

Our Ref: 80220021:JO'G  
Contact: John O'Grady

8 October 2020

Department of Planning, Industry & Environment, Green and Resilient Places Division  
Locked Bag 5022

**PARRAMATTA NSW 2124**

VIA DPIE Submissions Portal

**Cardno (NSW/ACT) Pty Ltd**  
ABN 95 001 145 035

Level 9 - The Forum  
203 Pacific Highway  
St Leonards NSW 2065  
Australia

**Phone +61 2 9496 7700**  
**Fax +61 2 9439 5170**

[www.cardno.com](http://www.cardno.com)

## **SUBMISSION TO THE EXHIBITION OF THE DRAFT CUMBERLAND PLAIN CONSERVATION PLAN**

We act on behalf of owners of approximately 27ha of land located at Luddenham, adjacent to the western boundary of the proposed Western Sydney Airport (**the Subject Land**).

Our submission maintains that categorisation of the Subject Land in its entirety as *Non-Certified – Avoided for Biodiversity* and its inclusion in entirety in the Strategic Conservation Area is inconsistent with its true biodiversity values and that the categorisation and inclusion should both be reviewed in order to reflect the actual biodiversity values of the land as described herein.

The landowners are dissatisfied with the decision making process in respect of the zoning of their land and the lack of response to a previous submission prepared on their behalf by Cardno to the then draft (now gazetted) *State Environmental Planning Policy (Western Sydney Aerotropolis) 2020*.

The landowners again request a meeting with relevant representatives of the Department of Planning, Industry and Environment to discuss the content of the earlier and this submission with particular regard to the implications of the Departments zoning of the Subject Land and their consequent intentions included in the draft *Cumberland Plain Conservation Plan*.

### **1.1 The Subject Land**

The Subject Land includes the following land parcels.

Address	Legal Title	Approximate Area (Hectares)
[REDACTED] Luddenham	[REDACTED] Luddenham	10.6
[REDACTED] Luddenham	[REDACTED] Luddenham	10.4
[REDACTED] Luddenham	[REDACTED] Road Luddenham.	6.75ha (area mapped as <i>Environment and Recreation</i> )
<b>Total Area</b>		<b>26.75ha</b>

Table 1-1 Subject Land

The location and extent of the Subject Lands is indicated at Figures 1-1 & 1-2. The land is located between [REDACTED] alignment and the future Outer Sydney Orbital motorway, approximately 250m west of the Western Sydney Airport boundary and 800m south west of the site of the western runway.

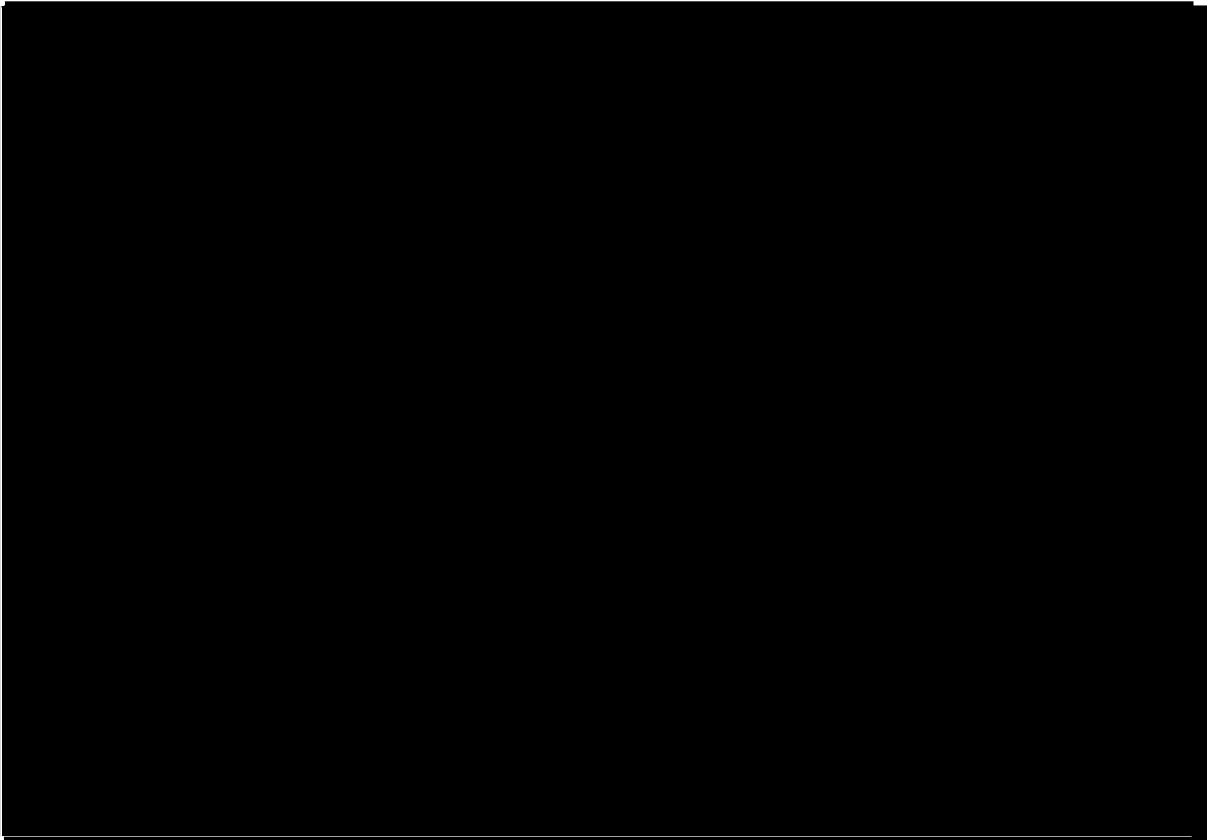


Figure 1-1 Site location (edged red) in relation to the Western Sydney Airport site

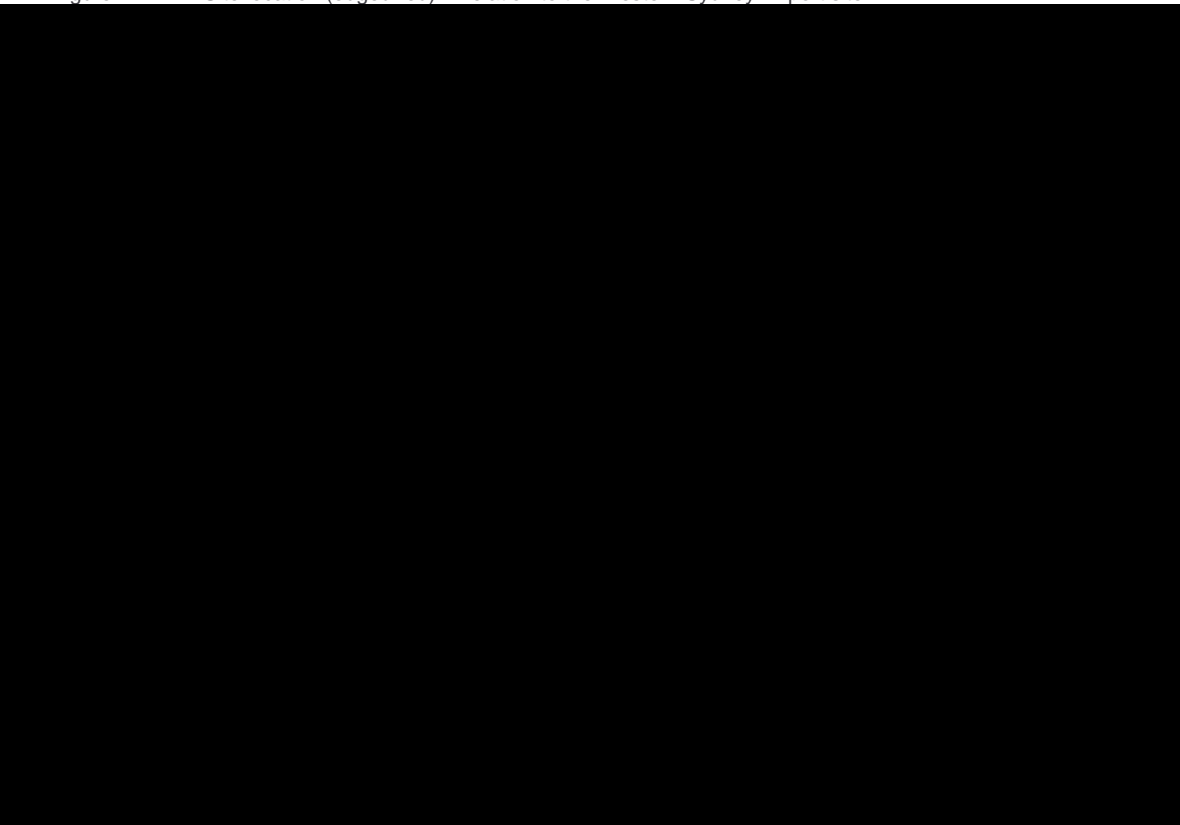


Figure 1-2 Local aerial – Subject Land edged red

## 1.2 Previous submission

In February 2020 Cardno prepared a submission on behalf of this group of landowners to the exhibition of the Stage 2 Western Sydney Aerotropolis Planning Package. That submission is attached in its entirety at Appendix A. In summary, the February submission made the following conclusions:

- > *The Subject Land does not display sufficient ecological or recreational value to be zoned as Environment and Recreation.*
- > *Zoning of the Subject Land as Environment and Recreation will potentially isolate adjoining land and impact negatively on its viability for development in accordance with its proposed Agribusiness zone.*
- > *Implications for airport safety need to be more thoroughly assessed before decisions are made regarding the zoning of the Subject Land.*
- > *The potential ecological values of the Subject Land would remain protected through legislation and planning controls under an Agribusiness zone.*
- > *Zoning of the land for Environment and Recreation purposes would represent a missed opportunity for development of Agribusiness based uses on land which has been found to be relatively unconstrained and viable for this use.*
- > *Zoning of the Subject Land as Environment and Recreation, if it were justifiable on planning and ecological grounds, would be inconsistent with the Department's Practice Note for environmental zonings.*

And recommended that:

*"the proposed zoning of the Subject Land as indicated in the draft mapping appended to the Western Sydney Aerotropolis SEPP Discussion Paper should be amended from Environment and Recreation to Agribusiness."*

## 1.3 This submission

This submission builds on the arguments and conclusions in the Cardno February 2020 submission with respect to the zoning of the Subject Land and develops commentary and recommendations on the draft Cumberland Plain Conservation Plan with respect to its proposal to categorise the Subject Land as *Non-Certified – Avoided for Biodiversity*.

The submission maintains:

- That the wholesale categorisation of the land as Non-Certified is inconsistent with its biodiversity values.
- That a significant portion of the land does not display biodiversity values and is suitable for Certification and development for Agribusiness purposes.
- That the assessment process leading to categorisation of the land as *Non-Certified – Avoided for Biodiversity* requires review as it has resulted in inaccurate conclusions with respect to biodiversity values across the Subject Land.
- That DPIE has not adequately consulted with the owners of the subject land with regard to its zoning under State Environmental Planning Policy (Western Sydney Aerotropolis), 2020 and that the rationale provided to the landowners for the zoning is inadequate.

Each of these contentions is explained below.

## 1.4 Draft Cumberland Plain Conservation Plan (draft CPCP)

### 1.4.1 Purpose and structure

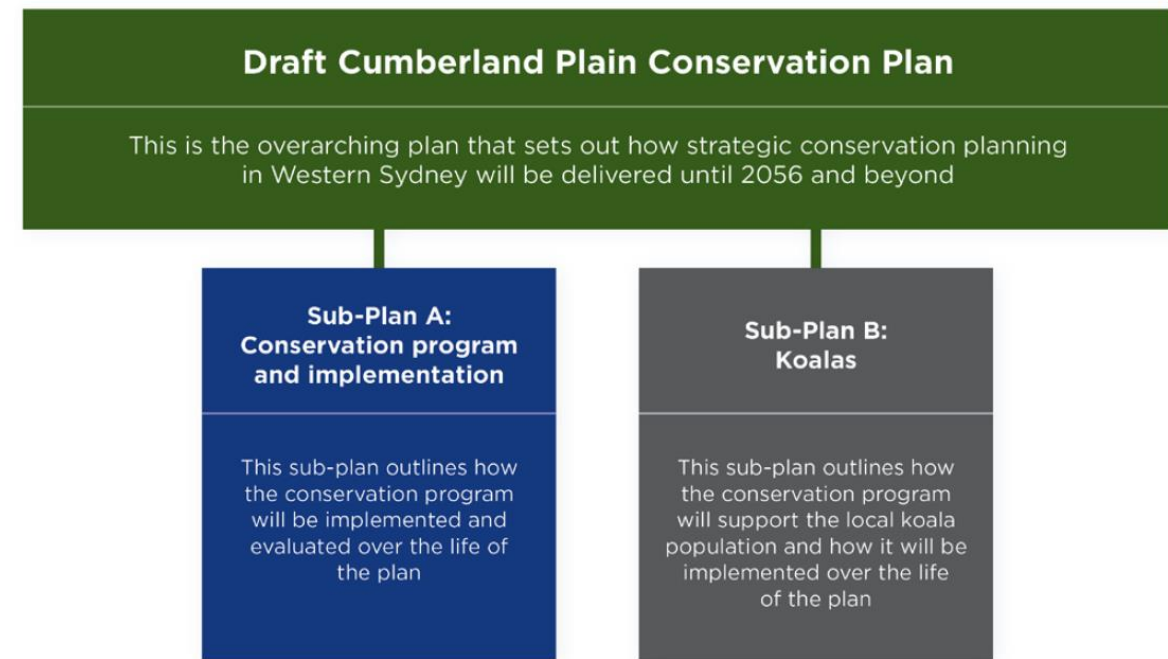
The NSW DPIE describes the draft Cumberland Plain Conservation Plan (DPIE 2020a) as 'a plan to support growth and biodiversity conservation in the Western Parkland City'<sup>1</sup>. The draft CPCP has identified areas for

growth and land for conservation. Once approved, the CPCP will be implemented by DPIE through a number of mechanisms.

The overarching purpose of the Plan is to support biodiversity and growth in the Western Sydney Parkland City by protecting the regions important conservation values. It will do this through the creation of new reserves, conservation areas and green spaces.

In essence the plan involves delivery of a conservation program to offset impacts of new development within the Western Parkland City on local and regional biodiversity.

The structure of the draft Plan is summarised in the diagram at Figure 1-3.



**Figure 1: Draft Cumberland Plain Conservation Plan and Sub-plans**

Figure 1-3 Structure of the draft Cumberland Plan Conservation Plan (Source: DPIE 2020)

The Subject Land does not include Koala Habitat so Sub-Plan B is not relevant to this submission.

#### 1.4.2 Proposal for the Subject Land

The draft CPCP proposes to categorise the Subject Land in its entirety as *Non-Certified – Avoided for Biodiversity* (Figure 1-4). This categorisation is in response to the zoning of the entire land parcel as Environment and Recreation in the SEPP (Western Sydney Aerotropolis).

Review of the Spatial Viewer on the DPIE website indicates that the Subject Land is also included in the Strategic Conservation Area. The Explanation of Effects document indicates that:

*“The Strategic Conservation Area represents areas of important biodiversity value to the Cumberland subregion. These areas include large remnants of native vegetation, areas with important connectivity across the landscape, and some areas with ecological restoration potential.*

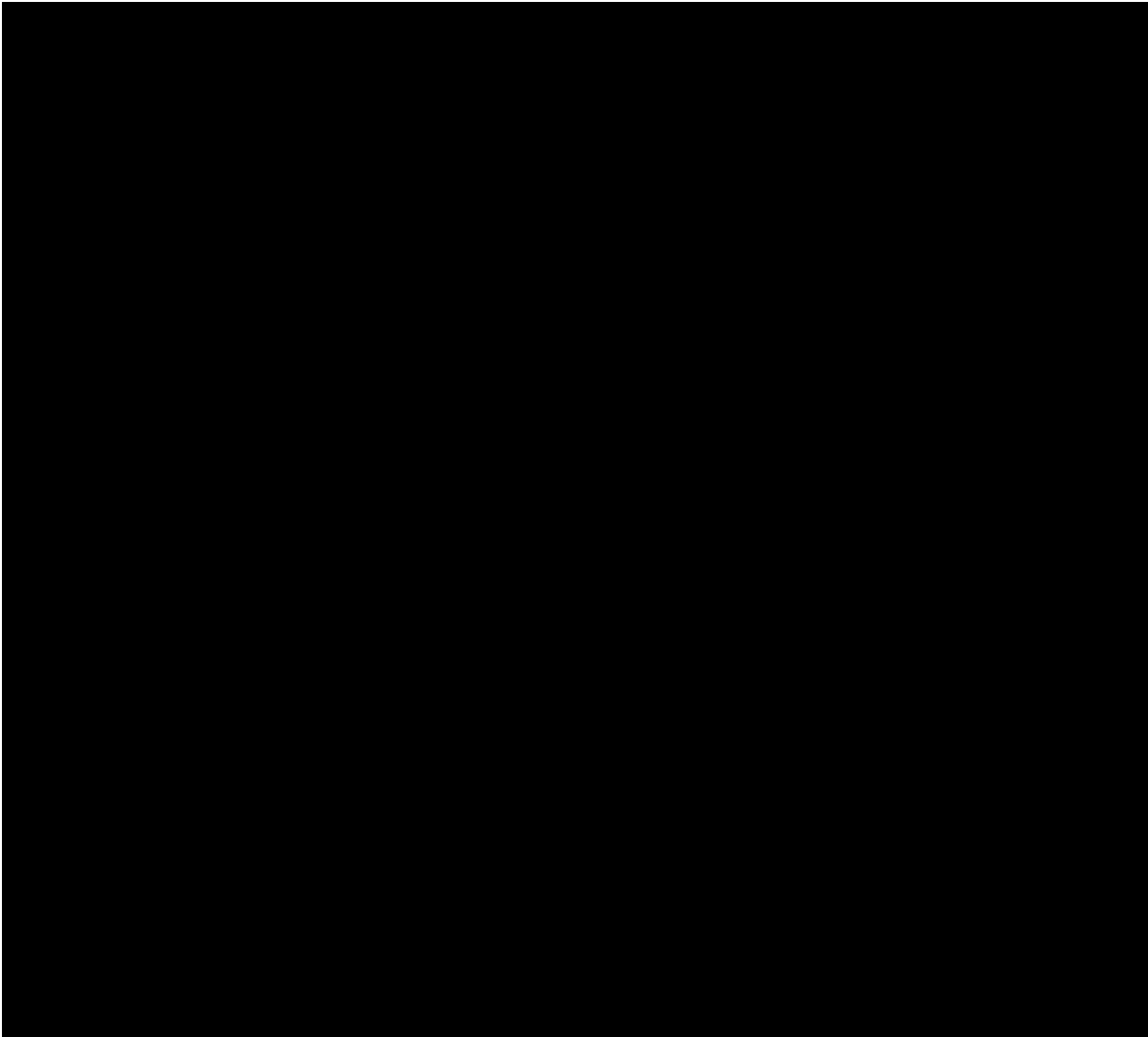


Figure 1-4 Western Sydney Aerotropolis Land Categories – subject land edged red (Excerpt draft Cumberland Plain Conservation Plan – Sub plan A)

## 1.5 Commentary on the proposed categorisation of the lands.

As part of its submission to the draft Aerotropolis Plan, Cardno carried out a detailed assessment of the biodiversity values of the Subject Lands. A further ecological assessment has been carried out to inform this submission to the draft Cumberland Plain Conservation Plan (enclosure to this submission). In brief, the findings of these two studies are:

- The properties support a mosaic of characteristics including cleared land, residential dwellings and native vegetation.
- Some areas would likely constitute significant vegetation with value for conservation, particularly where native vegetation in moderate condition occurs.
- There are inconsistencies in the allocation of biodiversity values in the CPCP when compared with the actual condition of the site.
- Information gathered during the Cardno preliminary assessment (Cardno 2020) would provide the proponent authority with information on the current condition of the site and will allow discussions on revision of the Draft Cumberland Plain Conservation Plan's mapping to more accurately represent the site's condition and values.
- The second order stream at [REDACTED] is not viable and should be considered for removal from the CPCP.
- The biodiversity value of vegetation at the site should be assessed and their inclusion for conservation purposes in the CPCP be reviewed.

- Cleared land within the site is not native vegetation and it does not have ecological value. Inclusion of cleared land in environmental zone (E2) should be reconsidered.

#### 1.5.1 Inclusion of the entire landholding in the Strategic Conservation Area

Cardno ecologists in their September 2020 report have provided the following commentary regarding the intention to include the Subject Land in the Strategic Conservation Area:

*The allocation of most of the property as Strategic Conservation Area (SCA) should be reviewed because:*

- *It includes cleared land and other areas (e.g. residential dwelling) with no biodiversity value.*
- *PCT 850 in moderate condition has potential to have biodiversity value, particularly if this PCT is consistent with the BC Act and EPBC Act listed Cumberland Plain Woodland (CEEC). The biodiversity value of PCT 850 in low conditions is likely to be less than that of the area in moderate condition. The restoration potential of these areas require investigation.*
- *The property is adjacent to [REDACTED] and at approximately 600 m from the nearest other patch of proposed SCA, which are separated by the proposed transport corridor to the west. This suggest that the SCA at the site will be an isolated patch with the transport Corridor to the west, Northern Road to the east, Airport land to the south and urban capable land to the north. There is no connectivity corridor joining this site to other retained vegetated areas.*
- *The property is located within 500m of the Western Sydney International (Nancy-Bird Walton) Airport. This has the potential of birds and bats being at risk of strike with aircraft.*

#### 1.5.2 DPIE assessment process

It is unclear what processes were followed by DPIE to inform the decision to zone the entire landholding as *Environment and Recreation* and to consequently categorise the land as *Non-Certified – Avoided for Biodiversity* in the draft CPCP. We have been informed by the landowners that to their knowledge, their land has not been inspected by DPIE personnel. We surmise from this that decisions regarding the zoning and categorisation of the land have been based on review of aerial photography only.

Cardno's February 2020 submission, informed by on ground assessments of the land carried out by Cardno's ecologists, provided a higher level of detail with regard to the biodiversity values of the land which should have been considered in the submissions review process. It appears that the additional information provided was not taken into account as minimal dialogue occurred with the landowners consequent to the submission, the land zoning remained unchanged in the SEPP and the draft CPCP proposes the Non-Certified categorisation.

Despite numerous requests from the landowners to meet or otherwise speak to the Department, an email from the Western Sydney Planning Partnership to one of the landowners was the only communication received in response to the submission. The email is quoted below.

*The Department of Planning, Industry and Environment's team who is leading the Cumberland Plain Conservation Plan work has advised that the Environment and Recreation zoning proposed for your family's property was based on a combination of factors. Cumberland Plain Woodland is present on the land, which is listed as a Critically Endangered Ecological Community under the Environment Protection and Biodiversity Conservation Act 1999 and Schedule 2, Part 1 of the Biodiversity Conservation Act 2016. Cumberland Plain Woodland can exist as a threatened community even without trees and shrubs present. The presence of Cumberland Plain Woodland provides the opportunity to implement a biodiversity stewardship site on the land.*

*Additionally, the riparian land definition under the Biodiversity Assessment Method Appendix 3, which is under the Biodiversity Conservation Act 2016, applies to the land as does the identification of the land as riparian land under the Water Management Act 2000. The riparian corridor reinforces the value of this patch, by providing a linkage through the downstream environment to the Nepean River*

Email to Antonio Aloschi, landowner, from Western Sydney Planning Partnership, 1<sup>st</sup> September 2020

This email makes no reference to the more detailed land assessment carried out by Cardno and does not provide justification for zoning of the portion of the land that has been found to have no biodiversity value. It also fails to respond to Cardno's findings that the riparian land, although mapped, is not physically present over most of the land or, where present, has minimal value as aquatic habitat.

Our overall opinion with regard to the assessment of biodiversity values of the Subject Land and the consultation process with the landowners is that both are inadequate to properly inform decisions on the zoning of the land and consequent draft classification as *Non-Certified – Avoided for Biodiversity*.

### 1.5.3 Ecological values

Cardno's detailed assessment of the biodiversity values of the Subject Lands resulted in the mapping indicated at Figures 1-5, 1-6 & 1-7.

The vegetation mapping at Figure 1-6 illustrates the extent of native vegetation that occurs on the Subject Lands. It also indicates the results of the Cardno ecologists' assessment of the ecological quality of the vegetation.

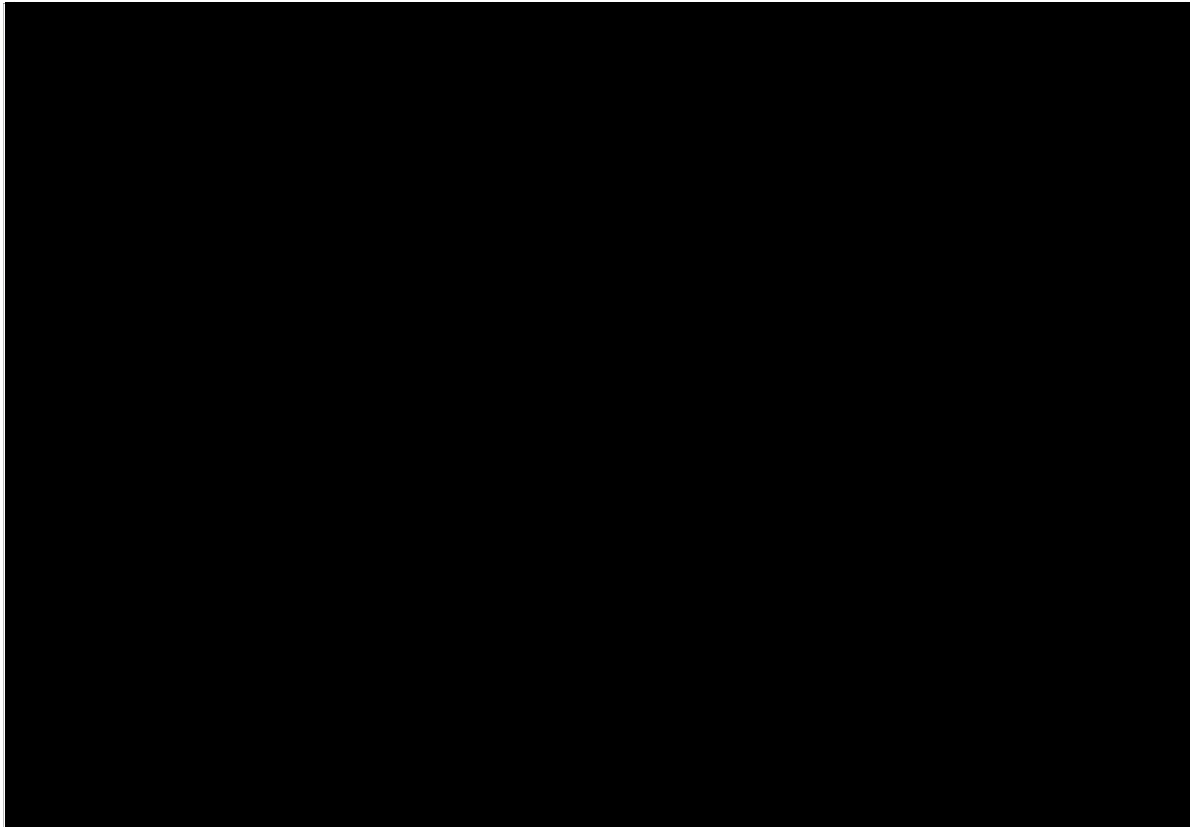


Figure 1-5 Vegetation on the Subject Lands

The mapping also indicates that, notwithstanding its condition, the native vegetation is isolated from significant tracts of native vegetation in moderate to good condition.

In summary, the outcomes of the Cardno ecological assessment of the Subject Lands were:

- Approximately 38% of the land area within the Subject Lands (10.32ha of the total 26.75ha land area) is completely cleared of native vegetation and is considered for this reason to be of negligible ecological value. This land should not have been included in the *Environment and Recreation* Zone in the SEPP (Western Sydney Aerotropolis) and should not be categorised as Non-Certified in the draft CPCP.
- The native vegetation present on the Subject Lands is commensurate with the Cumberland Plain Woodland in the Sydney Basin Bioregion, which is listed as critically endangered under the Biodiversity Conservation Act (BCA) and the Environmental Protection and Biodiversity Conservation Act (EPBC). Native vegetation mapped by Cardno in Figure 1-5 constitutes a total area of 16.53ha on the Subject Lands.
- Of the total area of native vegetation, 6.65ha (40%) was assessed as being in Moderate condition and 9.9ha (60%) was assessed as being in Low condition. Impacts on the quality of the indigenous vegetation identified on the Subject Lands included:



- Loss of native understorey;
  - Condition of the native trees which, where the communities were assessed as being in low condition, included dead “stags”, and trees with significant dieback or evidence of borer attack; and
  - Lack of connectivity to other remnants of native vegetation in moderate to good condition. The Subject Lands are isolated from other vegetation by [REDACTED] to the south west, the Sydney Orbital corridor to the west and the Northern Road realignment to the south east (currently under construction). The mapping at Figure 1-9 also indicates that the vegetation is disconnected from other native vegetation on the remaining boundaries of the Subject Lands.
- The ecologists’ overall opinion is that the cleared land and the land that supports native vegetation that has been assessed as being of low ecological value would have a correspondingly low potential for conservation.
  - Native vegetation on the Subject Lands that has been assessed as being in Moderate condition is also considered by the ecologists as having a low potential for conservation due to its isolation and lack of connectivity to other tracts of native vegetation in moderate to good condition in the local area.

#### 1.5.4 Urban planning – land capability

Cardno’s February 2020 submission also included the outcomes of a review of the urban planning consequences of zoning the Subject Lands as *Environment and Recreation* and a high level assessment of the capability of the land for development for Agribusiness purposes. This review is equally relevant to the proposed categorisation of the land as Non-Certified. The urban planning assessment is detailed in the February submission included as an enclosure and summarised below for the purposes of this submission.

The February 2020 assessment of the suitability and capability of the land for recreation and conservation functions against its suitability for agribusiness considered existing conservation values, connectivity to intact bushland, implications for proximity to the airport (specifically the western runway), connectivity to existing and future transport and impacts on viability of adjoining properties. The outcomes of that assessment are summarised below.

