4 Results

The following vegetation communities occur in the Edmondson Park South site:

- Cumberland Plain Woodland (including derived native grassland)
- Alluvial Woodland

Whilst no threatened flora have been recorded on the site, twenty-three (23) threatened flora have been recorded within a 10 km radius of Edmondson Park since 1980. Of these, there is potential habitat for the following three species;

- Downy Wattle *(Acacia pubescens)*
- Spiked Rice-flower *(Pimelea spicata)*
- Sydney Plains Greenhood *(Pterostylis saxicola)*

Five (5) species of threatened fauna are known to occur on the site, whilst of the 32 species recorded within a 10 km radius of the site a further 17 are likely or have the potential to occur on the site. The bulk of these species are highly mobile bird and bat species that may utilise elements of the site on an intermittent basis for opportunistic foraging. The following species are known to occur on the site;

- Cumberland Plain Land Snail *(Meridolum corneovirens)*
- Eastern Bentwing-bat *(Miniopterus schreibersii oceanensis)*
- Eastern False Pipistrelle *(Falsistrellus tasmaniensis)*
- Eastern Freetail-bat *(Mormopterus norfolkensis)*
- Greater Broad-nosed Bat *(Scoteanax rueppellii)*

5 Impact Evaluation

5.1 SITE CONTEXT

Strategic planning for Edmondson Park has focused on retention of higher quality remnant vegetation within a Regional Park, and supplementary areas of habitat located within an open space network across the site.

Consequently across the development approximately 28 hectares of 'Existing Native Vegetation' (ENV)[2] will be lost and 103 hectares will be retained. The breakdown of loss and retention on the basis of certified and non-certified lands is provided below.

Table 1. ENV Calculations

ENV	Certified Lands (ha)	Non Certified Lands (ha)
Retained	4.2ha (Open Space areas & Regional Park addition adjacent to Zouch Rd)	103.4
Lost	27.8	0.1 (boundary adjustment) + 0.3 (sewer alignment)
Total	**32.0**	**103.8**

The loss of 0.1 ha in the non-certified lands relates to the regional park boundary adjustment. The additional 4.2 ha that is certified for removal but will be retained relates to additional vegetation within open space reserves that was not identified in the Growth Centres Conservation Plan.

If this were a precinct planning process, validation of ENV would be required. During surveys of the boundary adjustment it was noted that approximately 4 hectares of high quality vegetation which includes the vegetation proposed to be added to the Regional Park has not been mapped as ENV. This appears to be a mapping error. If this were included as ENV, approximately 8 ha of additional ENV beyond the requirements of the Biodiversity Certification Order would be protected.

The above table has not included the disturbance of vegetation as part construction of the sewer line. This will result in the clearing and revegetation of approximately 0.3 ha of mapped ENV. Conservatively, this has been estimated on the basis of a 10 metre wide disturbance corridor, it is likely that in sensitive areas disturbance could be limited to a width of around 6 metres.

[2] Existing Native Vegetation, as mapped in the *Growth Centres Conservation Plan 2007* and referred to in the *Biodiversity Certification Order, 2007*

Implementation of the Biodiversity Certification Order that applies to the site *'will lead to the overall improvement or maintenance of biodiversity values'* (NSW State Government, 2007). As shown in Table 1, the retention of 4.2 ha of ENV within lands certified for clearing far outweighs the loss of 0.1ha of vegetation through the adjustment of the Regional Park boundary and temporary disturbance of 0.3ha during the construction of the sewer pipeline. The proposal is considered to exceed the requirements of the Biodiversity Certification Order and should therefore lead to an improvement in biodiversity values.

5.2 STAGE 1

Stage 1 is located within 'certified' lands. It will result in the loss of 1.8 ha of ENV and the modification of 2.3 ha of ENV immediately adjacent to the site (Figures 6 and 7). The area of ENV being modified requires thinning of the canopy and management of the understorey to be compliant with bushfire Asset Protection Zone requirements.

