FLORA AND FAUNA ASSESSMENT

Coca-Cola NSW Infrastructure Program PN 2147

For:

COCA-COLA AMATIL

July 2006

Final Report

Cumberland Ecology
PO Box 2474, Carlingford Court 2118

Report No. 6025RP1

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or recommendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology

Approved by:	David Robertson
Position:	Project Director
Signed:	David Robertson
Date:	*21 July, 2006*

Table Of Contents

Table Of Contents

Table Of Appendices

List of Tables

List of Figures

List of Photographs

Executive Summary

PURPOSE

The purpose of this report is to assess the flora and fauna values and potential ecological impacts of the expansion of warehousing facilities at the Coca-Cola Amatil site in Northmead, NSW.

SITE LOCATION AND DESCRIPTION

The Coca-Cola Amatil warehouse is located between 102-128 Briens Rd, Northmead, adjacent to Toongabbie Creek. Westmead Hospital is on the opposite bank of the creek. Northmead is part of Parramatta City Council.

Coca-Cola Amatil has a number of warehouses and offices in the study area as well as a number of parking lots. There are trees planted around many of the buildings and parking lots. A thick patch of vegetation exists along a drainage line. Toongabbie Creek runs along the southern boundary of the study area. The creek corridor is up to approximately 20m wide (from the boundary fence to the creek). This area is mainly overgrown with a large variety of weeds.

PROPOSED DEVELOPMENT

Coca-Cola Amatil proposes to upgrade the existing infrastructure located at Briens Rd, Northmead. Currently the land houses two large warehouses, a variety of office buildings, and parking areas. The following works are proposed:

- site preparation works;
- construction and use of a new 32 metre high and 128 metre long automated high-bay warehouse;
- adaptation of an existing warehouse to accommodate three new production lines and manufacturing services including boiler, refrigeration plant and compressor;
- construction and use of a new building to house a canteen, offices and training facilities;
- construction of a new gatehouse and driver amenities;

- upgrading and relocation of the on-site stormwater drainage system;
- implementation of access and traffic circulation improvements, including parking and new entrances; and
- site landscaping.

Coca-Cola Amatil plans to have the facility operational by July 2008.

FLORA AND FAUNA ASSESSMENT

A flora and fauna survey was conducted on the 12th May, 2006. The site was inspected in order to obtain an overview of the nature, distribution and variation of plant communities in the study area. Lists were made of flora species present along two transects: Toongabbie Creek and the open stormwater drain. Notes were made of fauna habitat features as well as any fauna species observed.

No threatened species or communities were located in the study area. Vegetation in the study area is highly degraded, with little left of the original vegetation community. A large number of weed species were recorded, with few native species. Many small birds, both native and introduced, were utilising the thick undergrowth of weeds.

IMPACTS

No threatened species, populations or communities will be impacted by this development. Safeguards will be required to be put in place during demolition and construction works to ensure that the proposed development does not impact negatively on Toongabbie Creek. The most significant pollutant is likely to be sediment, caused by the disturbance of soil and the removal of the vegetation and its stabilising effect on surface soils. Other contamination may include spillage from machinery such as fuels, oils and grease. Sedimentation has the potential to impact on aquatic biota through alteration of their habitat and through impacting on water quality.

RECOMMENDATIONS

Care must be taken to avoid run-off of pollutants into Toongabbie Creek and to prevent sedimentation of the creek and transfer of weeds downstream. Sediment control devices must be put in place during demolition and construction works to prevent pollution of the creek.

CONCLUSION

It is expected that there will be insignificant negative impact on native threatened species, population or communities as a result of this proposal. The conclusions of this report are then that there will be no significant adverse environmental impacts as a result of the proposed development, and as such, there is no resulting ecological difficulty with the project being approved.

Chapter 1

Introduction

1.1 Purpose

The purpose of this report is to assess the flora and fauna values and potential ecological impacts of the expansion of warehousing facilities at the Coca-Cola Amatil site in Northmead, NSW. The objectives of this report are to:

- Identify flora and fauna species present or likely to occur within the study area;
- Determine the presence of threatened species, endangered populations, or endangered ecological communities (as listed on the Schedules of the NSW TSC Act 1995 and the Commonwealth EPBC Act 1999), and map their distribution;
- Describe fauna habitats and fauna usage of the subject site, and assess the extent to which the site functions as a wildlife corridor;
- Formally assess the impacts of the proposed development in terms of Section 3A and 5A of the *Environmental Planning and Assessment Act 1979*;
- Assess the ecological constraints and opportunities for development on the subject site; and
- Where relevant, suggest mitigation measures or management recommendations to reduce the impacts of the proposed development on flora and fauna.

1.2 Site Location

The Coca-Cola Amatil warehouse is located between 102-128 Briens Rd, Northmead, adjacent to Toongabbie Creek. Westmead Hospital is on the opposite bank of the creek. Northmead is part of Parramatta City Council.

1.3 Site Description

Coca-Cola Amatil has a number of warehouses and offices in the study area as well as a number of parking lots. There are trees planted around many of the buildings and parking

lots. A thick patch of vegetation exists along a drainage line. Toongabbie Creek runs along the southern boundary of the study area. The creek corridor is up to approximately 20m wide (from the boundary fence to the creek). This area is mainly overgrown with a large variety of weeds.

1.4 Proposed Development

Coca-Cola Amatil proposes to upgrade the existing infrastructure located at Briens Rd, Northmead. Currently the land houses two large warehouses, a variety of office buildings, and parking areas. The following works are proposed:

- site preparation works;
- construction and use of a new 32 metre high and 128 metre long automated high-bay warehouse;
- adaptation of an existing warehouse to accommodate three new production lines and manufacturing services including boiler, refrigeration plant and compressor. The expansion of the bottling lines will not affect the development;
- construction and use of a new building to house a canteen, offices and training facilities;
- construction of a new gatehouse and driver amenities;
- upgrading and relocation of the on-site stormwater drainage system;
- implementation of access and traffic circulation improvements, including parking and new entrances; and
- site landscaping.

