW 2007) consist of a mosaic of two vegetation communities: RFEF and SOFF. Both RFEF and SOFF are listed as EECs under the NSW *Threatened Species Conservation Act 1995* (TSC Act). However grassland areas derived from the clearing of these two communities are not listed as threatened communities under the TSC Act.

A.5.2 Vegetation of the Subject Site

Vegetation within the subject site is highly modified and shows indications of historic clearing which corresponds with the DECCW mapping for the area.

The current vegetation community within the subject site consists of grassland derived from historic clearing of woodland (also referred to generally as “derived grassland”) and now contains scattered trees. The understorey within the subject site consists of a mix of native and exotic species and is dominated by the grass *Cynodon dactylon* (Couch grass). A shrub layer is largely absent while the scattered trees within the subject site mainly occur along the boundaries of the subject site. The trees within the subject site consist of young and regenerating individuals. Mature remnant trees are absent within the subject site.

Approximately 15-20 trees occur within the subject site and consist of a mix of native and planted species. The native species consist predominantly of *Eucalyptus tereticornis* (Forest Red Gum) with occasional occurrences of *Eucalyptus amplifolia* (Cabbage Gum) and *Eucalyptus moluccana* (Grey Box), characteristic canopy species of the EEC RFEF. Planted species include *Eucalyptus microcorys* (Tallow wood) and *Corymbia gummifera* (Red Bloodwood).

The native tree species mainly occur along the fenceline separating the subject site from the Regional Park (**Photograph 1**) while planted species occur mainly along the edge of the existing East-West Road at the north-western extent of the subject site (**Photograph 2**)

Photograph 1 **Modified grassland with scattered trees within the subject site (looking south-east)**

Photograph 2 **Mix of native and planted trees along the East-West Road (looking north)**

While vegetation within subject site is dominated by non-threatened derived grassland, the small patches of scattered native trees near the Regional Park fenceline do conform to a highly fragmented, low condition version of RFEF.

The vegetation within the Regional Park areas bordering the subject site also conforms to RFEF. The quality of RFEF vegetation gradually improves within the Regional Park, grading more into open woodland (**Photograph 1**).

A.5.3 Flora

Approximately 59 plant species were recorded within the study area, including 30 native speices and 29 planted or exotic species. A complete list of species recorded in the subject site is provided in **Appendix B**. No threatened flora species known to occur within the SMP were found during surveys of the site and no species are considered likely to occur there due to lack of suitable habitat.

A.5.4 Fauna Habitat

The vegetation within the subject site has very limited habitat potential for fauna due to its modified condition and relative lack of microhabitats such as fallen logs and bush rock. There is also very limited habitat potential for tree hollow-dependent fauna as the trees present in the subject site and surrounding areas are generally too young to form hollows. The majority of trees with potential to support hollows are located within the Regional Park.

However, many of the plants, including exotics, can provide potential foraging resources for nectarivorous mammals and birds that may use the subject site from time to time as part of a larger foraging range. The creek channels and soaks in the adjacent Regional Park provide small areas of habitat for common frogs and semi-aquatic reptiles.

Some fauna species that are common in disturbed environments were recorded during the field survey. **Table 1** below lists the fauna species detected on site during surveys. None of these species are protected under threatened species legislation.

Table 1 Fauna species recorded on subject site during surveys

Class	Common Name	Scientific Name	Recording Method
Amphibia	Common Eastern Froglet	*Crinia signifera*	Vocalisations
Aves	Magpie-lark	*Grallina cyanoleuca*	Visual Observation
Aves	Noisy Miner	*Manorina melanocephala*	Vocalisations/Visual Observation
Aves	Australian Raven	*Corvus coronoides*	Vocalisations/Visual Observation

A.6 Impact Assessment and Mitigation

The primary impact resulting from the proposed development is the direct loss of vegetation and associated habitat. However past and current use of the subject site has entailed historic clearing and modification of the native vegetation. The proposed development will entail the clearing of derived grassland vegetation and removal of less than 10 young, regrowth trees that form highly fragmented, low condition variants of the EEC RFEF. The remainder of the the trees present within the subject site will be retained.

However, and with due consideration of the distribution of the EEC in the region, the proposed development is not likely to have a significant impact on RFEF such that the large and viable representatives in the Regional Park would be placed at risk of extinction. The large and continuous remnants present in the Regional Park will be protected and enhanced through a range of mitigation measures identified and retained in perpetuity in public ownership. Nonetheless, a conservative approach as been taken and an Assessment of Significance (7-part test) has been conducted for the proposed development (**Appendix C**).

The removal of the degraded edges of these patches of RFEFalso has the potential to indirectly impact on RFEF through the increase of edge effects on the adjoining Regional Park. However, such potential indirect impacts can be minimised through the implementation of mitigation measures such as best practise sediment and erosion control control measures and appropriate weed control measures to prevent further growth and spread of invasive species during and after the construction process. The area should also be clearly demarcated and signed, where appropriate, to prevent unnecessary removal or damage to native vegetation being retained within the subject site.

No threatened flora or fauna species were recorded within the subject site and no significant impact is predicted to occur to threatened species as a result of the proposed development. As no significant impact is predicted to occur to threatened species or EECs listed under the TSC Act as a result of the development a Species Impact Statement is not required.

A.7 Conclusions

Past and current use of the subject site has entailed clearing and modification of the majority of pre-existing native vegetation. The proposed development will entail the clearing of modified grassland vegetation and removal of less than 10 young, regrowth trees that form highly fragmented, low condition variants of the EEC RFEF.