##### 1.5.4.1 Existing conservation values

38% of the total area of the Subject Land is cleared of bushland and / or supports existing housing and ancillary buildings. This land has negligible biodiversity value and is suitable for development for Agribusiness purposes.

The remainder of the land supports Cumberland Plain Woodland of variable quality - 60% of the vegetation has been allocated a low rating for ecological quality.

##### 1.5.4.2 Connectivity to viable bushland corridors

The bushland that occurs on the Subject Land is isolated from significant local bushland tracts and riparian corridors by existing and planned future transport infrastructure.

Figure 1-6 shows Stream Order in the Catchment that includes the Subject Lands and illustrates that Duncan Creek is the principle riparian corridor in the catchment, and supports the most significant tract of native vegetation in the locality. Figure 1-6 & 1-7 also include an indication of the proposed location of the Western Sydney Orbital Motorway corridor. Figures 1-8 and 1-9 show listed native vegetation in the locality and within and adjacent to the Subject Land, again with the proposed Orbital Corridor overlaid. The mapping indicates that when implemented, the Orbital Corridor will result in loss of a significant portion of the Medium Quality vegetation on Lot 18 and will truncate any potential connection between the vegetation on the Subject Lands and the Duncans Creek riparian corridor. We consider this loss of connectivity with local riparian / vegetation corridors to be a major constraint on the viability of the vegetation on the Subject Lands for conservation purposes.



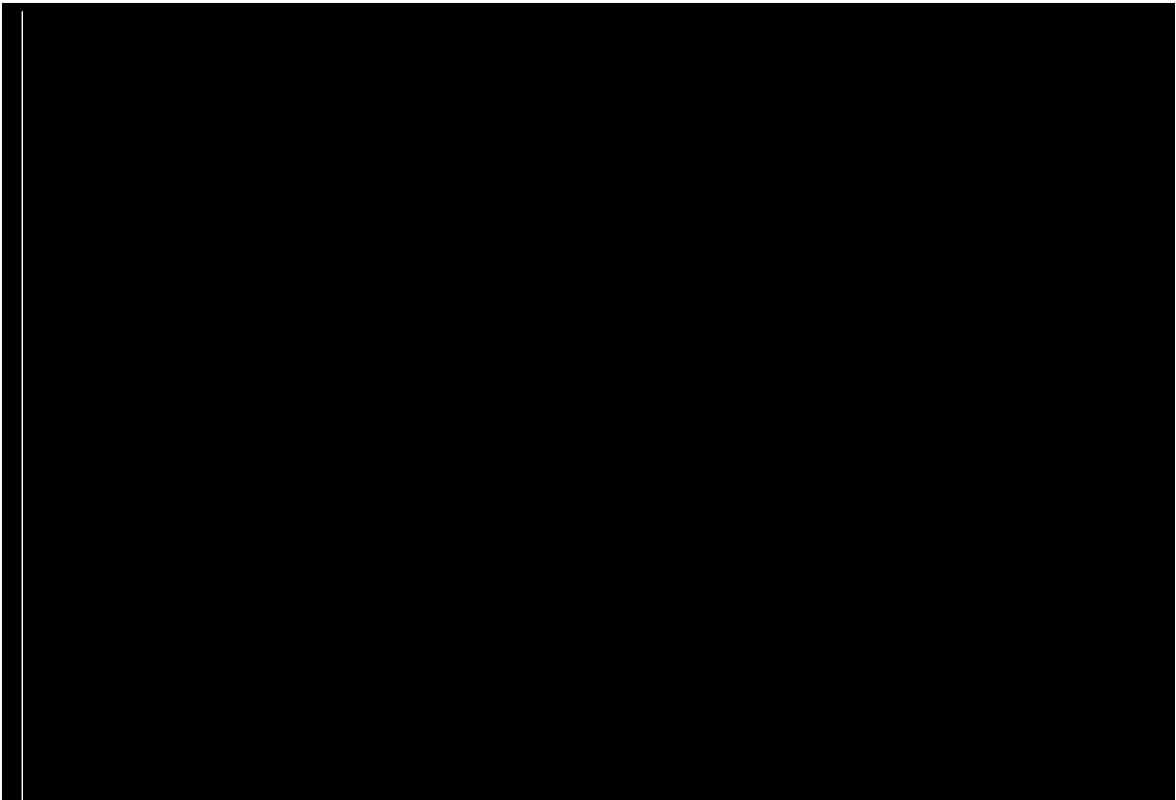


Figure 1-6      Stream order and transport corridor – catchment level

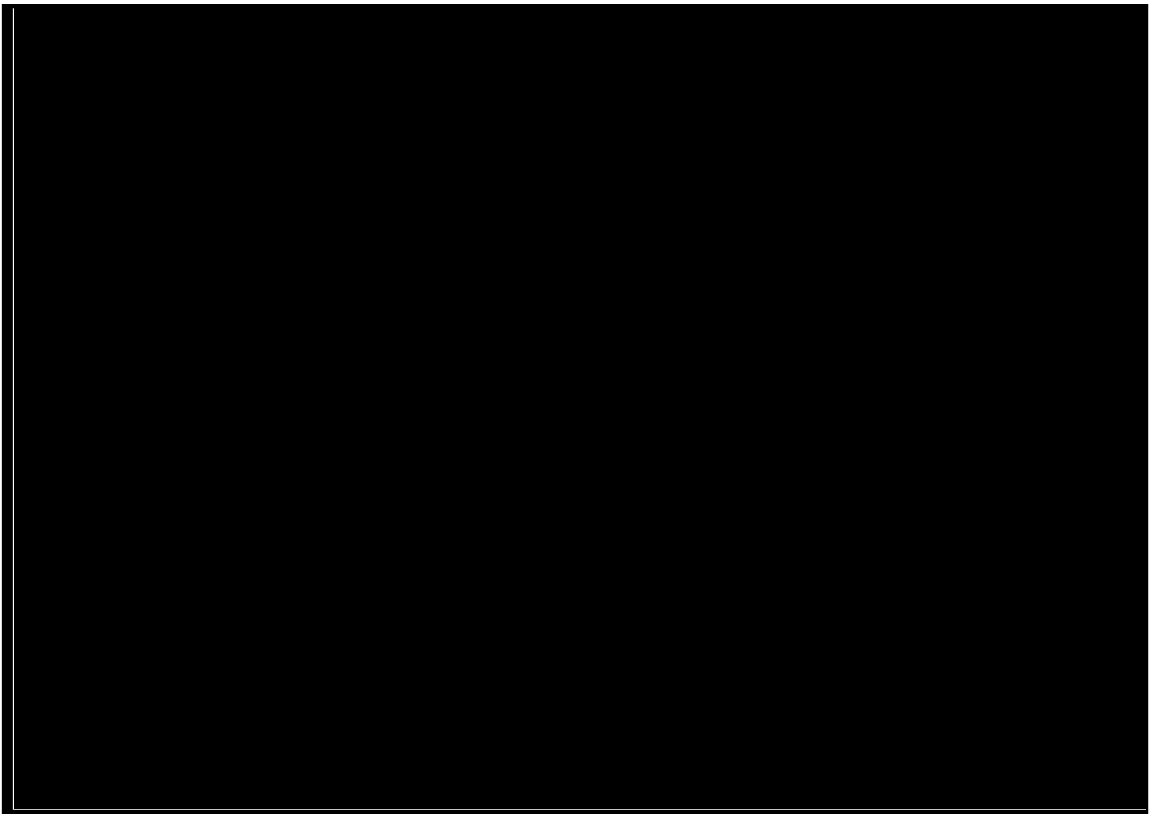


Figure 1-7      Stream order and transport corridor – site level

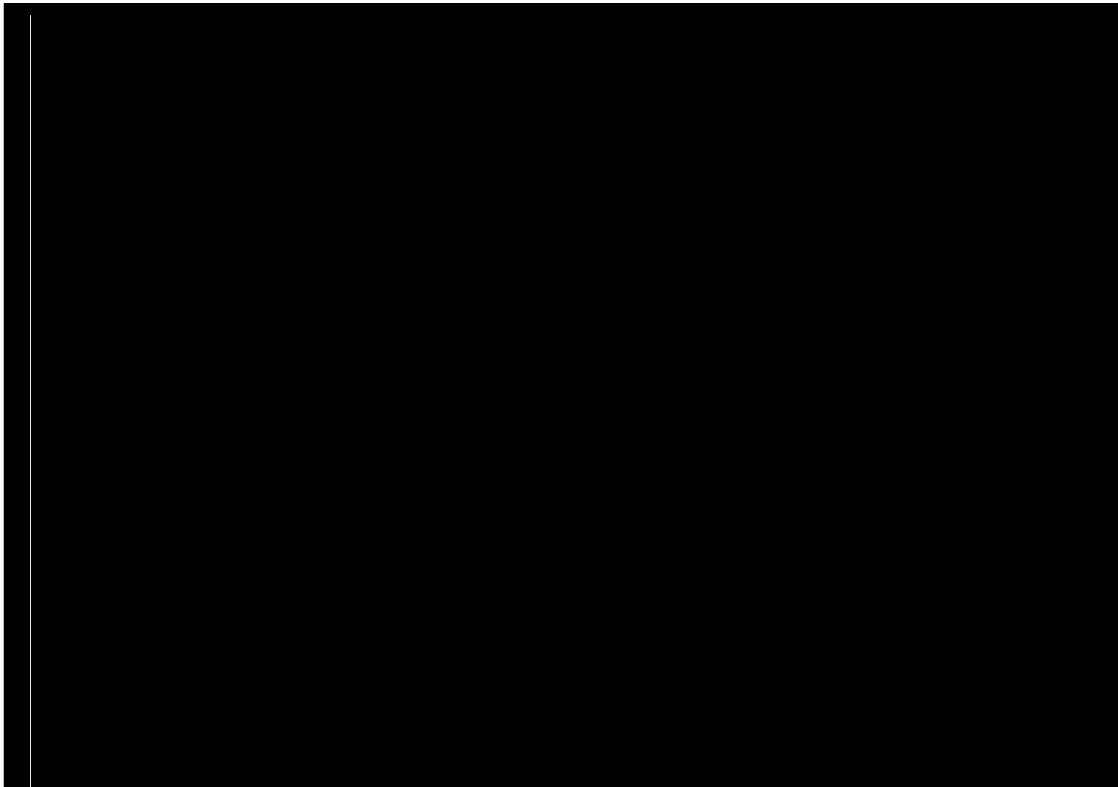


Figure 1-8 Scheduled vegetation map with transport corridors overlaid – catchment level

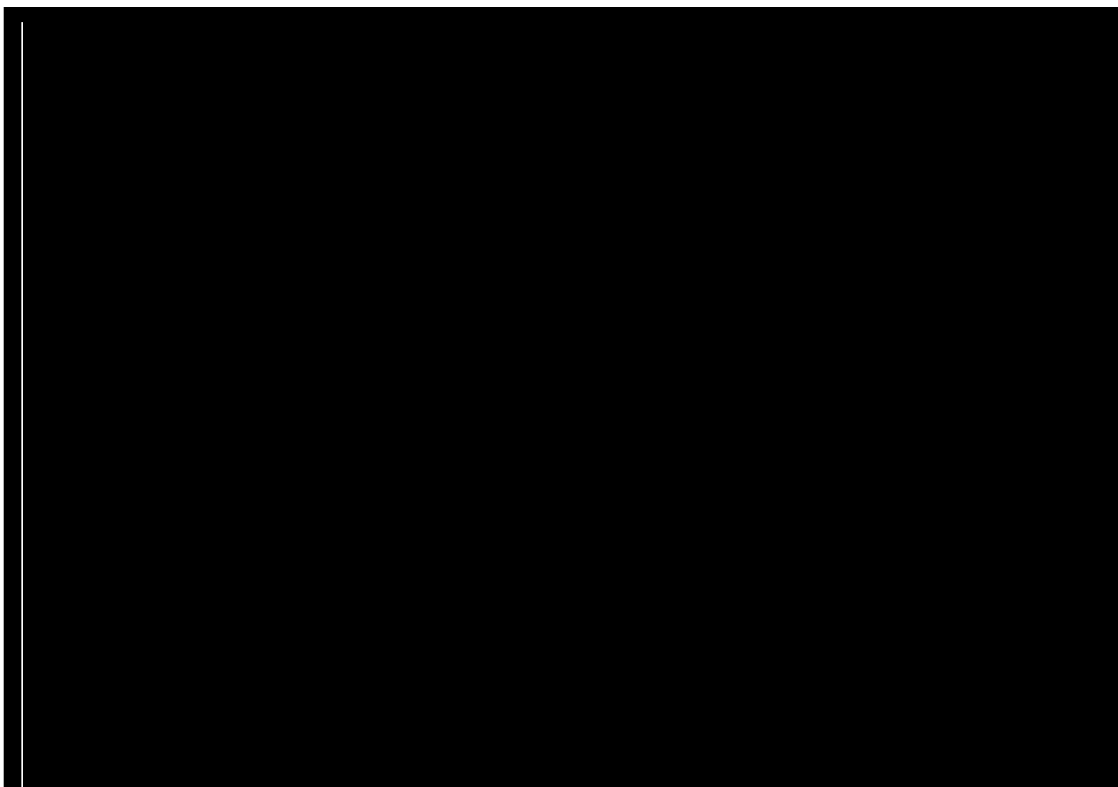


Figure 1-9 Scheduled vegetation map with transport corridors overlaid – site level

#### 1.5.4.3 *Other factors for affecting land capability*

Our land capability assessment of February 2020 also considered:

- Proximity of the Subject Land to the airport and the potential for wildlife strike risk

- Planning merits of committing the entire land to environment and recreational uses - The land does not appear to have any inherent recreational values and it would be isolated from other recreational land proposed in the local riparian corridor lands.
- Suitability of the land for agribusiness purposes (Figure 1-10) – there are no significant constraints on development of the land that does not have biodiversity value for Agribusiness purposes. Moreover, the land is well connected to regional transport corridors, under construction and planned, and will have direct transport access to the new airport.
- Impacts on the orderly development of adjoining land (Figure 1-11) - zoning of the entire Subject Lands for *Environment and Recreation* will result in isolation of the small land parcel to the south east of the Subject Land with consequent restrictions on its viability for development in accordance with its Agribusiness zoning.

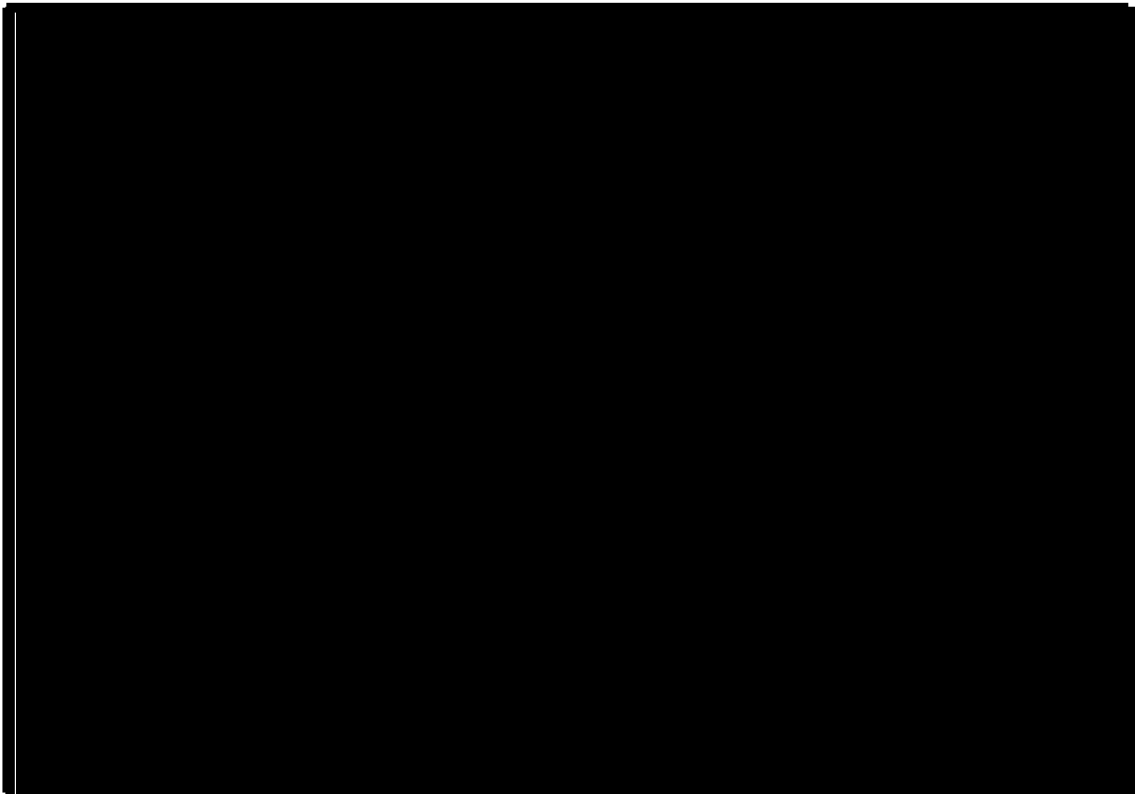


Figure 1-10 Subject lands in context - Connectivity to regional transport



Figure 1-11 Implications for the proposed zone - general planning commentary

## 1.6 Restriction of development rights and implications for land value

The application of the *Environment and Recreation* zone and the consequent categorisation of the land as Non-Certifiable will have substantial financial consequences for the landowners. The SEPP (Western Sydney Aerotropolis) sets out permissible land uses under the zone by default. That is, land uses not listed as permissible with consent are prohibited. Essentially, the zone permits only uses and activities that are directly associated with environmental or recreational that land uses.

On 30 April, 2009, the then Department of Planning issued *LEP Practice Note – Standard Instrument for LEPs – Environment Protection Zones (PN 09-002)*. The Department's Practice Note cautioned local councils (and itself) about highly restrictive uses associated with the application of environmental zones. Relevantly:

*“Council should be aware that the range of uses should not be drawn too restrictively as they may, depending on circumstances, invoke the Land Acquisition (Just Terms Compensation) Act 1991 and the need for the Minister to designate a relevant acquiring authority. Unless a relevant acquisition authority has been nominated and that authority has agreed to the proposed acquisition, council should ensure, wherever possible, that the range of proposed land uses assists in retaining the land in private ownership.”* (DoP Practice Note 09-002, p.2).

We reiterate our opinion in the February 2020 submission that the currently proposed zoning of the Subject Land as *Environment and Recreation* incorporating the highly restrictive land uses described above meets the circumstances cautioned against by the Department.

## 1.7 Conclusions and recommendation

This is the second submission that Cardno has prepared on behalf of the owners of the Subject Lands. The submission reiterates the conclusions of the February 2020 submission and makes the following conclusions with regard to the proposed categorisation of the entire landholding as *Non-Certified – Avoided for Biodiversity*.

- The process of assessment of the biodiversity values of the Subject Land carried out by DPIE is of insufficient detail to inform decisions regarding the zoning of the land or its consequent categorisation as *Non-Certified – Avoided for Biodiversity*.
- A significant percentage (38% or 10.32ha) of the land area within the Subject Lands is cleared of native vegetation and is unsuitable for Non-Certified categorisation.
- The riparian land mapped on the Subject Land is not physically present over most of the land or, where present, has minimal value as aquatic habitat. The Non-Certified categorisation of the mapped riparian land is inappropriate and should be reviewed.
- The Subject Land is isolated by existing and planned future infrastructure and the quality of native vegetation present on the site is variable. Its Non-Certified categorisation will not result in significant returns with respect to protection of regional biodiversity.
- Significant portions of the land have been demonstrated to have potential for development for agribusiness purposes. Wholesale categorisation of the entire land parcel as Non-Certified is inappropriate on planning grounds.
- Zoning of the Subject Land as *Environment and Recreation* and categorisation as Non-Certified, if it were justifiable on planning and ecological grounds, would be inconsistent with the Department's Practice Note for environmental zonings.

Informed by these conclusions, we contend that the proposed zoning of the Subject Land in the SEPP (Western Sydney Aerotropolis) is inappropriate and that the proposed categorisation of the land as *Non-Certified – Avoided for Biodiversity* in the draft Cumberland Plain Conservation Plan should be reviewed.

Further, we contend that the allocation of the entire land holding in the Strategic Conservation Area is inappropriate and should be reviewed.

We note that neither Cardno nor the landowners have received any formal response to the February 2020 Cardno submission and despite requests via Cardno to meet, the landowners were not given the opportunity to personally discuss the zoning of their land with DPIE prior to gazettal of the SEPP (Western Sydney Aerotropolis).

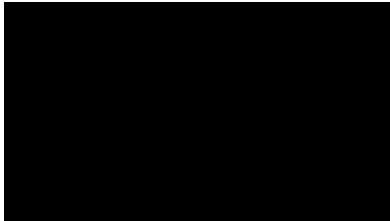
We agree with the landowners opinion that the decision to zone the land in its entirety as *Environment and Recreation* has been made without adequate consultation and further that it appears to have been made without the foundation of a rigorous analysis of the biodiversity value of the land against its potential for development. The consequent proposal to categorise the entire Subject Land as *Non-Certified – Protection of Biodiversity* in the draft *Cumberland Plain Conservation Plan* is considered equally inappropriate and requiring review.

The landowners have requested us to include in this submission that they do not intend to allow the zoning and proposed categorisation of their land without due process to go unchallenged.

On behalf of the landowners we again request the opportunity to meet with DPIE to discuss the implications of the zoning and proposed Non-Certified classification of the entire Subject land and its inclusion in the Strategic Conservation Area with regard to its value and potential to contribute to the orderly development of the Agribusiness precinct.

We urge the Department to consider this submission and the additional information on the Subject Lands therein and we look forward to receiving your response in due course.

Yours sincerely,



John O'Grady  
Manager Urban Planning  
for Cardno

Direct Line: [REDACTED]

Email: [REDACTED]

Enc: Letter – Ecological advice [REDACTED] Luddenham (Cardno) dated 25 September 2020  
Cardno submission to the draft Aerotropolis Plan dated 27 February 2020

Our Ref: 80220021:KR  
Contact: Kevin Roberts

25 September 2020

Anthony Ziino  
[REDACTED]  
**Luddenham NSW 2745**

Attention: Anthony Ziino

**Cardno (NSW/ACT) Pty Ltd**  
ABN 95 001 145 035

Level 9 - The Forum  
203 Pacific Highway  
St Leonards NSW 2065  
Australia

**Phone +61 2 9496 7700**  
**Fax +61 2 9439 5170**

www.cardno.com

Dear Anthony,

## **ECOLOGICAL ADVICE**

### **[REDACTED] LUDDENHAM**

Cardno (NSW/ACT) Pty Ltd (Cardno) has been engaged by the owners of three properties collectively referred to as [REDACTED] Luddenham (the site) to provide professional ecological opinion on the values of the land for conservation purposes in relation to the NSW Department of Planning, Industry and Infrastructure's (DPIE) *The Draft Cumberland Plain Conservation Plan*.

The [REDACTED] Luddenham site consist of the following properties:

- > [REDACTED] Luddenham NSW 2745 [REDACTED]
- > [REDACTED] Luddenham NSW 2745 [REDACTED]
- > [REDACTED] Luddenham NSW 2745 [REDACTED]

The following documents were reviewed:

- > NSW Department of Planning and Environment (2018) *Western Sydney Aerotropolis – Land Use and Infrastructure Implementation Plan – Stage 1: Initial Precincts*.
- > DPIE (2020) *The Draft Cumberland Plain Conservation Plan. A conservation plan for Western Sydney to 2056* (Draft CPCP), including the seven documents available for exhibition and the spatial viewer available on-line via: <https://www.planning.nsw.gov.au/Policy-and-Legislation/Strategic-conservationplanning/Cumberland-Plain-Conservation-Plan/Community-engagement>
- > Cardno (2020) Biodiversity values and advice – [REDACTED] Luddenham (Report 80220021, dated 26 February 2020).
- > Client's email correspondence with Cardno's John O'Grady and in regards to the Draft CPCP.
- > Any correspondence from DPIE regarding the previous submission and the draft CPCP.

Results of review of the above listed documents is provided in sub-sections below.

### **1.1 Cardno (2020) Biodiversity Values and Advice**

Cardno (2020) undertook a preliminary ecological assessment at the site.

- > The assessment was undertaken along a random meander transect across [REDACTED] and on a small portion of [REDACTED] (see **Figure 1-1**).
- > Approximately 10.32 ha of cleared land was identified at the site. The cleared land was not native vegetation and was considered to have low ecological value.
- > Approximately 16.53 ha of native vegetation was recorded at the site and was found to conform to Plant Community Type (PCT) 850 – Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion (commonly referred to as Cumberland Shale Hills Woodland). PCT 850 was recorded in two conditions, low and moderate. Given the level of disturbance, vegetation in low condition was considered to have low ecological value. Native vegetation in moderate condition at [REDACTED] had the potential to constitute 'significant vegetation' in accordance with the Liverpool LEP.
- > PCT 850 was considered to be commensurate with vegetation community *Cumberland Plain Woodland in the Sydney Basin Bioregion*, a threatened ecological community (TEC) listed as a critically endangered ecological community (CEEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act) and



potentially meet the definition of (Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The following was noted with regards to the site in the Western Sydney Aerotropolis *Land Use and Infrastructure Implementation Plan*:

- > The site is mapped as 'Potential and Existing Conservation Land' in the Conservation Values – Western Sydney Aerotropolis map of the NSW Department of Planning and Environment (DoPE) *Western Sydney Aerotropolis – Land Use and Infrastructure Implementation Plan – Stage 1: Initial Precincts* (DoPE 2018).
- > The site is mapped as part of the Agribusiness initial precinct and is zoned as 'Environment and Recreation' in the Structure Plan – Agribusiness map of the NSW Department of Planning, Industry and Environment (DPIE) *Western Sydney Aeropolis Plan – Draft – for public comment* (DPIE 2019).
- > Part 4 of the Draft DCP outlines Risk Minimisation and Management measures. Crucial Performance Outcomes are stated regarding the risk of bird strikes to aircraft and bush fire risk. The National Airports Safeguarding Framework (NASF) Guideline C: Managing Risks of Wildlife Strike in the Vicinity of Airports includes landscape design principles which will reduce wildlife attraction within a 3km, 8km and 13km radius of the Airport as mapped on the Wildlife Map.

The preliminary ecological assessment concluded that the site's mapping as 'Environment and Recreation' required review due to:

- > Presence of cleared land with low ecological value.
- > Much of the remnant native vegetation was in poor condition. The low condition in addition to the lack of connectivity with remnant patches of native vegetation in the locality reduces the ecological value of the land at the site. This warrants the land being zoned as Primary Production (RU1) as per the Liverpool LEP 2008.
- > Remnant native vegetation in moderate condition would have ecological value as it can provide habitat to native fauna.
- > Potential fauna risks due to proximity of the proposed Western Sydney International (Nancy-Bird Walton) Airport warrants further consideration of proposed land use.
- > Modification of the 'Environment and Recreation' in the Western Sydney Aerotropolis zoning should be considered to reflect current site conditions.

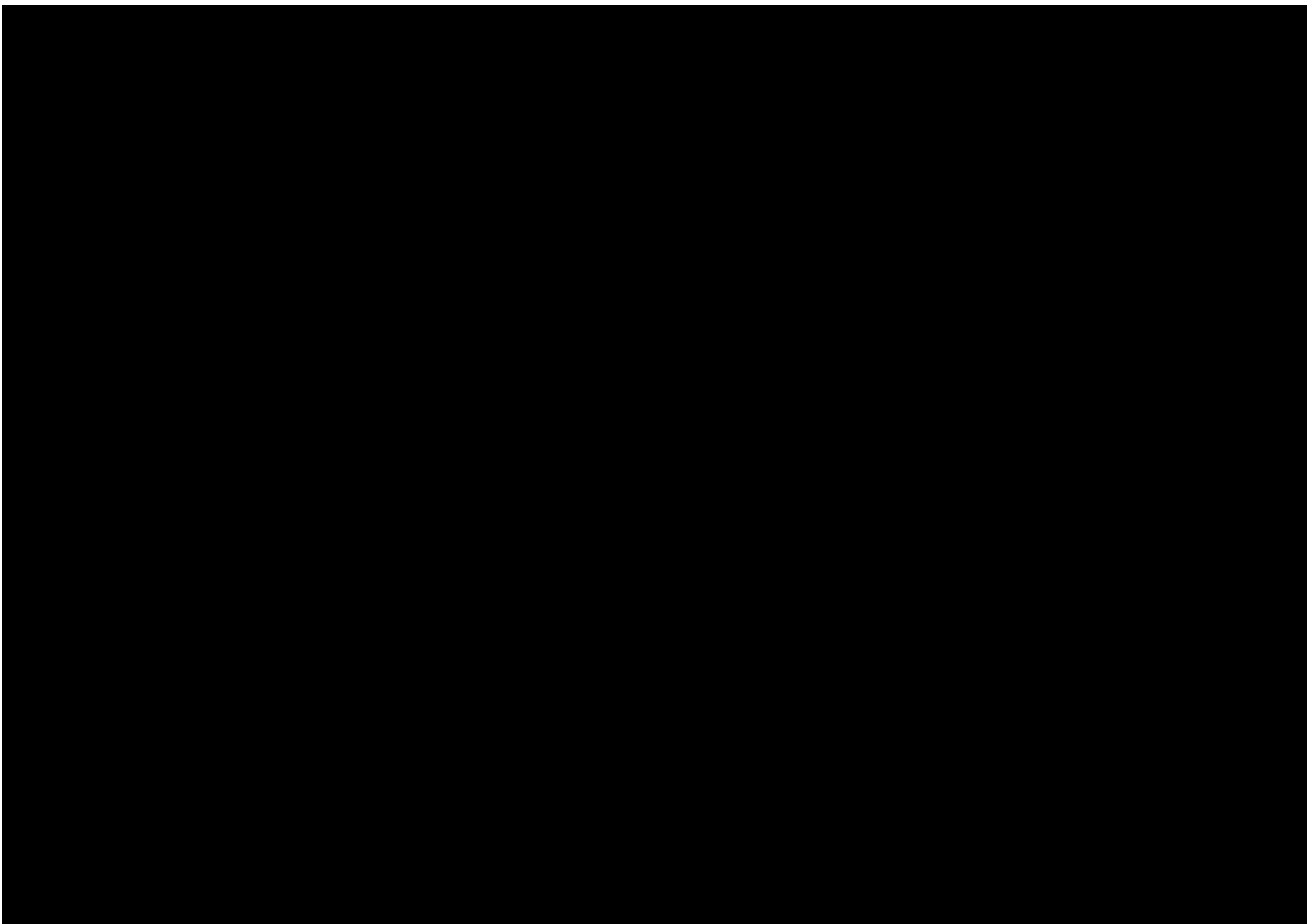


Figure 1-1 Vegetation mapping at [REDACTED] Luddenham (Cardno 2020)

## 1.2 Draft Cumberland Plain Conservation Plan

The NSW DPIE released the draft Cumberland Plain Conservation Plan (DPIE 2020a) as ‘a plan to support growth and biodiversity conservation in the Western Parkland City’<sup>1</sup>. The Draft CPCP has identified areas for growth and land for conservation. Once approved, the CPCP will be implemented by DPIE through a number of mechanisms.

