Appendix M
Ecology Assessment

Ecological Due Diligence Report

Six Reserves at Erskine Park

Prepared for
Penrith City Council

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Abbreviations

Abbreviation	Description
CBD	Central Business District
CPLS	Cumberland Plain Land Snail
CPW	Cumberland Plain Woodland
EEC	Ecologically Endangered Community
ELA	Eco Logical Australia Pty Ltd
EPBC Act	Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*
LGA	Local Government Area
OEH	Office of Environment and Heritage
TEC	Threatened Ecological Community
TSC Act	NSW *Threatened Species Conservation Act 1995*

Executive summary

Eco Logical Australia Pty Ltd (ELA) was commissioned by Penrith City Council to prepare an ecological due diligence assessment to inform the proposed rezoning and reclassification of six sites from public reserve to low density residential. This report assesses the ecological value and development constraints of each of the six reserves located in Erskine Park.

Erskine Park is located on the eastern edge of the Penrith Local Government Area (LGA), 45.5 kilometres (km) east of the Sydney CBD. Some of the sites are part of a larger public reserve and other sites comprise the entire reserve.

A database audit was conducted to produce a list of threatened fauna and flora species that may potentially use the subject site, considering the habitat available and using expert knowledge of the ecology of each species. The subject sites were surveyed by ecologist, Karen Spicer, on the 6 June 2016. The subject sites were traversed on foot to map the extent of vegetation communities and assess the occurrence of or potential habitat for threatened flora and fauna species.

A review of the Native Vegetation of the Cumberland Plain mapping (NPWS 2002) identified three vegetation types within the study area; Shale Gravel Transition Forest, Shale Plains Woodland and Alluvial Woodland. The field survey confirmed the presence of Shale Plains Woodland within the study sites. Shale Plains Woodland is a sub-community of Cumberland Plain Woodland (CPW).

All of the reserves surveyed are be suitable for rezoning, given that the long-term viability of the native vegetation is poor with no natural recruitment, the vegetation is relatively isolated, and that restoration would require extensive planting and weeding. Therefore, it is unlikely that removal of native vegetation at these sites would significantly impact on CPW.

Three threatened flora species have previously been recorded in the study area but were not recorded on the subject sites, and are unlikely to occur in these areas.

Potential foraging and roosting habitat has been recorded within the study area for nine threatened fauna species, namely microbats, birds, Grey-headed Flying-fox and Cumberland Plain Land Snail. Given the highly mobile nature of these species, the poor quality of habitat to be removed and that higher quality habitat is available in the surrounding landscape, any impact from the proposed rezoning and reclassification of these lands is not considered to be significant to the long-term survival of these eight threatened fauna species. It is recommended that, wherever possible, hollow bearing trees be retained within the sites, to provide habitat for these species. This should be explored further in the future development stages.

1 Introduction

1.1 Background

Eco Logical Australia Pty Ltd (ELA) was engaged by Penrith City Council to undertake an ecological due diligence assessment of six public reserves within Erskine Park. This report identifies the ecological values and development constraints of each reserve to inform a planning proposal to rezone and reclassify all or part of these lands from public reserve to low density residential.

1.2 Description of the subject site and study areas

Erskine Park is located on the eastern edge of the Penrith Local Government Area (LGA), 45.5 kilometres (km) east of the Sydney CBD. **Figure 1** shows the location of the six study sites. Some of the sites are part of a larger public reserve and other sites comprise the entire reserve. The reserve name, address and Lot/DP for each site is listed below in **Table 1** along with the proportion of each reserve that is proposed for rezoning and reclassification.

Table 1: Details of the six study sites.

