

LOT 5 DP 261728
WARADALE ROAD, SILVERDALE

PROPOSED REZONING

FLORA AND FAUNA
PRELIMINARY INVESTIGATION

March 2010





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31st March 2010

Date

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FIGURE 1 Aerial view of the subject site.

FIGURE 2 Proposed rezoning of the subject site.

FIGURE 3 Vegetation communities across the subject site.

FIGURE 4 Aerial view of the subject site in relation to surrounding lands.

APPENDIX 1 Threatened fauna species known from the locality.

APPENDIX 2 Inventory of flora species recorded.

APPENDIX 3 Fauna species known from the site and locality.

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1 INTRODUCTION

1.1 Context

This flora and fauna preliminary investigation report has been prepared to identify and consider potential flora and fauna issues pertinent to the proposed rezoning of Lot 5 DP 261728 Waradale Road, Silverdale, within the Wollondilly Local Government Area (LGA).

The subject site (Lot 5) is approximately 20 hectares in size, and is bounded to the east by existing residences fronting Silverdale Road, to the south by existing residences fronting Warradale Road, to the west by the unformed Marsh Road road reserve, and to the north by the unformed Government Road road reserve. Refer to Figure 1.

The site is dominated by two steep-sided creekline gullies which converge in the northern part of the site. The upper banks of the gullies contain rock outcroppings and minor escarpments. The gullies support relatively intact native vegetation.

Land to either side of the gullies is gently undulating, and contains disturbed open woodland/forest vegetation. Some previous clearing has occurred in these areas, particularly across the eastern half of the site.

The site is currently undeveloped, although appears to be in regular use by recreational trail bike riders. The northwestern corner of the site and all adjacent lands along the northern boundary are currently zoned industrial. The remainder of the site is currently zoned rural.

The proposed rezoning would retain the industrial zoning in the northwestern corner of the site, would create an environmental protection zone to encompass the two main gullies of the site, and would zone the remainder of the site residential. Refer to Figure 2. This zoning pattern would be consistent with surrounding and adjacent lands.

1.2 Objectives

The objectives of this preliminary investigation and report are:

- to identify and describe the existing vegetation of the subject site;
- to identify habitats for native fauna within the site, and compile a list of fauna species likely to occur on the site;

- to determine the likelihood of threatened flora and fauna species, populations and ecological communities (as listed under the *NSW Threatened Species Conservation Act 1995*, or under the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999*) occurring on the site or being affected by the proposed rezoning;
- to consider flora and fauna issues pertinent to the proposed rezoning, and identify possible constraints to development of the site;
- to recommend appropriate boundaries and buffer distances between the proposed residential zone and any areas of significant vegetation or important habitat;
- to suggest where further work would be required to enable a detailed assessment under relevant legislation;
- to consider possible impact amelioration and environmental protection measures which could be implemented within the site, to minimise the potential impacts of future development upon native flora and fauna.

2 FIELD SURVEYS AND RESEARCH

2.1 General

Desktop research and analysis included review of the previous Flora & Fauna Impact Survey report prepared for the site by CPE Tree Services in 2003, interpretation of aerial photography, and reference to broad-scale vegetation mapping of the region (NPWS 2002).

Relevant data (including records of threatened species) were obtained from a search of records listed within 10km of the subject site on the DECC Atlas of NSW Wildlife (data obtained August 2009).

Threatened fauna species recorded within 10km of the site since 1980 (DECC Atlas) are listed in Appendix 1 of this report, along with known details of their habits, habitat and foraging requirements, and distributions.

2.2 Flora

A botanical survey was conducted across the site on the 7th and 8th of September 2009, to identify the broad vegetation communities present, and to conduct targeted searches¹ for threatened plant species in areas that could be directly affected as a result of the proposed rezoning.

A second survey was conducted on the 23rd of March 2010, to further investigate and map vegetation boundaries on the site.

Some of the steep gully areas were difficult to access, and have not been thoroughly surveyed at this stage.

An inventory was compiled of all plant species recorded on the site (Appendix 2). Plant identifications conform to nomenclature in Harden (1990-1993) and to recent reclassifications and name changes listed in *Cunninghamia* and *Telopea*.

¹ with reference to the random meander technique described in Cropper (1993)

Ecological communities were identified and described with reference to the descriptions included in the Final Determinations of communities listed on the *NSW Threatened Species Conservation Act 1995* (TSC Act) and the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act), and using *The native vegetation of the Cumberland Plain, western Sydney: systematic classification and field identification of communities* (Tozer 2003).

The conservation significance of individual species, populations and vegetation communities recorded during the survey was established with reference to the EPBC Act in the national context, and to the TSC Act in the state context.

2.3 Fauna

A fauna habitat survey was conducted across most of the subject site on the 8th of September 2009, with a focus on areas that could be directly affected by development resulting from the proposed rezoning.

Specific searches were conducted for habitat or resources of relevance for threatened fauna species known from the general locality (DECC Wildlife Atlas), or which might be anticipated to occur on the site.

Searches were conducted opportunistically for indirect evidence of fauna (such as nests, dens, scats, tracks and scratchings).

Targeted searches were conducted for the threatened Cumberland Plain Land Snail, including turning of logs on the ground, and digging amongst deep leaf litter.

Opportunistic records were maintained of all observations of animal activity and aural identification of bird and frog calls.

A list of fauna species previously recorded on the site (CPE 2003), and of species known to have occurred in the vicinity of the site, and therefore potentially occurring on the site on occasions, is provided in Appendix 3. The conservation significance of native fauna species expected to occur was established with reference to the EPBC Act in the national context, and to the TSC Act in the state context.

3 EXISTING ENVIRONMENT

3.1 General Description

The subject site is approximately 20 hectares in size, and is dominated by two steep-sided creekline gullies (tributaries of Megarrity's Creek) which converge in the northern part of the site. The creeklines themselves are typically quite weed-infested, probably due to upstream influences.

The sides of the gullies support relatively intact native woodland to open-forest vegetation, with a moderately dense shrub layer.

The upper banks of the creekline gullies contain sandstone rock outcroppings and minor escarpments, which provide a range of cracks, crevices and small overhangs of potential shelter value for a range of native fauna species.

Land to either side of the gullies is gently undulating, and contains disturbed open woodland/forest vegetation. The understorey in these areas is much sparser. Some previous clearing has occurred in these areas, particularly across the eastern half of the site.

The site is currently undeveloped, although appears to be in regular use by recreational trail bike riders. A network of poorly formed roads and tracks cover much of the site. Some of these appear to be in a stable condition, whilst others show obvious signs of erosion. Some rubbish dumping has also occurred within the eastern portion of the site.

3.2 Flora

3.2.1 Species Details

Eastern Area

The eastern part of the subject site has been identified as a highly degraded remnant of Shale Sandstone Transition Forest (high sandstone influence), although with very few of the characteristic species remaining.

The upper canopy has a foliage cover of less than 20%. Characteristic species for Shale Sandstone Transition Forest (based on the NSW Scientific Committee's Final Determination) which occur in the eastern part of the site include Grey Gum *Eucalyptus punctata*, Narrow-leaved Ironbark *Eucalyptus crebra*, Red Mahogany *Eucalyptus resinifera* and White Stringybark *Eucalyptus globoidea*.

Occasional individuals of Turpentine *Syncarpia glomulifera* and Casuarina *Allocasuarina* spp are scattered across this part of the site.

The shrub layer in this area has been previously cleared, and has a foliage cover of less than 10%. Remnant shrubs are limited to along the boundary fencelines, and intermittently around the base of trees. The area has been burnt, which appears to have stimulated some regeneration of Wattles *Acacia* spp and Tea-trees *Leptospermum* spp up to 3m in height, with occasional smaller shrubs including Rice Flower *Pimelea linifolia* and Gorse Bitter Pea *Daviesia ulicifolia*.

The groundcover contains a mixture of native and introduced grasses, including the natives Tussock Grass *Poa labillardieri*, Wiry Panic *Entolasia stricta*, Wiry Ricegrass *Tetrarrhena juncea* and Netted Shaggy Pea *Podolobium scandens*.

A minor drainage line has been dammed on the eastern boundary of the site. The dam is completely covered with Water Hyacinth *Eichhornia crassipes*. The edges of the dam support Spikerush *Eleocharis* sp and Slender Knotweed *Persicaria decipiens*. Upstream, the drainage line is choked with the invasive weed, Crofton Weed *Ageratina adenophora*.

Central and western areas

The central and western parts of the site, including the creekline gullies, support relatively intact Upper Georges River Sandstone Woodland and Western Sandstone Gully Forest. Refer to Figure 3.

The canopy in the central area (in the vicinity of the main tributary of Megarritys Creek) has a foliage cover varying between 40 to 55%, and is dominated by Blackbutt *Eucalyptus pilularis* and Smooth-barked Apple *Angophora costata* to around 20m in height, with Red Bloodwood *Corymbia gummifera*, Mountain Mahogany *Eucalyptus notabilis* and White Stringybark *Eucalyptus globoidea* to around 15m in height. Yellow Bloodwood *Corymbia eximia* becomes increasingly dominant towards the west of the site.

The canopy in the western part of the site has a foliage cover of 55-60%, and is also dominated by Blackbutt and Smooth-barked Apple, but with less frequent occurrences of Mountain Mahogany, and a much greater dominance of Yellow Bloodwood.

A subcanopy of Turpentine *Syncarpia glomulifera* and Casuarinas *Allocasuarina* spp occurs throughout the central part of the site, with the Casuarinas and an increasing occurrence of Christmas Bush *Ceratopetalum gummiferum* occurring to the west.