At the time this advice was prepared, the portal had the following on exhibition:

- > DPIE (2020a) Draft Cumberland Plain Conservation Plan 2020-56.
- > DPIE (2020b) Sub-Plan A: Conservation Program and Implementation. Part of the Draft Cumberland Plain Conservation Plan.
- > DPIE (2020c) Sub-Plan B: Koalas. Part of the Draft Cumberland Plain Conservation Plan.
- > DPIE (2020d) Highlights of the Draft Cumberland Plain Conservation Plan. A Conservation Plan for Western Sydney (August 2020).
- > DPIE (2020e) Explanation of Intended Effect. State Environmental Planning Policy for Strategic Conservation Planning.
- > OpenLines and Biosis (2020a) Cumberland Plain Assessment Report.

---

<sup>1</sup> The Western Parkland City includes the existing city centres of Liverpool, Campbelltown and Penrith, and the new Western Sydney International (Nancy-Bird Walton) Airport and surrounding Western Sydney Aerotropolis (<https://www.wscd.sydney/a-parkland-city>). It was identified as part of the 2018 *Greater Sydney Regional Plan – A Metropolis of Three Cities* and is a partnership between the Australian Government, NSW and eight LGAs (Hawkesbury, Penrith, the Blue Mountains, Fairfield, Liverpool, Campden, Campbelltown and Wollondilly) via the Western Sydney City Deal. The deal is a 40 years vision for a global metropolis of three cities incorporating land use, transport and infrastructure planning.

> OpenLines and Biosis (2020b) Draft Cumberland Plain Assessment Report. Summary Report.

The DPIE website provides access to the Spatial Viewer showing the mapping as per the Draft CPCP.

Cardno reviewed the Spatial Viewer and above listed documents with regards to implications for the properties at [REDACTED]

The Draft CPCP provides a Spatial Viewer showing the map layers applicable to the plan. The layers are subdivided in three categories, Environment, Planning and Explanation of Intended Effect. Cardno reviewed all the map layers in the Spatial Viewer and identified those applicable to the site (see **Table 1-1**).

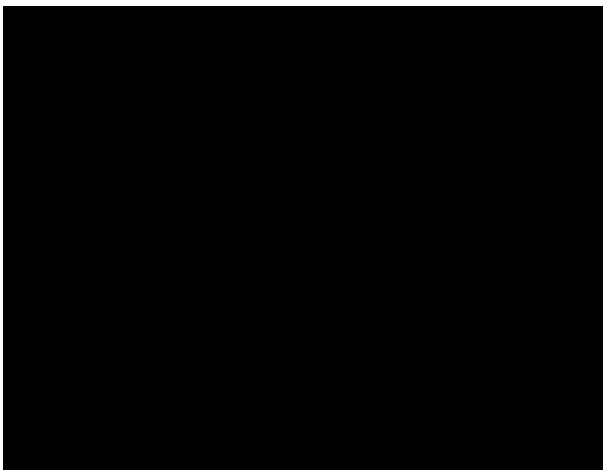
Table 1-1 Map layers in the Draft CPCP Spatial Viewer

Section	Layer	Applicable to the site?	
Environment	Stream (Strahler Order $\geq 2$ )	Yes	
	Strategic Conservation Area	Yes*	
	Already Protected Land	No	
	Native Vegetation	Yes	
	NSW Threatened Ecological Community	Yes	
	Georges River Koala Reserve	No	
	Important Koala Habitat	No	
Planning	Nominated Area	Yes	
	Precinct	Yes	
	Existing North West and South West	No	
	Western Sydney International (Nancy-Bird Walton) Airport	No	
	Land Category	Certified – Urban Capable Land	Yes
		Excluded Land	No
		Non certified – Western Sydney Aerotropolis	No
		Non certified – Avoided for Other Purposes	Yes
		Non certified – Avoided for Biodiversity	Yes
	Western Sydney Transport Corridors	Corridors included in Biodiversity Certification and Strategic Assessment	No
		Corridors included in Strategic Assessment	Yes
		Corridors included in Strategic Assessment (Tunnel)	No
	Explanation of Intended Effects	Strategic Conservation Area	Yes*
Proposed Environmental Conservation		Yes	
Existing Environmental Conservation		No	
*For the site, it is the same extent shown in the Spatial Viewer			

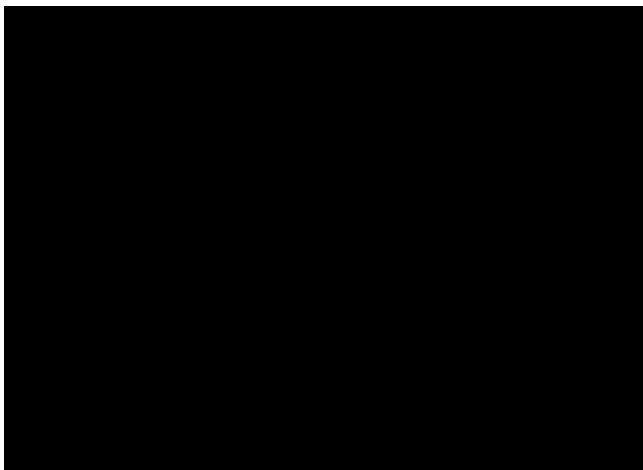
*\*For the site, it is the same extent shown in the Spatial Viewer*

The Draft CPCP documents were reviewed with regards to definitions of map layers applicable to the site and methodology used to define them. **Table 1-2** (see **Appendix A**) provides assessment of the consistency of the Draft CPCP zoning with vegetation at the site and the implications for development. Screen shots of Spatial Viewer layers applicable to the site are provided in **Figure 1-2** to **Figure 1-10** (see **Appendix B**).

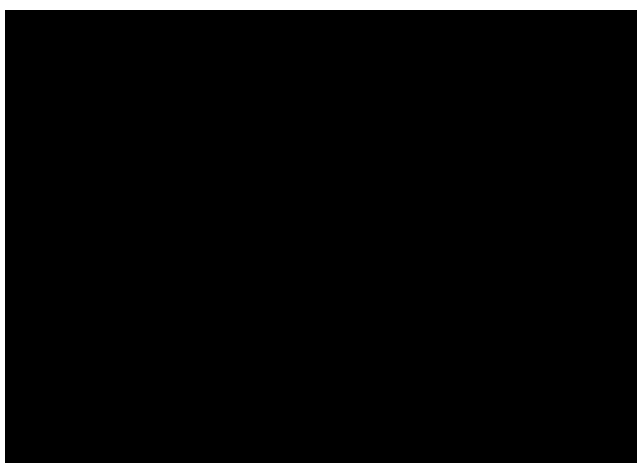
Visual evidence of condition of creek line at [REDACTED] properties is provided in **Plate 1** to **Plate 4**.



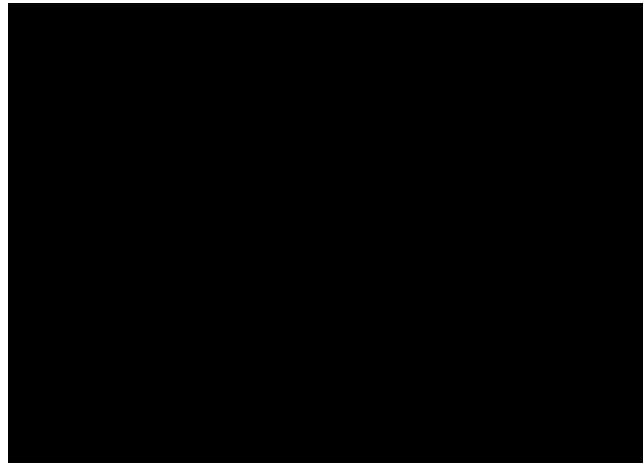
**Plate 1:** View of dry and eroded creek at [redacted] (Cardno, 16 January 2020)



**Plate 2:** View of eroded creek at [redacted] (Cardno, 16 January 2020)



**Plate 3:** View of creek line end at border between [redacted] (Cardno, 16 January 2020)



**Plate 4:** View of culvert on the southern boundary of [redacted] (Cardno, 16 January 2020)

### 1.3 Issues for discussion

The information presented in the following sections provide additional information for discussion which complements observations made in **Table 1-2 (Appendix A)**.

#### 1.3.1 Confirmation of the presence of EPBC Act listed Cumberland Plain Woodland

The Cumberland Plain Woodland is now known as Cumberland Plain Shale Woodland and Shale-gravel Transition Forest (CPSW & SGTF) under the EPBC Act (DAWE 2020).

In order to assess whether the vegetation present at the site corresponds to the EPBC Act listed TEC, review of the listing and threshold criteria need to be revised. The following is noted:

- > In the case of the EPBC Act listed TEC, the listing advice (TSSC 2009) states that *“For the purposes of listing under the EPBC Act, the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest always has upper tree layer species present and either a shrub or ground layer present”*.
- > The listing advice recognised the difficulty in assessing derived grasslands and shrublands as formerly being part of CPSW & SGTF, as states *“Therefore, due to the uncertainties, derived grasslands and shrublands are not included as part of the national ecological community. Despite this, it is acknowledged that derived native grasslands and shrublands often retain conservation values in their own right, e.g. high biodiversity (particularly in grasslands), important habitat or refugia for wildlife and contribute significantly to corridors and connectivity of remnants. In addition, derived grasslands and shrublands can be quite easily recovered to meet the Description and Condition Thresholds for the listed ecological*

*community through planting of key canopy tree species and ongoing management actions. Loss of ground layer diversity is much more difficult to replace“.*

- > The listing advice provides condition thresholds which assist identifying the presence of the EPBC Act listed TEC. The condition thresholds are of particular relevance in assessment of degraded lands as significantly degraded patches are not part of the EPBC Act listed TEC. It is noted that *“The condition thresholds only apply to patches of native vegetation that meet the description of the national ecological community, including the key diagnostic characteristics”* (TSSC 2009).

Therefore, areas of the property lacking canopy species characteristic of this TEC would not be commensurate with the EPBC Act listed TEC, such as cleared areas. Furthermore, where canopy species occur, the presence of species characteristic of the shrub and ground layer of the EPBC Act listed TEC would require assessment to find out if they are commensurate with the EPBC Act listed TEC.

### 1.3.2 Native vegetation condition states

Section 11.2.1 of the BCAR (OneLines and Biosis 2020a) define condition states for each vegetation polygon mapped as:

- > **Intact:** This condition state was assigned to areas of wooded vegetation community, including regrowth, that displays a range of structural layers and habitat features (e.g. tree hollows and large trees, fallen timber, leaf litter) with a largely unmodified canopy density and a range of age classes and species present. This condition state was assigned during the desktop mapping to areas where the Nearmap imagery indicated significant patches of continuous canopy and the canopy height model (CHM) indicated vegetation in both the upper and middle storeys. The CHM was created using aerial images (1 m LiDAR data).
- > **Thinned:** This condition state was assigned to native vegetation in various states of modification, including:
  - Wooded vegetation with a partly-cleared canopy and a more open structure compared to the intact PCT
  - Wooded vegetation that has been under scrubbed. This condition state was assigned during desktop mapping to areas where the Nearmap imagery indicated patches of notably reduced canopy density, which was typically where the CHM indicated canopy and visible ground only, with no discernible shrub layer or structural complexity
- > **Scattered trees:** This condition state includes a single tree or small group of trees surrounded by native or exotic pasture or areas of cultivation. Other structural components of the vegetation have typically been removed. This condition state was assigned during the desktop mapping to areas where the Nearmap imagery and LiDAR canopy polygons indicated one or a few likely native trees surrounded by cleared land
- > **Grasslands:** Grasslands included two separate state zones – exotic grassland and native grasslands. Areas of potential derived native grassland (DNG) were identified from the Nearmap imagery and later verified or reclassified in the field. Grasslands were considered to be DNG where they had a vegetation integrity score of greater than or equal to 15 (based on data collected in the field). Where grasslands were dominated by exotic species and the vegetation integrity score was less than 15, these were considered to be ‘non-offsettable grasslands’ (NOG)
- > **Urban native/exotic:** This condition type was assigned to areas of vegetation within urban areas that consisted of street trees, urban parks and other patches of planted vegetation that could provide habitat for native species. This condition type was also used to map areas of exotic vegetation.

Some of the vegetation at the site appears to be consistent with the thinned condition state. It is unclear why if any of the three properties were surveyed, only some areas within the site are allocated as SCA and/or for proposed conservation zoning. It is also clear that most of the grasslands were exotic or urban exotic and unlikely to meet the definition of DNG.

## 1.4 Conclusion

Review of existing information on the [REDACTED] properties indicates that cleared land, residential dwellings and native vegetation occurs therein. Information gathered as part of a biodiversity assessment

(Cardno 2020) indicates that some areas would likely constitute significant vegetation with value for conservation, particularly where native vegetation in moderate condition occurs. Review of mapping of the site as per the Draft Cumberland Plain Conservation Plan (CPCP) indicates that there are inconsistencies in the allocation of biodiversity values in the CPCP when compared with the actual condition of the site. Information gathered during the preliminary assessment (Cardno 2020) would provide the proponent authority with information on the current condition of the site and will allow discussions on revision of the Draft Cumberland Plain Conservation Plan's mapping to more accurately represent the site's condition and values.

Key Conclusions:

- > Second order stream at [REDACTED] should be considered for removal from the CPCP.
- > The biodiversity value of vegetation at the site should be assessed and their inclusion for conservation purposes in the CPCP be reviewed.
- > Cleared land within the site is not native vegetation and it does not have ecological value. Inclusion of cleared land in environmental zone (E2) should be reconsidered.

It is acknowledged that detailed plot surveys will be required to accurately assess condition of PCTs at the site and their correspondence with threatened ecological communities listed under the BC Act and EPBC Act.

Yours sincerely,

[REDACTED]

Review/Approved by:

Kevin Roberts  
Technical Director Environmental Services for Cardno  
Direct Line: [REDACTED]  
Email: [REDACTED]

[REDACTED]









Prepared by:

Dr Adriana Corona Mothe  
Ecologist  
Direct Line: [REDACTED]  
Email: [REDACTED]

Enc: Appendix A – Table 1-2.  
Appendix B - Figures  
Appendix C - References

Appendix A: Summary of land category allocations of the Draft CPCP and applicability to the Site

Table 1-2 Summary of land category allocations as per the Draft CPCP to properties in [redacted]


Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
Environment					
Stream (Strahler Order ≥ 2)  (see Figure 1-2)	The Spatial Viewer provides mapping of streams of second and higher order as per the Strahler classification within the Drat CPCP's application area.  Three water catchments occur within the Draft CPCP application area, Georges River catchment, Hawkesbury-Nepean catchment and Wianamatta (South Creek) sub-catchment. The Draft CPCP has identified streams of ≥2 order as having conservation value.  The Strahler stream ordering system is a classification system that gives a waterway an 'order' according to the number of tributaries associated with it.		A portion of a second order stream is mapped on the south-eastern corner of the property.	Streams of order ≥2 are identified as having conservation value in the Draft CPCP and will be retained for conservation. Therefore, no development would be allowed in areas mapped as having ≥2 order streams (including a buffer zone).	Despite the mapping, no stream with a defined bed or bank or riparian vegetation was identified across [redacted] between the farm dam and the border of the property (Plate 3). A defined creek line was identified on the south-eastern portion of [redacted] (Cardno 2020) as shown in Plate 1 to Plate 4. This section of the stream had little value as aquatic habitat. Suggest that the mapping of the second order stream on [redacted] be reconsidered.
			A portion of a second order stream is mapped extending from the south-eastern portion to the north-centre of the property.		
			Several streams of ≥2 order are mapped within the property.		These are outside of the proposed environmental conservation area.
Native Vegetation  (see Figure 1-2)	The Spatial Viewer provides mapping of native vegetation within the Drat CPCP's application area.  The Draft CPCP indicates that native vegetation was assessed based on existing information and undertaking surveys, including floristic plots, between 2017 and 2019.  Vegetation plots and threatened species surveys were undertaken on land where landholders granted access. Some areas of the nominated areas were not able to be accessed, which limited the ability to undertake threatened species surveys.  A total of 258 native vegetation plots were surveyed within the nominated areas, which meets the requirements of the BAM. A total of 2,190 hectares of combined species habitat was surveyed across the nominated areas (OpenLines and Biosis 2020a, 2020b). Flora surveys within the Western Sydney Aerotropolis were undertaken between February and November 208 across 56 days (initial for a surveys), between 29 June and 2 August 2019 across 10 days (winter surveys), and on 11 December 2019 (spring surveys).		Most of the property is mapped as Native Vegetation except for the south eastern edge of the property and a cleared corridor extending to the north past the farm dam.	The area mapped as native vegetation was assessed in accordance with its biodiversity values, particularly in relation to the Plant Community Type (PCT) present and whether or not the PCT is associated with a Threatened Ecological Community (TECs). Mapped areas were used as part of the assessment of the plan against criteria under the Biodiversity Conservation Act certification criteria and identified as 'avoided clearing'	Overall, mapped native vegetation extent is consistent with aerial images showing canopy cover across the site.  It is noted that the assessment report (OpenLines and Biosis 2020a, 2020b) do not provide a map showing survey effort. This map would have been useful in verifying the areas where transects, floristic plots and targeted flora and fauna surveys were undertaken.  In accordance with methodology in the BCAR (OpenLines and Biosis 2020a), the analysis was based on aerial image analysis where no field surveys were undertaken. The use of aerial imagery without field verification may result in errors of identification and should be subject to more detailed plot assessment before plan is finalised.
			The south-western portion of the property is part of a large and continuous patch extending to the property boundary. An area of cleared land surrounds the farmhouse. The northern boundary is mapped as part of a large continuous patch extending across the three properties.		
			The property is mapped as containing native vegetation part of a larger patch along its southern boundary and with numerous smaller patches across the property. Many of the smaller patches of native vegetation are associated with creek lines but outside of the environmental conservation area.		
NSW Threatened Ecological Community  (see Figure 1-3)	The Spatial Viewer provides mapping of NSW Threatened Ecological Communities (TECs) within the Drat CPCP's application area.  A total of 40 plant community types (PCTs) were identified within the Draft CPCP application area. Approximately 30 of those PCTs are associated with TECs listed under the BC Act and/or EPBC Act or classified as over-cleared vegetation types. Over-cleared vegetation types are those whose original extent has been lost by more than 70% due to clearing compared to the extent they had before European colonisation. Over-cleared vegetation communities are often of high conservation value because they contain the only remaining habitat for species and ecological communities that occur only in the Cumberland IBRA sub-region.  PCT 849 Cumberland Shale Plains Woodland was mapped at the site (OpenLines and Biosis 2020a, 2020b) as shown in Figure 1-8. PCT 849 is associated with a TEC, the Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as a Critically Endangered Ecological Community (CEEC) under the BC Act and the EPBC Act <sup>2</sup> .		One TEC is mapped within the property, the Cumberland Plain Woodland is mapped as occupying most of the property and corresponds with the native vegetation layer.	TECs are prioritised for conservation as per the Draft CPCP. This is particularly the case for over-cleared TECs, such as the Cumberland Plains Woodland.  The CPCP will seek to conserve these TECs as part of existing reserves, new reserves and as part of stewardship sites when they occur in private land.	The Draft CPCP, mapped the Cumberland Plain Woodland (CEEC) as having the same extent as native vegetation in these two properties.  This is consistent with Cardno (2020) as presence of cleared land and Cumberland Plain Woodland were recorded in these properties. A discrepancy occurred with regards to the PCT allocated, PCT 850 was recorded on site by Cardno (2020), whereas the Draft CPCP mapped the area PCT 849. Given that no BAM plots were collected at the site, it is assumed that PCT allocation was based on aerial image analysis.  The preliminary assessment identified PCT 850 in low and moderate condition at 260 [redacted] and PCT 850 in low condition at [redacted].
			One TEC is mapped within the property, the Cumberland Plain Woodland is mapped as occupying most of the property and corresponds with the native vegetation layer.		

<sup>2</sup> The EPBC Act listed Cumberland Plan Woodland changed its name to 'Cumberland Plain Shale Woodlands and Shale-gravel Transition Forest' TEC (<https://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=112&status=Critically+Endangered>).



Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
	<p>It is noted that PCT 850 Cumberland Shale Hills Woodland was recorded within the site (Cardno 2020). Both PCTs (i.e. 849 and 850) are closely related, they share approximately 50% of characteristic species and are the two grassy woodlands associated with the Cumberland Plain Woodland CEEC.</p> <p>PCT 835 Cumberland Riverflat Forest was mapped at [REDACTED] [REDACTED] PCT 835 is associated with a TEC known as River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions, listed as an Endangered Ecological Community (EEC) under the BC Act.</p> <p>It is noted that the condition of vegetation mapped as part of the Draft CPCP was assessed based on floristic plots. Map M14.3 of the Biodiversity Certification Assessment Report (BCAR) (OneLine and Biosis 2020a), provides vegetation condition for PCTs and shows location of BAM plots. A crop image if M14.3 for the Western Sydney Aerotropolis and showing the site is provided as <b>Figure 1-9</b>. Note no plots were undertaken on the site.</p>		<p>Two TECs are mapped within the property, Cumberland Plain Woodlands (CPW) and River-flat Eucalypt Forest (REF). A large patch of CPW is mapped on the southern portion of the land, whereas fragments of CPW and REF appear scattered across the property.</p>		<p>The Draft CPCP does not provide condition of vegetation within these two properties (see <b>Figure 1-9</b>). It is unknown why the condition mapping is not shown in these areas, but this prevents understanding the reason for their allocation as not certified. Based on the 'condition states' used in the Draft CPCP (see Section 1.3.2), vegetation in these properties would likely correspond to thinned vegetation.</p> <p>It is noted that the nearest BAM plots were located between 1.5km (north) and 3.5 km (south) away from the site.</p> <p>It is also noted that in order to accurately identify the condition of the vegetation, detailed floristic plots are required. This is of particular relevance to confirm whether the vegetation is commensurate with the TEC listing under the EPBC Act (see <b>Section 1.3.1</b>).</p> <p>The Draft CPCP, mapped the extent of native vegetation as PCT 849 and PCT 835. These PCTs are associated with the TECs Cumberland Plain Woodland (CEEC) and River-flat Eucalypt Forest (EEC).</p> <p>Similarly, to the other two properties, a discrepancy occurred in allocation of PCT 850 (Cardno 2020) vs PCT 849 (OpenLines and Biosis 2020a), to Cumberland woodland. Both PCTs are associated with the TEC known as Cumberland Plain Woodland.</p> <p>It is noted that the condition of vegetation within the property is not provided, except for some portions of the two TECs which are mapped as thinned (see <b>Figure 1-9</b>).</p> <p>Based on the preliminary assessment (Cardno 2020), it is known that PCT 850 in low condition, associated with Cumberland Plain Woodland, is present in a portion of the property, and would most likely correspond to the thinned condition state as per the CPCP. However, further assessment would be required to confirm presence of these TECs in other parts of this property and to accurately estimate their condition.</p>
Planning					
Nominated Area: Western Sydney Aerotropolis  (see <b>Figure 1-4</b> )	<p>The Spatial Viewer provides location of the nominated areas. There are four nominated areas:</p> <ul style="list-style-type: none"><li>Greater Macarthur Growth Area</li><li>Greater Penrith to Eastern Creek Investigation Area</li><li>Western Sydney Aerotropolis</li><li>Wilton Growth Area</li></ul> <p>These areas are nominated for urban development and major transport infrastructure. They have been prioritised to deliver new precincts as part of the long-term growth of Western Sydney. These nominated areas will be the key focus for development to 2056 and the centres of economic activity in Western Sydney. The Draft CPCP is seeking approval for development of the nominated areas under the BC Act and the EPBC Act, as follows:</p> <ul style="list-style-type: none"><li>Urban development and major infrastructure corridor approval via Strategic biodiversity certification under Pat 8 of the BC Act.</li><li>Urban development and major infrastructure corridor approval via Strategic Assessment under the EPBC Act.</li></ul>		<p>Most of the property is mapped as part of the Western Sydney Aerotropolis nominated area.</p>	<p>The portion of the site mapped as part of the Western Sydney Aerotropolis will be considered for development in accordance with the Western Sydney Aerotropolis plan.</p>	
			<p>The entire property is mapped as part of the Western Sydney Aerotropolis nominated area.</p>		
			<p>The entire property is mapped as part of the Western Sydney Aerotropolis nominated area.</p>		


Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
	The Draft CPCP “describes how development in nominated areas and major transport infrastructure across the Plan Area will occur” (DPIE 2020a). Development in each nominated area is guided by a structure plan that provide precinct planning and neighbourhood plans (DPIE 2020a).				
Precinct	The Spatial Viewer provides location of precincts as per the planning layer.		The eastern portion of the property is mapped as part of the Western Sydney Aerotropolis Agribusiness Precinct.	The portion of the properties mapped as part of the Western Sydney Aerotropolis Agribusiness Precinct would have the potential to be development as per allowed development in the agribusiness zoning. However, any part of the site mapped as non certified – avoided land for biodiversity and other purposes, will be used for conservation purposes per the Draft CPCP.	It is considered that based on the landscape and desktop analysis undertaken as part of the Draft CPCP preparation, the allocation of parts of the properties as avoided for conservation purposes is justified because: <ul style="list-style-type: none"><li>The desktop assessment, field survey and draft CPCP confirm the presence of PCT 850/849 and PCT 835 at the site.</li><li>The number of BAM plots collected within the Western Sydney Aerotropolis nominated area met the minimum BAM plot requirements as per the BAM despite none being collected on the site.</li></ul> However, information was collected at the site during the preliminary assessment (Cardno 2020), includes presence of cleared land that could be considered for inclusion in the Certified – Urban Capable Land within the Agribusiness precinct.  There is evidence that vegetation at part of the site is in low condition and might be unsuitable for conservation purposes. This will most likely be the case of PCT 850 within  as canopy trees appear to be in bad health and the soil has undergone considerable disturbance resulting in lack of shrub and groundcover layers.
(see <b>Figure 1-5</b> )	Precincts plans identify land uses, associated development and infrastructure at the finer scale, while ensuring considerations at the local level (DPIE 2020a).		The entire property is mapped as part of the Western Sydney Aerotropolis Agribusiness Precinct.		
	A proposed State Environmental Planning Policy (SEPP) for strategic conservation planning will require that zoning of the structure plans and precinct plans is consistent with the certified-urban capable land and the CPCP (DPIE 2020a).		The entire property is mapped as part of the Western Sydney Aerotropolis Agribusiness Precinct.		
	Action identified in the Western Sydney Aerotropolis Agribusiness Precinct is intensive plant agriculture (DPIE 2020a). Development in these areas may include the following, provided they meet the relevant objectives and satisfy the airport safeguarding guidelines: <ul style="list-style-type: none"><li>intensive plant agriculture, including protective cropping structures used primarily for horticultural applications to control specific environmental conditions and facilitate high-quality, high-quantity production of a defined fruit, vegetable or flower</li><li>the cultivation of irrigated crops for commercial purposes (other than irrigated pasture or fodder crops),</li><li>horticulture</li><li>viticulture</li></ul> The Draft CPCP states that ‘Inclusion of an action in the descriptions in this Plan does not confirm that the use is appropriate under the National Airports Safeguarding Framework (NASF). An assessment against the NASF will need to be undertaken separate to this Plan to ensure the use is appropriate in proximity to Western Sydney International (Nancy-Bird Walton) Airport’.				
Land Category					
Certified – Urban Capable Land	Biodiversity Certification occurs when a proposed development has undertaken assessment and has identified land suitable for development and land required to avoid, minimise and offset impacts on biodiversity. Once land has been granted certification, development can proceed in these areas without further approvals.		A very small area along the southern boundary is mapped in this category.	Development in Certified – Urban Capable Land will be allowed in accordance with the corresponding zoning.	The property has been divided in four land categories as per the Draft CPCP: <ul style="list-style-type: none"><li>Certified – Urban Capable Land: a very small area along the southern boundary. Based on aerial image, that area is vegetated, similarly to vegetation to the west and east. It corresponds to PCT 850 in moderate condition (Cardno 2020).</li><li>Corridors Included in Strategic Assessment: the western portion of the property, which has similar vegetation to the rest of the site i.e. PCT 850 in moderate condition (Cardno 2020).</li><li>Non certified – Avoided for Biodiversity: this includes cleared land, PCT 850 in moderate and in low condition (Cardno 2020).</li><li>Non certified – Avoided for other purposes: this area corresponds to a second order stream mapped in government databases (e.g. Six Maps).</li></ul> It is unclear why the boundaries for Non-certified land have been established – areas with similar vegetation have been included in certified areas and non-certified areas. It is likely that property boundaries were used to simplify the mapping but this is not reflected in  Consideration should be given to more refined mapping based on the actual site values. This
(see <b>Figure 1-6</b> )	Certified – Urban Capable Land are areas where new development may occur across the four nominated areas. These areas have been selected based on strategic planning to avoid and minimise impacts on biodiversity values and in accordance with the CPCP avoidance criteria.				
	The avoidance criteria states that for the purposes of the Cumberland Plain Assessment Report, land is considered unsuitable for urban development if it is: <ul style="list-style-type: none"><li>a riparian buffer, consistent with the <i>Water Management Act 2000</i> (NSW)</li><li>State-protected land with a slope of more than 18 degrees</li><li>existing protected land, including reserves and offset sites</li><li>Commonwealth land, such as the Defence Establishment Orchard Hills</li><li>land zoned for public recreation (Zone RE 1 under the standard instrument prescribed by the Standard Instrument (Local Environmental Plans) Order 2006).</li></ul>				

Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
	<p>Avoidance is consistent with a) guidance provided under Section 8 of the Biodiversity Assessment Method<sup>3</sup> (BAM), b) Draft guidelines for planning authorities for proposing conservation measures in strategic applications for biodiversity certification<sup>4</sup>; and c) terms of reference for the strategic assessment<sup>5</sup>.</p> <p>Urban capable land will be subject to strategic biodiversity certification for development under Part 8 of the BC Act. Development in these areas will not require further site by site biodiversity assessment once the CPCP is approved, so long as the approved conservation program detailed in the CPCP is implemented by DPIE.</p> <p>The Australian Government approval (under section 146B of the EPBC Act) will be sought for development that is taken in accordance with this Plan. This Plan requires development to be limited to the certified-urban capable land (except for essential infrastructure) and implemented consistent with the Plan and class of action approval obtained.</p> <p>Urban and industrial development will be limited to the certified-urban capable land in the nominated areas, and includes any development permitted through residential (R), business (B), or industrial (IN) zones, consistent with the structure plan and precinct plans for each nominated area.</p>		N/A		<p>would not change the measurement of biodiversity avoided included in the plan.</p> <p>Although aerial images indicate that vegetation is present in parts of this property, only canopy trees with bad health were present in parts of the property (Cardno 2020). The ecological value of the trees in this property is questionable given their poor condition and presence of holes on the trunks most likely created by borer insects. It is considered that the condition of trees in this property would not meet requirements for establishment of a conservation area as the historical use of the land has impacted on the soils.</p> <p>It is recommended that an arborist assessment is undertaken to provide the current condition of the trees and their life expectancy. This should be considered in refining of the boundaries of the conservation area.</p>
			Most of the land is mapped in this category, excluding areas mapped in other categories.		The area mapped as certified – urban capable land appears to be adequate, except for presence of vegetated areas with canopy cover higher than that observed in aerial images in the other two properties, and which based on mapping of vegetated areas in other properties would have qualify for biodiversity conservation.
Excluded land  (see <b>Figure 1-7</b> )	<p>Excluded land is excluded from NSW strategic biodiversity certification and strategic assessment under the EPBC Act. These areas will not receive any biodiversity approvals under the CPCP due to any of the following factors:</p> <ul style="list-style-type: none"> <li>the land is already developed for urban use</li> <li>development is already underway on this land under a separate process</li> <li>the land is environmentally protected, including reserves and offset sites</li> <li>Commonwealth land sites (such as the Defence Establishment Orchard Hills)</li> <li>there are roads or easements on this land</li> <li>it has specific urban zoning such as business, industrial, residential or special purpose (either already developed or to be developed).</li> </ul>		NA	NA	NA
			NA	NA	NA
			Several small portions on the eastern portion of the property are mapped in this category.	No information was found regarding which specific criteria was used to assign these areas as excluded land.	Unknown, no information found in relation to this land category at this particular property.
Non-certified – Avoided for Other Purposes  (see <b>Figure 1-7</b> )	<p>Non certified – Avoided for Other Purposes is land that cannot be feasible developed due to the topography (slope) of the land or having an environmental feature such as a riparian corridor or steep slope.</p> <p>Avoided land is avoided from development due to identified biodiversity values on the site, or because the land cannot legally or feasibly be developed due to its topography or due to an environmental feature such as a riparian corridor. In this instance, 'avoidance' refers to the approach the department has undertaken to avoid and minimise the impacts to biodiversity from development in the nominated areas, as required under the BC Act and EPBC Act. EPBC Act approval is being sought for certain essential infrastructure development, such as utilities, local roads and recreational development on non-certified land in the nominated areas.</p>		An area on the south-eastern portion of the property, corresponding to the mapped creek and its buffer.	Creek lines of ≥ 2 stream order in accordance with the Strahler stream classification method are avoided for development and included in the conservation areas of the Draft CPCP.	<p>A second order stream is mapped on the south-eastern corner of the property.</p> <p>However, the preliminary assessment (Cardno 2020) found that '<i>a dried and significantly eroded creek line is located in the south-eastern portion of the property</i>'. Observations at the site suggest that the value of the creek line as aquatic habitat is low given its condition (see <b>Plate 1</b> to <b>Plate 4</b>). Therefore, aquatic assessment of the creek is warranted to document the actual value of the creek line for biodiversity conservation.</p>
			The area following the mapped creek and a buffer is mapped in this category.		Four first order and a second order stream is mapped in this property. Consistent with







<sup>3</sup> OEH (2017) Biodiversity Assessment Method. NSW Office of Environment and Heritage, Sydney South.

<sup>4</sup> The final guidance: DPIE (2020e) Conservation measures in strategic applications for biodiversity certification: Guidance for Planning Authorities. NSW Department of Planning, Industry and Environment via its Environment, Energy and Science branch, Parramatta (September 2020).







<sup>5</sup> Terms of Reference for the Strategic Impact Assessment Report for the Cumberland Plain Conservation Plan.

Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
	<p>Non certified land are areas outside the certified-urban capable land but within the nominated areas and will not have biodiversity approval under the BC Act once the CPCP is approved.</p> <p>This means that once the CPCP is approved, if development is sought in non-certified land, that development will require a modification or series of modifications to the CPCP certification, or consideration under the applicable part of the NSW <i>Environmental Planning and Assessment Act 1979</i> (EP&amp;A Act).</p>		Most of the creek line with its associated buffer is mapped in this category.		<p>conservation values considered in the Draft CPCP, a second order stream is mapped.</p> <p>No creek line was observed across this property during the preliminary assessment (Cardno 2020). The presence of a second order stream should be reviewed.</p> <p>First, second, third and fourth order streams occur within this property. Streams of order <math>\geq 2</math> have been considered for conservation as per methods in the Draft CPCP.</p>
<p>Non certified – Avoided for Biodiversity</p> <p>(see <b>Figure 1-7</b>)</p>	<p>Is land outside of the certified-urban capable land but within the nominated areas that have been avoided due to biodiversity values present. This land will be ‘non-certified’ land and will not have biodiversity approval under the BC Act.</p> <p>Non certified – Avoided for Biodiversity land were identified based on the following main avoidance categories (OpenLines and Biosis 2020a):</p> <ul style="list-style-type: none"> <li>TECs and PCTs criteria: <ul style="list-style-type: none"> <li>1. Critically endangered ecological communities (CEECs) or PCTs <math>\geq 90\%</math> cleared in large patches and in good condition; or serious and irreversible impact (SAIL) entities (TECs)</li> <li>2. EECs or PCTs <math>\geq 70\%</math> to <math>&lt;90\%</math> cleared in large patches and in good condition</li> <li>3. PCTs <math>\geq 50\%</math> to <math>&lt;70\%</math> cleared in large patches and in good condition</li> <li>4. PCTs <math>&lt;50\%</math> cleared in large patches and in good condition</li> </ul> </li> <li>Threatened species criteria: <ul style="list-style-type: none"> <li>1. Known habitat^ for critically endangered species, SAIL entities (species), Saving Our Species (SOS) species polygons (where species-specific habitat is present), or large populations of threatened species (relative to typical size for that species); or known primary koala habitat</li> <li>2. Known habitat^ for endangered species or known secondary koala habitat</li> <li>3. Known habitat for vulnerable species</li> </ul> </li> <li>Ecological processes criteria: <ul style="list-style-type: none"> <li>1. Land identified as priority conservation lands, BIO Map core areas, or important local habitat corridors for key species including koalas</li> <li>2. Land identified as BIO Map regional corridors or as areas that provide significant opportunities to support important local habitat corridors for key species, including koalas</li> <li>3. Areas identified on the Biodiversity Values Map</li> </ul> </li> </ul> <p>The boundary rationalization considered likelihood of development induces significant edge effects, lack of opportunity to enhance connectivity or corridors that do not link important areas of habitat.</p> <p>In the proposed SEPP, environmental conservation zoning will protect areas that have been avoided for biodiversity reasons (DPIE 2020a).</p> <p>Zoning will be implemented through the proposed SEPP for strategic conservation planning or the relevant place based Environmental Planning Instrument (EPI), such as the Growth Centres SEPP or the draft Aerotropolis SEPP, if that is more appropriate (DPIE 2020a).</p> <p>Rezoning for development will occur over time, informed by the relevant strategic plan or structure plan and consistent with the certified-urban capable land under the Plan CPCP (DPIE 2020a). A Ministerial Direction made under section 9.1 of the <i>Environmental Planning and Assessment Act 1979</i>, will restrict future rezoning of land avoided for biodiversity or other environmental purposes to more intensive land uses (DPIE 2020a). Councils are required to address and follow the section 9.1 Directions in considering any Planning Proposals submitted to them.</p>		Most of the property is mapped in this category. It is consistent with area mapped for Strategic Conservation Area, but excluding the creek and riparian buffer.	<p>No development will occur in land mapped within this category and under the CPCP.</p> <p>Conservation of these areas will be sought via creation of reserves or preserved in perpetuity as stewardship sites. Conservation areas will be zoned as environmental conservation (E2) in the proposed SEPP.</p> <p>Where these areas occur within private property, land owners can establish a stewardship site in agreement with the Biodiversity Conservation Trust. Establishment of a Stewardship site requires the land to be managed to improve its biodiversity value via restoration management. Land owners would receive a payment from the BCT to manage the stewardship site.</p> <p>Note that Figure 16 in DPIE 2020a indicates that where not sufficient conservation land is obtained by the fifth year after approval of the CPCP, DPIE will seek to acquire land with biodiversity values by compulsory purchase. This would occur between year 5 and 8<sup>th</sup> after approval of the final CPCP.</p> <p>Where development is sought in non-certified land within the application area of the CPCP, development approval would follow the standard development application process as per planning instruments and legislation, e.g. LEP, DCP, EP&amp;A Act, BC Act and EPBC Act.</p>	<p>Cleared land, a residential dwelling, ancillary infrastructure and PCT 850 are present in the area mapped as Non certified – Avoided for Biodiversity (Cardno 2020). Cleared land, residential dwelling and ancillary infrastructure have no biodiversity value and no potential for natural regeneration and their inclusion for biodiversity conservation appear unjustified. The portion of the area consisting of PCT 850 in moderate condition is likely to have conservation value, less so is the area mapped as PCT 850 in low condition.</p> <p>Native vegetation within the property is mapped as having biodiversity values in the Biodiversity Values Map (see <b>Figure 1-10</b>).</p> <p>It is worth noting that detailed floristic plots would be required to more accurately identify the condition and conservation value of this vegetation. However, as noted above the allocation of this category to the site in the CPCP should be reviewed.</p> <p>Cleared land, a residential dwelling, ancillary infrastructure, animal enclosures and PCT 850 in low condition are present in this property (Cardno 2020). Furthermore, only trees in bad health are present therein. Therefore, the mapping of the entire property as Non certified – Avoided for Biodiversity appears unjustified, particularly as cleared land has very low biodiversity value.</p> <p>Native vegetation within the property is mapped as having biodiversity values in the Biodiversity Values Map (see <b>Figure 1-10</b>), which is a criterion used to allocate land for conservation.</p> <p>It is acknowledged that land category was allocated based on desktop assessment, however, findings during preliminary assessment in this property warrant revision of the Draft CPCP mapping.</p>
			Only a small portion of the property is mapped in this category. It includes a portion of area mapped as TEC (Cumberland Plain Woodland) and part of the riparian corridor.		<p>The portion of the property included in the preliminary assessment (Cardno 2020) consisted of PCT 850 in low condition. Allocation of this area as Non certified – avoided for Biodiversity Conservation is inconsistent with vegetation condition.</p> <p>The Biodiversity Values Map (see <b>Figure 1-10</b>), shows that eight patches/areas within this property are mapped as having biodiversity values. However, only one of those areas is included in the Draft CPCP as avoided for biodiversity conservation. Furthermore, a small area is mapped as avoided for biodiversity in the Draft CPCP, when this area appears to be</p>



Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
	Where the precincts have not yet been re-zoned by an EPI, the proposed SEPP will rezone the avoided land to E2 as part of the finalisation of the Plan.				cleared land in aerial images and is not mapped as having biodiversity values in the Biodiversity Values Map. It is unclear which criteria was used to allocate this area as avoided for biodiversity.
Western Sydney Transport Corridors  (see <b>Figure 1-7</b> )	<p>The Western Sydney Transport Corridors include three categories (Corridors Included in biodiversity Certification and Strategic Assessment; corridors included in Strategic Assessment; and Corridors included in Strategic Assessment (Tunnel)). Only one category is mapped within the site, the ‘Corridors included in Strategic Assessment’. These corridors are major infrastructure corridors, whose development will take place within a designated development footprint, primarily defined by infrastructure corridor widths. The infrastructure in these corridors will be subject to design definition, particularly regarding alignment within corridors, operations and the placement of transport equipment. In some circumstances, development activities may be necessary adjacent to the corridor, and in such circumstances the avoid, mitigate and offset hierarchy continues to apply to all actions. The final location and alignment of infrastructure within the corridor is subject to a future process of refinement following detailed planning and design.</p> <p>The design of the infrastructure and the exact staging of delivery are not yet determined and are subject to the legislated approvals process and funding.</p> <p>EPBC Act approval will be sought for certain essential infrastructure development, such as utilities, local roads and recreational development on non-certified land in the nominated areas.</p> <p>The Outer Sydney Orbital between Box Hill and the Hume Highway near Menangle is an initiative planned for investigation in 10-20 years from approval of the CPCP.</p>		<p>The western portion of the property is mapped as ‘Corridors included in Strategic Assessment’. This include the portion of the property outside of the nominated area and the ‘Certified – Urban Capable’.</p> <p>In accordance with Figure 11 of the Draft CPCP (DPIE 2020a), the area corresponds to the Outer Sydney Orbital.</p>	Investigations for the proposed Outer Sydney Orbital would occur in 10-20 years from approval of the CPCP.	<p>The design of the transport corridor is still unknown. Therefore, information regarding zoning in this corridor is not yet available.</p> <p>It is noted, that PCT 850 in moderate condition is present in the area mapped for transport corridor. This area has the potential to have biodiversity values and the possibility exists that it will be avoided because PCT 850 is associated with the EPBC Act listed Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, formerly listed as Cumberland Plain Woodland.</p>
			NA	NA	NA
			NA	NA	NA
<b>Explanation of Intended Effect<sup>6</sup></b>					
Strategic Conservation Area  (see <b>Figure 1-8</b> )	<p>The strategic conservation area represents areas of important biodiversity value to the Cumberland subregion. These areas include large remnants of native vegetation, areas with important connectivity across the landscape, and some areas with ecological restoration potential. The strategic conservation area has been identified as the area of greatest strategic value to deliver long-term conservation outcomes in the Cumberland subregion and which can offset for biodiversity impacts.</p> <p>The strategic conservation area will be monitored over the life of the CPCP and regularly refined as constraints and opportunities change.</p> <p>The map of the strategic conservation area will be used to identify suitable conservation lands to offset biodiversity impacts over the life of the CPCP. Suitable areas may be protected as a future reserve or biodiversity stewardship site as well as enhanced through an ecological restoration project. Not all of the strategic conservation area is expected to become new conservation land under the CPCP.</p> <p>These areas were identified based on the conservation priorities method to identify and map high-value conservation lands that:</p> <ul style="list-style-type: none"><li>best support an ecologically functioning, connected landscape, and</li><li>can simultaneously offset for direct, indirect, prescribed and cumulative impacts on biodiversity, in line with the statutory requirements of the EPBC Act and the BC Act.</li></ul>		Most of the property is mapped as Strategic Conservation Area.	Strategic Conservation Areas will be zoned as Environmental Conservation (E2) in the proposed SEPP. Once zoned E2, these areas will be conserved as part of the objectives and targets of the CPCP.	<p>The allocation of most of the property as Strategic Conservation Area (SCA) should be reviewed because:</p> <ul style="list-style-type: none"><li>It includes cleared land and other areas (e.g. residential dwelling) with no biodiversity value.</li><li>PCT 850 in moderate condition has potential to have biodiversity value, particularly if this PCT is consistent with the BC Act and EPBC Act listed Cumberland Plain Woodland (CEEC). The biodiversity value of PCT 850 in low conditions is likely to be less than that of the area in moderate condition. The restoration potential of these areas require investigation.</li><li>The property is adjacent to  and at approximately 600 m from the nearest other patch of proposed SCA, which are separated by the proposed transport corridor to the west. This suggest that the SCA at the site will be an isolated patch with the transport Corridor to the west,  the east, Airport land to the south and urban capable land to the north. There isno connectivity corridor joining this site to other retained vegetated areas.</li><li>The property is located within 500m of the Western Sydney International (Nancy-Bird Walton) Airport. This has the potential of</li></ul>

<sup>6</sup> The Explanation of Intended Effect (EIE) has been prepared under section 3.30 of the Environmental Planning and Assessment Act. It recommends the creation of a new State Environmental Planning Policy (SEPP) for strategic conservation planning.

Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
					birds and bats being at risk of strike with aircraft.
			The entire property is mapped in this category.		<p>The allocation of the entire property as Strategic Conservation Area (SCA) should be reviewed because:</p> <ul style="list-style-type: none"><li>It includes cleared land and other areas (e.g. residential dwelling) with no biodiversity value.</li><li>PCT 850 in low condition is present, as only remnant trees with evidence of decay. Although PCT 850 is associated with BC Act and EPBC Act listed Cumberland Plain Woodland (CEEC), the lack of shrub and ground layer is likely to be inconsistent with the EPBC Act listed TEC. The land is currently used for grazing by cattle and goats, with evidence of soil impacts due to trampling and cattle/goat urine. It is likely this land would have low to no restoration potential. Therefore, the conservation value of this land requires investigation.</li><li>The property is adjacent to  Avenue and at approximately 600 m from the nearest other large patch of proposed SCA, which are separated by the proposed transport corridor to the west. This suggest that the SCA at the site will be an isolated patch with the transport corridor to the west, Norther Road to the east, airport land to the south and east and urban capable land to the north. There is no connectivity corridor joining this site to other retained vegetated areas.</li><li>The property is located within 350m of the Western Sydney International (Nancy-Bird Walton) Airport. This has the potential of birds and bats being at risk of strike with aircraft.</li></ul>
			NA		<p>A portion of the property has been mapped as Not certified – avoided for Biodiversity, yet this area is not included as SCA.</p> <p>The possibility exists that the proximity to the airport has made this land or portions of it non-suitable for consideration for conservation purposes. The apparent inconsistency in allocation of SCA and Non certified to the three properties at the site, warrants review of criteria and boundaries</p>
Proposed Environmental Conservation Zoning  (see <b>Figure 1-8</b> )	Some land has been avoided from the certification process because it is: <ul style="list-style-type: none"><li>of high biodiversity value as per the CPCP’s avoidance criteria</li><li>not suitable for development because it is a riparian corridor and is regulated under <i>Water Management Act 2000</i> or it is too steep for development (any land with a slope greater than 18 degrees)</li><li>excluded from the area covered under the CPCP (excluded land) including because it is existing protected land, is Commonwealth land, or is land that is already developed (e.g. existing urban areas)</li><li>in the nominated areas and already assessed as part of another development approval (such as Bingara Gorge), or is progressing through an alternative development assessment (such as Mount Gilead and Menangle Park)</li></ul>		Most of the property is mapped, overall corresponding to the same area mapped as Strategic Conservation Area.	These areas will be conserved as part of the CPCP.	This is the same area as the SCA. Inconsistencies as identified before apply.
			The entire property is mapped in this category.	These areas will not be suitable for development.	
			Two areas within the property are mapped in this category, the south-western portion and buffers around creeks corresponding to ≥ 2 order streams as per the Strahler stream classification.		<p>The area proposed for environmental conservation zoning in this property includes the Non certified – Avoided for Other Purposes (i.e. ≥ 2 order streams) and Non certified – Avoided for Biodiversity areas.</p> <p>.</p>

Draft CPCP layer/area	Description	Property	Draft CPCP map applicability to the Site	Draft DCPC implications for the Site	Comment
	<p>Avoided land also includes some non-vegetated land such as small wetlands and waterbodies, land that is strategically important to protect or enhance corridors, or small enclosed clearings that are surrounded by native vegetation.</p> <p>To support the protection of these areas, the department is proposing to apply environmental conservation zoning (E2).</p>				



# Appendix B: Figures

---

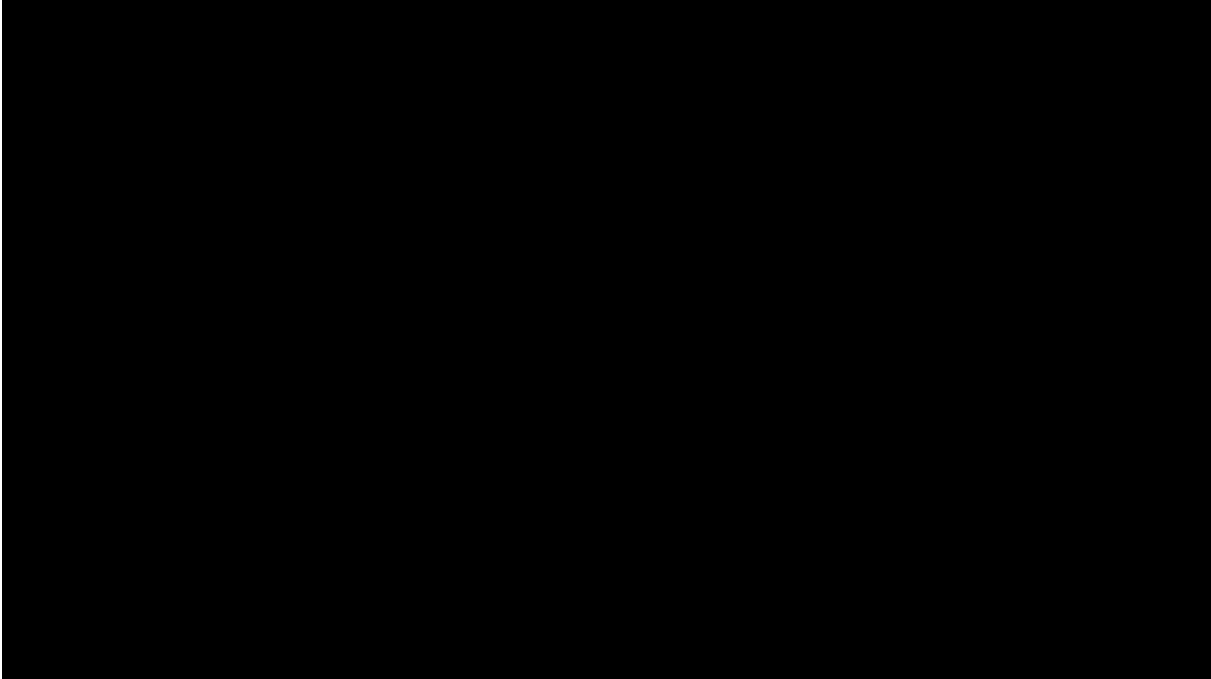


Figure 1-2 Native Vegetation mapping as per the Draft CPCP's Spatial Viewer (DPIE 2020)

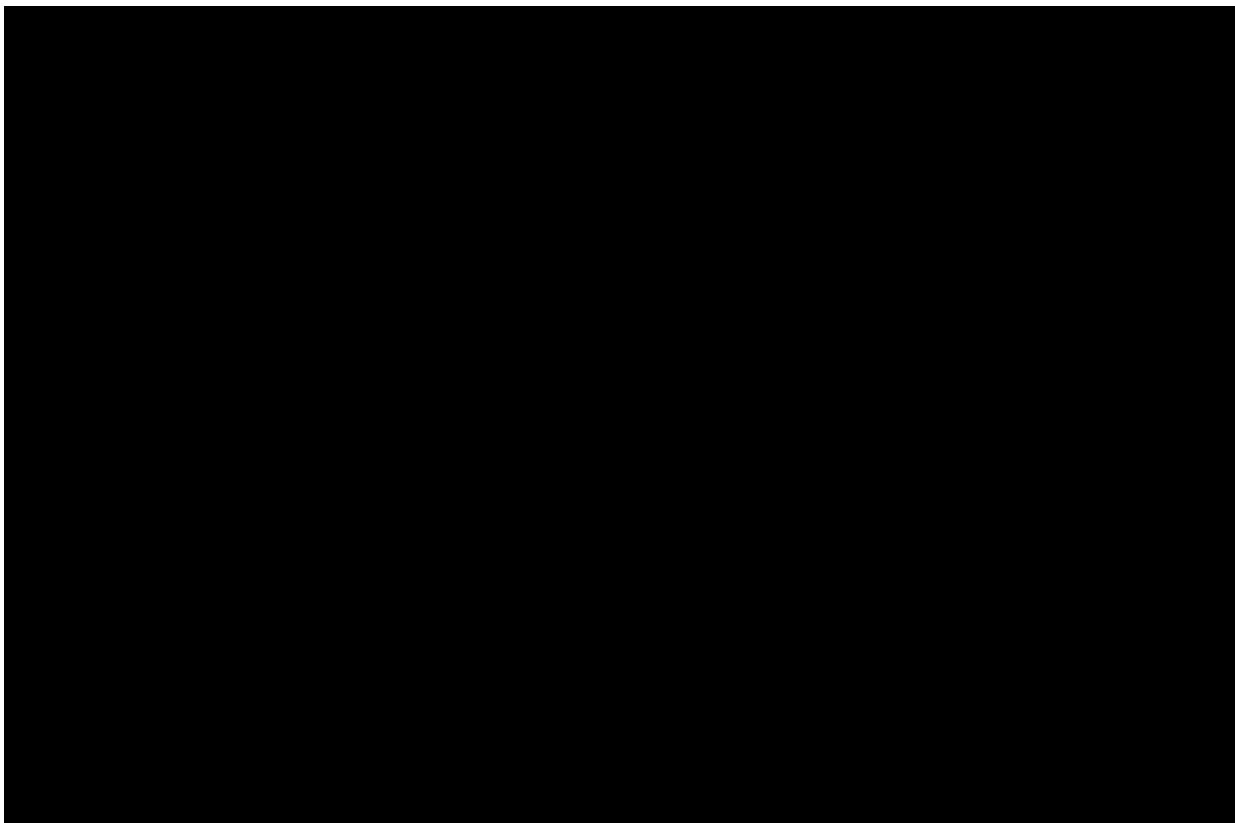


Figure 1-3 NSW Threatened Ecological Communities as per the Draft CPCP's Spatial Viewer (DPIE 2020)

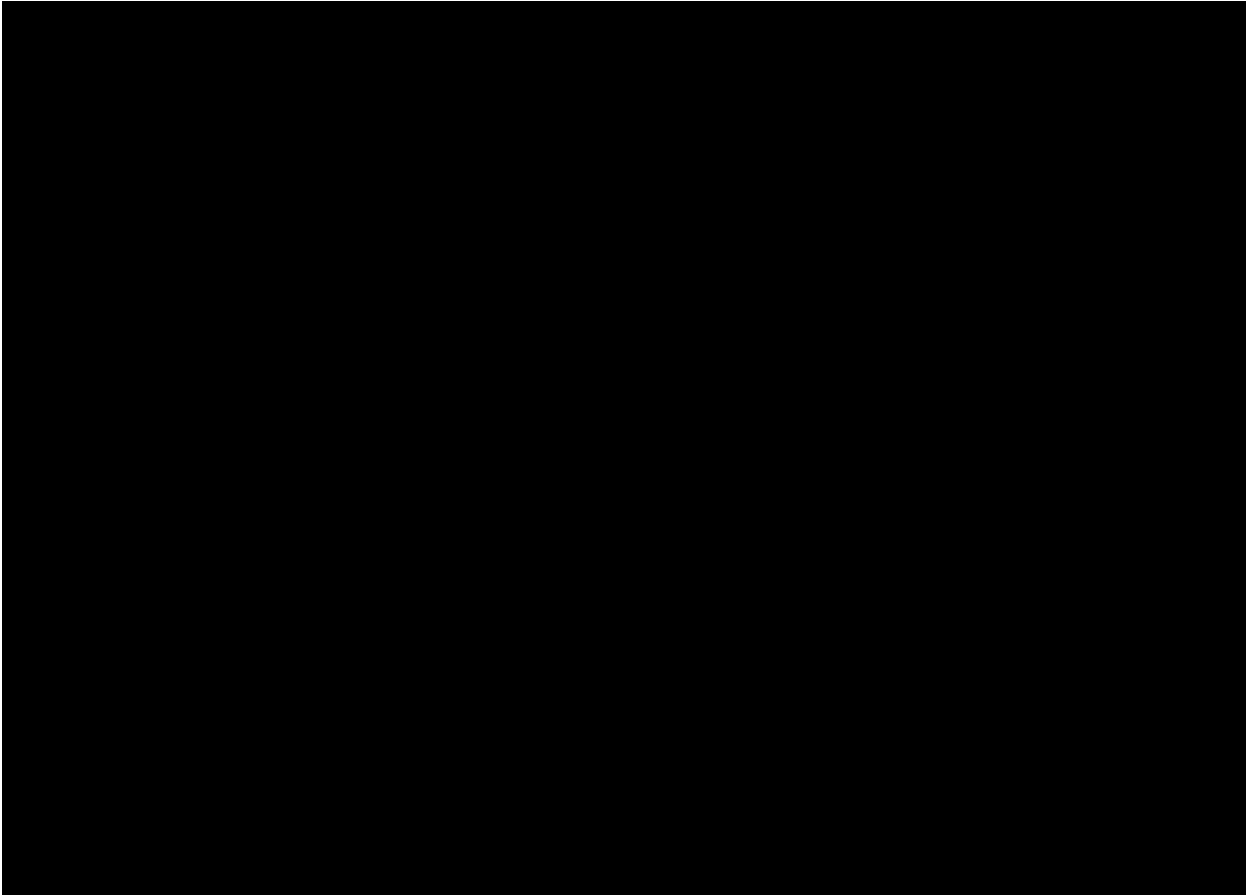


Figure 1-4 Nominated Areas as per the Draft CPCP's Spatial Viewer (DPIE 2020)

