Flora and Fauna
survey and assessment

Parklea Correctional Centre,
Parklea,
NSW.

Draft Version 1.0

February 2016

Cover photographs:

Left: The character of the proposed carpark area. Planted trees in a linear fashion can be seen in the background.
Right: Character of one of the impounded water bodies.

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by

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This report is prepared in accordance with both the 6th Edition of the Commonwealth of Australia (2002) Style Manual and the Roads and Maritime Services Editorial Style Guide (2014).

Contents

List of Figures **Page**

List of Tables

List of Appendices

Glossary

Abbreviation	Definition
ASL	Above Sea Level
^{0}C	Degrees Celsius
DECC	NSW Department of Environment and Climate Change (now known as the NSW Office of Environment and Heritage)
DE	Commonwealth Department of the Environment
FBA	Framework for Biodiversity Assessment
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPA Act	NSW *Environmental Planning and Assessment Act 1979*
FM act	NSW *Fisheries Management Act 1994*
LGA	Local Government Area
ha/mm/cm/m/km/m^2	Hectares, millimetres, centimetres, metres, kilometres, square metres
NSW	New South Wales
NPW Act	NSW *National Parks and Wildlife Act 1974*
NPWS	NSW National Parks and Wildlife Service (now known as the NSW Office of Environment and Heritage)
NW Act	NSW *Noxious Weeds Act 1993*
OEH	NSW Office of Environment and Heritage
PMST	Protected Matters Search Tool
RoTAP	Rare of Threatened Australian Plant
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TSC Act	NSW *Threatened Species Conservation Act 1995*

For the purpose of this investigation:

Subject site	is defined as 'the area directly affected by the proposed works' (as per DECC 2007).
Study area	is defined as 'the subject site and any additional areas that are likely to be affected by the proposed works, either directly or indirectly' (DECC 2007).
Study region	is considered to 'include the lands that surround the subject site for a distance of 10 km' (DECC 2007).
Proposal	is considered to include 'all activities likely to be undertaken within the subject site' (DECC 2007).
Local population	of a threatened species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area (DECC 2007).
Important population	is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range (DE 2013).
Fish	means marine, estuarine or freshwater fish or other aquatic animal life at any stage of their life history (whether alive or dead) including oysters and other aquatic molluscs, crustaceans, echinoderms, beachworms and other aquatic polychaetes (as per the definitions provided in the FM Act)

1. Introduction

At the request of NSW Public Works, a flora and fauna investigation has been carried out within a section of the Parklea Correctional Centre, Parklea, NSW (Figure 1). The investigation has been undertaken as the Department of Justice is proposing to upgrade this facility. The upgrade will result in the establishment of additional buildings, a car parking facility, underground services, perimeter fencing and earthworks (Figure 2).

Not to scale Source: Nearmap (2016)

Figure 1. Study area

The works proposed to be undertaken are all located to the north, north-west and south-east of the existing centre (Figure 2).

Two impounded water bodies associated with Second Ponds Creek are present within the boundaries of the Correctional Centre (Figure 1), neither of which will be directly disturbed by the scope of works proposed.

The assessment of possible impacts associated with the proposed upgrading of the Correctional Centre is based on a field investigation of the subject site, a literature review of previous studies undertaken in both the region and this portion of the Blacktown Council LGA, the consultation of standard databases and a consideration of the objectives of the EPBC Act, EPA Act, NPW Act, TSC Act, FM Act, and any relevant SEPP.

Figure 2. Parklea Correctional Centre upgrading proposal

An initial flora and fauna investigation report has been prepared by GIS Environmental Consultants (GIS Environmental Consultants 2016). After a review by OEH, OEH agreed that a FBA does not need to be fully implemented as part of the study. However, it is acknowledged that NSW Public Works has been directed by OEH to ensure that no native vegetation, water bodies or FBA assessable habitat for threatened biota occurs within the subject site. The current and GIS Environmental Consultants site inspections confirmed that no significant areas of native vegetation or any water bodies would be adversely affected (directly, or indirectly) by the porposal. No habitat for threatened biota was recorded, in particular habitat that could be assessed under the FBA.

2. Legislative requirements

A number of Commonwealth, State and local Acts, policies and documents are relevant to the proposal and its possible impact on the ecology of both the subject site and it's locality. The most relevant of these are listed in Table 1.

3. Environmental setting

The subject site is located within the Blacktown City LGA and covers an area of approximately 8 ha. The site currently supports carparks, paved areas, maintained and slashed grasslands, and other infrastructure associated with the Correctional Centre's outer grounds. Isolated tree plantings are present.

For reference, a photographic record of the area investigated has been provided (Appendix 1).

The entire Correctional Centre is surrounded by residential and commercial developments.

Whilst no water bodies occur within the subject site, two impounded and controlled open expanses of water occur within the Correctional Centre property. These water bodies are part of Second Ponds Creek. This creek flows north where it meets with Smalls Creek, then Cattai Creek before eventually draining into the Hawkesbury River at Cattai, approximately 18 km north/north-west of the study area.

The annual average rainfall in the region is 913.9 mm with the greatest falls being experienced between January and March. Average temperatures range from a July minimum of 4.5^{o}C to a December high of 28.4^{o}C (Bureau of Meteorology 2016).

Due to the presence of the existing Correctional Centre the subject site's topography has been significantly modified. The property is generally flat, however, earth bunds have been established along the northern and eastern property lines. The subject site has an elevation that ranges between 70 m and 82 m ASL.

The soils of the subject site have been mapped by Bannerman and Hazelton (1990) as being comprised of the Blacktown Residual Landscape.

These soils are derived from the underlying Wianamatta Group geology, this being generally comprised of laminate, siltstone and shale as well as fine to medium-grained quartz lithic sandstone (Bannerman and Hazelton 1990). The Blacktown Residual soils are generally comprised of red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines (Bannerman and Hazelton 1990). These soils are of low fertility and subject to moderate to high erosion hazard under concentrated flows (Bannerman and Hazelton 1990).

Through reference to the listings provided under the EPBC, TSC and FM Acts, it is noted that no gazetted areas of critical habitat for any flora or fauna species, populations or communities occur within, or in the vicinity of, the study area.

Table 1. Summary of legislative and policy requirements

Level	Relevant Legislation/Policy	Relevance to study area
Commonwealth	*Environment Protection and Biodiversity Conservation Act 1999*	Under this Act an action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance. Matters of national environmental significance include listed threatened species and ecological communities, and those migratory species protected under international agreements. Where found, the assessment criteria relevant to this Act will be drawn upon to determine whether there would be a significant effect on these species and communities and hence whether referral to the Federal Environment Minister is required. No threatened ecological communities or species were recorded. No assessments have been undertaken. Referral of the matter to the Federal Minister for the Environment is not necessary.
State	NSW *Environmental Planning and Assessment Act 1979*	Part 1, Section 5A of this Act requires that a determination be made as to whether a proposed action is likely to have a significant effect on species, populations and ecological communities listed on Schedules 1, 1A and 2 of the NSW *Threatened Species Conservation Act 1995*. Where found, the assessment criteria relevant to this Act (seven-part test) will be drawn upon to determine whether there would be a significant effect on these species and hence whether a Species Impact Statement is required. One critically endangered ecological community was recorded. An assessment under Part 1, Section 5A of this Act has been undertaken. No significant impact is expected. Preparation of a SIS is not necessary.
	NSW *Threatened Species Conservation Act 1995/Amendment 2002*	This Act makes further provision with respect to the conservation of threatened species, populations and ecological communities of animals and plants.
	NSW *National Parks and Wildlife Act 1974*	This Act defines those species listed as protected in NSW. No assessment is required under this Act, however potential impacts of the proposed works on these species will be considered. Protected native species were recorded. Mitigation measures to ensure the local viability of these species have been provided.
	NSW *Noxious Weeds Act 1993*	Part 3, Division 1, Section 13 of this Act requires individuals to control noxious weeds on their own land. Noxious weeds were recorded and recommendations for the treatment of these provided.
	NSW *Fisheries Management Act 1994*	The object of this Act is to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. In particular, the Act aims to: • conserve fish stocks and key fish habitats

Level	Relevant Legislation/Policy	Relevance to study area
		• conserve threatened species, populations and ecological communities of fish and marine vegetation • promote ecologically sustainable development, including the conservation of biological diversity. No habitat for any threatened fish is present within the subject site. No assessments have been undertaken.
Local	The Blacktown Local Environmental Plan 2015	This plan aims to make local environmental planning provisions for land in Blacktown in accordance with the relevant standard environmental planning instrument under Section 33A of the EPA Act. Particular aims of this plan that are relevant to the upgrading of the Correctional Centre are: (aim e) to minimise risk to the community by restricting development in sensitive areas that are subject to flooding and other hazards, (aim g) to conserve and enhance Blacktown's built, natural and cultural heritage, (aim h) to conserve, restore and enhance biological diversity and ecosystem health, particularly threatened species, populations and communities.

4. Literature review and field guides

Prior to undertaking any fieldwork, previous studies conducted in the region and known databases were consulted to identify the diversity of ecological communities, flora and fauna species known for, or potentially occurring in, the study region. The identification of those known or potentially occurring native species and communities within this portion of Blacktown City LGA, particularly those listed under the Schedules to the EPBC, TSC and/or FM Acts, thereby permits the tailoring of the field survey strategies to the detection of these plants, animals and vegetation associations, or their necessary habitat requirements. By identifying likely species, particularly any threatened plants and animals, the most appropriate species-specific survey techniques can be selected should their associated vegetation communities/habitat requirements be present. The undertaking of a literature search also ensures that the results from surveys conducted during different climatic, seasonal and date periods are considered and drawn upon as required. This approach therefore increases the probability of considering the presence of, and possible impacts on, all known and likely native species, particularly any plants and animals that are of regional, State and/or national conservation concern. This approach also avoids issues inherent with a one off 'snap shot' study.