Reserve Name	Address	Lot /DP	Proportion considered for rezoning (square metres)
Spoonbill Reserve	1a Spoonbill Street, Erskine Park	Lot 104 DP706344	Entire – 2,466
Dilga Cresent Reserve	9A Dilga Crescent, Erskine Park	Lot 148 DP703879	Entire – 2,315
Pacific and Phoenix Reserve	27A Phoenix Crescent, Erskine Park	Lot 1444 DP788282	Part – 1,234 of 12,510
Chameleon Drive	25 Chameleon Drive, Erskine Park	Lot 1106 DP709078	Part - 2,740 of 110,296
Regulus Reserve	73 Swallow Drive, Erskine Park	Lot 3280 DP786811	Entire – 4,400
Spica Reserve	85 Swallow Drive, Erskine Park	Lot 3281 DP786811	Part – 1,500 of 4,499

1.3 Objectives of this study

The key objectives of the due diligence assessment are to:

- Examine the ecological values on each reserve
- List the ecological communities, flora and fauna species, and fauna habitat present on each site
- Assess the regional context of each site, and how they contribute to biodiversity values in the LGA
- Describe the potential impacts of rezoning and subsequent development for each site on biodiversity values.
- Discuss the appropriateness of full or partial development of each site for low residential development.

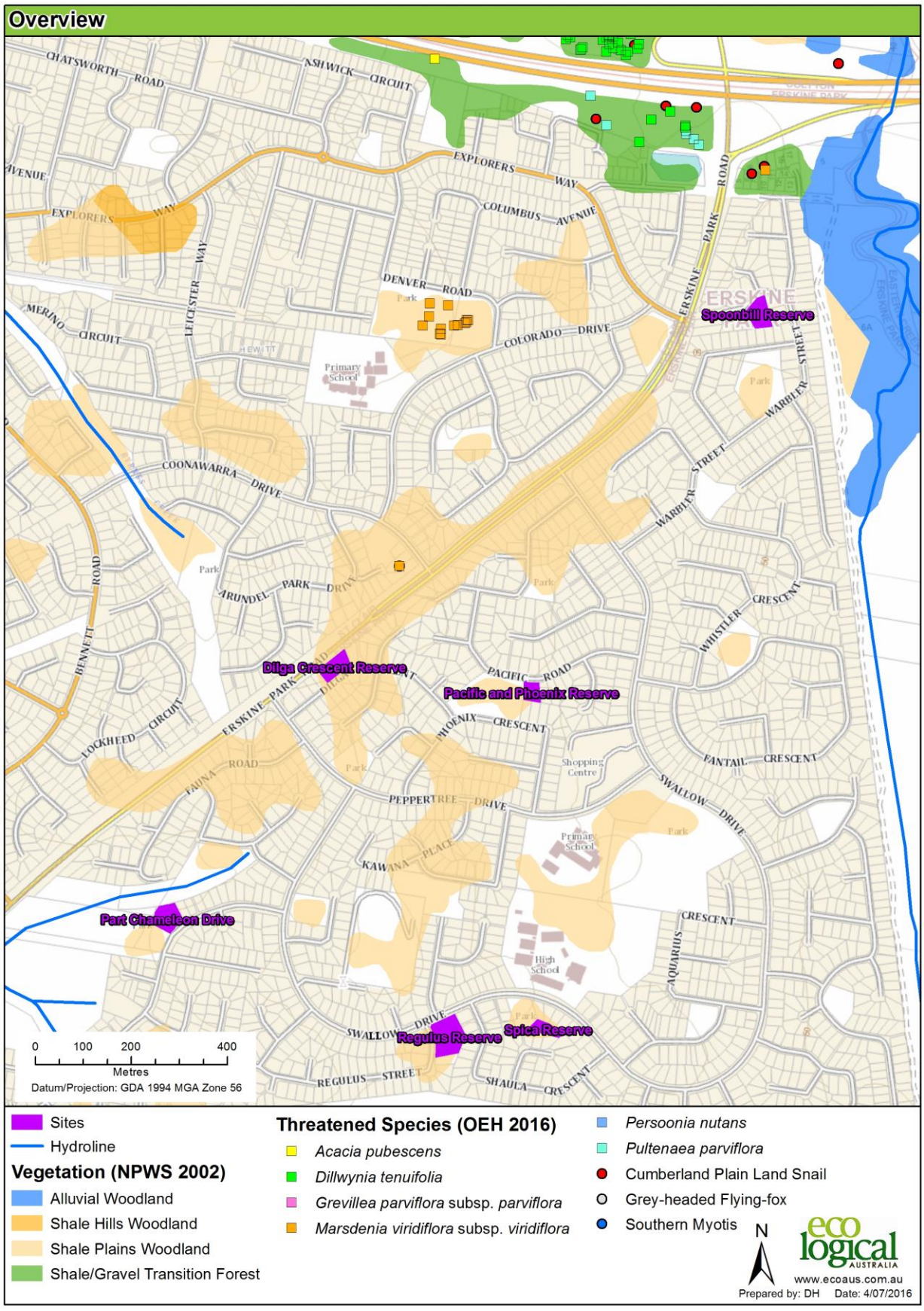

Figure 1: Locality map showing the location of the six sites, previous vegetation mapping (NPWS 2002) and threatened species records.

2 Methods

2.1 Literature review and database search

The following information and databases were reviewed prior to field survey:

- OEH Atlas of NSW Wildlife Database (OEH 2016)
- The Native Vegetation of the Cumberland Plain (NPWS 2002)

The Atlas of NSW Wildlife was searched on 3 May 2016, to determine if threatened flora or fauna had been previously recorded within or in proximity to the study sites.

2.2 Field survey

The study areas were surveyed by Karen Spicer (ELA ecologist) on 6 June 2016. The weather was cloudy with strong westerly winds and a maximum temperature of 18˚C. Heavy rainfall preceded the site inspection with an intense low pressure system delivering 245 mm over the weekend (5 and 6 June).

