30 October 2017

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ECOLOGICAL CONSTRAINTS ANALYSIS FOR THE REZONING OF DRAINAGE BASINS WITHIN THE ST MARYS REGIONAL PARK AND REZONING AN AREA OF EMPLOYMENT LAND TO RESIDENTIAL

Dear Sean,

The purpose of this letter is to present the findings of the ecological constraints analysis conducted by Cumberland Ecology to support the proposed application for rezoning of land zoned as 'Drainage' and 'Regional Park' within parts of the St Marys Property (SMP), in particular areas near the Western Precinct (now the suburb of Jordan Springs) and the Central Precinct (Jordan Springs East). Additionally, all land zoned as 'Employment' within the Central Precinct is proposed for rezoning as 'Residential'.

Cumberland Ecology has completed the requisite ecological constraints analysis for the proposed drainage basin and employment land rezoning areas. Our methods, results and conclusions have been explained in detail and are provided in **Appendix A** to this letter.

This ecological constraints analysis is considered to provide an adequate assessment for the purpose of rezoning within the *Sydney Regional Environmental Plan No. 30 – St Marys* (SREP 30) boundaries. However, detailed ecological impact assessments will be required for each drainage basin Development Application (DA), once detailed design plans are developed.

In the case of Drainage Basin B, which adjoins the Central Precinct, the areas for the current and proposed configuration have been fully assessed as part of the Species Impact Statement (SIS) for the Central Precinct Bulk Earthworks DA, and therefore the SIS should be read in conjunction with this constraints analysis. The areas for the current and proposed configuration for Basin I and Basin C/V6 have not been included in any detailed ecological assessments conducted to date and will be required for subsequent DAs related to these areas.

The area of land within the Central Precinct, which is zoned for 'Employment', and proposed for rezoning to 'Residential' has been fully assessed under the Central Precinct SIS. The change of proposed land use has no bearing on the findings of the assessment, and no significant impacts are predicted. The comprehensive management plans which address the potential impacts from the development of the Central Precinct, including the Weed Management Plan and the Feral and Domestic Animal Management Strategy are applicable to the changes in landuse from employment to residential, and are expected to satisfactorily manage the risks.

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 myself, or Vanessa Orsborn, on (02) 9868 1933.

Yours sincerely

Gitanjali Katrak
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Appendix A

Ecological Constraints Analysis

A.1 Introduction

Lend Lease are proposing to submit an application to rezone areas currently zoned as 'Drainage' and 'Regional Park' within parts of the St Marys Property (SMP), in particular areas near the Western Precinct (now the suburb of Jordan Springs) and the Central Precinct (Jordan Springs East). Additionally, all areas within the Central Precinct zoned as 'Employment' are proposed for rezoning to 'Residential'.

It is our understanding that Lend Lease have previously sent draft plans of the proposed changes within the SMP to the Office of Environment and Heritage (OEH) for comment and feedback on the impacts of the proposed amendments prior to submission of a formal rezoning application. The outcomes of this consultation with OEH have been supportive, and no significant amendments were requested by OEH.

The purpose of this ecological constraints analysis is to provide a summary of ecological assessments conducted to date in relation to the proposed rezoning to support the formal rezoning application. This ecological constraints analysis is considered to provide an adequate assessment for the purpose of rezoning, however, detailed ecological impact assessments are required for each drainage basin Development Application (DA), once detailed design plans are developed.

In the case of Drainage Basin B, which adjoins the Central Precinct, design plans have recently been developed, including incorporation of an outlet channel. The proposed configuration for the rezoned Basin B has been fully assessed as part of the Species Impact Statement (SIS) for the Central Precinct bulk earthworks DA (Cumberland Ecology, 2014a), and therefore the SIS should be read in conjunction with this constraints analysis.

A.2 Background

Sydney Regional Environmental Plan No. 30 – St Marys (SREP 30) is the main statutory plan applying to the SMP and provides a framework for sustainable development and management of land. SREP 30 requires a precinct plan to be adopted by the relevant council prior to any development taking place. The Central Precinct Plan was adopted by Penrith City Council in March 2009.

Amendments to SREP 30 for rezoning of all 'Employment' land within the Central Precinct, as shown in **Figure 1**, to 'Residential' is proposed as part of the rezoning application.