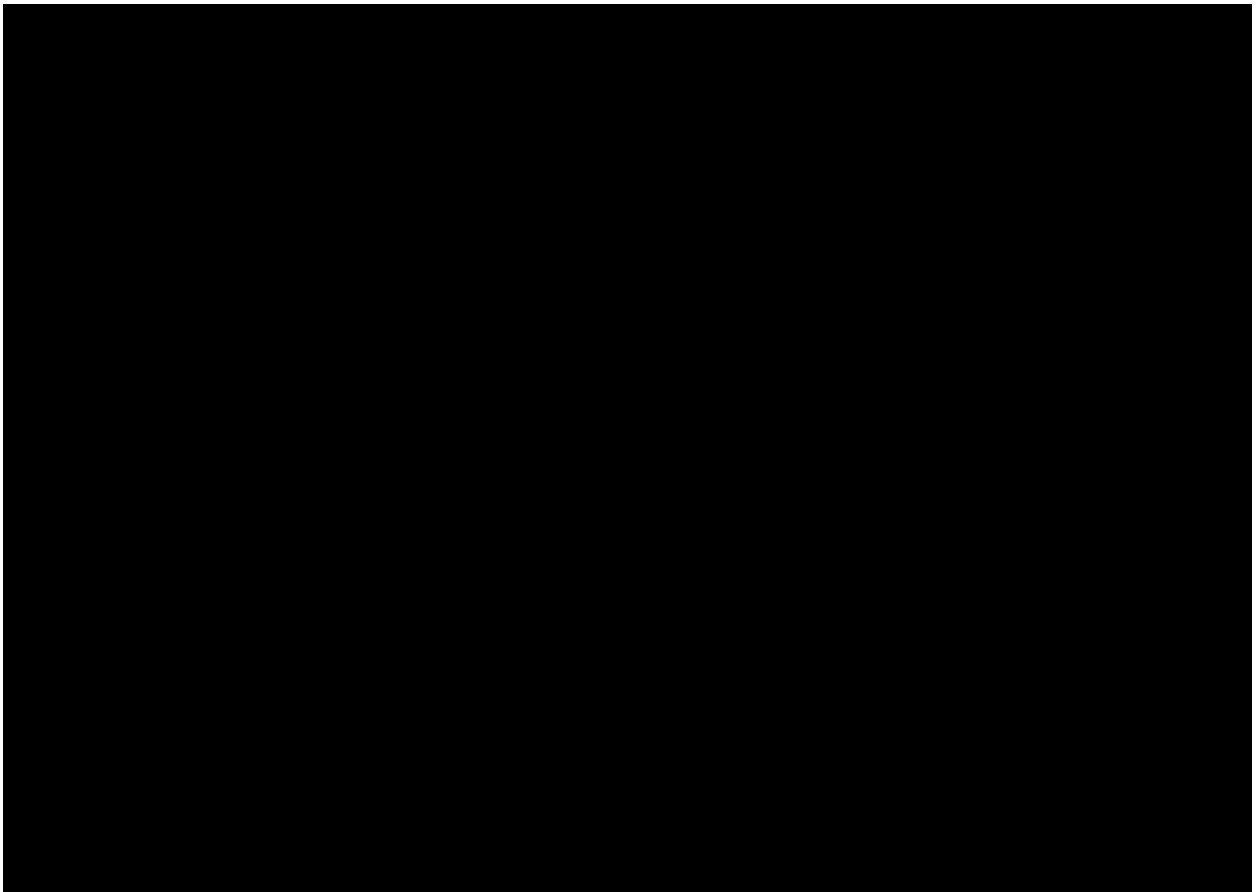


Figure 1-5      Precinct as per the Draft CPCP’s Spatial Viewer (DPIE 2020)

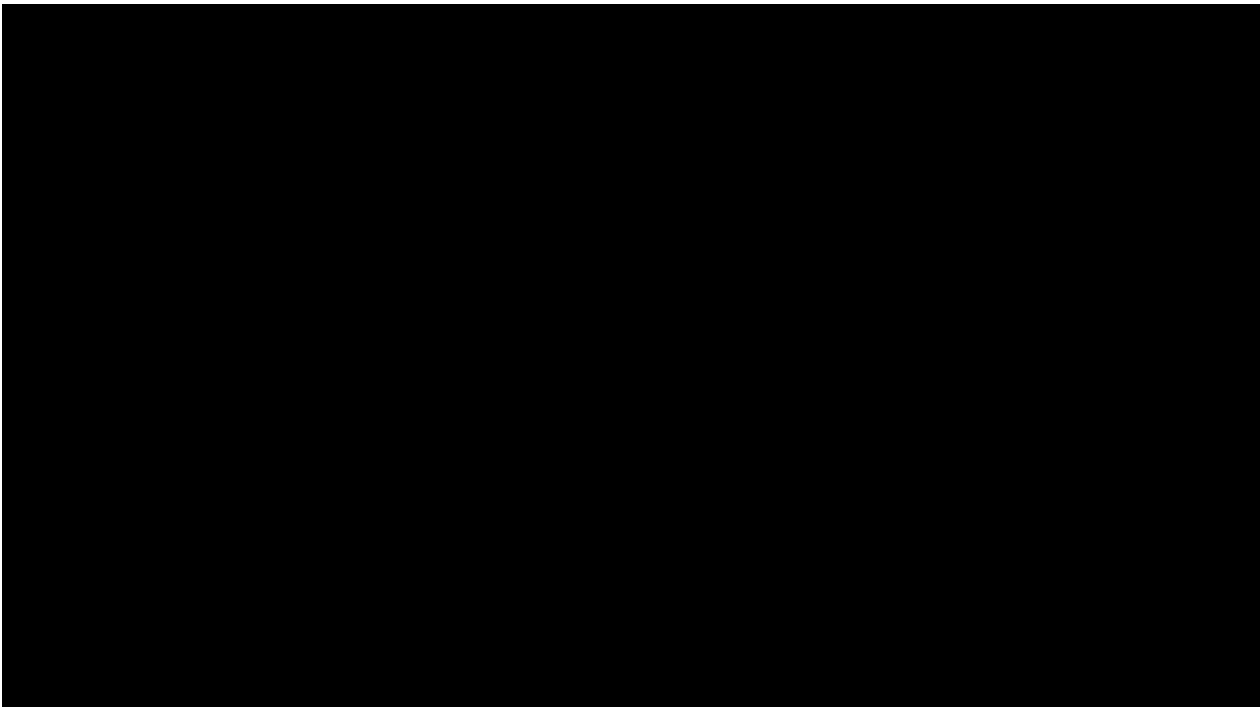


Figure 1-6      Planning Land Categories as per the Draft CPCP’s Spatial Viewer (DPIE 2020)

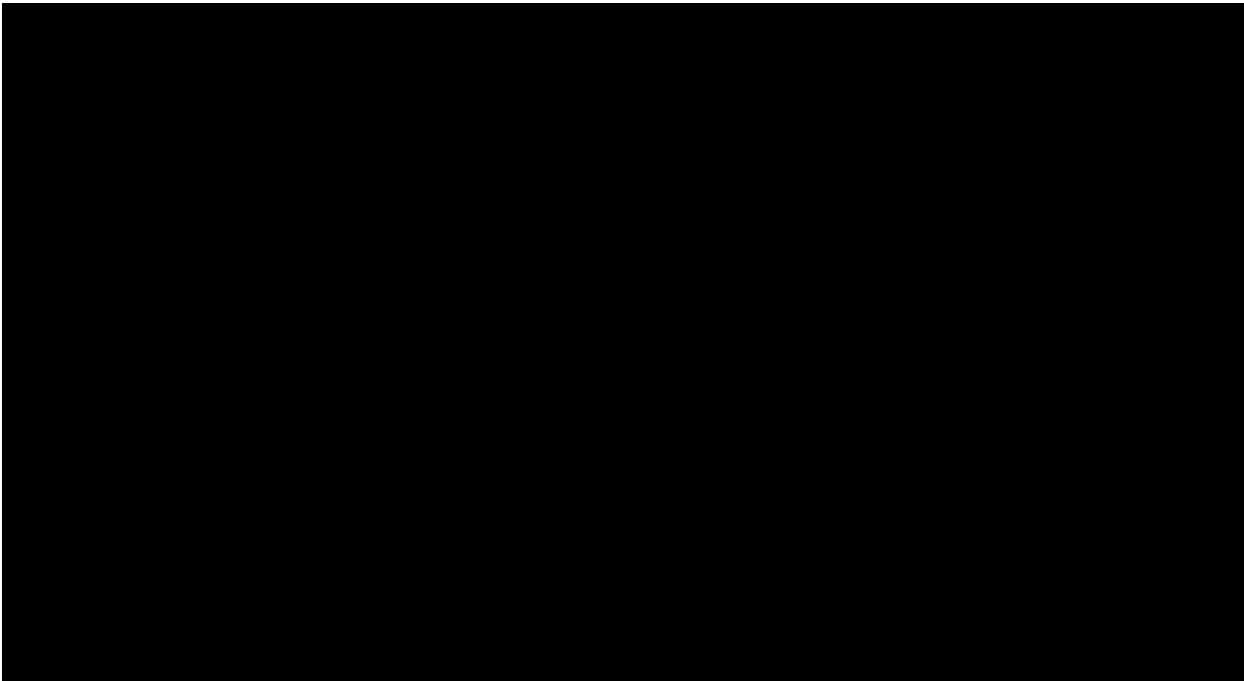


Figure 1-7      Explanation of Intended Effects as per the Draft CPCP’s Spatial Viewer (DPIE 2020)

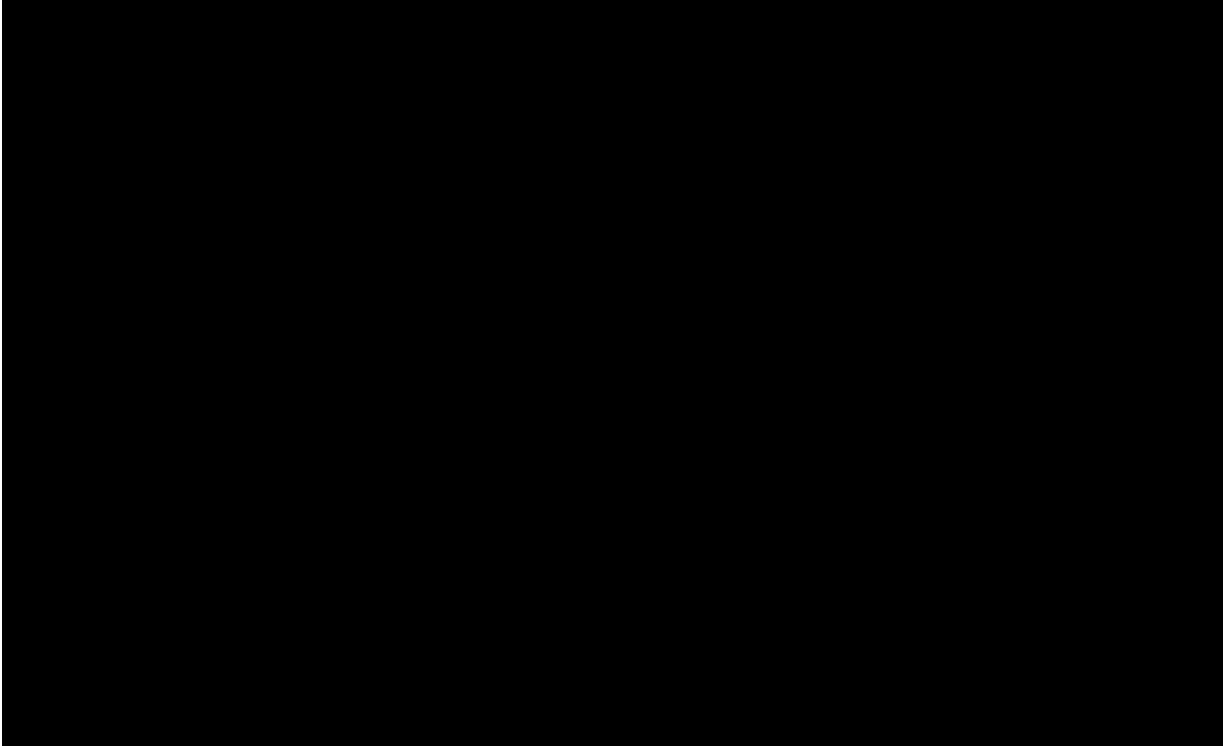


Figure 1-8 PCTs within the site as per Map M13.3 (OneLine and Biosis 2020a)

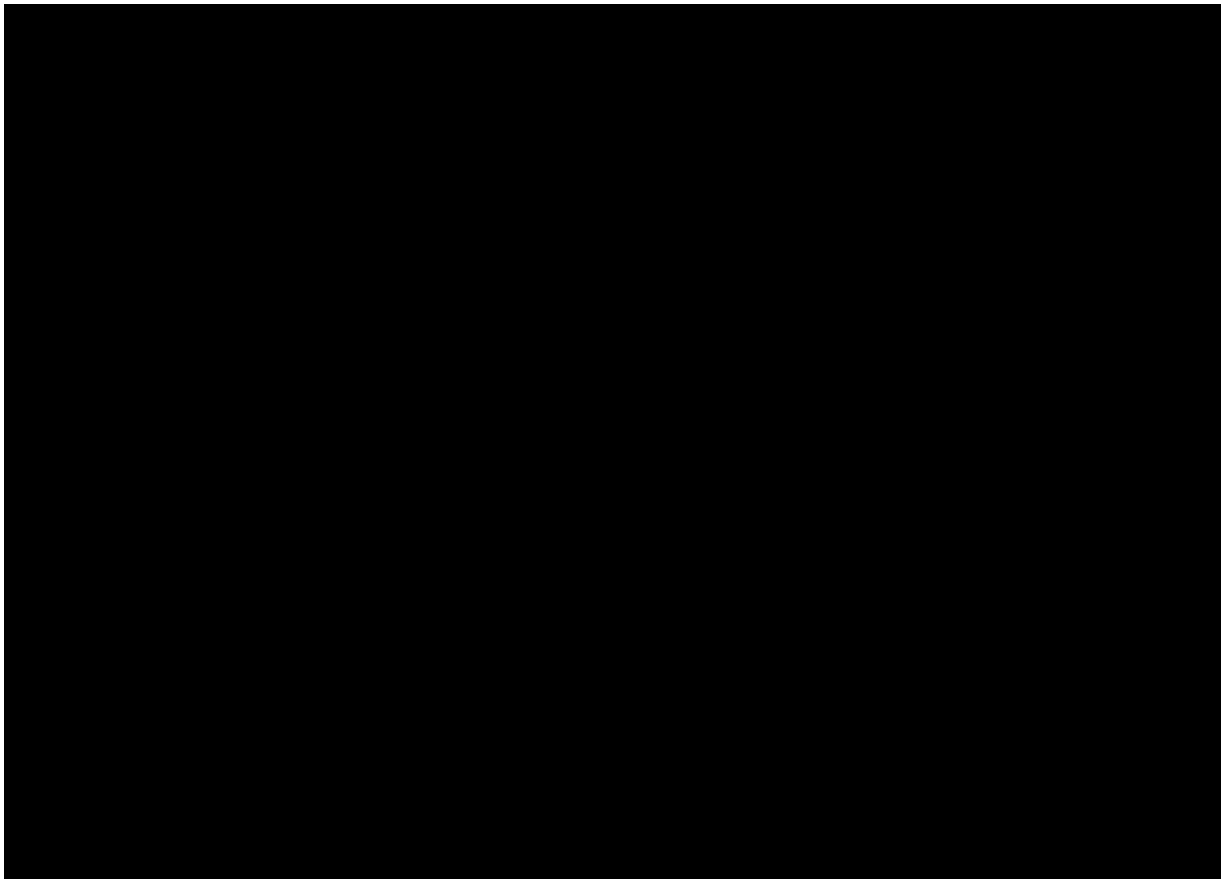


Figure 1-9 Vegetation Zones within the site as per map M14.3 (OneLine and Biosis 2020a)

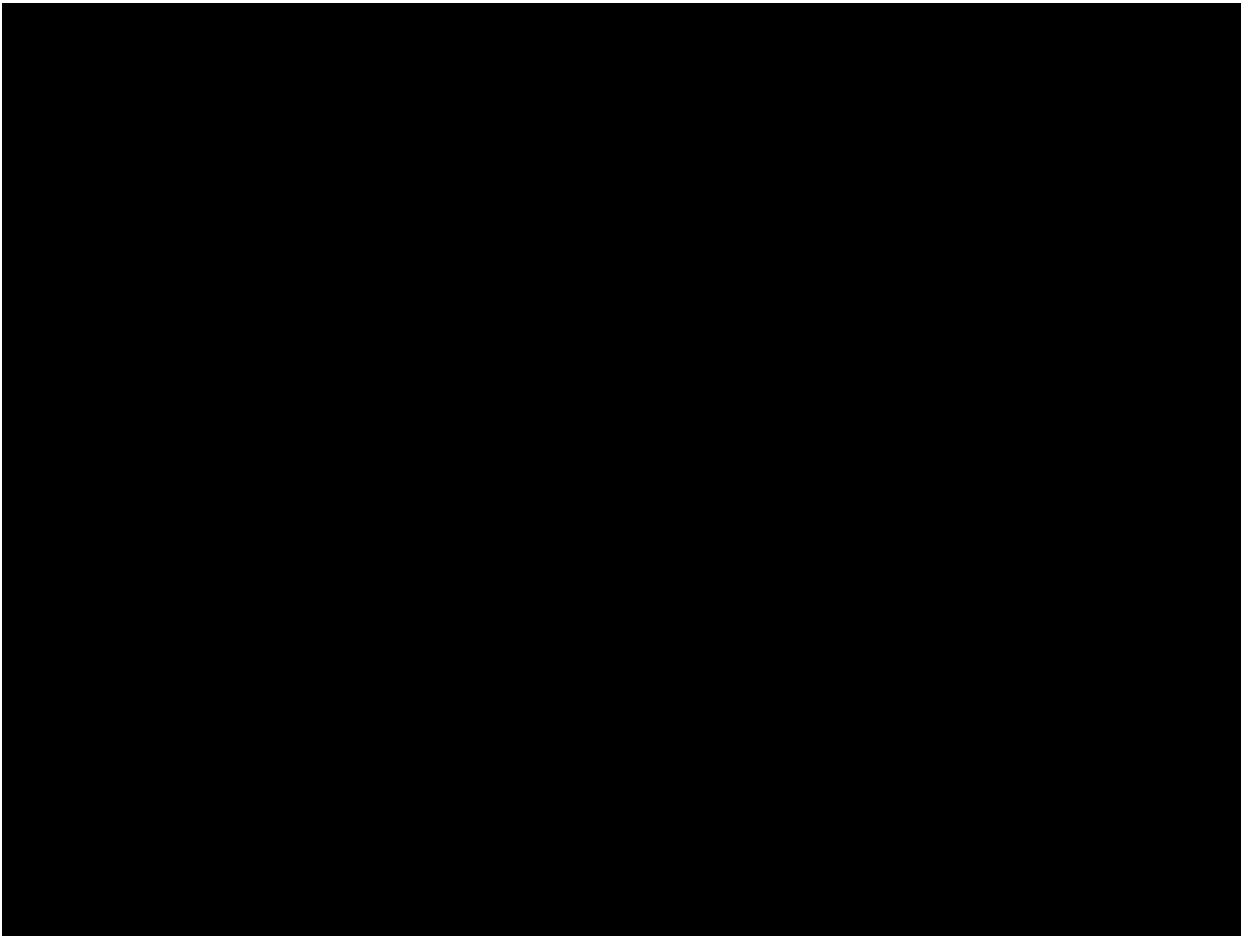


Figure 1-10 Biodiversity Values as per the Biodiversity Values Map

## Appendix C – References

---

Cardno (2020) Biodiversity Values and Advice – Luddenham. [REDACTED] Luddenham (Report reference 80220021, dated 26 February 2020).

DAWE (2020) SPRAT: Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest. Australian Government via Department of Agriculture, Water and the Environment (DAWE), on-line profile accessed via: <https://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=112&status=Critically+Endangered>

TSSC (2009) Commonwealth Listing Advice on Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest. Threatened Species Scientific Committee (TSSC) for the EPBC Act via the Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.

Our Ref: 80219020:JO'G  
Contact: John O'Grady

27 February 2020

Department of Planning, Industry and Environment,  
GPO Box 39  
Sydney NSW 2000

Via: DPIE Submissions Portal

**Cardno (NSW/ACT) Pty Ltd**  
ABN 95 001 145 035

Level 9 - The Forum  
203 Pacific Highway  
St Leonards NSW 2065  
Australia

Phone +61 2 9496 7700  
Fax +61 2 9439 5170

[www.cardno.com](http://www.cardno.com)

## **SUBMISSION TO THE EXHIBITION OF THE STAGE 2 WESTERN SYDNEY AEROTROPOLIS PLANNING PACKAGE**

We act on behalf of owners of approximately 27ha of land located at Luddenham, adjacent to the western boundary of the proposed Western Sydney Airport.

Our submission maintains that the proposed zoning of the Subject Lands in the draft Western Sydney Aerotropolis State Environmental Policy as Environment and Recreation is not consistent with the highest and best use of the land or with proper strategic planning practices.

We contend that the proposed zoning of the Subject Land in the draft *Sydney Aerotropolis State Environmental Policy* should be amended from *Environment and Recreation* to *Agribusiness*.

Our opinion in this regard has been formed based on the following findings:

- The proposed zoning is not consistent with the actual ecological value of the Subject Land. There are significant parts of the Land that do not support native vegetation and the condition of the mapped native vegetation on the Land is variable.
- The mapped native vegetation on the Land is disconnected from nearby vegetation corridors and would be further truncated by the Northern Road realignment and the proposed Western Sydney Orbital motorway. Its viability for conservation and wildlife corridor purposes is questionable.
- A precinct planning exercise should inform development of a coordinated recreation network embedded in the Agribusiness Precinct. Zoning of the Subject Land for recreational purposes in the absence of this planning process appears to be premature.
- The Endangered Ecological Community mapped on the Subject Land does not require zoning protection. Development Applications pertaining to the land would require assessment of its ecological values under the current planning regime prior to determination.
- The proposed zoning of the Land as Environment and Recreation will potentially impact negatively on the potential of adjoining lands to achieve the planning objectives of the Agribusiness zone.
- Zoning of the Subject Land for conservation purposes has the potential to increase risk to airport operations via wildlife strike.
- The highly restrictive nature of the Environment and Recreation zone will impact grossly on the value of the Subject Land to the market. This is considered an unjust impost on the landowners and is inconsistent with the Department of Planning Practice Note PN 09-002 – Environment Protection Zones.

In order to provide a more detailed explanation of the content of this Submission and to make our case for the recommendations therein, Cardno and the owners of the Subject Lands request a meeting with the Department during the post exhibition deliberations for the Stage 2 WSA Planning Package.



## 1.1 The Subject Land

Our clients have interests in the following land parcels (referred to in this submission as **the Subject Land**).








Address	Legal Title	Approximate Area (Hectares)
 Luddenham	 Luddenham	10.6
 Luddenham	 Luddenham	10.4
 Luddenham	 Road Luddenham.	6.75ha (area mapped as Environment & Recreation)
<b>Total Area</b>		<b>26.75ha</b>

Table 1-1 Subject Land

The location and extent of the Subject Lands is indicated at Figure 1-2. The land is located between The  realignment and the future Outer Sydney Orbital motorway, approximately 250m west of the Western Sydney Airport boundary and 800m south west of the site of the western runway.

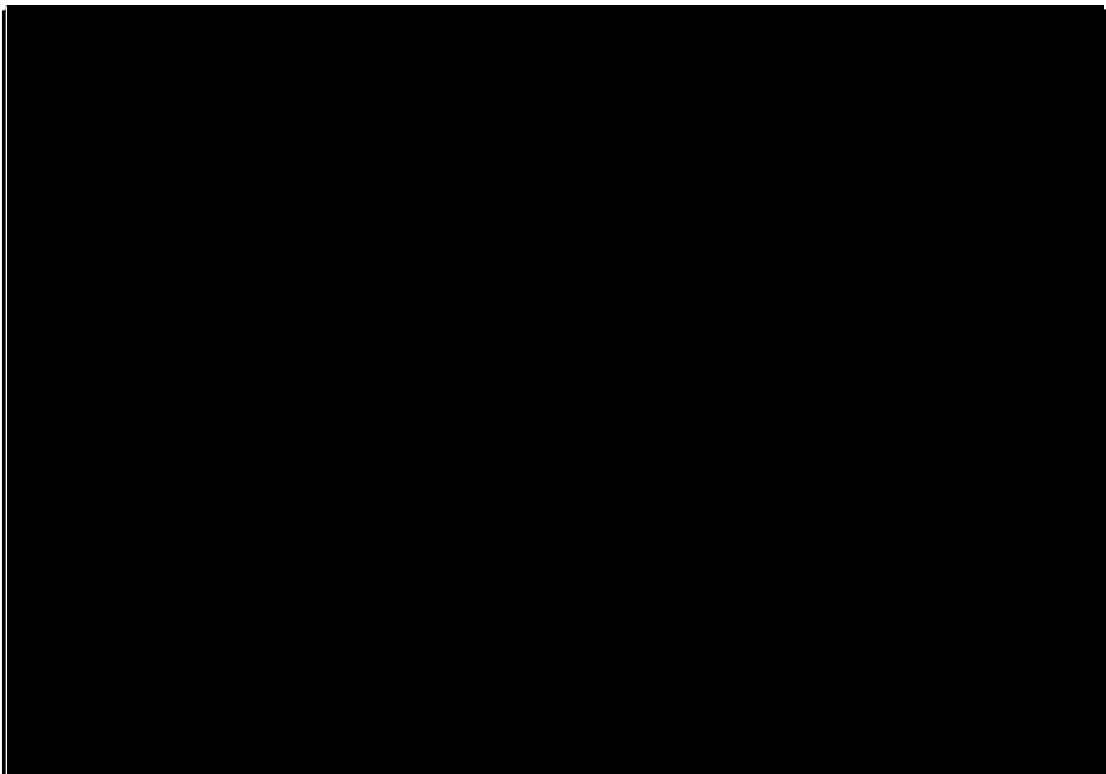


Figure 1-1 Site location (edged red) in relation to the Western Sydney Airport site

