26 July 2021

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Proposed development of the 'Red Shed' rowing facility on Black Mountain Peninsula, Acton, ACT – Ecological Impact Assessment

Capital Ecology project no. 3053

Dear Mr Frino,

This letter provides an Ecological Impact Assessment (EIA) for the development of the 'Red Shed' rowing facility on Black Mountain Peninsula (Block 11, Section 67), Acton, ACT (the 'proposed development'). The approx. 0.93 ha 'study area' for this EIA includes portions of the immediately surrounding blocks in order to capture all impacts associated with the proposed development.

The study area is a 'Designated Area' under the National Capital Plan (NCP). Within Designated Areas the National Capital Authority (NCA) has the responsibility for determining detailed planning policy and for Works Approval (otherwise known as a development assessment). A Works Approval must be granted under the *Australian Capital Territory (Planning and Land Management) Act 1988*. The ACT *Planning and Development Act 2007* (P&D Act), ACT *Nature Conservation Act 2014* (NC Act), and ACT *Tree Protection Act 2005* (TP Act) do not apply to development in Designated Areas.

The primary aim of this EIA is to identify and assess the terrestrial ecological values of the study area of formally recognised biodiversity conservation significance, specifically those currently listed pursuant to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Whilst the NC Act does not apply to development in Designated Areas, pursuant to the EPBC Act a proposed action undertaken by a Commonwealth Government entity and/or occurring on Commonwealth land must consider the significance of impacts on the 'whole of environment' in addition to EPBC Act listed Matters of National Environmental Significance (MNES). Accordingly, matters listed pursuant to the NC Act or otherwise of currently recognised specific conservation significance in the ACT are also addressed.

This EIA has been prepared based on:

- the results of database searches for the study area, including the EPBC Act Protected Matters Search Tool (PMST), ACTmapi, the Atlas of Living Australia, and Canberra Nature Map;
- a review of relevant studies and other background information, including the surveys and sources referenced herein;
- a field survey on 9 July 2021, completed to record and assess the ecological values of the study area; and
- the knowledge of the authors regarding the biota of the locality, specifically the threatened ecological communities, flora, and fauna (and associated habitat) with the potential to occur in the lowland ecosystems of the ACT and region.

This EIA is divided into the following sections.

1. Methods.
2. Results.
3. Avoidance, Minimisation and Mitigation Measures.
4. Summary of Proposed Direct Impacts
5. Legislative Requirements.
6. Conclusion and Recommendations.

1. Methods

1.1 Database and Literature Review

Capital Ecology completed a desktop review, involving the following.

- A list of threatened species (flora and fauna), threatened populations, and threatened ecological communities (TECs) listed pursuant to the EPBC Act with the potential to occur in the study area was obtained using the Department of Agriculture, Water and the Environment (DAWE) online EPBC Act Protected Matters Search Tool (PMST) on 8 July April 2021.
- A review of the ACT Government ACTmapi mapping tool, Atlas of Living Australia, and Canberra Nature Map to obtain the most current layers and point data for the significant ecological values of the locality. These values include species listed as threatened pursuant to the EPBC Act and/or the NC Act, together with flora species considered 'rare or uncommon in the ACT' and fauna species which are otherwise of a conservation focus.
- A review of previous and current studies undertaken by Capital Ecology and others in the locality.

1.2 Vegetation Survey and Mapping

Capital Ecology undertook a survey to classify and map the vegetation and habitat values in the study area, this included:

- assessing the native vs exotic dominance of the groundstorey vegetation throughout the study area with the objective of identifying and mapping any substantial native patches if present;
- recording all groundstorey species in the study area (a list was compiled of all flora species identified in the study area, with particular attention paid to the presence of threatened species);
- recording the species and characteristics of the planted native and exotic trees in the study area;
- assessing the habitat potential for threatened flora and fauna species which may occur in the locality; and
- mapping other ecological values and constraints (e.g. infestations of priority weeds etc.).

1.3 Likelihood of Occurrence Assessment

The Likelihood of Occurrence Assessment for threatened flora and fauna species is a categorisation used to determine the likelihood that the subject species occurs within a study area. The results are based on the findings of completed desktop studies and field surveys, expert opinion, and consideration of the species' currently recognised distribution and preferred habitat.

Threatened species and populations identified in the Likelihood of Occurrence Assessment include all of those identified during the database and literature review as potentially occurring within five kilometres of the study area. Included are threatened species listed pursuant to the EPBC Act and/or the NC Act and considered by Capital Ecology to have some potential to occur within the study area.

The likelihood of a species occurring within the study area is categorised as either negligible, low, moderate, or high. A species that has been identified within the study area during the surveys for this EIA or by other confirmed records is expressed as confirmed.

The completed Likelihood of Occurrence Assessment is provided as Appendix C. Species assigned a moderate or higher likelihood of occurrence within the study area, other than if this is limited to transient visitation, are considered in more detail in Section 2.6 (threatened flora) and Section 2.7 (threatened fauna) of this EIA.

2. Results

2.1 Database Searches

No 'Significant Plants and Animals' are mapped within the study area on the ACT Government's ACTmapi online mapping tool. However, Murray Cod *Maccullochella peelii* habitat (EPBC Act Vulnerable) is mapped in Lake Burley Griffin immediately surrounding Black Mountain Peninsula. A number of threatened flora and fauna are mapped in patches of intact vegetation within 5 km of the study area, particularly to the north on Black Mountain.

A radar search on Canberra Nature Map did not identify any rare or threatened fauna species as occurring in the study area. However, the following three rare or threatened fauna species were identified as occurring within 1 km of the study area: Dusky Woodswallow *Artamus cyanopterus cyanopterus* (NSW BC Act vulnerable); White-bellied Sea-eagle *Haliaeetus leucogaster*; and White-winged Triller *Lalage tricolor* (NC Act vulnerable).

As detailed in Appendix D (Likelihood of Occurrence Assessment), database searches returned 40 EPBC Act and/or NC Act listed threatened species and two EPBC Act and/or NC Act listed threatened ecological communities as having the potential to occur in the locality.

2.2 Study Area Description

The study area includes Blocks 11 12 and 13, Section 67, together with portions of the surrounding Block 17, Section 67, and extends to the lake edge. The study area encompasses approx. 0.93 ha and is zoned 'DES: Designated' and 'Pe: Urban Open Space' under the Territory Plan (ACTmapi 2021). As shown in Figure 1, the study area is bordered by:

- Lake Burley Griffin to the west; and
- scattered buildings among open spaces to the north, south, and east.

Historical aerial imagery of the study area and surrounding landscape dating back to 1955 (Figure 2) shows the study area entirely cleared of all natural vegetation. This image also shows the patch of remnant eucalypt trees at what is now the southern tip of the peninsular. Many of these trees are trees still present.

As a result of the historical land use of the study area, the vegetation of the study area is now characterised by planted native and exotic trees over a disturbed groundstorey entirely dominated by exotic grasses and herbaceous weeds.

2.3 Vegetation

Based on remnant Yellow Box and Blakely's Red Gum trees present in the southern tip of the peninsular, it is considered herein that the climax (i.e. pre-1750) ecological community throughout the study area would have been ACT Plant Community Type (PCT) 'ACT16 – Yellow Box *E. melliodora* – Blakely's Red Gum *E. blakelyi* Tableland Grassy Woodland'.

As described above, the study area has been historically cleared of all remnant native vegetation. The vegetation of the study area is now characterised by patches of planted native and exotic trees over a disturbed exotic groundstorey dominated by exotic grasses and common weeds.

Fringing vegetation at the lake edge, particularly the small patch of vegetation at the north-west corner of the study area, supports some native species such as Austral Rush *Juncus australis*, and Swamp Dock *Rumex brownii*, with common exotic weeds.

Table 1. PCTs recorded in the study area.

PCT	PCT name	PCT description	Occurrence in the study area
ACT16	Yellow Box – Blakely's Red Gum Grassy Woodland	PCT-ACT16 occurs on soils of moderate to high fertility and generally moderate depth. In its climax form, this community would have been characterised by an open canopy of Yellow Box *Eucalyptus melliodora* and Blakely's Red Gum *E. blakelyi*, a sparse or absent midstorey and shrubstorey, and a defined grassy groundstorey supporting a high diversity of native forbs.	This PCT was mapped across the entire study area.

As described below, in Table 2 to Table 4, and illustrated in Figure 3, the following vegetation zones of ACT16 were identified, assessed, and mapped during the field survey. A list of the flora species recorded during the survey is provided in Appendix A.