The shrub layer in the central area has a foliage cover of around 50%, increasing to 60% along the creekline. Dominant native shrubs include Tea-trees *Leptospermum* spp, Wattles *Acacia* spp, Hairpin Banksia *Banksia spinulosa*, Rice Flower *Pimelea linifolia*, Spider Flower *Grevillea mucronulata* and Gorse Bitter Pea *Daviesia ulicifolia*.

The shrub layer in western areas is much denser than elsewhere on the site, up to 70% foliage cover. Species composition is similar to the central area, but with many Fabacaceae:Faboideae (Pea family) shrubs also being dominant.

The groundcover has a foliage cover of 90-100%, and is dominated by Mat-rushes *Lomandra* spp, Tussock Grass *Poa labillardieri*, Wiry Panic *Entolasia stricta*, Wiry Ricegrass *Tetrarrhena juncea* and *Lepidosperma laterale*.

The groundcover in the southwestern part of the site has been previously disturbed and is dominated by introduced species.

Within and bordering the actual creeklines, there are dense infestations of invasive weeds including Privets *Ligustrum* spp, Lantana *Lantana camara*, Verbena *Verbena brasiliensis*, Wandering Jew *Tradescantia albiflora*, Blackberry *Rubus fruticosus* spp agg, Cassia *Senna pendula* var *glabrata* and Crofton Weed *Ageratina adenophora*.

3.2.2 Identification of Community

Regional vegetation mapping conducted by NPWS (2002) indicates that some parts of the site support Shale Sandstone Transition Forest. The majority of the site was not mapped as part of this project.

Appendix 2 indicates which of the plant species recorded on the site occur predominantly or only in sandstone-derived soils. The high occurrence of these species across the majority of the site, particularly the central and western areas, was the basis for identification of Sandstone communities occurring across the central and western parts of the site, rather than Shale Sandstone Transition Forest.

The boundary between Shale Sandstone Transition Forest in the east, and Upper Georges River Sandstone Woodland to the west was determined based on the following:

1. A marked change in the percentage of Blackbutt *Eucalyptus pilularis* from east to west. Tozer (2003) states that Blackbutt is a species that occurs less frequently in Shale Sandstone Transition Forest, with a cover/abundance of 1 = rare, few individuals present and cover less than 5%.

Blackbutt occurs at a percentage of 20% along the boundary shown on Figure 3. To the west of the boundary shown on Figure 3, the percentage of Blackbutt increases almost immediately to greater than 45%.

To the east of the boundary shown on Figure 3, the percentage of Blackbutt decreases abruptly to less than 5% at the western edge of the loop track. From the western edge of the loop track to the eastern boundary of the property, Blackbutt does not occur at all.

On this basis, the boundary shown on Figure 3 may over-estimate the extent of Shale Sandstone Transition Forest. The community boundary may in fact be closer to the western edge of the loop track.

2. The percentage occurrences of Mountain Mahogany *Eucalyptus notabilis* and Smooth-barked Apple *Angophora costata*. Tozer (2003) states that these two species also occur less frequently in Shale Sandstone Transition Forest, with a cover/abundance of 1 = rare, few individuals present and cover less than 5%.

These species occur at significantly greater percentages to the west of the boundary shown on Figure 3 than to the east. In particular, Smooth-barked Apple occurs at a percentage of greater than 25% immediately west of the boundary, and less than 10% east of the boundary.

Again, the community boundary may actually be further to the east than shown on Figure 3.

3. The percentage occurrence of Red Bloodwood *Corymbia gummifera*. Tozer (2003) states that this species also occurs less frequently in Shale Sandstone Transition Forest, with a cover/abundance of 2 = uncommon and cover less than 5%. The percentage of this species is significantly greater to the west of the boundary, than to the east.
4. Narrow-leaved Ironbark *Eucalyptus crebra* and Grey Gum *Eucalyptus punctata*. These species are listed as characteristic species for Shale Sandstone Transition Forest in the NSW Scientific Committee's Final Determination to list the community as endangered. These species do not occur at all to the west of the boundary shown on Figure 3.
5. Dominant shrub species recorded west of the boundary shown on Figure 3 (White Wattle *Acacia linifolia*, Sydney Golden Wattle *Acacia longifolia* and Hairpin Banksia *Banksia spinulosa*) are typically sandstone species, and were not observed east of the boundary shown on Figure 3.

3.2.3 Conservation Significance

No flora species listed as "threatened" under either the TSC Act or the EPBC Act were recorded within the site, or are known to occur.

No flora species being part of any "endangered population" listed under the TSC Act were recorded within the site, or are known to occur.

Targeted searches were conducted for the following species known to occur in the locality (DECC Atlas): *Cynanchum elegans*, *Marsdenia viridiflora* ssp *viridiflora*, *Epacris purpurascens* var *purpurascens*, *Dillwynia tenuifolia*, *Pultenaea parviflora*, *Acacia gordonii*, *Haloragis exalta* ssp *exalta* var *exalta*, *Eucalyptus benthamii*, *Ancistrachne maidenii*, *Grevillea juniperina* ssp *juniperina*, *Persoonia nutans* and *Pimelea spicata*. None of these species were recorded.

Approximately 5 hectares of highly degraded Shale Sandstone Transition Forest occurs across the eastern part of the site (Figure 3). This community is listed as an "endangered ecological community" under the NSW TSC Act, and is also listed under the Commonwealth EPBC Act.

3.3 Fauna

3.3.1 Fauna Habitats

The subject site contains a range of intact habitat types and resources for native fauna, particularly within the main creekline gullies. These include:

- mature trees containing hollows of various sizes, providing potential shelter and nesting features for arboreal mammals, microchiropteran bats and many species of bird;
- a moderately dense shrub layer with a variety of seasonal flowering shrubs, providing shelter for smaller birds and mammals from predators;
- patches of grassy understorey providing a foraging resource for granivorous birds such as cockatoos and pigeons;
- areas of accumulated leaf litter and ground debris, providing shelter features for terrestrial fauna such as reptiles;
- pools and occasional temporary riffle zones in the creeklines providing habitat for disturbance-tolerant amphibians, and a water source for other fauna; and
- rocky cracks, crevices, and small overhangs within sandstone outcropping around the top edge of the gullies, providing shelter for reptiles and small terrestrial mammals.

The site also contains areas of disturbed open woodland/forest due to previous understorey slashing and clearing, and selected removal of canopy trees. These areas provide habitat for a range of birds and other fauna common to most suburban parks and larger gardens through western Sydney.

3.3.2 Fauna Species

A list of fauna species previously recorded on the site (CPE 2003), and of species known to occur in the vicinity of the site, is provided in Appendix 3. Most of these species would be expected to occur on the site on occasions.

3.3.3 Conservation Significance

No fauna species listed as "*threatened*" under either the TSC Act or the EPBC Act were recorded on the site, or are known to occur, and no evidence for such species (*eg* chewed cones, scratches, nests, scats) was recorded.

No fauna species being part of any "*endangered population*" listed under the TSC Act were recorded or are known to occur on the site.

However, 26 fauna species listed as threatened under the TSC Act and/or EPBC Act have been recorded in the locality since 1980 (DECC Atlas). These species are listed in Appendix 1, along with details of their habits and habitat requirements, and a discussion as to their likelihood to occur on the site and/or be affected by the proposed rezoning.

In summary of Appendix 1, the gully areas of the site provide potential foraging habitat, and/or nesting/breeding habitat, for 17 of these species. Other parts of the site also provide potential foraging habitat for some of these species, but are not likely to be of value for roosting, nesting or breeding.

27 bird species listed as migratory under the EPBC Act are known to have occurred in the locality (Appendix 3). It is probable that some of these species would occur on the site on occasions.

3.4 Connectivity

The subject site is located near the headwaters of Megarrity's Creek, and is thus at the southern end of the corridor of natural vegetation that occurs along this creekline. This corridor has a significant narrowing just north of the subject site.

There is a tenuous canopy link from the site across lands to the west to the Warragamba Catchment Area. The Warragamba Catchment Area is then contiguous with the extensive Blue Mountains National Park. Refer to Figure 4.

There is no connectivity from the southern or eastern parts of the site, and none likely due to existing residential development and extensive clearing of freehold land.

4 LIKELY IMPACTS OF THE PROPOSED REZONING

4.1 Direct Impacts

The proposed re-zoning would result in more formal protection of the creekline gullies on the site, but would allow greater opportunity for extensive vegetation and habitat clearing from parts of the site that would be rezoned from rural to residential.

The rezoning would result in further clearing and loss of highly degraded vegetation and habitats from the eastern part of the site, including approximately 5 hectares of Shale Sandstone Transition Forest. This would occur regardless of the density of housing.

The rezoning would result in loss of a pocket of moderately intact (albeit with a weed-infested groundcover), pocket of Western Sandstone Gully Forest from the southwestern corner of the site.

The rezoning would not alter current vegetation clearing controls on industrial zoned land in the northwestern corner of the site (less than 1 hectare).

In summary, the proposed rezoning would:

- retain and protect approximately 6.5 hectares of relatively intact Upper Georges River Sandstone Woodland and Western Sandstone Gully Forest within the riparian corridors on the site;
- result in loss of approximately 5 hectares of highly degraded Shale Sandstone Transition Forest from the eastern part of the site; and
- result in loss of approximately 5.5 hectares of moderately intact Western Sandstone Gully Forest from the southwestern corner and eastern part of the site.

4.2 Indirect Impacts

In addition to the direct loss of vegetation and habitats, potential indirect impacts of the proposed rezoning could include increased nutrient loading of watercourses, increased weed invasion of the gully areas, and increased human presence.

These indirect impacts, however, are not new to the area, and could be managed through appropriate use of fertilisers, weed control activities, and standard controls on stormwater run-off.