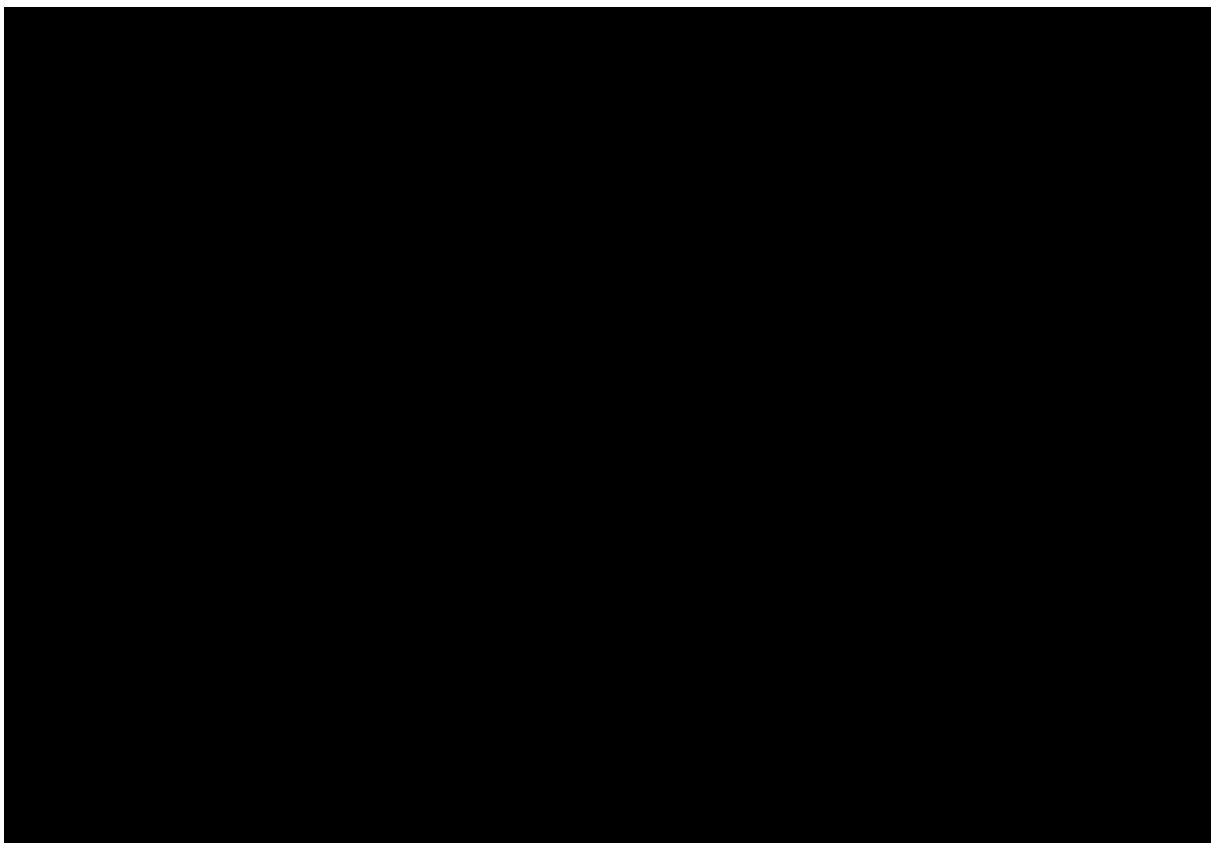


Figure 1-2 Local aerial – Subject Land edged red

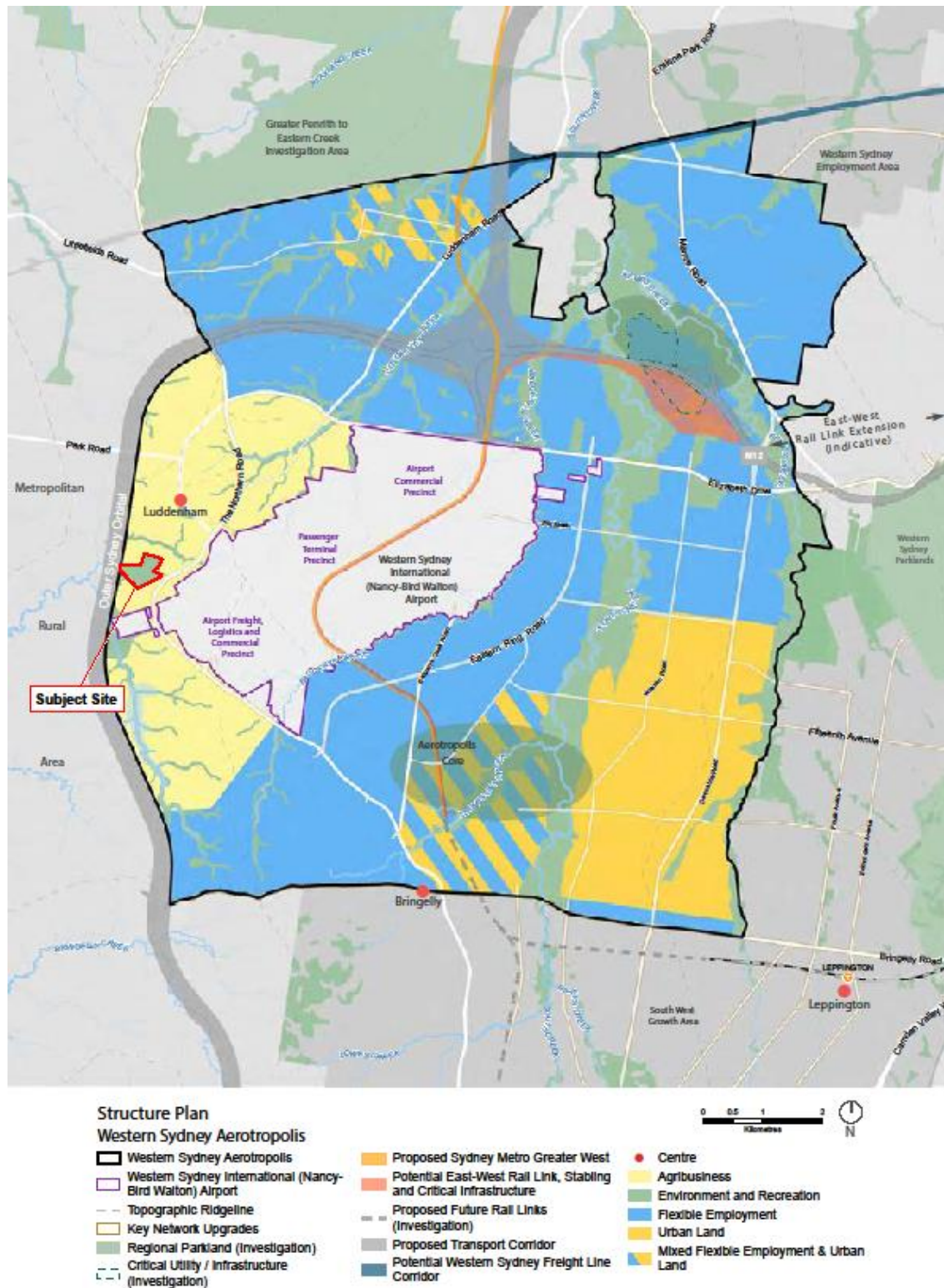


Figure 1-3 Subject lands (edged red) – context within the Western Sydney Aerotropolis. (Draft Western Sydney Aerotropolis Plan, Department of Planning, Industry and Environment, Dec 2019)

## 1.2 The submission

Our submission provides commentary on behalf of our client on the Planning Package placed on exhibition in December 2019, constituting Stage 2 of the Aerotropolis Plan. Specifically our submission is in relation to the following documents included in the Planning Package and currently on Exhibition:

- Western Sydney Aerotropolis Plan. Draft – for public comment, December 2019

- Western Sydney Aerotropolis Discussion Paper on the Proposed State Environmental Planning Policy – Draft for public comment, December 2019
- Western Sydney Aerotropolis Development Control Plan 2019. Phase 1 Draft – for public comment. December 2019

### 1.3 Western Sydney Aerotropolis Plan (WSAP). Draft – for public comment, December 2019

The 2019 iteration of the draft Aerotropolis Plan includes precinct structure plans for six “Initial Precincts” within the Aerotropolis. The land that is the subject of this submission is included in the Agribusiness Precinct and is designated as “Regional Parkland (Investigation)” in the draft Precinct Plan (see Figure 1-4).

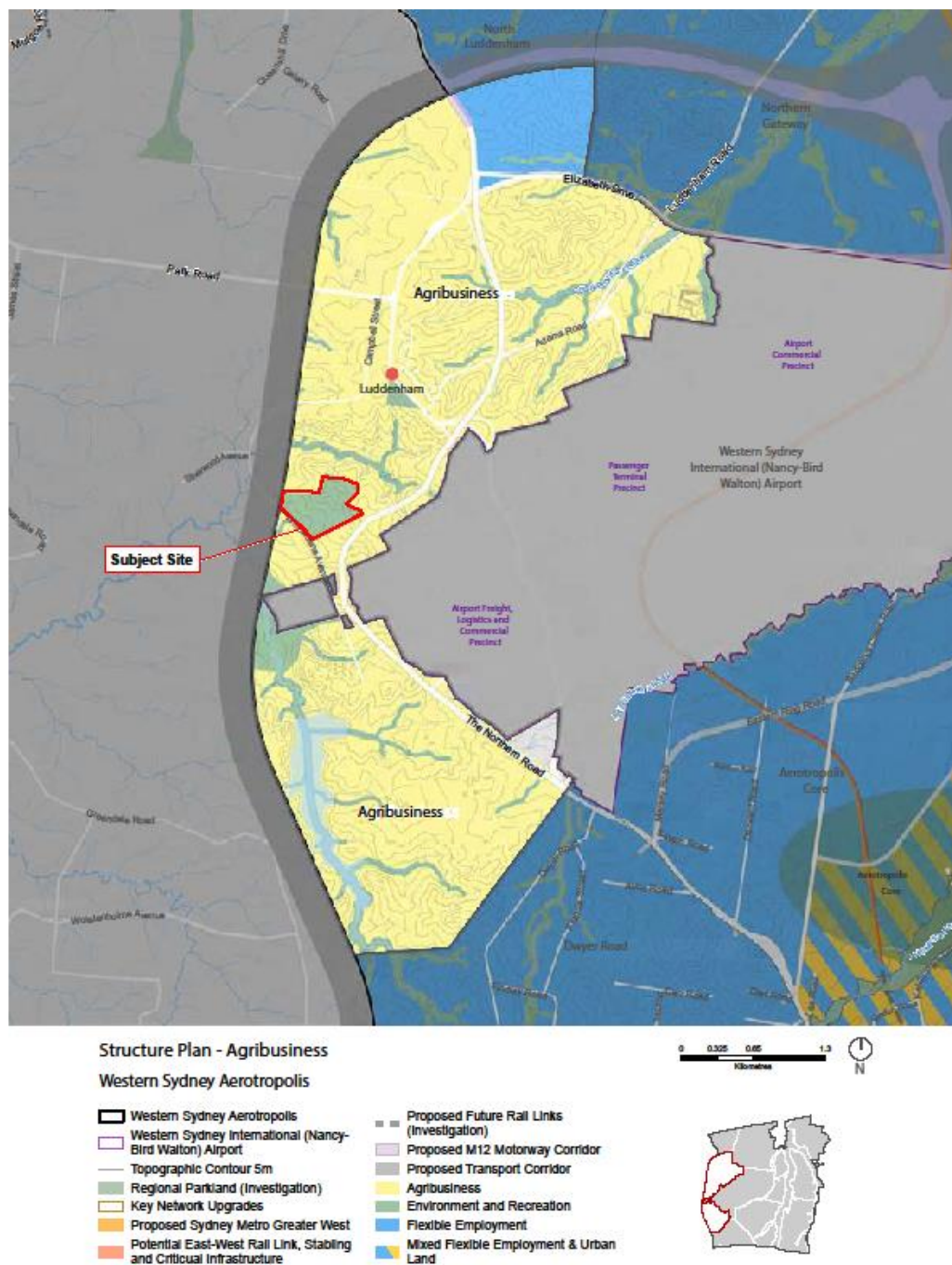


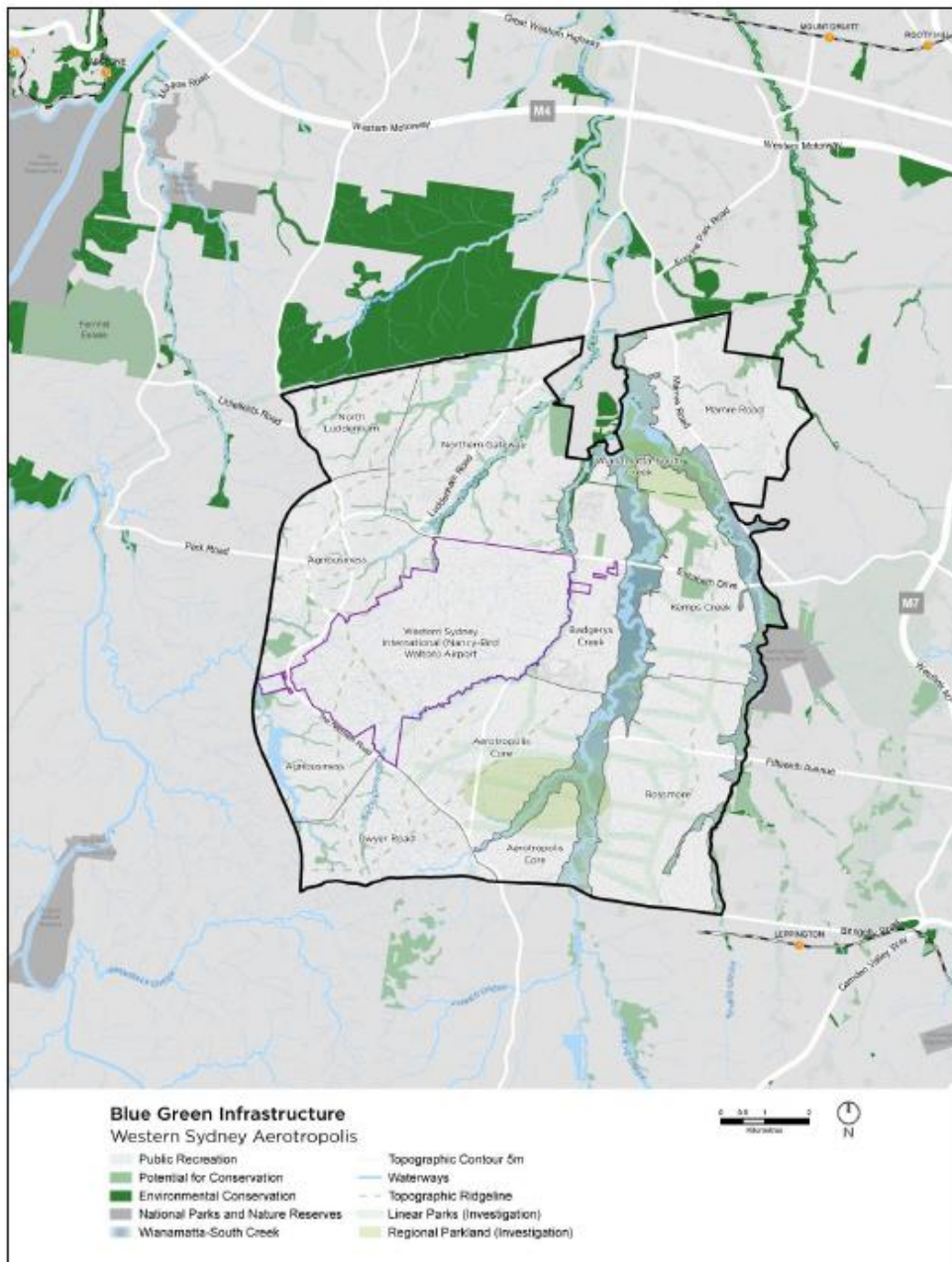
Figure 1-4 Western Sydney Aerotropolis – Agribusiness Precinct - draft Structure Plan (Department of Planning, Industry and Environment, Dec 2019)



## 1.4 Western Sydney Aerotropolis Discussion Paper on the Proposed State Environmental Planning Policy. Draft – for public comment, December 2019

The SEPP Discussion Paper flags that a State Environmental Planning Policy will be prepared in mid 2020. The SEPP will be the principle Planning Instrument that applies to the Aerotropolis lands. It will implement the WSAP by defining the Aerotropolis Precincts, applying land use zones, setting strategic planning objectives, planning controls and mapping.

The Subject Lands appear to be mapped as “Environment and Recreation” in the draft Structure Plan that is included in the SEPP Discussion Paper (Figure 1-4). In a Green Infrastructure Plan that is also included in the Paper, the lands are designated as “Potential for Conservation” (Figure 1-5).



**Figure 2 Green Infrastructure**

Figure 1-5 Green Infrastructure Plan (Ref: SEPP Discussion Paper, 2019)

## 1.5 Western Sydney Aerotropolis Development Control Plan 2019. Phase 1. Draft – for public comment, December 2019

A Development Control Plan (DCP) is to be prepared to guide development within the Aerotropolis in order to achieve connectivity, liveability, productivity and sustainability. A number of aims are listed in the 2019 Draft. The following of these are of direct relevance to this submission:

*“b) encouraging development that responds to its context and is compatible with the Principles set out in the Western Sydney Aerotropolis Plan (WSAP);*

*f) protecting and enhancing the green and blue assets of the area;*

*g) safeguarding the airport operations of Western Sydney International (Nancy-Bird) Airport(Airport);”*

The draft DCP also provides the basis for setting the Aerotropolis Precinct Vision and Place Statements into planning controls. With respect to the Agribusiness Precinct, the following Objectives are of relevance to this submission:

*“e) Allow for the successful implementation of the blue-green grid for the Western Parkland City.*

*j) Ensure development of the precinct in a logical and staged manner.*

*l) Protect the operations of the Airport, including 24-hour operations and provide appropriate protections for the community.”*

## 1.6 Implications of the Planning Package for the Subject Lands.

In summary, the documents included in the 2019 Planning Package indicate that the Subject Lands should be zoned as Environment and Recreation and, subject to further investigations, they may function as conservation lands. The nature and timing of these investigations is unclear and it is also unclear what the zoning of the land marked as “Potential” would be when the draft Aerotropolis SEPP is prepared.

The status of the Subject Land in the Planning Package leads to significant uncertainty with regard to planning for the land and for nearby properties. To address this, Cardno has carried out a detailed assessment of the ecological value of the land and its potential to fulfil conservation objectives. We have also carried out investigations into the planning implications of zoning the land as Environment and Recreation. And finally we have done a high level assessment of the suitability of the subject land for Agribusiness purposes. We recommend that the outcomes of the ecological assessment and planning investigations should inform the next round of decisions regarding the zoning of the land in the draft SEPP.

### 1.6.1 Ecological values

Cardno has carried out a detailed assessment of the biodiversity values of the Subject Lands. A report on the results of the assessment is attached to this submission (see attachment). This assessment was completed via the following process:

- > A desktop ecological investigation was carried out, including a review of:
  - Existing mapping of the site as per the Draft Western Sydney Aerotropolis Plan;
  - Existing vegetation mapping as available in NSW BioNet Vegetation Information System (NPWS 2002);
  - Local threatened species records within the NSW BioNet Atlas; and
  - Relevant Threatened Ecological Community description and assessment guidelines (DEWHA 2010; DoPIE 2019)
- > On the 16 January 2020, a site inspection and Random Meander Transect (RMT) was completed by Cardno ecologists Dr Andrew Smith and Dr Adriana Mothe with the intention of:
  - Identifying biodiversity values at the site, including the presence of native vegetation (including threatened ecological communities (TEC)), threatened flora and fauna species and habitat for fauna;
  - Assessing the general condition of the site in terms of disturbance and/or condition;
  - Establishing the presence of, or finding signs of occurrence of, the threatened species and ecological communities identified in searches of the BioNet atlas and vegetation mapping.

- Based on the outcomes of the desktop and site investigations, conclusions were drawn regarding the ecological values of the Subject Lands and merits or otherwise of setting the lands aside for conservation purposes.

The vegetation mapping at Figure 1-6 illustrates the extent of native vegetation that occurs on the Subject Lands. It also indicates the results of the Cardno ecologists' assessment of the ecological quality of the vegetation.

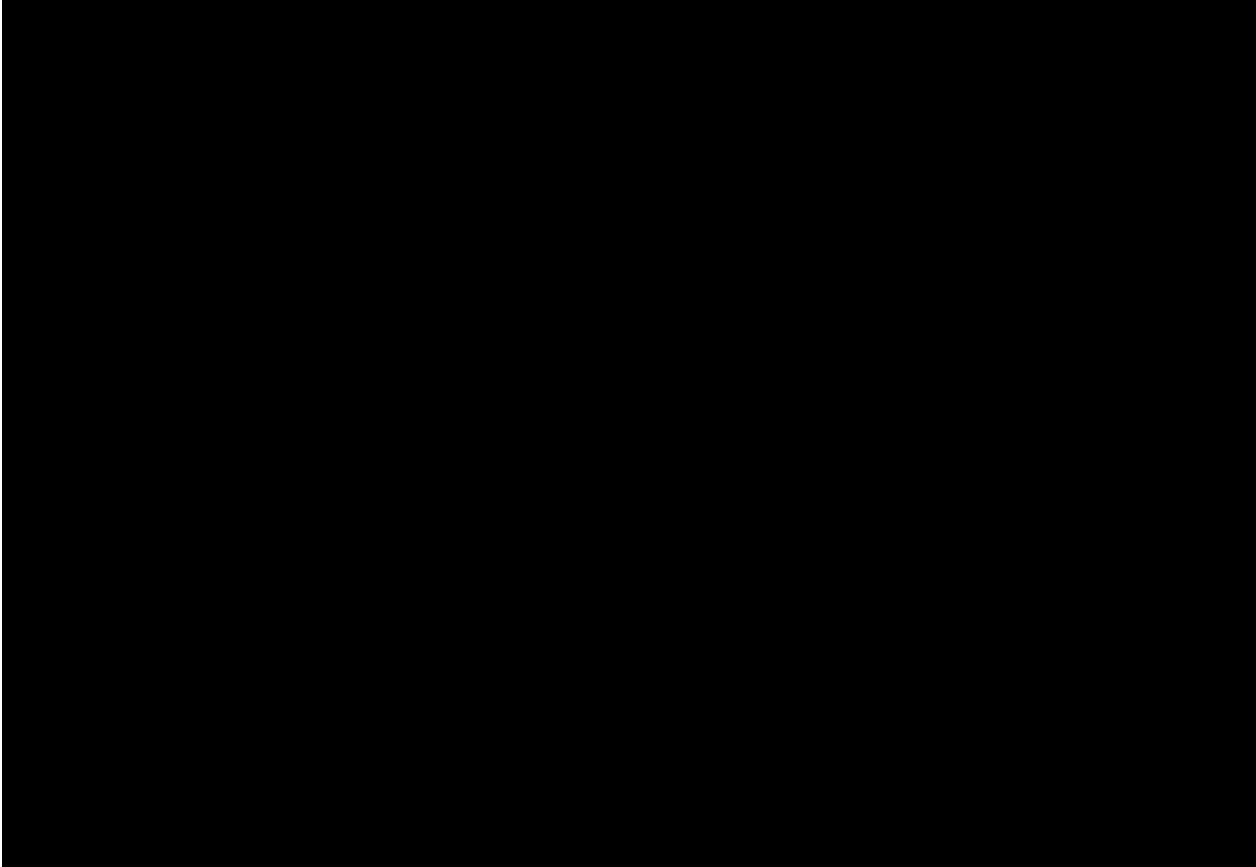


Figure 1-6 Vegetation on the Subject Lands

The mapping also indicates that, notwithstanding its condition, the native vegetation is isolated from significant tracts of native vegetation in moderate to good condition.

In summary, the outcomes of the Cardno ecological assessment of the Subject Lands were:

- > Large proportions of the three properties have been disturbed or have been otherwise cleared of indigenous vegetation. Approximately 38% of the land area within the Subject Lands (10.32ha of the total 26.75ha land area) is cleared of native vegetation and is considered for this reason to be of minimal ecological value.
- > The native vegetation present on the Subject Lands is commensurate with the *Cumberland Plain Woodland in the Sydney Basin Bioregion*, which is listed as critically endangered under the Biodiversity Conservation Act (BCA) and the Environmental Protection and Biodiversity Conservation Act (EPBC). Mapped native vegetation constitutes a total area of 16.53ha on the Subject Lands.
- > Of the total area of native vegetation, 6.65ha (40%) was assessed as being in Moderate condition and 9.9ha (60%) was assessed as being in Low condition. Impacts on the quality of the indigenous vegetation identified on the Subject Lands included:
  - Loss of native understorey;
  - Condition of the native trees which, where the communities were assessed as being in low condition, included dead “stags”, and trees with significant dieback or evidence of borer attack; and
  - Lack of connectivity to other remnants of native vegetation in moderate to good condition. The Subject Lands are isolated from other vegetation by [REDACTED] to the south west, the Sydney Orbital corridor to the west and the [REDACTED] realignment to the south east (currently under

construction). The mapping at Figure 1-9 also indicates that the vegetation is disconnected from other native vegetation on the remaining boundaries of the Subject Lands.

- > The ecologists' overall opinion is that the cleared land and the land that supports native vegetation that has been assessed as being of low ecological value would have a correspondingly low potential for conservation.
- > Native vegetation on the Subject Lands that has been assessed as being in Moderate condition is also considered by the ecologists as having a low potential for conservation due to its isolation and lack of connectivity to other tracts of native vegetation in moderate to good condition in the local area.

## 1.6.2 Urban planning

### 1.6.2.1 Land capability assessment

Cardno has carried out a high level assessment of the suitability capability of the land for recreation and conservation functions against its suitability for agribusiness. The assessment has considered existing conservation values, connectivity to intact bushland, implications for proximity to the airport (specifically the western runway), connectivity to existing and future transport and impacts on viability of adjoining properties. Each of these elements is discussed below.

#### 1.6.2.2 Existing conservation values

The Cardno ecological assessment has found that, although the native vegetation on the Subject Lands falls within the technical definition of Cumberland Plain Woodland, its condition and viability as an ecological resource is limited. Agricultural grazing, weed infestation, and variable condition of tree stock has led to an assessment of the quality of the ecological community as low to medium, with 60% of the vegetation being allocated a low rating for ecological quality. Further, a significant portion (38% of the total land area) is cleared of bushland and/or supports existing housing and ancillary buildings. This land is considered to have no value for ecological conservation purposes and would require complete bushland regeneration to be considered worthy of an environmental based zoning.

#### 1.6.2.3 Connectivity to viable bushland corridors

Figure 1-9 indicates that the medium quality native vegetation on the Subject Lands is generally confined to the south west portion of the lands, addressing [REDACTED]. The remainder of the mapped native vegetation, apart from a small portion at the northern boundary of [REDACTED] has been assessed as Low quality.

Figure 1-7 shows Stream Order in the Catchment that includes the Subject Lands and illustrates that Duncan Creek is the principle riparian corridor in the catchment, and supports the most significant tract of native vegetation in the locality. Figure 1-7 & 1-8 also include an indication of the proposed location of the Western Sydney Orbital Motorway corridor. Figures 1-9 and 1-10 show listed native vegetation in the locality and within and adjacent to the Subject Land, again with the proposed Orbital Corridor overlaid. The mapping indicates that when implemented, the Orbital Corridor will result in loss of a significant portion of the Medium Quality vegetation on Lot 18 and will truncate any potential connection between the vegetation on the Subject Lands and the Duncans Creek riparian corridor. We consider that this loss of connectivity with local riparian / vegetation corridors to be a major constraint on the viability of the vegetation on the Subject Lands for conservation purposes.



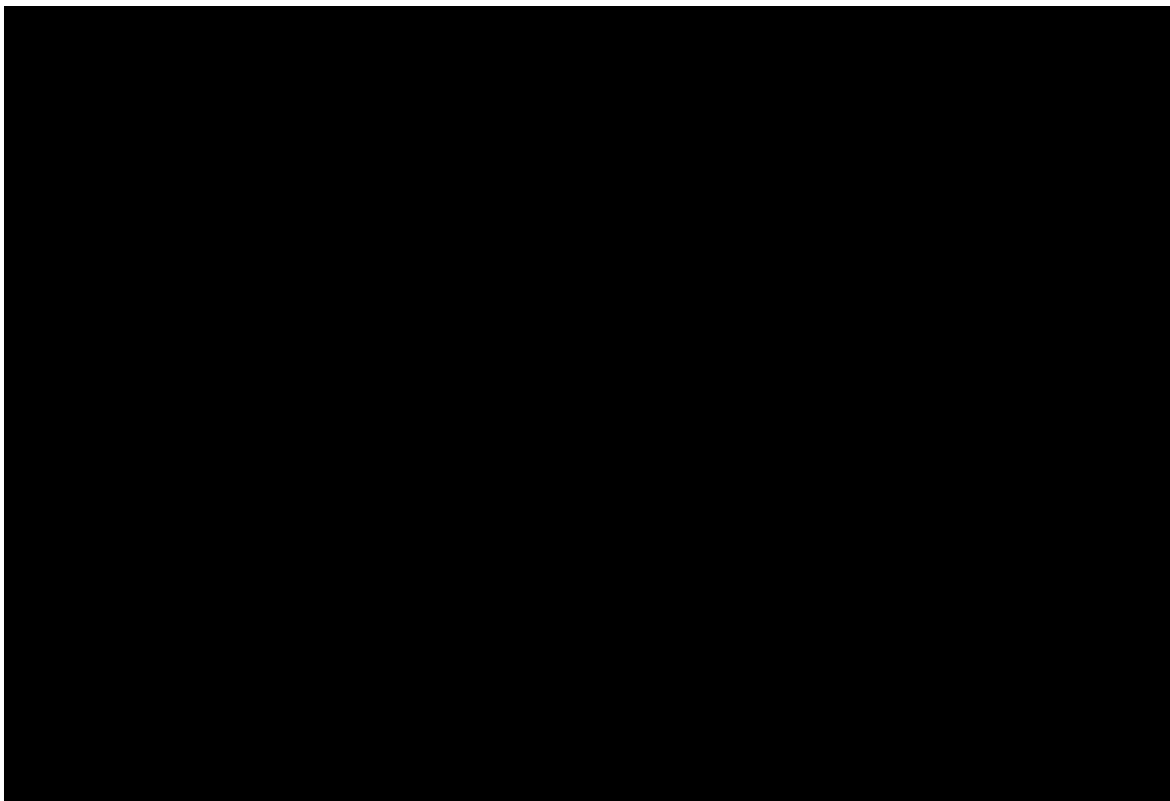


Figure 1-7 Stream order and transport corridor – catchment level

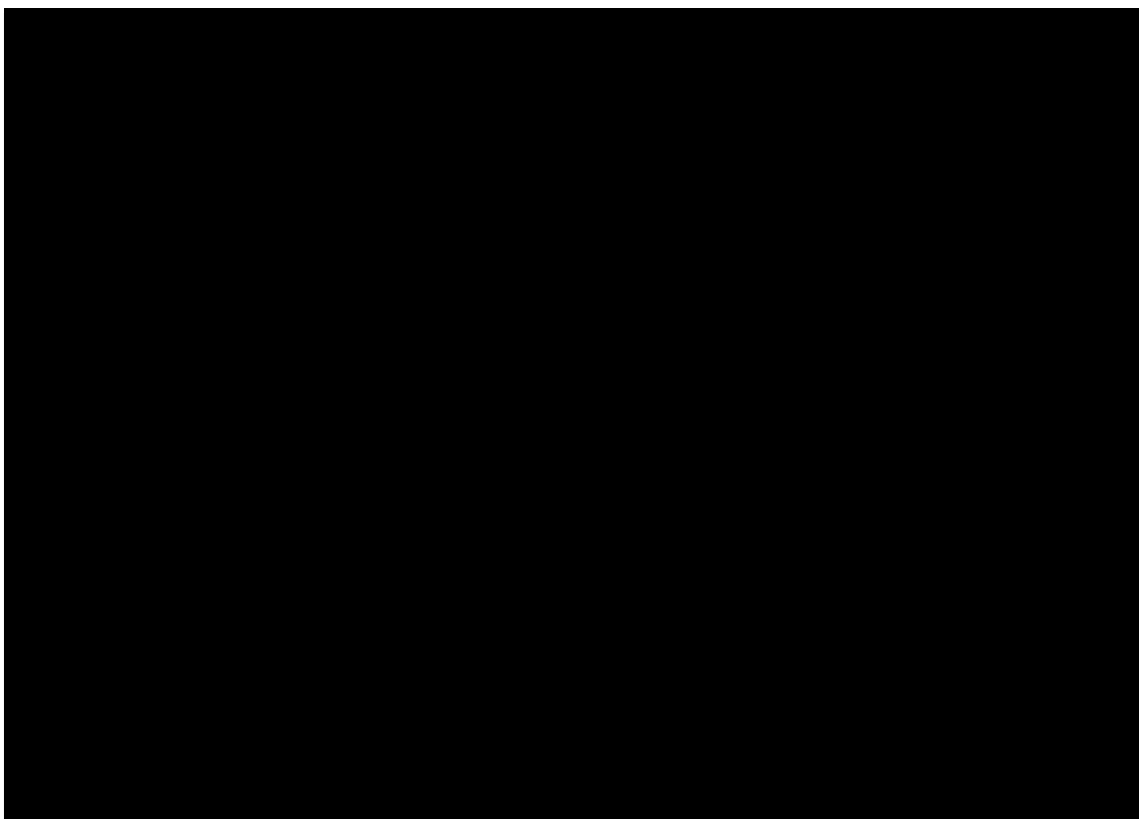


Figure 1-8 Stream order and transport corridor – site level

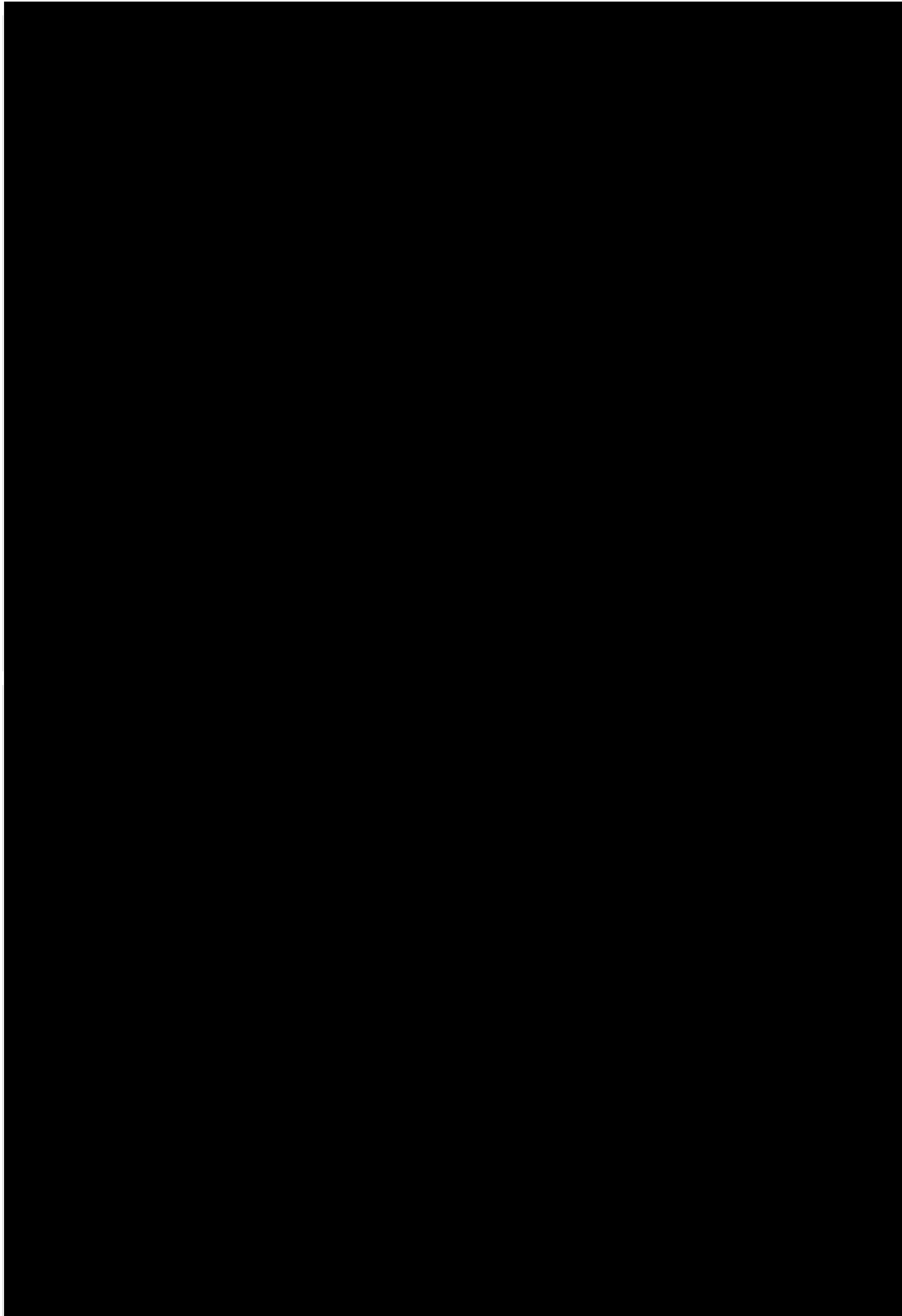


Figure 1-10 Scheduled vegetation map with transport corridors overlaid – site level