Each of the six subject sites were traversed on foot, with all visible flora species identified and noted. Each traverse included validation of the mapped vegetation communities and noting vegetation condition and fauna habitat features (e.g. hollow bearing trees) present. Potential habitat for threatened flora and fauna species was assessed. Flora species recorded within each study area is provided in **Appendix A**.

Searches for *Meridolum corneovirens* (Cumberland Plain Land Snail (CPLS)) were made in potential habitat by searching beneath leaf litter and logs, particularly around the base of *Eucalyptus tereticornis* and *Eucalyptus moluccana.* Conditions for detecting CPLS were ideal, as the heavy rainfall event created moist soil conditions that favour CPLS activity.

3 Results

3.1 Database and literature review

The Native Vegetation of the Cumberland Plain mapping (NPWS 2002) identified three vegetation types within the study area (Figure 1):

- Shale Gravel Transition Forest in the north along the M4 motorway. None of the study sites occurred within this mapped community.
- Shale Plains Woodland was mapped across most of the study area. All six subject sites occurred within this mapped.
- Alluvial Woodland was mapped to the east along Eastern Creek. None of the study sites occurred within this mapped community.

The vegetation within Chameleon Reserve and Spoonbill Reserve were not previous mapped by NPWS 2002. However, vegetation to the immediate south of Chameleon Reserve was mapped as Shale Plains Woodland.

The OEH Atlas of NSW Wildlife database results are shown in **Figure 1**. *Marsdenia viridiflora* subsp. *viridiflora* has been previously recorded in Denver Road Reserve and near Erskine Park Road to the north of Dilga Reserve.

4 Spoonbill Reserve

4.1 Flora and vegetation communities

The vegetation within this reserve was not previously mapped by NPWS 2002. The ground cover was a well maintained lawn, most likely weed grasses *Eragrostis curvula* (African Lovegrass) and *Pennisetum clandestinum.* However, this assumption is based on the colour of the grass as there were no diagnostic features present to confirm species identification.

The shrub layer was absent and the vegetation consisted of eight large remnant *Eucalyptus tereticornis* (Forest Red Gum), which is representative of Shale Plains Woodland, a sub-community of Cumberland Plain Woodland.