Coca-Cola Amatil plans to have the facility operational by July 2008.

1.5 Terminology

The following terminology is used throughout the report:

- Subject site is defined as the parcels of land on which Coca-Cola Amatil is located;
- Study area refers to the subject site and immediate surrounds that may be indirectly affected by the proposal, particularly the land along Toongabbie Creek;
- Locality refers to the land within a 5km radius of the subject site;

- TSC Act abbreviates the *Threatened Species Conservation Act 1995*;
- EPBC Act abbreviates the *Environment Protection and Biodiversity Conservation Act 1999*;
- EP&A Act abbreviates the *Environmental Planning and Assessment Act 1979*;
- DEC abbreviates Department of Environment and Conservation (NSW);
- LGA abbreviates Local Government Area;
- Threatened species refers to those flora and fauna species listed as vulnerable, endangered or critically endangered under the TSC Act or EPBC Act; and
- Assessments of Significance refer to the Section 5A Assessments of threatened species or endangered ecological communities under the EP&A Act.

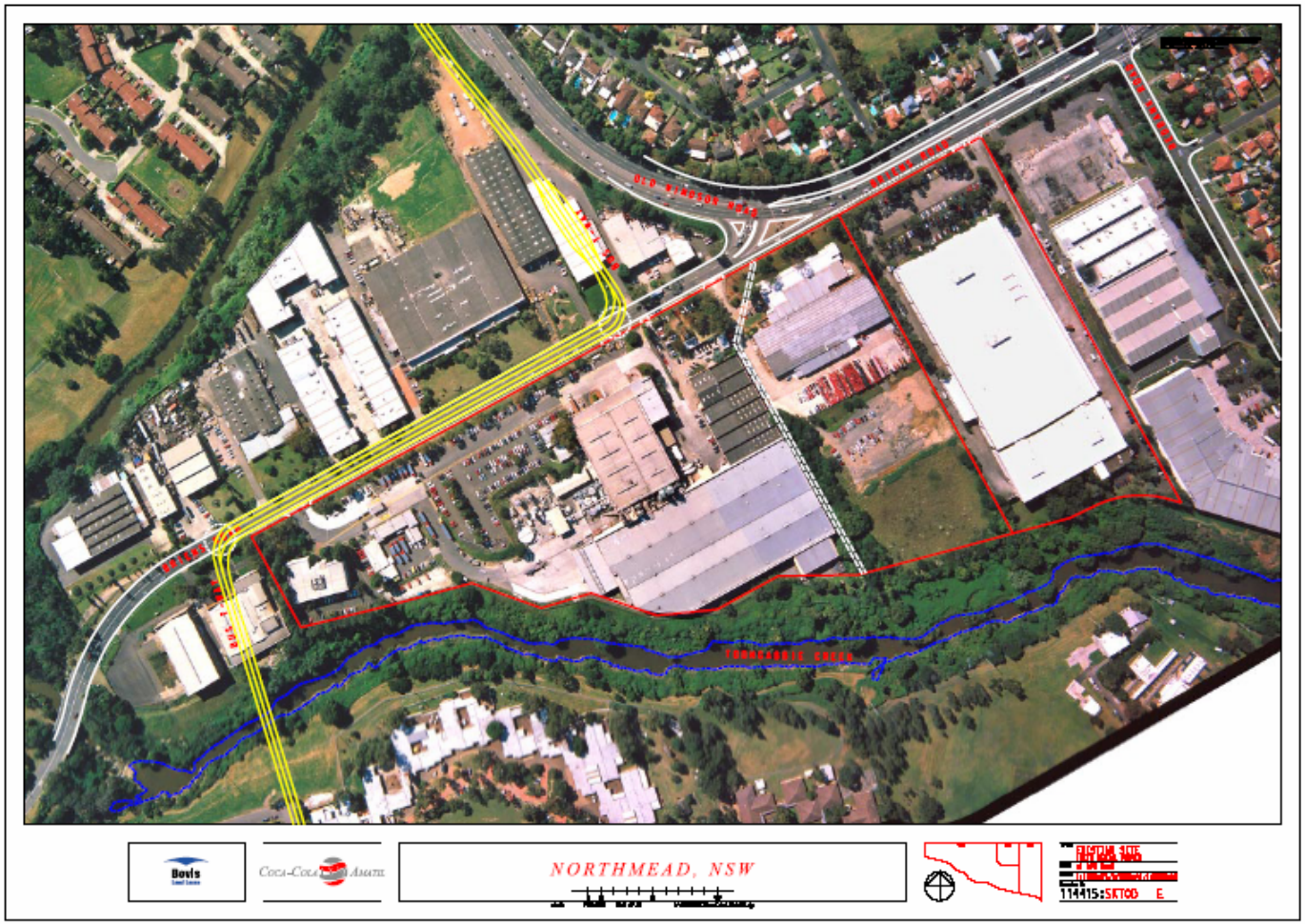

Figure 1.1 LOCATION OF SUBJECT SITE

Chapter 2

Background Information

2.1 Assessment Process

Coca-Cola Amatil is seeking approval for the project through the Department of Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*. The new Part 3A applies to State government infrastructure projects, developments previously classed as State significant, and other projects, plans or programs declared by the Minister. The aim of this Part is to facilitate major project infrastructure delivery and encourage economic development, while at the same time strengthening environmental safeguards (Department of Infrastructure 2005).

The flora and fauna assessment must comply with all relevant Commonwealth and State legislation regarding threatened species and communities. Attention must also be paid to any government policies which may apply to the study area.