The studies, reports and databases referred to include:

- the DE PMST (DE 2016)
- the OEH BioNet database [Atlas of NSW Wildlife] (OEH 2016a)
- the OEH Threatened Species website (OEH 2016b)
- the Western Sydney Urban Bushland Biodiversity study (NPWS 1997)
- previous ecological report prepared in this locality (Lesryk Environmental 2009, GIS Environmental Consultants 2016).

Other reports and documents referred to are provided within the bibliography section of this report.

When accessing the DE and OEH databases, the search area specified was a 5 km and 10 km buffer around the study area, respectively. The data searches were carried out on 15/02/2016.

All these databases and reports were reviewed and drawn upon where relevant. Whilst reviewing these documents, particular attention was paid to identifying relevant ecological matters listed under the Schedules of the EPBC, TSC and/or FM Acts, plants, animals and ecological communities that have been recorded in the region and which may occur within, or in the vicinity of, the study area.

Field guides and standard texts used include:

- Harden (1992, 1993, 2000 and 2002), Fairley and Moore (2010) and Robinson (2003) (used for the identification of plants)
- Cogger (2000) (reptiles and frogs)
- Churchill (2008) (microchiropterans)
- Simpson and Day (2008) (birds)
- Van Dyck and Strahan (2008) (non-flying mammals)
- Triggs (1996) (identification of scats, tracks and markings)
- Allen *et al*. (2002) (fish).

The naming of those species recorded or known for the region follows the nomenclature presented in these texts, or within the EPBC, TSC and FM Acts.

It is noted that the current accepted scientific names for some of the threatened fauna species previously recorded in this locality are not consistent with the names used/provided under either the EPBC, TSC and FM Acts. In these instances, nomenclature used within this report follows the current approved scientific conventions.

The conservation significance of those ecological communities, plants and animals recorded is made with reference to:

- the RoTAP publication (Briggs and Leigh 1996)
- the EPBC, TSC and FM Acts
- vegetation mapping of the study region (NPWS 2002a).

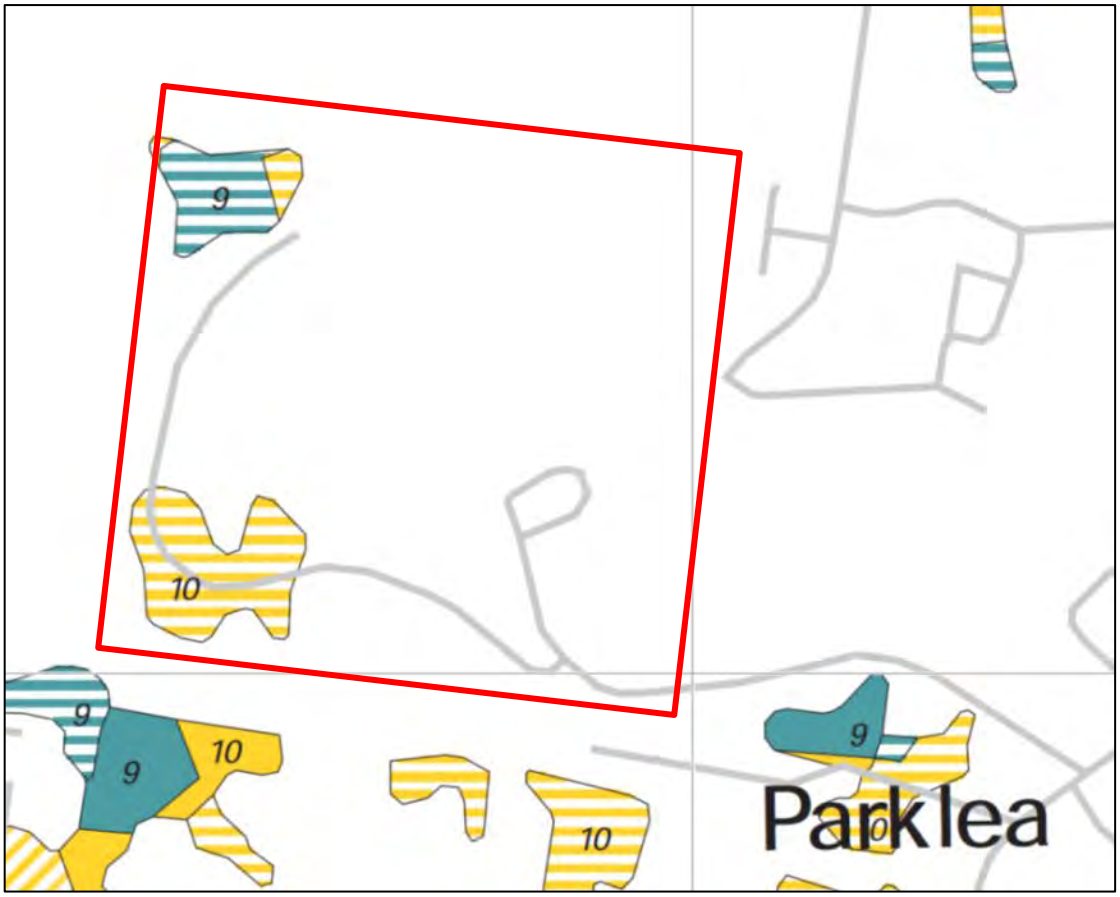
5. Results of the literature review

5.1. Threatened flora

A review of the DE and OEH databases (DE 2016, OEH 2016a) identified 35 threatened plants listed under the EPBC and/or TSC Acts that have been previously recorded, or are considered to have habitat, in the study region (Appendix 2). The subject site is not considered to contain suitable habitat for any of these plants.

5.2. Threatened ecological communities

Vegetation mapping of the study area was undertaken as part of the Cumberland Plain Vegetation mapping by NPWS (NPWS 2002a). This mapping indicates that Shale Hills Woodland and Shale Plains Woodland occur within the south-west and north-west portions of the Correctional Centre property (Figure 3). Both Shale Hills Woodland and Shale Plains Woodland are a component of the TSC Act critically endangered ecological community, Cumberland Plain Woodland and its EPBC Act equivalent, the critically endangered ecological community, Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.



Not to scale Source: NPWS (2002a)

Key

Cumberland Plain Woodland

9 - Shale Hills Woodland

10 - Shale Plains Woodland

Vegetation Condition Classes

Canopy Cover > 10% (Unless Remnant > 5ha, Where Canopy Cover > 5%)
(Areas mapped as classes: A, B, C, SA)

Canopy Cover < 10%
(Areas mapped as classes: Cmin, Tx, Txr)

Canopy Cover < 10% (Urban Areas)
(Areas mapped as class: Txu)

Note: Condition classes are shown as shading over the ecological community colour code.
Example shown is for 1 – Shale/Sandstone Transition Forest (Low Sandstone Influence).

Figure 3. Vegetation communities mapped within, and near to, the Correctional Centre (defined by red line. Site boundary is only indicative).

Whilst the south-western community is well away from the area expected to be disturbed, a portion of the proposed western end of the Stage 2 disposal area occurs in proximity to the mapped north-western community (Figure 3).

5.3. Threatened fauna

A review of the DE and OEH databases (DE 2016, OEH 2016a) identified 51 fauna species listed under the EPBC and/or TSC Acts that have been previously recorded, or are considered to have habitat, in the study region (Appendix 2).

Based on a consideration of the habitat needs of these threatened species (as provided in standard texts – refer to the Bibliography section for those used), combined with the identification of those habitats present within the study area, there is the potential for some of the animals listed in Appendix 2 to occur within, or in the vicinity of, the subject site. As such, during the course of the field investigation, targeted surveys for these species, or their necessary habitats, were undertaken.

It is acknowledged that some of the species listed in Appendix 2 may fly over or use the study area on occasion (e.g. Grey-headed Flying Fox *Pteropus poliocephalus*). Whilst this is the case, none of these animals would be considered to rely solely upon the resources provided by the subject site, such that the proposed upgrading would have a significant impact on the local populations of these species, or their habitats. As with the threatened fauna species considered unlikely to occur, it is considered unnecessary that any further assessments on the likely impacts of the proposal on these animals be conducted.

6. Field survey methods

A survey of the study area was undertaken by Deryk Engel $_{(B.Env.Sc\ [Hons])}$ and Stephen Bloomfield $_{(B.App.Sc)}$ on 17 February 2016. The weather conditions experienced during the site investigation were: overcast skies (80% cloud cover), light breeze and warm temperatures (22 ˚C).

The purpose of the field investigation was to locate any plants, animals or vegetation communities that are of regional, State and/or national conservation significance. When conducting the field investigations, the 'Random Meander Method' (as per Cropper 1993) (or a modification of this that is applicable to fauna surveys) was employed. This method is suitable for covering large areas and for locating any rare species (and their associated vegetation communities/habitat types) that may occur within a particular site.

The survey methods employed during the field investigations were:

- the identification of those dominant plants present within the area of likely disturbance, including both direct and indirect impacts
- the identification of the structure of those vegetation communities and fauna habitats present
- the direct observation of any fauna species present within, or adjacent to, the Correctional Centre
- diurnal call identifications of fauna species with all calls being identified in the field
- the identification of any indirect evidence such as tracks/scratchings that would suggest the presence of a particular fauna species
- litter and ground debris for reptiles, frogs and the State listed Cumberland Plain Land Snail (*Meridolum corneovirens*)[1].

Whilst conducting the site investigations, efforts were made to document the diversity, structure and value of those environments present within, and adjacent to, the subject site. This involved assessing the structure of the vegetation communities and fauna habitats present and determining their significance for native species, particularly any that are of State and/or national conservation concern. Whilst conducting the habitat assessments, efforts were made to identify features such as known vegetation associations, geological features, feed trees, mature trees with hollows, aquatic environments and other habitat features important to the life cycle needs of those threatened plants and animals previously recorded in the study region (as listed in Appendix 2).

By the completion of the field investigations, approximately four person hours of active searching had been accumulated. During the field surveys no limitations to the overall objectives of the site investigation, such as adverse climatic conditions or reduced site visibility, were encountered.