Development following the proposed rezoning would be likely to reduce current indirect impacts from uncontrolled trail bike use of the site, and illegal rubbish dumping.

Development controls and conditions provide an opportunity to implement weed control programs on the site, and to update/upgrade existing stormwater and pollution control features.

4.3 Cumulative Impacts

The proposed development is part of the ongoing development of Silverdale.

However, the site is essentially surrounded by existing cleared and developed land, such that development of the site would be an infill development, rather than an expansion of the urban boundary of Silverdale.

5 ISSUES & CONSTRAINTS

5.1 Shale Sandstone Transition Forest

5.1.1 Legislative Requirements

Shale Sandstone Transition Forest (SSTF) is listed as an endangered ecological community under both the *NSW Threatened Species Conservation Act 1995* (TSC Act) and the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

Relevant sections of both the TSC Act and EPBC Act would need to be addressed prior to development of the site.

TSC Act

The TSC Act contains a set of seven factors that must be taken into account by a consent or determining authority when considering whether a development proposal is likely to impose "a significant effect" on "threatened species, populations or ecological communities, or their habitats".

This seven part assessment (usually referred to as the '7-part test') would need to be conducted to formally assess the significance of the loss of SSTF on the site.

In the event that the loss is determined to be significant, then a Species Impact Statement would need to be prepared. The purpose of a Species Impact Statement is to further document the nature and extent of impacts, whilst justifying the impacts, and, where possible, proposing a strategy for compensating for the impacts.

EPBC Act

The EPBC Act requires that an action which has, will have or is likely to have a significant impact upon one or more matters of National Environmental Significance (NES) must be referred to the Commonwealth Minister for Environment & Heritage for approval. These actions are referred to as 'controlled actions'.

Matters of NES include World Heritage properties, Ramsar Wetlands of international importance, listed threatened species and communities, listed migratory species, nuclear actions and Commonwealth marine areas.

The loss of SSTF from the site would need to be considered with reference to guidelines published by the Commonwealth DEWHA, to determine whether the impacts upon SSTF are likely to be significant, and therefore, whether the proposal should be referred to the Commonwealth.

5.1.2 Discussion

Within the region, SSTF occurs as a fragmented north-south aligned broad band between the shale communities of the Cumberland Plain, and the sandstone communities of the Blue Mountains. The NPWS (2002) Vegetation Maps of the Cumberland Plain, Western Sydney show that several large and relatively intact remnant patches of SSTF occur to the north and south of the subject site.

The SSTF that occurs on the site has been degraded through previous clearing, agricultural activities, weed invasion, creation of tracks, ongoing trail bike activities, rubbish dumping and frequent fire (refer to Figure 3). Due to the extent of degradation of the community, and the nature of ongoing pressures, the patch of SSTF that occurs on the site is not regarded as a viable patch of this community.

The SSTF on the site would not regenerate to become a viable form of the community, without substantial weed removal activities, ongoing weed control, implementation of an appropriate fire

regime, effective control of trail bikes and rubbish dumping, and possibly some revegetation of understorey species to reinstate a natural species diversity.

The SSTF on the site is not directly connected to other areas of SSTF in the locality, and is not strategically located so as to justify the extent of effort and resources that would be required to regenerate this site.

5.1.3 *The Issue*

It is not likely that the loss of SSTF from the subject site would be regarded as significant, given its current condition and ongoing pressures.

However, the relative value of remnant patches of endangered ecological communities within western Sydney is a matter of ongoing discussion amongst ecologists. Guiding principles for assessment of these are constantly being updated. It is possible that by the time a development application is lodged for the site, that the value of the SSTF may be perceived as being greater than at present, and that a Species Impact Statement may be required.

Conversely, given that the site is zoned and cleared for agricultural use, and that the extent and condition of SSTF on the site would be expected to further decline over time, it may be the case that the site no longer supports a recognisable stand of SSTF by the time a development application is lodged.

In any event, the SSTF present is limited in extent, is fragmented, simplified, underscrubbed, weed-infested, and is not directly connected to other areas of SSTF. It would not be ecologically sensible to attempt to regenerate this site to a viable form of the community.

In summary, the presence of SSTF on the site is not considered to be a constraint to development of the site, but is an issue which would require further discussion and reporting. It is possible that some compensatory works may be required to offset the loss of SSTF on the site.

5.2 **Fauna habitat and shelter features**

5.2.1 *Legislative Requirements*

The gully areas of the site provide potential foraging habitat, and/or nesting/breeding habitat, for 17 fauna species listed as threatened under the TSC Act.

Further comprehensive survey work would be required to determine whether any of these species do in fact reside or breed within the site.

Relevant sections of both the TSC Act and EPBC Act would need to be addressed prior to development of the site.

TSC Act

The TSC Act contains a set of seven factors that must be taken into account by a consent or determining authority when considering whether a development proposal is likely to impose "a significant effect" on "threatened species, populations or ecological communities, or their habitats".

This seven part assessment (usually referred to as the '7-part test') would need to be conducted to formally assess the significance of potential impacts upon each threatened fauna species likely to occur on the site.

In the event that the impacts are determined to be significant, then a Species Impact Statement would need to be prepared. The purpose of a Species Impact Statement is to further document the nature and extent of impacts, whilst justifying the impacts, and, where possible, proposing a strategy for compensating for the impacts.

EPBC Act

The EPBC Act requires that an action which has, will have or is likely to have a significant impact upon one or more matters of National Environmental Significance (NES) must be referred to the Commonwealth Minister for Environment & Heritage for approval. These actions are referred to as 'controlled actions'.

Matters of NES include World Heritage properties, Ramsar Wetlands of international importance, listed threatened species and communities, listed migratory species, nuclear actions and Commonwealth marine areas.

The potential impacts of a proposed development upon each threatened species, and for migratory species, would need to be considered with reference to guidelines published by the Commonwealth DEWHA, to determine whether the impacts are likely to be significant, and therefore, whether the proposal should be referred to the Commonwealth.

5.2.2 Discussion

Habitat features of note were recorded almost entirely within the gully areas of the site. These include mature trees bearing medium to large-sized hollows, intact and moderately dense native understorey vegetation, and rocky outcrops along the steep slopes of the creekline gullies.

The proposed rezoning would retain and protect the creekline gullies, and so would be unlikely to significantly affect any threatened fauna species, even if such species were found to roost or breed on the site.

Other parts of the site also provide potential foraging habitat for some mobile and wide-ranging threatened fauna species, but are not likely to be of value for roosting, nesting or breeding. Foraging resources present on the site are insignificant in relation to the extensive areas of intact vegetation occurring nearby in the Warragamba Catchment Area and the Blue Mountains National Park, such that the loss of foraging habitat from the site is not considered to be a significant issue.

5.2.3 The Issue

The gully areas of the site should be regarded as a constraint to development. This has been recognised in the proposed rezoning of the site.

The primary issue is the location and treatment of the interface between new development and the creekline ? zone. It is recommended that the top edge of the steep banks of the creekline gullies be used as a guide for the limit of development. There should be no significant clearing, earth disturbance, or paved surfaces within 5m minimum of the top edge of the gullies, to maintain the stability of the gullies, and to provide a buffer to rocky outcrops which may be of importance as shelter features for native fauna.

The 5m buffer could probably be maintained as an asset protection zone without compromising the stability of the gullies, and could be used for informal unpaved footpaths, or as part of a passive recreation area.

It may be necessary to make minor adjustments to the boundary of the residential area following additional fauna surveys, to provide additional buffering or protection of specific fauna habitat features. This could be done as part of a future development design, if necessary.

6 CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

The presence of Shale Sandstone Transition Forest on the site is not considered a constraint to development of the site, but is an issue which would require further discussion and reporting. It is possible that a Species Impact Statement may be required, and that some compensatory works may be required to offset the loss of SSTF on the site.

The gully areas are a constraint to development, which has been recognised in the proposed rezoning of the site. It is recommended that the top edge of the steep banks of the creekline gullies be used as a guide for the limit of development, with a 5m minimum buffer area.

There should be no significant clearing, earth disturbance, or paved surfaces within the buffer area. The buffer could probably be maintained as an asset protection zone without compromising the stability of the gullies, and could be used for informal unpaved footpaths, or as part of a passive recreation area.

6.2 Recommendations

The following actions and strategies could be implemented within the site, to minimise and compensate for the impacts of future development:

- implementation of a weed control program within the gully areas, with particular focus on controlling invasive exotic weeds within the creeklines, which have the potential to smother and destroy native vegetation, and alter natural aquatic habitats;
- design of the development to manage stormwater run-off, to minimise the discharge of excess water and nutrients into waterways and nearby areas of native vegetation;
- use of locally indigenous plant species in replanting or landscaping schemes within the site, to provide habitat features for native flora and fauna, and to maintain the local and regional genetic resource. Those plant species which are known to be invasive, or which are listed on the *NSW Noxious Weeds Act 1993* for the Wollondilly LGA should not be used;
- construction of appropriate sediment control measures prior to any construction works on the site (eg silt fences, sediment traps). These should conform to relevant guidelines, should be maintained throughout the works period and should be carefully removed following the completion of works.

