17 December 2013

Project Manager
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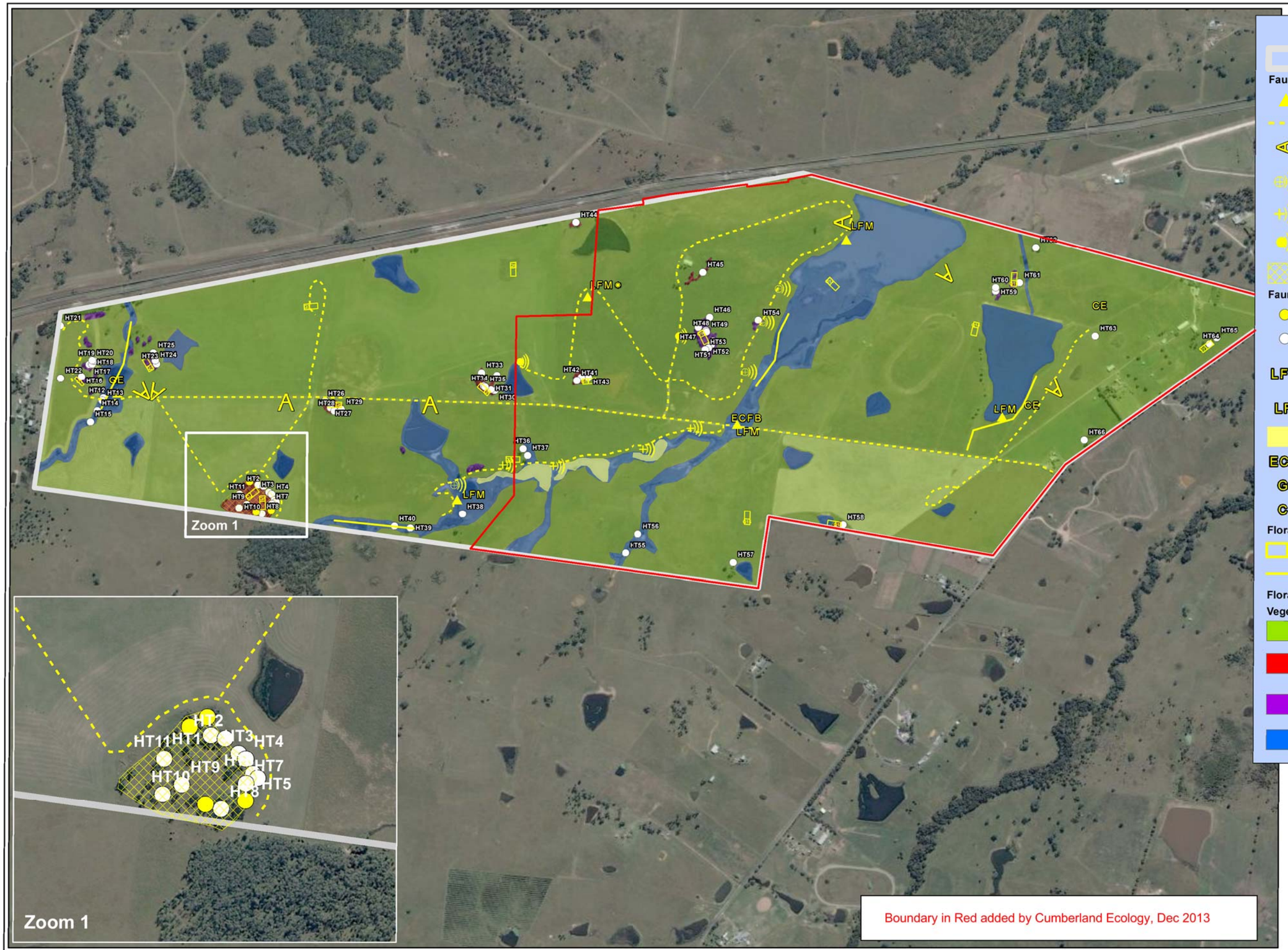
RE: PEER REVIEW OF ECOLOGICAL CONSTRAINTS ANALYSIS OF LOTS 201-203 DP 1152191 565 LUDDENHAM ROAD, LUDDENHAM BY TRAVERS BUSHFIRE & ECOLOGY

Dear Clair,

Cumberland Ecology was commissioned by APP Corporation Pty Ltd to provide a peer review of an Ecological Constraints Analysis of 565 Luddenham Road, prepared by Travers Bushfire and Ecology (hereafter referred to as "the Travers Ecology Report"). The purpose of this letter is to provide the results of our peer review of the aforementioned report. The results of our review are provided below.

1. Background

Travers Bushfire and Ecology prepared an Ecological Constraints Analysis of Lots 201-204 DP 1152191 565 Luddenham Road, which was made available in November 2010. Cumberland Ecology was provided with a Master Plan, on the 9th of December 2013, for urban development of the site which is referred to therein as Sydney Science Park. The preliminary master plan indicates that Lot 1 and part of Lot 2 only are to be developed, to provide for a range of employment, research and development, education, residential and retail uses in a landscaped setting. . Provision has been made in the Master Plan for the re-establishment of a riparian corridor along the central drainage line, and retention of some waterbodies on site as wetland areas. The development footprint totals 287ha and occupies a significantly smaller area than that originally surveyed by Travers in 2010 (Figure 1 below). The boundary in red outlines the development footprint of the current planning proposal.