2.2 Other Relevant Legislation and Policies

2.2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects the environment, particularly matters of National Environmental Significance. It is managed by the Commonwealth Department of Environment and Heritage (DEH). There are seven matters of national environmental significance under the EPBC Act:

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance (Ramsar Wetlands);
- Listed threatened species and ecological communities;
- Listed migratory species;
- The Commonwealth marine area; and

- Nuclear actions, including uranium mining.

A number of species and communities in Sydney are listed as threatened under the EPBC Act.

2.2.2 Threatened Species Conservation Act 1995

The NSW *Threatened Species Conservation Act 1995* (TSC Act) identifies and protects native plants and animals in danger of becoming extinct. Schedule 1 of the TSC Act lists threatened species, populations and ecological communities and species that are endangered or presumed extinct. Schedule 2 lists vulnerable species and Schedule 3 lists key threatening processes. The TSC Act is administered by the Department of Environment and Conservation (DEC). The DEC has issued guidelines for the assessment of threatened flora and fauna (DEC (NSW) 2004).

2.2.3 State Environmental Planning Policy Number 19 (SEPP 19) – Bushland in Urban Areas

The aims of SEPP 19 are to protect and preserve bushland within urban areas for reasons including:

- The long-term survival of plant and animal communities;
- The protection of rare or threatened flora and fauna;
- The protection of flora and fauna habitats;
- The protection of corridors and vegetation links between areas of bushland;
- The protection of bushland for the purpose of maintaining surface soil stability; and
- The protection of existing landforms, such as drainage lines and watercourses.

Bushland in this policy is defined to include land on which there is vegetation which is either a remainder of the natural vegetation of the land or, if altered, is still representative of the structure and floristics of the natural vegetation. The study area does not contain any bushland under this definition, nor does it adjoin any area of bushland zoned for environmental protection. The proposed development will therefore not impact any native bushland, however protection of watercourses is important under the project.

2.2.4 Parramatta City Council Biodiversity Plan

Parramatta City Council (PCC) has produced a Biodiversity Plan for the LGA (Parramatta City Council 2003). Biodiversity in Parramatta is subject to a wide range of impacts from urban surrounds and development. Much of the remnant bushland and waterways are

degraded, which have led to a loss of habitat for many species. Parramatta City Council has instigated a number of programs to monitor, conserve and enhance biodiversity, including:

- Natural Resources Management Program;
- Bushland Protection and Noxious Weeds Program; and
- Waterways Maintenance and Rehabilitation Program.

Principles of the Biodiversity Plan include the following (Parramatta City Council 2003):

- Apply a precautionary approach where there is a chance that a plan or activity may lead to irreversible biodiversity consequences;
- Conserve biodiversity within a regional context;
- Integrate and balance biodiversity conservation and management activities with broader environmental, social and economic considerations;
- Maintain and enhance existing biodiversity (no net loss);
- Minimise natural area fragmentation and promote corridor linkages whilst recognising the different habitat requirements of individual species;
- Give a high priority to the conservation and recovery of threatened species, populations and communities;
- Reduce the level of negative biodiversity impacts and threatening processes; and
- When restoring ecosystems, aim to represent those ecological communities and systems originally existing at that site.

Chapter 3

Ecological Assessment Methods

3.1 Literature and Database Review

A database review was carried out to determine if any threatened species were likely to occur in the area. The NSW Government's BioNet database was accessed and a threatened species report generated for the Parramatta LGA (NSW Government 2006). An EPBC Protected Matters search was used to provide a list of Commonwealth protected fauna and flora in the locality of the subject site. Relevant reports from previous ecological studies of the area were also reviewed.

3.2 Site Inspection

The study area was visited on May 12th, 2006, by a botanist and a zoologist from Cumberland Ecology. The purpose of this visit was to determine the following:

- Flora and fauna species and ecological communities present;
- Fauna habitat present; and
- Likelihood of occurrence of threatened species and communities.

3.2.1 Flora

The flora survey was conducted by botanist, Mr David Thomas. The site was inspected in order to obtain an overview of the nature, distribution and variation of plant communities in the study area. Lists were made of species present along two transects: Toongabbie Creek and the open stormwater drain.

Notes were made regarding species presence, plant community structure and dominant species, the proportion of exotic species present, impacts that could affect bushland viability, and other features of the site that would influence vegetation.

Plant communities were described based on the dominant canopy species and community structure according to Specht (Specht 1970). Plant species nomenclature conforms to Harden (Harden 1990-1993).

The potential conservation significance of communities and species was based on the *Threatened Species Conservation Act* 1995 (TSC Act) Schedules, *Environmental Protection & Biodiversity Conservation Act* 1999 (EPBC Act), Rare or Threatened Australian Plants (ROTAP) (Briggs and Leigh 1995); and Benson & Howell (Benson and Howell 1994).

At the time of the survey weather conditions were favourable for plant growth and production of features required for identification of most species. However, owing to the survey relying on a single inspection of any one location within this study area, it is unlikely that all species present have been recorded. Despite this, it is probable that the majority of species have been recorded and that issues including conservation significance of the flora, condition and viability of bushland, and likely impact on native vegetation have been satisfactorily assessed.

3.2.2 Fauna

Fauna species and habitat features were recorded during the site inspection by Dr Kirsten Crosby. Bird species were recorded if positively identified by sight or call. The day was overcast and cool, so reptile activity was limited. The nature and extent of fauna habitats on the subject site were assessed and areas where threatened fauna species could reside or forage were identified, including making a note of food tree species. Site assessments 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. An assessment of the structural complexity of vegetation, the age structure of the forest and the nature and extent of human disturbance throughout the study area was also undertaken and considered. Structural features considered included the extent and nature of the understorey and ground stratum, extent of canopy and flowering characteristics.

