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# Glenmore Park Stage 3, Mulgoa
# Planning Proposal

## Ecological & Riparian Issues & Assessment Report

F Dominic Fanning

April 2022

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**PLANNING PROPOSAL**

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## 1 INTRODUCTION

### 1.1 Preamble

This *Ecological & Riparian Issues & Assessment Report* (ERIAR) has been prepared by the undersigned to address the relevant issues for a *Planning Proposal* for the proposed Glenmore Park Stage 3 project (Attachment A); located to the immediate south of the existing Glenmore Park development – on the subject land south of Penrith in western Sydney (Figure 1).

It is to be noted at the outset that fine-tuning of and amendments to the *Planning Proposal* as currently designed are anticipated as part of the future *Development Application* (DA) process for individual stages of the Glenmore Park Stage 3 project – in accordance with relevant statutes at the time of each DA. This is the normal process for a *Planning Proposal* and its ultimate realisation (see discussion in Chapter 1.5).

The current Glenmore Park Stage 3 project *Master Plan* (Figure 2) has been prepared to achieve a balanced outcome between ecological/environmental aspirations (in a landscape where neither are currently pursued) and desired urban development requirements.

It is noted that the current project design has been developed through an intensive and extensive iterative process on the basis of input from and discussions with an array of interested parties and experts - including Penrith Council, consultants for Council and (through Council) representations by the Mulgoa Valley Landcare Group; and the Department of Planning & Environment (DPE).

The current design has been modified from the original *Planning Proposal* (originally provided in 2018 and modified in 2020) in response to various submissions to the original *Planning Proposal* (including a 'peer review' of the original 2018 Gunninah EIAR by Abel Ecology) and the discussions indicated above.

Furthermore, and crucially, the current Glenmore Park Stage 3 project *Master Plan* and *Planning Proposal* have also been developed in accordance with the *Draft Cumberland Plain Conservation Plan* (Draft CPCP). The Draft CPCP identifies parts of the subject land that are to be retained and protected '*avoided lands'*) and those parts that are appropriate for development purposes ('*urban capable lands*') – as discussed in more detail in Chapter 1.6 below. Adoption of the Draft CPCP will involve implementation of a biodiversity certification process – which facilitates development activities and resolves ecological and riparian issues.


Figure 1 The Glenmore Park Stage 3 *Planning Proposal* site

Figure 2 The Glenmore Park Stage 3 project *Master Plan* (courtesy of Mirvac)

## 1.2 The Subject Land

The Glenmore Park Stage 3 project site (Figures 1 and 2; Attachments A and B) is located between Mulgoa and Glenmore Park - within the Penrith Council Local Government Area (LGA).

It is bound by The Northern Road (along its eastern boundary); Chain-o-Ponds Road (along its southern boundary); private land (along its western boundary); land managed by the OEH (Mulgoa Nature Reserve - to the immediate northwest); and the existing Glenmore Park development (along its northern boundary).

The subject land is approximately 205 hectares in area; with the majority controlled by Mirvac Pty Ltd and Vianello Holdings (Figure 3).

The "*subject land*" (see Figure 1 and plans in Attachments A and B) for the purposes of this ERIAR consists of the following 21 allotments (Figure 2 below).

- Lot 3 in DP 1240361
- Lots 1-6 and 8 in DP29081
- Lot 1 in DP1088989
- Lot 2 in DP1240361
- Lots 18, 19 and 25-30 in DP244610
- Lot 3 in DP1224642
- Lot 1 in DP795841
- Lot 701 in DP1275647

Of those, 16 have been secured or are owned by Mirvac (Homes) NSW Pty Ltd and Vianelllo Holdings Pty Ltd (see Figure 3 below; Attachment B).

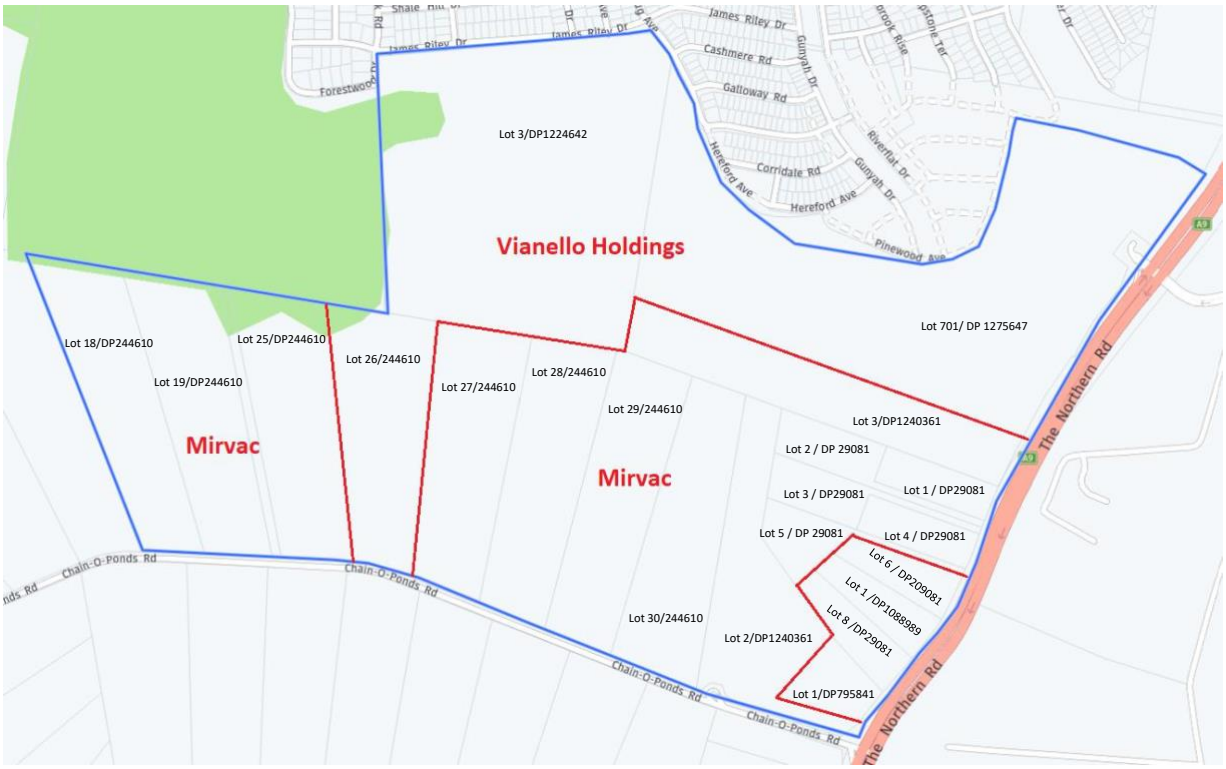


Figure 3 Landholdings within the Glenmore Park Stage 3 project boundaries

### 1.3 The Planning Proposal

The *Planning Proposal* for the Glenmore Park Stage 3 project at Mulgoa proposes the re-zoning of the subject land for urban development and environmental purposes – as depicted in the concept design (Figure 1; Attachments A and B). The proposed development is for a 2,400-lot residential development (as Stage 3 of Glenmore Park south to Chain-o-Ponds Road) - with a school, local centre, residential areas of various densities, recreation areas and environmental lands.

This proposal is for an amendment to the *Penrith Local Environment Plan 2010* (LEP 2010) - to provide appropriate zonings and provisions for the proposed forms of development on the site. It is noted that no physical works are proposed as part of the *Planning Proposal*. These will be documented in subsequent *Development Applications* (DAs) for individual portions or stages of the Glenmore Park Stage 3 project.

It is noted that the current Glenmore Park Stage 3 project *Master Plan* and *Planning Proposal* have been developed in accordance with the *Draft Cumberland Plain Conservation Plan* (Draft CPCP) and facilitates the desired outcomes of the Draft CPCP.

The relevant land is currently zoned *RU2 - Rural Landscape* and *E3 - Environmental Management* (see Figure 4); pursuant to Penrith LEP 2010.

- *RU2 - Rural Landscape* - the northern portion of the subject land immediately south of the existing Glenmore Park residential area
- *E3 - Environmental Management* - the southern portion of the subject land north of Chain-O-Ponds Road

The proposed re-zoning of the Glenmore Park Stage 3 site (Figure 5 on the following page) is for the following land uses.

- *B2 – Local Centre* - a patch in the northeastern part of the subject land; to the west of The Northern Road
- *SP2 – Infrastructure (School)* - another patch in the northeastern part of the subject land; to the west of The Northern Road and opposite the Local Centre
- *R2 – Low Density Residential* - throughout the subject land
- *R3 – Medium Density Residential* - at specified locations through the central parts of the subject land
- *RE1 – Public Recreation* - in parks and reserves through the subject land
- *C2 - Environmental Conservation* - in two bands along watercourses through the subject land and along the western boundary
- *C4 – Environmental Living* - at specified locations along the western, southern and eastern boundaries of the subject land

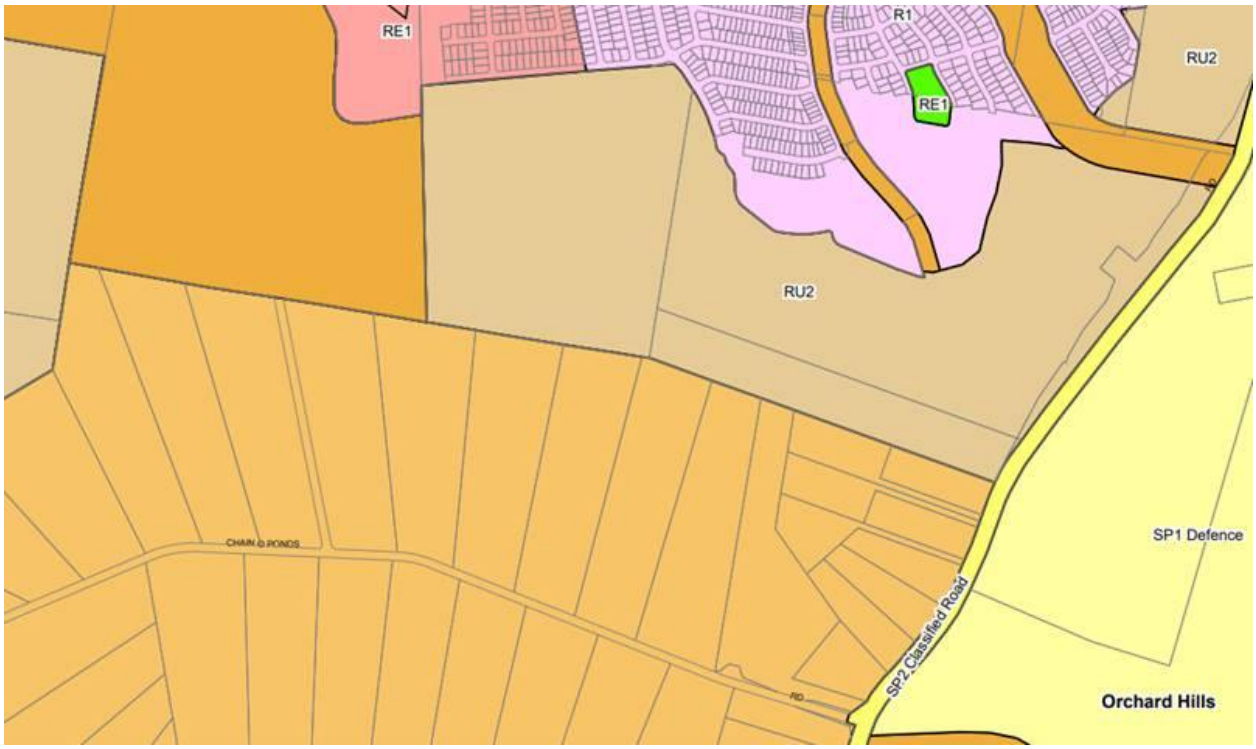


Figure 4 Current zoning of the subject land

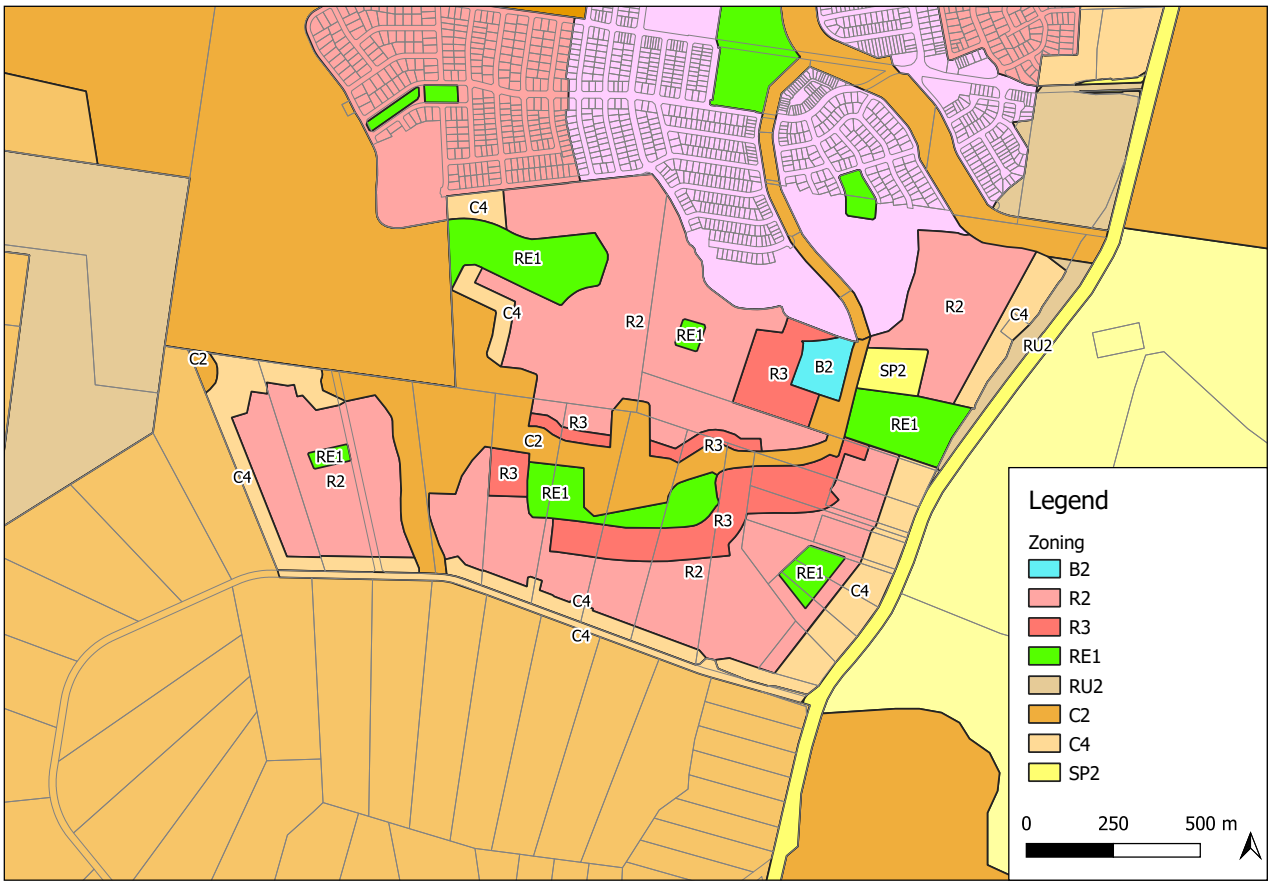


Figure 5 Proposed zoning of the subject land

### 1.4 Purpose of This Report

This ERIAR has been prepared by the undersigned to consider the likely environmental (ecological and riparian) effects of the *Planning Proposal* for the Glenmore Park Stage 3 site; and to address relevant statutory and planning requirements.

Relevant statutes and planning instruments that are addressed in this ERIAR include the following.

- *National Parks & Wildlife Act 1974* (NP&W Act)
- NSW *Biodiversity Conservation Act 2017* (BCon Act)
- *Environmental Planning & Assessment Act 1979* (EP&A Act)
- Commonwealth *Environment Protection & Biodiversity Conservation Act 1995* (EPBC Act)
- *Water Management Act 2000*
- *Penrith Local Environmental Plan 2010*
- *Draft Cumberland Plain Conservation Plan* (Draft CPCP)

### 1.5 Planning Proposal Guidelines

The Department of Planning, Industry & Environment[1] (DPIE) has provided *Guidelines* regarding the making of *Planning Proposals – A Guide to Preparing Planning* Proposals (DP&E December 2018).

The *Guidelines* state (Chapter 1.1) *inter alia* the following.

> "*The preparation of a planning proposal is the **first step** in preparing a LEP. Throughout the course of preparing the proposed LEP, **the planning proposal itself may evolve**. This is particularly the case for complex proposals*" (emphases added).
>
> "*The Minister for Planning (the Minister) or their delegate can issue a Gateway determination*" which "*enables planning proposals that lack strategic planning merit to be stopped early in the process **before time and resources are committed***" (emphasis added).
>
> "*The Gateway determination will confirm the information (**which may include studies**) and consultation required before the LEP can be finalised*" (emphasis added).
>
> "*The planning proposal **may change** over time from when it is initially prepared to the point where a definite proposal has been developed for the site, area, locality or local government area*" (emphasis added).

Further, the *Guidelines* state (Chapter 1.3) *inter alia* the following –

> "*A planning proposal relates **only to a LEP amendment**. It is **NOT a development application** nor does it consider **specific detailed matters** that should form part of a development application*" (emphases added).
>
> "*The planning proposal should contain enough information **to identify relevant** environmental, social, economic and other site-specific **considerations***" (emphases added).

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1 In its former incarnation as the Department of Planning & Environment (DP&E).

"*The scope for investigating any key issues should be identified in the initial planning proposal that is submitted for a Gateway determination. This would include* ***listing what additional studies*** *the PPA considers necessary to justify the suitability of the proposed LEP amendment*" (emphasis added).

"*The actual information/investigation may be undertaken* ***after*** *a Gateway determination has been issued and if required by the Gateway determination*" (emphasis added).

Further, the *Guidelines* state (Chapter 2.3) *inter alia* the following –

"*It is* ***not*** *expected that a council or proponent will provide* ***comprehensive information*** *to support a request for Gateway determination*" (emphases added).

"*As a minimum, a planning proposal before a Gateway determination has been issued must* ***identify*** *relevant environmental, social, economic and other site specific considerations. The planning proposal document* ***may identify the need for investigations*** *and an approach for addressing the issues*" (emphases added).

"*Explanatory note. Where vegetation management is an issue for a large site to be rezoned,* ***it would be sufficient*** *for the planning proposal to be submitted to the Gateway* ***to identify the issue*** *and indicate* ***what environmental studies*** *may be necessary to assess and analyse the value and location of the vegetation and* ***how the matter(s) could be addressed***" (emphases added).

Further, the *Guidelines* state (Chapter 2.3.1 *Questions to consider when demonstrating the justification*. *Section C*) *inter alia* the following –

"*A planning proposal that is submitted for a Gateway determination should identify if the land subject to the proposal has* ***the potential*** *to contain critical habitat or threatened species, populations or ecological communities, or their habitats*" (emphasis added).

"*If it is likely that the land* ***may*** *contain critical habitat or threatened species, populations or ecological communities, or their habitats the proposal should identify* ***what studies are necessary*** *to confirm the presence of these species or habitats and their significance. An assessment of its significance and/or consultation* ***should not take place until after, and if required*** *by, the Gateway determination*" (emphases added).

This ERIAR for the Glenmore Park Stage 3 project *Planning Proposal* has been prepared in accordance with those *Guidelines* and with the Gateway approval.

### 1.6 Draft Cumberland Plain Conservation Plan

The Department of Planning & Environment (DPE) has prepared the *Draft Cumberland Plain Conservation Plan* (Draft CPCP) – which was placed on exhibition in November 2020. The Draft CPCP is under current active review by the NSW government and is also being considered by the Commonwealth Minister for the Environment.

The Draft CPCP documents a strategic biodiversity certification program for the region which identifies areas for development purposes (which are termed '*urban capable land*') and areas of high value biodiversity and riparian corridors which are not considered appropriate for development activities. The latter would be excluded from urban development activities and are to be used for open space and biodiversity conservation purposes. These are termed 'avoided land' and are proposed to be placed into public ownership.

The approach adopted in the Draft CPCP is documented in the BCon Act which provides for the biodiversity certification of areas of land for urban and residential purposes and the exclusion of other land from development – for biodiversity conservation and riparian purposes. Subsequent development on 'certified' land does not require any further ecological assessment or offsets – because these have been addressed through the certification process and will be funded from the development areas.