- **Zone 1 – Planted native canopy - Exotic Dominant – Low Diversity.** This zone contains a native canopy of planted She-oak *Casuarina cunninghamiana* and local and non-local eucalypt species, over an almost entirely exotic groundstorey.
- **Zone 2 – Planted exotic canopy - Exotic Dominant – Low Diversity.** This zone contains planted exotic trees, Honey Locust *Gleditsia triacanthos* and Willows *Salix sp.*, over an almost entirely exotic groundstorey.
- **Zone 3 – No Canopy – Exotic Dominant – Low Diversity.** This zone is characterised by disturbed open grassland dominated by exotic grasses and herbaceous weeds. The overstorey, midstorey, or shrubstorey are all absent.

Table 2. ACT16 Zone 1 summary.

	ACT16 Zone 1
Description	This zone supports a canopy of planted native overstorey species of local and non-local origin. The northern patch and the south western patch contain She-oak *Casuarina cunninghamiana*. The remaining patches contain planted eucalypt species. The understorey is entirely exotic, with a low diversity of exotic weeds.
Area	0.23 ha.
Overstorey Species	She-oak, Red Box *E. polyanthemos*, Sydney Blue Gum *E. saligna*, and other non-local eucalypts.
Overstorey Regeneration	No.
Perennial Groundlayer	Exotic.
Significant weeds	Chilean Needle Grass *Nassella neesiana,* and Paspalum Grass *Paspalum dilatatum.*
EPBC Act and/or NC Act listed TEC	No.
NC Act Native Vegetation	Yes.

Table 3. ACT16 Zone 2 summary.

	ACT16 Zone 2
Description	This zone supports a canopy of planted exotic overstorey species of Honey Locust and Willows. This zone has no native overstorey, midstorey, or shrubstorey. The understorey is entirely exotic, with a low diversity of exotic weeds.
Area	0.19 ha.
Overstorey Species	Honey Locust *Gleditsia triacanthos* and Willows *Salix sp..*
Overstorey Regeneration	None.
Perennial Groundlayer	Exotic
Significant weeds	Chilean Needle Grass, Paspalum Grass, and Willow.
EPBC Act and/or NC Act listed TEC	No.
NC Act Native Vegetation	No.

Table 4. ACT16 Zone 3 summary.

	ACT16 Zone 3
Description	This zone has no overstorey, midstorey, or shrubstorey. The understorey is entirely exotic, with a low diversity of exotic weeds. There are patches of bare ground towards the lake edge.
Area	0.51 ha.
Overstorey Species	Absent.
Overstorey Regeneration	None.
Perennial Groundlayer	Exotic.
Significant weeds	Chilean Needle Grass, and Paspalum Grass.
EPBC Act and/or NC Act listed TEC	No.
NC Act Native Vegetation	No.

2.4 Threatened Ecological Communities

2.4.1 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Two EPBC Act listed threatened ecological communities (TEC's) have the potential to occur in the study area, both listed as critically endangered under the EPBC Act: 'Natural Temperate Grassland of the South Eastern Highlands' (NTG-SEH), and 'White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland' (Box-Gum Woodland).

Natural Temperate Grassland of the South Eastern Highlands

Description – The NTG-SEH TEC is characterised by grassy vegetation dominated by moderately tall (25–50cm) to tall (50–100cm), dense to open tussock grasses in the genera *Austrodanthonia* (note: now *Rytidosperma*), *Austrostipa*, *Bothriochloa*, *Poa* and *Themeda*. Up to 70% of all plant species may be forbs. The community may be treeless or contain up to 10% cover of trees, shrubs or sedges.

Presence in the study area – Absent – As detailed above, the climax (i.e. pre-European) ecological community for the entire study area is 'PCT-ACT16 – *Eucalyptus melliodora – E. blakelyi* Tableland Grassy Woodland'. No part of the study area would have once supported a grassland PCT. Accordingly, the study area does not support EPBC Act NTG-SEH.

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland

To determine whether a patch meets the criteria for the community, the vegetation must be assessed against the flowchart provided in *Policy Statement 3.5: White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands* (Commonwealth of Australia 2006[1]). An assessment of the vegetation in the subject land against this flowchart is provided below.

1. *Criterion 1. Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum?*

   Yes – Prior to the clearance of the study area in Canberra's early history, the study area is estimated to have historically supported Yellow Box and/or Blakely's Red Gum.

2. *Does the patch have a predominantly native understorey?*

   No – the understorey of ACT16 Zone 1, Zone 2, and Zone 3 is clearly dominated by exotic species (i.e. > 90% perennial exotic).

3. *Is the patch 0.1 ha (1000 m^2) or greater is size with 12 or more native understorey species present (excluding grasses)? There must be at least one important species.*

   Or

   Is the patch 2 ha or greater in size with an average of 20 or more mature trees per hectare, or is there natural regeneration of the dominant overstorey eucalypts?

   N/A – refer to 2.

Presence in the study area – Absent – as demonstrated by the above assessment, the study area does not support EPBC Act listed Box-Gum Woodland.

[1] Commonwealth of Australia (2006). *Policy Statement 3.5: White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands. Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth Department of Environment and Heritage.

2.4.2 ACT *Nature Conservation Act 2014*

Two NC Act listed threatened ecological communities (TEC's) have the potential to occur in the study area, both listed as endangered under the NC Act: 'Natural Temperate Grassland' and 'Yellow Box – Blakely's Red Gum Grassy Woodland' (Box-Gum Woodland, BGW). Based on the recorded PCT, landscape position, review of historical aerial imagery, and recorded species, only Box-Gum Woodland is considered to have the potential to occur in the study area.

Yellow Box – Blakely's Red Gum Grassy Woodland

The NC Act listed community is defined in the ACT Native Woodland Conservation Strategy and Action Plans (ACT Government 2019[2]). The key defining characteristics of Yellow Box – Blakely's Red Gum Grassy Woodland are:

- a discontinuous stratum of trees of medium height (10-35 m) with canopies that are separated and with 4-30% foliage cover;
- dominated by Yellow Box (*Eucalyptus melliodora*) and/or Blakely's Red Gum (*Eucalyptus blakelyi*). Apple Box (*Eucalyptus bridgesiana*) and Candlebark (*Eucalyptus rubida*) are the most common co-dominant trees;
- remnants of the community in good condition have a ground cover dominated (50% or more of the perennial species) by native grasses and forbs;
- the ground cover of remnants in lower condition may not be dominated by native species, yet retain a canopy of mature trees (20 or more per hectare on average) and/or support natural regeneration;
- a patch size of at least 0.1 ha.

Polygons within which most or all of the trees have been cleared (described as secondary grassland) also constitute the NC Act listed community, provided:

- Yellow Box and/or Blakely's Red Gum are estimated to have previously been the dominant or co-dominant species;
- a relatively diverse native understorey is present; and
- the patch size is at least 0.1 ha.

Presence in the study area – Absent – The study area has been modified to the extent that they now lack the required canopy cover, natural regeneration, native groundstorey, and native understorey diversity to meet the definition of NC Act Box-Gum Woodland. The study area does not support NC Act listed Box-Gum Woodland.

[2] ACT Government (2019). *ACT Native Woodland Conservation Strategy and Action Plans*. Environment, Planning and Sustainable Development, Canberra.

2.5 Native Vegetation

Pursuant to the NC Act, 'native vegetation' is defined as present if:

- *trees or shrubs indigenous to the area have a canopy cover of 10% or greater in any stratum; or*
- *native plants indigenous to the area comprise 50% or more of the cover of the groundstorey (grasses, small shrubs, forbs, sedges etc.).*

Although no zone supports a native understorey, ACT16 supports an overstorey of planted local and non-local overstorey species. While the south-eastern patch of eucalypts contains some planted non-indigenous species, these trees area interspersed with planted trees that are indigenous to the area. We have therefore defined all ACT16 Zone 1 as NC Act native vegetation (refer Figure 3).

The study area therefore supports 0.23 ha of NC Act native vegetation (Figure 3).

2.6 Threatened Flora Occurrence

No EPBC Act and/or NC Act listed threatened flora species were recorded in the study area during the field surveys, nor have any been previously recorded in the study area (as indicated by previous ecological studies, ACTmapi, and Canberra Nature Map). Given the study area's history of disturbance, none of the threatened flora species with the potential to occur in the locality are considered to have a moderate or higher likelihood of occurrence in the study area.

2.7 Fauna Habitat and Threatened Fauna Occurrence

2.7.1 Native fauna recorded

As detailed in Appendix B, 10 native bird species were recorded during the field survey. All of these are common urban-adapted species in the ACT and region. No EBPC Act or NC Act listed species were recorded during surveys.

2.7.2 Fauna habitat

The study area supports the following fauna habitat features.

- The nectar and seed from the numerous Eucalypts *Eucalyptus* spp., River Sheoak *Casuarina cunninghamiana*, and other native species planted within the study area would provide a foraging resource for numerous woodland bird species, potentially including listed species.