Chapter 4

Ecological Assessment Results

4.1 Literature and Database Review

A small number of threatened species occur or are known to have occurred in Parramatta LGA. A number of endangered ecological communities are known to occur in the Cumberland Catchment Management Authority (CMA) Sub-region. These are shown in **Table 4.1** and **Table 4.2**.

Table 4.1 THREATENED SPECIES IN PARRAMATTA LGA, AND LIKELIHOOD OF OCCURRENCE IN STUDY AREA

Scientific Name	Common Name	Status	Habitat requirements	Likelihood of Occurrence
Litoria aurea	Green and Golden Bell Frog	Endangered	Marshes, dams or streams with Typha (bullrushes) or Eliocharis (spikerushes)	Low
Ninox connivens	Barking Owl	Vulnerable	Roost along creek lines, amongst dense vegetation	Possible
Xanthomyza phrygia	Regent Honeyeater	Endangered	Dry open woodland or riparian forests of River She-oak (Casuarina cunninghamiana)	Low
Dasyurus maculatus	Tiger Quoll	Vulnerable	Range of habitat types	Low
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Feed on nectar and pollen of native trees and also fruit	Possible
Mormopterus norfolkensis	Eastern Little Mastiff-bat	Vulnerable	Dry forest and woodland, roost in tree hollows and in man-made structures	Possible
Miniopterus schreibersii oceanensis	Common Bent-wing Bat	Vulnerable	Forage over forested areas, roost in caves, stormwater drains, buildings and so on	Possible
Scoteanax	Greater Broad-	Vulnerable	Range of habitats, roosts in	Possible

Table 4.1 THREATENED SPECIES IN PARRAMATTA LGA, AND LIKELIHOOD OF OCCURRENCE IN STUDY AREA

Scientific Name	Common Name	Status	Habitat requirements	Likelihood of Occurrence
rueppellii	nosed Bat		hollows and buildings, forages along creek and river corridors	
Acacia pubescens	Downy Wattle	Vulnerable	Open forests on clay soil	Low
Persoonia nutans	Geebung	Endangered	Open forests on clay soil and alluvium of the Cumberland Plain	Possible
Pimelea spicata	Rice Flower	Endangered	Found amongst grasses in open forest on clay soil	Low
Pultenaea pedunculata	Bush Pea	Endangered	Open places on clay soil	Possible

Table 4.2 ENDANGERED ECOLOGICAL COMMUNITIES IN THE CUMBERLAND CMA SUB-REGION, AND THEIR LIKELIHOOD OF OCCURRENCE IN THE STUDY AREA

Scientific Name	Common Name	Likelihood of Occurrence
Blue Gum High Forest	Blue Gum High Forest	Low
Castlereagh Swamp Woodland Community	Castlereagh Swamp Woodland Community	Low
Cooks River/ Castlereagh Ironbark Forest in the Sydney Basin Bioregion	Cooks River/ Castlereagh Ironbark Forest in the Sydney Basin Bioregion	Low
Cumberland Plain Woodland	Cumberland Plain Woodland	Low
Hygrocybeae Community of Lane Cove Bushland Park	Hygrocybeae Community of Lane Cove Bushland Park	Low
Moist Shale Woodland in the Sydney Basin Bioregion	Moist Shale Woodland in the Sydney Basin Bioregion	Low
River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	River-Flat Eucalypt Forest on Coastal Floodplains	Low
Shale Gravel Transition Forest in the Sydney Basin Bioregion	Shale Gravel Transition Forest in the Sydney Basin Bioregion	Low
Shale/Sandstone Transition Forest	Shale/Sandstone Transition Forest	Possible

Table 4.2 ENDANGERED ECOLOGICAL COMMUNITIES IN THE CUMBERLAND CMA SUB-REGION, AND THEIR LIKELIHOOD OF OCCURRENCE IN THE STUDY AREA

Scientific Name	Common Name	Likelihood of Occurrence
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Swamp oak floodplain forest	Low
Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Swamp Sclerophyll Forest on Coastal Floodplains	Low
Sydney Turpentine-Ironbark Forest	Sydney Turpentine-Ironbark Forest	Low
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	Western Sydney Dry Rainforest in the Sydney Basin Bioregion	Low

4.2 Flora

Vegetation in the study area is highly degraded, with little resemblance to the original vegetation community. One generalised plant community was recorded in the study area: exotic scrub (see Photograph 4.1). Appendix A contains a list of all flora species recorded during the survey.

The vegetation along Toongabbie Creek was considered a variant of exotic scrub as it had been modified by early stages of rehabilitation work. This mainly comprised removal of exotic trees, especially the noxious weeds *Cinnamomum camphora* (Camphor Laurel) and *Ligustrum* spp. (Privets).

The remaining vegetation was largely herbaceous with intertwining introduced vines and early regrowth of exotic trees and shrubs. Other typical species included: *Ricinis communis* (Castor Oil Plant) introduced Asteraceae, *Sida rhombifolia* (Paddys Lucerne), *Eragrostis curvula* (African Love-grass), *Anredera cordifolia* (Madeira Vine), *Cardiospermum grandiflorum* (Balloon Vine), *Ipomoea purpurea* (Purple Morning Glory) and *Tradescantia fluminensis* (Wandering Jew).

Indigenous species were limited to small numbers of: *Acacia decurrens*, *Acmena smithii* (Lilly Pilly), *Pittosporum undulatum* (Sweet Pittosporum), two shrubs species, *Pteridium esculentum* (Bracken Fern) and five herbs and vines. Some locally native species had been planted as a part of earlier rehabilitation work - *Eucalyptus saligna* (Blue Gum) and *Kunzea ambigua* (Tick Bush).