It is noted that the Draft CPCP has not yet been approved; although it is considered that approval is highly likely by both the state and federal governments - given that both are enthusiastic about strategic planning approaches to development and biodiversity conservation outcomes.

Consequently, this ERIAR has been prepared to address both the existing statutory process at both state and federal levels (*ie* the BCon Act and the EPBC Act) and the approach that would ensue on the basis of the approval of the Draft CPCP (*ie* the biodiversity certification of the subject land)

### 1.7 Assumptions and Limitations

This ERIAR is based on four inspections of the subject land by the undersigned - plus a two-day survey by AEP (see Chapter 2). Although these investigations have been relatively brief, they are appropriate for a *Planning Proposal* (see detailed discussion in Chapter 1.5 above). In addition, the considerations contained in this ERIAR have been informed by other data and mapping for the Draft CPCP and by the extensive experience of the author in the locality.

It is an assumption of his ERIAR that future development of the subject land (generally in accordance with the *Concept Plan* – Figure 2) will be undertaken in an environmentally responsible manner – in accordance with 'best practice' and the environmental requirements of relevant statutes and planning controls; as well as all of the conditions of consent for future DAs.

## 2 INFORMATION BASE

The author of this *Report* has inspected the subject land at Glenmore Park on four occasions (19 February 2018, 14 and 20 November 2018, 03 April 2019); and has previously conducted studies of the St Thomas Anglican Church site at Mulgoa and the Wallacia Golf Course (both to the southwest of the subject land); as well as of a number of other sites in the locality.

A 2-day survey of the subject land by ecologists from Anderson Environment & Planning (AEP) was undertaken by walked inspection of the land and observations of the flora and fauna present - including identifying any threatened biota. Nocturnal surveys on two nights included call playback (for bitterns and forest owls) and spotlighting over 4 person-hours per night on 20 and 21 February 2018.

The recent upgrading of The Northern Road between Mersey Road Bringelly and Glenmore Parkway Glenmore Park involved the conduct of flora and fauna surveys (Jacobs 2017) – which also provide a source of additional information for the Glenmore Parklands Stage 3 project.

In addition, Penrith Council commissioned a 'peer review' of the previous edition of this ERIAR (Gunninah EIAR 2018) by Abel Ecology. Information and data from that *Report* (which involved a walked and driven 10-hour daytime survey of the subject land by 4 ecologists from Abel Ecology on 08 October 2018) has also informed this ERIAR; and has contributed to the 'final' design for the *Master Plan* for the Glenmore Park Stage 3 project *Planning Proposal*.

In addition, the Glenmore Park Stage 3 *Master Plan* has responded to the Draft CPCP; and generally aligns the proposed future development footprint within the boundaries of the '*urban capable land*' and outside of the 'avoided land' areas.

Existing information regarding relevant threatened and other native biota was also obtained from the following sources.

- The OEH[2] Atlas of NSW Wildlife records for the locality (100km$^2$ around and including the subject land).
- Information contained on the OEH website regarding threatened biota.
- *Matters of National Environmental Significance* (MNES) – listed with 5km of the subject land on the EPBC Act website.
- Published scientific information and data.
- The general knowledge and extensive experience (over four decades) of the author – both locally and more widely.

2 The OEH (Office of Environment & Heritage) is now part of the Department of Planning & Environment - which incorporates most of the former Department of Environment, Climate Change & Water (DECCW) and includes the National Parks & Wildlife Service (NPWS).

# 3 NATURE of the SUBJECT LAND

## 3.1 Location and Size

The subject land for the Glenmore Park Stage 3 project is located in western Sydney, north of the village of Mulgoa and south of Penrith. It is located approximately 52km west of the Sydney CBD; near the western boundary of the Cumberland Plain. The Hawkesbury River is just 5km to the west; and beyond the River rise the Blue Mountains.

Relevantly, the Glenmore Park Stage 3 site is located to the immediate south of the existing Glenmore Park residential development project; which is currently being constructed (Figures 1 and 2). That development includes a portion of the Vianello Holdings land (see Figure 3 above), which has already been zoned for residential purposes. That land is currently the site of residential construction activities.

## 3.2 Topography

The subject land is predominantly gently to moderately undulating – ranging from the lowest elevations of approximately 50m AHD to elevations of 91m AHD (Figure 6; Attachment B).

There is a large tract of the most elevated land in the northeast of the subject land (covering most of Lot 2 in DP 1224642) and lands along the eastern boundary (along The Northern Road) and in the southeast (along Chain-O-Ponds Road). Lower elevations are located in the western parts of the northern (Vianello) portion of the land and in the northwestern parts of the southern (Mirvac) portion of the land.

The Glenmore Park Stage 3 site generally drains to the northwest, with the northeastern corner of the subject land draining to the northeast (Figure 6 below).

Most of the Glenmore Park Stage 3 site drains to a watercourse which traverses the land from east to west through the southern part of the land. Additional (generally small and highly modified) watercourses through the land join this main watercourse further downstream (on the OEH land to the northwest). There is also a substantial watercourse in the western part of the subject land – which drains from lands to the south northwards towards Mulgoa Creek.

Figure 6 Topography and contours on the Glenmore Park Stage 3 site and surrounding lands

### 3.3 Land Uses

The overwhelming majority of the subject land (Figure 7; Attachment B) consists of agricultural land with patches of regrowth and/or areas of degraded native vegetation (as discussed in detail in Chapter 3.2). The lands have long been cleared and used for a range of agricultural activities – including grazing (sheep, cattle, horses *etc*), ploughing and pasture improvement, cropping and intensive small lot market gardening (see historical and current aerial photographs in Attachment B). There a number of dwellings on most of the allotments; plus an assortment of sheds, stockyards, fences, tracks and farm dams.

As noted, most of the subject land (Figure 7; Attachments B and D) has long been cleared of native vegetation; and is either cropped or pasture-improved. There are patches of native open forest and woodland scattered through parts of the subject land; although all are highly modified or degraded (see Chapter 3.1). There are small isolated patches of open forest and woodland in the northwest and southeast of the subject land; and a scattered band of woodland patches through the centre of the subject land (mostly associated with watercourses)

The more heavily vegetated land to the immediate northwest of the Glenmore Park Stage 3 project site is currently being dedicated to the OEH for biodiversity and conservation purposes; and will form part of the Mulgoa Nature Reserve. Land approximately 500m to the west (beyond the cleared Penrith Waster Services site) is 'Wallaroo' – a 38ha private 'conservation park' currently being managed for biodiversity conservation by the Cumberland Land Conservancy.

Lands to the south and immediate west of the Glenmore Park Stage 3 project site are largely cleared, but also contain scattered trees and stands of regrowth woodland vegetation. These lots are generally 10ha or more in size; and are used for a range of rural-residential purposes including agricultural and horticultural production. The land to the east is largely cleared and used for defence purposes. The land to the immediate north of the Glenmore Park Stage 3 project site is occupied by new residential development (Glenmore Park), which is currently being completed (Figure 7).

Figure 7 Aerial photograph of the Glenmore Park Stage 3 site and surrounding lands

# 4 ECOLOGICAL CHARACTERISTICS

## 4.1 Flora and Vegetation

The majority of the subject land at Mulgoa has long been cleared of native vegetation and used for an array of agricultural activities. As noted by Abel Ecology (2018), the subject land "*is mostly heavily grazed with very little ground cover of pasture or other herbs*" and *"There is very little shrub cover*".

Only small areas or patches of native vegetation remain; although all are in a modified and/or degraded state, and all are regrowth (*ie* no areas of remnant woodland are present on the subject land). As noted by Abel Ecology (2018), the trees on the subject land "*are generally very young, being scattered paddock trees and patches of young regrowth. Very few mature trees are present*". As also acknowledged by Abel Ecology (2018), the subject land "*has very little ecological integrity due to a history of grazing and market gardens*" and "*has internal features and topography that renders it more suitable for residential construction than reconstruction as a native forest*".

Native vegetation types on the Glenmore Park Stage 3 site at Mulgoa in Sydney's southwest (Figure 8; Attachments C and D) include the following.

- **Introduced and Native Grasslands**

  Most of the Glenmore Park Stage 3 site at Mulgoa is characterised by introduced and partially or (in small areas) derived native grasslands, with most areas dominated by introduced pasture grasses and weeds. Small areas have grasslands where native species (such as Kangaroo Grass *Themeda australis*) are dominant or co-dominant.

  In most areas, the grasslands are heavily grazed and/or pasture-improved; and are in poor to degraded condition. Patches of *Themeda*-dominated grasslands could constitute elements of the CPW community ("*derived native grasslands*") as listed in the BCon Act; although it is noted that "*derived native grasslands*" are not listed as part of the equivalent CPW community in the EPBC Act.

  A small area of "*derived native grasslands*" has been mapped in the eastern part of Lot 2 in DP 1224642 - during the studies for the upgrade of The Northern Road (in the northeast of the Glenmore Park Stage 3 site). It is likely that other (mostly small) patches of "*derived native grasslands*" (predominantly *Themeda*-dominated grasslands) are present throughout the Glenmore Park Stage 3 site. It is also noted that grasslands (artificial and native) are characteristic of much of the surrounding landscape at Mulgoa.

- **Cumberland Plain Woodland**

  There are patches of native (albeit mostly highly degraded) woodland throughout the Glenmore Park Stage 3 site at Mulgoa; particularly in the northwestern and central parts of the site. Most of these woodland patches are dominated by Grey Box, Forest Red Gum and Narrow-leaved Ironbark – all species characteristic of the Cumberland Plain Woodland (CPW) community (as discussed below).

  Woodlands of the Cumberland Plain, including CPW, have been substantially cleared and/or degraded over the last 200+ years. Consequently, many (most) of the woodland types on the Cumberland Plain have been listed as '*Threatened Ecological Communities*' (TECs) in

either or both the BCon Act and/or the EPBC Act. The CPW community has been listed as a "*critically endangered ecological community*" (CEEC) at both the state and federal levels[3].

In the majority of those woodland patches, the understorey is very modified to highly degraded; in some patches so much so that the woodland does not constitute the community as listed in the EPBC Act.

Whilst CPW does not constitute a prohibition on development activities, the desire to retain the better stands of CPW through the Glenmore Park Stage 3 site has informed the *Master Plan* design and the location and configuration of the open space and conservation areas through the project (Figure 2; Attachments A and B). Importantly, the *Master Plan* has responded to the Draft CPCP and generally aligns the proposal with the boundaries of the 'urban capable land' and 'avoided land'.

- **Riparian Vegetation**

  Riparian woodland is very limited on the Glenmore Park Stage 3 site at Mulgoa – restricted to modified to highly degraded narrow strips of vegetation along parts of the two larger watercourses that traverse the site.

  Trees such as Rough-barked Apple *Angophora floribunda* and Broad-leaved Apple *A. subvelutina* characterise some of these strips of vegetation. Other riparian vegetation – including several sedges and rushes – is also confined to narrow bands along some of the larger watercourses.

  Most of the riparian vegetation on the subject has long been modified and/or degraded as a result of agricultural activities – including grazing, cropping and fertiliser use.

  Similar vegetation types are typical of many of the smaller watercourses in the locality and region; with larger and more extensive tracts of riparian vegetation confined to the larger watercourses further downstream (such as Mulgoa Creek and the Hawkesbury River).

- **Lakes and Dams**

  There is a substantial number of lakes and dams on the Glenmore Park Stage 3 site at Mulgoa. All of them are artificial. Many of the dams are highly disturbed (predominantly from grazing stock) and have little or no fringing or riparian vegetation.

  However, some of the farm dams and associated fringing vegetation, whilst artificial, provide potential habitat for an array of native biota (particularly amphibians and waterbirds). Such resources are typical of most of the agricultural lands in the vicinity.

As discussed in detail above (in Chapter 1.5), it is not the role of a *Report* such as this (which is in respect of a *Planning Proposal*; not a *Development Application*) to address the requirements of the relevant statutes and planning instruments in detail.

Nevertheless, the relevant legislation and planning instruments are addressed through this ERIAR – on a conceptual or hypothetical basis. It is also important to note that the Glenmore Park Stage 3 project has been prepared in accordance with the Draft CPCP; and that the subsequent clearing of vegetation will be in accordance with the intended biodiversity certification of the 'urban capable land'.

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3 The TEC is listed in the BCon Act as 'Cumberland Plain Woodland' and in the EPBC Act as 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest'

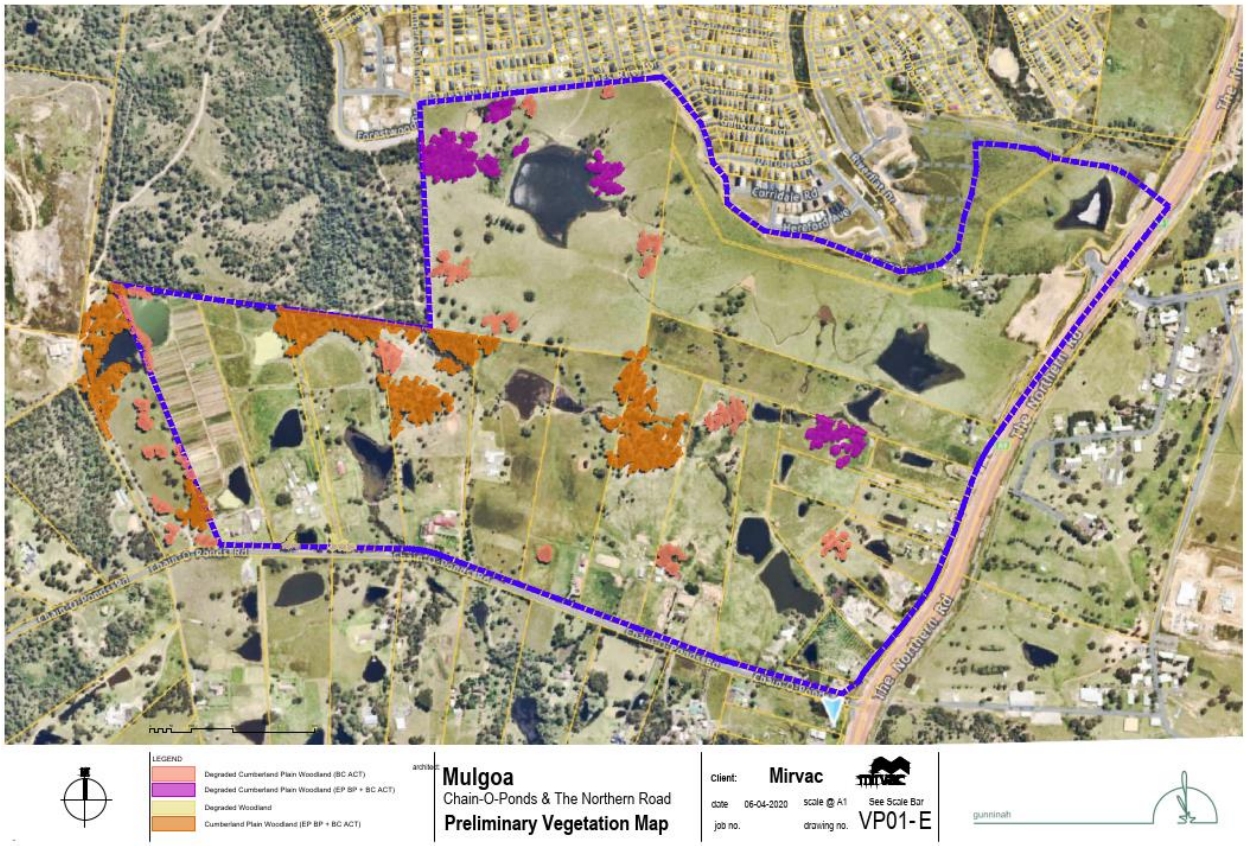


Figure 8 Vegetation types (preliminary mapping by Gunninah) on the subject land at Mulgoa

### 4.2 Fauna and Fauna Habitats

Habitats for native fauna (including threatened species) on the Glenmore Park Stage 3 site at Mulgoa are somewhat limited - because of the extent of previous clearing, modification and intensive agricultural activities. As acknowledged by Abel Ecology (2018) - the subject land "*has very little ecological integrity due to a history of grazing and market gardens*".

The majority of the subject land (as documented throughout this ERIAR) consists of open grasslands or market gardens. These are of only limited value – for a small number of species which utilise such habitats (*eg* Richard's Pipit and the Willie Wagtail); although occasional visitors (such as the Square-tailed Kite) could potentially forage over the grasslands and through the small patches of woodland.

It is noted, however, that the grasslands present (where not replaced by ploughed and/or cropped land) are mostly heavily grazed, and in many instances are significantly degraded and/or consist predominantly of pasture grasses and other introduced species.

As documented elsewhere in this ERIAR, there are patches of woodland scattered across the subject land - most of which are also highly modified or degraded. There is only a minimal shrub layer throughout these patches of woodland; and therefore there is only limited flowering of shrubs, and limited habitat and shelter for small woodland birds. As noted by Abel Ecology 2018 - *"There is very little shrub cover*".

A few of the somewhat less disturbed portions of woodland provide habitat for the Cumberland Plain Land Snail *Meridolum corneovirens* – which was recorded in three locations on the subject site (see Chapter 5.1.2). However, most of the patches of woodland on the subject land are too degraded and/or open to support this species.

The overwhelming majority of the trees present on the subject land are relatively young regrowth specimens (as noted above by Abel Ecology 2018; Chapter 4.1), and none of the woodland present would constitute 'remnant' vegetation. As a consequence of the historical land uses on the subject land, there are very few hollow-bearing trees present; mostly supporting only small hollows (potentially suitable for microchiropteran bats and potentially glider and possums).

Large tree-hollows are extremely rare on the subject land; although a few scattered specimens (even one or two potentially suitable for forest owls) are present.

Any future development of the Glenmore Park Stage 3 site would (or at least should) include the implementation of a 'Tree-Hollow Protocol' – as documented below in Chapter 12.

No cliffs or rock outcrops are present on the Glenmore Park Stage 3 site; and no caves are present on the site. Species dependent on these resources are therefore not likely to be present; with the possible exception of wide-ranging foraging microchiropteran bats such as the Bent-wing Bats and possibly the Southern Myotis (all of which are threatened species).

The Glenmore Park Stage 3 site contains a large number of lakes and dams; all of which are artificial. In most instances, grazing stock have denuded the dams, and there is little or no fringing vegetation present. These dams would provide habitat for a variety of ducks and also for foraging waders (such as herons and egrets); however, no threatened species associated with such habitats are likely to be present.

Some of the dams, and small stretches of the larger watercourses across the subject land, support fringing vegetation such as Typha (reeds) and sedges. These provide suitable potential habitat for some amphibians and several bird species (such as coots, the Australasian Swamphen and possibly some bitterns).

Threatened species of potential relevance are discussed in detail in Chapter 5 below.

### 4.3 Ecological Values and Significance

As documented in detail above, the Glenmore Park Stage 3 site is characterised predominantly by open grasslands, introduced and/or degraded pastures and horticulturally managed land. The majority of the subject land has been grazed, ploughed, fertilised and pasture-improved, cropped and/or used for market gardens over a very long period.

As noted by Abel Ecology (2018), the whole of the subject land "*has very little ecological integrity due to a history of grazing and market gardens*"; and "*has internal features and topography that renders it more suitable for residential construction than reconstruction as a native forest*". The undersigned concurs with that assessment of the subject land.

The majority of the grasslands are dominated by introduced pasture grasses and weeds (mostly overwhelmingly so); although there are also patches where native grasses appear dominant or co-dominant. These, however, are relatively small in size; and are subject to ongoing agricultural activities (as noted above).

As also noted above, there are various (albeit mostly small) patches of woodland scattered across the Glenmore Park Stage 3 site – predominantly in the northwest and central parts of the subject land, with smaller patches in the southeast (see Figure 8 above and Attachment B). Many of these patches of woodland are dominated by trees characteristic of the Cumberland Plain Woodland (CPW) community; although in most areas with an understorey characterised predominantly by introduced plant species.

Relevant matters for consideration with respect to the patches of 'CPW' woodland across the Glenmore Park Stage 3 site are as follows.

- All of the woodland patches are disturbed and modified from their original condition; and all are regrowth, not remnant, vegetation.
- The understorey in all of the patches has been modified and includes an array of non-native plant species. In most instances, the native understorey/groundcover is less than 50% (for patches <5ha) or 30% (for patches >5ha and/or connected to other areas) native species.
- In these instances, these patches of vegetation do not meet the EPBC Act criteria for CPW; and in many instances may not satisfy the BCon Act criteria.
- Many of the patches are isolated from other native vegetation by intervening areas of agricultural or horticultural lands.