Coordinate System: MGA Zone 56 (GDA 94)

Western Precinct

The Link Road

Central Precinct

Dunheved Precinct

Ropes Creek Precinct

Eastern Precinct

Legend

St Marys Property Boundary

Precinct Boundary

Zone

Employment

Road and Road Widening

Drainage

Regional Park

Urban

Regional Open Space

Grid North

Image:
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(date 5-5-2016)

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I:\...\17209\Figures\Letter 2\20171027\Figure 1. Zoning_St Marys

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

500 0 500 1000 1500 2000 m

Three major areas within the SMP are currently zoned for Drainage as per the SREP 30. However, ongoing developments, refinements and assessments in relation to the Western Precinct and Central Precinct have determined reconfigured designs and preferred locations for stormwater management. These design reconfigurations will involve utilising areas currently zoned as Regional Park for drainage and the return of areas currently zoned as Drainage to the Regional Park.

A number of options for drainage basin locations and layout were considered during ongoing consultation between Lend Lease (current landholders), Jacobs (Drainage design), Cumberland Ecology (Ecology) and National Parks and Wildlife Services (NPWS) division of OEH, who will become the land managers of the Regional Park, when it is transferred from the current landholders.

The following basins, as per design plans agreed upon in October 2015 with further amendments to Basin B in October 2017, are being considered for rezoning:

- **Basin B**: Proposed for reduction in size to largely avoid mature riparian forest, to be contained predominantly within exotic grassland, as shown in **Figure 2**;
- **Basin I**: Proposed for reconfiguration and expansion in size to make up for the reduction in size of Basin B, includes exotic dominated grassland, as shown in **Figure 3**;
- **Basin C**: Existing SREP basin location (Basin C) to be avoided, returning mature woodland to Regional Park. Proposed Basin C to be located near the Village 6 development area within mainly young regenerating woodland, as shown in **Figure 4**; and
- **Basin V6**: Newly proposed basin to make up for the reduction in size of proposed Basin C. Located within young regenerating woodland and an existing track, as shown in **Figure 4**.

Coordinate System: MGA Zone 56 (GDA 94)

Legend

- SREP Basin B
- Proposed Basin B

Vegetation Community (CE, 2011)

- River Flat Eucalypt Forest (EEC)
- Shale Gravel Transition Forest (>10% canopy cover)
- Cumberland Plain Woodland (CEEC)
- Regenerating Cumberland Plain Woodland (CEEC)
- Derived Native Grassland (CEEC)
- Low Diversity Derived Native Grassland
- Exotic Grassland

Vegetation Community (DECCW, 2008)

- Shale Plains Woodland (CEEC)
- Shale/Gravel Transition Forest (EEC)
- Alluvial Woodland (EEC)
- Alluvial Woodland (EEC) (5-10% canopy cover)

Threatened Fauna
2011 Records

- Cumberland Plain Land Snail

Grid North

Image Source:
Image © 2015 Aerometrex
(dated 1-1-2014)

Data Source:
DECCW (2008). Change in the Distribution of Cumberland Plain Woodland.Department of Environment, Climate Change and Water NSW. .

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50 0 50 100 150 200 m

I:\...\17209\Figures\Letter 2\20171027\Figure 2. Vegetation_Basins Area B

Figure 2. Vegetation within Existing (SREP) and Proposed Basins - Area B

Coordinate System: MGA Zone 56 (GDA 94)

Grid North

Legend

- SREP Basin I
- Proposed Basin I

Vegetation Community (CE, 2011)

- River Flat Eucalypt Forest (EEC)
- Regenerating River-flat Eucalypt Forest (EEC)
- Regenerating Cumberland Plain Woodland (CEEC)
- Derived Native Grassland (CEEC)
- Exotic Grassland
- Freshwater Wetland
- Wetland (weedy)

Vegetation Community (DECCW, 2008)

- Shale Plains Woodland (CEEC)
- Shale Plains Woodland (CEEC) (5-10% canopy cover)
- Alluvial Woodland (EEC)
- Alluvial Woodland (EEC) (5-10% canopy cover)

Threatened Flora

2013 Records

- *Grevillea juniperina ssp juniperina*

2009 Records

- *Grevillea juniperina ssp juniperina*

Threatened Fauna

2011 Records

- Cumberland Plain Land Snail

Image Source:
Image © 2015 Aerometrex
(dated 1-1-2014)

Data Source:
DECCW (2008). Change in the Distribution of Cumberland Plain Woodland.Department of Environment, Climate Change and Water NSW.