7 BIBLIOGRAPHY

- Auld BA and Medd RW. 1992. *Weeds. An illustrated botanical guide to the weeds of Australia*. Inkata Press, Sydney
- Beadle N, Evans O and Carolin R. 1982. *Flora of the Sydney Region*. Reed Books, Sydney.
- Benson D and Howell J. 1990. *Taken for Granted. The Bushland of Sydney and its Suburbs*. Kangaroo Press, Sydney.
- Beruldsen G. 1995. *Which Bird of Prey is that?* Gordon Beruldsen, Kenmore Hills, Qld.
- Blakers M, Davies SJJF and Reilly PN. 1985. *The Atlas of Australian Birds*. Royal Australian Ornithologists Union/Melbourne University Press.
- Brooker MIH and Kleinig DA. 1990. *Field Guide to Eucalypts Volume 1 - Southeastern Australia*. Inkata Press, Melbourne.
- Cogger HG. 1992. *Reptiles and Amphibians of Australia*. AH & AW Reed, Sydney.
- Cropper SC. 1993. *Management of Endangered Plants*. CSIRO, Melbourne.
- Environment Australia. 2000. *EPBC Act Administrative Guidelines on Significance*. Environment Australia.
- Fairley A and Moore P. 1995. *Native Plants of the Sydney District*. Kangaroo Press, Sydney.
- Fairley A. 2004. *Seldom Seen. Rare Plants of Greater Sydney*. Reed New Holland, Sydney.
- Griffiths K. 1987. *Reptiles of the Sydney Region*. Three Sisters Publications, Winmalee.
- Harden G (ed). 1990. *Flora of New South Wales Vol 1*. NSW University Press, Kensington.
- Harden G (ed). 1991. *Flora of New South Wales Vol 2*. NSW University Press, Kensington.
- Harden G (ed). 1992. *Flora of New South Wales Vol 3*. NSW University Press, Kensington.
- Harden G (ed). 1993. *Flora of New South Wales Vol 4*. NSW University Press, Kensington.
- Leonard G. 1993. *Eucalypts: A Bushwalkers Guide*. NSW University Press, Kensington.
- Lindsey TR. 1992. *Encyclopaedia of Australian Animals: Birds*. Australian Museum/Angus & Robertson.
- Muyt A. 2001. *Bush Invaders of South-East Australia: a guide to the identification and control of environmental weeds found in South-East Australia*. RG and FJ Richardson, Meredith, Victoria.
- NPWS. 2002a. *Native Vegetation Maps of the Cumberland Plain Western Sydney*. NSW National Parks and Wildlife Service, Hurstville.
- NPWS. 2002b. *Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney, Final Edition*. NSW National Parks & Wildlife Service, Hurstville.
- Richardson FJ, Richardson RG & Shepherd RCH. 2006. *Weeds of the south-east: an identification guide for Australia*. Richardson FJ and Richardson RG, Victoria.
- Robinson L. 1991. *Field Guide to the Native Plants of Sydney*. Kangaroo Press, Sydney.
- Robinson M. 1996. *A Field Guide to Frogs of Australia*. Australian Museum/Reed Books.

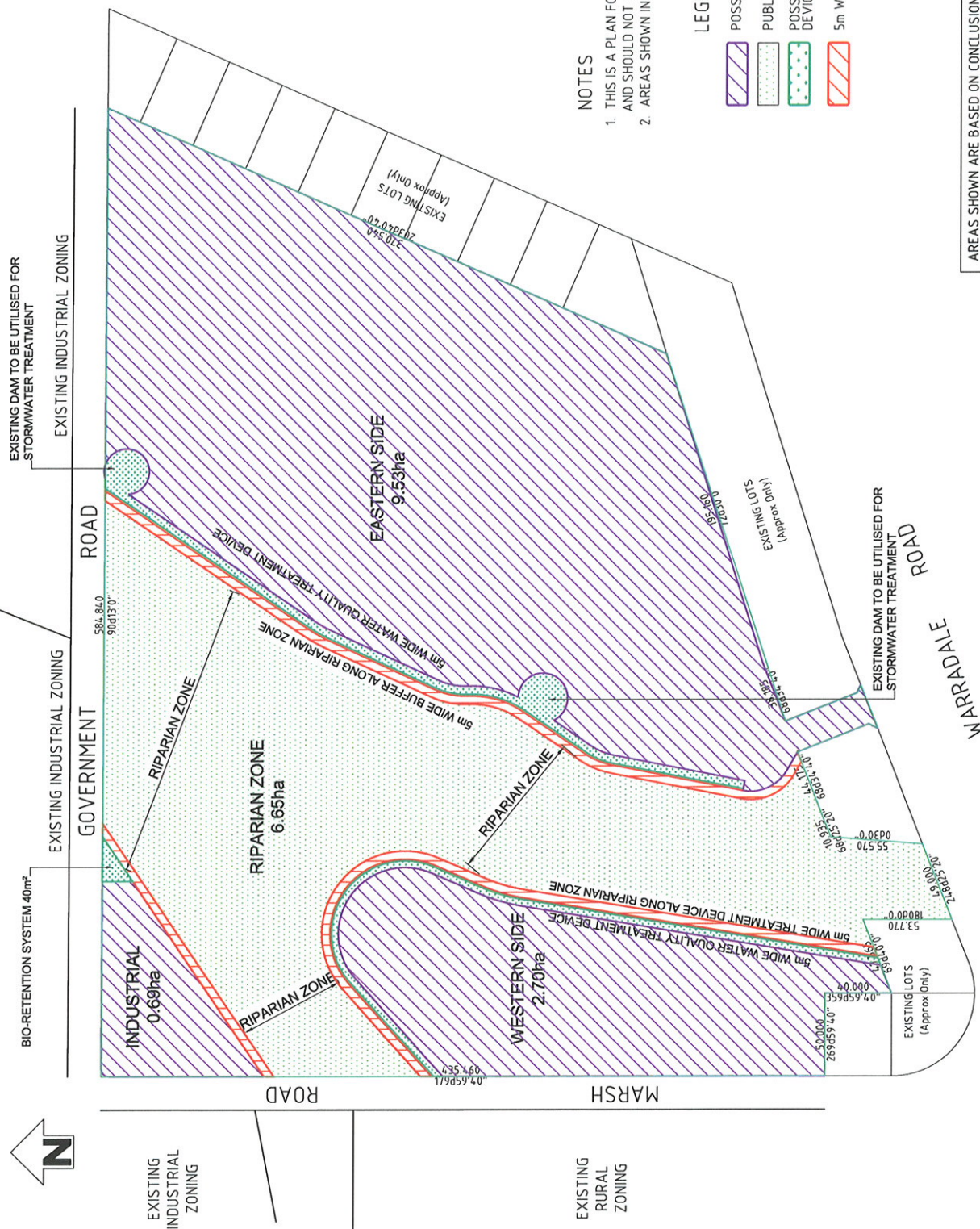
- Slater P, Slater P and Slater R. 1989. *The Slater Field Guide to Australian Birds*. Weldon Publishing, Sydney.
- Specht RL & Specht A. 1999. *Australian Plant Communities. Dynamics of Structure, Growth and Biodiversity*. Inkata Press, Melbourne.
- Strahan R (ed). 1995. *The Mammals of Australia*. Angus & Robertson Publishers, Sydney.
- Swan G. 1990. *A Field Guide to the Snakes and Lizards of New South Wales*. Three Sisters Publications, Winmalee.
- Tozer M. 2003. The native vegetation of the Cumberland Plain, western Sydney: systematic classification and field identification of communities. *Cunninghamia* 8(1). National Herbarium of NSW, Sydney.
- Triggs B. 1998. *Tracks, Scats and Other Traces: A Field Guide to Australian Mammals*. Oxford University Press, Melbourne.



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FIGURE 1 Aerial view of the subject site.

FIGURE 2



NOTES

1. THIS IS A PLAN FOR THE PURPOSES OF REZONING OF LOT 5 DP 261728 AND SHOULD NOT BE USED FOR ANY OTHER PURPOSES.
2. AREAS SHOWN INCLUDE POTENTIAL WATER QUALITY TREATMENT DEVICES.

LEGEND

- POSSIBLE RESIDENTIAL LOTS
- PUBLIC RESERVE
- POSSIBLE LOCATION OF WATER QUALITY IMPROVEMENT DEVICES – DEPENDANT ON FINAL SUBDIVISION DESIGN
- 5m WIDE BUFFER ZONE AS ADVISED BY HAYES ENVIRONMENTAL

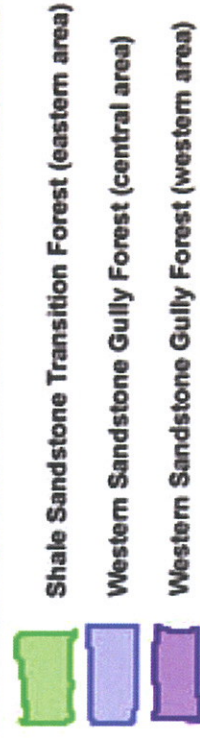
AREAS SHOWN ARE BASED ON CONCLUSIONS AND RECOMMENDATIONS WITHIN THE FLORA AND FAUNA INVESTIGATION REPORT UNDERTAKEN BY HAYES ENVIRONMENTAL DATED MARCH 2010

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FIGURE 3 Native vegetation communities across the subject site.





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FIGURE 4 Aerial view of the subject site in relation to surrounding lands.

LOT 1 DP 261728 WARADALE ROAD, SILVERDALE
PROPOSED REZONING

FLORA AND FAUNA PRELIMINARY INVESTIGATION

APPENDIX 1

Threatened fauna species known from the locality

March 2010

APPENDIX 1

Threatened fauna known to have occurred within 10km of the subject site since 1980 (DECC Atlas, data obtained August 2009).