  Hollows were recorded within several Willows at the lake edge in ACT16 Zone 2. These hollows may provide habitat for woodland birds.

- The absent midstorey and shrubstorey is likely to limit the habitat value of the study area for many of the region's threatened and rare woodland birds, which generally prefer to inhabit woodland where such features are more intact.

- The study area supports a sparse understorey dominated by exotic species. Such areas are unlikely to be of value to threatened fauna species but may be used by common native fauna (e.g. birds, kangaroos, reptiles, arthropods).

- The lake supports habitat for numerous aquatic species including several waterbirds, the aquatic mammal Rakali (Water Rat) *Hydromys chrysogaster*, as well as the EPBC Act listed Murray Cod *Maccullochella peelii*.

- As detailed in the Likelihood of Occurrence Assessment (Appendix D), several threatened woodland birds may visit the study area to forage. However, it is unlikely that the foraging resources present within the study area constitute an important proportion of those present within the locality for any threatened fauna species.
- The study area is unlikely to constitute important habitat for any EPBC Act listed migratory birds, although some migratory species may periodically forage within the study area.

2.8 Pest Animals

No exotic pest species were recorded in the study area during the field surveys. However, it can be assumed that the exotic pest species, European Rabbit *Oryctolagus cuniculus*, Red Fox *Vulpes vulpes*, Common Starling *Sturnus vulgaris*, Indian Myna *Acridotheres tristis*, and House Sparrow *Passer domesticus* will likely be present or visit the study area to forage. Each of these species is commonly encountered in such peri-urban sites.

2.9 Pest Plants

Twenty (20) exotic plant species were recorded in the study area. Whilst the majority of these are common weeds across urban land throughout the region, the species in Table 7 are listed as Commonwealth Weeds of National Significance (WoNS) and/or as declared pest plant species in the ACT.

Table 7. Noxious weed occurrence

Name	Growth Form	Status	Description of Occurrence	Threat Level
Nassella neesiana Chilean Needle Grass	Tussock <1.2 m	WoNS/ Must be contained/ Prohibited	Moderate to high presence across the study area	Moderate – Control of this species is recommended to prevent its proliferation in the study area and adjoining land.
Paspalum dilatatum Paspalum Grass	Tussock <1.2 m	Must be contained/ Prohibited	Moderate presence across the study area.	Low
Salix sp. Willow	Tree >3m	WoNS/ Must be suppressed/ Prohibited	Small patch of trees in south-west corner of the study area	Low

Key for table. WoNS - (Commonwealth) Weed of National Significance. Declared pest plant species in the ACT listed under the *Pest Plants and Animals (Pest Plants) Declaration 2005*: Notifiable; Must be suppressed; Must be contained; Prohibited.

3. Avoidance, Minimisation and Mitigation Measures

A number of measures are proposed to further minimise and mitigate the impact of the proposed development upon the ecological values of the study area and surrounds.

Site selection

The site of the proposed development has been carefully considered. One of the deciding factors for the choice of this site is the entirely modified vegetation of the study area. The proposed development will result in a very small area of native vegetation clearance, that may be limited to the trimming of the canopy of one She-oak tree.

Weed management

The key potential risk to the biodiversity values of the study area and adjoining areas during construction of the proposed development is the facilitated spread of the high threat weeds. Three exotic plant species listed as ACT Pest Plants were recorded in the study area, including two (Chilean Needle Grass and Willow) which are also listed as a Commonwealth Weeds of National Significance (WoNS). These species should be controlled as part of the proposed development. Therefore, at a minimum, the following weed management measures will be implemented during construction.

- Appropriate vehicle hygiene will be maintained. Vehicles and machinery entering the study area will be clean of weed seed or propagules.
- Only sterile materials such as hessian/jute or rice straw will be used for soil stabilisation or similar purposes.
- High threat weeds will be prevented from establishing on newly created road verges, landscaped areas, and other open space.

Sedimentation and erosion control

Best practice sediment and erosion control, such as the use of sediment traps, sediment interception ponds, silt fences and haybale fences, will be implemented as required during construction to minimise the flow of water and associated material into the surrounding areas and water sources.

Recommendations for landscaping

The following principles should be followed for landscaping.

- Local native species will be used for landscaping to the fullest extent practicable.
- Where practicable, a diversity in strata should be established (i.e. groundcover grasses and forbs, midstorey shrubs, and canopy trees) to increase habitat complexity. This will discourage urban-adapted species and encourage small woodland birds to visit the study area and surrounds.

4. Summary of Proposed Direct Impacts

As illustrated in Figure 5, the proposed development will result in the maximum clearance of a total area 0.16 ha of vegetation, consisting of the following.

- 0.01 ha of PCT16 Zone 1 may be impacted. This impact could potentially be limited to the trimming of the canopy of the planted She-oak that overhangs the extent of the proposed development. However, there is the possibility that this tree will be removed due to the proposed development. This vegetation meets the definition of NC Act native vegetation in low condition.
- 0.16 ha of low diversity exotic groundstorey vegetation (i.e. PCT16 Zones 1, 2, and 3).
- The removal of two exotic Honey Locust trees to the east of the proposed development.

The proposed development will not impact an EPBC Act threatened ecological community or potentially important habitat for any EPBC Act or NC Act listed threatened flora or fauna species.

5. Legislative Requirements

5.1 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Matters of National Environmental Significance

The EPBC Act is the key Commonwealth Government legislation for the protection and conservation of Australia's environment and biodiversity. The EPBC Act provides the legislative framework for the assessment and approval mechanism requiring that proposed 'actions' to be assessed in terms of their potential to impact upon 'Matters of National Environmental Significance' (MNES). MNES currently listed under the EPBC Act are:

- listed threatened species and communities;
- listed migratory species;
- Ramsar wetlands of international importance;
- Commonwealth marine environment;
- world heritage properties;
- national heritage places;
- the Great Barrier Reef Marine Park;
- nuclear actions; and
- a water resource, in relation to coal seam gas development and large coal mining development.

Where a potential impact on a MNES may occur as a result of a proposed action, the significance of that impact must be assessed. Guideline criteria for determining whether an impact is significant are provided under the Act[3]. Where a proposed action will, or is likely to, have a significant impact on a MNES, the proposed action must be referred to the Commonwealth Minister for Agriculture, Water and the Environment. The purpose of the referral is to determine whether a proposed action requires approval and/or controls under the EPBC Act.

With regard to the above, it is unlikely that the proposed development will have a significant impact on a MNES given the study area does not:

- support any EPBC Act listed ecological communities;
- support any EPBC Act listed flora species; or
- contain habitat of potential importance to any EPBC Act listed threatened or migratory fauna species.

In light the above, EPBC Act referral is unwarranted and is not recommended

Whole of Environment

[3] Commonwealth of Australia (2013a). *Matters of National Environmental Significance - Significant Impact Guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth Department of the Environment

As the proposed development will occur on Designated Land, the significance of the proposed action on the 'whole of environment' must also be assessed. Guidelines for determining whether an impact is significant are provided by the Department of the Environment (Commonwealth of Australia 2013b[4]) and are addressed below. If the proposed action will, or is likely to, have a significant impact on the 'whole of environment', it must be referred to the Commonwealth Minister for Agriculture, Water and the Environment. The purpose of the referral is to determine whether a proposed action requires approval and/or controls under the EPBC Act.

In deciding whether or not the proposed action is likely to have a significant impact on the 'whole of environment', the following must be considered.

- The environmental context

  The vegetation which occurs in the study area is highly modified and manicured. The study area has been cleared, intensively landscaped, and regularly mown over a long period of time. The remnant overstorey is absent and the native midstorey and shrubstorey have been entirely removed. The groundstorey is heavily modified and dominated by a variety of exotic lawn grasses and common weeds. The few native non-grass species present in the study area are primarily non-local native species of various provenance, all of which have been planted for landscaping purposes.

  The study area is adjacent to high quality habitat to the north (i.e. Black Mountain Nature Reserve). Given the historic modification of the study area and the ongoing disturbance caused by visitors to Black Mountain peninsular, it is unlikely that the study area constitutes a significant component of a wildlife movement corridor or is otherwise important for fauna habitat connectivity. This is evident as the majority of the study area is not identified as a 'Local Link' or as possessing 'Regional Linkage Value' on ACTmapi.

- The potential impacts likely to be generated by the action, including indirect consequences of the action

  Given the historic modification of the study area and its long-term and ongoing use as a recreational area, it is unlikely that the planted trees or exotic pasture constitute a significant resource for fauna in the locality. Furthermore, the study area is adjacent to high quality habitat to the north (i.e. Black Mountain Nature Reserve) that contains intact native vegetation and expanses of important habitat for native fauna. The planted trees in the study area comprise only a very small proportion of the trees present within a one-kilometre radius of the study area.