4.2 Fauna habitat

No previous threatened species have been recorded in or close to this reserve. Fauna habitat is generally poor given the lack of vegetation structure. The Forest Red Gum were large remnant trees and while no hollows were obvious, trees of this size and age are likely to contain hollows. A previous arborist report noted that three of the trees present contained small hollows or cavities that may be suitable for wildlife (Laws 2015).

Searches for CPLS were conducted but none were found. Habitat for CPLS is virtually absent considering the lack of leaf litter and the current land management practice of mowing up to the base of the trees.

The site would provide potential foraging habitat for highly mobile threatened species including *Pteropus poliocephalus* (Grey-headed Flying-fox), *Hieraaetus morphnoides* (Little Eagle) and *Daphoenositta chrysoptera* (Varied Sittella).

Given the presence of small tree hollows and cavities, the site is considered potential habitat for the following threatened species of microbats - *Miniopterus australis* (Little Bentwing-bat), *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat), *Mormopterus norfolkensis* (Eastern Freetail-bat), *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat) and *Scoteanax rueppellii (*Greater Broad-nosed Bat).

4.3 Regional context

This reserve is approximately 100 m from the vegetation corridor along Eastern Creek. As such, this reserve may be used as a stepping stone for more mobile fauna (birds and bats) across the urban landscape via other vegetation patches.

4.4 Impact assessment

The site contains approximately 0.19 ha of Shale Plains Woodland (CPW) which, as a sub-community of CPW, is a Critically Endangered Ecological Community under the TSC Act. The vegetation condition does not meet the EPBC Act criteria for listing.

Given the current land management practice (mowing), the long-term viability of this patch is poor given that natural recruitment of vegetation is absent. As such, when the standing trees senesce, there is nothing to replace this CPW vegetation. The exotic lawn appears to be well established, so an absence of mowing would require revegetation and intensive weed management to create a native CPW ground cover and understorey.

Therefore, removal of the vegetation from this reserve is unlikely to have a significant impact on the local occurrence of CPW.

As potential habitat is present for a number of highly mobile threatened birds and bats, an assessment of significance would be required for the following species:

Potential foraging habitat - Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Potential roosting habitat - Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

Given the small amount of clearing required and the quality of habitat present significant impacts on these species is unlikely.

4.5 Recommendations

The size, girth and age of these remnant trees is unique and in itself of conservation significance, given that large trees are rare in the landscape and are likely to contain hollows and/or form hollows into the near future. Tree hollows are a rare and valuable fauna habitat feature.

However, this reserve may be considered for rezoning to residential given that:

- the long-term viability of the CPW is poor with no natural recruitment
- the vegetation is relatively isolated
- restoration of CPW would require intensive planting and weeding
- a significant impact on CPW from removal of the vegetation is unlikely

Council should consider retention of some trees in future development stages, in particularly the trees identified as hollow-bearing trees by Law (2015).

Plate 1: The trees are likely to contain hollows.

Plate 2: The reserve is comprised of large remnant *Eucalyptus tereticornis*.

Figure 2: Spoonbill Reserve vegetation mapping and fauna habitat.

5 Dilga Crescent Reserve

5.1 Flora and vegetation communities

Dilga Reserve has been previously mapped as Shale Plains Woodland (NPWS 2002). A previous record of *Grevillea juniperina* subsp. *juniperina* and *Marsdenia viridiflora* subsp. *viridiflora* occurs 200 m north of the site.

The site contains a mown ground cover likely to be dominated by exotic grasses. The shrub layer was absent apart from a planted *Photinia* sp. hedge along the northwest boundary with Erskine Park Road.

The site contained approximately 25 *Eucalyptus moluccana* (Grey Box), and one *Eucalyptus fibrosa* (Red Ironbark). These remnant trees are part of Shale Plains Woodland, a sub-community of Cumberland Plain Woodland. The general health of the Grey Box was poor, with one dead standing tree (stag) and some other trees lacking healthy foliage.

5.2 Fauna habitat

Noisy Miner and Australian Magpie were recorded at the site and other common urban native species are likely to use the site.