[1] This being the only invertebrate targeted.

Based on the observations made during the diurnal investigation it was considered that no nocturnal survey work was required. No resources of significant value (i.e. hollow-bearing trees or natural water bodies) for those nocturnal species that are known to occur in the surrounding region, particularly those that are of conservation significance, are present within, or close to the limits of, the subject site. Therefore, none would be adversely affected by the proposal.

7. Results

7.1. Flora species recorded

By the completion of the flora survey, 28 native species and 20 exotic plants had been recorded (Appendix 3). It is noted that Appendix 3 is not intended to be a comprehensive list of all species present within the subject site, and only represents those plants that were recorded whilst undertaking searches for:

- those native species and ecological communities of State and/or national conservation concern that are known, or expected to occur, in the locality
- noxious weeds that would require treatment.

Whilst their presence was considered and targeted investigations undertaken, none of the plants listed in Appendix 2 (nor any species being considered for inclusion on the EPBC and/or TSC Acts) were recorded within, or close to, the subject site. Nor are any considered likely to occur. As such, the proposal is not likely to have a direct or indirect impact on any threatened plant.

Similarly, no RoTAP species was recorded.

Two of the plants detected are listed as a noxious weed in the Blacktown LGA under the NW Act, these being:

- Fireweed (*Senecio madagascariensis*)
- Giant Parramatta Grass (*Sporobolus fertilis*).

Fireweed is also included on the list of Weeds of National Significance, which is part of a combined State and Commonwealth initiative to combat invasive species.

Under the NW Act:

- Fireweed has been assigned a control class of 4 which states ‘the plant must not be sold, propagated or knowingly distributed’
- Giant Parramatta Grass has been assigned a control class of 3 which states ‘the plant must be fully and continuously suppressed and destroyed’.

It is considered appropriate that all instances of these plants be removed prior to construction to avoid the further spread of this species.

7.2. Vegetation communities and habitats recorded

The subject site is dominated by a grassland that is regularly mown/slashed. This community/habitat type consists of a mixture of native and introduced grasses, herbs and forbs that, where not mown, reach a height of 30 cm and are of a high density. The introduced species present are more dominant than the native plants and include Pigeon Grass (*Setaria sp.*), African Lovegrass (*Eragrostis curvula*), Rhodes Grass (*Chloris gayana*), Goose Grass (*Eleusine tristachya*), Kikuyu Grass (*Cenchrus clandestinus*), Lamb’s Tongue (*Plantago lanceolata*), Carolina Mallow (*Modiola caroliniana*) and Fleabane (*Conyza bonariensis*).

Common native species include Couch (*Cynodon dactylon*), Windmill Grass (*Chloris truncata*), Early Spring Grass (*Eriochloa pseudoacrotricha*) and Kidney Weed (*Dichondra repens*).

Within this habitat type, where the carparks and northern perimeter fencing are proposed to be established, a number of planted trees occur. These trees vary in height from 3 m to 8 m, and include Prickly-leaved Paperbark (*Melaleuca stypheliodes*), Bracelet Honeymyrtle (*Melaleuca armillaris* subsp. *armillaris*), Broad-leaved Paperbark (*Melaleuca quinquenervia*), a Bottlebrush (*Callistemon sp.*), Spotted Gum (*Corymbia maculata*), River She-Oak (*Casuarina cunninghamiana*), Mountain Water Gum (*Tristaniopsis collina*), *Eucalypt sp.*, and Narrow-leaved Scribbly Gum (*Eucalyptus racemosa*), along with the introduced Radiata Pine (*Pinus radiata*). The plants have either been established in rows or as isolated individuals. When established in rows, the plants have been located approximately 3 m apart with a distance of around 4 m occurring between each row. There appears to be five rows of plantings and the success of establishment overall is relatively good. Presumably to permit slashing close to or between the rows, a number of the plants present exhibited crown raising due to the pruning of their lower branches.

One remnant Broad-leaved Ironbark (*Eucalyptus fibrosa*) is present near the area to be disturbed, this reaching a height of 10 m.

None of the trees present contain any hollows suitable for the sheltering needs of native species.

In association with the planted trees area, some additional groundcover species were observed. Notably were the native Creeping Christian (*Commelina cyanea*), *Glycine sp.*, *Einadia sp.* and a Bluegrass (*Dichanthium sp.*).

Two impounded water bodies exist within the boundaries of the Parklea Correctional Centre. Each of these is an open expanse of water and they are around 10,000 m^2 and 72,900 m^2 in size, respectively. Both of the water bodies support patches of reed beds along their banks and emergent snags (dead trees), the larger 'lake' including floating aquatic vegetation and a vegetated island. Riparian vegetation is either absent, or composed of 'narrow' bands of 10 m high Casuarinas and Eucalypts. Each of the water bodies has an urban catchment and flow out of these is controlled.

Due to the presence of two raised dam walls, each of the water bodies are considered to be an 'artificial' construct. Though artificial, each is considered to provide 'Moderate Fish Habitat [Class 2]' as they are named permanent waterways with clearly defined beds and banks and support freshwater aquatic vegetation (Faithfull and Witheridge 2003). The section of Second Ponds Creek that is present within the study area is identified on mapping of Key Fish Habitat in the Sydney Metropolitan Region (NSW Department of Primary Industries undated).

Given their urban catchment and 'artificial' nature of each water body, fish expected to be present within these lakes would include Eels (*Anguilla sp.*), Freshwater Catfish (*Tandanus tandanus*) and the introduced Mosquitofish (*Gambusia holbrooki*), European Carp (*Cyprinus carpio*) and Goldfish (*Carassius auratus*).

No species listed under the FM Act are considered to occupy either water body present.

Neither water body would be directly affected by the scope of works proposed. The upgrading of the Correctional Centre will not present any further barriers to, or impede the movement of, any aquatic species.

Indirect impacts due to the input of surface runoff may occur. The proposed upgrading would include the reuse of around 60% of the surface runoff generated within the facility, the remainder entering Second Ponds Creek. Mitigation measures to minimise any indirect impacts due to the input of this runoff have been presented in Section 10.

7.2.1. Conservation Significance of the vegetation and value of the habitats present

As the area would have been vegetated by the critically endangered Cumberland Plain Woodland ecological community in the past, prior to its clearing and subsequent land uses, it is noted that a number of plants found within this ecological community are present within the subject site. Whilst this is the case, this ecological community is no longer considered to be present within the majority of the subject site (excluding the north-western portion of the Stage 2 disposal area) due to the lack of species richness, frequency and community structure.

The north-western portion of the Stage 2 disposal area was not investigated due to restricted site access issues. GIS Environmental Consultants (2016), who surveyed this portion of the site previously, have not mapped any endangered ecological communities as being present in this area, though they note, as do NPWS (2002a), that Cumberland Plain Woodland occurs in proximity. Reference to the spoil disposal plan provided and aerial photography indicates that some tall shrubs/trees may be cleared to permit the use of the north-western portion of the Stage 2 disposal area. As this area was not surveyed, a precautionary approach has been adopted and an assessment on the critically endangered Cumberland Plain Woodland conducted using the criteria provided under Part 1, Section 5A of the EPA Act (see Appendix 4).

In relation to the EPBC Act, the vegetation to be disturbed does not meet the key diagnostic characteristics in the listing advice for the analogous critically endangered ecological community, Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (DEWHA 2010). As such, it is not considered necessary to undertake an assessment using the criteria provided under the EPBC Act (i.e. Significant Impact Guidelines).

7.3. Fauna species recorded during the field investigation

By the completion of the field investigation, 31 native birds, one frog and one reptile had been recorded within, adjacent to or flying over the subject site (Appendix 5). All of the species were generally detected by direct observation, though the presence of several of the birds was determined based on the identification of their calls.

Of those animals recorded, none are listed, or currently being considered for listing, on the Schedules to the EPBC or TSC Acts.

The areas proposed to be disturbed as part of the Correctional Facility upgrade are highly modified and disturbed. Though targeted and considered, given the open and regularly mown nature of those lawns and plantings present, no habitat for the Cumberland Plain Land Snail is present.

All of the native species recorded during the field survey are protected, as defined by the NPW Act, but considered to be common to abundant throughout their distribution ranges. Within the surrounding region, these species have been recorded in association with a range of woodland and forest habitats. The species recorded would not be solely reliant upon the highly disturbed and regularly maintained grassland areas proposed to be developed, such that the removal or further disturbance of these would threaten the occurrence of these animals.

Eight White-winged Choughs (*Corcorax melanorhamphos*) were observed moving through the tree canopy to the south of the smaller of the two impounded water bodies (approximately 580 m from the proposed development area). This bird is listed as being regionally significant in the Blacktown LGA (NPWS 1997). The White-winged Chough occupies woodland habitats and would therefore not be reliant upon the grassland areas that are to be disturbed. The species may forage over these on occasion, but the lack of ‘significant’ tree cover and exposure to predation would limit the value of these habitats.

As no significant areas of habitat for the White-winged Chough are present within the proposed disturbance areas, the local viability of this species would not be affected. The

proposed works would not present any barriers to the local movement patterns of the White-winger Chough or isolate any of its necessary habitat areas. Dispersal, roosting and foraging opportunities within the Parklea Correctional Centre site, and north and south along the vegetated corridor provided by Second Ponds Creek, would remain, thereby ensuring the local presence of this regionally significant bird. The proposed upgrading would not have an adverse cumulative impact on the occurrence of this species when associated with any other developments being carried out in the study region.

A number of the threatened fauna species listed in Appendix 2 may use or traverse over the study area on occasion (e.g. the Varied Sittella *Daphoenositta chrysoptera*, microchiropterans and Grey-headed Flying-fox *Pteropus poliocephalus*). However, the subject site only represents a very small portion of potential habitat for these animals, areas of similar habitat occurring within, adjacent to and beyond the limits of the Correctional Centre. No habitat resources crucial to the life-cycle requirements of such species (e.g. intact stands of woodland) are present within those areas proposed to be disturbed. As such, the proposal is not likely to have a direct or indirect impact on any of these species. Therefore, it is considered that further assessment of impacts under the relevant legislation is not necessary.