Construction of the sewer line requires the clearing and subsequent revegetation of approximately 0.3 ha of mapped ENV. Conservatively, this has been estimated on the basis of a 10 metre wide disturbance corridor, it is likely that in sensitive areas disturbance could be limited to a width of around 6 metres.

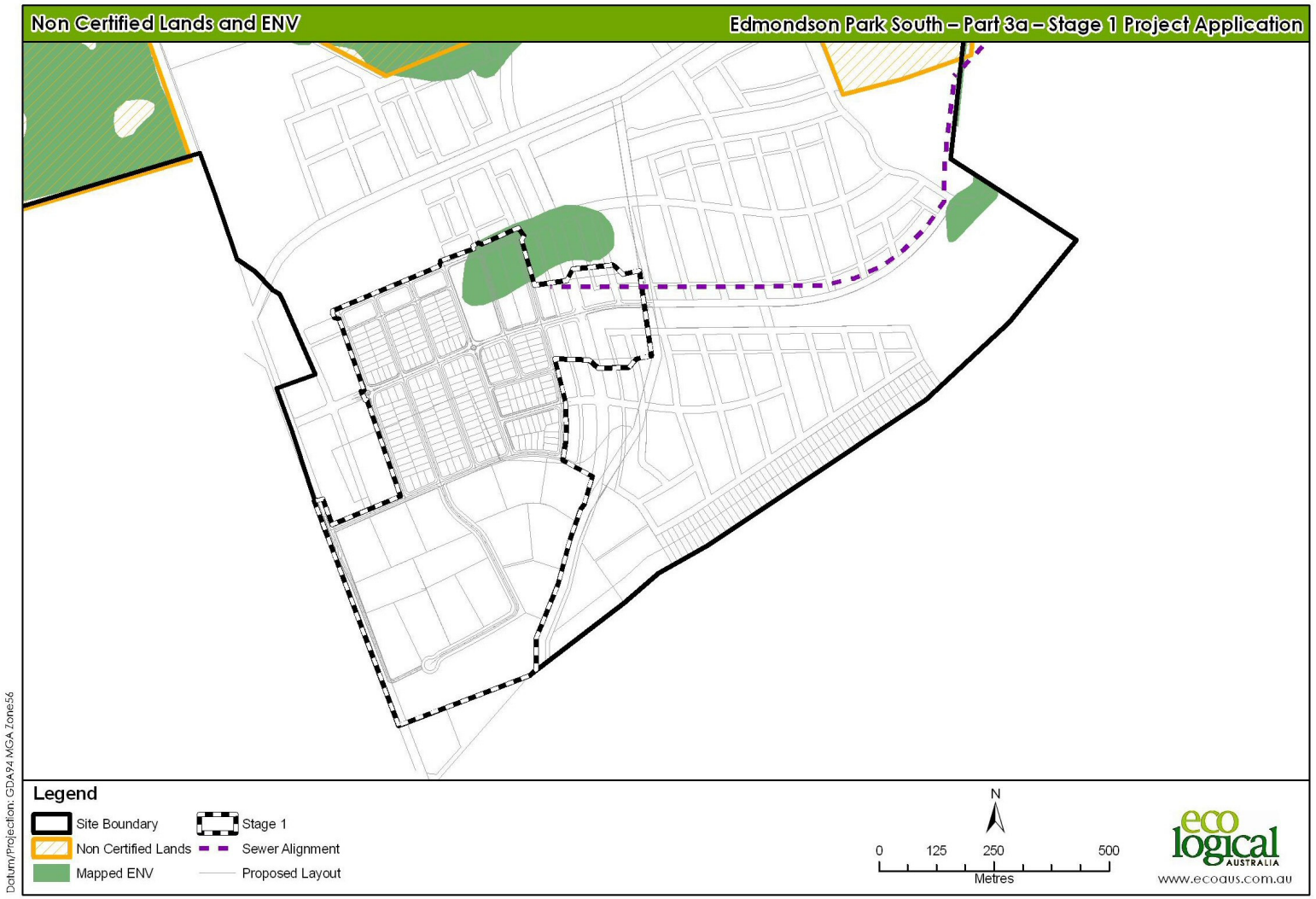

Figure 6. Non-certified Lands and ENV

6 Mitigation

Edmondson Park has been designed to retain some 79% of ENV plus additional areas of ecological value within a Regional Park and Open Space network that will be revegetated. This equates to an ENV offset ratio of approximately 4 to 1. These areas will be provided with high levels of protection and will be subject to ongoing management that will reduce threats to the environment and lead to a significant improvement in the quality of habitat in these areas.