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I:\...\17209\FiguresLetter 2\20171027\Figure 2. Vegetation_Basins Area I

Figure 3. Vegetation within Existing (SREP) and Proposed Basins - Area I

50 0 50 100 150 200 m

Coordinate System: MGA Zone 56 (GDA 94)

N
Grid North

Legend

SREP Basin C
Proposed Basin C
Proposed Basin V6

Vegetation Community (CE, 2011)

Regenerating Cumberland Plain Woodland (CEEC)
Derived Native Grassland (CEEC)
Exotic Grassland

Vegetation Community (DECCW, 2008)

Shale Plains Woodland (CEEC)
Shale Plains Woodland (CEEC) (5-10% canopy cover)
Alluvial Woodland (EEC)

Threatened Flora

2013 Records

Grevillea juniperina ssp juniperina

2009 Records

Grevillea juniperina ssp juniperina

Threatend Fauna

2013 Records

Cumberland Plain Land Snail

2011 Records

Cumberland Plain Land Snail
Eastern Bent-wing Bat
Eastern Freetail Bat

Image Source:
Image © 2015 Aerometrex
(dated 1-1-2014)

Data Source:
DECCW (2008). Change in the Distribution of Cumberland Plain Woodland.Department of Environment, Climate Change and Water NSW.

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I:\...\17209\Figures\Letter 2\20171027\Figure 4. Vegetation_Basins Area C & V6

Figure 4. Vegetation within Existing (SREP) and Proposed Basins - Area C & V6

50 0 50 100 150 200 m

A.3 Methods

A.3.1 Review of Existing Information

Cumberland Ecology has been involved in the development of the SMP since 2004 and prepared the following documents for the Central Precinct Plan and SREP 30:

- Biodiversity Assessment, dated May 2009 (Cumberland Ecology, 2009) ;
- Feral and Domestic Animal Management Strategy, dated July 2008 (Cumberland Ecology, 2008a); and
- Weed Management Plan, dated July 2008 (Cumberland Ecology, 2008b).

As all employment land within the Central Precinct is to be rezoned to residential, these documents were reviewed by Cumberland Ecology (letter dated 6 March 2016) to determine if the biodiversity assessment and management strategies related to these areas required amendments to support the proposed rezoning. The findings of the review are summarised in **Section A.4**.

Detailed ecological assessments have been conducted between 2011 and 2015 for developments related to the Central Precinct and Western Precinct (Cumberland Ecology, 2012; Cumberland Ecology, 2014a; Cumberland Ecology, 2014c; Cumberland Ecology, 2014b). The information relating to the vegetation, flora and fauna from these previous assessments, in particular assessments conducted in the vicinity of the existing and proposed drainage basin locations and the proximate parts of the Western Precinct and Central Precinct were reviewed to gain an appreciation of the potential flora and fauna values within the drainage basins.

As part of this process, vegetation mapping for the Cumberland Plain (DECCW, 2007) was also reviewed.

A.3.2 Field surveys

Field surveys were conducted by two ecologists on 29 October 2015, and involved meandering surveys of parts of the existing and proposed drainage basins (collectively referred to as 'the study area'). Additionally, an inspection of the location of an outlet channel for proposed Drainage Basin B was conducted by an ecologist on 24 October 2017. The location of the outlet was entirely within the area of the existing Drainage Zoning, and has been previously assessed in detail as part of the Bulk Earthworks DA for the Central Precinct (Cumberland Ecology, 2014a).

The general condition of the vegetation was noted at several locations or waypoints and photographs were taken to record conditions during the survey, particularly within the areas of change under the proposed drainage basin locations. In particular, the following were noted during the meander survey:

- Approximate age class and structure of vegetation;

- Vegetation community type and general condition;
- Presence of noxious and environmental weeds;
- Location of potential fauna habitat, including hollow bearing trees and logs;
- Locations of threatened flora species known to occur in the vicinity of the Regional Park, Western and Central Precincts; and
- Potential habitat trees for the threatened Cumberland Plain Land Snail.