Legend

Property boundary

Fauna Survey Effort (2010)

- Anabat Station
- Spotlighting transect
- Spotting scope
- Australian Bittern and Green and Golden Bell Frog call-playback
- Green and Golden Bell Frog call-playback
- Owl and Bush Stone-curlew call-playback
- Cumberland Plain Land Snail targeted search area

Fauna Survey Results (2010)

- Nesting Tree
- Habitat tree
- LFM* Large-footed Myotis (recorded from a single call sequence)
- LFM Large-footed Myotis (numerous recordings)
- Large-footed Myotis (observed foraging by spotlight)
- ECFB East-coast Freetail Bat
- GE Great Egret
- CE Cattle Egret

Flora Survey Effort

- Flora Quadrats
- Flora Transects

Flora Survey Results

Vegetation Communities

- Cleared / Pastoral
- Disturbed Grey Box/ Forest Red Gum Open Woodland (EEC - Cumberland Plain Woodland)
- Disturbed Swamp Oak Woodland - Forest (EEC - River-flat Eucalypt Forest on Coastal Floodplains)
- Dams and Creeks with Fringing Vegetation

Flora and fauna survey locations are approximate and have not been fixed by land survey.

*Subject Site boundary subject to final survey

Travers bushfire & ecology

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Central Coast Highway, Kariong NSW 2250
Ph (02) 4340 5331 Fax (02) 4340 2151
e-mail: info@traversecology.com.au

0 150 300 450 600 m

1:14,000

Original plan produced in A3 colour

Drawing No.	A10094F	Date
Drawn By	KA	14/09/10
Amendment		Date
A		
B		
C		

Figure 1 -

Flora and Fauna Survey and Results

Luddenham Rd, Luddenham

Source: Google Earth Pro, Satellite Imagery.

Location: N:/10094

2. Methods

Our peer review was based upon the following:

1. Extensive past experience with similar sites on the Cumberland Plain;
2. Detailed review of the Travers Ecology Report and ancillary documents such as the Final Determination for Cumberland Plain Woodland and the Cumberland Plain Recovery Plan and
3. An inspection of the site.

In order to inform our review, we visited the site to examine woodland and grassland areas mapped by Travers Bushland & Ecology to verify the condition and type of vegetation. In particular we assessed whether any of the areas mapped by Travers Bushfire and Ecology as Pastoral/Grassland were actually derived native grasslands included in the listing of Cumberland Plain Woodland Critically Endangered Ecological Community (CEEC).

3. Key Findings

3.1 Methods

The ecological constraints analysis by Travers Bushfire & Ecology involved field studies of both flora and fauna species occurring on site.

Travers Bushfire and Ecology reviewed previous vegetation mapping before visiting the subject site. Detailed 20x20m quadrats were used to sample flora species, nested within 50x20m quadrats which underwent biometric assessment. A total of 17 flora quadrats were surveyed, sampling all vegetation communities on site. In addition, four flora transects were undertaken to assess the aquatic and fringing vegetation of water bodies on site. The site was searched for hollow bearing trees and GPS records of all such identified trees documented.

Fauna surveys by Travers Bushfire and Ecology consisted of the following:

- Visual surveys and call identification for diurnal birds;
- Call identification, call-playback, and spotlighting for nocturnal birds;
- Spotlighting at night, and identification of secondary indications during the day (i.e. scats, tree scratches, diggings, etc.) for arboreal and terrestrial mammals. In particular koalas were targeted with the aforementioned methods plus call-playback;
- Anabat detector recording and interpretation for bat species. In addition spotlighting was used to survey for large bat species;
- Call identification and spotlighting for frog species. Frogs and tadpoles found for visual identification were handled using approved hygiene protocols;

- Physical search of reptile habitat during day and night; and
- Physical search of threatened Cumberland Plain Land Snail habitat for individuals

Their surveys included targeted searches for threatened species that were identified as having potential to occur on site by identifying those recorded from within a 10km radius by the NSW Wildlife Atlas database.

The field surveys undertaken by Travers Bushfire and Ecology are considered to have been adequate to comprehensively assess the ecological attributes of the site.

3.2 Baseline Flora and Fauna Information

In total Travers identified 4 highly degraded vegetation communities on site. Of these communities 2 are listed as threatened communities; Cumberland Plain Woodland (CPW) that is listed as a Critically Endangered Ecological Community (CEEC) under both the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and River-Flat Eucalypt Forest on Coastal Woodlands (RFEF), which is listed as an Endangered Ecological Community (EEC) under the TSC Act only.

Based on our site visit we concur with Travers Bushfire and Ecology that all patches of the threatened communities within the development footprint fall into the category of Low Condition under a biometric assessment. All patches within the currently designated development footprint consist of a small number of trees less than 0.25ha in size. The understorey of these areas consists of mostly exotic pastoral weeds, with no native mid-storey species.