Most of the patches of woodland on the Glenmore Park Stage 3 site are of low to moderate biodiversity conservation value at best – because of their degraded condition, isolation and/or relatively small sizes. Doubtless many such patches could be rehabilitated; although in most instances very substantial efforts and significant active management (and expense) would be required; and the biodiversity conservation benefits dubious unless they are connected to other patches.

Nevertheless, as discussed below, the current Glenmore Park Stage 3 project will achieve significant improvements in the extent and condition of CPW, and other vegetation types, on the subject land. It is also noted that the current Glenmore Park Stage 3 project is consistent with and has been refined to reflect the outcomes identified in the *Draft Cumberland Plain Conservation Plan* (Draft CPCP).

There are also scattered small linear patches of woodland along some of the watercourses through the Glenmore Park Stage 3 site, although these are small and usually highly degraded. Some of the dams and short stretches of the watercourses have patches of fringing vegetation (such as reeds and sedges); although these again are highly modified and degraded.

Riparian vegetation on the Glenmore Park Stage 3 site is restricted to very narrow bands (either within the channels or within just a few metres; as is typical of such ephemeral streams in western Sydney. All of the watercourses on the Glenmore Park Stage 3 site are ephemeral; and contain limited (or in many cases no) areas of intact riparian habitat. In addition, most of the streams contain farm dams – some of considerable size.

It is important to note that the Glenmore Park Stage 3 *Planning Proposal* includes the retention, rehabilitation and reconnection of woodland patches and other vegetation through the substantial areas of open space contained in the *Master Plan* (Figure 1; plans in Attachment B). The majority of the better patches of 'CPW' and other vegetation across the Glenmore Park Stage 3 site will be retained within the tracts of open space or environmental zoned land; and extended and rehabilitated. This approach is consistent with the outcomes and 'avoided lands' identified in the Draft CPCP.

The proposed network of open space and conservation areas along the drainage lines through the Glenmore Park Stage 3 site will also significantly improve the connectedness of native vegetation through the site and into areas of native vegetation beyond the subject land – particularly the Mulgoa Nature Reserve to the immediate northwest.

These outcomes will be of benefit to the native flora and fauna of the locality, including the threatened species recorded on or likely to occur or be present on the Glenmore Park Stage 3 site. Threatened biota of particular relevance in this regard include microchiropteran bats and some threatened bird species – particularly those that are tolerant of urban environments (as discussed below in Chapter 5).

The areas of woodland to be retained and rehabilitated within the Glenmore Park Stage 3 site will also supplement the areas of retained native (predominantly CPW) woodland on the adjoining lands to the west and northwest of the Glenmore Park Stage 3 site including the Mulgoa Nature Reserve; and will reduce the potential for weed invasion into those lands (although the converse cannot be anticipated).

# 5 THREATENED and MIGRATORY BIOTA

## 5.1 NSW BIODIVERSITY CONSERVATION ACT

It is critical to note at the outset that the Glenmore Park Stage 3 project has been prepared in accordance with the *Draft Cumberland Plain Conservation Plan* (Draft CPCP). The Draft CPCP identifies that the subsequent development of the Glenmore Park Stage 3 land would be in accordance with the intended biodiversity certification of the 'urban capable land' and that adverse impacts on the natural environment (including threatened biota) had been addressed at the planning and design stages of the project.

However, in the event that the Draft CPCP Is not adopted and the Glenmore Park Stage 3 project must be assessed pursuant to the existing statutory regime, further detailed flora and fauna surveys would be undertaken in respect of future *Development Applications* (DAs) for the staged residential and/or other development of the Glenmore Park Stage 3 site. This approach has been identified by the DPE as appropriate for the purposes of a *Planning Proposal* (see discussion in Chapter 1.5 of this ERIAR).

### 5.1.1 Threatened Flora

Several threatened flora species have been recorded within 5km of the Glenmore Park Stage 3 site on the OEH database (Attachment E).

However, as discussed above (Chapter 3.2), it is likely that very few (if any) threatened flora species would be present on the subject land at Mulgoa- because of the extent and long history of clearing and agricultural/horticultural activities on the land, and the lack of undisturbed or remnant patches of native woodland or open forest.

Nevertheless, scattered specimens of some of the more resilient and adaptable species could occur on the Glenmore Park Stage 3 site; predominantly within or associated with the small scattered patches of CPW woodland present. Species such as *Grevillea juniperina* are often found in highly modified and degraded sites in western Sydney; although this species has not been recorded on the Glenmore Park Stage 3 site.

Other threatened understorey or climbing plant species (such as *Marsdenia viridiflora* subsp *viridflora*, *Dillwynia tenuifolia* and *Pimelea spicata*) could also theoretically occur on the Glenmore Park Stage 3 site (noting that Marsdenia has been recorded nearby – OEH Atlas). However, if present, any such specimens would most likely be associated with the better quality CPW woodland patches across the subject land; most of which are to be retained and rehabilitated – consistent with the *Draft Cumberland Plain Conservation Plan* (Draft CPCP).

No specimens of any threatened flora species have been recorded on the Glenmore Park Stage 3 site at Mulgoa (FDF *pers obs*; AEP 2018; Abel Ecology 2018). As noted above, this outcome is not surprising - given the history of the subject land and the extent of land modification and the intensive agricultural and horticultural activities.

It is no doubt possible that a few individuals of the threatened flora species known from western Sydney and/or included in the OEH database could occur at scattered locations across the subject land. Resilient and widespread threatened species could potentially be present in isolated locations; although most individuals of any such species would most likely occur in or be associated with the more intact patches

of CPW woodland. Most of those are to be retained and rehabilitated within the planned open space areas on the Glenmore Park Stage 3 site – consistent with the Draft CPCP.

### 5.1.2 Threatened Fauna

A number of threatened fauna species would be likely to occur on the Glenmore Park Stage 3 site (as discussed in Chapter 4 of this EIAR); despite the degree of modification and degradation of the subject land. It is a fact that many threatened flora and fauna species are tolerant of and/or are capable of adapting to modified environments.

Of the threatened species recorded in the OEH database and/or other threatened species that could potentially be present on the Glenmore Park Stage 3 site at Mulgoa (Attachment E), it is likely that only a few individuals of the more mobile species would be present - because of the extent and long history of clearing, modification and agricultural/horticultural activities.

In particular, it is not likely that threatened terrestrial mammals that rely on dense groundcover (such as the Tiger Quoll) or arboreal species dependent on relatively high quality forest habitats (such as the Greater Glider, Squirrel Glider and Yellow-bellied Glider) would be present at all. Other species (such as the Koala – which has been recorded more than one kilometre to the west) would only likely be present on rare or transient occasions; if at all.

Highly mobile and/or urban tolerant and adaptable threatened species are likely to be present; although in some instances, only on rare or seasonal circumstances. The following threatened species could potentially occur on the Glenmore Park Stage 3 site at Mulgoa.

- Microchiropteran bats

  Several 'threatened' microchiropteran bats would be highly likely to be present on the Glenmore Park Stage 3 site – given their widespread distribution, adaptability, tolerance of urban and/or modified landscapes, and general abundance.

  Species such as the Eastern (Common) Bent-wing Bat, Southern Myotis, Eastern False Pipistrelle and Greater Broad-nosed Bat are regularly recorded in the Sydney Basin; including in highly urbanised environments.

  Some of these species would primarily use the subject land solely for foraging purposes (*eg* the Common Bent-wing Bat – which roosts in caves and tunnels) whilst others (tree-hollow dependent species) could reside in the patches of woodland containing the few suitable tree-hollows present.

- Grey-headed Flying Fox

  Individuals of the Grey-headed Flying Fox are highly likely to forage on the subject land on occasions; particularly when some of the eucalypts are in flower.

  However, even individuals of this species could not be dependent on the subject land *per se* for their survival in the locality – given its small size relative to their home ranges and their wide-ranging habits as well as the scarcity of relevant resources.

- Square-tailed Kite

  Wide-ranging raptors such as the Square-tailed Kite, and other similar threatened raptors, could forage over the subject land on occasions, assuming that they might be present.

  However, any such species would not be dependent on the subject land *per se* for their survival in the locality (even if present) – given its small size relative to their home ranges, the limited opportunities for nesting and the extent of alternative suitable habitat in the vicinity and general locality.

- Forest Owls

  Individuals of the Powerful Owl and Masked Owl, and possibly the Barking Owl and (less likely the Sooty Owl), could theoretically occur on the subject land on occasions; particularly as visitors from larger patches of woodland and forest in the locality.

  However, no such species would reside on the subject land; and none could be dependent on the subject land *per se* for their survival in the locality (even if present) – given the minimal forest cover present; the lack or scarcity of suitable tree-hollows for breeding; and the certain very low densities of potential prey species.

- Regent Honeyeater, Turquoise Parrot, Swift Parrot

  Similar considerations apply to these seasonal and wide-ranging/long distance travellers as to the raptors above.

  Individuals of these species could potentially occur on the Glenmore Park Stage 3 site on occasions; given their very extensive seasonal movements around southeastern Australia. Any such occurrences, however, would likely be fleeting; and there are no population 'centres' for these or other such species on the Glenmore Park Stage 3 site or in the general vicinity.

  Even if they do appear on the subject land on occasions, they could not be dependent on the subject land *per se* for their survival in the locality in any case – given its small size relative to their home ranges and the extent (and quality) of alternative suitable habitat in the vicinity and general locality.

- Varied Sittella, Diamond Firetail, Flame Robin

  Individuals of these more sedentary avian species could potentially occur on the Glenmore Park Stage 3 site; although they were not recorded during the preliminary site investigations.

  Any such occurrences, however, would likely be isolated; and there are only limited and disturbed habitats or resources for these or other such species on the Glenmore Park Stage 3 site.

- Green & Golden Bell Frog

  A few of the artificial dams on the Glenmore Park Stage 3 site could provide suitable habitat for the Green & Golden Bell Frog – where there are reeds and sedges present (for shelter and sun basking) and areas of open water. These are rare, however.

  It is noted, however, that most of the dams support populations of the Plague Minnow, which is a predator of Green & Golden Bell Frog eggs and tadpoles. Even if present (which is highly unlikely), supplementary habitat and resources could be provided in the future extensive open space areas on the Glenmore Park Stage 3 site.

- Cumberland Plain Land Snail

  As noted above, some of the better quality CPW woodland patches on the Glenmore Park Stage 3 site (those with a dense leaf litter layer and logs) provide suitable habitat for the Cumberland Plain Land Snail. Three such patches along the northwestern boundaries of the subject land contained specimens of this species (Abel Ecology 2018).

  These better patches of CPW are to be retained in the open space within the Glenmore Park Stage 3 site.

It is particularly relevant to note that significant areas of similar habitats and resources are available for all of these species in the immediate vicinity, general locality and region; including in the substantial areas of conservation reserves present (such as Mulgoa Nature Reserve to the immediate northwest and the Blue Mountains National Park to the west).

### 5.1.3 Threatened Ecological Communities

The only "*threatened ecological communities*"[4] (TECs) listed in the BCon Act that are or might be present within the Glenmore Park Stage 3 site at Mulgoa in western Sydney are the 'Cumberland Plain Woodlands' TEC (CPW) and the River-flat Eucalypt Forest on Coastal Floodplains TEC (REFCF). The latter, if present, is only represented by very small and narrow strips along a few watercourses; usually with adjacent CPW vegetation.

All of the woodland vegetation on the subject land has been modified from its original state (most of it significantly so) – as a result of almost 200 years of agricultural and horticultural activities. As noted above, there are only a few scattered hollow-bearing trees present and the overwhelming majority of the trees within the patches of woodland are young regrowth.

In addition, the woodland patches on the subject land are moderately to seriously degraded; with most lacking a shrub layer and having a groundcover dominated by introduced species or of almost bare earth. Even the best of the woodland patches on the Glenmore Park Stage 3 site do not appear to have a groundcover that is >50% native species.

Furthermore, most of the patches of woodland on the subject land are isolated or have only a tenuous link to larger areas of woodland on the adjacent land to the northwest. The isolation, as well as their long boundaries, renders such patches more susceptible to 'edge effects', particularly given the lack of ecological management of the patches, and the nature of the adjoining activities (including grazing, ploughing and fertilising).

As noted by Abel Ecology (2018), the subject land "*has very little ecological integrity due to a history of grazing and market gardens*"; and "*has internal features and topography that renders it more suitable for residential construction than reconstruction as a native forest*".

Notwithstanding those considerations, most of the larger and/or better quality patches of woodland on the subject land are to be retained within public reserves and rehabilitated – consistent with the desired outcomes of the Draft CPCP.

4 As listed in the NSW BCon Act (formerly in the TSC Act).

## 5.2 FEDERAL ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT

As above for the BCon Act, it is critical to note at the outset that the Glenmore Park Stage 3 project has been prepared in accordance with the *Draft Cumberland Plain Conservation Plan* (Draft CPCP). The Draft CPCP identifies that the subsequent development of the Glenmore Park Stage 3 land would be in accordance with the intended biodiversity certification of the 'urban capable land' and that adverse impacts on the natural environment (including threatened biota) had been addressed at the planning and design stages of the project.

At the date of this ERIAR, the Draft CPCP is being considered for approval by the Commonwealth Minister for the Environment.

### 5.2.1 Threatened Flora

Whilst it is possible that some of the threatened flora species listed in the EPBC Act could occur on the Glenmore Park Stage 3 site (Attachment F), there is no evidence of the presence of any such species on the subject land. Furthermore, the highly degraded nature and condition of the vegetation present on the subject land renders the site of little or no relevance to the potential threatened flora species that could be present.

Furthermore, there are significant similar habitats and resources for any such threatened EPBC Act species in the immediate vicinity, general locality and region; including in the substantial conservation reserves present in the locality.

### 5.2.2 Threatened Fauna

Similar considerations as discussed above (in Chapter 5.1 with respect to threatened species listed in the BCon Act) apply to potentially relevant threatened fauna listed in the EPBC Act (several of which are the same species); as the Glenmore Park Stage 3 site provides potential habitat and resources for a few of the threatened fauna species listed in the EPBC Act (Attachment F).

Again, the most likely threatened EPBC Act species would be highly mobile species – birds and bats (such as the Regent Honeyeater, Swift Parrot, Large-eared Pied Bat and Grey-headed Flying Fox). It is not likely that any such species would be present on the subject site other than as individuals – mostly on an occasional or transitory basis (as discussed in detail above for most of the same species).

Other species included in the list of threatened fauna species listed in the EPBC Act (Attachment F), such as the Green & Golden Bell Frog, Greater Glider and Grey-headed Flying Fox, have been addressed above. The subject land is not likely to be of significance for any such species.

The degree of long-term disturbance to the Glenmore Park Stage 3 site means that terrestrial and less mobile species, and those dependent on undisturbed habitats and resources (such as tree-hollows), would not likely be to occur or, if present at all, would not likely be dependent on the subject land or on any of the scattered resources present thereon.

Furthermore, the areas of habitat of greatest likely or potential value for any such species (the larger areas of better quality woodland) are to be retained in the open space areas throughout the Glenmore Park Stage 3 site (see details above in Chapter 3.3). In addition, as noted above, there are significant

similar habitats and resources for these species in the immediate vicinity, general locality and region; including in the substantial conservation reserves present.

Given those circumstances, the Glenmore Park Stage 3 project is not likely to be of any relevance to the survival of any of the threatened fauna species listed in the EPBC Act that are likely to, or could, occur on the subject land at Mulgoa.

### 5.2.3 Threatened Ecological Communities

The only "*threatened ecological community*"[5] (TEC) listed in the EPBC Act that might be present within the Glenmore Park Stage 3 site at Mulgoa in western Sydney is the 'Cumberland Plain Woodlands'[6] (CPW) TEC.

However, most of the patches of woodland on the Glenmore Park Stage 3 site at Mulgoa are too degraded to satisfy the criteria in the EPBC Act for the CPW TEC; as the groundcover layer in most of the woodland patches is less than 30% native species. In any case, any patches that might constitute the TEC would be contained within the open space areas on the Glenmore Park Stage 3 site (see *Master Plan* in Attachment A).

### 5.2.4 Migratory Species

The Glenmore Park Stage 3 site at Mulgoa in western Sydney also contains some potential (theoretical in most instances) habitat and/or resources for an array of migratory fauna listed in the EPBC Act (Attachment F). These would include a few common wetland and wading birds, and possibly the Cattle Egret (an alleged 'migratory' species) and/or a few woodland birds.

Other species less likely to be present (other than as occasional individuals overhead) might include the Fork-tailed Swift and White-throated Needletail.

By their nature, however, the majority of these "*migratory*" species traverse significant areas on a (usually) annual basis – some travelling thousands of kilometres. The Glenmore Park Stage 3 site could not conceivably be of any significance for any such species.

Others (such as the Satin Flycatcher, Rainbow Bee-eater and Rufous Fantail) are less 'migratory' (or not really 'migratory' at all). These species are not likely to be adversely affected by the proposed development of the Glenmore Park Stage 3 site, at all.

As noted elsewhere, there are significant similar habitats and resources for these species in the immediate vicinity, general locality and region; including in the substantial conservation reserves present. The Glenmore Park Stage 3 site could not conceivably be of any significance for any migratory species listed in the EPBC Act.

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5 As listed in the Commonwealth EPBC Act

6 The EPBC Act listed community is actually 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest'

## 6 ENVIRONMENTAL PLANNING & ASSESSMENT ACT

In the first instance, it is to be noted that this ERIAR and the Glenmore Park Stage 3 development proposal which it supports is for a *Planning Proposal* for the re-zoning of the subject land at Mulgoa to facilitate residential development with associated urban and open space (including biodiversity conservation). The future development of the subject land is depicted in the *Master Plan* (Figure 2; Attachment A); and the future development of the land would be staged and subject to subsequent *Development Applications* (DAs) and associated documentation.

As detailed above in Chapter 1.5, the documentation required in support of a *Planning Proposal* does not require the same level of detail or assessment as that required for a DA pursuant to the EP&A Act. Nevertheless, this ERIAR has considered the potential impacts of the *Planning Proposal* and the associated concept design (Attachment A) on relevant elements of the natural environment.

Section 4.15(b) of the EP&A Act requires (relevantly) that a consent authority is to take into consideration "*the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality*". The application of Section 4.15(b) of the EP&A Act, therefore, is a matter of balancing the "*environmental impacts*" of a development proposal against the development outcomes.

As discussed in the preceding chapters of this ERIAR, the Glenmore Park Stage 3 site at Mulgoa has long been modified from its original condition; and vegetation present on parts of the land is predominantly weed-infested, highly modified and of low biodiversity value or significance. Given those circumstances, development of the subject land as proposed in the *Planning Proposal* and the associated *Master Plan* (Figure 2; Attachments A and B) is not likely to impose any significant adverse impacts upon any threatened biota or upon any biodiversity values.

In addition, the Glenmore Park Stage 3 project facilitates the retention and rehabilitation of the more significant patches of native vegetation as well as the more significant watercourses, consistent with the *Draft Cumberland Plain Conservation Plan* (CPCP) – see Figure 1 and discussions above. Furthermore, any future DA for the development of the land as envisaged would be subject to the relevant considerations of the BCon Act - as discussed in detail below (Chapter 7).

Given the considerations above, the proposed development of the subject land at Mulgoa does not constitute an activity which would be regarded as unacceptable or unreasonable in terms of Section 4.15(b) of the EP&A Act. The proposal will not impose any significant or relevant adverse impact on the "*natural .. environments .. in the locality*" – particularly given achievement of the biodiversity offset requirements of the BCon Act (see Chapter 7).

Conversely, as documented below, the proposal will involve an exceedance of "*the biodiversity offsets scheme threshold*" - pursuant to Section 7.2(1)(b) of the BCon Act. In the event that the Draft CPCP is not adopted, future DAs for the residential development of the land would require the preparation of a '*biodiversity development assessment report*' (BDAR) – either for each DA or for the Glenmore Park Stage 3 project *in toto*.

## 7 NSW BIODIVERSITY CONSERVATION ACT

It is noted that the detailed considerations below are provided on an assumption that the Draft CPCP is not adopted, and that the existing NSW statutory regime (including the BCon Act and EP&A Act) will continue to apply to the Glenmore Park Stage 3 project.

### 7.1 The Statutory Regime

The BCon Act has modified the EP&A Act by the provision of specific requirements for the consideration and assessment of the clearing of native vegetation and the potential for impacts on "*threatened species*"[7].

Section 7.7(2) of the BCon Act states that if a "*proposed development is likely to significantly affect threatened species, the application for development consent is to be accompanied by a biodiversity development assessment report*".