The criteria for a tree to be determined as suitable habitat for the Cumberland Plain Land Snail (CPLS) include:

- Medium to Large trees with a minimum Diameter at Breast Height (DBH) of 10cm; and
- Presence of leaf litter within 1m of the base of the tree.

Locations of habitat features and threatened species were recorded using a hand-held GPS unit.

A.4 Results

A.4.1 Desktop Assessment

i. Employment Land Rezoning

The change of proposed land use, from employment to residential, within parts of the Central Precinct has no bearing on the findings of the Precinct Plan as they relate to ecology. The comprehensive management plans which address the potential impacts from the development of the Central Precinct, including the Weed Management Plan and the Feral and Domestic Animal Management Strategy are applicable to the changes in landuse from employment to residential, and are expected to satisfactorily manage the risks, as discussed below.

a. Biodiversity Assessment and Species Impact Statement

The Biodiversity Assessment (Cumberland Ecology, 2009) was conducted to determine potential impacts of the future development of the Central Precinct on flora and fauna, particularly threatened species, populations and communities that are listed under the schedules of the *NSW Biodiversity Conservation Act 2016* (formerly the NSW *Threatened Species Conservation Act 1995* (TSC Act) – repealed). Approval under Commonwealth legislation was granted for the development of the SMP under the *Environment Protection (Impact of Proposals) Act 1974* and no further approvals are required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

However, since the submission of the 2009 report, one of the ecological communities recorded within the Central Precinct, Cumberland Plain Woodland, was uplisted from Endangered to Critically Endangered (gazettal date December 2009) under the TSC Act (repealed), and this

listing is now transferred to the BC Act. A Final Recovery Plan for the communities and associated threatened species and populations of the Cumberland Plain (Cumberland Plain Recovery Plan) has been adopted by the Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water [DECCW]) (DECCW, 2011).

Cumberland Ecology subsequently prepared a SIS (Cumberland Ecology, 2014a) which was submitted to Penrith City Council as DA 14/1228 for bulk earthworks within the Central Precinct. The SIS report provided an updated ecological assessment for the Central Precinct, which accounted for the updates in relevant legislation, in particular the uplisting fo Cumberland Plain Woodland.

The findings of the Biodiversity Assessment report and the SIS are equally applicable to residential or employment lands as both zonings will entail complete clearing of the vegetation within the area and are not affected by the proposed rezoning. Therefore the 2014 SIS report is to be used in conjunction with the 2009 Biodiversity Assessment Report to support the proposed rezoning of land within the Central Precinct.

b. Feral and Domestic Animal Management Strategy

The Feral and Domestic Animal Management Strategy (FDAMS) for the Central Precinct was submitted in July 2008 (Cumberland Ecology, 2008a). No new feral or pest species have been listed for consideration since the submission of the FDAMS. The field surveys conducted for the 2014 SIS report also did not record any feral or pest species that have not been addressed in the FDAMS.

Although the FDAMS mentions employment lands in the description of the SMP, the management strategies for feral and domestic fauna listed in the FDAMS continue to be relevant and are equally applicable to residential and employment land. Therefore no amendments or updates to the FDAMS are required.

c. Weed Management Plan

The Weed Management Strategy (WMS) for the Central Precinct was submitted in July 2008 (Cumberland Ecology, 2008b). Since the submission of the WMS, several additional weed species have been listed as Weeds of National Significance (WONS) or listed as Priority Weeds under the *NSW Biosecurity Act 2015* (formerly the *Noxious Weed Act 1993*) As several of these species were recorded during the field surveys conducted for the 2014 SIS report and in surrounding parts of the SMP, control measures for these additional weed species must be incorporated into the management of weeds for the Central Precinct.

Although the WMS mentions employment lands in the description of the SMP, the listed management strategies are equally applicable to residential and employment land. While the management strategies for weeds listed in the WMS continue to be relevant and must be implemented, control measures for additional weed species must be incorporated into the management of weeds.

ii. Drainage Rezoning

Vegetation mapping for the Cumberland Plain (DECCW, 2007) and ground truthing by Cumberland Ecology (Cumberland Ecology, 2012; Cumberland Ecology, 2014a; Cumberland Ecology, 2014c; Cumberland Ecology, 2014b) have mapped the vegetation within and adjacent to the drainage basins as patches of the Threatened Ecological Communities (TECs); River-flat Eucalypt Forest (RFEF) (in the form of Alluvial Woodland) and Cumberland Plain Woodland (CPW) (in the form of Shale Plains Woodland).