The small drainage line (dotted white line on Figure 1.1) largely contained the noxious weeds *Cinnamomum camphora*, *Ligustrum* spp. and *Lantana camara* (Lantana) (see Photograph 4.2). *Tradescantia fluminensis* was the dominant ground cover, with *Eragrostis curvula* being very common at the margins. Indigenous species were rare in this area but comprised: *Acacia* spp., *Pittosporum undulatum*, *Lomandra longifolia* (Spiny-headed Mat-rush), *Hardenbergia violacea* and *Oplismenus imbecillis* (a grass).

Vegetation along the creek has been mapped as Shale/Sandstone Transition Forest with canopy cover of less than 10% (NSW NPWS 2002) which is listed as an Endangered Ecological Community (EEC) under the TSC Act. However, the vegetation of the study area is so degraded that it could no longer be considered a native vegetation community. This is owing to the general lack of indigenous species and modification of habitat to the extent that it would be impossible for natural regeneration to re-establish vegetation representative of the natural community. Therefore the Shale/Sandstone Transition Forest endangered ecological community does not occur in the study area, nor does the existing community resemble any other endangered ecological communities. No threatened or other significant flora species were observed in the study area.

The original vegetation along the banks of Toongabbie Creek appears to have been Blue Gum Open Forest. This could be considered a variant of Blue Gum High Forest on alluvial soil. It is possible that Shale Sandstone Transition Forest occurred further away from the creek, as indicated for an adjacent area in the vegetation map for the Cumberland Plain (NSW NPWS 2002).

Photograph 4.1 **Weeds along Toongabbie Creek with Blue Gums in the distance**

Photograph 4.2 Stormwater channel with Lantana in the background

4.3 Fauna Habitat

Fauna habitat was sparse. Main habitat features included a thick shrubby understorey and dense creekline vegetation along the stormwater drain. These areas provided habitat for small birds. Rodents are also likely to use the areas of thick understorey, however none were seen. The banks of Toongabbie Creek were steep clay soil. The upper banks held sandstone rocks, which may have been placed for stability. These areas would provide habitat for snakes. Rubbish piles, together with the thick understorey provide habitat for foxes. No hollow-bearing trees were located in the study area. Large Sydney Blue Gums (*Eucalyptus saligna*) are present downstream from the study area. These probably provide foraging and also roosting habitat for a range of species.

4.4 Fauna Species

Low diversity of fauna was found in the subject area. A range of bird species, both native and introduced, were, however, recorded (see **Table 4.3**). Small passerine birds (Fairy Wrens, Silvereyes and Sparrows) were present in large numbers in the understorey and shrubs. Other species were present in small numbers. Staff at the site also mentioned the occurrence of Red-bellied Black Snakes (*Pseudechis porphyriacus*), Eastern Brown Snakes (*Pseudonaja textilis*) and the introduced Fox (*Vulpes vulpes*).

Table 4.3 BIRDS RECORDED IN THE STUDY AREA

Scientific Name	Common Name	Habitat
Accipiter novaehollandiae	Grey Goshawk	Flying
Acridotheres tristis	*Indian Myna	Shrubs, trees
Anas superciliosa	Pacific Black Duck	Creek
Anthochaera carunculata	Red Wattlebird	Shrubs, trees
Corvus coronoides	Australian Raven	Flying
Egretta novaehollandiae	White-faced Heron	Flying
Gymnorhina tibicen	Australian Magpie	Shrubs, trees
Hirundo neoxena	Welcome Swallow	Flying
Malurus cyaneus	Superb Fairy Wren	Thick undergrowth
Manorina melanocephala	Noisy Miner	Shrubs, trees
Meliphagus lewinii	Honeyeater	Shrubs, trees
Passer domesticus	*Sparrow	Shrubs, trees
Petroica multicolor	Scarlet Robin	Shrubs, trees
Pycnonotus jocosus	*Red-whiskered Bulbul	Shrubs, trees
Rhipidura fuliginiosa	Grey Fantail	Shrubs, trees
Zosterops lateralis	Silvereye	Shrubs, trees

*Notes: * Introduced*

4.5 Threatened Species and Communities

No threatened species were identified in the study area. Vegetation is degraded and does not conform to any native community type, let alone an endangered ecological community.

Chapter 5

Potential Impacts of the Proposal

5.1 Flora

The proposed development will result in the removal of some native vegetation, mainly along the current stormwater drain. No plant communities listed as threatened under the TSC Act or Commonwealth EPBC Act occur in the study area. No threatened plant species occur in the study area. A variety of weed species will be removed along the stormwater channel as a result of the proposal. Care must be taken to ensure that neither weed seeds nor vegetative parts enter Toongabbie Creek during the construction process.

5.2 Fauna

No threatened fauna were identified in the study area. There is a possibility, however, that some threatened species could utilise the vegetation. Threatened fauna species which have been identified from the BioNet database as potentially occurring or potentially utilising the subject site are listed in **Table 4.1**. It is considered unlikely that they will be adversely affected by the proposed development; however, formal Assessment of Significance tests have been carried out for these fauna species (Appendix B).

A range of bird species currently make much use of the thick weed understorey along Toongabbie Creek. Currently, some rehabilitation of this area is underway, however it was noted that the diverse weed community has been replaced by a small number of natives (Sydney Blue Gum, Sydney Golden Wattle and Green Wattle), reducing habitat for these birds.

5.3 Habitat Corridor Function

The riparian zone along Toongabbie Creek is a habitat corridor for a range of vertebrate species. This corridor will not be negatively impacted by the proposed development.

5.4 Aquatic Habitats

The proposed development has the potential to negatively impact on Toongabbie Creek if safeguards are not put in place during demolition and construction works. Surface water runoff from areas disturbed by construction has the potential to contain considerable levels of pollution. The most significant pollutant is likely to be sediment, caused by the disturbance of soil and the removal of the vegetation and its stabilising effect on surface soils. Other contamination may include spillage from machinery such as fuels, oils and grease. Furthermore, the disturbance to soils could deposit increased levels of salts and nutrients. Sedimentation has the potential to impact on aquatic biota through alteration of their habitat and through impacting on water quality. Surface water runoff can also act as a vector for transporting weeds to other areas.