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
BIRDS		
Black-necked Stork <i>Ephippiorhynchus asiaticus</i> E (TSC)	Usually inhabits swamps associated with river systems and large permanent pools (Blakers <i>et al</i> 1984). Inhabits tropical to warm temperate wetlands, lagoons, swamps, mud-flats and irrigated cropland (Lindsey 1992). Feeds in shallow water for fish and frogs (Blakers <i>et al</i> 1984). Nests high in a tree in a secluded swamp (Lindsey 1992). 1 record in the locality since 1980 (DECC Atlas).	The site does not contain habitat for this species. The Black-necked Stork would not be likely to occur on the site, nor would be likely to be affected by the proposed rezoning.
Black-tailed Godwit <i>Limosa limosa</i> V (TSC)	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia, and flies to Australia for the summer (August to March). In NSW, it is most frequently recorded at Kooragang Island, with occasional records elsewhere. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed (DEC Profile). Usually found in coastal sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps. Individuals have been recorded in wet fields and sewerage treatment works (DEC Profile). Forages for insects, crustaceans, molluscs, worms, larvae, spiders, fish eggs, frog eggs and tadpoles in soft mud or shallow water. Roosts and loaf on low banks of mud, sand and shell bars. Frequently recorded with Bar-tailed Godwits (DEC Profile). 1 record in the locality since 1980 (DECC Atlas).	The site does not contain habitat for this species. The Black-tailed Godwit would not be likely to occur on the site, nor would be likely to be affected by the proposed rezoning.