The CPW within the study area occurs in three forms based on presence and general age of trees: CPW, regenerating CPW and low diversity derived native grassland (DNG). The RFEF occurs in two forms based on the general age of trees RFEF and regenerating RFEF. For the purposes of all vegetation area calculations conducted for this assessment, a conservative approach has been taken and all areas mapped as Shale Plains Woodland and Shale Plains Woodland (5-10% cover) in the DECCW mapping have been included in the area calculations for the main CPW form while areas mapped as Alluvial Woodland and Alluvial Woodland (5-10% cover) have been included in the area calculations for the main RFEF form.

The list of threatened species known or likely to occur in the area, identified that one threatened flora species, *Grevillea juniperina ssp juniperina* and several threatened fauna species; including Cumberland Plain Land Snail (*Meridolum corneovirens*), Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) and Eastern Freetail Bat (*Mormopterus norfolkensis*) had potential to be present within the study area. A number of threatened fauna species have been recorded in close proximity to the study area, including threatened woodland birds and microbats, and therefore have potential to be present.

A.4.2 Field Survey

i. Basin B

The current SREP Basin B is approximately 7.7 ha in size. Vegetation within the SREP basin includes a patch of good quality RFEF consisting of a mix of mature and young trees towards the north, as shown in **Photograph 1**, and also large areas of low diversity derived native grassland (DNG) and exotic grassland. The proposed Basin B (as shown in **Figure 1**), is greatly reduced (approximately 3.22 ha) and is predominantly restricted to the low diversity DNG and exotic grassland, as shown in **Photograph 2**, and a small area of RFEF for the inclusion of an outlet channel to South Creek (**Photograph 3**).

There is an overall gain in habitat quality for the Regional Park as a result in the rezoning of Basin B, as shown in **Table 1**.

Table 1 Basin B – Analysis of habitat loss and gain for existing and proposed locations

Vegetation Community	Existing	Proposed	Community Loss/Gain
	Area (Ha)		
CPW	0.09		0.09
Regen CPW			
CPW Low diversity DNG	3.25	1.40	1.85
RFEF	2.79	0.30	2.49
Regen RFEF			
Weedy Wetland			
Exotic	1.58	1.53	0.05
Overall CPW	**3.34**	**1.40**	**1.94**
Overall RFEF	**2.79**	**0.30**	**2.79**
General Condition			
Age of woodland areas	Mature forest and young trees present	Young trees	Gain
Presence of Exotic vegetation	Low in forest and high in grassland	High in grassland, low in woodland/forest	Gain to Neutral
Hollows/Potential hollows	No	No	Neutral
Connectivity	Connectivity to woodland and along riparian corridor	Limited connectivity to woodland. Adjoins corridor	Gain

*Key: Community Loss/Gain = Green text represents a gain, **black text** is a neutral change, and red text represents a loss in habitat value for the Regional Park by the proposed basin location*

Photograph 1 **Existing Basin B. Area of good quality, RFEF to be returned to Regional Park**

Photograph 2 **Proposed Basin B. Note the exotic grassland and stockpile**

Photograph 3 Young Woodland vegetation in drainage outlet

ii. Basin I

The current SREP Basin I is approximately 7.4 ha and includes an area of weedy Freshwater Wetlands, as shown in **Photograph 4**, moderate quality RFEF as well as small areas of exotic grassland. The proposed Basin I (as shown in **Figure 3**), has been increased in area (approximately 9.7 ha), but reconfigured to avoid a patch of moderate quality, mature RFEF (**Photograph 5**) and include a larger area of low quality regenerating RFEF (**Photograph 6)**, and exotic grassland (**Photograph 7**).

Proportionately, a large part of the increase in size for Basin I has utilised areas of exotic grassland while avoiding areas of native vegetation (mostly RFEF) with older, more mature trees. Therefore, while there is a minor loss in the area of CPW, there is a gain in the area of RFEF being retained as well as an improvement in the quality of the vegetation (i.e. areas with more mature trees) being returned to the Regional Park with larger areas of degraded exotic grassland being utilised for drainage. This results in an overall, albeit minor, gain in habitat quality for the Regional Park as a result in the rezoning of Basin I, as shown in **Table 2**.