  The loss of such a small patch of exotic pasture and two exotic trees is unlikely to significantly impact the environment. In addition, the proposed development includes substantial plantings of local and non-local trees, shrubs, and groundcover. Once mature, these plantings will help to offset the impact of the proposed development.

  With respect to the above, it is highly unlikely that the removal of the planted exotic trees will significantly impact the environment, either directly or indirectly.

[4] Commonwealth of Australia (2013b). *Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies - Significant Impact Guidelines 1.2. Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth Department of the Environment

- Whether mitigation measures will avoid or reduce these impacts

  The study area supports substantially modified vegetation and is primarily used for recreational purposes. As a result, the majority of the study area has been intensively landscaped and regularly mown over a long period of time. This has modified the groundlayer and encouraged the proliferation of exotic species. The selection of this site for the proposed development therefore largely avoids impacts on the environmental values of the locality.

  Combined with the weed control strategies outlines in Section 3, the mitigation measures outlined in this EIA further reduce the potential impacts on the environment.

With respect to the above, and from an ecological values perspective, the proposed development is unlikely to significantly impact upon the 'whole of environment'. As such, EPBC Act referral is unwarranted and is not recommended.

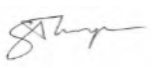
6. Conclusion and Recommendations

As detailed herein and illustrated in Figure 5, the proposed development:

- may clear a small area (0.01 ha) of NC Act native vegetation;
- will not impact any EPBC Act or NC Act listed threatened ecological communities;
- will not impact any EPBC Act and/or NC Act listed threatened flora species (or species considered 'rare and uncommon' in the ACT);
- is unlikely to significantly impact any EPBC Act and/or NC Act listed threatened fauna species; and
- is unlikely to significantly impact any EPBC Act and/or NC Act listed threatened or migratory fauna species (or species considered conservation dependent in the region).

We trust that this EIA provides the information and advice required. If, however, you should have any questions relating to this report, please do not hesitate to contact us.

Yours sincerely,



Robert Speirs

Director / Principal Ecologist

Shannon Thompson

Ecologist

Attachments:

Figure 1. Locality Plan

Figure 2. Study Area on Historical Aerial Imagery (1955)