7.4. Wildlife corridors and vegetation links

The area expected to be impacted by the proposed development is not considered to be part of an important local or regional wildlife corridor or vegetation link. Given the existing character of the study locality, and the limited vegetation present within the portion of the Correctional Centre investigated, it is considered that the proposal would not present any further barriers to the movement patterns of any native animals such that their local populations would be adversely affected.

8. Legislative considerations

8.1. Commonwealth - *Environment Protection and Biodiversity Conservation Act 1999*

No threatened species or communities listed under the EPBC Act were recorded at the subject site. Similarly none were considered likely to occur within, or be reliant upon, the habitats present.

As such, the proposal would not have a detrimental impact on any ecological communities, flora or fauna species of national conservation significance. Therefore it is considered that the matter does not require referral to the Federal Minister for the Environment for further consideration or approval.

8.2. State - *Environmental Planning and Assessment Act 1979*

The critically endangered ecological community, Cumberland Plain Woodland, was considered to occur within the north-western portion of the subject site. A seven-part test referring to the criteria provided under Part 1, Section 5A of the EPA Act (Appendix 4) found that the proposed works are unlikely to significantly affect this community, or its habitat.

No threatened species or populations listed under the TSC Act were recorded at the subject site. Similarly none were considered likely to occur within, or be reliant upon, the habitats present. The aquatic habitats present beyond the limits of the scope of works proposed would not be suitable for any threatened freshwater fish listed under the FM Act.

As such, the proposal would not have a detrimental impact on any ecological communities, flora or fauna species or populations of State conservation significance. Therefore, it is considered that a SIS need not be prepared.

9. Conclusion

Based on an adoption of the precautionary principle, one critically endangered ecological community listed on the TSC Act, Cumberland Plain Woodland, was deemed as occurring at the subject site. It was considered that the proposed works would not significantly affect this community, or its habitat. No other threatened species, populations, or communities listed under the EPBC, TSC or FM Acts were recorded at, or considered to be reliant upon, the subject site. Whilst some listed species may traverse over or occur on an occasional basis, it is considered that the scope of the proposed works would not have an adverse impact on any threatened species of State or national conservation significance.

Referral of the matter to the Federal Minister for the Environment for further consideration or approval in relation to the proposed works would not be necessary. Similarly, the preparation of a SIS is not required.

The adoption of those mitigation measures provided would ensure that the works proposed are undertaken in an ecologically sustainable manner.

10. Recommendations

Based on the principles of Ecologically Sustainable Development, as identified in Schedule 2 of the Environmental Planning and Assessment Regulation, the following recommendations are provided:

- All instances of the weed of national significance, Fireweed, should be removed from the subject site prior to the commencement of earthworks.

- The isolated remnant Broad-leaved Ironbark tree that occurs 94 m south-west of the Sentry Drive and site entrance intersection should be retained. If required, an ecologist should identify the location of this tree and temporary fencing be erected on site at its outer drip line.

- To maintain the water quality of Second Ponds Creek, excess surface runoff should be channeled into the smaller southern water body. This water body should be used as a water quality and sedimentation pond.

- To minimize any potential impacts on the Cumberland Plain Woodland, the north-western portion of the Stage 2 disposal area should be surveyed to determine the quality and structure of the habitat present. Alternatively, excess spoil should be located in either the clearer north-eastern corner of the property or those previously disturbed cleared grassland areas (e.g. north of the proposed playing field).

- Newly exposed surfaces should be stabilised as soon as possible in order to reduce the potential for soil erosion. This should be done through the planting of native species endemic to the study area or non-invasive grass species.

- Any shrub or tree plantings to be undertaken as part of landscaping works should include a suite of those native plants that constitute Cumberland Plain Woodland.

- In line with the recovery plan prepared for the Cumberland Plain, a management plan for the stands of Cumberland Plain Woodland present within the boundaries of the Correctional Centre should be prepared. This plan should address the management of threatened biodiversity and be consistent with:
    - the Cumberland Plain recovery plan
    - the DEC (2005a) publication '*recovering bushland on the Cumberland Plain: Best practice guidelines for the management and restoration of bushland*'
    - the recommended fire regimes in Appendix 3 of the recovery plan
    - any other best practice documents that DECCW may promote at a later date.

  Development of this plan will also assist the local White-winged Chough population.

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Appendix 1. Photographic record of the study area

Plate 1. The character of the cleared grassland environment.

Plate 2. The character of the proposed carpark area. Planted trees in a linear fashion can be seen in the background.

Plate 3. The cleared grassland environment and linear plantings in the northern portion of the subject site.

Plate 4. Character of one of the impounded water bodies.

Appendix 2. Threatened flora and fauna species previously recorded in the study region and their likelihood of occurrence

Key
V – Vulnerable E – Endangered EP –endangered population M – Migratory CE - Critically Endangered

Species underlined are those which the PMST (DE 2016) predicted as occurring or are likely to have habitat within 10 km of the study area.

* - habitat requirements were generally extracted from Frith (1997), Churchill (2008), Cogger (2004), Harden (1992-2002), Van Dyck and Strahan (2008), the NSW Scientific Committees Final Determinations (Scientific Committee various dates) and OEH (2016b) with other references used being identified in the references.