Section 7.2(1) of the BC Act details the following required considerations.

*(1) For the purposes of this Part, development or an activity is **likely to significantly affect threatened species** if:*

*(a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3, or*

*(b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or*

*(c) it is carried out in a declared area of outstanding biodiversity value.*

As discussed above, this ERIAR and the 'development proposal' which it addresses is for a *Planning Proposal* for the re-zoning of the Glenmore Park Stage 3 site at Mulgoa. It has not been prepared in support of or with respect to a *Development Application* (DA) or an application for any works to be undertaken on the subject land.

Consequently, the assessment process of the BCon Act does not strictly apply – as there is no "*activity*" which can formally be 'assessed' pursuant to the requirements of the BCon Act.

Nevertheless, this ERIAR has considered the potential future impacts of the *Planning Proposal* and the associated *Master Plan* for the Glenmore Park Stage 3 project (Figure 2; Attachments A and B) on relevant elements of the natural environment.

It is also noted, importantly, that the current Glenmore Park Stage 3 project has been prepared as the result of an iterative process involving extensive consultation with an array of relevant agencies; and has also been modified to be consistent with the *Draft Cumberland Plain Conservation Plan* (Draft CPCP).

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7 The term "*threatened species*" includes "*threatened species, populations and ecological communities*" listed in the *Biodiversity Conservation Act 2016*.

### 7.2 Section 7.2(1) of the BCon Act

Consideration of the proposed (conceptual) residential subdivision and development of the subject land at Mulgoa - generally in accordance with the Glenmore Park Stage 3 *Master Plan* (Figure 2; Attachments A and B) - pursuant to Section 7.2(1) of the BCon Act (see above) provides the following assessments.

*(a) likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3*

The proposed future development of the subject land at Mulgoa would not be "***likely** to **significantly** affect threatened species or ecological communities, or their habitats, according to the test in section 7.3*"; as discussed in detail below (in Chapter 7.3 of this *Report*).

*(b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values*

The proposed Glenmore Park Stage 3 development of the subject land at Mulgoa would exceed "*the biodiversity offsets scheme threshold*", pursuant to Section 7.2(1) of the BC Act - on the basis of the following considerations.

1 The Glenmore Park Stage 3 project would result in "*the clearing of native vegetation of an area declared by clause 7.2* [of the Regulation] *as exceeding the* [biodiversity offsets scheme] *threshold*". The area of "*native vegetation*" (albeit highly modified and degraded) to be removed would be greater than the "*biodiversity offsets scheme threshold*" – which for the subject land (once rezoned) would be 2,500m$^2$.

2 Further, parts of the subject land at Mulgoa are "*included on the Biodiversity Values Map published under clause 7.3*" of the *Regulation* (see Figure 9; Attachment B) - notwithstanding the inaccuracies in that mapping.

*(c) It is carried out in a declared area of outstanding biodiversity value*

The subject land at Mulgoa is not "*in a declared area of outstanding biodiversity value*".

***Conclusions***

Given those considerations, and in particular the exceedance of "*the biodiversity offsets scheme threshold*" in some parts of the site, the proposed future development of the Glenmore Park Stage 3 land at Mulgoa would "*significantly affect threatened species*" - pursuant to Section 7.2(1)(b) of the BCon Act. This conclusion assumes that the Draft CPCP is not adopted.

Some of the DAs for proposed future residential subdivision and development of the Glenmore Park Stage 3 land would therefore need to apply the *Biodiversity Assessment Method* (BAM) process in accordance with the BCon Act. Such DA may need "*to be accompanied by a biodiversity development assessment report*" (BDAR) to satisfy the requirements of the BCon Act (again assuming that the Draft CPCP is not adopted).

Conversely, as discussed elsewhere in this ERIAR, a *Planning Proposal* would not trigger a requirement for a BDAR - as it is not an application for development or for works and as the final development design may differ from that contained in the *Planning Proposal*.

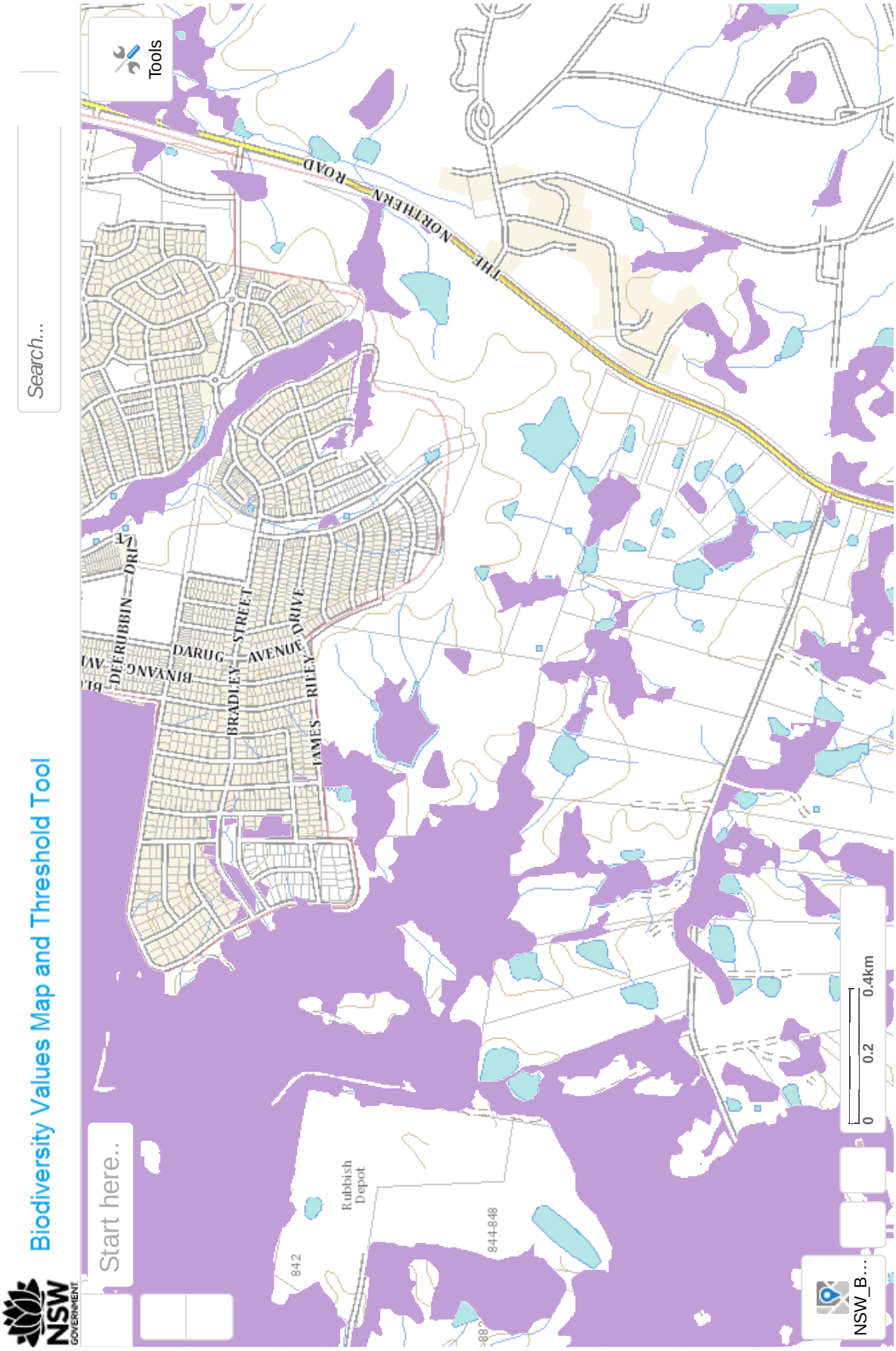


Figure 9 The current *Biodiversity Values Map* for the Glenmore Park Stage 3 land at Mulgoa

### 7.3 Section 7.3 of the BCon Act

Section 7.3 of the BCon Act provides the "*Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats*" referred to in Section 7.2(a) of the BCon Act (as noted above).

Section 7.3 of the BCon Act is a modified version of the pre-existing Section 5A of the EP&A Act. This Section of the BCon Act contains the specific requirements and matters that "*must be taken into account for the purposes of determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats*".

In addition to the factors which "*must be taken into account*" (where relevant) pursuant to Section 7.3(1) of the BCon Act, Section 7.3(2) of the Act identifies that the "*Minister may, by order published in the Gazette with the concurrence of the Minister for Planning, issue guidelines relating to the determination of whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats*". Where relevant, such guidelines have been taken into account by the undersigned in the consideration of potential impacts on threatened biota.

It is to be noted that, as discussed elsewhere in this ERIAR, a *Planning Proposal* is not an application for development or for works; and the specific assessment provisions of the BCon Act do not strictly apply. The following indicative 'Assessment of Significance' (pursuant to Section 7.3 of the BCon Act) is conceptual; and assumes that the Draft CPCP has not been adopted.

This ERIAR also assumes the following.

A Development of the Glenmore Park Stage 3 site will occur generally in accordance with the attached *Master Plan* (Figure 2; Attachments A and B).

B Development of the Glenmore Park Stage 3 site will be undertaken in an environmentally sensitive manner – using 'best practice' techniques and management regimes.

C The BAM process would be activated; and each DA would therefore be accompanied by a BDAR which addresses threatened species issues and determines the number and types of Biodiversity Credits for each stage of the Glenmore Park Stage 3 development.

D The majority of the proposed Glenmore Park Stage 3 development is to occur in highly modified and degraded parts of the subject land (as discussed above in Chapters 4 and 5.1).

E The array of conservation reserves and riparian areas on the Glenmore Park Stage 3 land, as depicted in the attached *Master Plan* (Figure 2; Attachments A and B) will satisfactorily protect threatened biota recorded on the subject land.

#### Factor (a) Threatened Species – Risk of Extinction

It is not likely that those parts of the Glenmore Park Stage 3 land at Mulgoa which are proposed for development purposes would support or be crucial to the survival of a "*viable local population*" of any "*threatened species*" known from the general locality or which could potentially be present.

No threatened flora species have been recorded on or are likely to occur on those parts of the subject land to be developed for residential purposes – given the long history of significant modification, degradation, agriculture and weed infestation.

The only threatened fauna which would be likely to occur on (or over) the development footprint on the subject land (generally as depicted in the attached Glenmore Park Stage 3 *Master Plan* – Figure 2; Attachments A and B) are highly mobile and wide-ranging and are generally urban-tolerant species – some microchiropteran bats, individuals of a few threatened bird species and possibly the Grey-headed Flying Fox. The Cumberland Plain Land Snail has been recorded on the subject land (Abel Ecology 2018); in three patches of relatively more intact CPW (in the northwestern parts of the land). These patches are all in areas to be set aside in the *Master Plan* as reserves (Figure 2; Attachments A and B).

It is not considered likely that a "*viable local population*" of any "*threatened species*" would be dependent on the resources present within the proposed Glenmore Park Stage 3 development footprint for its survival in this general location (see discussion in Chapter 5); and occurrences of most threatened species within or above the development footprint would predominantly be transitory and infrequent.

Given the considerations discussed above, it is **not** "*likely*" that a "*viable local population*" of any "*threatened species*" would be "*placed at risk of* ***extinction***" (emphasis added) by the proposed future residential subdivision and development of the Glenmore Park Stage 3 land at Mulgoa - generally in accordance with the attached *Master Plan* (Attachment A) and the Draft CPCP.

**Factor (b) Threatened Ecological Communities – Risk of Extinction**

As discussed above (in Chapter 4.1), the subject land at Mulgoa contains patches of disturbed vegetation that do or may conform to two "*threatened ecological communities*" listed in the BCon Act. The TECs[8] listed in the BCon Act that are or might be present on the subject land at Mulgoa are the 'Cumberland Plain Woodland' (CPW) TEC and the 'River-flat Eucalypt Forest on Coastal Floodplains' (REFCF) TEC.

As discussed in detail in Chapters 4 and 5.1.3 of this ERIAR, most of the patches of CPW have a groundcover layer which is dominated by introduced species and many patches may not constitute CPW. Nevertheless, for the purposes of addressing Section 7.3 of the BCon Act[9], the areas of vegetation with a CPW canopy are regarded (without concession) as the relevant TEC.

As also noted in Chapters 4 and 5.1.3, narrow patches of REFCF are or may be present along a few small stretches of the watercourses through the land; although these are also highly degraded) and weed-infested.

The relevant considerations in Factor (b) of Section 7.3(1) of the BCon Act are whether the "*proposed development or activity*" is likely to adversely affect the "*extent*" or the "*composition*" of the TEC "*such that its local occurrence is likely to be placed* ***at risk of extinction***" (emphasis added).

Both of the relevant TECs have a scattered and patchy distribution throughout the Glenmore Park Stage 3 land at Mulgoa; but there are substantial areas of those TECs on the adjoining lands to the northwest (the Mulgoa Nature Reserve) and on Wallaroo (further to the west).

Most of the areas of CPW and REFCF on the subject land, particularly those patches that are more intact, larger and/or less degraded, will be retained and rehabilitated. In addition, the proposed development of

8 As listed in the NSW BCon Act (formerly in the TSC Act) and in the EPBC Act.

9 Noting that a *Planning Proposal* is not subject to the assessment requirements of a *Development Application* pursuant to the EP&A Act.

the subject land will significantly increase the connectedness of retained TECs throughout the subject land and enhance their connections to the adjoining Mulgoa Nature Reserve.

Given those circumstances, the "*local occurrences*" of either or both TECS will not be "*placed **at risk of extinction***". Both TECs will remain viable on both the subject land and in the immediate vicinity.

**Factor (c) Impacts on Habitat for Threatened Biota**

As discussed in detail above (Chapter 4), the Glenmore Park Stage 3 land at Mulgoa is predominantly modified and degraded; and the remaining native vegetation contains only limited habitat for native (including threatened) biota. Most of the trees present are young regrowth; and there are only a small number of hollow-bearings present.

Further, the groundcover throughout most of the Glenmore Park Stage 3 land is dominated by introduced weeds and pasture grasses; with only small areas containing significant native grasses or forbs. There are only small areas of fringing vegetation around a few of the farm dams; and the watercourses are mostly heavily degraded.

Given the circumstances of the Glenmore Park Stage 3 land at Mulgoa, the following considerations apply to "*the action proposed*" (see footnote 10 above – noting that the *Planning Proposal* does not *per se* constitute an "*action*") with respect to Factor (c) of Section 7.3(1) of the BCon Act.

- The "*extent*" of habitat for any potential threatened biota that is to be "*removed or modified*" from the Glenmore Park Stage 3 land at Mulgoa (*ie* that within the *Master Plan* footprint) is not regarded as significant for those threatened species known or likely to occur – given its condition and circumstances; and given the extent of habitat and resources to be retailed on the land and in the vicinity and locality.

  No threatened biota are likely to be dependent on the vegetation, habitats or resources located within the Glenmore Park Stage 3 *Master Plan* development footprint on the subject land at Mulgoa (*ie* habitat that is to be "*removed or modified*") for their survival either in the vicinity or locality.

  The extent of habitat to be "*removed or modified*" by the proposed future residential development of the subject land at Mulgoa is limited - Factor (c)(i).

- The proposed future Glenmore Park Stage 3 residential subdivision and development of the subject land at Mulgoa is not likely to result in any relevant habitat for any threatened biota becoming "*fragmented or isolated from other areas of habitat*" – Factor (c)(ii), given that the project will provide new and additional rehabilitated vegetation links through the subject land

- The vegetation within the Glenmore Park Stage 3 *Master Plan* development footprint on the subject land at Mulgoa is not likely to be of importance with respect to "*the long-term survival*" of any of the potential threatened biota known or likely to occur "*in the locality*" – Factor (c)(iii), given the matters discussed above.

**Factor (d) Impacts on Areas of Outstanding Biodiversity Value**

The proposed development of the Glenmore Park Stage 3 land at Mulgoa will not involve any impacts (direct or indirect) on any "*declared area of outstanding biodiversity value*" listed in the BCon Act.

**Factor (e) Key Threatening Processes**

The proposed future residential development of the Glenmore Park Stage 3 land at Mulgoa (generally as per the *Planning Proposal* for the project) will involve the imposition of several "*key threatening processes*" (KTPs) listed in the BCon Act – including 'the clearing of native vegetation', the 'loss of hollow-bearing trees' and the 'loss of dead wood and dead trees'.

However, it is important to note that the Glenmore Park Stage 3 project has been designed, modified and refined through an iterative process over several years - which has included consideration of the *Draft Cumberland Plain Conservation Plan* (CPCP) and has incorporated the desired outcomes of the Draft CPCP into the current design.

Further, it is noted that the removal of vegetation for the future residential subdivision and development of the subject land is not considered likely to place any threatened biota "*at risk of* ***extinction***" (as discussed above) – particularly given the retention and future rehabilitation of vegetation on the subject land.

## 7.4 Conclusions

The proposed future development of the Glenmore Park Stage 3 land at Mulgoa, generally in accordance with the *Planning Proposal* for the project (Figure 2; Attachments A and B) and consistent with the Draft CPCP, is not "*likely*" to impose a "*significant effect*" upon any "*threatened species or ecological communities, or their habitats*" - pursuant to Section 7.3(1) of the BCon Act.

However, as discussed above, the proposal will involve an exceedance of "*the biodiversity offsets scheme threshold*" at some locations - pursuant to Section 7.2(1)(b) of the BCon Act - and some of the future *Development Applications* for the Glenmore Park Stage 3 project would therefore require the preparation of a BDAR.

It is noted, however, that these considerations would be resolved in the circumstance that the Draft CPCP is adopted. In that instance, the impacts on the natural environment in general and threatened biota in particular would have been appropriately addressed, and there would be no further requirements for further ecological assessments pursuant to the BCon Act. And there would be no requirement for a BDAR for any DA.

## 8 ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT

### 8.1 Statutory Considerations

The *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) requires consideration of the potential for a "*significant impact*" to be imposed by an activity on a *Matter of National Environmental Significance* (MNES).

In the event that such an "*impact*" is "*likely*" to be imposed, the activity proposed must be referred to the Commonwealth for determination as to whether it constitutes a "*controlled action*". Where a development activity does constitute a "*controlled action*", an approval from the Commonwealth Minister of the Environment is required.

The proposed subdivision and future residential development of the Glenmore Park Stage 3 land at Mulgoa in accordance with the *Planning Proposal* and generally in accordance with the attached *Master Plan* (Figure 2; Attachments A and B) could not possibly affect any MNES other than (theoretically):

- listed threatened species and ecological communities
- migratory species

### 8.2 Threatened Biota

*Threatened Species*

No threatened flora species listed in the EPBC Act have been recorded on or are likely to occur within the Glenmore Park Stage 3 *Master Plan* development footprint on the subject land at Mulgoa (FDF *pers obs*; AEP 2018; Abel Ecology 2019). It is not "*likely*" that the proposed future development of the subject land at Mulgoa (generally in accordance with the *Planning Proposal* for the project – Figure 2; Attachments A and B A) would impose a "*significant impact*" on any such species.

As discussed in Chapter 5.2, the only threatened fauna species (listed in the EPBC Act) likely to occur on the subject land would be highly mobile species – birds and bats (such as occasional individuals of the Regent Honeyeater, Swift Parrot, Large-eared Pied Bat and Grey-headed Flying Fox). It is not "*likely*" that the proposed future development of the Glenmore Park Stage 3 land at Mulgoa (generally in accordance with the *Planning Proposal* for the project – Figure 2; Attachments A and B) would impose a "*significant impact*" on any such species.

*Threatened Ecological Communities*

The TECs listed in the EPBC Act that are or might be present within the subject land at Mulgoa are the 'Cumberland Plain Woodlands'[10] (CPW) TEC and the REFCF TEC.

However, most of the areas of woodland on the subject land at Mulgoa with a CPW canopy are too degraded to satisfy the criteria in the EPBC Act for the TEC; as the groundcover layer is significantly less than 30% native species. Most of the vegetation which could constitute the REFCF community is

10 The EPBC Act listed community is actually 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest'.

confined to narrow strips along one or a few small lengths of the watercourses is highly modified and degraded.

The proposed future development of the Glenmore Park Stage 3 land at Mulgoa (generally in accordance with the *Planning Proposal* for the project and the Draft CPCP) will involve substantial rehabilitation and regeneration of CPW and REFCF vegetation. The proposed future development of the subject land at Mulgoa (Figure 2; Attachments A and B) is not considered "*likely*" to impose a "*significant impact*" upon any TECs listed in the EPBC Act.