No previous threatened species have been recorded in Dilga Reserve. The closest record is approximately 200 m north where CPLS was recorded. Searches for CPLS were conducted but none were found. Habitat for CPLS is currently absent considering the lack of leaf litter and the current land management practice of mowing up to the base of the trees.

Fauna habitat is generally poor given the lack of vegetation structure. One stag with decorticating bark provides potential roosting habitat for threatened species of microbats including Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

The site would provide potential foraging habitat for highly mobile threatened species including Grey-headed Flying-fox, Little Eagle and Varied Sittella.

5.3 Regional context

The site has relatively poor connectivity apart from being a stepping stone to other vegetation within the urban matrix. Some roadside vegetation (CPW) exists on the opposite side of Erskine Park Road which has been previously mapped as Shale Plains Woodland (NPWS 2002).

5.4 Impact assessment

Removal of the vegetation within the site will impact on 0.19 ha of Cumberland Plain Woodland (CPW), which is listed as a Critically Endangered Ecological Community under the TSC Act. The vegetation condition does not meet the EPBC Act criteria for listing.

Given the current land management practice (mowing) and the general poor health of the Grey Box trees, the long-term viability of this patch is poor. Natural recruitment of vegetation is absent and as the standing trees senesce, there is nothing to replace this vegetation. The exotic lawn appears to be well established, so an absence of mowing would require revegetation and intensive weed management to create a native CPW ground cover and understorey.

Therefore, removal of the vegetation from this reserve is unlikely to have a significant impact on the local occurrence of CPW.

As potential habitat is present for a number of highly mobile threatened birds and bats, an assessment of significance would be required for the following species:

Potential foraging habitat - Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Potential roosting habitat - Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

Given the small amount of clearing required and the quality of habitat present, significant impacts on these species is unlikely to result.

5.5 Recommendation

Given that the CPW vegetation within Dilga Reserve is generally in poor health with poor long-term viability, this reserve is recommended for urban development.

Plate 3: *Eucalyptus moluccana* are the dominant tree in Dilga Reserve and are of general poor health.

Plate 4: Stage with decorticating bark – potential microbat habitat.

Figure 3: Dilga Reserve vegetation mapping and fauna habitat

6 Regulus Reserve

6.1 Flora and vegetation communities

Regulus Reserve contains a mown ground cover which made species identification difficult. However, the dominant species would most likely be the exotic *Eragrostis curvula* (African Lovegrass) which was recorded at the site. Another exotic grass *Ehrharta erecta* was also recorded beneath some planted vegetation.

The shrub layer was absent apart from planted vegetation along eastern and southern boundaries of the reserve. These planted areas are shown in **Figure 4** and contained *Callistemon* sp., *Casuarina cunninghamiana* (River Oak), *Corymbia citriodora* (Lemon-scented Gum), *Eucalyptus tereticornis, Grevillea robusta* (Silky Oak), *Melaleuca decora* and *Schinus areira.*

The site also contained large remnant *Eucalyptus moluccana* (Grey Box), part of Shale Plains Woodland, a sub-community of Cumberland Plain Woodland. The general health of these Grey Box was poor, with four dead standing trees (stags) and others trees with dead limbs and lacking healthy foliage.

6.2 Fauna habitat

Fauna habitat is generally poor apart from the presence of four dead trees, one of which had decorticating bark and another had a small hollow which is potential habitat for threatened microbats including Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

The site may provide potential foraging habitat for highly mobile threatened species including Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Cumberland Plain Land Snail searches were made but none were found and potential habitat onsite is poor.

6.3 Regional context

Regulus Reserve is relatively isolated from any large intact areas of native vegetation.

6.4 Impact assessment

Approximately 0.23 ha of Cumberland Plain Woodland EEC would be removed. The vegetation does not meet the condition criteria under the EPBC Act. As the Grey Box trees representative of this community are in poor health, the long-term viability of this small stand of CPW is poor. In addition, the current land management practice (mowing) is preventing any natural recruitment of vegetation. However, the exotic lawn appears to be well established, so an absence of mowing would require revegetation and intensive weed management to create a native CPW ground cover and understorey.