Chapter 6

Recommendations and Conclusions

6.1 Recommendations

6.1.1 Vegetation

Due to the lack of native vegetation in the subject site, and the poor condition of vegetation along the adjacent Toongabbie Creek, there will be insignificant negative impact from the proposed development on the ecology of the area. Possible mitigation measures include:

- The retention of native vegetation where possible;
- The protection of areas to be conserved adjacent to the proposed development from possible impacts during and post-construction; and
- Treatment of wastewater runoff to avoid contamination of watercourses.

6.1.2 Aquatic Habitats

Care must be taken to avoid run-off of pollutants into Toongabbie Creek and to prevent sedimentation of the creek. Runoff can also transfer weeds downstream. Sediment control devices must be put in place during demolition and construction works to prevent pollution of the creek.

6.2 Conclusions

The Coca-Cola site at Northmead and the adjoining section of Toongabbie Creek contained exotic scrub with scattered small numbers of locally indigenous species. The latter included naturally occurring and planted species. No threatened flora was recorded in or adjacent to the study area. All the vegetation in the study area was highly degraded and any development would have an insignificant impact on conservation of native plant community or species. The removal of all vegetation in the small drainage line within the Coca-Cola property would result in the local loss of *Acacia parramattensis* and *Oplismenus imbecillis* from the property.

The conclusions of this report are that there will be no significant adverse environmental impacts as a result of the proposed development, and as such, there is no resulting ecological difficulty with the project being approved.

References

Benson, D. and Howell, J. (1994) **The natural vegetation of the Sydney 1:100 000 map sheet** *Cunninghamia* 3(4): 677-995.

Briggs, J.D. and Leigh, J.H. (1995) **Rare or Threatened Australian Plants** CSIRO, Canberra.

Churchill, S. (1998) **Australian Bats** Reed New Holland, Sydney.

DEC (NSW) (2004) **Threatened Biodiversity Survey and Assessment: Guidelines for Development and Activities. Working Draft**. DEC (NSW), Sydney.

DEC (NSW) (2005) **Recovering bushland on the Cumberland Plain: Best Practice Guidelines for the Management and Restoration of Bushland** Department of Environment and Conservation (NSW), Sydney South.

Department of Infrastructure, Planning and Natural Resources (2005) **Commencement of Part 3A (Major Projects) of the EP&A Act** *DIPNR Circular* PS 05-006.

Harden, G.J. (1990-1993) **Flora of NSW** Volumes 1-4. University of New South Wales Press, Kensington.

NSW Government (2006) **BioNet** http://www.bionet.nsw.gov.au/

NSW NPWS (2001) **Threatened Species Information: Grey-headed Flying-fox** NSW National Parks and Wildlife Service, Hurstville.

NSW NPWS (2002) **Native Vegetation Maps of the Cumberland Plain Western Sydney** NSW National Parks and Wildlife Service, Sydney.

NSW NPWS (2003) **Draft Recovery Plan for the Barking Owl *Ninox connivens*** NSW National Parks and Wildlife Service, Hurstville.

Parramatta City Council (2003) **Parramatta Biodiversity Plan** Parramatta City Council, Parramatta.

Specht, R.L. (1970) **Vegetation** The Australian Environment 4th edition. CSIRO Melbourne University Press, Melbourne.

Appendix A

Species Lists

Table A.1 PLANT SPECIES RECORDED IN THE STUDY AREA

Species	Name	Noxious Weed Category	Creekline	Stormwater Channel
Trees				
**Acer negundo*	Hard Alder			r
Casuarina glauca	Swamp Oak		r	
Acacia decurrens	Green Wattle		o	r
Acacia parramattensis	Parramatta Wattle			r
**Erythrina crista-gali*	Thorny Coral Tree	W4b		o
**Cinamomum camphora*	Camphor Laurel	W4d	c	v
**Morus alba*	Mulberry			r
Acmena smithii	Lilly Pilly		o	
Tristaniopisis laurina	Water Gum		r	
**Ligustrum lucidum*	Large-leaved Privet	W4b	o	c
Pittosporum undulatum	Sweet Pittosporum		r	r
**Salix babylonica*	Weeping Willow	W4g		r
Shrubs				
**Ricinis communis*	Castor Oil Plant	W2	c	
Acacia falcata	Sickle Wattle		o	
**Senna pendula* var *glabrata*	Cassia	W4b	r	
Eucalyptus saligna	Blue Gum		o - pl	
Kunzea ambigua	Tick Bush		r - pl?	
**Ligustrum sinense*	Small-leaved Privet	W4b	c	v
Bursaria spinosa	Blackthorn		r	r
**Cestrum parqui*	Green Cestrum	W2	o	r
Solanum aviculare	Kangaroo Apple		o - pl?	
**Solanum mauritianum*	Tobacco Weed		o	r
**Lantana camara*	Lantana	W2	o	v
**Phoenix canariensis*	Canary Is. Date Palm			r
Herbs - Fern				
Pteridium esculentum	Bracken Fern		c	
Herbs - Dicots				