Figure 3. Study Area on Recent Aerial Imagery

Figure 4. Vegetation Survey and Mapping

Figure 5. Proposed Impact Area

Appendix A. Flora Species Recorded

Appendix B. Fauna Species Recorded

Appendix C. Threatened Species Likelihood of Occurrence Assessment

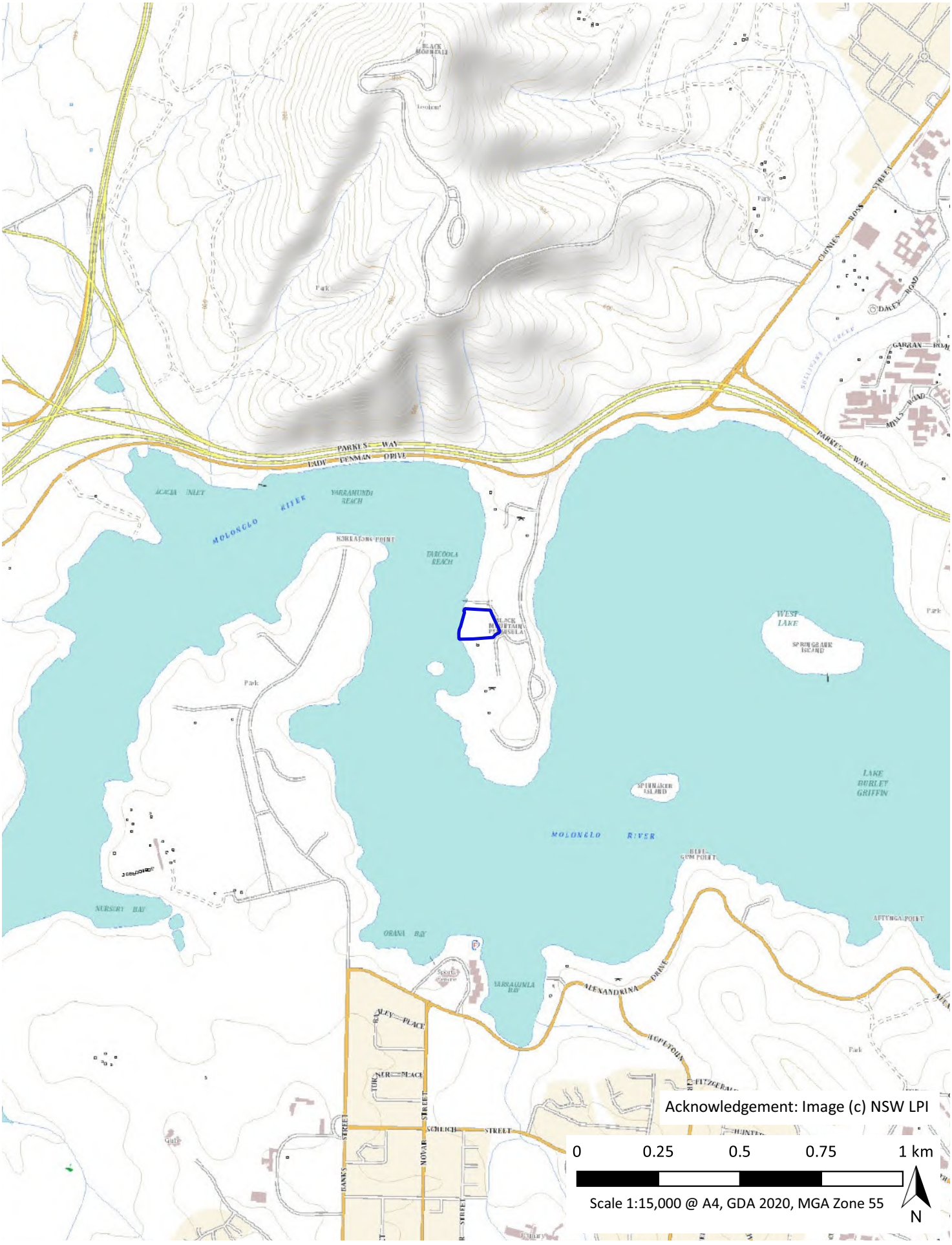


Figure 1. Locality Plan

Legend

Study Area

Capital Ecology Project No: 3053
Drawn by: S. Thompson
Date: 15 July 2021

capital ecology

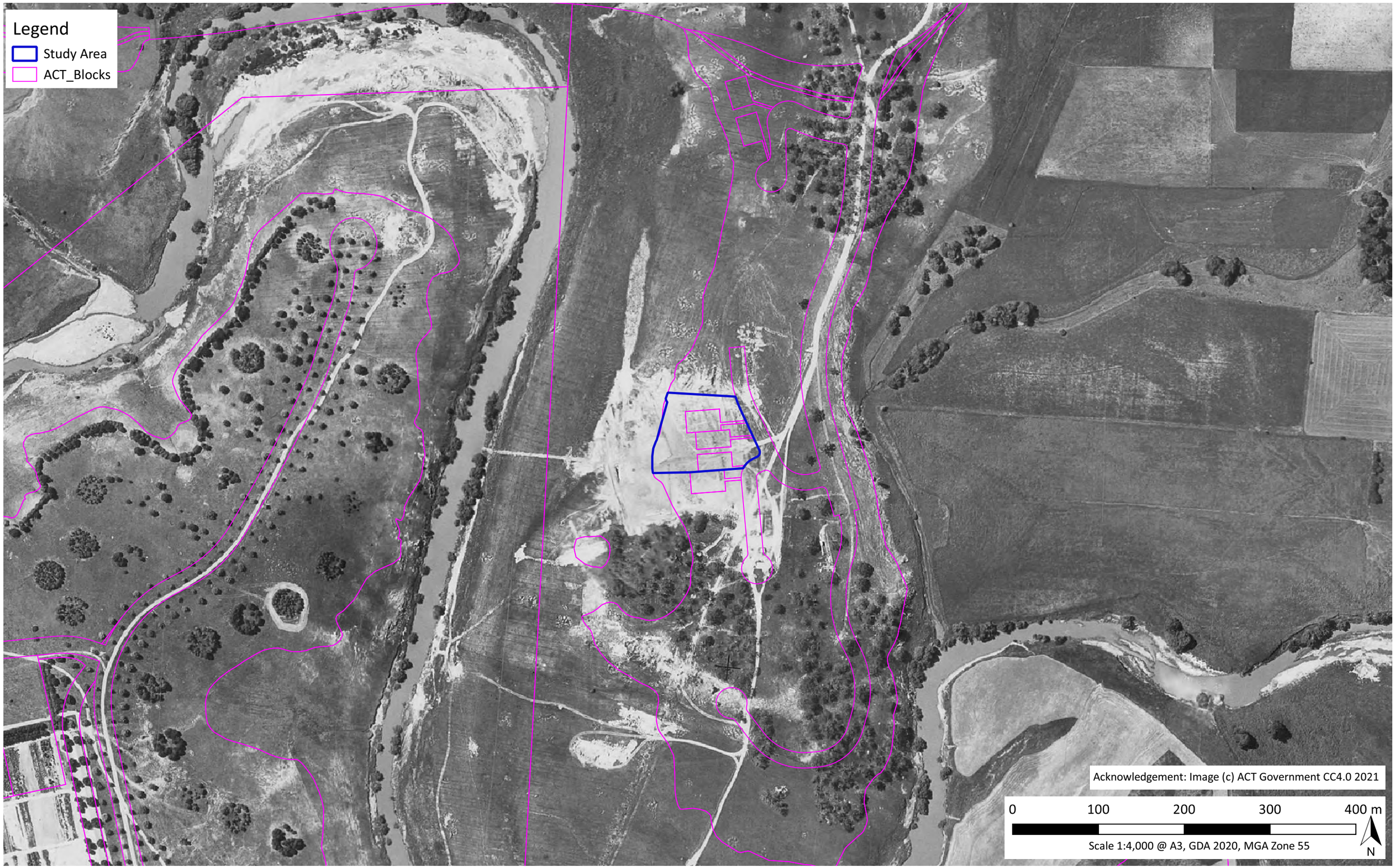


Figure 2. Study Area on Historical Aerial Imagery (1955)

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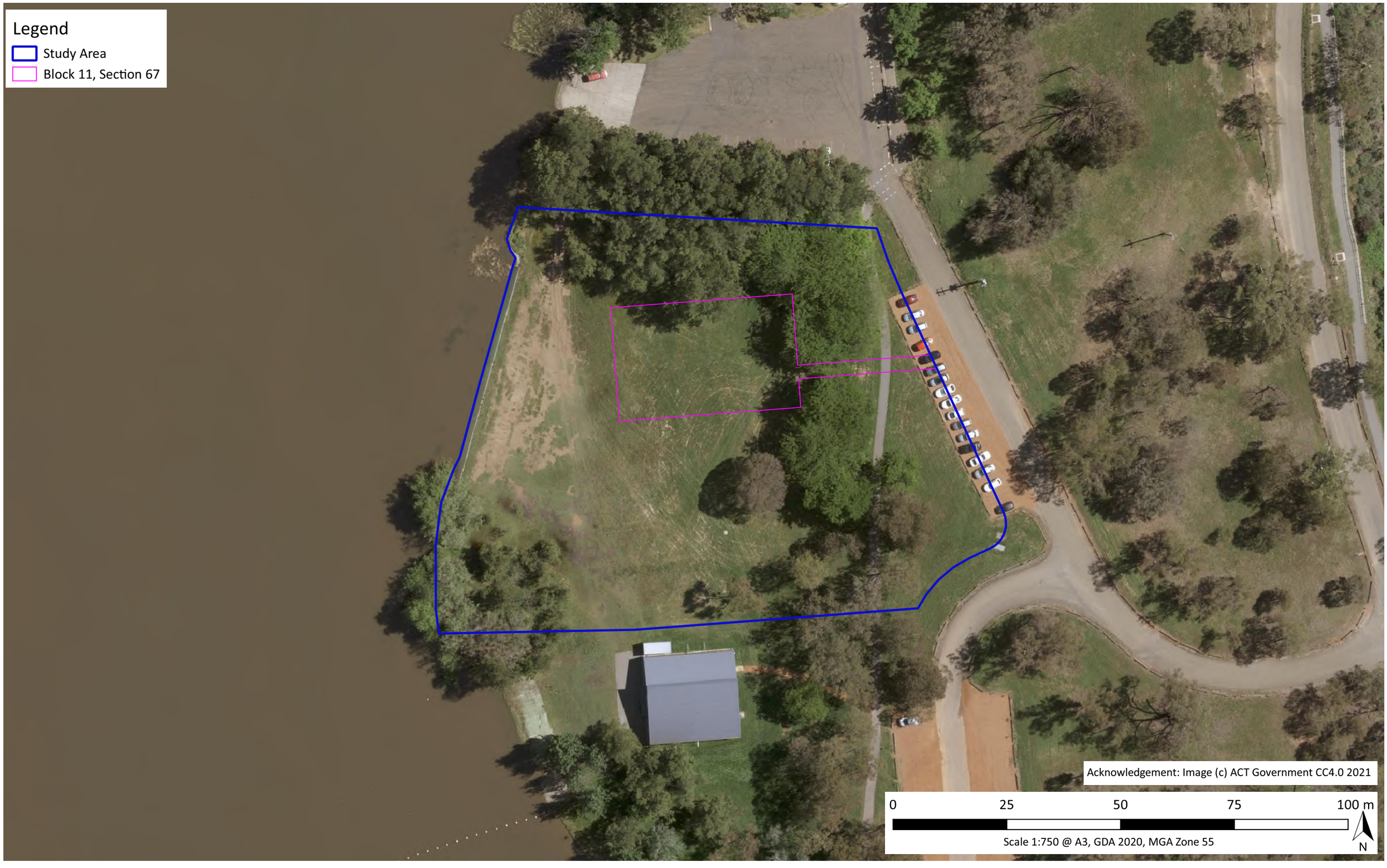

Figure 3. Study Area on Recent Aerial Imagery (Nov 2020)

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Figure 4. Vegetation Survey and Mapping

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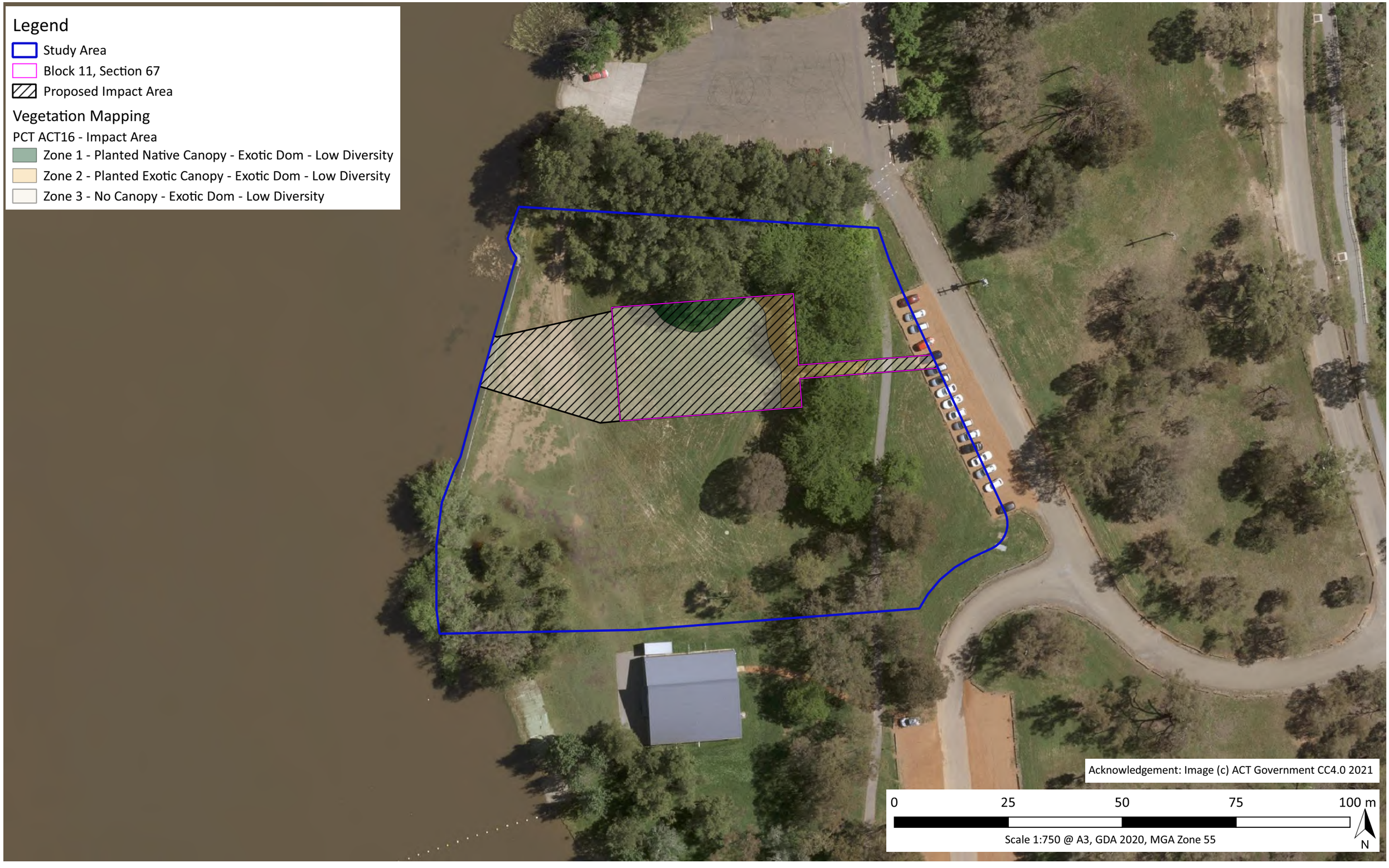