### 8.3 Migratory Species

The Glenmore Park Stage 3 land at Mulgoa contains no special habitat and/or resources for any migratory fauna listed in the EPBC Act. The only alleged 'migratory' species which could even conceivably occur on the subject land are highly mobile, wide-ranging and cosmopolitan (see discussion in Chapter 5.2).

The proposed future development of the Glenmore Park Stage 3 land at Mulgoa, generally in accordance with the *Planning Proposal* for the project and the Draft CPCP (Figure 2; Attachments A and B), is not considered "*likely*" to impose a "*significant impact*" upon any migratory species listed in the EPBC Act.

### 8.4 Conclusions

The proposed future development of the Glenmore Park Stage 3 land at Mulgoa, generally in accordance with the *Planning Proposal* for the project and the Draft CPCP (Figure 2; Attachments A and B), is not considered "*likely*" to impose a "*significant impact*" upon any threatened or migratory biota listed in the EPBC Act; or on any other MNES.

There is no requirement for a future *Development Application* for residential development on the Glenmore Park Stage 3 land at Mulgoa to be the subject of a '*Referral*' to the Commonwealth for approval.

## 9 PENRITH LOCAL ENVIRONMENTAL PLAN 2010

The *Penrith Local Environmental Plan 2010* (PLEP 2010) includes the mapping of 'Natural Resources Sensitive Land'; *inter alia* including the subject land at Mulgoa. It is noted that Lot 17 in DP 244610 on Chain o Ponds Road is no longer part of the Glenmore Pak Stage 3 *Planning Proposal*; and there is no 'Natural Resources Sensitivities Land' on the subject land.

There are no other provisions of PLEP 2010 relating to ecological or riparian matters that apply to the subject land in a manner which would constrain development of the land generally in accordance with the *Planning Proposal* for the project and the Draft CPCP (Figure 2; Attachments A and B).

## 10 RIPARIAN CONSIDERATIONS

### 10.1 Introduction

It is to be noted at the outset that the *Water Management Act 2000* (WM Act) is only of relevance to a *Planning Proposal* (PP) with respect to developing the design and to determining appropriate environmental outcomes and solutions regarding watercourses and waterbodies (including existing dams). As there is no 'activity' actually proposed in a PP, further practical application of the WM Act and its *Regulation* and provisions will occur at the stage of individual DAs for actual development of the Glenmore Pak Stage 3 land.

The undersigned has undertaken initial assessments of many of the watercourses on the subject land – including with respect to the presence (or otherwise) of "*waterfront land*" and the ecological values of various of the watercourses present (see below).

This ERIAR considers the issues associated with the WM Act on the basis of the current *Planning Proposal* and *Master Plan* (Figure 2; Attachments A and B). It is highly pertinent to note that the Glenmore Pak Stage 3 project has been amended through an extensive iterative process to be consistent with the *Draft Cumberland Plain Conservation Plan* (CPCP) - which *inter alia* seeks to protect the most relevant watercourses.

### 10.2 Application of the Act

The *Water Management Act 2000* (WM Act) and the *Water Management (General) Regulation 2018* (the '*Regulation*') provide the relevant definitions and mechanisms for implementation of the Act. The Act, relevantly for the Glenmore Pak Stage 3 land at Mulgoa, provides definitions for the terms "*river*", "*lake*" and "*waterfront land*".

The *Regulation* also *inter alia* identifies the Hydroline[11] mapping and the Strahler system of stream classification. It is to be noted that the Hydroline mapping is not mandated by any Section of the Act or by any Clause of the Regulation; but it is identified in the NSW Department of Industry's '*Determining Stream Order Fact Sheet*' as the basis for determining stream orders.

The defining element of the WM Act and of the *Regulation* (with respect to planning and development) is "*waterfront land*".

This is because the requirement for a *Controlled Activity Approval* (CAA) pursuant to the WM Act is determined by the undertaking of a relevant "*activity*" (as defined in the *Dictionary* in the Act) "*in, on or under waterfront land*" pursuant to Section 91(2) of the WM Act (see definition and discussion below). Activities on "*waterfront land*" (*ie* within 40m of the "*highest bank*" of a "*river*") require a *Controlled Activity Approval* (CAA) from the NRAR pursuant to Section 91(2) of the WM Act.

In other words, a CAA is **only** required when a proposal proposes to undertake "*a specified controlled activity at a specified location in, on or under waterfront land*" – Section 91(2).

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[11] The *Water Management (General) Regulation 2018 Hydro Line Spatial Data* dataset of mapped watercourses and waterbodies in NSW. It is based on the Spatial Services (Department of Finance, Services & Innovation) NSW Hydro Line dataset. It is to be noted that the Hydroline mapping is not accurate or reliable; and has in most locations not been ground-truthed.

The correct identification of "*waterfront land*" is therefore critical to the decision-making process (noting that the NRAR *Guidelines* identify the 'recommended', not 'required', widths of Riparian Zones for the different Stream Orders on the land). Because absent "*waterfront land*" on a particular site, there is no 'trigger' for implementation of the WM Act.

The NRAR has provided the following documents.

- The Strahler (1957) System for the stratification of watercourses.
- The Hydroline mapping system for watercourses in NSW.
- A set of "*Guidelines for Controlled Activities on Waterfront Land"* (2018).

### 10.3 Watercourses on the Subject Land

The Glenmore Park Stage 3 site at Mulgoa contains an array of watercourses of various sizes (Figure 10). However, most of the watercourses present are very small or are just shallow swales; and all are ephemeral.

There are two watercourses of moderate size that traverse the Glenmore Park Stage 3 site. It is to be noted that even these watercourses are ephemeral and have been substantially modified and degraded; and support only limited areas of riparian vegetation (see Photographic Essay in Attachment D).

Even in their natural state, however, these watercourses would have supported only very narrow strips of riparian vegetation – because of the topography of the land. Watercourses in these parts of the Cumberland Plain would naturally have been fringed by sedges and reeds in places, with a narrow strip of riparian vegetation only a few metres wide; giving way to xeric woodland (in many instances within less than 5 metres of the stream).

Most of the mapped watercourses on the Glenmore Park Stage 3 site (see Figure 10) are 1$^{st}$ order watercourses (according to Hydroline). However, many (most) of these mapped 1$^{st}$ order 'watercourses' (or at least parts of them) are not "*rivers*" (as defined in the WM Act) – as they are devoid of any "*bed or banks*".

As a consequence of that circumstance, most of those 'watercourses' (subject to subsequent detailed site analysis at the DA stage) do not contain any "*waterfront land*". They therefore do not require any riparian setbacks; and will not require approval from the NRAR.

It is also relevant to note that such watercourses can, and regularly are, removed or piped for the purposes of residential and urban development throughout Sydney; often in association with the rehabilitation and enhancement of larger and more valuable watercourses - as is proposed in the Glenmore Park Stage 3 project (Figure 2; Attachments A and B).

### 10.4 Outcomes

The two main watercourses traversing the Glenmore Park Stage 3 site, in the main, are to be retained within the open space areas, and are to be rehabilitated – leading to substantially better environmental outcomes than present (see Figure 2; Attachments A and B). The extensive areas of weeds and agricultural or horticultural lands along those two watercourses are to be cleared and regenerated – primarily as passive open space and/or as *Environmental Protection Zones*.

These would be the subject of further detailed survey, and riparian buffers, setbacks and management regimes – which would be determined pursuant to a consultative process with the relevant authorities at the time of more detailed development design; and for the lodgement of any future *Development Applications* (DAs).

It is anticipated that all retained and/or rehabilitated/recreated riparian areas would be subject to detailed *Vegetation Management Plans* (VMPs) - for their long-term maintenance, enhancement (where necessary) and management in the long-term.

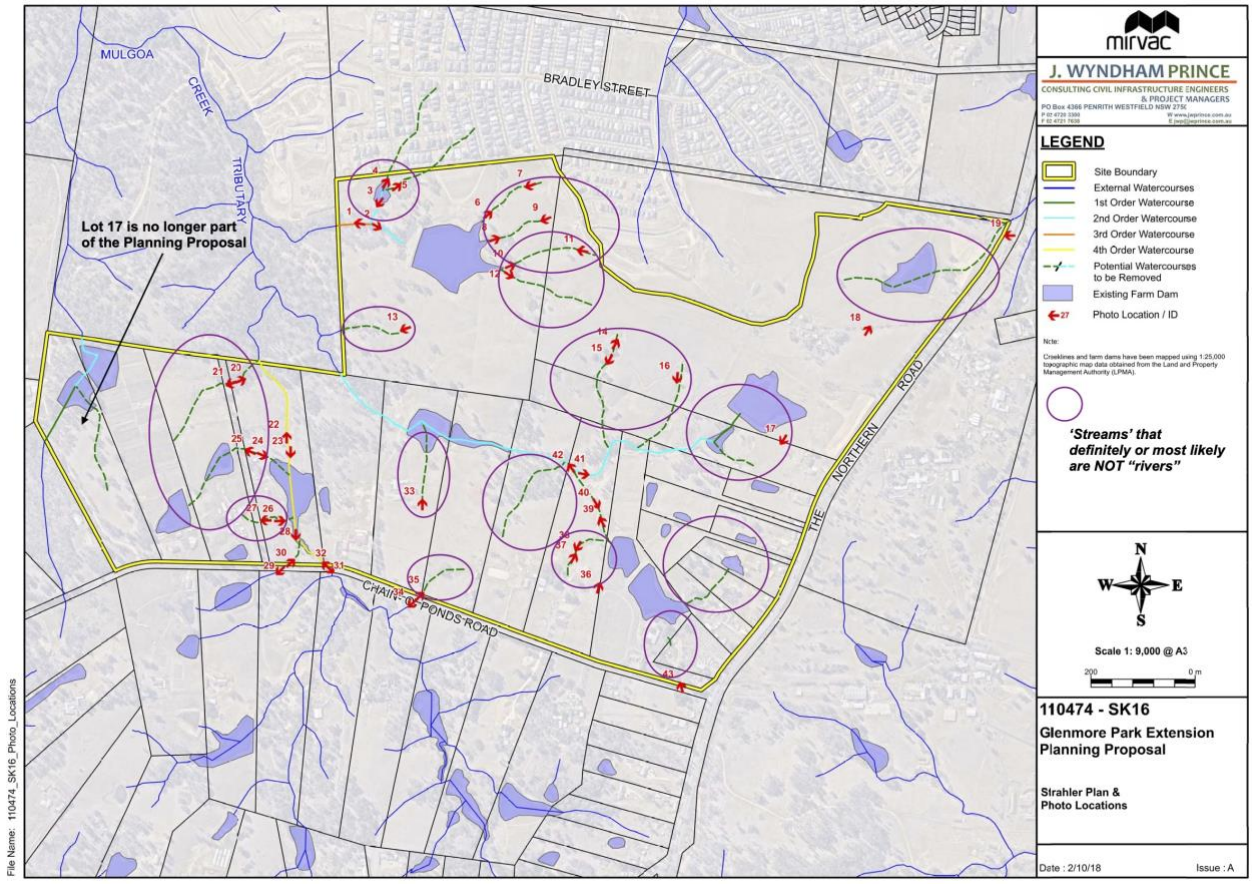



Figure 10 Preliminary stream analysis by JWP; with additional annotation by the author of this ERIAR

## 11 POTENTIAL ECOLOGICAL IMPACTS

The *Planning Proposal* for the Glenmore Park Stage 3 site at Mulgoa (see Chapter 1 of this EIAR and the *Master Plan* – Figure 2; Attachments A and B) is for the rezoning of the subject land in order to facilitate future residential development of the land, as well as the provision of open space (active and passive), and the achievement of biodiversity and environmental protection and management outcomes.

The future development of the Glenmore Park Stage 3 site at Mulgoa would undoubtedly involve the imposition of some (generally minimal) adverse impacts upon some of the native (albeit modified and/or degraded) vegetation and some native fauna on the site – given the need to remove some patches or parts of patches of vegetation and habitats for development of the site. This might include the imposition of some minor and insignificant adverse impacts upon a number of threatened species (dependent on the final development concepts and designs) and habitat and resources for some native fauna and flora.

Whilst such impacts are inevitable, the information provided in this ERIAR indicates that development of the Glenmore Park Stage 3 site at Mulgoa pursuant to the *Master Plan* (Figure 2; Attachments A and B) would not be of significance for any threatened biota or the natural environment (including all native flora and fauna) in general.

Notwithstanding the considerations identified above with respect to threatened biota, it is not considered "*likely*" that the development of the Glenmore Park Stage 3 site would impose a "*significant effect*" or a "*significant impact*" on any threatened or migratory biota (pursuant to Section 7.3 of the BCon Act or the criteria of the EPBC Act) because of the following considerations.

- The modified, disturbed and/or degraded condition of most of the vegetation and habitats present on the Glenmore Park Stage 3 site at Mulgoa. As noted by Abel Ecology (2018), the subject land "*has very little ecological integrity due a history of grazing and market gardens*".
- The isolated circumstances (by areas of agricultural activities) and relatively small size of most of the patches of vegetation on the Glenmore Park Stage 3 site at Mulgoa.
- The limited habitats or resources that would need to be removed for the proposed development of the Glenmore Park Stage 3 site at Mulgoa - in accordance with the *Master Plan* for this PP (Figure 2; Attachments A and B).
- The opportunities presented and embraced by the proposed concept design for the Glenmore Park Stage 3 site at Mulgoa for the conservation and enhancement of biodiversity on the subject lands.

Indeed, the proposed development of the Glenmore Park Stage 3 site, pursuant to the current *Master Plan* (Figure 2; Attachments A and B), would result in a nett environmental improvement over current circumstances on the site. The proposed development provides for the retention of most of the native (degraded) woodland present on the site within open space areas, and also provides for their rehabilitation and enhancement. Importantly, the Glenmore Park Stage 3 project is consistent with the desired outcomes of the *Draft Cumberland Plain Conservation Plan* (Draft CPCP).

Nevertheless, the Glenmore Park Stage 3 project would result in an exceedance of "*the biodiversity offsets scheme threshold*" - pursuant to Section 7.2(1)(b) of the BCon Act.

In the event that the Draft CPCP is not adopted and enacted (and the '*urban capable land*' is therefore not '*certified*'), future DAs for development of the land would be the subject of a *Biodiversity Assessment Method* (BAM) analysis pursuant to the BCon Act and (in some instances at least) would require the

preparation of a BDAR. Alternatively, again assuming that the Draft CPCP is not approved and enacted prior to approval of the Glenmore Park Stage 3 project, a BDAR for the whole project could be generated.

There will be opportunities for the protection and enhancement of elements of the natural environment on the Glenmore Park Stage 3 site at Mulgoa (see Chapter 7), and any residual impacts would be offset according to the statutory processes of the NSW BCon Act and the Commonwealth EPBC Act.
All of these matters would be subject to the appropriate merit-based impact assessment procedures and considerations, pursuant to the relevant statutory regimes, at the relevant juncture.

Any development of the Glenmore Park Stage 3 site at Mulgoa would need to satisfy the principles of the OEH policy that development proposals in NSW should approach the issue of potential impacts on biota and ecosystems on the following basis.

- First – Avoidance. Seek to avoid the imposition of adverse impacts
- Second – Mitigation. If adverse impacts are unavoidable, implement measures to mitigate or reduce any remaining impacts
- Third – Offset. Where there are remaining impacts, adopt mechanisms to offset those impacts.

The current Glenmore Park Stage 3 project (Figure 2; Attachments A and B) has been the subject of an extensive and intensive iterative design process involving consultation with relevant agencies and authorities – which has sought to avoid the impacts of development on important elements of the natural environment to the greatest extent reasonably practicable. It is, as noted above, consistent with the desired outcomes of the *Draft Cumberland Plain Conservation Plan* (Draft CPCP), ensuring that the future Glenmore Park Stage 3 development footprint is located generally or predominantly outside of the 'avoided land' area identified in the Draft CPCP.

Development of some of the Glenmore Park Stage 3 site would also be subject to consideration pursuant to the Commonwealth *Environment Protection & Biodiversity Conservation Act 2017* (EPBC Act); and the implementation of appropriate impact avoidance and/or amelioration measures (as determined potentially pursuant to a *Referral* to the Commonwealth).

As discussed below, impacts on riparian areas are unlikely to be of particular concern – because most of the important watercourses and several of the dams on the Glenmore Park Stage 3 site at Mulgoa would be retained and modified or enhanced. The smaller 'watercourses' proposed to be removed are either not "*rivers*" according to the *Water Management Act 2000* (WM Act) and therefore are not protected (see Chapter 10) or are so highly modified and degraded as to not warrant retention. It is noted that many of the farm dams are not "*lakes*" pursuant to the WM Act.

The proposed development of the Glenmore Park Stage 3 land at Mulgoa pursuant to the identified *Master Plan* concept design (Figure 2; Attachments A and B) would result in a nett environmental improvement over current circumstances on the site.

## 12 IMPACT AMELIORATION and ENVIRONMENTAL OUTCOMES

As discussed above in Chapter 5, the future development of the Glenmore Park Stage 3 site at Mulgoa would undoubtedly involve the imposition of some (generally minor) adverse impacts upon some of the native (albeit modified and/or degraded) vegetation and some native fauna on the subject land - given the need to remove some patches or parts of patches of vegetation and habitats for development of the site.

There are, however, opportunities to avoid and/or minimise environmental impacts by the proposal; and opportunities to achieve positive environmental outcomes from the project.

At the outset, it is important to note that all of the native vegetation on the Glenmore Park Stage 3 site is modified and moderately to seriously degraded; and the long-term prognosis for the woodland vegetation under the current land uses is not good. There are no prospects under the current land use regime for the rehabilitation or enhancement of any of the patches of woodland on the subject land.

The Glenmore Park Stage 3 project, as depicted in the *Master Plan* (Figure 2; Attachments A and B) has, in the first instance, been designed to retain most of the better quality woodland vegetation in open space areas through the project (see Figure 11 below; Attachment A). It is also consistent with the desired outcomes of the *Draft Cumberland Plain Conservation Plan* (Draft CPCP).

This circumstance provides the opportunity for the implementation of intensive rehabilitation and enhancement measures - which will result in a significant environmental benefit from the project; which would not otherwise be likely to occur.

Furthermore, the woodland patches currently are mostly isolated by surrounding agricultural and horticultural activities or are only connected by tenuous links to the larger areas of woodland to the northwest. The Glenmore Park Stage 3 project provides the opportunity to link several of these isolated patches of woodland to other woodland habitat, through the open space areas on the subject land.

Whilst some of the open space is designated for active recreation purposes (see *Master Plan* - Figure 2; Attachments A and B), there are substantial areas identified as passive open space. These will be used in part to regenerate woodland and other habitats for native biota; with the only disturbances being pedestrian/bicycle paths and occasional benches.

It is anticipated that many of the areas of passive open space will be rehabilitated and managed in accordance with a detailed *Vegetation Management Plan* (VMP) – which will direct the weed removal, vegetation rehabilitation and enhancement, and habitat re-creation (in the many areas now devoid of native vegetation). This approach will substantially enhance and increase the quantum of native vegetation on the Glenmore Park Stage 3 site; and ensure its appropriate management in the long-term.

All plantings within the passive open space areas will be of plants native to the locality – in particular those typical of CPW woodland and riparian vegetation typical of western Sydney.

The Glenmore Park Stage 3 project will also adopt a ‘no nett loss of tree-hollows’ policy; through implementation of a ‘Tree-Hollow Protocol’ which involves the following actions.

- The salvage of individual tree-hollows and/or hollow-bearing trees prior to clearing activities for the project.
- The re-deployment of individual tree-hollows and/or hollow-bearing trees into areas to be retained – with tree-hollows wired and bolted into larger trees in retained patches of

woodland and intact hollow-bearing trees relocated adjacent to such patches.

- The installation of additional nest-boxes – to replace any tree-hollows that cannot be salvaged and to supplement the small number of tree-hollows on the Glenmore Park Stage 3 site.

This approach will result in a substantial nett increase in resources for hollow-dependent fauna within the Glenmore Park Stage 3 site.

In addition to the activities and environmental outcomes outlined above, development of the Glenmore Park Stage 3 site would implement all of the appropriate environmental management and protection measures that are standard 'best practice' in NSW. Measures to maintain or improve water quality, protect retained vegetation and trees, prevent erosion and sediment discharges, and to avoid any discharges of pollutants into the natural environment would be implemented throughout the development of the Glenmore Park Stage 3 site.

On the basis of all of the measures identified above, the Glenmore Park Stage 3 project will result in a nett environmental benefit at this location; and has avoided the imposition of significant adverse impacts on the natural environment. As noted, it is also consistent with the desired outcomes of the *Draft Cumberland Plain Conservation Plan* (Draft CPCP) – with the future Glenmore Park Stage 3 development footprint being predominantly located within the boundaries of the 'urban capable land' and outside of the 'avoided land' areas (with very minor exemptions).