6.1 BIODIVERSITY CERTIFICATION ORDER

The site is subject to Biodiversity Certification by way of its inclusion in Clause 7a of the Growth Centres SEPP. Biodiversity Certification has been conferred upon the SEPP as the Minister for the Environment is satisfied that this:

'*will lead to the overall improvement or maintenance of biodiversity values*.'

All lands within Stage 1 are 'certified', clearing can occur without the need for impact assessment. Whilst an area of mapped ENV occurs in the centre north of the site; it is not required to be retained as it is certified.

Clearing and revegetation as part of sewer main construction requires the agreement of DECCW as it is located on land marked with a red hatching in the Growth Centres Conservation Plan (GCC, 2007).

6.2 EPBC ACT CONSERVATION AGREEMENT

A Conservation Agreement under the EPBC Act applies to the site. This agreement requires the following measures to be implemented to ameliorate and offset the impact to matters of National Environmental Significance:

1. Establishment and management of a Regional Park including undertaking control measures for existing areas of African Olive;
2. Sympathetic management of Public Open Space (for Conservation) that contains CPW; and
3. An environmental offset outside the Precinct to offset unavoidable impacts.

The Regional Park includes approximately 79 hectares of CPW and 31 hectares of River-Flat Eucalypt Forest on Coastal Floodplains. A further 9 hectares of currently cleared land is required to be rehabilitated and restored to CPW.

The above onsite outcomes are indicated in Figure 3 of the Conservation Agreement (see Appendix C).

This proposal meets or exceeds the requirement identified above. A small number of minor variations from the outcomes identified in Figure 3 of the Conservation Agreement are proposed that will result in an increase in the area of Cumberland Plain Woodland protected across the site.

Figure 7 below maps the location of the proposed changes, of these only altering the open space areas is relevant to Stage 1. The Conservation Agreement does not have any requirements relating to the open space areas that are proposed to be altered.

6.2.1 Sewer Alignment

The proposed sewer alignment would impact on approximately 1,100 m^2 of 'A' class Cumberland Plain Woodland. It would impact upon approximately 1,800 m^2 of Alluvial Woodland, which is not protected under the EPBC Act. This is a small scale temporary disturbance that will be fully revegetated and will not result in a material difference to the conservation outcomes.

6.2.2 Open Space Modification

The Conservation Agreement requires sympathetic management of CPW on lands identified as Public Open Space (for Conservation). No changes are proposed for these areas and the proposal is consistent with the Conservation Agreement.

Other areas of Open Space are proposed to be modified. Whilst this does not impact on the requirements of the Conservation Agreement the proposed Open Space areas differ from Figure 3 in the Conservation Agreement in the following way:

1. Location of electricity substation in an area mapped as Proposed Open Space Public (4)
2. Reduction in the length and width of a riparian corridor mapped as Open Space Public (1)
3. Increase in the width of a riparian corridor mapped as Open Space Public (1)
4. Rezoning of a strip of Open Space Public (1) along the boundary with the Hume Highway to Residential with development controls
5. Addition of three (3) new areas of Open Space Public (for Conservation) (2)