Black Bittern <i>Ixobrychus flavicollis</i> V (TSC)	A wide distribution across Australia. In NSW, the species is scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves (DEC Profile). Inhabits quiet pools and backwaters of meandering densely wooded coastal streams, always with dense vegetation (Lindsey 1992). Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds. When disturbed, freezes in a characteristic bittern posture (stretched tail, bill pointing up, so that shape and streaked pattern blend with upright stems of reeds), or will fly up to a branch or flush for cover where it will freeze again (NPWS Profile). Generally solitary, but occurs in pairs during the breeding season, from December to March. Nests are built on a branch overhanging water and consist of a bed of sticks and reeds on a base of larger sticks. The species has a characteristic booming call that is mainly heard during the breeding season, at day or night. 1 record in the locality since 1980 (DECC Atlas).	The site does not contain likely habitat for this species. However, it is possible that the Black Bittern could occur in the more sheltered sections of the creekline gullies. Further survey work would be required to determine whether this species does or does not occur on the site. In either case, it's habitat would not be directly affected by development resulting from the proposed rezoning.
Square-tailed Kite <i>Lophoictinia isura</i> V (TSC)	Has a widespread distribution across virtually all of mainland Australia, excepting waterless desert (NPWS 1999). Typically inhabits tropical and temperate coastal forests and woodlands, and also inland along timbered watercourses (NPWS 1999). Appears to migrate seasonally, south in summer, north in winter (Blakers <i>et al</i> 1984). In NSW, it is often associated with forests dominated by <i>Eucalyptus longiflora</i>, <i>Corymbia maculata</i> or <i>E. elata</i>, <i>E. smithii</i>. Also sighted within forests containing other eucalypts, <i>Angophora</i> spp and <i>Callitris</i> spp with a shrubby understorey and Box-Ironbark woodland (NPWS 1999). Feeds on passerine birds, especially honeyeaters, nestling birds, rabbits, reptiles and carrion (NPWS 1999; Lindsey 1992). Nests is a substantial structure of sticks, usually constructed in a fork or on a large horizontal limb of <i>Angophora</i> spp or <i>Eucalyptus</i> spp approx 15-20m above the ground, along or near watercourses (Lindsey 1992; NPWS 1999). 2 records in the locality since 1980 (DECC Atlas).	The site does not contain typical habitat for this species. However, the Square-tailed Kite could forage within the site, and perhaps nest in larger trees along the creeklines. On the basis of the extent of potential foraging habitat available for the Square-tailed Kite in the locality (refer to Figure 4), it is not likely that the loss of potential foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine whether any nests are located within the site. If a nest is located within the site, a suitable buffer would need to be retained around the nest tree. This would probably not be a major issue, given that the creekline gullies would be retained in any case.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Gang Gang Cockatoo <i>Callocephalon fimbriatum</i> V (TSC)	Inhabits tall montane forests and woodlands in summer, particularly heavily timbered mature wet sclerophyll forests. Also occurs in sub-alpine Snow Gum woodland and occasionally in temperate rainforests. Undertakes nomadic and seasonal movements, and in winter tends to occur at lower altitudes in drier, more open eucalypt forest and woodland, particularly Box-Ironbark associations, and in dry forest in coastal areas (NSW Scientific Committee). Feeds on green acacia seeds, eucalypt seeds, fruits and berries, including seeds, fruits and berries of introduced plant species (Lindsey 1992; Blakers <i>et al</i> 1984). Tends to exhaust one food supply before moving to another (Blakers <i>et al</i> 1984). Nests in hollows in large old trees, usually close to water. Shows strong nest site fidelity. Breeding occurs mainly in tall mature wet sclerophyll forests with a dense understorey (NSW Scientific Committee). 9 records in the locality since 1980 (DECC Atlas).	The site does not contain typical habitat for this species. However, the Gang Gang Cockatoo could forage across the site during winter. It is theoretically possible, but not likely, that the Gang Gang Cockatoo would nest within the site, in sheltered forest in the gullies where there is a dense understorey. On the basis of the extent of potential foraging habitat available for the Gang Gang Cockatoo in the locality (refer to Figure 4), it is not likely that the loss of potential foraging habitat which would result from the proposed rezoning would affect this species. If a nesting hollow is located within the site during additional survey work, a suitable buffer would need to be retained around the nest tree. This would probably not be a major issue, given that the creekline gullies would be retained in any case.
Glossy Black Cockatoo <i>Calyptrorhynchus lathami</i> V (TSC)	Inhabits drier eucalypt forest and woodland, characteristically on sites with low soil nutrient status (Blakers <i>et al</i> 1984; NPWS 1999; DEC 2004a). Prefers intact landscapes (NPWS 1999; DEC 2004a). Feeds almost exclusively on seeds of <i>Allocasuarina</i> spp - predominantly <i>A. littoralis</i> and <i>A. torulosa</i> (Lindsey 1992; Blakers <i>et al</i> 1984; NPWS 1999). Inland birds use a more diverse range of species, including <i>A. cristata</i> (Blakers <i>et al</i> 1984). In the central west of NSW they also eat the seeds of Cypress Pine (DEC 2004a). Birds favour individual trees which produce seeds with high nutrient content, and may sample a few trees before selecting one to feed in (DEC 2004a). Lives in loose groups which occupy an area permanently (Blakers <i>et al</i> 1984) Nests in a large tree hollow (Lindsey 1992; NPWS 1999). 21 records in the locality since 1980 (DECC Atlas).	The Glossy Black Cockatoo could occur within the subject site, and could nest in larger hollow-bearing trees in more intact vegetation in the gullies of the site. On the basis of the extent of potential foraging habitat available for the Glossy Black Cockatoo in the locality (refer to Figure 4), it is not likely that the loss of potential foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine whether any nesting hollows are located within the site. If so, a suitable buffer would need to be retained around the nest tree. This would probably not be a major issue, given that the creekline gullies would be retained in any case.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Little Lorikeet <i>Glossopsitta pusilla</i> V (TSC)	Mostly occurs in dry, open eucalypt forests and woodlands, from just north of Cairns, around the east coast of Australia, to Adelaide. In NSW they occur in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri (NSW Scientific Committee). Occurs in both old-growth and logged forests in the eastern part of their range, and in remnant woodland patches and roadside vegetation on the western slopes. In a SE Qld study, they were more likely to occupy forest sites with relatively short to intermediate logging rotations (15–23 years) and sites that have had short intervals (2.5– 4 years) between fires (NSW Scientific Committee). Feeds primarily on nectar and pollen in the tree canopy, particularly on profusely-flowering eucalypts, but also on melaleucas and mistletoes. On the western slopes and tablelands White Box <i>Eucalyptus albens</i> and Yellow Box <i>E. melliodora</i> are particularly important food sources. They are also reported as feeding on fruits, particularly those of mistletoes (NSW Scientific Committee). Apparently nomadic, related to food availability (NSW Scientific Committee). 2 records in the locality since 1980 (DECC Atlas).	The site does not contain typical habitat for this species. The Little Lorikeet would not be expected to occur on the site, other than opportunistically, at times when the eucalypts present are flowering in abundance. Given the extent of potential foraging habitat available for the Little Lorikeet in the locality, the proposed rezoning would not be likely to affect this species.
Swift Parrot <i>Lathamus discolor</i> E (TSC) E (EPBC)	Breeds only in Tasmania, (Lindsey 1992, Blakers <i>et al</i> 1984; NSW Scientific Committee). Occurs in forests and woodlands of NSW from May to August (NSW Scientific Committee). Forages in the upper tree canopy for nectar, pollen and lerps (Blakers <i>et al</i> 1984). Lives in small flocks which appear in areas where eucalypts are flowering in profusion (Blakers <i>et al</i> 1984). Dependent on flowering resources across a wide range of habitats in its wintering grounds of NSW (NSW Scientific Committee). 3 records in the locality since 1980 (DECC Atlas).	The site does not contain typical habitat for this species, and does not contain breeding habitat. The Swift Parrot may forage opportunistically on the site during winter months, at times when the eucalypts present are flowering in abundance. Given the extent of potential foraging habitat available for the Swift Parrot in the locality, the proposed rezoning would not be likely to affect this species.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Powerful Owl <i>Ninox strenua</i> V (TSC)	Inhabits tall moist productive eucalypt forests of the eastern tableland edge, and the mosaic of wet and dry sclerophyll forests occurring on undulating, gentle terrain near the coast. Ideally with a tall shrub layer and/or abundant hollows supporting a high density of arboreal marsupials (DEC 2005a; Blakers <i>et al</i> 1984; Lindsey 1992). A nocturnal sedentary species which lives alone or in pairs; occupies permanent territories up to 1500 ha in size which contain several roost sites (Blakers <i>et al</i> 1984; Lindsey 1992; DEC 2005a). Roosts by day in dense foliage of mid-canopy trees (including <i>Allocasuarina</i> spp., rainforest species, Turpentine and eucalypts), often amongst groves of up to 2ha of similar-sized trees in the height range of 3-15m (DEC 2005a), in sheltered gullies, often along streams and wide creek flats between ridges covered with eucalypt forest (DEC 2005a; Blakers <i>et al</i> 1984). Prefers to forage in moist unlogged forest in gully systems, but also forages in dry and regrowth forest. Preys on arboreal mammals (80% of diet), birds (18%) and insects and some terrestrial mammals (2%) (Blakers <i>et al</i> 1984). The Common Ringtail Possum is a primary prey species in lowland areas, and the Greater Glider in highland areas (DEC 2005a). Nests in a large tree-hollow (greater than 45cm wide and 100cm deep), usually high (at least 20m from the ground) in a very large eucalypt (with a DBH of at least 80cm) (Lindsey 1992; DEC 2005a). Nesting sites are typically in unlogged unburnt gullies and lower slopes, within 100m of streams, and surrounded by trees or tall shrubs (DEC 2005a). 10 records in the locality since 1980 (DECC Atlas).	The site contains potential habitat for this species, although is probably not large enough to provide adequate buffers against human disturbances to facilitate nesting and breeding. This wide-ranging bird would be more likely to utilise the extensive tracts of intact and less disturbed habitat within the locality for roosting, within the Warragamba Catchment Area and the Blue Mountains National Park. The Powerful Owl would not be expected to breed within the site. The Powerful Owl would not be likely to be affected by development resulting from the proposed rezoning.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Masked Owl <i>Tyto novaehollandiae</i> V (TSC)	Inhabits eucalypt forest and woodland from the coast to the western plains (DEC 2005a). It is most abundant within 300km of the coast (DEC 2005a; Blakers <i>et al</i> 1984). Optimal habitat includes a mosaic of sparse (grassy) and dense (shrubby) groundcover on gentle terrain (DEC 2005a). A sedentary species which occupies permanent territories 500-1000 ha in size (Blakers <i>et al</i> 1984). Nocturnal, roosts by day in hollows, in cover of dense vegetation in gullies or in caves (Blakers <i>et al</i> 1984; Lindsey 1992; DEC 2005a). Roosts at least 5m above the ground (DEC 2005a). Forages at forest edges or in partial clearing for small terrestrial mammals including rabbits, supplemented by some arboreal mammals, bats and birds (Blakers <i>et al</i> 1984; Lindsey 1992; DEC 2005a). Nests in tree hollows greater than 40cm wide and greater than 100cm deep. No relationship with distance to streams. Entrances are at least 3m above the ground in trees with DBH of at least 90cm. Generally faithful to traditional hollows (DEC 2005a). 1 record in the locality since 1980 (DECC Atlas).	The site does not contain likely habitat for this species. The Masked Owl would not be likely to be affected by development resulting from the proposed rezoning.
Speckled Warbler <i>Pyrrholaemus sagittatus</i> V (TSC)	Inhabits woodland with a grassy understorey, often on rocky ridges or in gullies. Mainly recorded from the hills and tablelands of the Great Dividing Range (Blakers <i>et al</i> 1984; NSW Scientific Committee). A sedentary species, apparently social, with breeding territories approx 10 ha in size. Forages mainly on the ground for seeds and insects, seldom wandering far from the shelter of bushes and shrubs (Blakers <i>et al</i> 1984; Lindsey 1992). Preferred foraging habitat is areas with a combination of open grassy patches, leaf litter and shrub cover (NSW Scientific Committee). Nests on the ground in grass tussocks, dense litter and fallen branches (NSW Scientific Committee). 2 records in the locality since 1980 (DECC Atlas).	The rocky gully areas of the site may provide habitat for the Speckled Warbler. Further survey work would be required to ascertain this. Whilst the Speckled Warbler could occur on the site, it would probably not be substantially affected by the proposed rezoning, given that the rocky gully areas would be retained in any case.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Hooded Robin <i>Melanodryas cucullata</i> V (TSC)	Occurs throughout SE Australia, although mainly west of the Great Dividing Range, in a range of drier eucalypt woodlands, acacia shrublands and open forests, often in or near clearings (Blakers <i>et al</i> 1984; Lindsey 1992). Possibly seasonally migratory in some areas (Blakers <i>et al</i> 1984). Lives in small family groups within large home ranges (NSW Scientific Committee). Forages mainly on open ground by pouncing from a perch. Forages in areas with a mix of bare ground, ground cover and litter (Blakers <i>et al</i> 1984; NSW Scientific Committee). Nests in a cup of grass in a fork or small tree hollow usually within a few metres of the ground (Lindsey 1992). 3 records in the locality since 1980 (DECC Atlas).	The site does not contain likely habitat for this species, and is probably too small to provide sufficient space for a resident family group. The Hooded Robin would not be likely to be affected by the proposed rezoning.
Regent Honeyeater <i>Xanthomyza phrygia</i> E (TSC) E (EPBC)	Semi-nomadic, usually recorded on western slopes of the Great Dividing Range, in open eucalypt forest and woodland. Usually recorded in box-ironbark associations, also wet lowland coastal forests. Forages in the upper canopy of flowering eucalypts for nectar, fruits and insects (NPWS 1999; Lindsey 1992; Blakers <i>et al</i> 1984). Nectar taken from approximately 16 species of eucalypt (NPWS 1999). A noisy, aggressive and conspicuous species, gregarious when not breeding. Observed bathing in roadside puddles. Nests in the fork of a tree 1-20m above the ground (Lindsey 1992). Specific requirements in mature ironbark and Red-Yellow Box communities (NPWS 2003). 3 records in the locality since 1980 (DECC Atlas).	The site does not contain typical habitat for this species. The Regent Honeyeater would not be expected to occur on the site, other than opportunistically, at times when the eucalypts present are flowering in abundance. Given the extent of potential foraging habitat available for the Regent Honeyeater in the locality, the proposed rezoning would not be likely to affect this species.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Diamond Firetail <i>Stagonopleura guttata</i> V (TSC)	Inhabits eucalypt woodland, forests and mallee where there is a grassy understorey, including agricultural land, mainly inland of the Great Dividing Range (Lindsey 1992; Blakers <i>et al</i> 1984; NSW Scientific Committee). Generally sedentary, lives in pairs or small groups, consolidating into flocks during winter (Lindsey 1992; Blakers <i>et al</i> 1984; NSW Scientific Committee). Forages on the ground for grass seeds, other plant material and insects (NSW Scientific Committee; Lindsey 1992; Blakers <i>et al</i> 1984). Nests in a bulky flask-shaped structure with a side entrance approached by a woven tunnel, usually placed in dense foliage in a bush or mistletoe clump, several metres from the ground (Lindsey 1992). 2 records in the locality since 1980 (DECC Atlas).	The site does not contain likely habitat for this species. The Diamond Firetail would not be likely to be affected by the proposed rezoning.
AMPHIBIANS		
Red-crowned Toadlet <i>Pseudophryne australis</i> V (TSC)	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones, within the Sydney Basin (Pokolbin in the north, the Nowra area to the south, and west to Mt Victoria in the Blue Mountains) (DEC Profile). Inhabits periodically wet drainage lines below sandstone ridges, that often have shale lenses or cappings. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter (DEC Profile). Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters (DEC Profile). 2 records in the locality since 1980 (DECC Atlas).	The site does not contain typical habitat for this species. It is also probable that the creekline is too degraded to support breeding activities. However, further survey work would be required to ascertain that this species does not occur on the site. In the event that it does occur, the details of development resulting from the proposed rezoning could be designed to avoid both direct and indirect disturbances to habitat for the Red-crowned Toadlet.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Green & Golden Bell Frog <i>Litoria aurea</i> E (TSC) E (EPBC)	Has been recorded in a wide variety of both ephemeral and permanent water bodies, including marshes, dams and stream-sides (NPWS 2005; NPWS 1999). Apparently prefers unshaded water with plenty of emergent vegetation, particularly bullrushes <i>Typha</i> spp or spikerushes <i>Eleocharis</i> spp (NPWS 2005; NPWS 1999; Robinson 1998; Cogger 1996), with nearby grassy areas and diurnal sheltering sites such as rocks or tussocky vegetation (NPWS 1999). Does not usually occur in conjunction with the predatory fish Plague Minnow <i>Gambusia holbrooki</i> (NPWS 1999). Once abundant along the whole coast of NSW and extending up into tableland areas, most surviving populations are now coastal (NPWS 1999). 1 record in the locality since 1980 (DECC Atlas).	The site does not contain habitat for this species. The Green & Golden Bell Frog would not be likely to be affected by the proposed rezoning.
MAMMALS		
Spotted-tailed Quoll <i>Dasyurus maculatus</i> V (TSC) E (EPBC)	Variety of habitats including sclerophyll forest and woodlands, coastal heathlands and rainforest (NPWS 1999; Edgar & Belcher 1995). Occasionally sighted in open country, grazing lands, rocky outcrops and other treeless areas (NPWS 1999). Usually nocturnal, partly arboreal (Edgar & Belcher 1995; NPWS 1999). Apparently defines its territory with 'latrines' (Edgar & Belcher 1995). Requires suitable den sites (eg hollow logs, tree-hollows, rock crevices or caves), an abundance of food (small terrestrial birds and mammals, up to the size of small wallabies), and relatively large areas of intact vegetation for foraging (NPWS 1999; Edgar & Belcher 1995). Uses numerous den sites within its home range, which is estimated to be between 800ha and 20km ² (NPWS 1999). A highly mobile species recorded travelling several kilometres overnight (NPWS 1999). 2 records in the locality since 1980 (DECC Atlas).	The site does contain potential habitat for the Spotted-tailed Quoll, although it is possible that the site is too isolated to be of value for this species. Further survey work would be required to determine whether any signs of this species occur on the site, or whether any den sites occur. In the event that the Spotted-tailed Quoll does utilise the site, it is the gully area that would be of most value, and which provides possible den sites. Details of development resulting from the proposed rezoning could be designed to provide suitable buffer distances from den sites. Site connectivity would not be affected in any case.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Yellow-bellied Glider <i>Petaurus australis</i> V (TSC)	Inhabits tall mature forests in areas of high rainfall along the east coast of Australia (Menkhorst & Knight 2001). Prefers areas where year-round food resources are available from a mixture of eucalypt species (NPWS 1999). Plant and Insect exudates make up the bulk of its diet (Russell 1995). Makes characteristic triangular or V-shaped incisions in tree trunks to obtain sap (NPWS 1999; Menkhorst & Knight 2001). Nocturnal, it rests by day in a den in a hollow branch. Usually occurs in very low densities. Its home range is in the order of 30-65ha (NPWS 1999; Russell 1995). 4 records in the locality since 1980 (DECC Atlas).	The taller intact vegetation in the gully areas of the site may provide habitat for this species. Further survey work would be required to comprehensively survey trees for chew marks, and to search for possible den sites. In the event that this species does occur on the site, the details of development resulting from the proposed rezoning could be designed to provide suitable buffer distances from den sites. Site connectivity would not be affected in any case.
Brush-tailed Rock Wallaby <i>Petrogale penicillata</i> E (TSC) V (EPBC)	Inhabits rocky areas in a wide range of vegetation types. Strong preference to sites with a northerly aspect (Eldridge & Close 1995). Three habitat categories have been identified for this species (DEC 2005b; NSW Scientific Committee): • loose piles of large boulders containing a maze of subterranean holes and passageways; • cliffs with many mid-level ledges and with some caves and/or ledges covered by overhangs. Cliff height is usually over 15m; • isolated rock stacks, usually sheer-sided and often girdled with fallen boulders. Vegetation is also of importance, as a source of food, and in some areas, shelter (eg spreading fig trees). Core habitat appears to be areas of rainforest or wet sclerophyll forest in association with complex cliffs and rock outcrops (DEC 2005b). Lives in small family groups which maintain permanent territories in loose colonies. Colonies do not appear to move (DEC 2005b). Feeds on a wide range of grasses and plant material (including fruits, roots, bark, seeds, lichen), and also on termite mounds, cowpat, bone, rotten log (DEC 2005b). 2 records in the locality since 1980 (DECC Atlas).	The site does not contain habitat for this species. The Brush-tailed Rock Wallaby would not be likely to be affected by the proposed rezoning.