Table A.1 PLANT SPECIES RECORDED IN THE STUDY AREA

Species	Name	Noxious Weed Category	Creekline	Stormwater Channel
**Alternanthera philoxeroides*	Alligator Weed	W1	o	
**Amaranthus* sp			r	
**Foeniculum vulgare*	Fennel		o	
**Ageratina adenophora*	Crofton Weed	W2/3	o	r
**Bidens pilosa*	Farmers Friends		v	r
**Cirsium vulgare*	a Thistle		r	
**Conyza sp*	a Fleabane		c	r
**Lactuca seriola*			r	
Sigesbeckia orientalis			r	
**Solvia* sp	Bindii		r	
**Sonchus oleraceus*	Sow Thistle		r	
**Tagetes minuta*	Stinking Roger		c	
**Xanthium* sp	Bathurst Burr	W2/3	r	
**Brassica fruticulosa*			o	
**Cardamine sp*			r	
**Rorripa nasturtium-aquaticum*	Water Cress		o	
**Chenopodium album*	Fat Hen		r	
Einadia nutans ssp linifolia			r	
**Trifolium repens*	White Clover		r	
**Modiola caroliniana*				
**Sida rhombifolia*	Paddys Lucerne		c	r
**Acetosa sagittata*	Turjey Rhubarb	W4b	r	
Persicaria decipiens			r	
Persicaria sp			o	
**Solanum nigrum*	Blackberry Nightshade		o	
**Solanum sp*		?W2/3	r	
**Verbena officinalis*	Small-flowered Purpletop		o	
Herbs - Monocots				
**Tradescantia fluminensis*	Wandering Jew	W4c	c	c
**Cyperus* sp			o	r

Table A.1 PLANT SPECIES RECORDED IN THE STUDY AREA

Species	Name	Noxious Weed Category	Creekline	Stormwater Channel
Lomandra longifolia	Spiny-headed Mat-rush			r
**Arundo donax*	Giant Reed	W2/4a	r	
**Cortaderia selloana*	Pampas Grass	W2	r	r
**Cynodon dactylon*	Couch Grass		o	o
**Digitaria sanguinalis*	Summer Grass		o	
**Eleusine indica*	Crowsfoot Grass		o	
**Eragrostis curvula*	African Love-grass	W2/3	v	c
Oplismenus imbecillis				r
**Paspalum dilatatum*	Paspalum		o	
**Pennisetum clandestinum*	Kikuyu		o	
**Setaria gracilis*	Slender Pigeon Grass		o	
**Setaria palmifolia*				r
Vines				
**Araujia sericifera*	Moth Vine	W4c	o	r
**Anredera cordifolia*	Madeira Vine	W4c	c	r
**Ipomoea indica*	Morning Glory	W4c	o	r
**Ipomoea purpurea*	Purple Morning Glory		c	
Hardenbergia violacea	Purple Coral Pea		r	c
**Rubus fruticosus*	Blackberry	W2	o	
**Cardiospermum grandiflorum*	Balloon Vine	W4c	v	

Appendix B

Assessments of Significance

B.1 Introduction

An Assessment of Significance (7 Part Test under Section 5A of the EP&A Act) is provided for any threatened species, population or community which may be impacted by the proposal. This assessment recently replaced the old "8 Part Test". Threatened species listed under the TSC Act and EPBC Act that have been found or have the potential to occur on the subject land at Northmead and for which this procedure was carried out include:

- Barking Owl
- Grey-headed Flying Fox;
- Microchiropteran bats.

No threatened plants or communities are considered likely to occur in the study area.

B.2 Assessments of Significance

B.2.1 Barking Owl (Ninox connivens)

The Barking Owl occurs at low densities throughout its range in eastern and south-eastern Australia. It roosts in dense vegetation, particularly in riparian zones, by day and hunts arboreal marsupials in open or closed sclerophyll forest or woodlands.

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,

The Barking Owl has been recorded in the locality of the subject site but there are no suitable hollow bearing trees in the study area for nesting habitat for this species. Some of these habitat trees occur upstream and downstream of the study area. Given the large home range of the species (pairs maintain and hunt throughout a home range that may be over 1000 ha), the presence of suitable adjacent habitat and its ability to adapt to disturbance within its home range, it is unlikely that the viability of the local population will be adversely affected by the proposed development.

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,

No endangered populations of this species have been listed in Schedule 1 Part 2 of the TSC Act 1995 within the region.

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.

Not applicable.

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.

A small area of vegetation is proposed to be cleared for the development. Roosting or nesting habitat is unlikely to be available to this species in this area due to the lack of suitable nesting hollows; therefore, the proposal is not expected to affect the Barking Owl habitat in this area to a significant extent.

The proposal is not likely to fragment or isolate any areas of habitat for this species as it is highly mobile. The species is capable of flying over developed areas.

The subject site only affords minimal habitat for the species. As the Barking Owl is highly mobile, it is likely to use a much broader area of habitat. Therefore the land affected by the proposal is not important habitat for the species.

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

No critical habitat for this species has currently been identified by the Director-General of the DEC.

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

A draft recovery plan for the Barking Owl has been prepared (NSW NPWS 2003). The overall objective of this plan is *"to ensure the long term persistence of the Barking Owl in*

NSW." No specific objectives directly relate to the proposal as these are more focussed on increasing the understanding of the species, public awareness and the coordination of this recovery plan with threat abatement plans, corridor strategies and other recovery plans. However, the proposal is not inconsistent with these objectives. Although some highly degraded habitat will be removed for the proposed development, potential habitat for the species will be retained in riparian areas.

The threat abatement plan for predation by the red fox is relevant to this species. The proposal is not inconsistent with these objectives, which focus on fox control programs.

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 Barking Owl is threatened by or the proposal will further impact the species through the following processes:

- Clearing of native vegetation – the proposal may clear potential diurnal roosting habitat which is highly degraded; and
- Predation by the European Red Fox – fledgings can become prey items for foxes. Foxes already exist on the subject land and are not likely to be increased in number by the proposal.

Conclusion

The proposal will not have a significant impact on a local population of the Barking Owl.