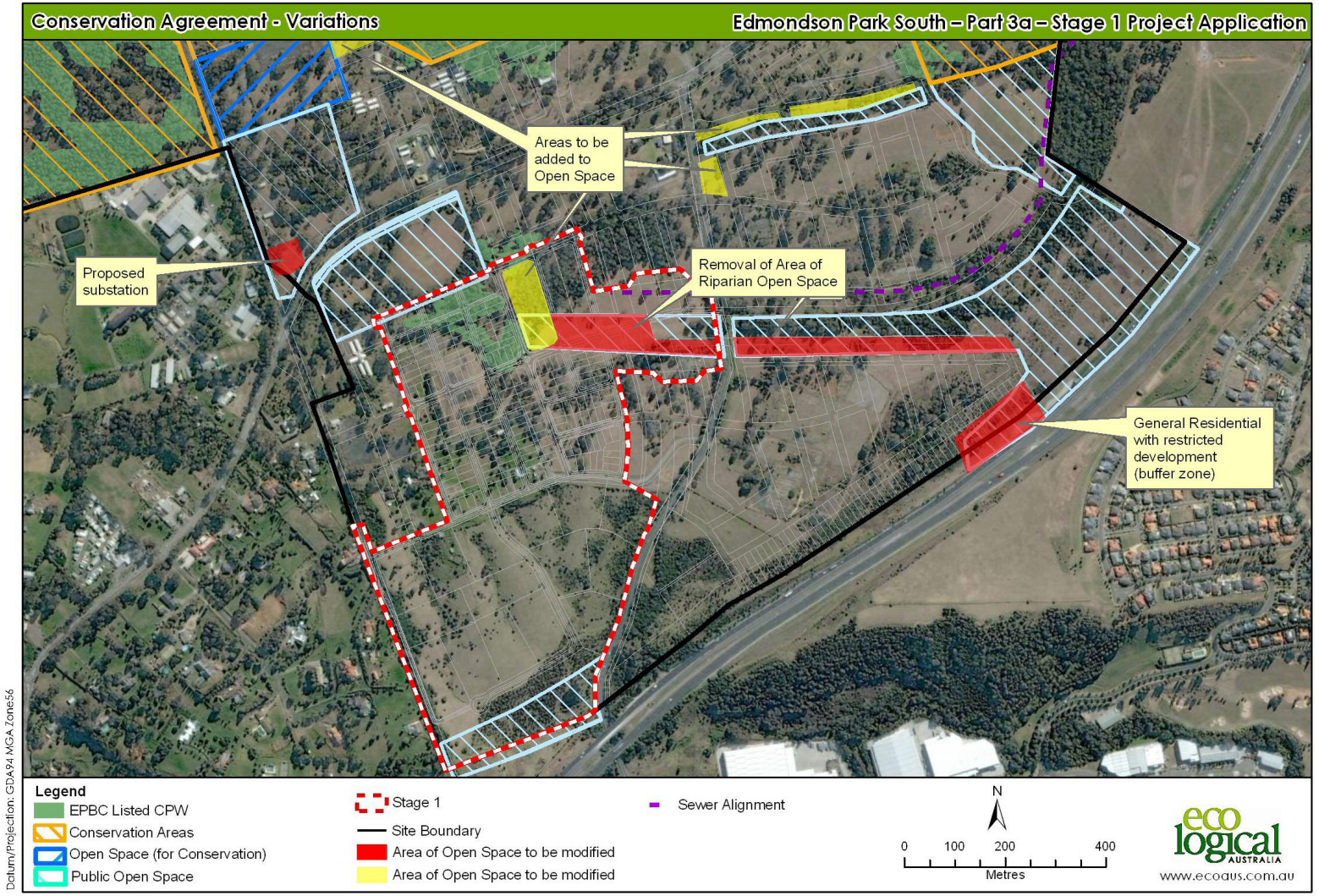

Figure 7. Conservation Agreement modifications

7 Water and Riparian

The Director Generals Requirements require the following issues to be addressed that are relevant to this ecological assessment report.

> (2) Identify any potential impacts on groundwater and groundwater dependant ecosystems, and how impacts will be avoided mitigated or managed.
>
> (4) Assess any proposed variation to riparian corridors and associated buffers in accordance with the Riparian Corridor Management Study (RCMS) approach applied to the Growth Centres, and provide justification for any changes. Details of any rehabilitation works for corridors should be provided.