Therefore, removal of the vegetation from this reserve is unlikely to have a significant impact on the local occurrence of CPW.

As potential habitat is present for a number of highly mobile threatened birds and bats, an assessment of significance would be required for the following species:

Potential foraging habitat - Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Potential roosting habitat - Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

Given the small amount of clearing required and the poor quality of habitat present, significant impacts on these species is unlikely to result.

6.5 Recommendations

This biodiversity values of this reserve are relatively low, given the small area of CPW within the reserve, the poor health of the Grey Box trees and the lack of connectivity at a regional scale. Development of this reserve is unlikely to have a significant impact on CPW or other threatened fauna that may potential use the site.

Plate 5: Dead *Eucalyptus moluccana.*

Plate 6: Regulus Reserve.

Figure 4: Regulus Reserve vegetation mapping and fauna habitat.

7 Pacific and Phoenix Reserve

7.1 Flora and vegetation communities

Pacific and Phoenix Reserve is 12,510 square metres and consists of mown grass with remnant Shale Plains Woodland (CPW) previously mapped by NPWS 2002. Only 1,234 m^2 is being considered for rezoning and is shown in Error! Reference source not found. as the north east corner of the reserve.

Within the study site, the ground cover is mown which made species identification difficult. However, the dominant species would most likely be the exotic *Eragrostis curvula* (African Lovegrass) which was recorded at the site.

The shrub layer was absent apart from planted vegetation in the south-eastern corner of the reserve (**Figure 5**). These planted areas contained non-local trees *Corymbia citriodora* (Lemon-scented Gum), and *Eucalyptus bicostata* and a local native (but planted) *Corymbia maculata* (Spotted Gum).

The site also contained remnant *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis* (Forest Red Gum), which are part of Shale Plains Woodland, a sub-community of Cumberland Plain Woodland.

7.2 Fauna habitat

Fauna habitat is generally poor apart from the presence of one lopped *Eucalyptus tereticornis*, which is likely to be hollow and provide potential habitat for threatened microbats including Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

The site may provide potential foraging habitat for highly mobile threatened species including Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Cumberland Plain Land Snail searches were made but none were found. Some leaf litter is present at the base of the planted trees.

7.3 Regional context

The site has relatively poor connectivity with other native vegetation, apart from native trees retained in the urban matrix.

7.4 Impact assessment

Approximately 0.03 ha of Cumberland Plain Woodland EEC would be removed. The vegetation does not meet the condition criteria under the EPBC Act.

Therefore, removal of the vegetation from this reserve is unlikely to have a significant impact on the local occurrence of CPW given the small size of the remnant and lack of connectivity with other vegetation. In addition, the current land management practice (mowing) is preventing any natural recruitment of vegetation. However, the exotic lawn appears to be well established, so an absence of mowing would require revegetation and intensive weed management to create a native CPW ground cover and understorey.

As potential habitat is present for a number of highly mobile threatened birds and bats, an assessment of significance would be required for the following species:

Potential foraging habitat - Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Potential roosting habitat - Little Bentwing-bat, Eastern Bentwing-bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat and Greater Broad-nosed Bat.

Given the small amount of clearing required, significant impacts on these species is unlikely to result.

7.5 Recommendations

The biodiversity values of this reserve are relatively low, given the small area of CPW within the reserve and the lack of connectivity at a regional scale. Development of this reserve is unlikely to have a significant impact on CPW or other threatened fauna that may potentially use the site and the site is recommended for development.

Plate 7: CPW vegetation at Pacific and Phoenix Reserve

Plate 8: Potential hollow bearing tree.

Figure 5: Vegetation mapping of Pacific and Phoenix Reserve.

8 Spica Reserve

8.1 Flora and vegetation communities

The section of Spica Reserve proposed for rezoning is 1,500 square metres and is part of a larger reserve of 4,499 sq. m. The study site is currently surrounded by property boundaries on all side apart from the western end which joins into the rest of the reserve.