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
FLORA					
Acacia bynoeana	V	E	Occurs in heath or dry sclerophyll forest on sandy soils preferring open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Numerous records Wyee-Morisset.	Low. Habitat absent.	None
Acacia gordonii	E	E	Dry sclerophyll open forest, woodland and heath on sandy soil amongst sandstone outcrops.	Low. Habitat absent.	None
Acacia pubescens	V	V	Open woodland and forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland.	Low. Habitat absent.	None
Allocasuarina glareicola	E	E	Restricted to the Penrith to Richmond area where it grows in Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla and Melaleuca decora*.	Low. Habitat absent.	None
Asterolasia elegans	E	E	Open forest in sheltered gullies on Narrabeen sandstone in near Wisemans Ferry and the Colo River.	Low. Habitat absent.	None
Cryptostylis hunteriana	V	V	Occurs in a range of communities, including swamp-heath and woodland.	Low. Habitat absent.	None
Cynanchum elegans White-flowered Wax Plant	V	V	Usually on the edge of dry rainforest vegetation but also in littoral rainforest, coastal scrubs, Forest Red Gum woodland and Spotted Gum open forest/ woodland	Low. Habitat absent.	None
Darwinia biflora	V	V	Heath, woodland and open forest on duplex soils over	Low.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
			sandstone between The Hawkesbury River and Port Jackson.	Habitat absent.	
Dillwynia tenuifolia		EP,V	Castlereagh woodlands on Tertiary alluvial sediment.	Low. Habitat absent.	None
Epacris purpurascens var. *purpurascens*		V	Found in a range of habitat types, most of which have a strong shale soil influence.	Low. Habitat absent.	None
Eucalyptus nicholii	V	V	Northern tableland species often planted outside its range.	Low. Habitat absent.	None
Eucalyptus sp. Cattai		CE	Occurs as a rare emergent tree in scrub, heath and low woodland on sandy soils, usually as isolated individuals or occasionally in small clustered groups. The sites at which it occurs are generally flat and on ridge tops. Associated soils are laterised clays overlying sandstone.	Low. Habitat absent.	None
Genoplesium baueri Yellow Gnat-orchid	E	E	Moss gardens on sandstone outcrops	Low. Habitat absent.	None
Grevillea juniperina subsp. *juniperina*		V	Grows within Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest on clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels.	Low. Habitat absent.	None
Grevillea parviflora subsp. *supplicans*		E	Occurs in heathy woodland associations on skeletal sandy soils over massive sandstones.	Low. Habitat absent.	None
Haloragis exalata subsp. *exalata* Wingless Raspwort	V	V	Protected and shaded damp situations in riparian habitats.	Low. Habitat absent.	None
Hibbertia superans		E	The species occurs on sandstone ridgetops often near the shale/sandstone boundary. Occurs in both open woodland and heathland, and appears to prefer open disturbed areas, such as tracksides.	Low. Habitat absent.	None
Lasiopetalum joyceae	V	V	Grows in heath on sandstone.	Low. Habitat absent.	None
Leucopogon fletcheri subsp. *fletcheri*		E	Occurs in dry eucalypt woodland or in shrubland on clayey lateritic soils, generally on flat to gently sloping terrain along ridges and spurs.	Low. Habitat absent.	None
Melaleuca deanei	V	V	Heath and woodland on clay-influenced sandstone ridgetops.	Low. Habitat absent.	None
Micromyrtus minutiflora	V	E	Dry sclerophyll woodland - Castlereagh woodlands in sandy clay soils of Tertiary alluvium.	Low. Habitat absent.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
Olearia cordata	V	V	Grows in dry open sclerophyll forest and open shrubland, on sandstone ridges.	Low. Habitat absent.	None
Pelargonium sp. striatellum	E		Just above the high water level of irregularly inundated or ephemeral lakes.	Low. Habitat absent.	None
Persoonia hirsuta	E	E	Heath and woodland on sandstone.	Low. Habitat absent.	None
Pilularia novae-hollandiae		E	Grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous.	Low. Habitat absent.	None
Pimelea curviflora var. *curviflora*	V	V	Woodland and heath on clayey ridge-tops on sandstone south of the Hawkesbury River and in the Illawarra.	Low. Habitat absent.	None
Pimelea spicata	E	E	Substrates derived from Wianamatta Shale in open woodland of *Eucalyptus moluccana*, *E. crebra, Bursaria spinosa* and *Themeda australis*.	Low. Habitat absent.	None
Pterostylis gibbosa	E	E	Known from Forest Red Gum woodland in the Illawarra.	Low. Habitat absent.	None
Pterostylis saxicola	E	E	Known from Forest Red Gum woodland in the Illawarra. Apparently extinct in western Sydney	Locally extinct	None
Pultenaea parviflora	V	E	Dry sclerophyll open forest on heavy shale soils.	Low. Habitat absent.	None
Syzygium paniculatum	V	E	Subtropical and littoral rainforest on sandy soils or stabilised dunes near the sea.	Low. Habitat absent.	None
Tetratheca glandulosa		V	Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone. Occurs in heaths and scrub to woodlands/open woodlands, and open forest.	Low. Habitat absent.	None
Thesium australe	V	V	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*)	Low. Habitat absent.	None
Zieria involucrata	V	E	Open forest in sheltered gullies on Narrabeen sandstone.	Low. Habitat absent.	None
FAUNA					
Hoplocephalus bungaroides Broad-headed Snake	V	E	Woodland on Hawkesbury Sandstone in the Sydney Basin with exfoliated material, rock crevices and caves.	Low. Habitat not present.	None.
Heleioporus australiacus Giant Burrowing Frog	V	V	Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based	Low. Habitat absent.	None
Litoria aurea	V	E	Marshes, dams and stream-sides, particularly those containing	Low.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
Green and Golden Bell Frog			bullrushes (*Typha spp.*) or spikerushes (*Eleocharis spp.*). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available.	Habitat absent.	
Litoria littlejohni Littlejohn's tree Frog	V	V	Restricted to sandstone woodland and heath communities within dams, creeks and lagoons at mid to high altitude.	Low. Habitat absent.	None
Litoria raniformis Southern Bell Frog	V	E	Permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys	Low. Habitat absent.	None
Mixophyes balbus Stuttering Frog	V	E	Terrestrial inhabitant of rain, artic birch and wet sclerophyll forests. Usually found near permanently running water.	Low. Habitat absent.	None
Pseudophryne australis Red-crowned Toadlet		V	Almost totally confined to drainage lines in areas of Hawkesbury Sandstone, especially those that support weathered shale lenses.	Low. Habitat absent.	None
Oxyura australis Blue-billed Duck		V	The Blue-billed Duck favours deep, permanent, densely vegetated freshwater swamps and lakes, especially those with beds of Cumbungi Typha. This species is completely aquatic and rarely seen on land	Low. Habitat absent.	None
Ardea alba Great Egret	M		Wetland, flooded crops, pasture, dams, roadside ditches, estuarine mudflats, mangroves and reefs.	Low. Habitat absent.	None
Ardea ibis Cattle Egret	M		Wet pasture with tall grass, shallow open wetland and margins, mudflats.	Moderate. Species may traverse site but unlikely to be affected by the proposed action.	None
Botaurus poiciloptilus Australasian Bittern	E	E	The Australasian Bittern occupies shallow, vegetated freshwater or brackish swamps, usually dominated by tall, dense reed beds of *Typha sp.*, *Juncus sp.* and *Phragmites sp.* Nests on platforms of reeds and rushes, usually built over water in dense cover.	Low. Habitat absent.	None
Dasyornis brachypterus Eastern Bristlebird	E		Dense, low vegetation including heath and open woodland with a heath understorey.	Low. Habitat absent.	None
Pandion cristatus Osprey	M	V	A fish eating raptor, the Osprey inhabits mainly coastline areas. Nests are usually constructed in a large, dead tree, though rocky outcrops and artificial structures are also known to be	Low. Habitat absent.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
			used.		
Tringa nebularia Common Greenshanlk	M		The Common Greenshank prefers coastal lagoons, estuaries and bays that are sheltered sandy and muddy. Also found on fresh marshes near streams, dams and sewage farms. Sometimes found at inland lakes.	Low. Habitat absent.	None
Hieraaetus morphnoides Little Eagle		V	Open eucalypt forest, woodland or open woodland.	Moderate. Species may fly over site but unlikely to be affected by the proposed action.	None
Lophoictinia isura Square-tailed Kite		V	Coastal and sub-coastal open forests and woodlands where it preys on small birds, such as honeyeaters, in the canopy.	Moderate. Species may fly over site but unlikely to be affected by the proposed action.	None.
Callocephalon fimbriatum Gang-gang Cockatoo		V	Tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests through to more open eucalypt forests and woodlands.	Low. Habitat absent.	None
Calyptorhynchus lathami Glossy Black-cockatoo		V	Inhabits eucalypt woodland and feeds almost exclusively on Casuarina fruits.	Low. Habitat absent.	None
Glossopsitta pusilla Little Lorikeet		V	Forages primarily in the open Eucalypt forest and woodland canopies, particularly along water courses; occasionally in Angophoras, Melaleucas and other tree species.	Low. Habitat absent.	None
Lathamus discolor Swift Parrot	E	E	Non-breeding migrant to Australian south-east mainland from Tasmania between March and October. Occurs in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*	Low. Habitat absent.	None
Neophema pulchella Turquoise Parrot		V	Grassy woodlands and forest edges.	Low. Habitat absent.	None
Ninox strenua Powerful Owl		V	A range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. It preys mainly on arboreal mammals and nest in large tree hollows	Low. Habitat absent.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
Tyto novaehollandiae Masked Owl		V	Open forest with a sparse mid-storey layer, but with patches of dense low ground cover.	Low. Habitat absent.	None
Merops ornatus Rainbow Bee-eater	M		Breeding migrant to southern Australia occurring in usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water. Nests in burrows constructed in the banks of rivers, creeks or dams, or similar exposed substrates	Low. Habitat absent.	None
Gallinago hardwickii Latham's Snipe	M		Wet, treeless, tussocky grasslands, short grasses and/or marshes along freshwater streams and channels, though it can also be found in any vegetation around freshwater wetlands, in sedges, grasses, lignum, reeds and rushes, saltmarshes, creek edges, crops and pastures.	Low. Habitat absent.	None
Rostratula australis Australian Painted Snipe	E		This species prefers shallow freshwater swamps.	Low. Habitat absent.	None
Apus pacificus Fork-tailed Swift	M		Forages for insects over a wide variety of habitats	Moderate. Species may forage aerially over site but unlikely to be affected by the proposed action.	None
Hirundapus caudacutus White-throated Needletail	M		Forages for insects over a wide variety of habitats	Moderate. Species may forage aerially over site but unlikely to be affected by the proposed action.	None
Myiagra cyanoleuca Satin Flycatcher	M		Heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests	Low. Habitat absent.	None
Symposiachrus melanopsis Black-faced Monarch	M		Rainforests, wet sclerophyll forest, scrubs and gullies. More open woodland during migration.	Low. Habitat absent.	None
Symposiachrus trivirgatus Spectacled Monarch	M		Understorey of rainforests, thickly wooded, waterside vegetation.	Low. Habitat absent.	None
Rhipidura rufifrons Rufous Fantail	M		Undergrowth of rainforest and wet eucalypt forest. On migration may turn up in urban areas.	Low. Habitat absent.	None
Climacteris picumnus victoriae Brown Treecreeper (eastern		V	Commonly found in association with dry open forests and eucalypt woodlands of the inland plains and slopes of the	Low. Habitat absent.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
subspecies)			Great Diving Range. Those woodlands and forests occupied by this species have an open grassy understorey.		
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)		V	Occupies drier open eucalypt woodland containing box-ironbark associations and Red River Gum.	Low. Habitat absent.	None
Acrocephalus australis Australian Reed-Warbler	M		Occupies almost every reedbed, large or small.	Low. Habitat absent.	None
Pyrrholaemus sagittatus Speckled Warbler		V	Wide range of Eucalypt-dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	Low. Habitat absent.	None
Grantiella picta Painted Honeyeater	V	V	Inhabits eucalypt woodlands and scrub, usually heavily infested with mistletoe.	Low. Habitat absent.	None
Anthochaera phrygia Regent Honeyeater	E,M	CE	Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, riparian forests of River Oak and occasionally planted or remnant trees in urban areas. Woodland habitats have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	Low. Habitat absent.	None
Daphoenositta chrysoptera Varied Sittella		V	Eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Low. Habitat absent.	None
Petroica boodang Scarlet Robin		V	Dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs	Low. Habitat absent.	None
Pteropus poliocephalus Grey-headed Flying-fox	V	V	Roosts in large camps in moist gullies. Forages widely on fruiting and flowering trees.	Moderate. Species may fly over site but unlikely to be affected by the proposed action.	None
Saccolaimus flaviventris Yellow-bellied Sheathtailbat		V	Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Roosts in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	Low. Habitat absent.	None
Chalinolobus dwyeri Large-eared Pied Bat	V	V	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features	Low. Habitat absent.	None

Species	Status		Habitat*	Likelihood of Occurrence	Possible Impacts
	EPBC Act	TSC Act			
Falsistrellus tasmaniensis Eastern Falsistrelle		V	Hollow-roosting bat that forages in eucalypt woodland.	Low. Habitat absent.	None
Myotis macropus Large-footed Myotis		V	Cave-roosting bat, nearly always in the vicinity of suitable water bodies.	Low. Habitat absent.	None
Scoteanax rueppellii Greater Broad-nosed Bat		V	Variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Usually roosts in tree hollows, but has also been found in buildings	Low. Habitat absent.	None
Vespadelus troughtoni Eastern Cave Bat		V	Habitats in which it has been recorded include drier forests and tropical woodlands, sandstone overhangs, tunnels and occasionally buildings; has been recorded roosting in disused mine workings. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Low. Habitat absent.	None
Miniopterus australis Little Bentwing Bat		V	This species forages for insects within well-timbered habitats such as tropical rainforests, wet and dry sclerophyll forests and melaleuca swamps. Roosting occurs predominantly within caves, though it will use abandoned mines, storm water drains and disused buildings when available. Often found sharing roosts with the Eastern Bentwing Bat.	Low. Habitat absent.	None
Miniopterus schreibersii oceanensis Eastern Bentwing-bat		V	Roosts in caves, mines tunnels etc. Forages over large areas of open forest.	Low. Habitat absent.	None
Mormopterus norfolkensis Eastern Freetail-bat		V	Dry sclerophyll forest and woodland east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures.	Low. Habitat absent.	None
Meridolum corneovirens Cumberland Plain Land Snail		V	Intact remnants of Cumberland Plain Woodland where it lives amongst litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish	Targeted. Species absent from site	None
Pommerhelix duralensis Dural Woodland Snail	E		The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris.	Low. Habitat absent.	None