#### 1.6.2.4 Proximity to the airport

Figure 1-2 illustrates the location of the Subject Land in relation to the Western Sydney International Airport. The Figure indicates that the Subject Lands range in distance from 250m to approximately 1km from the boundary of the Airport lands and approximately 800m from the southern end of the proposed western runway. The land would be in the order of 400 – 500m from the flight path for this runway. There are a number of controls proposed in the Planning Package that are aimed at protecting the operations of the airport and

managing the associated risks. The location of the Subject Land and their proximity to the airport has implications for at least one of these controls:

- > Wildlife strike risk – Figure 1-11 is an extract from the SEPP Discussion Paper, indicating Wildlife Buffer Zones to the airport. The Subject Lands are located within the 3km Buffer Zone. Airport Safeguarding measures proposed to be included in the SEPP include, amongst others:
  - “implementation of performance-based outcomes and acceptable solutions in the assessment of potentially incompatible land uses;
  - landscape design principles which will reduce wildlife attraction within a 3km, 8km and 13km radius of the Airport as mapped on the Wildlife Map;”

Landuses and their corresponding risk with regard to wildlife strike are described in *“The National Airports Safeguarding Framework, Guideline C – Managing the Risks of Wildlife Strikes in the Vicinity of Airports.”* (Australian Government). The Guideline includes a land use table with corresponding level of risk for wildlife strike and corresponding recommended actions. Conservation in a dryland environment is allocated a Moderate Risk in the table and it is recommended that Mitigation to manage the risk is carried out on land within 3kms of an airport. Conversely, the Agribusiness zone as proposed would permit a range of uses that are listed in the Guideline as resulting in low to very low risk for wildlife strike.

In light of these proposed controls and the potential risk to aviation activities posed by Conservation based land uses, we maintain that more detailed investigations of the implications for wildlife strike should be carried out prior to finalising any decision to zone the Subject Lands for Environmental and Recreation uses.

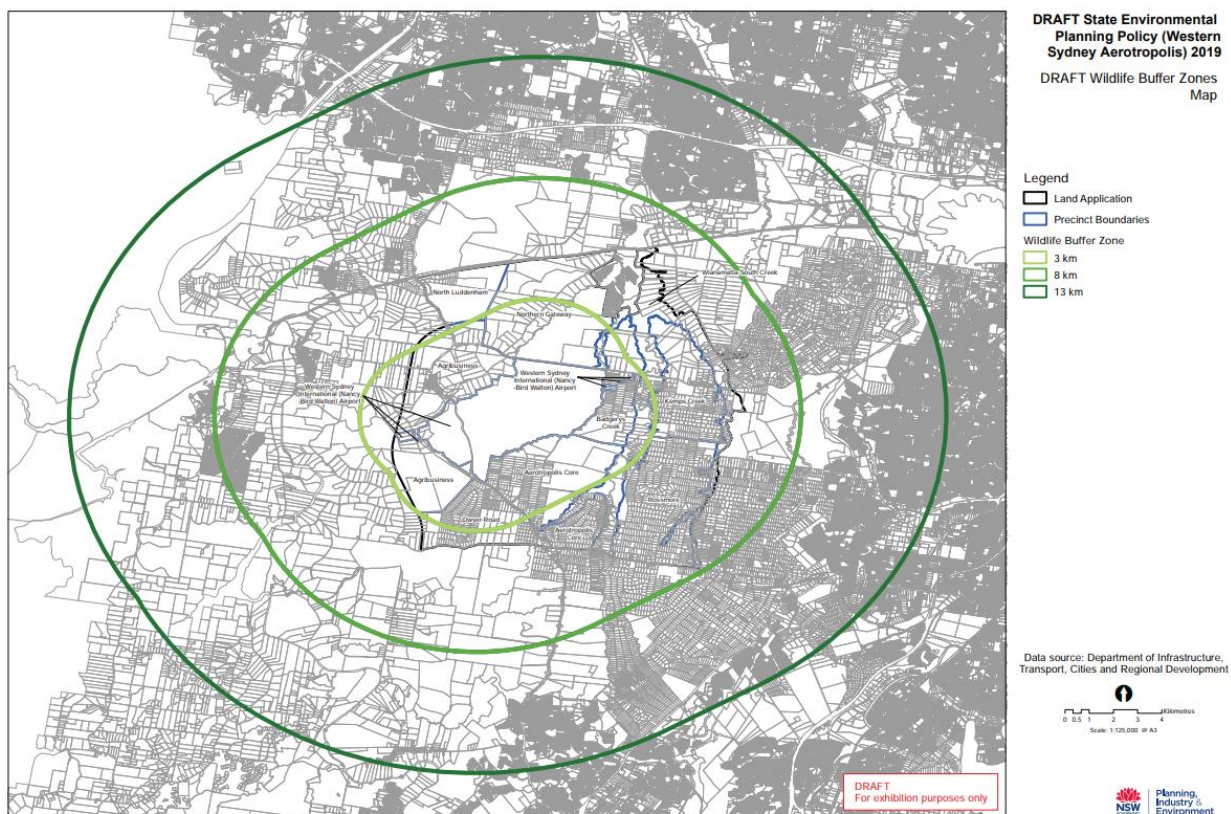


Figure 1-11 Draft Wildlife Buffer Zones Map – extract draft SEPP Western Sydney Aerotropolis, 2019

#### 1.6.2.5 Planning merits of recreational uses

The planning outcome of this proposed rezoning would be a single parcel of recreational land in the order of 2ha in size. The land does not appear to have any inherent recreational values and it would be isolated from other recreational land proposed in the local riparian corridor lands.

From a planning perspective our opinion is that land uses permissible under the Agribusiness Zone would be unlikely to create a significant demand for a dedicated single parcel of recreational land as would be the result of the proposed zoning of the Subject Land. Rather, given that the Agribusiness Zone would be founded on commercial activity, it would seem to be more appropriate to include controls aimed at providing recreational

facilities in a campus style environment. This could be achieved via masterplanning for the Precinct, allowing for recreation uses on public and private land delivered as part of an integrated planning process. This approach would result in an integrated network of recreational facilities within the Precinct to serve the recreational needs of workers and visitors while avoiding the risk of sterilising land that may be suitable for Agribusiness prior to an orderly Precinct masterplanning process.

#### 1.6.2.6 *Suitability for agribusiness purposes*

Our high level assessment of the land is that there are no significant constraints to development and it would be well suited to agribusiness based land uses.

##### *Hydraulics and flood*

The land is not flood affected and does not support designated riparian corridors. Figures 1-7 & 1-8 illustrate that the land supports 1<sup>st</sup> Order Streams only. In the absence of other constraints, including flood, the presence of these low order streams is not sufficient constraint to preclude the land from development for agribusiness purposes via zoning. Any protection required would be provided under the Water Management Act which would apply at the development application level.

##### *Ecological constraints*

Our assessment has found that the conservation value of the scheduled Cumberland Plain Woodland on the land is generally low. Moreover, there are significant tracts of land within the greater landholding that have been cleared of native vegetation and have no value for ecological conservation purposes.

##### *Connectivity to regional transport*

Figure 1-12 indicates that the Subject Lands would be immediately adjacent to the realigned [REDACTED] which would provide direct access to the Airport and, via Elizabeth Drive to the future Western Sydney Orbital. This connectivity to regional transport is a contributing factor to the value of the land for Agribusiness uses.

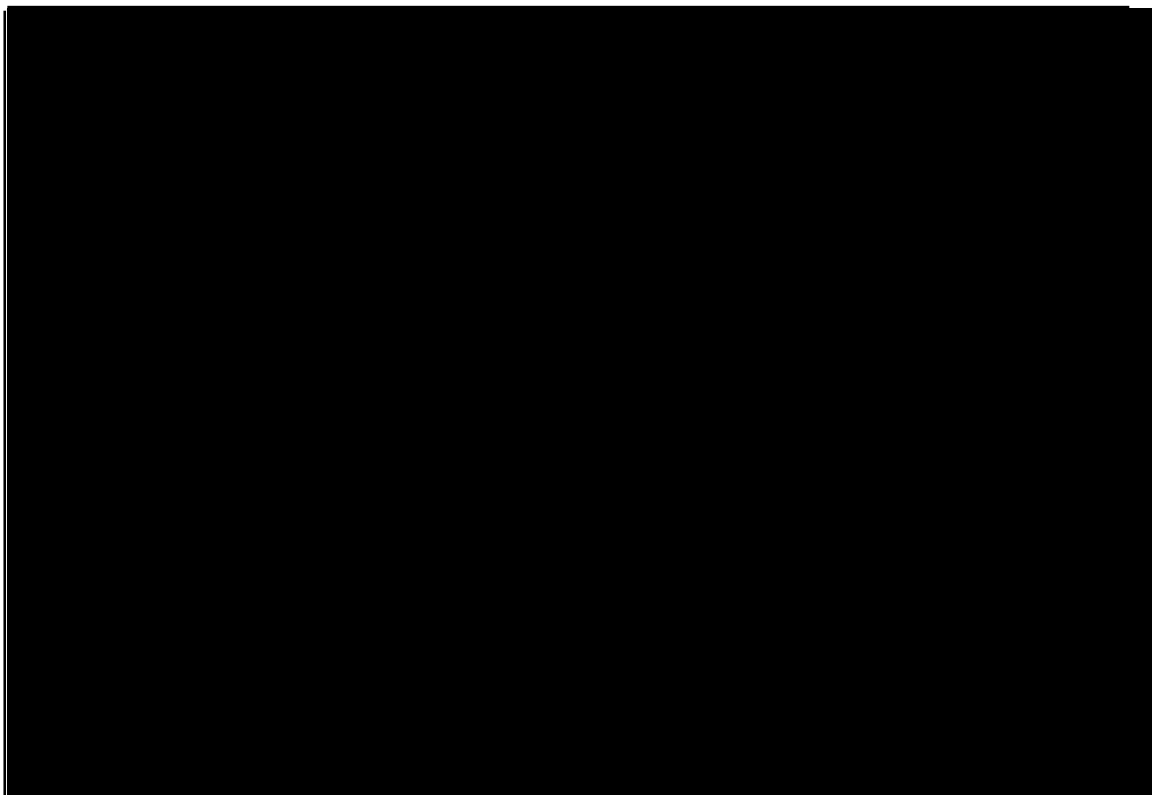


Figure 1-12 Subject lands in context - Connectivity to regional transport

#### 1.6.2.7 *Impacts on adjoining properties*

Figure 1-13 illustrates that zoning of the entire Subject Lands for Environment and Recreation will result in isolation of the small land parcel to the south east of the Subject Land. This triangular shaped land parcel would be restricted by the [REDACTED] corridor to the south east, [REDACTED] to the west. If the entire Subject Land was zoned for Environment and Recreation, we consider that the viability of this remnant

parcel for development for Agribusiness purposes would be significantly restricted by its size, shape and difficulty of access. Our opinion is that this would be a sub-optimal planning outcome.

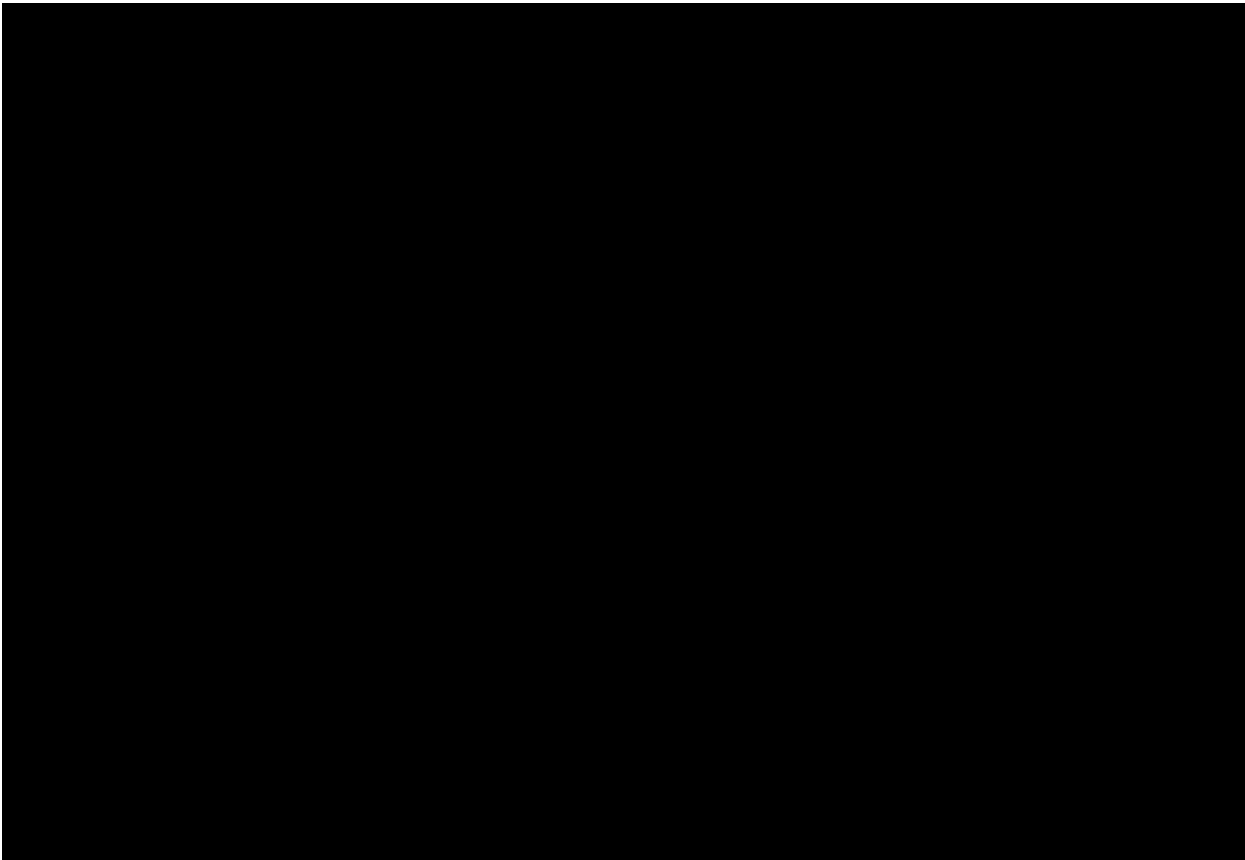


Figure 1-13 Implications for the proposed zone - general planning commentary

## 1.7 Statutory planning processes

After land zoning is set by the proposed Western Sydney Airport SEPP, development will be subject to a process that includes preparation of Precinct Plans (with allowance for masterplanning by private concerns for land parcels in excess of 100ha in area). Development applications can be lodged for zoned land and will follow the process set by the *Environmental Planning and Assessment Act, 1979*. They will be assessed and determined against the suite of planning laws and statutory controls that apply to the allocated land zoning under the SEPP. Any development application pertaining to the Subject Land would trigger an assessment of impacts on Endangered Ecological Communities listed under the *Biodiversity Conservation Act* against that Act and all other relevant controls and standards. In this regard, the mapped Cumberland Plain Woodland present on the Subject Land would be protected by the relevant legislation and impacts of any proposed development on the Community would require assessment prior to determination of any corresponding Development Application.

In the context of the existing planning regime that applies to the Subject Land, and its potential suitability for uses that would be permissible under the Agribusiness Zone, it is our opinion that:

- > There is sufficient protection for the ecological values of the land under relevant legislation and controls; and,
- > Although zoning of the land as Environment and Recreation would provide some additional statutory protection of these values, the prohibition of Agribusiness based uses on the land would not be justifiable on planning grounds.

## 1.8 Restriction of development rights and implications for land value

The proposed application of the Environment and Recreation zone will have substantial financial consequences for the landowners. The WSA SEPP Discussion Paper sets out permissible land uses available under the zone as:

- > Environmental protection works

- > Flood mitigation works
- > Environmental facility
- > Information and education facility
- > Kiosk
- > Recreation area
- > Recreation facilities (outdoor)
- > Water recreation structure
- > Road

On 30 April, 2009, the then Department of Planning issued *LEP Practice Note – Standard Instrument for LEPs – Environment Protection Zones (PN 09-002)*. The Department's Practice Note cautioned local councils (and itself) about highly restrictive uses associated with the application of environmental zones. Relevantly:

*"Council should be aware that the range of uses should not be drawn too restrictively as they may, depending on circumstances, invoke the Land Acquisition (Just Terms Compensation) Act 1991 and the need for the Minister to designate a relevant acquiring authority. Unless a relevant acquisition authority has been nominated and that authority has agreed to the proposed acquisition, council should ensure, wherever possible, that the range of proposed land uses assists in retaining the land in private ownership."* (DoP Practice Note 09-002, p.2).

Our opinion is that the currently proposed zoning of the Subject Land as Environment and Recreation incorporating the highly restrictive land uses listed above meets the circumstances cautioned against by the Department.

## 1.9 Conclusions and recommendation

Cardno has carried out a high level assessment of the land that is the subject of the submission in order to gain an understanding of:

- > Its value for conservation and environmental purposes.
- > Its value for recreational purposes.
- > The positive and negative implications for the future planning and operation of the Aerotropolis and the Western Sydney Airport of the proposed zoning of the land as Environment and Recreation.
- > The suitability of the land for Agribusiness purposes.
- > The potential consequences for property value.

Based on the outcomes of this assessment, our conclusions are:

- > The Subject Land does not display sufficient ecological or recreational value to be zoned as Environment and Recreation.
- > Zoning of the Subject Land as Environment and Recreation will potentially isolate adjoining land and impact negatively on its viability for development in accordance with its proposed Agribusiness zone.
- > Implications for airport safety need to be more thoroughly assessed before decisions are made regarding the zoning of the Subject Land.
- > The potential ecological values of the Subject Land would remain protected through legislation and planning controls under an Agribusiness zone.
- > Zoning of the land for Environment and Recreation purposes would represent a missed opportunity for development of Agribusiness based uses on land which has been found to be relatively unconstrained and viable for this use.
- > Zoning of the Subject Land as Environment and Recreation, if it were justifiable on planning and ecological grounds, would be inconsistent with the Department's Practice Note for environmental zonings.

Informed by these conclusions, we recommend that the proposed zoning of the Subject Land as indicated in the draft mapping appended to the Western Sydney Aerotropolis SEPP Discussion Paper should be amended from Environment and Recreation to Agribusiness.

We thank the Department for the opportunity to make this submission on behalf of our client group and we would appreciate your consideration of its content.

Finally, we reiterate our request to meet with the Department during the post exhibition deliberations for the Stage 2 WSA Planning Package. We will be in contact in the coming weeks to formalise this request.

Yours sincerely,



John O'Grady  
Manager Urban Planning  
for Cardno  
Direct Line: [REDACTED]  
Email: [REDACTED]



# Biodiversity Values and Advice - Luddenham

Willowdene Avenue, Luddenham

80220021



Prepared for  
Anthony Ziino

26 February 2020



## Contact Information

### Cardno (NSW/ACT) Pty Ltd

ABN 95 001 145 035

Level 9 - The Forum

203 Pacific Highway

St Leonards NSW 2065

Australia

www.cardno.com

[REDACTED]  
[REDACTED]

### Author(s):

Name: Dr Andrew Smith

Job title: Senior Ecologist

### Approved By:

Name: Craig Blount

Job title: Senior Environmental Scientist

## Document Information

Prepared for Anthony Ziino

Project Name [REDACTED]  
Luddenham

File Reference 80220021\_Luddenham\_Ecol  
ogy\_20200226\_Rev001.doc  
m

Job Reference 80220021

Date 26 February 2020

Version Number Rev0

Effective Date 26/02/2020

Date Approved 26/02/2020

## Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
Rev0	26/02/2020	Final to client	Dr Andrew Smith Dr Adriana Mothe	Dr Craig Blount

© Cardno. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

This document is produced by Cardno solely for the benefit and use by the client in accordance with the terms of the engagement. Cardno does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

## Table of Contents

---

1	Background	1
2	Methodology	1
	2.1 Desktop Assessment	1
	2.2 Field Survey	1
3	Results	2
	3.1 Vegetation Mapping	2
	3.2 Flora Species	7
	3.3 Fauna Species	8
4	Discussion	10
5	Conclusions	11
6	References	12

## Tables

---

Table 3-1	Flora species observed.	7
Table 3-2	Fauna species detected.	9

## Figures

---

Figure 3-1	Vegetation Mapping.	6
------------	---------------------	---

# 1 Background

The owners of approximately 27 ha of land located at Luddenham, adjacent to the western boundary of the proposed Western Sydney Airport, engaged Cardno to undertake a preliminary ecological assessment (the site). The assessment was required to inform a review for the proposed zoning of the site in the draft Western Sydney Aerotropolis State Environmental Policy as Environment and Recreation to ensure that it is consistent with the highest and best use of the land and with proper strategic planning practices.

The site included the following properties:

- > [REDACTED] Luddenham NSW 2745 (hereafter referred to as [REDACTED])
- > [REDACTED] Luddenham NSW 2745 (hereafter referred to as [REDACTED] and [REDACTED])
- > Part of [REDACTED] Luddenham NSW 2745 (hereafter referred to as [REDACTED])

# 2 Methodology

## 2.1 Desktop Assessment

Prior to attending the site, Cardno ecologists undertook a desktop study that included a review of:

- > Existing mapping of the site as per the Draft Western Sydney Aerotropolis Plan;
- > Existing vegetation mapping as available in NSW BioNet Vegetation Information System (NPWS 2002);
- > Local threatened species records within the NSW BioNet Atlas; and
- > Relevant Threatened Ecological Community description and assessment guidelines (DEWHA 2010; DoPIE 2019).

## 2.2 Field Survey

Cardno ecologists Dr Andrew Smith and Dr Adriana Mothe inspected the site on the 16 January 2020 and undertook a random meander transect (RMT) across the three properties with the objective to:

- > Identify biodiversity values at the site, including the presence of native vegetation (including Threatened Ecological Communities (TEC)), threatened flora and fauna species and habitat for fauna;
- > Allocate native vegetation to a Plant Community Type (PCT). In NSW and in accordance with the Vegetation Information System (VIS), native vegetation communities are allocated a PCT number and its common name; and
- > Assess the general condition of the site in terms of disturbance and/or condition.

In particular, the RMT focused on establishing the presence of, or finding signs of occurrence of, the following threatened species and ecological communities given searches of the BioNet atlas and vegetation mapping indicated they had been recorded within and/or in close proximity to the Study Area:

- > Cumberland Plain Land Snail (*Meridolum corneovirens*) – listed as endangered under the NSW Biodiversity Conservation Act 2016 (BC Act);
- > Grey-headed Flying-fox (*Pteropus poliocephalus*) – listed as vulnerable under the BC Act and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);
- > Little Eagle (*Hieraaetus morphnoides*) – listed as vulnerable under the BC Act;
- > Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) – listed as vulnerable under the BC Act;
- > *Pimelea spicata* (Spiked Rice-flower) – listed as endangered under the BC Act and EPBC Act; and
- > Cumberland Plain Woodland in the Sydney Basin Bioregion – listed as critically endangered under the BC Act and EPBC Act.

## 3 Results

### 3.1 Vegetation Mapping

#### 3.1.1 [REDACTED]

Vegetation present at the property included:

- > Cleared land: Approximately 2.73 ha of the 10.16 ha constituted unsealed access tracks, lawns and residential property with ancillary structures (e.g. water tank) (**Figure 3-1**). This area had undergone clearance and is not native vegetation (**Plate 1**); and
- > Native vegetation: Approximately 7.29 ha of the 10.16 ha constituted native vegetation, which was present on the south-western and north-eastern portion of the land (**Figure 3-1**). This vegetation consists mainly of young trees which had regrowth in an otherwise disturbed area (**Plate 2**). The vegetation therein included native trees with a low native understorey (shrubs and ground layer). Dominant native trees included Forest Red Gum (*Eucalyptus tereticornis*) and Grey Box (*E. moluccana*). Native shrub layer was represented by Native Blackthorn (*Bursaria spinosa*) and wattle regrowth (*Acacia* sp.). The groundcover was poorly represented and included the following native species: Fishweed (*Einadia trigonos* subsp. *trigons*), Kidney Weed (*Dichondra repens*) and Bristly Cloak Fern (*Cheilanthes distans*). Numerous weeds were present in this vegetation zone and there were abandoned vehicles present and evidence of disturbance by rabbits. The vegetation conformed to Plant Community Type (PCT) 850 – Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion, commonly referred to as Cumberland Shale Hills Woodland. This PCT is considered to be commensurate with the Cumberland Plain Woodland in the Sydney Basin Bioregion TEC listed under the NSW Biodiversity Conservation Act 2016 (BC Act) and Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). The PCT 850 was present in two condition states as follows:
  - PCT 850 - Moderate condition: approximately [REDACTED] and
  - PCT 850 - Low condition: approximately [REDACTED]

A dried and significantly eroded creek line is located in the south-eastern portion of the property.