7.1 GROUNDWATER DEPENDENT ECOSYSTEMS

Groundwater dependent ecosystems on the site are principally concerned with riparian zones and floodplains that are vegetated with Alluvial Woodland. There are no natural wetlands on the site. As riparian zones are being protected across the site, impacts to Groundwater dependent ecosystems will occur through altered hydrological regimes as a result of an urbanised catchment.

The potential impacts to Groundwater dependent ecosystems are being mitigated through the following measures:

1. Protection and revegetation of a system of riparian corridors
2. Bush regeneration of vegetated floodplain areas that are subject to existing weed infestation
3. Improvement of water quality through the implementation of Water Sensitive Urban Design Measures
4. Management of peak storm flows and flood flows through a series of stormwater detention basins to reduce erosion.

7.2 RIPARIAN CORRIDORS

The approach to riparian corridors is primarily addressed in J. Wyndham Prince (2010) where a detailed assessment of the geomorphic character, hydrological regime and Strahler Stream Order has been undertaken. The proposed changes to the riparian areas compared to that previously identified for the site have been considered below in relation to ecological values.

During rezoning of Edmondson Park a detailed assessment of the site using the RCMS methodology implemented in the Growth Centres was undertaken. This proposal is broadly consistent with the

outcomes of this earlier assessment and provides for a network of riparian corridors across the site, with corridor widths determined by the relative importance of the creeklines. One change is proposed in stage 1;

1. A decrease in the width (approximately 35m decrease) and length (approximately 250m decrease) of the southern riparian corridor. This corridor was assigned a wider than necessary width to compensate for it being a concrete lined channel. It is now proposed to remove the concrete lining and restore a natural channel. Based on hydrological assessment of the catchments to the West of Macdonald Road (J. Wyndham Prince, 2010) this revised approach is considered practical given the greater knowledge of flow conveyance requirements. Assigning this as a 'Category 3' stream reflects that there is little ecological value in this stream and the emphasis is on bed and bank stability. The area to be removed is currently cleared.

   The reduction in length has been based on geomorphic assessment of the drainage depressions to the West of MacDonald Road. J. Wyndham Prince, 2010 has identified that the drainage depressions in this area do not meet the definition of a 'river' under the *Water Management Act, 2000* and therefore there should be no requirement to protect these areas. These areas are currently grazed agricultural land and are considered to be of little ecological value.

8 Ecologically Sustainable Development (ESD)

The Director Generals Requirements require consideration of the principles of Ecologically Sustainable Development:

> (1) The EA should demonstrate that all aspects of the concept plan satisfy the principles of ESD including compliance with BASIX.
>
> (2) The EA should outline commitments to sustainability including water reuse, waste minimisation, the minimisation of energy use and car dependency.

Whilst these principles are generally considered in the context of the built environment it is notable that the urban design of Edmondson Park has facilitated the protection of a substantial area of critically endangered ecological communities and potential threatened species habitat. The approach has focused on the retention of large habitat nodes and the provision of vegetated corridors between these nodes.

Areas that will be revegetated will utilise local provenance native species, maintaining the genetic integrity of the bushland.

Construction of the proposed sewer main, whilst resulting in a temporary disturbance to an area of bushland, will negate construction of a sewer pump station as the site can now be serviced by a gravity main. This will reduce potential impacts during the construction of a pump station, remove a potential sewer overflow point and avoid long-term carbon emissions.

The provision of passive recreation including cycle links through the Regional Park provides an opportunity to reduce car use.

9 Regional Park

The Director Generals Requirements require consideration of the proposal in relation to the Regional Park:

(1) Identify measures to mitigate interface impacts (both construction and operational) on the ecological values of the Regional Park from adjoining urban areas.

(2) Assess the consistency of the proposal with the Statement of Interim Management Intent for the Regional Park. Outline and justify any variations and provide an appropriate assessment of any potential impacts.

Stage 1 is well separated from the Regional Park and will not have any impacts on the Regional Park.