NPWS (2002) previously mapped the vegetation as Shale Plains Woodland and the site inspection confirmed this vegetation community within some western sections of the site. *Eucalyptus moluccana* (Grey Box) is present with the study site as three large remnant trees (see

Figure 6), but the health of these trees appears to be poor.

The remainder of the site is planted and consists of *Callistemon* sp., *Casuarina cunninghamiana* (River Oak), *Corymbia citriodora* (Lemon-scented Gum), *Eucalyptus tereticornis,* and *E. punctata.* A hedge of *Photinia* sp. has been planted around the edge of the site adjacent to fences.

8.2 Fauna habitat

Fauna habitat is relatively poor and no hollows were present within the vegetation. However, the site may provide potential foraging habitat for highly mobile threatened species including Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Cumberland Plain Land Snail searches were made but none were found. Some leaf litter is present at the base of the planted trees.

8.3 Regional context

The site is relatively isolated from other areas of native vegetation apart from retained remnant trees throughout the urban matrix.

8.4 Impact assessment

Shale Plains Woodland is a sub-community of Cumberland Plain Woodland (CPW). Approximately 0.05 ha of CPW EEC would be removed. The vegetation does not meet the condition criteria under the EPBC Act.

Removal of the vegetation from this reserve is unlikely to have a significant impact on the local occurrence of CPW given the small size of the remnant and lack of connectivity with other vegetation. In addition, the current land management practice (mowing) is preventing any natural recruitment of vegetation. However, the exotic lawn appears to be well established, so an absence of mowing would require revegetation and intensive weed management to create a native CPW ground cover and understorey.

As potential habitat is present for a number of highly mobile threatened birds and bats, an assessment of significance would be required for Grey-headed Flying-fox, Little Eagle and Varied Sittella.

Given the small amount of clearing required, significant impacts on these species is unlikely to result.

8.5 Recommendations

The reserve is of low conservation significance given that three remnant trees are present and the remainder of the vegetation is planted. We recommend that the site is rezoned for residential development.

Plate 9: Planted vegetation at Spica Reserve.

Plate 10: Remnant *Eucalyptus moluccana*.

Figure 6: Vegetation mapping within Spica Reserve.

9 Chameleon Reserve

9.1 Flora and vegetation communities

Chameleon Reserve is 110,296 square metres and the study site proposed for rezoning is 2,740 sq. m. NPWS (2002) mapped the vegetation to the south of the study area as Shale Plains Woodland. The site inspection confirmed that the study site does not contain remnant Shale Plains Woodland. The vegetation within the study area appears to be planted with native species and consisted of *Eucalyptus moluccana, Melaleuca decora, Casuarina cunninghamiana, E. tereticornis, E. microcorys* (Tallowwood)*, and E. racemosa* subsp. *racemosa.*

The ground cover consisted of mown lawn for the majority of the site except within the planted area along the northern boundary that had a thick layer of bark chip mulch. Ground cover species included *Einadia nutans, Ehrharta erecta* and the Class 4 Noxious Weed *Asparagus aethiopicus.*

A hedge of *Photinia* sp. has been planted along the eastern property boundary adjacent to the fence. The hedge contained *Araujia sericifera* (Moth Vine).

9.2 Fauna habitat

Fauna habitat is poor. Some leaf litter was present beneath the planted vegetation and a search for CPLS was conducted but none found. Given the young age of the vegetation, it is unlikely to form part of potential foraging habitat for threatened fauna.

9.3 Regional context

The site is relatively isolated from other stands of native vegetation and backs onto a cleared drainage reserve to the rear. The vegetation along the edges of this drainage reserve also appears to be planted. An area of Shale Plains Woodland occurs to the south of the site but will not be impacted by the proposed rezoning and residential development.

9.4 Impact assessment

As the site does not contain any EEC's or habitat for threatened fauna no assessments of significance area required.