**Plate 1:** Cleared land within [REDACTED]





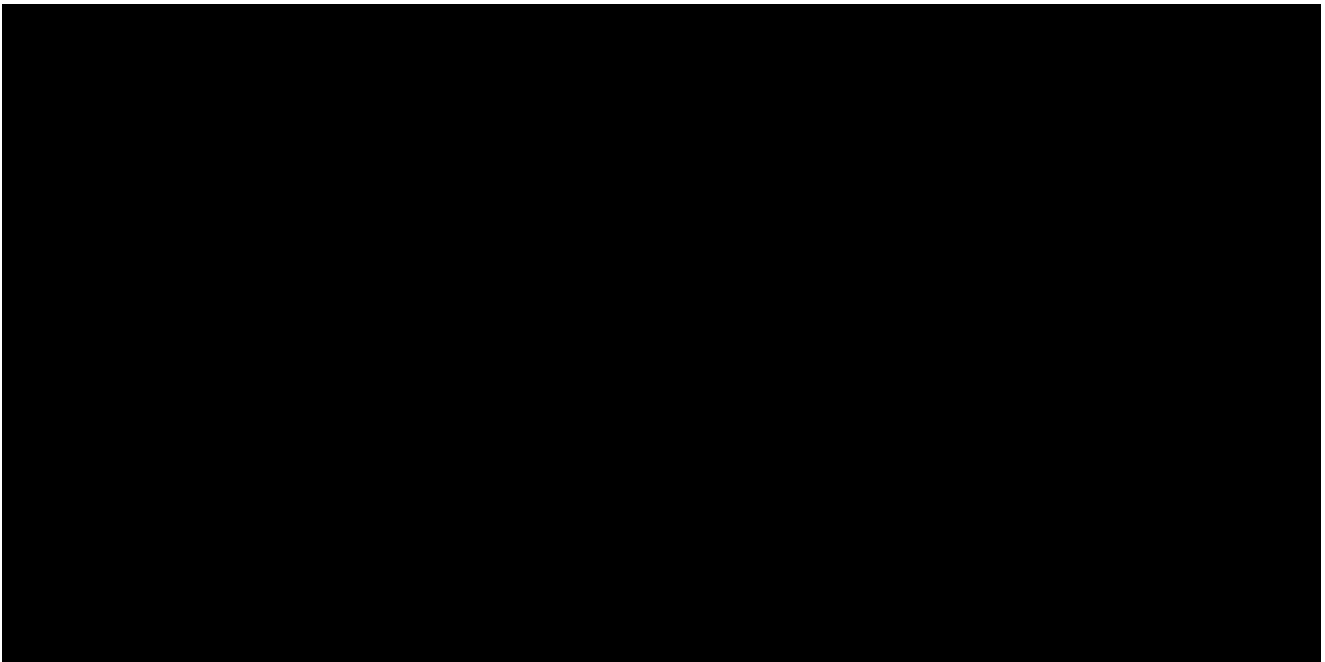
**Plate 2:** Regrowth native vegetation within [redacted]

### 3.1.2 [redacted]

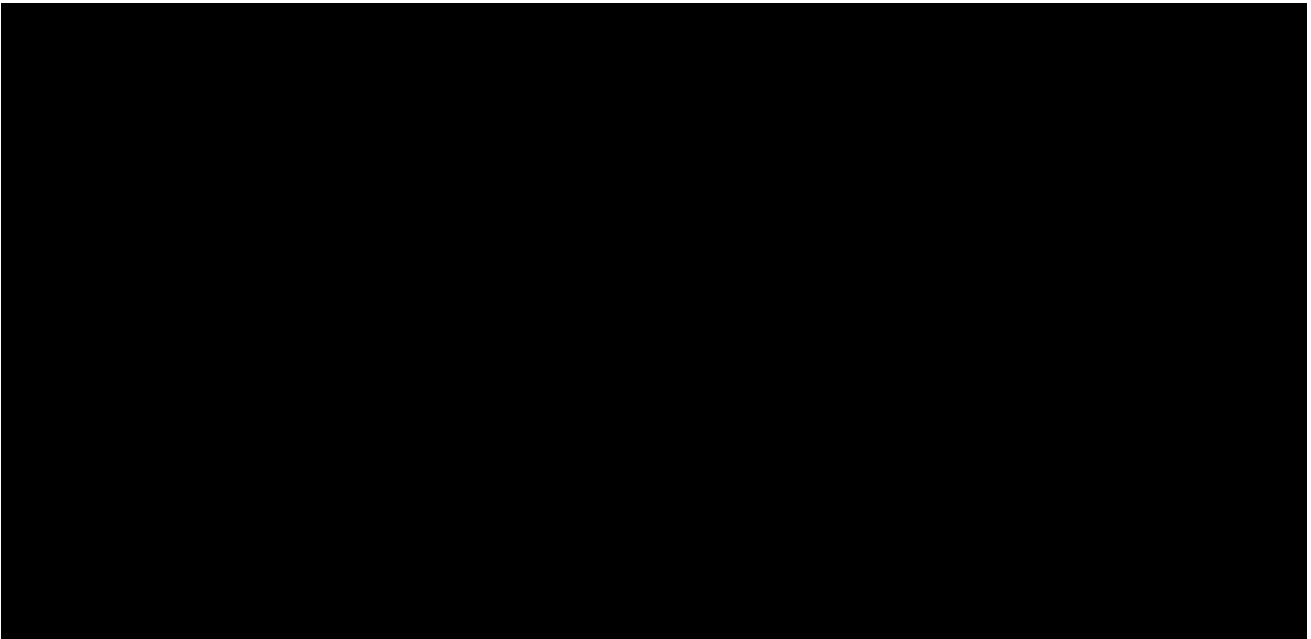
Vegetation present at the property included:

- > Cleared land: Approximately 5.53 ha of the 10.16 ha constituted unsealed access tracks, lawns and residential property with ancillary structures (e.g. underground water tank and waste treatment) (**Figure 3-1**). This area had undergone clearance and was not native vegetation (**Plate 3**); and
- > Native vegetation: Approximately 4.63 ha of the 10.16 ha constituted native vegetation (**Figure 3-1**), which was present on the western and northern part of the property but it consisted of highly disturbed land currently used for grazing by cattle and goats (**Plate 4**). This vegetation only contained remnant native trees with no understorey (i.e. shrub and ground layers). At the time of the site inspection, it was noted that many of the trees appeared to have several levels of decay and borer holes were visible on the trunk. Most of the vegetation therein was in low condition. Remnant native trees included Forest Red Gum (*Eucalyptus tereticornis*) and Grey Box (*E. moluccana*). These trees were likely part of the PCT 850 which is considered to be commensurate with the *Cumberland Plain Woodland in the Sydney Basin Bioregion* TEC listed under the BC Act and EPBC Act. PCT 850 was present in two condition states as follows:
  - PCT 850 - Moderate condition: less than 0.01 ha; and
  - PCT 850 - Low condition: approximately 4.63 ha.

A farm dam was present on the northern portion of the property. No other water bodies were present.



**Plate 3:** Cleared area and residential dwelling at [REDACTED]



**Plate 4:** Remnant native trees at [REDACTED]

### 3.1.3 [REDACTED]

Only the south-western portion of [REDACTED] was inspected.

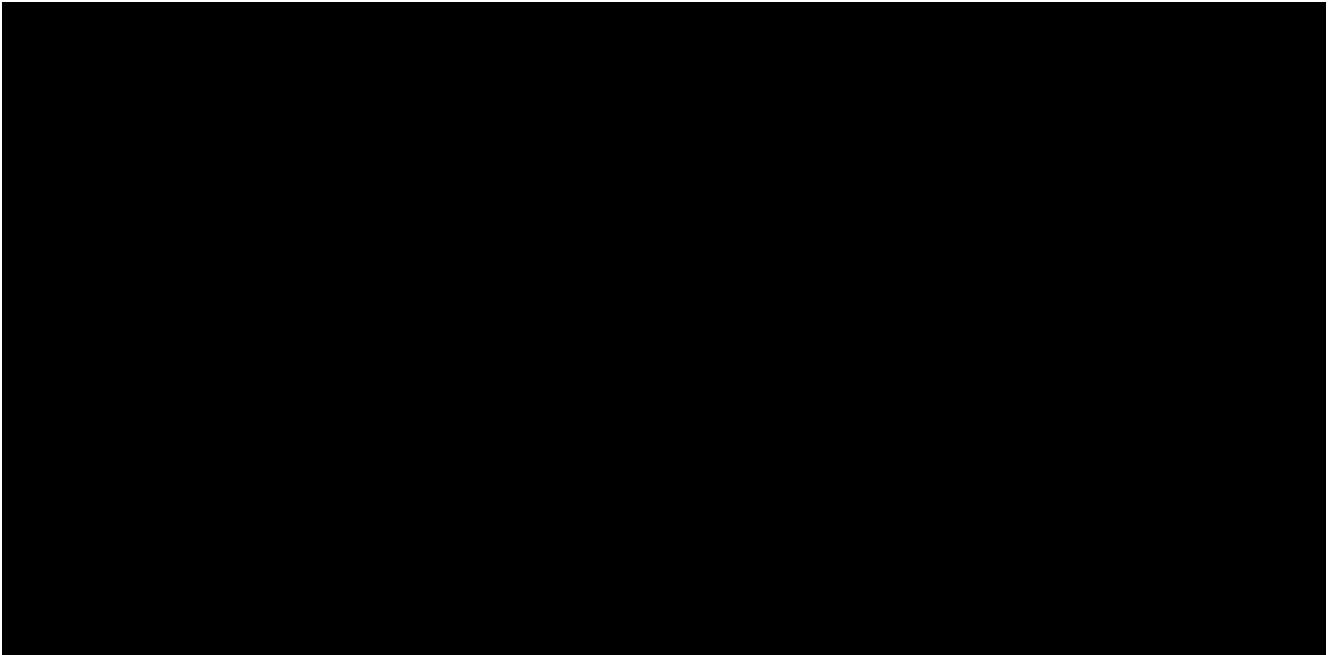
Vegetation present at the property included:

- > Cleared land: Approximately 2.15 ha of the 6.75 ha (study area part of the property) constituted cleared land (**Figure 3-1**). The area had undergone clearance and was not native vegetation (**Plate 5**).
- > Native vegetation: Approximately 4.61 ha of the 6.75 ha (study area part of the property) constituted native vegetation (**Figure 3-1**). The vegetation therein included native trees, with very poor representation of native shrub and ground layers (**Plate 6**). Many of the trees present therein appeared to be regrowth. Native species present therein included Forest Red Gum (*Eucalyptus tereticornis*), Grey Box (*E. moluccana*), Native Cherry (*Exocarpos cupressiformis*), Native Blackthorn (*Bursaria spinosa*), Fishweed (*Einadia trigonos* subsp. *trigons*), Kidney Weed (*Dichondra repens*) and Bristly Cloak Fern (*Cheilanthes distans*). Numerous weeds were present, including African Olive (*Olea europea* subsp. *cuspidata*). It is considered that most of the vegetation in this area was in low condition. Vegetation therein conformed to

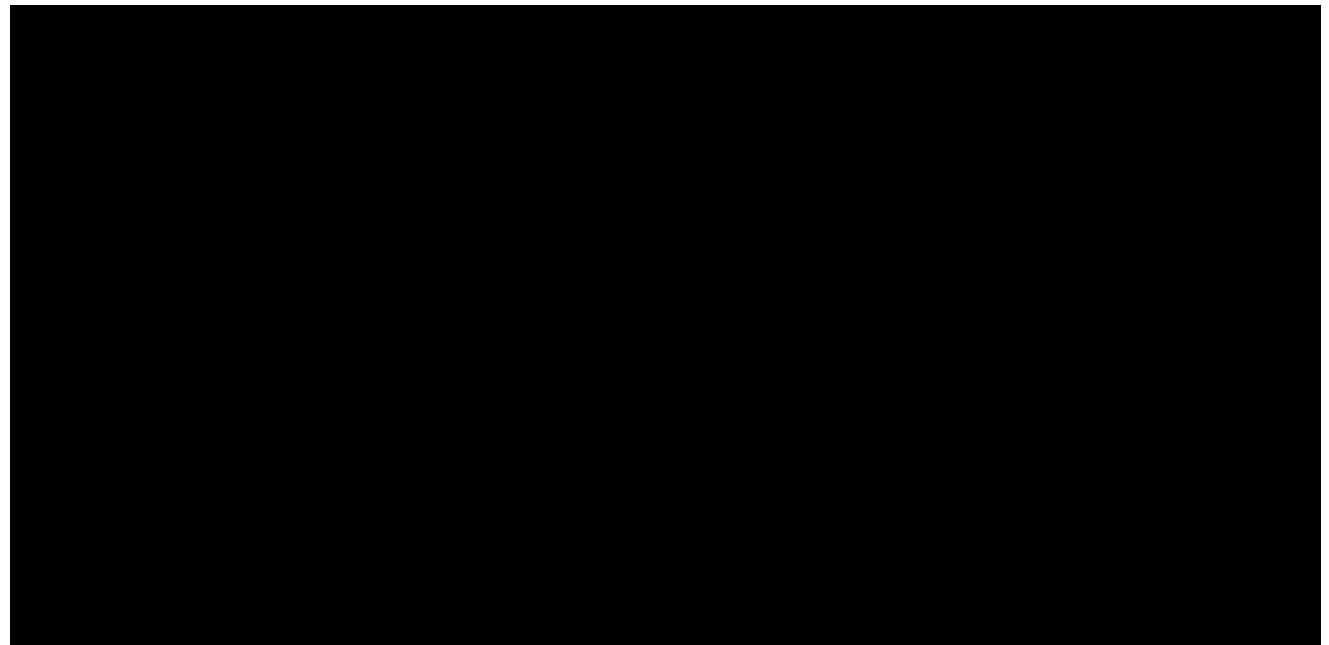
PCT 850 which is considered to be commensurate with the *Cumberland Plain Woodland in the Sydney Basin Bioregion* TEC listed under the BC Act and EPBC Act. PCT 850 was present in two condition states as follows:

- PCT 850 - Moderate condition: less than 0.01 ha; and
- PCT 850 - Low condition: approximately 4.61 ha.

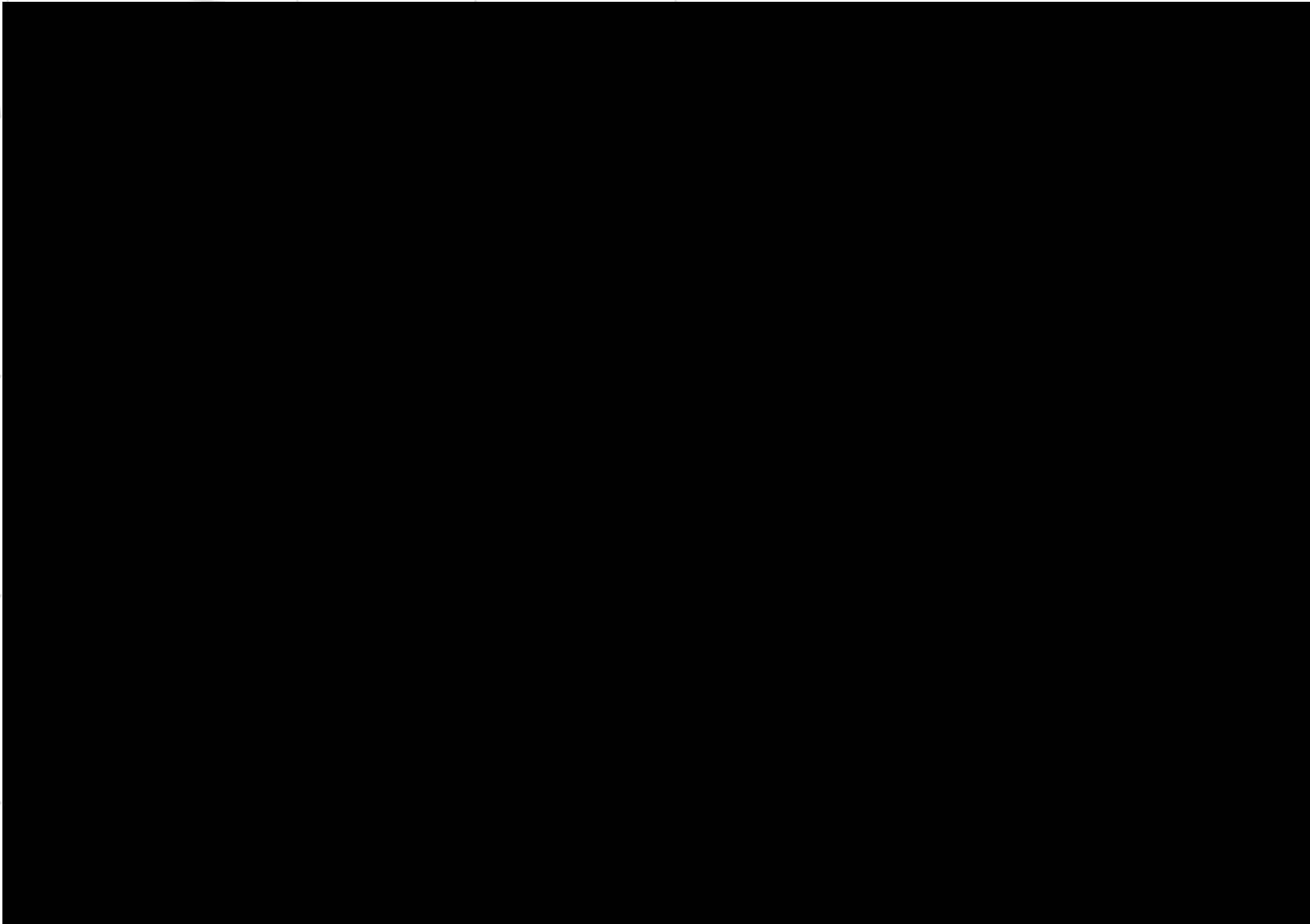
The presence of scats across the area suggested that grazing by cattle and rabbits occurred within the property.



**Plate 5:** Cleared areas within



**Plate 6:** Native vegetation within





## 3.2 Flora Species

No threatened flora species were recorded during the site survey. A total of 35 flora species were recorded across the three properties. These included 24 exotic species (69%) and eleven natives (31%). The list of flora species is presented in **Table 3-1** below.

Table 3-1 Flora species observed.

Family	Scientific Name	Common Name	BC Act	EPBC Act
<b>Trees</b>				
Myrtaceae	<i>Eucalyptus acmenoides</i>	White Mahogany	-	-
	<i>Eucalyptus fibrosa</i>	Broad Leaved Ironbark	-	-
	<i>Eucalyptus moluccana</i>	Grey Box	-	-
	<i>Eucalyptus tereticornis</i>	Forest Red Gum	-	-
Oleaceae	<i>Olea europaea</i> subsp. <i>cuspidata</i> *	African Olive	-	-
Pinaceae	<i>Pinus</i> sp.* (Cultivar)	-	-	-
Santalaceae	<i>Exocarpos cupressiformis</i>	Native Cherry	-	-
<b>Shrubs</b>				
Fabaceae - Mimosoideae	<i>Acacia</i> sp.	a Wattle	-	-
Pittosporaceae	<i>Bursaria spinosa</i>	Native Blackthorn	-	-
<b>Ground Cover</b>				
Adiantaceae	<i>Cheilanthes sieberi</i>	Rock Fern	-	-
Anthericaceae	<i>Dichopogon</i> sp.	Chocolate Lily	-	-
Asteraceae	<i>Cirsium vulgare</i> *	Spear Thistle	-	-
Cactaceae	<i>Opuntia stricta</i> *	Prickly Pear	-	-
Chenopodiaceae	<i>Einadia trigonos</i> subsp. <i>trigonos</i>	Fishweed	-	-
Commelinaceae	<i>Commelina cyanea</i>	Native Wandering Jew	-	-
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	-	-
Malvaceae	<i>Malva</i> sp.*	Mallow	-	-
	<i>Sida rhombifolia</i> *	Paddy's Lucerne	-	-
Oxalidaceae	<i>Oxalis perennans</i>	-	-	-
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	-	-
	<i>Chloris ventricosa</i>	Tall Chloris	-	-
	<i>Cynodon dactylon</i> *	Common Couch	-	-
	<i>Enteropogon</i> sp.	Windmill Grass	-	-
	<i>Eragrostis curvula</i> *	African Lovegrass	-	-

Family	Scientific Name	Common Name	BC Act	EPBC Act
	<i>Panicum</i> sp.	-	-	-
	<i>Themeda triandra</i>	Kangaroo Grass	-	-
	<i>Vulpia</i> sp.*	Rat's-tail Fescue	-	-
Portulacaceae	<i>Portulaca oleracea</i>	Purslane	-	-
Sinopteridaceae	<i>Cheilanthes distans</i>	Bristly Cloak Fern	-	-
	<i>Solanum prinophyllum</i>	Forest Nightshade	-	-
Solanaceae	<i>Solanum pseudocapsicum</i> *	Jerusalem Cherry	-	-
	<i>Solanum</i> sp.*	-	-	-
Urticaceae	<i>Urtica incisa</i>	Stinging Nettle	-	-
<b>Epiphytes</b>				
Loranthaceae	<i>Amyema miquelii</i>	Mistletoe	-	-
<b>Vines</b>				
Fabaceae/faboideae	<i>Desmodium varians</i>	Slender Tick-trefoil	-	-

Notes: \* = Introduced.

### 3.2.2 Weeds

Two weed species are listed as primary weeds within the Greater Sydney Local Land Services area, which includes the Liverpool LGA where the sites are located. Primary weeds and their biosecurity duty under the NSW *Biosecurity Act 2015* (Bio Act) were:

- > Prickly Pear (*Opuntia stricta*): its biosecurity duty is 'Prohibition on Dealings', the plant "Must not be imported into the State or sold". This species is also listed as a Weed of National Significance (WoNS); and
- > African Olive (*Olea europea* subsp. *cuspidata*): the biosecurity duty for this plant is 'Regional Recommended Measure'. An exclusion zone is established for all lands in Blue Mountains City Council local government area and in Penrith local government area west of the Nepean River. The remainder of the region is classified as the core infestation area. Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Exclusion zone: The plant is eradicated from the land and the land kept free of the plant. Core infestation area: Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets.

It is noted that in accordance with the Bio Act, all landowners must comply with the 'General Biosecurity Duty' which states that "All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable". Under the same act, management of primary weeds must be done in accordance with their biosecurity duty

## 3.3 Fauna Species

No threatened fauna species were observed during the site survey. A total of 21 fauna species were recorded, including 19 native and two introduced species. Species included one frog, two reptile, 17 bird and one mammal species. Most of the fauna species detected were birds that are common to the general locality. The introduced species observed included the Indian Myna and Rabbit. A full list of the fauna species observed within the Study Area is given in **Table 3-2**.

Table 3-2 Fauna species detected.

Family	Scientific Name	Common Name	BC Act	EPBC Act
<b>Frog</b>				
Hylidae	<i>Litoria dentata</i>	Bleating Tree Frog	-	-
<b>Reptiles</b>				
Scincidae	<i>Lampropholis guichenoti</i>	Pale-flecked Garden Sunskink	-	-
Varanidae	<i>Varanus varius</i>	Lace Monitor	-	-
<b>Birds</b>				
Acanthizidae	<i>Acanthiza nana</i>	Yellow Thornbill	-	-
Columbidae	<i>Geopelia striata</i>	Peaceful Dove	-	-
	<i>Ocyphaps lophotes</i>	Crested Pigeon	-	-
Artamidae	<i>Cracticus tibicen</i>	Australian Magpie	-	-
Corvidae	<i>Corvus coronoides</i>	Australian Raven	-	-
Maluridae	<i>Malurus cyaneus</i>	Superb Fairy-wren	-	-
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark	-	-
Meliphagidae	<i>Manorina melanocephala</i>	Noisy Miner	-	-
Sturnidae	<i>Acridotheres tristis</i> *	Indian Myna	-	-
Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow	-	-
Meliphagidae	<i>Manorina melanophrys</i>	Bell Miner	-	-
Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird	-	-
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler	-	-
Psittacidae	<i>Psephotus haematonotus</i>	Red-rumped Parrot	-	-
Monarchidae	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	-	-
Rhipiduridae	<i>Rhipidura albiscapa</i>	Grey Fantail	-	-
	<i>Rhipidura leucophrys</i>	Willie Wagtail	-	-
<b>Mammals</b>				
Leporidae	<i>Oryctolagus cuniculus</i> *	Rabbit	-	-

Notes: \* = Introduced.

## 4 Discussion

The site was mapped as 'Potential and Existing Conservation Land' in the Conservation Values – Western Sydney Aerotropolis map of the NSW Department of Planning and Environment's *Western Sydney Aerotropolis – Land Use and Infrastructure Implementation Plan – Stage 1: Initial Precincts* (DoPE 2018). In that map, the site was part of the proposed 'Agriculture and Agribusiness' initial precinct.

The NSW Department of Planning, Industry and Environment (DPIE) released the *Western Sydney Aerotropolis Plan – Draft – for public comment* in December 2019 (DPIE 2019). The site is mapped as part of the Agribusiness initial precinct and is zoned as 'Environment and Recreation' in the Structure Plan – Agribusiness map.

The preliminary assessment of the site indicates that large proportions of the three properties have been disturbed or have had the land cleared of vegetation. Vegetation at the site included:

- > Areas cleared of native vegetation (approximately 10.32 ha of the 27.12 ha of the Study Area) that were considered to have low ecological value. These areas included mowed lawns, housing and other hard surface infrastructure. Although these areas are currently mapped as having environmental importance appears to have a low level of justification. It is recommended that these mapped areas are not included among the areas of ecological importance in the final Structure Plan for Western Sydney Aerotropolis i.e. 'Environment and Recreation';
- > Areas with native vegetation that were present in low to moderate condition and were considered to be commensurate with the *Cumberland Plain Woodland in the Sydney Basin Bioregion*, which is listed as critically endangered under the BC Act and EPBC Act. Based on this preliminary assessment:
  - At [REDACTED] approximately 7.29 ha of native vegetation was considered to be commensurate with the Cumberland Plain Woodland TEC, however, it occurred in a low to moderate condition. Vegetation in moderate condition had the potential to constitute 'significant vegetation' as per the Liverpool LEP 2008. Its current mapping as 'Environment and Recreation' in the draft Structure Plan for Western Sydney Aerotropolis, however, is questionable, due to the lack of connectivity with other patches of native vegetation in moderate to good condition in the local area (i.e. the property is bounded by [REDACTED] on the south and cleared or highly impacted vegetation to other sides);
  - At [REDACTED] there was approximately 4.63 ha of highly disturbed native vegetation that was limited to remnant trees within little to not native understorey. Many of the trees were dead stags or had numerous dead limbs with many trees having signs of borer attack. As such, this vegetation is considered to be mostly in a poor condition with limited ecological value. Notwithstanding this, the remnant trees are likely to form part of a Cumberland Plain Woodland TEC. Given most of the vegetation in this lot was considered to be in a low condition, its inclusion as 'Environment and Recreation' in the draft Structure Plan for Western Sydney Aerotropolis is questionable; and
  - At [REDACTED] approximately 4.61 ha of native vegetation is considered to form part of the Cumberland Plain Woodland TEC, however, it is mostly highly disturbed with a highly disturbed understorey (from cattle grazing) and many trees had died or were showing sign of die back from borer attack. Overall, this vegetation is in low condition and its inclusion as 'Environment and Recreation' in the draft Structure Plan for Western Sydney Aerotropolis is questionable.

## 5 Conclusions

Based on the preliminary assessment, it is concluded that mapping of many areas of the site as 'Environment and Recreation' in the draft Structure Plan for Western Sydney Aerotropolis warrants modification to more accurately reflect present condition. This is particularly so for [REDACTED] and [REDACTED] where the lack of significant biodiversity value at the properties warrants zoning as Primary Production (RU1) as per the Liverpool LEP 2008. It is noted that the portion of 260 [REDACTED] where Cumberland Plain Woodland in moderate condition occurs, could justifiably continue to be identified as Environmentally Significant Land as per the Liverpool LEP 2008. Given the condition of this area, it would have potential to provide important habitat to native fauna. Notwithstanding this, given this area of vegetation would become isolated from other intact patches of native vegetation as a consequence of the Structure Plan for Western Sydney Aerotropolis, the long term ecological value of this vegetation and its preservation remains questionable.

In summary, it can be concluded that:

- > Limited information was available for justifying some areas presently mapped as 'Environment and Recreation', or conversely, for not being included in this category. Given many of the Environment and Recreation areas presently mapped within the site consist of mowed lawns, housing or have hard surfaces. They would have little ecological value and should probably not be in this category. In contrast, there are other areas within the Western Sydney Aerotropolis zone not included in this category that contain patches of the ecologically important Cumberland Plain Woodland;
- > The 'Environment and Recreation' mapping also included areas that were degraded from grazing by cattle or other live stock. Some areas also included cleared land and patches of paddock trees. The low ecological value of these areas does not justify them being currently mapped as 'Environment and Recreation';
- > Given digital mapping of the site (e.g. shapefile) is not available there is limited information for accurately assessing the quality of the proposed environmental zones;
- > Part 4 of the Draft DCP outlines Risk Minimisation and Management measures. Crucial Performance Outcomes are stated regarding the risk of bird strikes to aircraft and bush fire risk. The DCP needs to be amended to ensure any proposed environmental areas do not impact on the ability to comply with these risks;
- > The National Airports Safeguarding Framework (NASF) Guideline C: Managing Risks of Wildlife Strike in the Vicinity of Airports includes landscape design principles which will reduce wildlife attraction within a 3km, 8km and 13km radius of the Airport as mapped on the Wildlife Map; and
- > It is to be noted that this preliminary assessment assigns vegetation condition based on preliminary assessment only. In order to more accurately determine the condition of PCTs present at the site, it is recommended that detailed floristic plots are undertaken.

Our overall conclusion is that zoning of the entire Subject Land as Environment and Recreation is inappropriate with respect to the ecological values evident on the land. Moreover, the ecological value of the majority of the Cumberland Plain Woodland community on the land is in poor ecological condition and would require substantial rehabilitation work to bring it to an ecologically viable condition. The CPW on the land is also isolated and would be further isolated from connections with local ecological corridors by the works proposed in the draft Western Sydney Aerotropolis Plan.

## 6 References

---

DEWHA (Commonwealth Department of the Environment, Water, Heritage and the Arts) (2010). *Cumberland Plain Shale Woodlands and Shale-Gravel Transition forest. A guide to identifying and protecting the nationally threatened ecological community.*  
<https://www.environment.gov.au/system/files/resources/3c01d3d1-c135-4d91-a605-f5730975d78c/files/cumberland-plain-shale-woodlands.pdf>

DoPE (NSW Department of Planning and Environment) (2018). *Western Sydney Aerotropolis. Land use and infrastructure implementation plans. Stage 1: Initial Precincts.* August 2018.

DoPIE (NSW Department of Planning, Industry and Environment) (2019). *Cumberland Plain Woodland in the Sydney Basin Bioregion - critically endangered ecological community listing. NSW Scientific Committee - final determination.*  
<https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2008-2010/Cumberland-Plain-Woodland-critically-endangered-ecological-community-listing>

NPWS (NSW National Parks and Wildlife Service) (2002). *Native Vegetation Maps of the Cumberland Plain Western Sydney.*  
<https://www.environment.nsw.gov.au/resources/nature/cumbPlainMappingInterpguidelines.pdf>

NSW State Government (2019). *Western Sydney Aerotropolis Plan. Draft – for public comment.* December 2019

## About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

## Contact

Level 9 - The Forum  
203 Pacific Highway  
St Leonards NSW 2065  
Australia

Phone +61 2 9496 7700  
Fax +61 2 9439 5170

Web Address  
[www.cardno.com](http://www.cardno.com)