10 Additional Assessment Requirements (Project App)

Construction Requirements
(2) Identify strategies to minimise impacts on the ecological values of the regional park and open space areas, as well as to minimise the extent of vegetation clearing within the development area.

Active planning and management of the interface area is required to reduce potential impacts to the Regional Park and Open Space areas. At the planning stage this has included:

1. Inclusion of perimeter roads to avoid having houses backing on to the Regional Park and Open Space areas
2. Identification of 'desire lines' and intelligent placement of pathways to reduce the likelihood of informal access routes
3. Detailed design of the high use precincts within the parks to concentrate activities in areas of lower environmental sensitivity
4. Preparation of water and sediment control plans

During construction the potential to damage the environmental values of the Regional Park and Open Space areas will be mitigated through:

1. Provision of fencing to keep contractors out of the Regional Park and Open Space areas
2. Provision of signage that identifies the location of critically endangered ecological communities and liability for prosecution under State and Commonwealth legislation
3. Inclusion of an environmental site induction
4. Identification of environmental protection requirements in contracts
5. Installation of sediment control devices (sediment fences, hay bales, ponds) during construction
6. Use of sterile cover crops in spray grass applications
7. Regular weed management along the interface

Whilst thinning will occur in the area of ENV in the centre north of the site, clearing across the remainder of the site will be confined to areas of urban development. Due to the requirement to undertake bulk earthworks it is not practical to try and retain individual trees in the urban area.

11 Conclusion

The site has been subject to detailed previous assessment that has facilitated the site being 'biodiversity certified' under the *NSW Threatened Species Conservation Act, 1995*. A Conservation Agreement signed by the state and Commonwealth governments under the *Commonwealth Environment Protection and Biodiversity Conservation Act, 1999* approves development of the site providing it is consistent with the Conservation Agreement. The Conservation Agreement does not contain any requirements for protection or management of lands within Stage 1 and the proposal is considered to be consistent with the requirements of the Conservation Agreement.

This proposal is consistent with the Biodiversity Certification and the Conservation Agreement. This proposal is also consistent with the Edmondson Park Concept Plan lodged under Part 3A of the *Environmental Planning and Assessment Act, 1979*.

Subdivision of a large area will require the use of bulk earthwork machinery and will result in significant ground disturbance. Due to these activities it is not considered practical to retain trees within the urban development area. Trees will however be retained within the Open Space areas and to the centre north of the site where thinning of an area of ENV will occur.

This report includes a suite of recommendations that if implemented will reduce the potential for areas of ecological value adjacent to the site to be impacted.

References

DEC, 2005. *Draft Guidelines for Threatened Species Assessment.*

DEWHA, 2009. *Approved Conservation Advice for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.*

Eco Logical Australia, 2002. *Edmondson Park Ecological Assessment*.

Growth Centres Commission, 2007. *Growth Centres Conservation Plan.*

Hassell, 2010., Edmondson Park Part 3A Concept Plan Landscape Masterplan.

J. Wyndham Prince, 2010. *Water Cycle Management Plan Edmondson Park Part 3A Application.*

Manidis Roberts, 2008. *Edmondson Regional Park Statement of Interim Management Intent.*