Figure 5. Proposed Impact Area

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Appendix A. Flora Species Recorded

Species	Common Name	Status
Exotic		
Arctotheca calendula	Cape Weed	-
Cirsium vulgare	Spear Thistle	-
Cynodon dactylon	Couch Grass	-
Eleusine tristachya	Goose Grass	-
Lactuca serriola	Prickly Lettuce	-
Lolium perenne	Perennial Ryegrass	-
Malva sp.	Mallow / Marshmallow Weed	-
Modiola caroliniana	Red-flowered Mallow	-
Nassella neesiana	Chilean Needle Grass	ACT Pest Plant, WoNS
Paronychia brasiliana	Brazilian Whitlow	-
Paspalum dilatatum	Paspalum Grass	ACT Pest Plant
Salix sp.	Willow	ACT Pest Plant, WoNS
Trifolium sp.	Clover	-
Vulpia sp.	Rat's Tail Fescue	-
Native		
Allocasuarina cunninghamiana	River She-oak	Protected
Daucus glochidiatus	Native Carrot	Protected
Eucalyptus polyanthemos	Red Box	Protected
Eucalyptus saligna	Sydney Blue Gum	Protected
Juncus australis	Austral Rush	Protected
Rumex brownii	Swamp Dock	Protected
	Number of Species	20
	Number of Native Species	6
	Number of Exotic Species	14
	Number of ACT Pest Plants	3
	Number of WoNS	2

Appendix B. Fauna Species Recorded

Scientific Name	Common Name	Classification	Status
Cacatua galerita	Sulphur-crested Cockatoo	Aves	Native
Corvus coronoides	Australian Raven	Aves	Native
Fulica atra	Eurasian Coot	Aves	Native
Gymnorhina tibicen	Australian Magpie	Aves	Native
Manorina melanocephala	Noisy Miner	Aves	Native
Ocyphaps lophotes	Crested Pigeon	Aves	Native
Platycercus elegans	Crimson Rosella	Aves	Native
Platycercus eximius	Eastern Rosella	Aves	Native
Strepera graculina	Pied Currawong	Aves	Native
Sturnus vulgaris	Common Starling	Aves	Exotic

Appendix C. Threatened Species Likelihood of Occurrence Assessment

Key for the below table:

1) Listed pursuant to the EPBC Act as Critically Endangered (CE), Endangered (E), or Vulnerable (V)
2) Listed pursuant to the NC Act as Critically Endangered (CE), Endangered (E) or Vulnerable (V)