Appendix 3. Flora species recorded during the field investigation

Key
* - introduced species
N - species listed under the NW Act

	GENUS Species	Common Name
PINOPSIDA		
Pinaceae	*Pinus radiata* *	Radiata Pine
MAGNOLIOPSIDA - DICOTYLEDONS		
Asteraceae	*Conyza bonariensis* *	Fleabane
	Hypochaeris radicata *	Catsear
	Senecio madagascariensis * N	Fireweed
Basellaceae	*Anredera cordifolia* *	Madeira Vine
Campanulaceae	*Wahlenbergia sp.*	
Casuarinaceae	*Casuarina cunninghamiana*	River She-Oak
	Casuarina glauca	Swamp She-Oak
Chenopodiaceae	*Einadia sp.*	
Commelinaceae	*Commelina cyanea*	Creeping Christian
Convolvulaceae	*Dichondra repens*	Kidney Weed
Fabaceae: Faboideae	*Desmodium sp.*	
	Glycine sp.	
	Trifolium repens *	White Clover
Malvaceae	*Modiola caroliniana* *	Carolina Mallow
	Sida rhombifolia *	Paddy's Lucerne
Myrtaceae	*Callistemon sp.*	Bottlebrush
	Corymbia maculata	Spotted Gum
	Eucalyptus fibrosa	Broad-leaved Ironbark
	Eucalyptus racemosa	Narrow-leaved Scribbly Gum
	Eucalyptus sp. 1	
	Eucalyptus sp. 2	
	Eucalyptus tereticornis?	Forest Red Gum
	Melaleuca armillaris subsp. *armillaris*	Bracelet Honeymyrtle
	Melaleuca quinquenervia	Broad-leaved Paperbark
	Melaleuca stypheliodes	Prickly-leaved Paperbark
	Tristaniopsis collina	Mountain Water Gum
Oxalidaceae	*Oxalis sp.* *	Oxalis
Plantaginaceae	*Plantago lanceolata* *	Lamb's Tongue
Solanaceae	*Solanum sp.* *	
MAGNOLIOPSIDA - MONOCOTYLEDONS		
Poaceae	*Axonopus fissifolius* *	Carpet Grass
	Briza subaristata *	Lantern Grass
	Chloris gayana *	Rhodes grass
	Chloris truncata	Windmill Grass
	Cynodon dactylon	Couch
	Dichanthium sp.	A Bluegrass
	Eleusine tristachya *	Goose Grass
	Eragrostis curvula *	African Love Grass
	Eragrostis leptostachya	Paddock Lovegrass
	Eragrostis elongata	Clustered Lovegrass
	Eriochloa pseudoacrotricha	Early Spring Grass
	Paspalidium distans	Slender Panic
	Paspalum dilatatum *	Paspalum
	Cenchrus clandestinus *	Kikuyu Grass
	Setaria sp. *	Pigeon Grass
	Sporobolus fertilis * N	Giant Parramatta Grass
	Sprobolus elongatus	Slender Rat's Tail Grass
	Themeda triandra	Kangaroo Grass

Appendix 4. Ecological assessment – Cumberland Plain Woodland

Part 1, Section 5A of the EPA Act (the Assessment of Significance) requires a consideration of the impacts of a proposed action on threatened species, populations and communities listed under the TSC Act.

Whilst the north-western portion of the Stage 2 disposal area was not surveyed during the current study, reference to vegetation mapping undertaken by NPWS (2002a) and GIS Environmental Consultants (2016) indicates the presence of the TSC Act listed critically endangered Cumberland Plain Woodland ecological community in proximity. Accordingly, a precautionary approach has been applied and the likely impacts of the proposal on the community assessed.

(a) *in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction*,

Not applicable to a critically endangered ecological community.

(b) *in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction*:

Not applicable to a critically endangered ecological community.

(c) *in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed*:

(i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction*,

The proposal would result in the disturbance of approximately 0.8 ha of potentially occurring Cumberland Plain Woodland habitat within the north-western portion of the subject site, this consisting predominantly of grassland though some isolated shrubs and trees may potentially be impacted. It is considered that this disturbance would not place the local occurrence of this community at risk of extinction.

(ii) *or is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*,

Based on the observations made within the other portions of the subject site, as well as the south-western Cumberland Plain Woodland example, and given the land use history by the Correctional Centre, the potentially occurring Cumberland Plain Woodland is expected to already be heavily modified. The further disturbance of this area would not substantially modify the composition of the vegetation present. Better developed (i.e. structure, species richness) Cumberland Plain Woodland occurs to the south of this area and within the south-western portion of the Correctional Centre. The proposed disturbance of this portion of the study area is unlikely to have an impact on the potentially occurring Cumberland Plain Woodland and would not place it at risk of extinction.

(d) *in relation to the habitat of a threatened species, population or ecological community*:

(i) the *extent to which habitat is likely to be removed or modified as a result of the action proposed,*

The proposed works would result in the disturbance of approximately 0.8 ha of potentially occurring Cumberland Plain Woodland habitat.

(ii) *and whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action,*

The disturbance of this area is unlikely to contribute to fragmentation or isolation of remaining stands of the Cumberland Plain Woodland community within this locality.

(iii) *and the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality*,

It is considered that the area affected is not vital to the long-term survival of the Cumberland Plain Woodland community in the locality.

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

No critical habitat would be adversely affected by the proposal. The subject site is not listed as critical habitat under Part 3 Division 1 of the TSC Act.

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

A recovery plan has been prepared for the Cumberland Plain (DECCW 2011), which encompasses Cumberland Plain Woodland. To provide for the long-term survival of the threatened biodiversity of the Cumberland Plain, the recovery plan has four specific recovery objectives, these being:

1. To build a protected area network, comprising public and private lands, focused on the identified priority conservation lands.
2. To deliver best practice management to remnant bushland across the Cumberland Plain on public lands where the primary management objectives are compatible with biodiversity conservation.
3. To develop an understanding and enhanced awareness in the community of the Cumberland Plain's threatened biodiversity, the best practice standards for its management, and the recovery program.
4. To increase knowledge of the threats to the survival of the Cumberland Plain's threatened biodiversity, and thereby improve capacity to manage these threats in a strategic and effective manner.

Ensuing recovery actions and key performance targets accompany these four objectives.

Blacktown Council is among those government agencies charged with responsibility for a number of these actions. Of relevance is:

- 'Local government will manage to best practice standards any lands which are under their ownership or for which they have care, control and management, which contain Cumberland Plain Woodland'.

Best practice standards are provided in Appendix 2 of the recovery plan. In relation to the proposed Correctional Centre upgrading a site action or management plan should be

prepared which addresses the management of threatened biodiversity. This plan should be consistent with:

- the recovery plan
- the DEC (2005a) publication '*recovering bushland on the Cumberland Plain: Best practice guidelines for the management and restoration of bushland*'
- the recommended fire regimes in Appendix 3 of the recovery plan
- any other best practice documents that DECCW may promote at a later date.

Whilst it is acknowledged the area to be disturbed is relatively small, degraded and likely to have a simplified structure, recommendations have been provided to conform to the recovery plan.

Whilst this is the case, this is not considered to have any bearing on the impact of the works on the Cumberland Plain Woodland ecological community.

(g) *whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process,*

Currently 35 Key Threatening Processes for mainland NSW are listed under Schedule 3 of the TSC Act. Of these, 'clearing of native vegetation' and 'invasion of native plant communities by exotic perennial grasses' would be applicable to the proposed works. The proposed works are not considered to significantly contribute to these Key Threatening Processes such that the life cycle requirements of the Cumberland Plain Woodland would be compromised.

Conclusion

The proposed works are considered unlikely to significantly affect Cumberland Plain Woodland, or its habitat. The proposal would not remove a significant portion of this ecological community nor would it present any additional barriers to the seed dispersal mechanisms operating within this community. As such, the preparation of a SIS, that further considers the impacts of the proposal on the Cumberland Plain Woodland, is not required.

Appendix 5: Fauna species recorded or known to occur in the vicinity of the study area

Source of Records
1 = Species recorded during present study
2 = OEH (2016a)
3 = GIS Environmental Consultants (2016)
4 = Lesryk Environmental (2009)

Key
A - indicates species listed under the EPBC Act.
F - migratory Family listed under the EPBC Act.
M - species listed as migratory listed under the EPBC Act.
B - indicates species listed under the TSC Act or FM ACT (fish)
E - species is Endangered
V - species is Vulnerable
* - indicates introduced species