Species	Habitats/Requirements/Records in the locality	Occurrence on the subject site
Grey-headed Flying-fox <i>Pteropus poliocephalus</i> V (TSC) V (EPBC)	Occurs in rainforest, tall sclerophyll forests and woodlands, heaths and swamps along the east coast of Australia from Bundaberg to Melbourne, generally to the east of the Great Dividing Range (NPWS 2001). Also recorded in urban gardens and cultivated fruit crops (NPWS 2001). Forages on pollen, nectar and fruits of native trees (in particular <i>Melaleuca</i>, <i>Eucalyptus</i> and <i>Banksia</i>), and is an important pollinator and seed-disperser of native trees (NPWS 2001). Partly migratory in response to food availability. Roosts in large congregations or 'camps' during the day (NPWS 2001; Strahan 1995), which are generally located within 20km of a regular food source, in stands of riparian rainforest, paperbark or casuarina forest (NPWS 2001). Camp site fidelity is high. Recorded on the CSIRO site in 1997 and 2002. 10 records in the locality since 1980 (DECC Atlas).	The site provides potential habitat for the Grey-headed Flying-fox. On the basis of the extent of foraging habitat available for this species in the locality (refer to Figure 4), it is not likely that the loss of foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine whether any camps occur within the site. If so, a suitable buffer would need to be retained around the camp. This would probably not be a major issue, given that camps generally occur in sheltered gully areas, which would be retained on the site in any case.
Large-eared Pied Bat <i>Chalinolobus dwyeri</i> V (TSC) V (EPBC)	Inhabits dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range, from Queensland to Bungonia. Has also been recorded occasionally in sub-alpine woodlands above 1500m, and at the edge of rainforest and moist eucalypt forest (Hoye & Dwyer 1995). First recorded in a dis-used mine tunnel near Copeton, NSW in early 1960's. Probably forages for insects below the forest canopy (Hoye & Dwyer 1995). Roosts by day in tree-hollows, caves and dis-used mine-tunnels (DEC NRMAS-7 2004; Hoye & Dwyer 1995). In caves it often selects positions close to the entrance in the 'twilight zone'. Appears to hibernate during winter (Hoye & Dwyer 1995). 2 records in the locality since 1980 (DECC Atlas).	The site provides potential habitat for the Large-eared Pied Bat. On the basis of the extent of foraging habitat available for the Large-eared Pied Bat in the locality (refer to Figure 4), it is not likely that the loss of foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine the likelihood of the Large-eared Pied Bat roosting within the site. This would be most likely to occur in larger hollow-bearing trees in the gully areas, which would be retained on the site in any case.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Large-footed Myotis <i>Myotis adversus</i> V (TSC)	Occurs in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers (DEC Profile). Generally roosts in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage (DEC Profile). Colonies never occur far from bodies of water, ranging from rainforest streams to large lakes and reservoirs (Richards 1995b). Forage over streams and pools catching insects and small fish by raking their feet across the water surface (DEC Profile; Richards 1995b). Males roost alone and defend territories when not breeding. Torpid in winter in roosts separate to maternity sites (Richards 1995b). 2 records in the locality, 2004 (NPWS Atlas).	The site provides potential habitat for the Large-footed Myotis. On the basis of the extent of foraging habitat available for the Large-footed Myotis in the locality (refer to Figure 4), it is not likely that the loss of foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine the likelihood of the Large-footed Myotis roosting within the site. This would be most likely to occur in larger hollow-bearing trees in the gully areas, which would be retained on the site in any case.
Eastern Freetail Bat <i>Mormopterus norfolkensis</i> V (TSC)	Usually recorded in dry eucalypt forest and woodland east of the Great Dividing Range, but has also been recorded in rainforest and wet sclerophyll forest (Allison & Hoyer 1995). Apparently solitary. Predominantly tree-dwelling, but has been recorded roosting in the roof of a hut (Allison & Hoyer 1995). 9 records in the locality since 1980 (DECC Atlas).	The site provides potential habitat for the Eastern Freetail Bat. On the basis of the extent of foraging habitat available for the Eastern Freetail Bat in the locality (refer to Figure 4), it is not likely that the loss of foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine the likelihood of the Eastern Freetail Bat roosting within the site. This would be most likely to occur in larger hollow-bearing trees in the gully areas, which would be retained on the site in any case.
Eastern Bent-wing Bat <i>Miniopterus schreibersii oceanensis</i> V (TSC)	Typically inhabits well-timbered valleys where it forages above the tree canopy (Dwyer 1995b). Roosts in caves, old mines, stormwater channels and comparable structures (DEC NRMAS-7 2004; Dwyer 1995b). In SE Australia it seeks cold roosts through winter to allow hibernation. Depends upon specific mass nursery sites in Spring to rear its young (Dwyer 1995b), thus prone to mass damage from catastrophic events (DEC NRMAS-7 2004). 7 records in the locality since 1980 (DECC Atlas).	The site provides potential foraging habitat for the Eastern Bent-wing Bat. The site does not contain likely roosting features for this species. On the basis of the extent of potential foraging habitat available for the Eastern Bent-wing Bat in the locality (refer to Figure 4), it is not likely that the loss of potential foraging habitat which would result from the proposed rezoning would affect this species.

Species	Habits/Requirements/Records in the locality	Occurrence on the subject site
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i> V (TSC)	Inhabits gullies and river systems draining the Great Dividing Range, occurs in a variety of woodland and forest habitats, from open eucalypt woodland to rainforest. Open woodlands suit its direct flight pattern, in denser rainforests it favours creekline corridors for foraging (Hoye & Richards 1995). Usually roosts in tree-hollows, but has been found in old buildings (Hoye & Richards 1995). 3 records in the locality since 1980 (DECC Atlas).	The site provides potential habitat for the Greater Broad-nosed Bat. On the basis of the extent of foraging habitat available for the Greater Broad-nosed Bat in the locality (refer to Figure 4), it is not likely that the loss of foraging habitat which would result from the proposed rezoning would affect this species. Further survey work would be required to determine the likelihood of the Greater Broad-nosed Bat roosting within the site. This would be most likely to occur in larger hollow-bearing trees in the gully areas, which would be retained on the site in any case.
INVERTEBRATES		
Cumberland Plain Land Snail <i>Meridolum corneovirens</i> E (TSC)	Appears to be restricted to the Cumberland Plain and Castlereagh Woodlands of Western Sydney, and also along the fringes of River-flat Forest (NPWS 1999). Typically occurs in moist loose soil under logs and other debris, amongst leaf and bark accumulations around the base of trees, and sometimes under grass clumps (NPWS 1999). Apparently burrows deeply into soil during dry conditions (R Hayes pers obs). 35 records in the locality since 1980 (DECC Atlas).	The site does not contain suitable habitat for this species, as it is largely on sandstone-derived soils with associated sandstone vegetation communities. The Cumberland Plain Land Snail would not be likely to be affected by the proposed rezoning.