Note: The brief descriptions of species distribution and habitat are paraphrased from or based on information sourced from the threatened species profiles, recovery plans and listing determinations prepared for each species by the Commonwealth and ACT governments. These resources and their references can be found on the relevant government websites.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Plants				
Amphibromus fluitans River Swamp Wallaby-grass	V	-	River Swamp Wallaby-grass has been recorded along the Lachlan River at sites at Laggan near Crookwell and the headwaters of the Wollondilly River. The species grows mostly in permanent swamps, as well as lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground, such conditions being caused by seasonally-fluctuating water levels.	Negligible The species is not known to occur near the study area and was not recorded during the field survey.
Eucalyptus aggregata Black Gum	V	-	Black Gum occurs on the central and southern tablelands of NSW, and in a small disjunct population in Victoria. In NSW, it occurs predominantly in the South Eastern Highlands Bioregion. The species is a small to medium-sized woodland tree which grows in grassy woodlands on alluvial soils in moist sites along creeks on broad, cold and poorly-drained flats and hollows. It commonly occurs with Candlebark *Eucalyptus rubida*, Ribbon Gum *E. viminalis*, and Snow Gum *E. pauciflora*, with a grassy understorey of River Tussock *Poa labillardieri*. Most populations are located on private land or road verges and travelling stock routes.	Negligible The species is not present in the study area.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Lepidium hyssopifolium Basalt Peppercress	E	-	This species is known from a few populations in NSW, Victoria and Tasmania. The Basalt Pepper-cress is known to establish on open, bare ground with limited competition from other plants. It was previously recorded from Eucalypt woodland with a grassy ground cover, low open Casuarina woodland with a grassy ground cover and tussock grassland. Recently recorded localities have predominantly been in weed-infested areas of heavy modification, high degradation and high soil disturbance such as road and rail verges, on the fringes of developed agricultural land or within small reserves in agricultural land. Many populations are now generally found amongst exotic pasture grasses and beneath exotic trees.	Negligible The species is not known to occur near the study area and was not recorded during the field surveys.
Leucochrysum albicans var. *tricolor* Hoary Sunray	E	-	The Hoary Sunray occurs from Queensland to Victoria and in Tasmania. In the ACT the species can be seen in spring in abundance on the roadside along Fairbairn Avenue and into Mt Ainslie Nature Reserve, on the western slopes of Mt Majura and adjacent to the Federal Highway road easement. The species is usually found in ungrazed and lightly grazed areas, along roadsides in particular. It appears to be very sensitive to grazing but responds to disturbance as a coloniser and appears to tolerate mowing. Flowers spring to summer.	Negligible The species is conspicuous when in flower and has not been recorded in the study area. It is unlikely that the species is present and has not been previously identified.
Pomaderris pallida Pale Pomaderris	V	-	A compact perennial shrub, growing to 1.5 m high. It is found in the ACT, southern NSW and eastern Victoria. In the ACT it is scattered along the Cotter, Paddy's and Murrumbidgee Rivers and through the Molonglo Gorge. It is found along the plateau edge and very steep upper slopes and cliffs of river valleys, in shallow, pale brown sandy loam soil over granite rock. It grows in shrubland, surrounded by *Eucalyptus* or *Callitris* woodland. In the ACT, it is only found on the eastern banks of the rivers.	Negligible The species is not known to occur near the study area and was not recorded during the field survey.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Prasophyllum petilum Tarengo Leek Orchid	E CE (listed as *Prasoiphyllum* sp. Wybong)	E	When first described in 1991, the Tarengo Leek Orchid was known only from the Hall Cemetery in the ACT. It has since been found at four sites in New South Wales: Captains Flat Cemetery, Ilford Cemetery, Steves Travelling Stock Route (TSR) at Delegate and the Tarengo TSR near Boorowa. The Tarengo Leek Orchid occurs on relatively fertile soils in grassy woodland or natural grassland. The three cemetery sites originally contained grassy woodland, dominated by Snow Gum *Eucalyptus pauciflora* and Black Gum *E. aggregata* at Captains Flat, and Blakely's Red Gum *E. blakelyi* and Yellow Box *E. melliodora* at Hall and Ilford. Both Tarengo TSR and Steves TSR are natural grasslands. The species is intolerant of grazing and this is considered to be the key reason it has been found only within cemeteries and TSRs, land from which grazing has been restricted.	Negligible The study area is too modified to constitute potential habitat. The species is not known to occur near the study area, and it was not recorded during the field survey.
Rutidosis leptorrhynchoides Button Wrinklewort	E	E	In the ACT and NSW, Button Wrinklewort occurs in box-gum woodland, secondary grassland derived from box-gum woodland or in natural temperate grassland. It prefers open spaces where it does not have to compete for light. It is known from several sites in the ACT, NSW and Victoria, where it is threatened by habitat loss, grazing and weed encroachment.	Negligible The study area is too modified to constitute potential habitat. The species is not known to occur near the study area, and it was not recorded during the field survey.
Senecio macrocarpus Large-fruit Groundsel	V	-	The Large-fruit Groundsel is a small perennial plant endemic to south-eastern Australia. While most known populations occur within Victoria and South Australia, the species has been recorded within the NSW southern tablelands. This species occurs in a variety of habitats, including grasslands, shrublands and woodlands. The species is known to grow in association with Teatree and Kangaroo Grass populations, as well as Yellow Box woodlands. The species appears to be intolerant of grazing and agricultural pressures. Main loss of habitat is thought to be due to sheep grazing and pasture improvement of relevant habitat.	Negligible The study area is unlikely to provide potential habitat to the species due to land use history and the degraded nature of the vegetation present. The species is also not known to occur in the locality.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Swainsona recta Small Purple-pea	E	E	The Small Purple-pea occurs in the grassy understorey of woodlands and open forests dominated by Blakely's Red Gum, Yellow Box, Candlebark and Bundy. The species grows in association with understorey dominants that include Kangaroo Grass, poa tussocks and spear-grasses. Plants die back in summer, surviving as rootstocks until they shoot again in autumn. The species is intolerant of grazing but generally tolerant of fire, which also enhances germination by breaking the seed coat and reducing competition from other species.	Negligible The study area is too modified to constitute potential habitat. The species is not known to occur near the study area, and it was not recorded during the field survey.
Thesium australe Austral Toadflax	V	-	Found in very small to large populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Austral Toadflax is a root parasite that takes water and some nutrients from other plants, especially Kangaroo Grass. It is often found in damp sites in association with Kangaroo Grass but it is also found on other grass species at inland sites. Occurs on clay soils in grassy woodlands or coastal headlands.	Negligible The study area is unlikely to constitute potential habitat for this species. The study area is too modified and the usual host species are not present.
Mammals				
Chalinolobus dwyeri Large-eared Pied Bat	V	-	The Large-eared Pied Bat is found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. The species roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin *Petrochelidon ariel*. The species frequents low to mid-elevation dry open forest and woodland close to roosts and is often found in well-timbered areas containing gullies.	Low No potential roosting habitat is present in the study area or nearby. As the species is known to forage close to roost sites, it is unlikely to forage in the study area.
Dasyurus maculatus maculatus Spot-tailed Quoll (SE mainland population)	E	V	The Spot-tailed Quoll occurs along the east coast of Australia and the Great Dividing Range. The species uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings have been made in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Seventy per cent of the diet is medium-sized mammals, and also feeds on invertebrates, reptiles and birds. Individuals require large areas of relatively intact vegetation through which to forage. The home range of a female is between 180 and 1000ha, while males have larger home ranges of between 2000 and 5000ha. Breeding occurs from May to August.	Negligible The species is highly unlikely to occur within the study area.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Petauroides Volans Greater Glider	V	-	The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria, with an elevational range from sea level to 1200 m above sea level. The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, and is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species	Negligible The study area does not contain potential habitat for the species.
Petrogale penicillate Brush-tailed Rock-wallaby	V	E	The Brush-tailed Rock-wallaby was once widespread in south-eastern Australia, but its range and numbers have contracted, particularly in Victoria and southern NSW. The last sighting of this species in the ACT was in Tidbinbilla Nature Reserve in 1959. Populations are comprised of small, isolated groups or 'colonies'. Each colony may occupy a territory of up to 35 ha. The species prefers rocky habitats/outcrops and steep slopes/cliffs, combined with dense arboreal cover. They are associated with rainforest, wet and dry sclerophyll forest, vine thicket, and open forest.	Negligible The species is not known to occur in the lowland/urban areas of the ACT.
Phascolarctos cinereus Koala (combined populations of Qld, NSW and the ACT)	V	-	In NSW, the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. They are solitary with varying home ranges. In high quality habitat home ranges may be 1 -2 ha and overlap, while in semi-arid country they are usually discrete and around 100 ha.	Negligible The species is not known to occur in the lowland/urban areas of the ACT region.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Pteropus poliocephalus Grey-headed Flying Fox	V	-	The Grey-headed Flying Fox occurs in the coastal belt from Rockhampton in central Queensland to Melbourne in Victoria. Whilst Brisbane, Newcastle, Sydney and Melbourne are occupied continuously, the species is widespread throughout their range during summer. In autumn the species occupies coastal lowlands and is uncommon inland. In winter the species congregates in coastal lowlands north of the Hunter Valley and is occasionally found on the south coast of NSW and on the northwest slopes (associated with flowering eucalypts of these areas). The Grey-headed Flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. The Grey-headed Flying-fox roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. The roost at Commonwealth Park in Canberra is the only known roost in the ACT region.	Low The species may periodically forage within the study area on flowering eucalypts. However, the study area is highly unlikely to contain habitat of significance to the species. Finally, the study area is not located near any known camps.
Birds				
Anthochaera phrygia Regent Honeyeater	CE	E	A semi-nomadic species occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. It also utilises a number of other eucalypt species. Nectar and fruit from the mistletoes *Amyema miquelii*, *A. pendula*, and *A. cambagei* are also eaten during the breeding season. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and sheoaks as well as within mistletoe haustoria (section of the root which connects with the host tree). An open cup-shaped nest is constructed by the female of bark, grass, twigs and wool.	Low There are records of this species within 1.5 km north on Black Mountain and 5 km east on Mt. Ainslie. The species may periodically visit the study area to forage, however it is not known to nest in the locality and the potential foraging habitat is not of potential importance to the species.
Botaurus poiciloptilus Australasian Bittern	E	E1	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes *Typha* spp. and spikerushes *Eleocharis* spp.. Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails.	Negligible There is no potential habitat for this species in the study area and there are no records in the locality.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Calidris ferruginea Curlew Sandpiper	CE	-	The Curlew Sandpiper occurs around the coast of Australia, and are also widespread inland, albeit in smaller numbers. In the south-east they are occasionally recorded in the Tablelands and often in the Riverina. When inland, they are found around ephemeral and permanent lakes, dams, waterholes and bore drains. Curlew Sandpipers prey mainly on invertebrates, foraging on mudflats and at the edge of shallow pools, wading up to depths of 60 mm deep. They generally roost on dry shingle or sandy beaches, sandspits, and islets. Curlew Sandpipers are migratory and adults are found in Australia from August to April, juveniles are found year-round. This species does not breed in Australia.	Negligible The study area does not support potential habitat for this species.
Calyptorhynchus lathami Glossy Black-cockatoo	-	V	The Glossy Black-cockatoo has a patchy distribution, having once been widespread across most of the south-east of Australia. The species is now distributed throughout an area which extends from the coast near Eungella in eastern Queensland to Mallacoota in Victoria. Glossy black-cockatoos feed on casuarina seeds, however they occasionally consume seeds from eucalypts, angophoras, acacias and hakeas, as well as insect larvae. In the ACT region the species feeds almost exclusively on Drooping Sheoak (*Allocasuarina verticillata*). Pairs mate for life and nest in the hollows of large, old living or dead eucalypt trees. Breeding takes place between March and August.	Low The study area does not provide potential breeding habitat or substantial foraging habitat for this species (note the species feeds almost exclusively on Drooping Sheoak).
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	-	V	In the ACT region, Brown Treecreepers occur in dry woodlands and open forest below 1,000 metres. The species is relatively common along the Clear Range and along the Lower Naas River. Other populations occur at Mulligans Flat Reserve, Campbell Park, Burbong and former quarries south of the airport in the northern part of the ACT, and at Castle Hill, north of Tharwa. Brown Treecreepers also frequent paddocks and grasslands where there are sufficient logs, stumps and dead trees nearby. The species prefers relatively undisturbed woodland and dry open forest where the native understorey, especially grasses, has been preserved. The species usually prefers predominantly rough-barked trees such as Stringybarks and rough barked Boxes.	Low The species may periodically visit the study area to forage, however it is unlikely to nest within the study area.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Daphoenositta chrysoptera Varied Sittella	-	V	In the ACT region, the Varied Sittella occurs in a wide variety of woodland and forest habitats, particularly in lowland areas. The species prefers areas with a dominance of rough barked trees, notably Red Stringybark at relatively high density. The species is rarely recorded in sparsely treed areas.	Low There are records of this species within 1.5 km north on Black Mountain and 5 km east on Mt. Ainslie. The species may visit the study area to forage, however it is unlikely to nest in the study area.
Falco hypoleucos Grey Falcon	V	-	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. The species is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Negligible The species has not been recorded in the locality. The study area does not contain any foraging or breeding habitat for this species.
Grantiella picta Painted Honeyeater	V	V	The Painted Honeyeater is found in Queensland and New South Wales west of the Great Dividing Range, through to northern Victoria. The species displays some migratory movement and is occasionally found in the Northern Territory and is a vagrant to South Australia and the ACT. The species frequents eucalypt forests and woodlands, particularly those that are infested heavily with mistletoes. In the ACT, the species' primary habitat is River Oak (*Casuarina cunninghamiana*) along river systems, especially the Murrumbidgee River.	Low The species may periodically visit the study area to forage, however it is not known to nest in the locality.
Hieraaetus morphnoides Little Eagle	-	V	The Little Eagle is distributed throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment, and occupies habitats rich in prey within open eucalypt forest, woodland or open woodland. The species is sensitive to human disturbance.	Low The study area may be part of the range of an individual or pair of Little Eagles, but the species is unlikely to forage or nest in the study area.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Hirundapus caudacutus White-throated Needletail	V	-	The White-throated Needletail is a trans-equatorial migratory bird species which has been recorded in all coastal regions of Queensland and New South Wales and is widespread throughout Victoria. Breeding sites have been primarily located in Asia. In Australia, this species is often recorded above open forest and rainforest, and coastal areas. Feeds on a wide variety of insects during non-breeding season then returns north. Roosts amongst dense tree foliage and in tree hollows.	Negligible There is no potential habitat for this species in the study area.
Lathamus discolor Swift Parrot	CE	V	The Swift Parrot occurs in woodlands and forests of NSW (and occasionally the ACT) from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.	Low The species may visit the study area during winter, however this is unlikely given the habitat present.
Numenius madagascariensis Eastern Curlew	CE	-	The eastern curlew is Australia's largest shorebird and a long-haul flyer. The eastern curlew takes an annual migratory flight to Russia and north-eastern China to breed, arriving back home to Australia in August to feed on crabs and molluscs in intertidal mudflats. It is extremely shy and will take flight at the first sign of danger.	Negligible The study area does not support potential foraging habitat for the species.
Petroica boodang Scarlet Robin	-	V	The Scarlet Robin is found in south-eastern Australia (extreme south-east Queensland to Tasmania, western Victoria and south-east South Australia) and south-west Western Australia. In NSW it occupies open forests and woodlands from the coast to the inland slopes, breeding in drier eucalypt forests and temperate woodlands.	Low There are records of this species within 1.5 km north on Black Mountain and 5 km east on Mt. Ainslie. The species may periodically visit the study area to forage, however it is not known to nest in the locality and the potential foraging habitat is not of potential importance to the species.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Polytelis swainsonii Superb Parrot	V	V	Found mainly in open, tall riparian River Red Gum forest or woodland. Often found in farmland including grazing land with patches of remnant vegetation. Breeds in hollow branches of tall eucalypt trees within 9 km of feeding areas.	Low The species may periodically visit the study area to forage. The study area does not contain breeding habitat for the species.
Rostratula australis Australian Painted Snipe	E	-	Usually found in shallow inland wetlands including farm dams, lakes, rice crops, swamps and waterlogged grassland. The species prefers freshwater wetlands, ephemeral or permanent, although it has been recorded in brackish waters.	Negligible The study area does not provide potential habitat for the species and the species is only rarely recorded at a few locations in the ACT region (i.e. Jerrabomberra Wetlands, upper Yerrabi Ponds etc.).
Amphibians				
Litoria aurea Green and Golden Bell Frog	V	-	The species is found in marshes, dams and stream sides, particularly those containing bullrushes or spikerushes. Preferred habitat contains water bodies that are unshaded, are free of predatory fish, have a grassy area nearby and have diurnal sheltering sites nearby such as vegetation or rocks, although the species has also been recorded from highly disturbed areas including disused industrial sites, brick pits, landfill areas and cleared land.	Negligible There is no potential habitat in the study area for this species and the species is not known to occur in the locality.
Litoria booroolongensis Booroolong Frog	E	-	The Booroolong Frog is restricted to tablelands and slopes in NSW and north-east Victoria at 200–1300 m above sea level. The species is predominantly found along the western-flowing streams and their headwaters of the Great Dividing Range, and a small number of eastern-flowing streams in the north end of its range. The Booroolong Frog occurs along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins, or near slow-flowing connected or isolated pools that contain suitable rock habitats. Streams range from small slow-flowing creeks to large rivers in dissected mountainous country, tablelands, foothills and lowland plains. Primary habitat requirements for the Booroolong Frog are extensive rock bank structures along permanent rivers. The species can occur in cleared grazing land and pasture.	Negligible There is no potential habitat in the study area for this species and the species is not known to occur in the locality.