9.5 Recommendations

The site has low ecological constraints and is recommended for development.

Plate 11: Planted vegetation along the northern boundary of Chameleon Reserve.

Plate 12: The majority of the reserve is cleared with planted native vegetation along the northern edge.

Figure 7: Vegetation mapping within Chameleon Reserve.

Conclusion

This report assesses the ecological value and development constraints of each of the six reserves, to inform the proposed rezoning and reclassification of these lands from public reserve to low density residential.

The subject sites were surveyed by ecologist, Karen Spicer, on 6 June 2016. A review of the Native Vegetation of the Cumberland Plain mapping (NPWS 2002) identified three vegetation types within the study area; Shale Gravel Transition Forest, Shale Plains Woodland and Alluvial Woodland. The field survey confirmed the presence of Shale Plains Woodland within the study area. All of the reserves surveyed may be considered for rezoning, given that the long-term viability of the Cumberland Plain Woodland is poor with no natural recruitment, the vegetation is relatively isolated, and that restoration would require extensive planting and weeding. Given this, it is unlikely that removal of vegetation at these sites would significantly impact on CPW.

Three threatened flora species have previously been recorded in the study area but were not recorded on the subject sites, and are unlikely to occur in these areas.

Potential foraging and roosting habitat has been recorded within the study area for nine threatened fauna species, namely microbats, birds, Grey-headed Flying-fox and Cumberland Plain Land Snail. Given the highly mobile nature of these species, the poor quality of habitat to be removed and that higher quality habitat is available in the surrounding landscape, any impact from the proposed rezoning and reclassification of these lands is not considered to be significant to the long-term survival of these nine threatened fauna species. It is recommended that, wherever possible, hollow bearing trees should be retained within the sites, to provide habitat for these species.

References

Laws, G. (2015). Preliminary Aboricultural Assessment Report – Proposed Residential Sub-divisions Erskine Park and St Clair Reserves. Prepared for Penrith City Council.

NPWS 2002. Native Vegetation of the Cumberland Plain.

Appendix A Flora list

Family	Scientific Name	Common Name	Spoonbill	Regulus	Dilga	Phoenix & Pacific	Spica	Chameleon
Anacardiaceae	*Schinus areira**	Pepper Tree		x				
Apocynaceae	*Araujia sericifera**	Moth Vine						x
Asparagaceae	*Asparagus aethiopicus***	Asparagus Fern						x
Casuarinaceae	*Casuarina cunninghamiana*	River Oak		x			x	x
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush						x
	Einadia trigonos	Fishweed		x			x	x
Convolvulaceae	*Ipomoea cairica**	Morning Glory					x	
Malaceae	*Photinia* sp.*	Chinese Photinia		x	x		x	x
Myrtaceae	*Callistemon* sp.	Bottlebrush		x			x	
	Corymbia citriodora	Lemon-scented Gum		x		x	x	
	Corymbia maculata	Spotted Gum				x		
	Eucalyptus bicostata					x		
	Eucalyptus eugenioides	Thin-leaved Stringybark						
	Eucalyptus fibrosa	Red Ironbark			x			
	Eucalyptus longifolia	Woollybutt						

Family	Scientific Name	Common Name	Spoonbill	Regulus	Dilga	Phoenix & Pacific	Spica	Chameleon
	Eucalyptus moluccana	Grey Box		x	x	x	x	x
	Eucalyptus racemosa subsp. *racemosa*							x
	Eucalyptus tereticornis	Forest Red Gum	x	x		x	x	x
	Melaleuca decora			x				x
	Melaleuca nodosa	Prickly-leaved Paperbark						
Poaceae	*Ehrharta erecta**	Panic Veldtgrass		x			x	x
	*Eragrostis curvula**	African Lovegrass		x		x		
	*Pennisetum clandestinum**	Kikuyu					x	
Proteaceae	*Grevillea robusta*	Silky Oak		x				

* Exotic vegetation, ** Noxious weeds

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