Table 2 Basin I – Analysis of habitat loss and gain for existing and proposed locations

Vegetation Community	Existing	Proposed	Community Gain/Loss
	Area (Ha)		
CPW		0.03	-0.03
Regen CPW		0.28	-0.28
CPW Low diversity DNG		0.03	-0.03
RFEF	5.4	4.5	0.9
Regen RFEF	0.1	0.63	-0.53
Weedy Wetland	0.71	0.73	-0.02
Exotic grassland	1.21	3.51	-2.3
Overall CPW	0	0.34	-0.34
Overall RFEF	5.5	5.13	0.37
General Condition			
Age of woodland areas	Mature	Mature and young regrowth	Gain
Presence of Exotic vegetation	Moderate	Extensive	Gain
Hollows/Potential hollows	No	No	Neutral
Connectivity	Connected to woodland and along riparian corridor	Connected to woodland and along riparian corridor	Neutral

*Key: Community Loss/Gain = Green text represents a gain, **black text** is a neutral change, and red text represents a loss in habitat value for the Regional Park by the proposed basin location*

Photograph 4 Existing Basin I, to be retained for Drainage

Photograph 5 Existing Basin I vegetation to be returned to Regional Park

Photograph 6 **Proposed Basin I, new area. Note high density of weeds**

Photograph 7 **Proposed Basin I. Open exotic grassland**

iii. Basins C and V6

The current SREP Basin C is approximately 4.5 ha in size, and is part of a larger a patch of good quality, mature CPW, as shown in **Photograph 8** and **Photograph 9**. The existing Basin C contains a patch of *Grevillea juniperina* ssp. *juniperina* (**Photograph 8**), which was also previously recorded during surveys in 2013, and previous records of Cumberland Plain Land Snail. The SREP 30 Basin C will be returned to the Regional Park. The proposed Basin C (as shown in **Figure 4**), is approximately 3.6 ha and is located predominantly within regenerating CPW close to the Village 6 development area, and includes a small area of more mature CPW, as well as an existing cleared area which has been maintained as a firetrail. The mature CPW in proposed Basin C includes some mature trees with, with a single hollow recorded, and some other trees with potential to form hollows, as shown in **Photograph 11**.

To offset for the reduction in area of the proposed Basin C in comparison to SREP Basin C, a new basin; Basin V6 is proposed. Basin V6 is approximately 0.6 ha and is located wholly within young regenerating CPW, as shown in **Photograph 12**, and includes a cleared area which has been maintained as a firetrail.

There is an overall gain in habitat quality for the Regional Park as a result in the rezoning of Basin C, and creation of V6, as shown in **Table 3**.

Table 3 Basins C and V6 – Analysis of habitat loss and gain for existing and proposed locations

Vegetation Community	Existing	Alt C	V6	Community Loss/Gain
	Area			
CPW	4.52	3.63	0.64	0.25
Regen CPW				
CPW Low diversity DNG				
RFEF				
Regen RFEF				
Weedy Wetland				
Exotic				
Overall CPW	4.52	3.63	0.64	0.25
Overall RFEF				
General Condition				
Age of woodland	Mature woodland	Young regrowth and some mature	Young regrowth	Gain
Exotic vegetation	Low	Low	Low	Neutral
Hollows/Potential hollows	Yes	Yes	None	Neutral

Table 3 Basins C and V6 – Analysis of habitat loss and gain for existing and proposed locations

Vegetation Community	Existing	Alt C	V6	Community Loss/Gain
Connectivity	Connectivity to woodland, surrounded by Regional Park areas,	Connectivity to woodland, interrupted by firetrail, near development area	Connectivity to woodland to the south only, interrupted by firetrail, near development area	Gain

*Key: Community Loss/Gain = Green text represents a gain, **black text** is a neutral change, and red text represents a loss in habitat value for the Regional Park by the proposed basin location*

Photograph 8 Existing Basin C. Note the patch of Grevillea juniperina ssp juniperina in foreground

Photograph 9 Mature CPW in Existing Basin C

Photograph 10 Proposed Basin C

Photograph 11 Proposed Basin C - Regenerating CPW with mature trees

Photograph 12 Proposed Basin V6 in young regenerating CPW

A.5 Conclusion

Areas of land within the Central Precinct, which are zoned for 'Employment', and proposed for rezoning to 'Residential' have been fully assessed under the Central Precinct SIS. The change of proposed land use has no bearing on the findings of the ecological assessments, and no significant impacts are predicted. The comprehensive management plans which address the potential impacts from the development of the Central Precinct, including the Weed Management Plan and the Feral and Domestic Animal Management Strategy are applicable to the changes in landuse from employment to residential, and are expected to satisfactorily manage the risks.