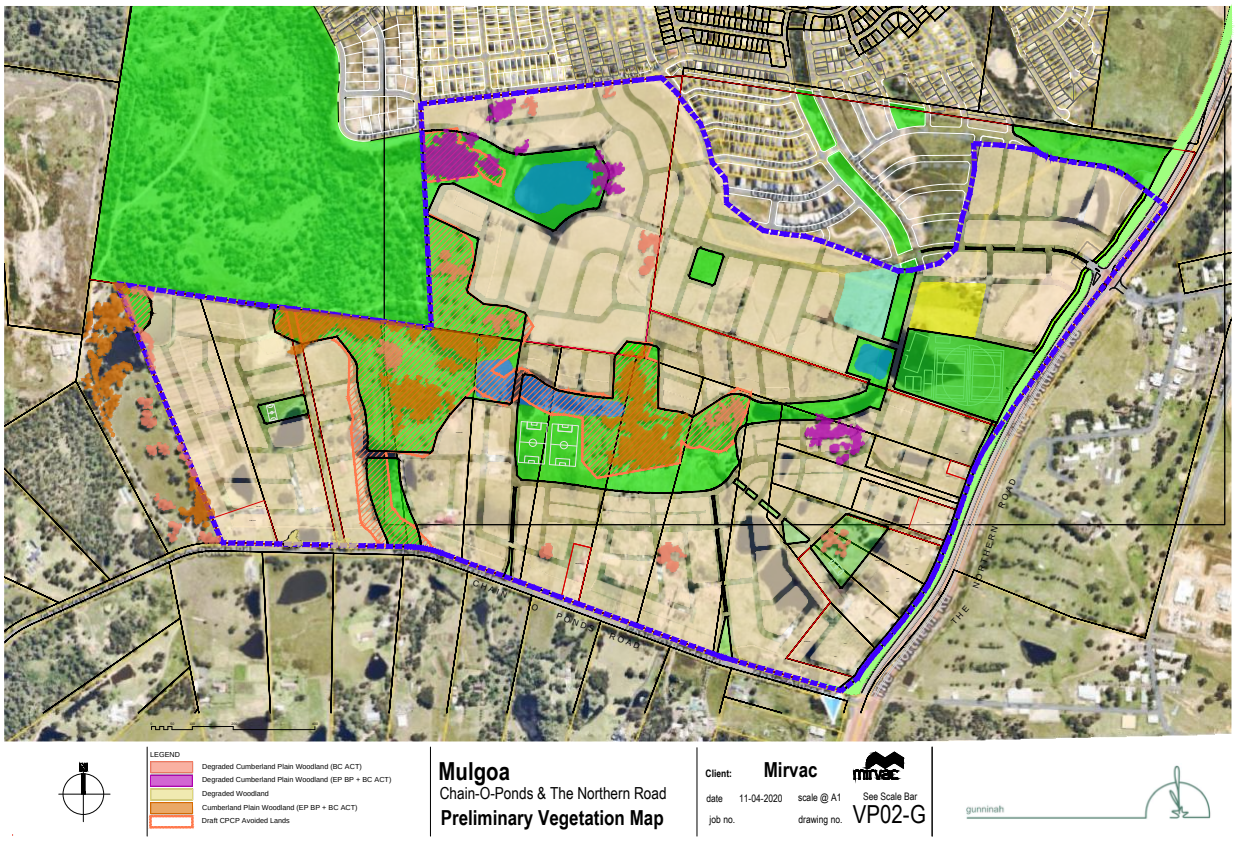



Figure 11 Overlay of the current *Master Plan* on the vegetation of the subject land at Mulgoa

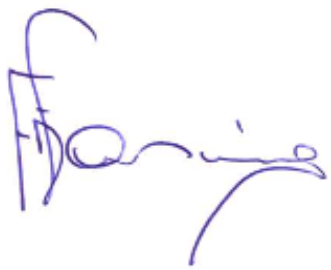
## 13 CONCLUSIONS

There are no ecological or riparian impediments to approval of the *Planning Proposal* for the Glenmore Park Stage 3 site at Mulgoa generally pursuant to the current *Master Plan* (Figure 2).

The proposed rezoning of the Glenmore Park Stage 3 site at Mulgoa has aimed to optimise both residential outcomes and the achievement of meaningful biodiversity conservation. Indeed, the proposal will result in a nett environmental improvement over current circumstances on the Glenmore Park Stage 3 site. It is important to note that the current *Master Plan* (Figure 2; Attachments A and B) is consistent with the desired outcomes of the *Draft Cumberland Plain Conservation Plan* (Draft CPCP) – which identifies both '*urban capable land*' (for urban development purposes) and '*avoided land*' (to be retained for open space and conservation purposes).

In this regard, the following considerations are pertinent.

- The likely presence of an array of threatened biota have been considered in the *Planning Proposal*; and will be a key factor in the finalisation of detailed development designs and *Development Applications*.
- No threatened biota are likely to be threatened with local extinction as a result of the proposed development of the Glenmore Park Stage 3 site at Mulgoa.
- There are significant areas within the Glenmore Park Stage 3 site at Mulgoa to be retained for the conservation of native biota (notably in the extensive areas of open space and conservation lands); and the proposal will result in the enhancement of native vegetation and habitats within the Glenmore Park Stage 3 site.
- There are significant similar habitats and resources for these species in the immediate vicinity, general locality and region; including in the substantial conservation reserves present.
- In the unlikely event that the CPCP is not adopted (and the project is not biodiversity certified), detailed surveys for all such species would be undertaken to inform any future DAs for residential or other development within the Glenmore Park Stage 3 site at Mulgoa.
- All areas of retained vegetation and all retained riparian areas would be subject to detailed *Vegetation Management Plans* (VMPs) for their maintenance, enhancement (where necessary) and management in the long-term



**F Dominic Fanning**
**Gunninah**

**GLOSSARY**

| | |
|---|---|
| BCon Act | *Biodiversity Conservation Act 2016* (NSW) |
| Biota | "*Biota*" means the animals and plants, and other organisms, of a geographic region or locality |
| CEEC | A "*critically endangered ecological community*" listed in the BCon Act and/or in the EPBC Act |
| CPCP | *Cumberland Plain Conservation Plan* |
| CPW | *Cumberland Plain Woodland* – as defined in the BCon Act and in the EPBC Act |
| Critical Habitat | Any "*habitat declared to be critical habitat*" pursuant to Part 3 of the TSC Act or Division 3 of Part 7A of the *Fisheries Management Act 1994* |
| DA | *Development Application* - prepared pursuant to the EP&A Act |
| DCP | *Development Control Plan* |
| DEC | Department of Environment & Conservation |
| DECC | Department of Environment & Climate Change |
| DECCW | Department of Environment, Climate Change & Water |
| DPI Water | Department of Primary Industries – Water (NSW) |
| EEC | An "*endangered ecological community*" listed in the BCon Act or EPBC Act |
| Ecological Community | BCon Act - "*an assemblage of species occupying a particular place*" |
| Endangered Population | A "*population specified in Part 2 of Schedule 1*" of the BCon Act |
| EP&A Act | *Environmental Planning & Assessment Act 1979* (NSW) |
| EPBC Act | *Environment Protection & Biodiversity Conservation Act 1999* (Commonwealth) |
| KTP | Key Threatening Process - "*a threatening process specified in Schedule 3*" of the BCon Act |
| LEP | *Local Environmental Plan* |
| Locality | An area included within a 10km radius around the subject site |
| MNES | *Matters of National Environmental Significance* - as listed in the EPBC Act |
| NOW | NSW Office of Water (now relevantly DPI - Water) |
| NPWS | NSW National Parks & Wildlife Service |
| OEH | NSW Office of Environment & Heritage |
| Recovery Plan | A "*plan prepared and approved under*" Part 4 of the TSC Act and/or Division 5 of Part 7A of the *Fisheries Management Act* and/or pursuant to the EPBC Act and/or prepared pursuant to the EPBC Act |

| | |
|---|---|
| Region | A "*bioregion defined in a national system of bioregionalisation that is determined (by the Director-General by order published in the Gazette) to be appropriate for those purposes*" (BCon Act) |
| SIS | *Species Impact Statement* - prepared pursuant to Sections 109, 110 and 111 of the TSC Act |
| REFCF | River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Regions – as listed in the BCon Act |
| Subject Land | The Glenmore Park Stage 3 site at Mulgoa – which includes Lot 2 in DP 224861; Lots 17-19 and 25-31 in DP244610; Lots 1-6 and 8 in DP29081; Lots 2 and 3 in DP1224642; Lot 1 in DP1088989; Lot 1 in DP795841 |
| TEC | A "*threatened ecological community*" – as specified in Schedule 1 of the BCon Act and/or as listed in the EPBC Act |
| Threatening Process | A "*process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities*" (BCon Act) |
| Threatened Species | A "*species specified in Part 1 or 4 of Schedule 1 or in Schedule 2*" of the BCon Act and/or as listed in the EPBC Act |
| TSC Act | *Threatened Species Conservation Act 1995* (NSW) |

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# Glenmore Park Stage 3, Mulgoa
# Planning Proposal

## Ecological & Riparian Issues & Assessment Report

Attachment A
Glenmore Park Stage 3 Master Plan

F Dominic Fanning

April 2022


CHAIN O PONDS ROAD
THE NORTHERN ROAD

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# Glenmore Park Stage 3, Mulgoa
# Planning Proposal

## Ecological & Riparian Issues & Assessment Report

## Attachment B
## Other Relevant Aerial Photographs, Maps and Plans

F Dominic Fanning

April 2022


Lot 3/DP1224642
Lot 4/DP240361
Lot 18/DP244610
Lot 25/DP244610
Lot 19/DP244610
Lot 26/244610
Lot 28/244610
Lot 27/244610
Lot 3/DP1240361
Lot 2 / DP 29081
Lot 29/244610
Lot 1 / DP29081
Lot 3 / DP29081
Lot 30/244610
Lot 4 / DP29081
Lot 5 / DP 29081
Lot 6 / DP29081
Lot 1 / DP1088989
Lot 8 / DP29081
Lot 2/DP1240361
Lot 1/DP795841


James Riley Dr
Cashmere Rd
Galloway Rd
Gunyah Dr
Riverflat Dr
Corridale Rd
Hereford Ave
Pinewood Ave
Forestwood Dr
Lot 3/DP1224642
Vianello Holdings
Lot 701/ DP 1275647
Lot 18/DP244610
Lot 25/DP244610
Lot 26/244610
Lot 19/DP244610
Lot 27/244610
Lot 28/244610
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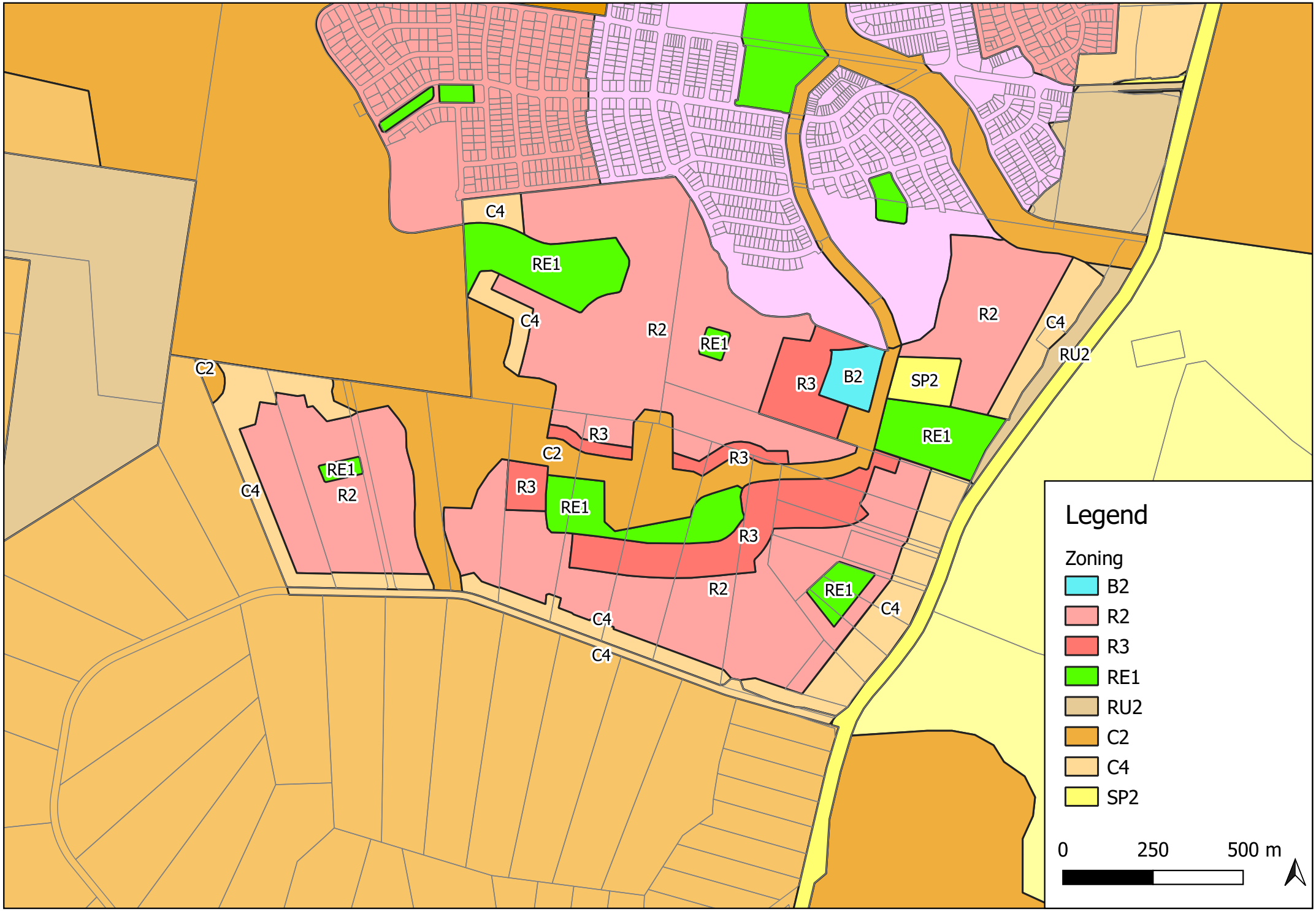
Lot 6 / DP209081
Lot 1 /DP1088989
Lot 8 /DP29081
Lot 30/244610
Lot 2/DP1240361
Lot 1/DP795841
Chain-O-Ponds Rd
The Northern Rd
A9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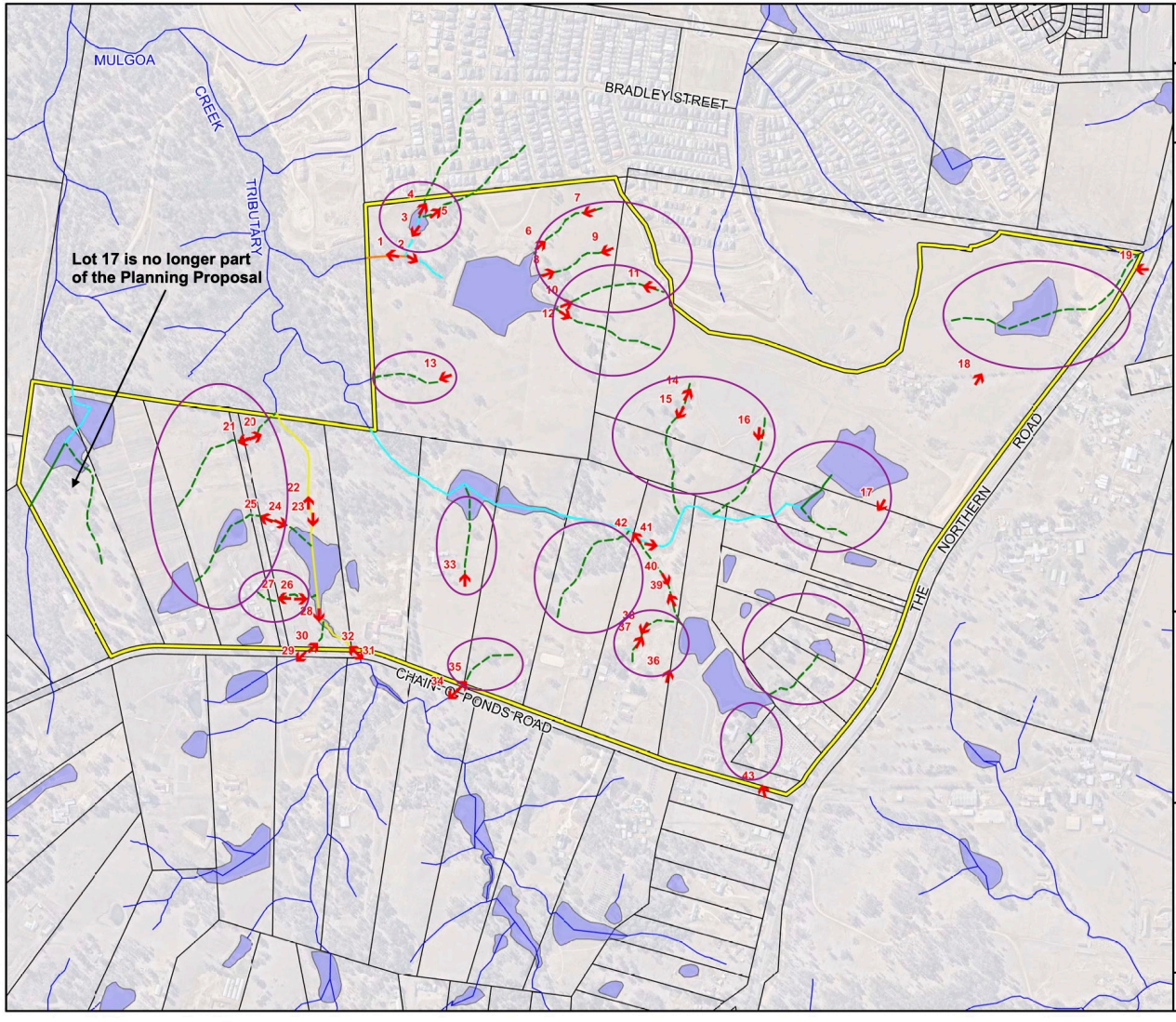


mirvac

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## LEGEND

- Site Boundary
- External Watercourses
- 1st Order Watercourse
- 2nd Order Watercourse
- 3rd Order Watercourse
- 4th Order Watercourse
- Potential Watercourses to be Removed
- Existing Farm Dam
- 27 Photo Location / ID

Note:

Creeklines and farm dams have been mapped using 1:25,000 topographic map data obtained from the Land and Property Management Authority (LPMA).