However, and with due consideration of the distribution of this EEC in the region, the proposed development is not likely to have a significant impact on RFEF such that the larger and better quality representatives in the Regional Park would be placed at risk of extinction. A range of mitigation measures are proposed to minimise indirect impacts from the clearing such as erosion and sediment control to avoid stormwater and sediment runoff and signage to ensure that no unnecessary clearing occurs.

No significant impact is predicted to occur to threatened species or EECs, listed under the TSC Act as a result of the development. Therefore a Species Impact Statement is not required.

Appendix B

Flora Species recorded within the Subject Site

Table 2 Flora species recorded within the Subject Site.

Stratum	Species	Native/Exotic/Planted
Trees	*Corymbia gummifera*	p
	Eucalyptus amplifolia	n
	Eucalyptus eugenioides	n
	Eucalyptus microcorys	p
	Eucalyptus moluccana	n
	Eucalyptus tereticornis	n
Small Trees	*Casuarina glauca*	n
Shrubs	*Acacia parramattensis*	n
	Bursaria spinosa	n
	Hibbertia diffusa	n
	Ligustrum lucidum	e
Herbs - Ferns and Allies	*Cheilanthes sieberi*	n
Herbs - Climbers	*Araujia sericifera*	e
	Asparagus asparagoides	e
	Desmodium varians	n
	Glycine microphylla	n
	Glycine tabacina	n
Herbs - Dicots	*Alternanthera denticulata*	n
	Anagallis arvensis	e
	Bidens pilosa	e
	Cardamine hirsuta	e
	Centella asiatica	n
	Cirsium vulgare	e
	Einadia trigonos	n
	Galium aparine	e
	Hypericum gramineum	n
	Hypochaeris radicata	e
	Modiola caroliniana	e
	Oxalis perennans	n
	Persicaria decipiens	n
	Pratia purpurascens	n

Table 2 Flora species recorded within the Subject Site.

Stratum	Species	Native/Exotic/Planted
	Richardia stellaria	e
	Rumex crispus	e
	Senecio madagascariensis	e
	Sida rhombifolia	e
	Solanum pseudocapsicum	e
	Verbena bonariensis	e
	Verbena rigida	e
	Vernonia cinerea	n
	Xanthium occidentale	e
Herbs - Monocots (Grasses)	*Andropogon virginicus*	e
	Aristida ramosa	n
	Axonopus fissifolius	e
	Bothriochloa decipiens	n
	Chloris gayana	e
	Cymbopogon refracta	n
	Cynodon dactylon	e
	Eragrostis curvula	e
	Microlaena stipoides	n
	Panicum effusum	n
	Paspalum dilatatum	e
	Setaria parviflora	e
	Sporobolus creber	n
	Stenotaphrum secundatum	e
	Themeda australis	n
Herbs - Monocots (Other)	*Carex appressa*	n
	Commelina cyanea	n
	Cyperus eragrostis	e
	Juncus usitatus	n

Appendix C

Assessment of Significance: River-flat Eucalyptus Forest

C.1 River-flat Eucalypt Forest

River-flat Eucalypt Forest (RFEF) is found on coastal floodplains and has a tall canopy of eucalypts. The most widespread canopy trees include *Eucalyptus tereticornis, E. amplifolia, Angophora floribunda* and *A. subvelutina*. It may have a layer of small trees and a scattering of shrubs. The ground cover consists of abundant forbs, scramblers and grasses. RFEF occurs on alluvial soils on river-flats of the NSW North Coast, Sydney Basin and South East Corner bioregions.

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 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,*

Not applicable.

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.*

The RFEF within the subject site has been historically cleared and the current RFEF exists as small, scattered patches of young and regenerating trees over a highly disturbed understory. Less than 15 RFEF trees occur within the subject site. The patches of RFEF within the subject site are connected to larger areas of RFEF (a form of Alluvial Woodland) in the Regional Park.

The removal of less than 10 trees and associated disturbed understorey is not likely to have an adverse effect on the extent of the community such that its local occurrence is likely to be placed at risk of extinction. The community is well-represented within the adjacent Regional Park where it has a higher conservation value and is in better condition.

The composition may be modified in parts of the subject site where representations of the RFEF community are retained. Although patches of vegetation are not likely to be retained with structural complexity or composition resembling RFEF, this will not adversely modify composition to place the local occurrence at risk of extinction because of the retention of RFEF in the Regional Park.

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.

Removal of RFEF will entail the removal of less than 10 young or regenerating trees and associated disturbed understorey. The subject site has been historially cleared and RFEF present occurs as small regenerating patches adjacent to larger patches of RFEF in the neighbouring Regional Park.

The RFEF to be removed, modified or isolated as a result of the proposed development is not important to the long-term survival of the community within the locality. River-flat Eucalypt Forest of high conservation significance will be conserved within the Regional Park and managed for conservation. The vegetation within the Regional Park is considered to be more important than that within the subject site as it is in better condition and is more intact.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat for this endangered ecological community has currently been identified by the Director-General of the OEH.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plans,

A Recovery Plan for the Cumberland Plain has been gazetted. The main actions proposed in the Recovery Plan include:

- Building the protected area network;
- Delivering best practice management;
- Promoting awareness, education and engagement; and
- Enhancing information, monitoring and enforcement.

The proposed development is consistent with these actions because the largest and best quality areas of RFEF in the SMP will be conserved within the Regional Park, adding to the protected area network with opportunity to deliver best practice management. The sparse patches of RFEF in the subject site are comparatively small and degraded compared to the representation

in the Regional Park and will not greatly add to the viability of the community if retained, once the subject site is developed.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will result in Clearing of native vegetation. However, the vegetation to be cleared consists of degraded RFEF and higher quality examples of the community will be conserved within the Regional Park.

Conclusion

The proposed development is not likely to have a significant impact on River-flat Eucalypt Forest.