B.2.2 Grey-headed Flying Fox

This species feeds on a wide variety of flowering and fruiting plants including *Eucalyptus*, *Melaleuca, Banksia* and rainforest trees and vines (NSW NPWS 2001). Grey-headed Flying Foxes roost in trees at specific camp sites, generally located within 20 km of a regular food source, however, they migrate within their range in response to food availability throughout the year (NSW NPWS 2001). Grey-headed Flying Foxes breed once a year, and young are born generally around October, following a six-month gestation period (NSW NPWS 2001).

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,

No known Grey-headed Flying Fox camps exist in the study area. The proposed development area provides little foraging habitat for this species, however, a very small area will be affected by the proposal. Better habitat occurs elsewhere within the locality. The proposed development is therefore not likely to have an adverse effect on the species such that a viable local population is placed at risk of extinction.

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,

No endangered populations of this species have been listed in Schedule 1 Part 2 of the TSC Act 1995 within the region.

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.

Not applicable.

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.

A small area of potential foraging habitat will be impacted by the proposal. This is not considered to be a significant area of habitat on a regional scale for this wide-ranging species.

Removal of the small area of potential foraging habitat at the site would not isolate a known area of habitat for this species from currently interconnecting or proximate areas of habitat. The Grey-headed Flying Fox is a highly mobile species capable of flying over cleared areas. The proposed development is unlikely to significantly impact upon habitat connectivity.

Potential foraging habitat to be removed from the subject site is minimal compared to available habitat in the locality. There are other areas of potential foraging habitat for the species throughout the locality.

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

No critical habitat for this species has currently been identified by the Director-General of the DEC.

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

No recovery plan for this species has been prepared by the NSW National Parks and Wildlife Service to date.

The threat abatement plan for predation by the red fox is relevant to this species. The proposal is not inconsistent with these objectives, which focus on fox control programs.

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 Grey-headed Flying Fox is threatened by or the proposal will further impact the species through the following processes:

- Clearing of native vegetation as this will clear foraging habitat. However, potential foraging habitat will be retained on the subject land; and
- Predation by the European red fox as juveniles can become prey items for foxes. Foxes already exist on the subject land and are not likely to be increased in number by the proposal.

Conclusion

The proposal is not likely to have a significant impact of a local population of this species as:

- The proposal will not result in the removal of a significant proportion of potential foraging habitat for this species and no camps are known on the site; and
- The proposal will not isolate proximate areas of potential habitat for this species.

B.2.3 Microbats

The following Assessment of Significance demonstrates that no significant impacts will occur to the threatened microchiropteran species:

- Eastern Bent-wing Bat (*Miniopterus schriebersii oceanensis*)
- Eastern Little Mastiff Bat (*Mormopterus norfolkensis*); and

- Greater Broad-nosed Bat (*Scoteanax rueppellii*).

These species have been recorded in the locality and have the potential to forage over the study area. The Eastern Bent-wing Bat hunts in forested areas and roosts primarily in caves. This species also can potentially roost in buildings and possibly drainage channels. The Eastern Little Mastiff Bat and the Greater Broad-nosed Bat both roost in either tree hollows or buildings (Churchill 1998). There are few roosting opportunities in the study area (apart from buildings) and little in the way of forest or woodland to forage in.

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,

The proposed development will result in the clearance of some vegetation. The area to be cleared does not represent a large area of potential foraging habitat for microbats. Bats are highly mobile species and as such, are likely to forage throughout the study area, and in surrounding parks and reserves. The subject site is not an area suitable for maternity roosting for any species, and is unlikely to provide general roosting opportunities. It is not expected that the proposed development would have an adverse effect on the life cycle of these microchiropteran species such that a viable local population would be placed at risk of extinction.

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.

Not applicable.

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.

A small area of potential foraging habitat will be impacted by the proposal on the subject site. This is not considered to be a significant area of habitat on a regional scale for these highly mobile species.

Removal of the small area of potential foraging habitat at the site would not isolate a known area of habitat for these species from currently interconnecting or proximate areas of habitat. None of the species are known to use the subject land and are highly mobile species, capable of flying over cleared areas. The proposed development is unlikely to significantly impact upon habitat connectivity.

Potential foraging habitat to be removed from the subject site is minimal compared to available habitat in the locality. There are other areas of potential foraging habitat for the species throughout the locality.

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

No critical habitat for these bat species have currently been listed in the critical habitat registry by the Director-General of the DEC.

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

No recovery plan has been finalised or drafted for these species. No threat abatement plan is relevant to these species.

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 constitutes the key threatening process: Clearing of native vegetation, as it involves the clearing of foraging habitat. However, potential foraging habitat will be retained in the study area.

Conclusion

The proposal is not likely to have a significant impact on the viability of local populations of these species as it is not likely that any species roosts in the study area and foraging habitat is limited.

Appendix C

Cumberland Ecology Staff

Dr Kirsten Crosby has a BSc. (Hons) in Zoology and a PhD which focussed on the evolution and ecology of possums. She has extensive experience in ecological survey and research, gained both academically and professionally. Prior to joining Cumberland ecology, Kirsten worked as a technical officer at the University Of New South Wales. In this position she managed student field trips around New South Wales, and taught field survey methods for mammals, birds, and aquatic and terrestrial invertebrates. As a project manager at Cumberland Ecology Kirsten manages fauna assessment and related report writing for a range of projects, including local government environment plans, species impact statements, and environmental assessments. Kirsten also has experience in relocating animals prior to vegetation clearing activities.

Mr David Thomas is a highly experienced botanist with more than 20 years of experience within the woodlands of the Sydney Basin and surrounding areas. He is a Member of Ecological Consultants Association and currently works as an Environmental Consultant. His areas of expertise include vegetation survey; assessment & mapping; preparation of management plans for natural areas; bushland reconstruction, rehabilitation & regeneration planning. David has worked throughout the Sydney region and country NSW, and has completed numerous Vegetation Surveys and Assessments and Management Plans. Previously he was employed as an Environmental Officer for Sydney Water and prior to that he worked in several engineering roles.