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Litoria castanea Yellow-spotted Tree Frog	E	-	The Yellow-spotted Tree Frog previously had a disjunct distribution, being recorded on the New England Tablelands and on the Southern Tablelands from Lake George to Bombala. The species has only recently (2010) been rediscovered on the Southern Tablelands. Prior to this the species had not been recorded on the Southern Tablelands since the 1970s. Found in large permanent ponds, lakes and dams with an abundance of bulrushes and other emergent vegetation, it shelters during autumn and winter under fallen timber, rocks, other debris or thick vegetation.	Negligible There is no potential habitat in the study area for this species and the species is not known to occur in the locality.
Reptiles				
Aprasia parapulchella Pink-tailed Worm-lizard	V	V	The Pink-tailed Worm-lizard is a fossorial species which lives beneath surface rocks and occupies ant burrows. It feed on ants, particularly their eggs and larvae. Thought to lay eggs within the ant nests under rocks that it uses as a source of food and shelter and for thermoregulation. Key habitat features are a cover of native grasses, particularly Kangaroo Grass, sparse or no tree cover, little or no leaf litter, and scattered small rock with shallow embedment in the soil surface.	Negligible There is no potential habitat in the study area for this species.
Delma impar Striped Legless Lizard	V	V	The Striped Legless Lizard is patchily distributed in grasslands of south-eastern NSW, the ACT, north-eastern, central and south-western Victoria, and south-eastern South Australia. In the ACT, the species is known to occur at four separate locations - in grassland areas of Gungahlin, Majura and Jerrabomberra Valleys, and Yarramundi. Unsuitable habitat, roads and urban development separate these sites. Most areas where the species persists are thought to have had low to moderate levels of agricultural disturbance in the past and it has been suggested that ploughing in particular may be incompatible with the survival of the species. Until recently, the species was thought to inhabit only native grasslands dominated by species such as Tall Speargrass and Kangaroo Grass. In recent years, surveys have revealed the Striped Legless Lizard in many sites dominated by exotic species such as Phalaris, Serrated Tussock and Flatweed (Biosis Research 2012). They have also been found in several secondary grassland sites, generally within two kilometres of primary grassland.	Negligible There is no potential habitat in the study area for this species.
Fish and Crustacea				

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Maccullochella macquariensis Trout Cod	E	E	Trout Cod is endemic to the southern Murray–Darling river system. This species has suffered major declines in range and abundance with only a single 'natural' remnant population remaining (the Murray River between Yarrawonga and Barmah). Other populations have been re-established either through historic translocation (1920s) or through the national recovery program. The species is broadly found in rivers and larger streams and rarely in smaller creeks. In the ACT, Trout Cod is currently restricted to the Murrumbidgee and Cotter rivers, where it has been reintroduced. In the Murrumbidgee River in the ACT, scattered individuals are occasionally captured throughout the Murrumbidgee, particularly near Kambah Pool and Gigerline Gorge downstream of Angle Crossing. Similarly, in the Cotter River, individuals are regularly recorded in Bendora Reservoir and occasional individuals are sampled downstream of Bendora Dam.	Negligible The species is not known to occur in Lake Burley Griffin. There is no potential habitat in the study area for the species.
Maccullochella peelii Murray Cod	V	-	The Murray Cod's natural distribution extends throughout the Murray-Darling basin ranging west of the divide from south east Queensland, through NSW into Victoria and South Australia. The species is found in the waterways of the Murray– Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers, billabongs and large deep holes. Murray Cod is entirely a freshwater species and will not tolerate high salinity levels.	**Confirmed** This species is known to occur in Lake Burley Griffin. The proposed development is unlikely to impact upon the species.
Macquaria australasica Macquarie Perch	E	E	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their substantial tributaries.	Negligible The species is not known to occur in Lake Burley Griffin.
Insects				

Species Name	EPBC Act Status	NC Act Status	Description (Distribution and Habitat)	Likelihood of Occurrence/Impact
Synemon plana Golden Sun Moth	CE	E	The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut and the species has been recorded at many sites in the lowland areas of the ACT. The species occurs in Natural Temperate Grasslands and Box-Gum Grassy Woodland in which the groundcover is dominated by Wallaby Grasses (*Rytidosperma* spp.). It is believed that the females lay up to 200 eggs at the base of the Wallaby Grass tussocks. After hatching, the larvae tunnel underground where they remain feeding on the roots of Wallaby Grass tussocks. The species is also known to feed on the introduced species (and Weed of National Significance), Chilean Needle Grass *Nassella neesiana*.	Low While the study area contains the feed species Chilean Needle Grass, the groundstorey is highly disturbed and degraded to the extent that the species is highly unlikely to occur.