A	B	Common Name	Family and Scientific Name	1	2	3	4
		MAMMALS[2]					
			Petauridae				
		Sugar Glider	*Petaurus breviceps*		x		
			Pseudocheiridae				
		Common Ringtail Possum	*Pseudocheirus peregrinus*		x		
			Phalangeridae				
		Common Brushtail Possum	*Trichosurus vulpecula*		x		
			Pteropodidae				
		Black Flying Fox	*Pteropus alecto*		x		
V	V	Grey-headed Flying-fox	*Pteropus poliocephalus*		x		
			Emballonuridae				
	V	Yellow-bellied Sheathtailbat	*Saccolaimus flaviventris*		x		
			Rhinolophidae				
		Eastern Horseshoe Bat	*Rhinolophus megaphyllus*		x		
			Vespertilioidae				
V	V	Large-eared Pied Bat	*Chalinolobus dwyeri*		x		
		Gould's Wattled Bat	*Chalinolobus gouldii*		x		
	V	Eastern Falsistrelle	*Falsistrellus tasmaniensis*		x		
	V	Large-footed Myotis	*Myotis macropus*		x		
		Lesser Long-eared Bat	*Nyctophilus geoffroyi*		x		
		Gould's Long-eared Bat	*Nyctophilus gouldi*		x		
	V	Greater Broad-nosed Bat	*Scoteanax rueppellii*		x		
		Eastern Broad-nosed Bat	*Scotorepens orion*		x		
		Large Forest Bat	*Vespadelus darlingtoni*		x		
		Little Forest Bat	*Vespadelus vulturnus*		x		
			Miniopteridae				
	V	Little Bentwing Bat	*Miniopterus australis*		x		
	V	Eastern Bentwing Bat	*Miniopterus* (*schreibersii*) *orianae oceanensis*		x		
			Molossidae				
		White-striped Freetail Bat	*Austronomus australis*		x		
	V	East-coast Freetail Bat	*Micronomus norfolkensis*		x		
		Eastern Freetail Bat	*Mormopterus ridei*		x		
			Muridae				
		* House Mouse	*Mus musculus*		x		
		Bush Rat	*Rattus fuscipes*		x		

[2] Though identified as having been recorded within 10 km of the subject site, this list does not include a number of those mammals that have been previously recorded such as the Eastern Grey Kangaroo (*Macropus giganteus*), Echidna (*Tachyglossus aculeatus*) and Yellow-bellied Glider (*Petaurus australis*). Urban development and habitat loss would ensure that these species are not present as viable populations. 'Small' or urban tolerant mammals are included.

A	B	Common Name	Family and Scientific Name	1	2	3	4
		* Black Rat	*Rattus rattus*		x		
			Canidae				
		* Fox	*Vulpes vulpes*	x	x	x	
		* Dog	*Canis familiaris*		x		
			Felidae				
		* Feral Cat	*Felis catus*		x		
			Leporidae				
		* Rabbit	*Oryctolagus cuniculus*	x	x	x	
		* Brown Hare	*Lepus capensis*		x		
		BIRDS					
			Phasianidae				
		Brown Quail	*Coturnix ypsilophora*		x		
		King Quail	*Coturnix chinensis*		x		
F			**Anatidae**				
		Black Swan	*Cygnus atratus*		x		
		Plumed Whistling-Duck	*Dendrocygna eytoni*		x		
		Pacific Black Duck	*Anas superciliosa*	x	x	x	
		* Mallard	*Anas platyrhynchos*		x		
		Grey Teal	*Anas gracilis*	x	x		
		Chestnut Teal	*Anas castanea*	x	x		
		Hardhead	*Aythya australis*	x	x		
		Australian Wood Duck	*Chenonetta jubata*	x	x		
	V	Blue-billed Duck	*Oxyura australis*		x		
			Podicipedidae				
		Great Crested Grebe	*Podiceps cristatus*		x		
		Australasian Grebe	*Tachybaptus novaehollandiae*	x	x		
			Columbidae				
		White-headed Pigeon	*Columba leucomela*		x		
		* Rock Dove	*Columba livia*	x	x	x	
		* Spotted Dove	*Streptopelia chinensis*	x	x		x
		Brown Cuckoo-Dove	*Macropygia amboinensis*		x		
		Peaceful Dove	*Geopelia striata*		x		
		Bar-shouldered Dove	*Geopelia humeralis*		x		
		Emerald Dove	*Chalocophaps indica*		x		
		Crested Pigeon	*Ocyphaps lophotes*	x	x		x
		Wonga Pigeon	*Leucosarcia picata*		x		
			Podargidae				
		Tawny Frogmouth	*Podargus strigoides*		x		
			Aegothelidae				
		Australian Owlet-nightjar	*Aegotheles cristatus*		x		
			Apodidae				
M		White-throated Needletail	*Hirundapus caudacutus*		x		
			Anhingidae				
		Darter	*Anhinga novaehollandiae*		x		
			Phalacrocoracidae				
		Pied Cormorant	*Phalacrocorax varius*		x		
		Little Pied Cormorant	*Phalacrocorax melanoleucos*	x	x		
		Great Cormorant	*Phalacrocorax carbo*	x	x		
		Little Black Cormorant	*Phalacrocorax sulcirostris*	x	x		
			Pelecanidae				
		Australian Pelican	*Pelecanus conspicillatus*	x	x		
			Ardeidae				
		White-necked Heron	*Ardea pacifica*		x		
		White-faced Heron	*Egretta novaehollandiae*	x	x		
M		Cattle Egret	*Ardea ibis*		x		
M		Great Egret	*Ardea alba*		x		
		Intermediate Egret	*Ardea intermedia*		x		

A	B	Common Name	Family and Scientific Name	1	2	3	4
		Nankeen Night-Heron	*Nycticorax caledonicus*		x		
E	E	Australasian Bittern	*Botaurus poiciloptilus*		x		
			Threskiornidae				
		Australian White Ibis	*Threskiornis molucca*		x		
		Straw-necked Ibis	*Threskiornis spinicollis*		x		
		Royal Spoonbill	*Platalea regia*		x		
		Yellow-billed Spoonbill	*Platalea flavipes*		x		
F			**Accipitridae**				
		Pacific Baza	*Aviceda subcristata*		x		
		Black-shouldered Kite	*Elanus axillaris*		x		
	V	Square-tailed Kite	*Lophoictinia isura*		x		
		Whistling Kite	*Haliastur sphenurus*		x		
M		White-bellied Sea-eagle	*Haliaeetus leucogaster*		x		
		Wedge-tailed Eagle	*Aquila audax*		x		
	V	Little Eagle	*Hieraaetus morphnoides*		x		
		Brown Goshawk	*Accipiter fasciatus*	x	x		
		Collared Sparrowhawk	*Accipiter cirrocephalus*		x		
		Grey Goshawk	*Accipiter novaehollandiae*		x		
F			**Falconidae**				
		Peregrine Falcon	*Falco peregrinus*		x		
		Australian Hobby	*Falco longipennis*		x		
		Brown Falcon	*Falco berigora*		x		
		Nankeen Kestrel	*Falco cenchroides*		x		
			Rallidae				
		Buff-banded Rail	*Gallirallus phillippensis*		x		
		Dusky Moorhen	*Gallinula tenebrosa*	x	x	x	
		Purple Swamphen	*Porphyrio porphyrio*	x	x		
		Eurasian Coot	*Fulica atra*	x	x	x	
			Recurvirostridae				
		Black-winged Stilt	*Himantopus himantopus*		x		
F			**Charadriidae**				
		Masked Lapwing	*Vanellus miles*	x	x	x	
		Red-kneed Dotterel	*Erythrogonys cinctus*		x		
F			**Scolopacidae**				
M		Latham's Snipe	*Gallinago hardwickii*		x		
			Turnicidae				
		Painted Button-quail	*Turnix varius*		x		
			Laridae				
		Silver Gull	*Chroicoephalus novaehollandiae*		x		
			Cacatuidae				
	V	Glossy Black-Cockatoo	*Calyptorhynchus lathami*		x		
		Yellow-tailed Black Cockatoo	*Calyptorhynchus funereus*		x		
	V	Gang-gang Cockatoo	*Callocephalon fimbriatum*		x		
		Galah	*Eolophus roseicapillus*		x		
		Long-billed Corella	*Cacatua tenuirostris*	x	x		
		Little Corella	*Cacatua sanguinea*		x		
		Sulphur-crested Cockatoo	*Cacatua galerita*		x		
			Psittacidae				
		Rainbow Lorikeet	*Trichoglossus haematodus*	x	x	x	x
		Scaly-breasted Lorikeet	*Trichoglossus chlorolepidotus*		x		
		Musk Lorikeet	*Glossopsitta concinna*		x	x	
	V	Little Lorikeet	*Glossopsitta pusilla*		x		
		Australian King Parrot	*Alisterus scapularis*		x		
E	E	Swift Parrot	*Lathamus discolor*		x		
		Crimson Rosella	*Platycercus elegans*		x		
		Eastern Rosella	*Platycercus eximius*	x	x		
		Red-rumped Parrot	*Psephotus haematonotus*	x	x		

A	B	Common Name	Family and Scientific Name	1	2	3	4
			Cuculidae				
		Pallid Cuckoo	*Cacomantis pallidus*		x		
		Brush Cuckoo	*Cacomantis variolosus*		x		
		Fan-tailed Cuckoo	*Cacomantis flabelliformis*		x		
		Horsfield's Bronze-Cuckoo	*Chalcites basalis*		x		
		Shining Bronze-Cuckoo	*Chalcites lucidus*		x		
		Eastern Koel	*Eudynamys orientalis*		x		
		Channel-billed Cuckoo	*Scythrops novaehollandiae*		x		
		Pheasant Coucal	*Centropus phasianinus*		x		
			Strigidae				
	V	Powerful Owl	*Ninox strenua*		x		
		Southern Boobook	*Ninox novaeseelandiae*		x		
			Tytonidae				
	V	Masked Owl	*Tyto novaehollandiae*		x		
		Eastern Barn Owl	*Tyto javanica*		x		
			Alcedinidae				
		Azure Kingfisher	*Ceyx azureus*		x		
			Halcyonidae				
		Laughing Kookaburra	*Dacelo novaeguineae*		x		
		Sacred Kingfisher	*Todiramphus sanctus*		x		
			Meropidae				
M		Rainbow Bee-eater	*Merops ornatus*		x		
			Coraciidae				
		Dollarbird	*Eurystomus orientalis*		x		
			Climacteridae				
		White-throated Treecreeper	*Cormobates leucophaea*		x		
	V	Brown Treecreeper	*Climacteris picumnus*		x		
			Ptilonorhynchidae				
		Satin Bowerbird	*Ptilonorhychus violaceus*		x		
			Maluridae				
		Superb Fairy-wren	*Malurus cyaneus*	x	x		
		Variegated Fairy-wren	*Malurus lamberti*		x		
			Acanthizidae				
		White-browed Scrubwren	*Sericornis frontalis*		x		
		Yellow-throated Scrubwren	*Sericornis citreogularis*		x		
		Weebill	*Smicrornis brevirostris*		x		
		White-throated Gerygone	*Gerygone albogularis*		x		
		Brown Thornbill	*Acanthiza pusilla*		x		
		Yellow Thornbill	*Acanthiza nana*		x		
		Striated Thornbill	*Acanthiza lineata*		x		
		Buff-rumped Thornbill	*Acanthiza reguloides*		x		
		Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*		x		
			Pardalotidae				
		Spotted Pardalote	*Pardalotus punctatus*		x		
		Striated Pardalote	*Pardalotus striatus*		x		
			Meliphagidae				
		Red Wattlebird	*Anthochaera carunculata*		x		
		Little (Brush) Wattlebird	*Anthochaera chrysoptera*		x		
		Noisy Friarbird	*Philemon corniculatus*		x		
C	C	Regent Honeyeater	*Anthochaera phrygia*		x		
		Bell Miner	*Manorina melanophrys*		x		
		Noisy Miner	*Manorina melanocephala*	x	x	x	x
		Lewin's Honeyeater	*Meliphaga lewinii*		x		
		Yellow-faced Honeyeater	*Lichenostomus chrysops*		x		
		White-eared Honeyeater	*Lichenostomus leucotis*		x		
		Yellow-tufted Honeyeater	*Lichenostomus melanops*		x		
		Fuscous Honeyeater	*Lichenostomus fuscus*		x		