Overall there is a net gain in habitat area and vegetation condition across the SMP for the Regional Park through the rezoning of the drainage basins within and adjoining the Regional Park. The greatest gain in habitat and connectivity is from the return of Basin C to the Regional Park, and the reduction in area of Basin B, which collectively returns mature CPW, connective riparian corridor vegetation (aside from a small outlet channel), and mature RFEF in good condition, to the Regional Park. There has been an effort to reconfigure the proposed drainage basins to avoid areas with mature trees and include exotic vegetation over woodland, where possible. **Table 4** presents a summary of the overall loss and gain of habitat areas, and **Table 5** shows the overall habitat quality being returned to Regional Park.

It should be noted that the vegetation area values provided below are for rezoning purposes only. The drainage areas will be subject to detailed design and development applications for which further ecological assessments will be conducted as required. There is potential during the future design and assessment stages to further avoid areas of native vegetation where feasible, which may potentially be returned to the Regional Park at the end of the development process.

In the case of Drainage Basin B, which adjoins the Central Precinct, design plans have recently been developed, including incorporation of an outlet channel. The proposed configuration for the rezoned Basin B has been fully assessed as part of the Species Impact Statement (SIS) for the Central Precinct Bulk Earthworks DA, and therefore the SIS should be read in conjunction with this constraints analysis.

Table 4 Summary of overall loss and gain of habitat values from the proposed basins

	Basin B	Basin C/V6	Basin I	Overall Gain/Loss of Vegetation Community / Habitat
Vegetation Community	**Area (Ha)**			
CPW	0.09	0.25	-0.03	0.31
Regen CPW	0	0	-0.28	-0.28
CPW Low diversity DNG	1.85	0	-0.03	1.82
RFEF	2.49	0	0.9	3.39

Table 4 Summary of overall loss and gain of habitat values from the proposed basins

	Basin B	Basin C/V6	Basin I	Overall Gain/Loss of Vegetation Community / Habitat
Vegetation Community	**Area (Ha)**			
Regen RFEF	0	0	-0.53	-0.53
Weedy Wetland	0	0	-0.02	-0.02
Exotic	0.05	0	-2.3	-2.25
Overall CPW	**1.94**	**0.25**	**-0.34**	**1.85**
Overall RFEF	**2.49**	**0**	**0.37**	**2.86**
Threatened species habitat				
Grevillea juniperina	1.94	0.25	-0.34	1.85
CPLS	0.09	0.25	-0.03	0.31
Birds/Bats	2.58	0.25	0.87	3.70

*Key: Community Loss/Gain = Green text represents a gain, **black text** is a neutral change, and red text represents a loss in habitat value for the Regional Park by the proposed basin location*

Table 5 Overall summary of general habitat condition loss and gain from the proposed drainage rezoning

General Condition	Vegetation to be rezoned Drainage	Vegetation to be returned to Regional Park	Overall Gain/Loss of Habitat Condition
Age of woodland	Saplings to young trees, very occasional mature trees	Saplings to mature trees	Gain
Exotic vegetation	Extensive	Limited	Gain
Hollows/Potential hollows	None or very low abundance	Low abundance, but with high future potential due to mature age of trees	Gain
Connectivity	Poor connectivity	Good connectivity with mature woodland, and as part of a riparian corridor	Gain

*Key: Community Loss/Gain = Green text represents a gain, **black text** is a neutral change, and red text represents a loss in habitat value for the Regional Park by the proposed basin location*

A.6 References

Cumberland Ecology (2008a). *St Marys Property - Central Precinct: Feral and Domestic Animal Management Strategy*. Cumberland Ecology, Carlingford Court, NSW.

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