Appendix A: Likelihood of Occurrence

THREATENED FAUNA

Common Name	Scientific Name	Legal Status	Likelihood
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	Known
Cumberland Plain Land Snail	*Meridolum corneovirens*	E1	Known
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V	Known
Eastern Freetail-bat	*Mormopterus norfolkensis*	V	Known
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	Known
Varied Sittella	*Daphoenositta chrysoptera*	V	Likely
Little Lorikeet	*Glossopsitta pusilla*	V	Likely
Little Eagle	*Hieraaetus morphnoides*	V	Likely
Square-tailed Kite	*Lophoictinia isura*	V	Likely
Large-footed Myotis	*Myotis adversus*	V	Likely
Scarlet Robin	*Petroica boodang*	V	Likely
Flame Robin	*Petroica phoenicea*	V	Likely
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	Likely
Spotted Harrier	*Circus assimilis*	V	No
White-fronted Chat Epthianura albifrons (Jardine & Selby, 1828) in the Sydney Metropolitan Catchment Management Authority area	*Epthianura albifrons*	E2	No
Giant Burrowing Frog	*Heleioporus australiacus*	V	No
Brush-tailed Rock-wallaby	*Petrogale penicillata*	E1	No
Red-crowned Toadlet	*Pseudophryne australis*	V	No
Spotted-tailed Quoll	*Dasyurus maculatus*	V	Potential
Swift Parrot	*Lathamus discolor*	E1	Potential
Black-chinned Honeyeater (eastern subsp.)	*Melithreptus gularis gularis*	V	Potential
Southern Myotis	*Myotis macropus*	V	Potential
Powerful Owl	*Ninox strenua*	V	Potential
Superb Parrot	*Polytelis swainsonii*	V	Potential
Speckled Warbler	*Pyrrholaemus sagittatus*	V	Potential
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	Potential
Regent Honeyeater	*Xanthomyza phrygia*	E1	Potential
Magpie Goose	*Anseranas semipalmata*	V	Unlikely
Major Mitchell's Cockatoo	*Cacatua leadbeateri*	V	Unlikely
Eastern Pygmy-possum	*Cercartetus nanus*	V	Unlikely
Green and Golden Bell Frog	*Litoria aurea*	E1	Unlikely
Koala	*Phascolarctos cinereus*	V	Unlikely

THREATENED FLORA

Common Name	Scientific Name	Legal Status	Likelihood
Allocasuarina glareicola	*Allocasuarina glareicola*	E1	No
White-flowered Wax Plant	*Cynanchum elegans*	E1	No
Narrow-leaved Black Peppermint	*Eucalyptus nicholii*	V	No
Wallangarra White Gum	*Eucalyptus scoparia*	E1	No
Grevillea caleyi	*Grevillea caleyi*	E1	No
Grevillea parviflora	*Grevillea parviflora*	V	No
Small-flower Grevillea	*Grevillea parviflora subsp. parviflora*	V	No
Grevillea shiressii	*Grevillea shiressii*	V	No
Leucopogon exolasius	*Leucopogon exolasius*	V	No
Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	*Marsdenia viridiflora subsp. viridiflora*	E2	No
Deane's Paperbark	*Melaleuca deanei*	V	No
Hairy Geebung	*Persoonia hirsuta subsp. hirsuta/evoluta*	E1	No
Nodding Geebung	*Persoonia nutans*	E1	No
Pultenaea pedunculata	*Pultenaea pedunculata*	E1	No
Syzygium paniculatum	*Syzygium paniculatum*	V	No
Tetratheca juncea	*Tetratheca juncea*	V	No
Woronora Beard-heath	*Leucopogon exolasius*	V	No
Leucopogon fletcheri subsp. fletcheri	*Leucopogon fletcheri subsp. fletcheri*	E1	No
Downy Wattle	*Acacia pubescens*	V	Potential
Spiked Rice-flower	*Pimelea spicata*	E1	Potential
Sydney Plains Greenhood	*Pterostylis saxicola*	E1	Potential
Dillwynia tenuifolia	*Dillwynia tenuifolia*	E2	Unlikely
Juniper-leaved Grevillea	*Grevillea juniperina subsp. juniperina*	V	Unlikely

Appendix B: Qualifications

The following people have been involved in the preparation of this report:

Name	Role	Qualifications
Steven House	Project Director Field survey, reporting	Bachelor of Science Grad Dip. Bushfire Scientific License: S10805
Ross Wellington	Project Manager Field survey	Bachelor of Arts Diploma of Education Scientific License: S10805
Robert Mezzatesta	GIS Manager GIS analysis, map preparation	Bachelor of Science Master of Environmental Planning

Certification

I certify that this is a true and accurate report.

Steven House

Director

26th August, 2010

Appendix C: Conservation Agreement

Appendix D: Biodiversity Certification Order

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