***'Streams' that definitely or most likely are NOT "rivers"***

N W E S

**Scale 1: 9,000 @ A3**

200 0 m

# 110474 - SK16

## Glenmore Park Extension Planning Proposal

**Strahler Plan & Photo Locations**

Date : 2/10/18 Issue : A

File Name: 110474_SK16_Photo_Locations

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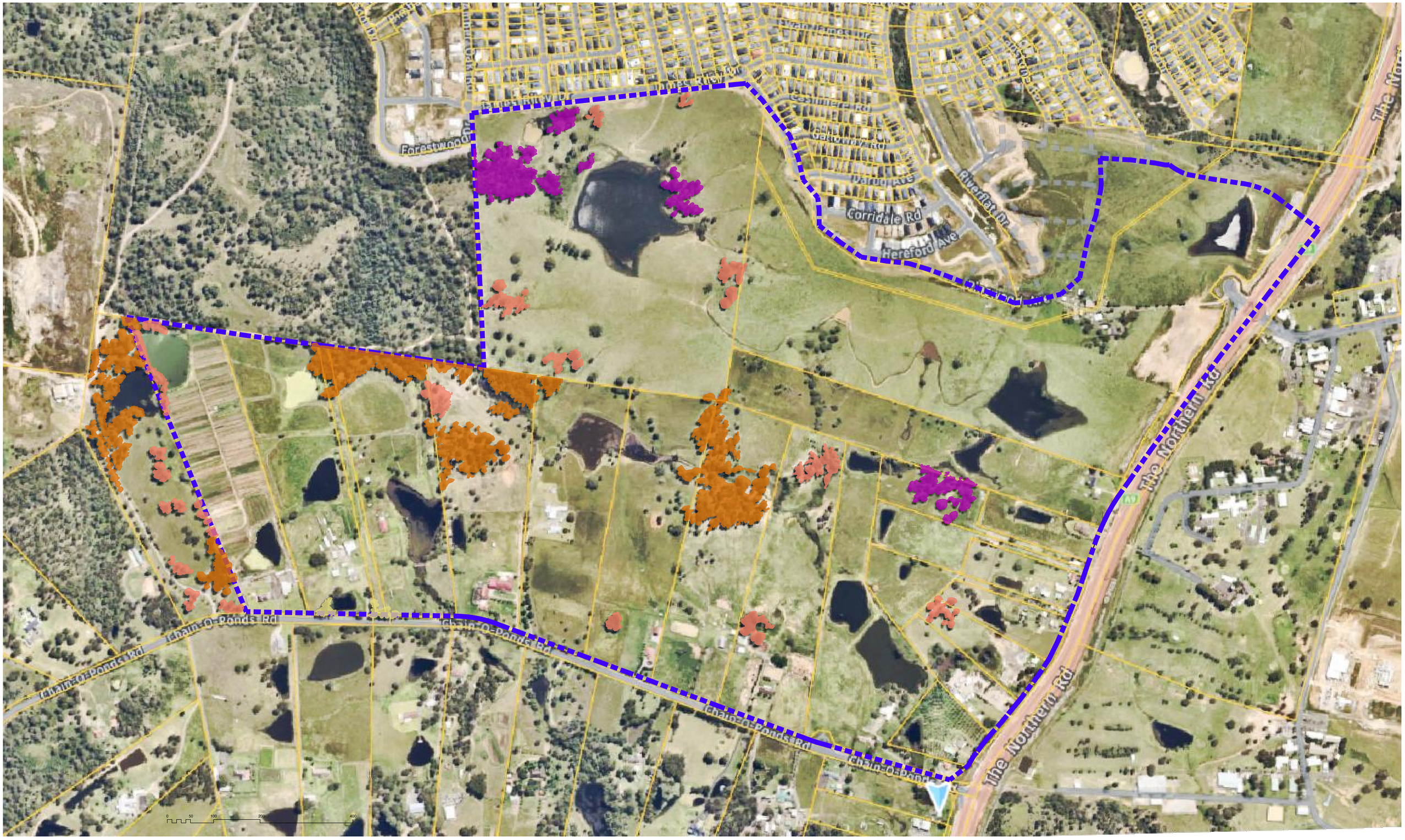
Glenmore Park Stage 3, Mulgoa
Planning Proposal

# Ecological & Riparian Issues & Assessment Report

Attachment C
Vegetation Mapping - Gunninah

F Dominic Fanning

April 2022




N

LEGEND

- Degraded Cumberland Plain Woodland (BC ACT)
- Degraded Cumberland Plain Woodland (EP BP + BC ACT)
- Degraded Woodland
- Cumberland Plain Woodland (EP BP + BC ACT)

architect: **Mulgoa**

Chain-O-Ponds & The Northern Road

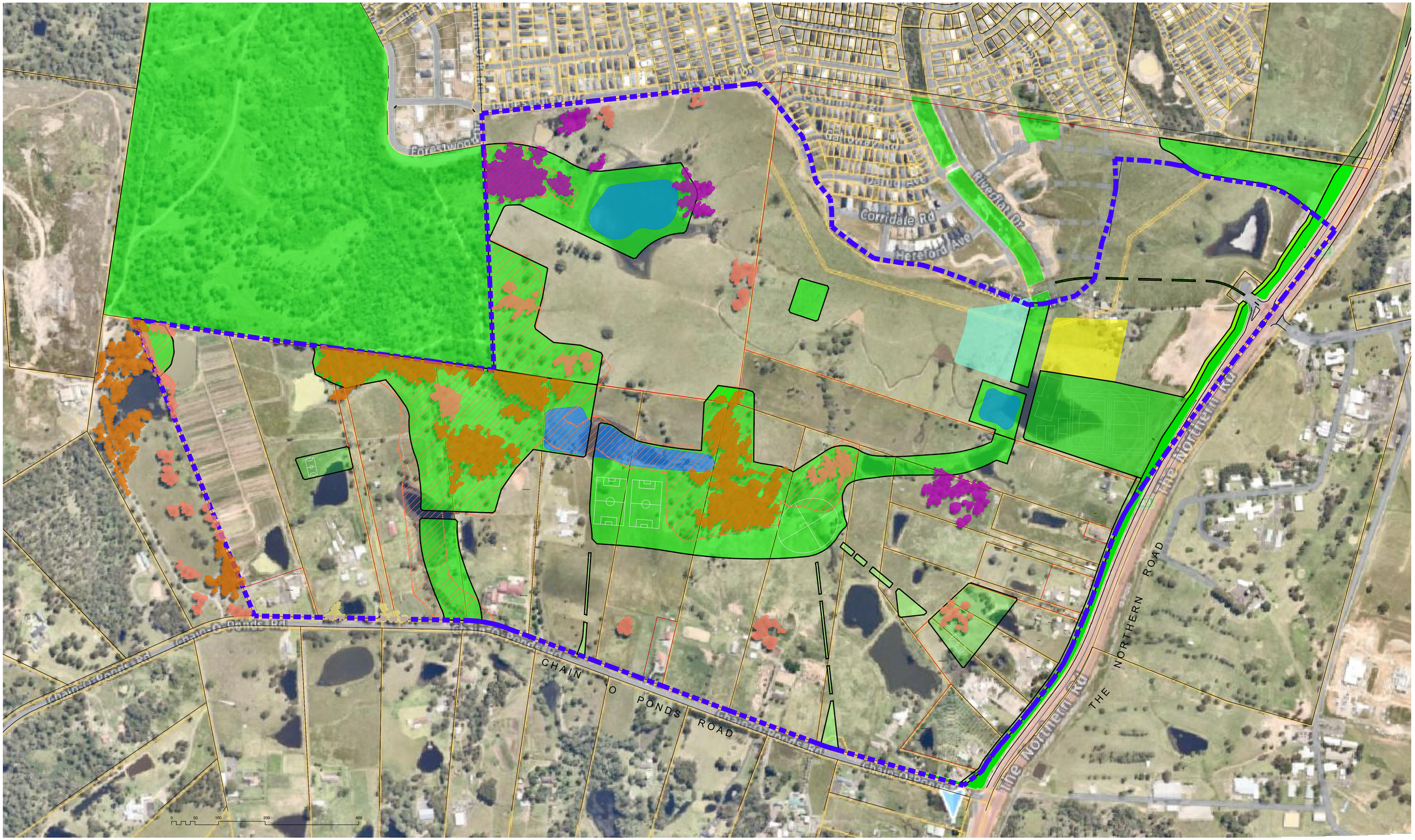
# Preliminary Vegetation Map

Client: **Mirvac**

date 06-04-2020 scale @ A1 See Scale Bar

job no. drawing no. VP01-E

gunninah




N

LEGEND

- Degraded Cumberland Plain Woodland (BC ACT)
- Degraded Cumberland Plain Woodland (EP BP + BC ACT)
- Degraded Woodland
- Cumberland Plain Woodland (EP BP + BC ACT)

architect: **Mulgoa**

Chain-O-Ponds & The Northern Road

# Preliminary Vegetation Map

Client: **Mirvac**

date 06-04-2022 scale @ A1 See Scale Bar

job no. drawing no. VP03- F

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# Glenmore Park Stage 3, Mulgoa
# Planning Proposal

## Ecological & Riparian Issues & Assessment Report

Attachment D
Photographic Essay

F Dominic Fanning

April 2022

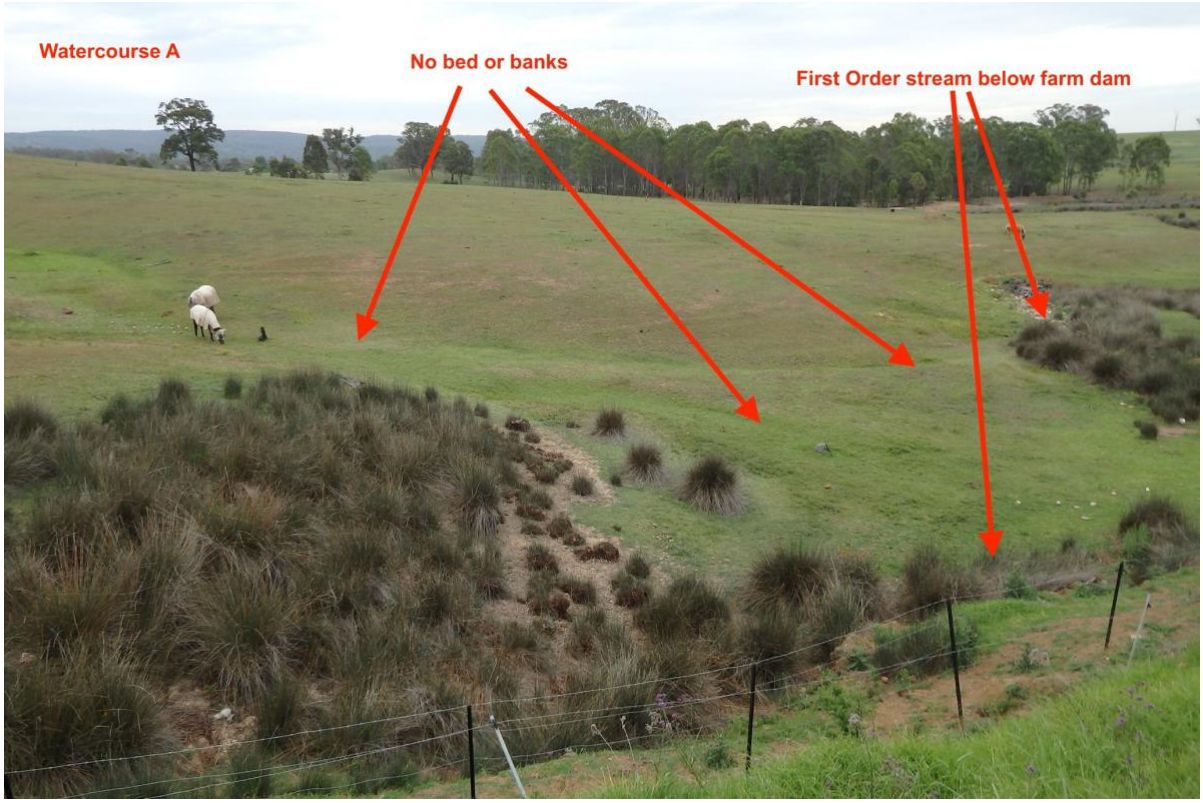


Photo 1 An example of a '1st Order Hydroline stream' (in left and centre) that is not a "*river*" due to the absence of a "*bed*" or "*banks*". There is no "*waterfront land*" associated with this 'stream'. This circumstance applies to most of the '1st Order Hydroline streams' on the subject land.


Photo 2 Another example of a '1st Order Hydroline stream' that is not a "*river*".

Photo 3 The farm dam on the southern part of Lot 19 (near the western end of the subject land). The dam and this part of lot 19 are heavily grazed and ploughed; and the small patches of heavily degraded CPW vegetation and scattered trees do not contain tree-hollows. In addition, the farm dam has little fringing vegetation, and is of extremely limited habitat value.

Photo 4 The farm dam in the central eastern part of Lot 19 with its tributary (which flows under Chain-O-Ponds Road). This dam and its tributary have extensive fringing vegetation; and provide potentially suitable habitat for amphibians and bitterns. The small patches of degraded CPW vegetation and scattered trees, however, are of only very limited value; and contain no tree-hollows or other relevant habitat features.

Photo 5 The northern part of Lot 19 (near the western end of the subject land); with ploughed and grazed fields either side of a farm dam with little fringing vegetation. The CPW vegetation in the background and to the right is in better condition than most of the CPW on the subject land; and has been identified for retention and enhancement in the *Master Plan*.

Photo 6 The northwestern part of Lot 26 at the western end of the subject land; with grazed and pasture-improved paddocks and scattered paddock trees. The band of vegetation in the background (on a ridge located in the northwestern part of lot 26) contains better quality CPW; albeit with apparently few hollow-bearing trees and only a sparse understorey.

Photo 7 A farm dam in the central part of the subject land (on Lot 27) with a good cover of fringing vegetation. This part of the subject land is variously regularly ploughed and fertilised; and generally retains only small patches of heavily degraded CPW vegetation and scattered trees. Many of the trees are in decline.

Photo 8 Heavily grazed and ploughed paddocks typical of the eastern and northern parts of the subject land; generally with only sparse and small paddock trees or small copses. Ecological values here are particularly low; and habitat features of any value (such as hollow-bearing trees) are sparse and often senescent.

Photo 9 A small patch of heavily degraded CPW vegetation behind dwellings and other structures on Lot 30; with heavily ploughed and grazed paddocks all around.

Photo 10 Heavily grazed and ploughed paddocks with only sparse and small paddock trees or small copses typical of the southeastern parts of the subject land. Ecological values here are particularly low.

Photo 11 Heavily grazed and ploughed paddocks on Lot 2 (south of the Glenmore Park development on Lot 2); with only sparse and generally small paddock trees. The small upper tributary in the centre left is also quite degraded; although there is a line of moderately large trees (notably paperbarks) along the watercourse.

Photo 12 View to the west in the western part of Lot 3 (in the northwestern part of the subject land); with heavily grazed and ploughed paddocks and the southern edge of the large farm dam at this location. Most of the woodland vegetation in the middle distance is located on the adjoining land to the west; but some is located between the farm dam and that land.

Photo 13 View to the northwest – with heavily grazed and ploughed paddocks in the western part of Lot 3 surrounding the large farm dam. The CPW woodland vegetation to the right of the farm dam is heavily degraded; whilst that beyond the farm dam is in better condition. The existing Glenmore Park development appears in the centre right of the photograph.

Photo 14 View to the north along the dam wall in the western part of Lot 3; with existing Glenmore Park development in the background. Whilst there is an area of dense weed infestation immediately downstream of the dam, there is moderate quality CPW woodland further to the west (left of photograph).

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Glenmore Park Stage 3, Mulgoa
Planning Proposal

# Ecological & Riparian Issues & Assessment Report

Attachment E
OEH Wildlife Atlas Records within 100km$^2$

F Dominic Fanning

April 2022

Data from the BioNet Atlas website, which holds records from a number of custodians.
The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.
Species listed under the Sensitive Species Data Policy may have their locations denatured
(^ rounded to 0.1°C; ^^ rounded to 0.01°C.

Search criteria - Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -33.76 West: 150.63 East: 150.73 South: -33.86] returned a total of 1,004 records of 51 species.

Report generated on 5/04/2022 2:43 PM

| Common Name | Scientific Name | NSW | EPBC | Records |
|---|---|---|---|---|
| Red-crowned Toadlet | *Pseudophryne australis* | V, P | | 3 |
| Green & Golden Bell Frog | *Litoria aurea* | E1, P | V | 2 |
| White-throated Needletail | *Hirundapus caudacutus* | P | V, C, J, K | 1 |
| Black-necked Stork | *Ephippiorhynchus asiaticus* | E1, P | | 2 |
| Australasian Bittern | *Botaurus poiciloptilus* | E1, P | E | 1 |
| White-bellied Sea Eagle | *Haliaeetus leucogaster* | V, P | | 7 |
| Square-tailed Kite | *^^Lophoictinia isura* | V, P, 3 | | 2 |
| Bush Stone-curlew | *Burhinus grallarius* | E1, P | | 2 |
| Black-tailed Godwit | *Limosa limosa* | V, P | C, J, K | 1 |
| Gang Gang Cockatoo | *^^Callocephalon fimbriatum* | V, P, 3 | E | 8 |
| Glossy Black Cockatoo | *^Calyptorhynchus lathami* | V, P, 2 | | 20 |
| Swift Parrot | *^^Lathamus discolor* | E1, P, 3 | CE | 23 |
| Barking Owl | *^^Ninox connivens* | V, P, 3 | | 2 |
| Powerful Owl | *^^Ninox strenua* | V, P, 3 | | 5 |
| Masked Owl | *^^Tyto novaehollandiae* | V, P, 3 | | 12 |
| Sooty Owl | *^^Tyto tenebricosa* | V, P, 3 | | 4 |
| Brown Tree-creeper (eastern subspecies) | *Climacteris picumnus victoriae* | V, P | | 1 |
| Speckled Warbler | *Chthonicola sagittata* | V, P | | 6 |
| Regent Honeyeater | *Anthochaera phrygia* | E4A, P | CE | 8 |
| Varied Sittella | *Daphoenositta chrysoptera* | V, P | | 19 |
| Dusky Wood-swallow | *Artamus cyanopterus cyanopterus* | V, P | | 11 |
| Hooded Robin (south-eastern form) | *Melanodryas cucullata cucullata* | V, P | | 1 |
| Scarlet Robin | *Petroica boodang* | V, P | | 2 |
| Flame Robin | *Petroica phoenicea* | V, P | | 3 |
| Diamond Firetail | *Stagonopleura guttata* | V, P | | 1 |

| | | | | |
|---|---|---|---|---|
| Tiger Quoll | *Dasyurus maculatus* | V, P | E | 2 |
| Koala | *Phascolarctos cinereus* | V, P | E | 9 |
| Eastern Pygmy Possum | *Cercartetus nanus* | V, P | | 1 |
| Yellow-bellied Glider | *Petaurus australis* | V, P | | 3 |
| Squirrel Glider | *Petaurus norfolcensis* | V, P | | 1 |
| Greater Glider | *Petauroides volans* | P | V | 2 |
| Grey-headed Flying Fox | *Pteropus poliocephalus* | V, P | V | 63 |
| Yellow-bellied Sheath-tail Bat | *Saccolaimus flaviventris* | V, P | | 1 |
| Eastern Coastal Free-tailed Bat | *Micronomus norfolkensis* | V, P | | 13 |
| Large-eared Pied Bat | *Chalinolobus dwyeri* | V, P | V | 5 |
| Eastern False Pipistrelle | *Falsistrellus tasmaniensis* | V, P | | 1 |
| Southern Myotis | *Myotis macropus* | V, P | | 11 |
| Greater Broad-nosed Bat | *Scoteanax rueppellii* | V, P | | 9 |
| Little Bent-winged Bat | *Miniopterus australis* | V, P | | 1 |
| Large Bent-winged Bat | *Miniopterus orianae oceanensis* | V, P | | 14 |
| Cumberland Plain Land Snail | *Meridolum corneovirens* | E1 | | 116 |
| Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas | *Marsdenia viridiflora subsp. viridiflora* | E2 | | 524 |
| | *Isotoma fluviatilis subsp. fluviatilis* | | X | 1 |
| | *Dillwynia tenuifolia* | V | | 7 |
| | *Pultenaea parviflora* | E1 | V | 49 |
| Downy Wattle | *Acacia pubescens* | V | V | 1 |
| Camden White Gum | *Eucalyptus benthamii* | V | V | 1 |
| Scrub Turpentine | *Rhodamnia rubescens* | E4A | CE | 3 |
| Juniper-leaved Grevillea | *Grevillea juniperina subsp. juniperina* | V | | 7 |
| Nodding Geebung | *Persoonia nutans* | E1, P | E | 1 |
| Spiked Rice-flower | *Pimelea spicata* | E1 | E | 11 |

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Glenmore Park Stage 3, Mulgoa
Planning Proposal