Our site inspection confirmed that the areas mapped in the Travers Ecology Report as Cleared/Pastoral do not qualify as the Derived Native Grasslands variant of Cumberland Plain Woodland listed under the TSC Act as the ground cover in these areas consisted of predominately exotic weeds (as it does across the site).

The flora surveys undertaken by Travers Bushfire and Ecology identified 111 flora species on the larger site, with only 50 of these comprising native species. These native species included several non-endemic planted species. They found no threatened flora species and concluded that no suitable habitat for threatened flora species is present. Based on our site inspection, we concur that suitable habitat for most threatened flora species with potential to be found in the area does not exist on the site, especially under the current grazing regime.

Fauna surveys by Travers Bushfire and Ecology identified 63 fauna species on or near the larger site, with 12 of these being exotic species. Although suitable habitat in the form of dams exists for the threatened Green and Golden Bell Frog (*Litoria aurea*) on the larger site, they did not find the species during their amphibian survey. During the fauna surveys they recorded two threatened fauna species on site. These were both bats, the East-Coast Freetail Bat (*Micronomus norfolkensis*), and the Large-Footed Myotis (*Myotis macropus*). Two migratory birds protected under the EPBC Act; the Cattle Egret (*Ardea ibis*) and the Great Egret (*Ardea alba*) were also recorded.

A large number of habitat trees were recorded on site, though few had hollows, and all hollows were less than 20cm in size and therefore not suitable for large fauna species.

3.3 Proposed Mitigation/Compensation

Travers Bushfire and Ecology propose that the most appropriate measures for the mitigation of the potential impacts of the development on Cumberland Plain Woodland in the site is to retain and revegetate the central riparian corridor and dam. This would provide habitat and foraging grounds for both threatened bat species recorded as occurring on site. Habitat would also be provided for wetland birds, particularly the federally protected migratory Cattle Egret, and Great Egret observed on site.

This mitigation measure is considered to be appropriate, however further mitigation measures could be considered (see below).

4. Conclusions and Recommendations

We concur with the findings of the Travers Ecology Report and agree that the site has been substantially cleared for agriculture, such that it retains very little native vegetation. The majority of the site is now grassland dominated by exotic species, and contains several farm dams. We found at the time of our site visit on the 31st of July 2013 that the site is largely in the same condition as during the survey undertaken by Travers Bushfire and Ecology in November 2010. Some very small patches of bushland, remain on the site, as described by the Travers Ecology Report. It is not anticipated as a result of the current planning proposal that there will be any significant effects to threatened flora or fauna or Endangered Ecological Communities.

The central drainage area within the site is proposed to be recreated and embellished with riparian planting It is proposed to appy a RE1 Public Open Space zoning. Under Local Government Act 1993 (LG Act) a Plan of Management must be prepared and implemented for this land. Chapter 6, Part 2, Division 2 of the LG Act sets out a number of elements that must be addressed in a plan of management including requirements for land that includes ecological communities. This plan of management would include identification of ongoing management of habitat resources, weeds, future landscaping and site works to retain mature trees.

We concur with the following recommendations from the Travers report:

- In respect to threatened fauna species the collective retention of the central drainage, the natural vegetated fringes to this drainage, nearby connective remnants and nearby hollows is recommended. Disturbed areas within the conservation limits may be restored to offset habitat loss in remaining locations of the site. Bat boxes could also be provided within the conservation areas to offset the loss of hollows elsewhere within the site.

- Any restoration of the central drainage line should be so that open water areas will not be consumed by aquatic vegetation. Outlier areas (not inundated) should be revegetated as River-flat Eucalypt Forest or Cumberland Plain Woodland.

- Standard Phytophthora cinnamomi protocol applies to the cleaning of all plant, equipment, hand tools and work boots prior to delivery onsite to ensure that there is no loose soil or vegetation material caught under or on the equipment and within the tread of vehicle tyres. Any equipment onsite found to contain soil or vegetation material is to be cleaned in a quarantined work area or wash station and treated with anti-fungal herbicides.

- Erosion control measures are to be in place to reduce temporary erosion and sedimentation risks to adjacent EEC vegetation and any nearby drainage channel.

We advise that dam decommissioning studies should be carried out prior to draining any of the larger water bodies on site to mitigate impacts on aquatic and semi-aquatic wild life. Particularly important is the relocation of native fauna species such as the amphibians recorded by Travers Bushfire and Ecology as present, additional survey for unrecorded aquatic native species such as reptiles (turtles) and fish species (eels), and to outline protocols for euthanisation of recorded exotic fauna species (carp, mosquito fish).

There is potential habitat for the Green and Golden Bell Frog on the site, and although Travers Bushfire and Ecology surveyed for this species and did not record it, their notes indicate no rain occurred during the period of their surveying. This species is much more likely to be active and call immediately following or during rain in the spring and summer period. It is known to utilise water bodies in degraded areas, particularly farm dams, and there is potential that a population occurs on the site that has not been recorded.

If you would like to discuss this matter further, please contact either Bryan Furchert or myself on 9868 1933.

Yours sincerely,

David Robertson
Director
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