A	B	Common Name	Family and Scientific Name	1	2	3	4
		White-plumed Honeyeater	*Lichenostomus pencillatus*		x		
	V	Black-chinned Honeyeater	*Melithreptus gularis*		x		
		Brown-headed Honeyeater	*Melithreptus brevirostris*		x		
		White-naped Honeyeater	*Melithreptus lunatus*		x		
		White-cheeked Honeyeater	*Phylidonyris niger*		x		
		New Holland Honeyeater	*Phylidonryis novaehollandiae*		x		
		Brown Honeyeater	*Lichmera indistincta*		x		
		Eastern Spinebill	*Acanthorhynchus tenuirostris*		x		
			Psophodidae				
		Eastern Whipbird	*Psophodes olivaceus*		x		
			Neosittidae				
	V	Varied Sittella	*Daphoenositta chrysoptera*		x		
			Campephagidae				
		Black-faced Cuckoo-shrike	*Coracina novaehollandiae*		x		
		White-bellied Cuckoo-shrike	*Coracina papuensis*		x		
		White-winged Triller	*Lalage sueurii*		x		
			Pachycephalidae				
		Crested Shrike-tit	*Falcunculus frontatus*		x		
		Grey Shrike-thrush	*Colluricincla harmonica*		x		
		Golden Whistler	*Pachycephala pectoralis*		x		
		Rufous Whistler	*Pachycephala rufiventris*		x		
			Oriolidae				
		Olive-backed Oriole	*Oriolus sagittatus*		x		
		Australasian Figbird	*Sphecotheres vieilloti*		x		
			Artamidae				
		Masked Woodswallow	*Artamus personatus*		x		
		White-browed Woodswallow	*Artamus superciliosus*		x		
		Dusky Woodswallow	*Artamus cyanopterus*		x		
		Grey Butcherbird	*Cracticus torquatus*	x	x		x
		Pied Butcherbird	*Cracticus nigrogularis*		x		
		Australian Magpie	*Cracticus tibicen*	x	x	x	x
			Dicruridae				
		Spangled Drongo	*Dicrurus bracteatus*		x		
			Rhipiduridae				
		Grey Fantail	*Rhipidura albiscapa*		x		
M		Rufous Fantail	*Rhipidura rufifrons*		x		
		Willie Wagtail	*Rhipidura leucophrys*	x	x		
			Corvidae				
		Australian Raven	*Corvus coronoides*	x	x	x	x
			Monarchidae				
		Leaden Flycatcher	*Myiagra rubecula*		x		
M		Satin Flycatcher	*Myiagra cyanoleuca*		x		
		Restless Flycatcher	*Myiagra inquieta*		x		
M		Black-faced Monarch	*Monarcha melanopsis*		x		
		Magpie-lark	*Grallina cyanoleuca*	x	x	x	
			Corcoracidae				
		White-winged Chough	*Corcorax melanorhamphos*	x	x		
			Petroicidae				
		Rose Robin	*Petroica rosea*		x		
	V	Scarlet Robin	*Petroica boodang*		x		
		Eastern Yellow Robin	*Eopsaltria australis*		x		
		Jacky Winter	*Microeca fascinans*		x		
			Alaudidae				
		* Eurasian Skylark	*Alauda arvensis*		x		
F			**Cisticolidae**				
		Golden-headed Cisticola	*Cisticola exilis*		x		
F			**Acrocephalidae**				

A	B	Common Name	Family and Scientific Name	1	2	3	4
M		Australian Reed-Warbler	*Acrocephalus australis*		x		
F			**Megaluridae**				
		Little Grassbird	*Megalurus gramineus*		x		
			Timaliidae				
		Silvereye	*Zosterops lateralis*		x		
			Hirundinidae				
		Welcome Swallow	*Hirundo neoxena*	x	x		
		Tree Martin	*Petrochelidon nigricans*		x		
		Fairy Martin	*Petrochelidon ariel*		x		
			Pycnonotidae				
		* Red-whiskered Bulbul	*Pycnonotus jocosus*		x		
F			**Turdidae**				
		* Common Blackbird	*Turdus merula*		x		
			Sturnidae				
		* Common Starling	*Sturnus vulgaris*	x	x		x
		* Common Myna	*Sturnus tristis*	x	x	x	x
			Nectariniidae				
		Mistletoebird	*Dicaeum hirundinaceum*		x		
			Estrildidae				
		Double-barred Finch	*Taeniopygia bichenovii*	x	x		
		Zebra Finch	*Taeniopygia guttata*		x		
		Red-browed Finch	*Neochmia temporalis*		x		
		* Nutmeg Mannikin	*Lonchura puntulata*		x		
			Passeridae				
		* House Sparrow	*Passer domesticus*	x	x	x	
			Motacillidae				
		Australasian Pipit	*Anthus naovaeseelandiae*		x		
		REPTILES					
			Chelidae				
		Eastern Snake-necked Turtle	*Chelodina longicollis*		x		
			Carphodactylidae				
		Broad-tailed Gecko	*Phyllurus platurus*		x		
		Thick-tailed Gecko	*Underwoodisaurus milii*		x		
			Diplodactylidae				
		Wood Gecko	*Diplodactylus vittatus*		x		
			Pygopodidae				
		Common Scaly-foot	*Pygopus lepidopodus*		x		
			Scincidae				
		Red-throated Skink	*Acritoscincus platynotus*		x		
		Striped Snake-eyed Skink	*Cryptoblepharus virgatus*		x		
		Robust Ctenotus	*Ctenotus robustus*		x		
		Ribbon Ctenotus	*Ctenotus taeniolatus*		x		
		Eastern Water Skink	*Eulamprus quoyii*		x		
		Dark-flecked Garden Sun-skink	*Lampropholis delicata*	x	x	x	
		Pale-flecked Garden Sun-skink	*Lampropholis guichenoti*		x		
		Tree-base litter-skink	*Lygisaurus foliorum*		x		
		Weasel Skink	*Saproscincus mustelinus*		x		
		Eastern Blue-tongued Lizard	*Tiliqua scincoides*		x		
			Agamidae				
		Jacky Lizard	*Amphibolurus muricatus*		x		
		Eastern Water Dragon	*Intellagama lesueurii*		x		
		Bearded dragon	*Pogona barbata*		x		
			Varanidae				
		Lace Monitor	*Varanus varius*		x		
			Elapidae				
		Red-naped Snake	*Furina diadema*		x		
		Red-bellied Black Snake	*Pseudechis porphyriacus*		x		

A	B	Common Name	Family and Scientific Name	1	2	3	4
		Eastern Brown Snake	*Pseudonaja textilis*		x		
		AMPHIBIANS					
			Limnodynastidae				
V	V	Giant Burrowing Frog	*Heleioporus australiacus*		x		
		Eastern Banjo Frog	*Limnodynastes dumerilii*		x		
		Brown-striped Frog	*Limnodynastes peronii*		x		
		Spotted Grass Frog	*Limnodynastes tasmaniensis*		x		
		Ornate Burrowing Frog	*Platyplectrum ornatum*		x		
			Myobatrachidae				
		Common Eastern Froglet	*Crinia signifera*	x	x	x	
	V	Red-crowned Toadlet	*Pseudophryne australis*		x		
		Brown Toadlet	*Pseudophryne bibronii*		x		
		Dusky Toadlet	*Uperoleia fusca*		x		
		Smooth Toadlet	*Uperoleia laevigata*		x		
		Wrinkled Toadlet	*Uperoleia rugosa*		x		
			Hylidae				
V	E	Green and Golden Bell Frog	*Litoria aurea*		x		
		Green Tree Frog	*Litoria caerulea*		x		
		Bleating Tree Frog	*Litoria dentata*		x		x
		Eastern Dwarf Tree Frog	*Litoria fallax*		x		
		Broad-palmed Frog	*Litoria latopalmata*		x		
		Lesueur's Frog	*Litoria lesueuri*		x		
		Peron's Tree Frog	*Litoria peronii*		x		
		Tyler's Tree Frog	*Litoria tyleri*		x		
		Verreaux's Tree Frog	*Litoria verreauxii*		x		
		INVERTERBRATES					
			Camaenidae				
	E	Cumberland Plain Land Snail	*Meridolum corneovirens*		x		
E		Dural Woodland Snail	*Pommerhelix duralensis*		x		
		FISH					
		Eel species	*Anguilla sp.*		x		
		* Mosquitofish	*Gambusia holbrooki*		x		