# Ecological & Riparian Issues & Assessment Report

Attachment F
EPBC Act Records

F Dominic Fanning

April 2022

Australian Government
Department of the Environment and Energy

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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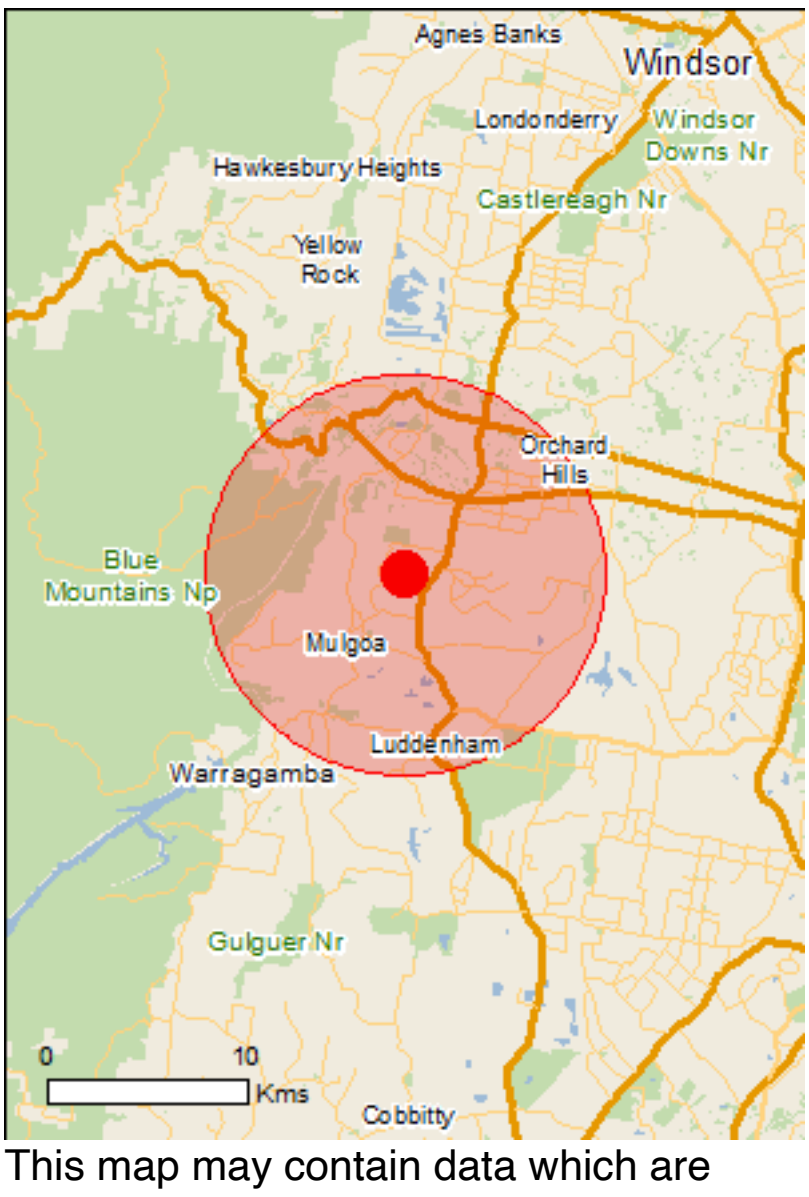


This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

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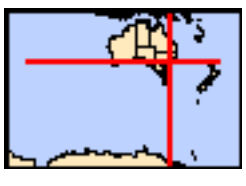

# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | 1 |
| National Heritage Places: | 1 |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 9 |
| Listed Threatened Species: | 49 |
| Listed Migratory Species: | 16 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Land: | 12 |
| Commonwealth Heritage Places: | 1 |
| Listed Marine Species: | 22 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

| | |
|---|---|
| State and Territory Reserves: | 3 |
| Regional Forest Agreements: | None |
| Invasive Species: | 50 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

# Details

## Matters of National Environmental Significance

| World Heritage Properties | | [ Resource Information ] |
|---|---|---|
| Name | State | Status |
| The Greater Blue Mountains Area | NSW | Declared property |

| National Heritage Properties | | [ Resource Information ] |
|---|---|---|
| Name | State | Status |
| Natural | | |
| The Greater Blue Mountains Area | NSW | Listed place |

| Listed Threatened Ecological Communities | | [ Resource Information ] |
|---|---|---|

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

| Name | Status | Type of Presence |
|---|---|---|
| Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion | Endangered | Community may occur within area |
| Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community | Endangered | Community may occur within area |
| Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion | Critically Endangered | Community likely to occur within area |
| Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest | Critically Endangered | Community likely to occur within area |
| Shale Sandstone Transition Forest of the Sydney Basin Bioregion | Critically Endangered | Community likely to occur within area |
| Temperate Highland Peat Swamps on Sandstone | Endangered | Community known to occur within area |
| Turpentine-Ironbark Forest of the Sydney Basin Bioregion | Critically Endangered | Community likely to occur within area |
| Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion | Endangered | Community likely to occur within area |
| Western Sydney Dry Rainforest and Moist Woodland on Shale | Critically Endangered | Community likely to occur within area |

| Listed Threatened Species | | [ Resource Information ] |
|---|---|---|
| Name | Status | Type of Presence |
| Birds | | |
| Anthochaera phrygia<br>Regent Honeyeater [82338] | Critically Endangered | Species or species habitat known to occur within area |
| Botaurus poiciloptilus<br>Australasian Bittern [1001] | Endangered | Species or species habitat known to occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat likely to occur within area |
| Grantiella picta<br>Painted Honeyeater [470] | Vulnerable | Species or species habitat likely to occur within area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area |

| Name | Status | Type of Presence |
|---|---|---|
| Lathamus discolor<br>Swift Parrot [744] | Critically Endangered | Species or species habitat known to occur within area |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Rostratula australis<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat known to occur within area |
| **Fish** | | |
| Macquaria australasica<br>Macquarie Perch [66632] | Endangered | Species or species habitat known to occur within area |
| Prototroctes maraena<br>Australian Grayling [26179] | Vulnerable | Species or species habitat likely to occur within area |
| **Frogs** | | |
| Heleioporus australiacus<br>Giant Burrowing Frog [1973] | Vulnerable | Species or species habitat known to occur within area |
| Litoria aurea<br>Green and Golden Bell Frog [1870] | Vulnerable | Species or species habitat known to occur within area |
| Litoria littlejohni<br>Littlejohn's Tree Frog,  Heath Frog [64733] | Vulnerable | Species or species habitat may occur within area |
| Mixophyes balbus<br>Stuttering Frog, Southern Barred Frog (in Victoria) [1942] | Vulnerable | Species or species habitat likely to occur within area |
| **Insects** | | |
| Synemon plana<br>Golden Sun Moth [25234] | Critically Endangered | Species or species habitat known to occur within area |
| **Mammals** | | |
| Chalinolobus dwyeri<br>Large-eared Pied Bat, Large Pied Bat [183] | Vulnerable | Species or species habitat known to occur within area |
| Dasyurus maculatus  maculatus (SE mainland population)<br>Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184] | Endangered | Species or species habitat known to occur within area |
| Petauroides volans<br>Greater Glider [254] | Vulnerable | Species or species habitat known to occur within area |
| Petrogale penicillata<br>Brush-tailed Rock-wallaby [225] | Vulnerable | Species or species habitat likely to occur within area |
| Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)<br>Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Vulnerable | Species or species habitat known to occur within area |
| Pseudomys novaehollandiae<br>New Holland Mouse, Pookila [96] | Vulnerable | Species or species habitat may occur within area |
| Pteropus poliocephalus<br>Grey-headed Flying-fox [186] | Vulnerable | Roosting known to occur within area |
| **Other** | | |

| Name | Status | Type of Presence |
|---|---|---|
| Pommerhelix duralensis<br>Dural Land Snail [85268] | Endangered | Species or species habitat known to occur within area |
| **Plants** | | |
| Acacia bynoeana<br>Bynoe's Wattle, Tiny Wattle [8575] | Vulnerable | Species or species habitat likely to occur within area |
| Acacia pubescens<br>Downy Wattle, Hairy Stemmed Wattle [18800] | Vulnerable | Species or species habitat likely to occur within area |
| Allocasuarina glareicola<br>[21932] | Endangered | Species or species habitat likely to occur within area |
| Cryptostylis hunteriana<br>Leafless Tongue-orchid [19533] | Vulnerable | Species or species habitat may occur within area |
| Cynanchum elegans<br>White-flowered Wax Plant [12533] | Endangered | Species or species habitat likely to occur within area |
| Eucalyptus aggregata<br>Black Gum [20890] | Vulnerable | Species or species habitat may occur within area |
| Eucalyptus benthamii<br>Camden White Gum, Nepean River Gum [2821] | Vulnerable | Species or species habitat known to occur within area |
| Genoplesium baueri<br>Yellow Gnat-orchid [7528] | Endangered | Species or species habitat may occur within area |
| Grevillea parviflora subsp. parviflora<br>Small-flower Grevillea [64910] | Vulnerable | Species or species habitat may occur within area |
| Haloragis exalata subsp. exalata<br>Wingless Raspwort, Square Raspwort [24636] | Vulnerable | Species or species habitat may occur within area |
| Melaleuca deanei<br>Deane's Melaleuca [5818] | Vulnerable | Species or species habitat may occur within area |
| Persicaria elatior<br>Knotweed, Tall Knotweed [5831] | Vulnerable | Species or species habitat may occur within area |
| Persoonia acerosa<br>Needle Geebung [7232] | Vulnerable | Species or species habitat likely to occur within area |
| Persoonia hirsuta<br>Hairy Geebung, Hairy Persoonia [19006] | Endangered | Species or species habitat known to occur within area |
| Persoonia nutans<br>Nodding Geebung [18119] | Endangered | Species or species habitat likely to occur within area |
| Pimelea curviflora var. curviflora<br>[4182] | Vulnerable | Species or species habitat may occur within area |
| Pimelea spicata<br>Spiked Rice-flower [20834] | Endangered | Species or species habitat known to occur within area |

| Name | Status | Type of Presence |
|---|---|---|
| [Pomaderris brunnea](#)<br>Rufous Pomaderris [16845] | Vulnerable | Species or species habitat likely to occur within area |
| [Pterostylis saxicola](#)<br>Sydney Plains Greenhood [64537] | Endangered | Species or species habitat may occur within area |
| [Pultenaea glabra](#)<br>Smooth Bush-pea, Swamp Bush-pea [11887] | Vulnerable | Species or species habitat likely to occur within area |
| [Pultenaea parviflora](#)<br>[19380] | Vulnerable | Species or species habitat known to occur within area |
| [Rhizanthella slateri](#)<br>Eastern Underground Orchid [11768] | Endangered | Species or species habitat may occur within area |
| [Syzygium paniculatum](#)<br>Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307] | Vulnerable | Species or species habitat may occur within area |
| [Thelymitra kangaloonica](#)<br>Kangaloon Sun Orchid [81861] | Critically Endangered | Species or species habitat may occur within area |
| [Thesium australe](#)<br>Austral Toadflax, Toadflax [15202] | Vulnerable | Species or species habitat may occur within area |
| Reptiles | | |
| [Hoplocephalus bungaroides](#)<br>Broad-headed Snake [1182] | Vulnerable | Species or species habitat may occur within area |

Listed Migratory Species [ Resource Information ]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|---|---|
| Migratory Marine Birds | | |
| [Apus pacificus](#)<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Migratory Terrestrial Species | | |
| [Cuculus optatus](#)<br>Oriental Cuckoo, Horsfield's Cuckoo [86651] | | Species or species habitat may occur within area |
| [Hirundapus caudacutus](#)<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area |
| [Monarcha melanopsis](#)<br>Black-faced Monarch [609] | | Species or species habitat known to occur within area |
| [Monarcha trivirgatus](#)<br>Spectacled Monarch [610] | | Species or species habitat may occur within area |
| [Motacilla flava](#)<br>Yellow Wagtail [644] | | Species or species habitat likely to occur within area |
| [Myiagra cyanoleuca](#)<br>Satin Flycatcher [612] | | Species or species habitat known to occur within area |

| Name | Threatened | Type of Presence |
|---|---|---|
| [Rhipidura rufifrons](#) | | |
| Rufous Fantail [592] | | Species or species habitat known to occur within area |
| **Migratory Wetlands Species** | | |
| [Actitis hypoleucos](#) | | |
| Common Sandpiper [59309] | | Species or species habitat likely to occur within area |
| [Calidris acuminata](#) | | |
| Sharp-tailed Sandpiper [874] | | Species or species habitat known to occur within area |
| [Calidris ferruginea](#) | | |
| Curlew Sandpiper [856] | Critically Endangered | Species or species habitat likely to occur within area |
| [Calidris melanotos](#) | | |
| Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| [Gallinago hardwickii](#) | | |
| Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area |
| [Numenius madagascariensis](#) | | |
| Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| [Pandion haliaetus](#) | | |
| Osprey [952] | | Species or species habitat known to occur within area |
| [Tringa nebularia](#) | | |
| Common Greenshank, Greenshank [832] | | Species or species habitat likely to occur within area |

## Other Matters Protected by the EPBC Act

### Commonwealth Land [ Resource Information ]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

| Name |
|---|
| Commonwealth Land - |
| Commonwealth Land - Australian Postal Commission |
| Commonwealth Land - Australian Postal Corporation |
| Commonwealth Land - Australian Telecommunications Commission |
| Commonwealth Land - Defence Housing Authority |
| Commonwealth Land - Defence Service Homes Corporation |
| Commonwealth Land - Director of War Service Homes |
| Defence - 1CAD ORCHARD HILLS KINGSWOOD |
| Defence - AIR HEADQUARTERS AUSTRALIA - GLENBROOK |
| Defence - PENRITH DEPOT (Army Stores) |
| Defence - RANMME (DEOH) |
| Defence - SIGNAL STRS DEPOT-KINGSWOOD |

### Commonwealth Heritage Places [ Resource Information ]

| Name | State | Status |
|---|---|---|
| **Natural** | | |
| [Orchard Hills Cumberland Plain Woodland](#) | NSW | Listed place |

### Listed Marine Species [ Resource Information ]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|---|---|
| **Birds** | | |
| [Actitis hypoleucos](#) | | |
| Common Sandpiper [59309] | | Species or species |

| Name | Threatened | Type of Presence |
|---|---|---|
| | | habitat likely to occur within area |
| [Apus pacificus](#)<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| [Ardea alba](#)<br>Great Egret, White Egret [59541] | | Species or species habitat known to occur within area |
| [Ardea ibis](#)<br>Cattle Egret [59542] | | Species or species habitat may occur within area |
| [Calidris acuminata](#)<br>Sharp-tailed Sandpiper [874] | | Species or species habitat known to occur within area |
| [Calidris ferruginea](#)<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat likely to occur within area |
| [Calidris melanotos](#)<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| [Chrysococcyx osculans](#)<br>Black-eared Cuckoo [705] | | Species or species habitat likely to occur within area |
| [Gallinago hardwickii](#)<br>Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area |
| [Haliaeetus leucogaster](#)<br>White-bellied Sea-Eagle [943] | | Species or species habitat known to occur within area |
| [Hirundapus caudacutus](#)<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area |
| [Lathamus discolor](#)<br>Swift Parrot [744] | Critically Endangered | Species or species habitat known to occur within area |
| [Merops ornatus](#)<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| [Monarcha melanopsis](#)<br>Black-faced Monarch [609] | | Species or species habitat known to occur within area |
| [Monarcha trivirgatus](#)<br>Spectacled Monarch [610] | | Species or species habitat may occur within area |
| [Motacilla flava](#)<br>Yellow Wagtail [644] | | Species or species habitat likely to occur within area |
| [Myiagra cyanoleuca](#)<br>Satin Flycatcher [612] | | Species or species habitat known to occur within area |
| [Numenius madagascariensis](#)<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| [Pandion haliaetus](#)<br>Osprey [952] | | Species or species habitat known to occur |

| Name | Threatened | Type of Presence within area |
|---|---|---|
| Rhipidura rufifrons<br>Rufous Fantail [592] | | Species or species habitat known to occur within area |
| Rostratula benghalensis (sensu lato)<br>Painted Snipe [889] | Endangered* | Species or species habitat known to occur within area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | | Species or species habitat likely to occur within area |

## Extra Information

### State and Territory Reserves [ Resource Information ]

| Name | State |
|---|---|
| Blue Mountains | NSW |
| Mulgoa | NSW |
| Yellomundee | NSW |

### Invasive Species [ Resource Information ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

| Name | Status | Type of Presence |
|---|---|---|
| Birds | | |
| Acridotheres tristis<br>Common Myna, Indian Myna [387] | | Species or species habitat likely to occur within area |
| Alauda arvensis<br>Skylark [656] | | Species or species habitat likely to occur within area |
| Anas platyrhynchos<br>Mallard [974] | | Species or species habitat likely to occur within area |
| Carduelis carduelis<br>European Goldfinch [403] | | Species or species habitat likely to occur within area |
| Carduelis chloris<br>European Greenfinch [404] | | Species or species habitat likely to occur within area |
| Columba livia<br>Rock Pigeon, Rock Dove, Domestic Pigeon [803] | | Species or species habitat likely to occur within area |
| Lonchura punctulata<br>Nutmeg Mannikin [399] | | Species or species habitat likely to occur within area |
| Passer domesticus<br>House Sparrow [405] | | Species or species habitat likely to occur within area |
| Passer montanus<br>Eurasian Tree Sparrow [406] | | Species or species habitat likely to occur within area |

| Name | Status | Type of Presence |
|---|---|---|
| Pycnonotus jocosus<br>Red-whiskered Bulbul [631] | | Species or species habitat likely to occur within area |
| Streptopelia chinensis<br>Spotted Turtle-Dove [780] | | Species or species habitat likely to occur within area |
| Sturnus vulgaris<br>Common Starling [389] | | Species or species habitat likely to occur within area |
| Turdus merula<br>Common Blackbird, Eurasian Blackbird [596] | | Species or species habitat likely to occur within area |
| **Frogs** | | |
| Rhinella marina<br>Cane Toad [83218] | | Species or species habitat likely to occur within area |
| **Mammals** | | |
| Bos taurus<br>Domestic Cattle [16] | | Species or species habitat likely to occur within area |
| Canis lupus familiaris<br>Domestic Dog [82654] | | Species or species habitat likely to occur within area |
| Felis catus<br>Cat, House Cat, Domestic Cat [19] | | Species or species habitat likely to occur within area |
| Feral deer<br>Feral deer species in Australia [85733] | | Species or species habitat likely to occur within area |
| Lepus capensis<br>Brown Hare [127] | | Species or species habitat likely to occur within area |
| Mus musculus<br>House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus<br>Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Rattus norvegicus<br>Brown Rat, Norway Rat [83] | | Species or species habitat likely to occur within area |
| Rattus rattus<br>Black Rat, Ship Rat [84] | | Species or species habitat likely to occur within area |
| Vulpes vulpes<br>Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| **Plants** | | |
| Alternanthera philoxeroides<br>Alligator Weed [11620] | | Species or species habitat likely to occur within area |
| Anredera cordifolia<br>Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] | | Species or species habitat likely to occur within area |
| Asparagus aethiopicus<br>Asparagus Fern, Ground Asparagus, Basket Fern, | | Species or species |

| Name | Status | Type of Presence |
|---|---|---|
| Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]<br>Asparagus asparagoides | | habitat likely to occur within area |
| Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]<br><br>Asparagus plumosus | | Species or species habitat likely to occur within area |
| Climbing Asparagus-fern [48993] | | Species or species habitat likely to occur within area |
| Cabomba caroliniana<br>Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]<br>Chrysanthemoides monilifera | | Species or species habitat likely to occur within area |
| Bitou Bush, Boneseed [18983] | | Species or species habitat may occur within area |
| Chrysanthemoides monilifera subsp. monilifera<br>Boneseed [16905] | | Species or species habitat likely to occur within area |
| Cytisus scoparius<br>Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934] | | Species or species habitat likely to occur within area |
| Dolichandra unguis-cati<br>Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119] | | Species or species habitat likely to occur within area |
| Eichhornia crassipes<br>Water Hyacinth, Water Orchid, Nile Lily [13466] | | Species or species habitat likely to occur within area |
| Genista monspessulana<br>Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126] | | Species or species habitat likely to occur within area |
| Genista sp. X Genista monspessulana<br>Broom [67538] | | Species or species habitat may occur within area |
| Lantana camara<br>Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]<br>Lycium ferocissimum | | Species or species habitat likely to occur within area |
| African Boxthorn, Boxthorn [19235] | | Species or species habitat likely to occur within area |
| Nassella neesiana<br>Chilean Needle grass [67699] | | Species or species habitat likely to occur within area |
| Nassella trichotoma<br>Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884] | | Species or species habitat likely to occur within area |
| Opuntia spp.<br>Prickly Pears [82753] | | Species or species habitat likely to occur within area |
| Pinus radiata<br>Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780] | | Species or species habitat may occur within area |
| Rubus fruticosus aggregate<br>Blackberry, European Blackberry [68406] | | Species or species habitat likely to occur within area |
| Sagittaria platyphylla<br>Delta Arrowhead, Arrowhead, Slender Arrowhead | | Species or species |

| Name | Status | Type of Presence |
| --- | --- | --- |
| [68483] | | habitat likely to occur within area |
| Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii | | |
| Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497] | | Species or species habitat likely to occur within area |
| Salvinia molesta | | |
| Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665] | | Species or species habitat likely to occur within area |
| Senecio madagascariensis | | |
| Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624] | | Species or species habitat likely to occur within area |
| Ulex europaeus | | |
| Gorse, Furze [7693] | | Species or species habitat likely to occur within area |
| **Reptiles** | | |
| Hemidactylus frenatus | | |
| Asian House Gecko [1708] | | Species or species habitat likely to occur within area |

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods.  Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc).  In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-33.81404 150.67689

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

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Please feel free to provide feedback via the Contact Us page.


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