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PROPOSED REZONING

FLORA AND FAUNA PRELIMINARY INVESTIGATION

APPENDIX 2

Inventory of flora species recorded

March 2010

APPENDIX 2 Plant species recorded on the subject site at Silverdale.

KEY

Status

* Exotic weed species (including native horticultural and non-endemic species)

N Noxious Weed (class#) listed on the *NSW Noxious Weeds Act 1993* for the Wollondilly LGA

Record

SS Species which typically occur only in sandstone-derived soils, based on information in Harden (1990-1993), and Tozer (2003)

Status	SCIENTIFIC NAME	COMMON NAME	SS
*	<i>Acacia baileyana</i>	Cootamundra Wattle	
	<i>Acacia binervia</i>	Coast Myall	
	<i>Acacia decurrens</i>	Black Wattle	
	<i>Acacia linifolia</i>	White Wattle	✓
	<i>Acacia longifolia</i> ssp <i>longifolia</i>	Sydney Golden Wattle	✓
	<i>Acacia myrtifolia</i>	Red-stemmed Wattle	
	<i>Acacia terminalis</i> ssp <i>angustifolia</i>	Sunshine Wattle	✓
	<i>Acacia trinervata</i>	Three-veined Wattle	✓
	<i>Acacia ulicifolia</i>	Prickly Moses	✓
	<i>Adiantum aethiopicum</i>	Common Maidenhair	
*	<i>Ageratina adenophora</i>	Crofton Weed	
	<i>Allocasuarina littoralis</i>	Black She-oak	
	<i>Allocasuarina torulosa</i>	Forest Oak	
	<i>Angophora costata</i>	Sydney Red Gum	✓
*	<i>Anredera cordifolia</i>	Madeira Vine	
*	<i>Asparagus aethiopicus</i>	Asparagus Fern	
	<i>Banksia spinulosa</i> var <i>spinulosa</i>	Hairpin Banksia	✓
*	<i>Bidens pilosa</i>	Cobblers Pegs	
	<i>Billardiera scandens</i>	Hairy Apple Berry	
	<i>Boronia ledifolia</i>	Showy Boronia	
	<i>Bossiaea obcordata</i>	Spiny Bossiaea	✓
	<i>Breynia oblongifolia</i>	Coffee Bush	
	<i>Calochlaena dubia</i>	Soft Bracken	
	<i>Centella asiatica</i>	Indian Pennywort	
	<i>Ceratopetalum gummiferum</i>	Christmas Bush	✓
	<i>Cheilanthes sieberi</i> ssp <i>sieberi</i>	Mulga Fern	
	<i>Clematis glycinoides</i> var <i>glycinoides</i>	Headache Vine	
*	<i>Conyza albida</i>	Tall Fleabane	
*	<i>Coreopsis lanceolata</i>	Coreopsis	
*	<i>Cortaderia selloana</i>	Pampas Grass	
	<i>Corymbia eximia</i>	Yellow Bloodwood	✓
	<i>Corymbia gummifera</i>	Red Bloodwood	✓

APPENDIX 2 cont Plant species recorded on the subject site at Silverdale.

Status	SCIENTIFIC NAME	COMMON NAME	SS
	<i>Corymbia maculata</i>	Spotted Gum	
*	<i>Cyperus eragrostis</i>		
	<i>Daviesia squarrosa</i>		
	<i>Daviesia ulicifolia</i> ssp <i>ulicifolia</i>	Gorse Bitter Pea	
	<i>Dianella caerulea</i> var <i>productum</i>	Blue Flax-lily	
	<i>Dianella revoluta</i> var <i>revoluta</i>	Paroo Lily	
	<i>Dodonaea triquetra</i>	Large-leaf Hop-bush	
	<i>Dodonaea triquetra</i>	Large-leaf Hop-bush	
	<i>Drosera auriculata</i>		
	<i>Echinopogon caespitosus</i> var <i>caespitosus</i>	Tufted Hedgehog-grass	
N(3)	<i>Eichornia crassipes</i>	Water Hyacinth	
	<i>Eleocharis</i> sp.	Spikerush	
	<i>Entolasia stricta</i>	Wiry Panic	
	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	
	<i>Eucalyptus globoidea</i>	White Stringybark	
	<i>Eucalyptus notabilis</i>	Mountain Mahogany	
	<i>Eucalyptus pilularis</i>	Blackbutt	✓
	<i>Eucalyptus punctata</i>	Grey Gum	
	<i>Eucalyptus resinifera</i> ssp <i>resinifera</i>	Red Mahogany	
	<i>Glossodia major</i>	Waxlip Orchid	
	<i>Glycine clandestina</i>		
	<i>Gompholobium grandiflorum</i>	Large Wedge Pea	✓
	<i>Gompholobium latifolium</i>	Golden Glory Pea	✓
	<i>Gompholobium minus</i>	Dwarf Wedge Pea	
	<i>Goodenia hederacea</i> ssp <i>hederacea</i>	Forest Goodenia	
	<i>Grevillea mucronulata</i>		✓
	<i>Grevillea sericea</i> ssp <i>sericea</i>	Pink Spider Flower	✓
	<i>Hakea dactyloides</i>	Finger Hakea	
	<i>Hardenbergia violacea</i>	Purple Twining Pea	
	<i>Hibbertia aspera</i>	Rough Guinea Flower	
	<i>Hovea linearis</i>		✓
	<i>Imperata cylindrica</i>	Blady Grass	
	<i>Indigofera australis</i>	Australian Indigo	
	<i>Kennedia rubicunda</i>	Dusky Coral Pea	
	<i>Lambertia formosa</i>	Mountain Devil	✓
	<i>Lepidosperma laterale</i>		
	<i>Leptospermum continentale</i>	Tea-tree	✓
	<i>Leptospermum polygalifolium</i> ssp <i>polygalifolium</i>	Yellow Tea-tree	✓
	<i>Leucopogon ericoides</i>	Pink Beard-heath	
*	<i>Ligustrum lucidum</i>	Large Leaved Privet	

APPENDIX 2 cont Plant species recorded on the subject site at Silverdale.

Status	SCIENTIFIC NAME	COMMON NAME	SS
*	<i>Ligustrum sinense</i>	Small Leaved Privet	
	<i>Lindsaea microphylla</i>	Lacy Wedge Fern	
	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	
	<i>Lomandra obliqua</i>		
	<i>Lomatia silaifolia</i>	Crinkle Bush	
	<i>Melaleuca ericifolia</i>	Swamp Paperbark	
	<i>Melaleuca thymifolia</i>	Thyme Honey-myrtle	
	<i>Mirbelia rubifolia</i>	Heathy Mirbelia	
	<i>Notelaea longifolia</i> forma <i>longifolia</i>	Large Mock-olive	
	<i>Pandorea pandorana</i>	Wonga Wonga Vine	
	<i>Parsonsia straminea</i>	Common Silkpod	
*	<i>Paspalum dilatatum</i>	Paspalum	
*	<i>Paspalum urvillei</i>	Vasey Grass	
*	<i>Passiflora edulis</i>	Common Passionfruit	
	<i>Patersonia glabrata</i>	Leafy Purple-flag	
	<i>Patersonia longifolia</i>		
	<i>Pennisetum clandestinum</i>	Kikuyu Grass	
	<i>Persicaria decipiens</i>	Slender knotweed	
	<i>Persoonia levis</i>	Broad-leaved Geebung	
	<i>Persoonia linearis</i>	Narrow-leaved Geebung	
	<i>Phyllanthus hirtellus</i> forma A		
	<i>Pimelea linifolia</i> ssp <i>linifolia</i>	Slender Rice Flower	
	<i>Pittosporum undulatum</i>	Sweet Pittosporum	
	<i>Poa labillardieri</i>	Tussock Grass	
	<i>Podolobium ilicifolium</i>	Prickly Shaggy Pea	
	<i>Podolobium scandens</i>	Netted Shaggy Pea	
	<i>Pomax umbellata</i>	Pomax	
	<i>Pratia purpurascens</i>	Whiteroot	
	<i>Pteridium esculentum</i>	Common Bracken	
	<i>Pultenaea retusa</i>		
N(4)	<i>Rubus fruticosus</i> agg sp	Blackberry	
*	<i>Senecio madagascariensis</i>	Fireweed	
*	<i>Senna pendula</i> var <i>glabrata</i>	Cassia	
*	<i>Sida rhombifolia</i>	Paddy's Lucerne	
*	<i>Sonchus oleraceus</i>	Common Sowthistle	
	<i>Stylidium productum</i>	Trigger Plant	
	<i>Stypandra glauca</i>	Nodding Blue Lily	
	<i>Syncarpia glomulifera</i> ssp <i>glomulifera</i>	Turpentine	
	<i>Tetrarrhena juncea</i>	Wiry Ricegrass	
	<i>Themeda australis</i>	Kangaroo Grass	

| **APPENDIX 2 cont** Plant species recorded on the subject site at Silverdale.

Status	SCIENTIFIC NAME	COMMON NAME	SS
*	<i>Thunbergia alata</i>	Black-eyed Susan	
*	<i>Tradescantia albiflora</i>	Wandering Jew	
*	<i>Verbena brasiliensis</i>		
	<i>Xanthorrhoea</i> sp	Grass Tree	
	<i>Xylomelum pyriforme</i>	Woody Pear	

Class 3 Noxious Weed – The plant must be fully and continuously suppressed and destroyed.

Class 4 Noxious Weed – The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority.

LOT 5 DP 261728 WARADALE ROAD, SILVERDALE
PROPOSED REZONING

FLORA AND FAUNA PRELIMINARY INVESTIGATION

APPENDIX 3

Fauna species known from the site and locality

March 2010

APPENDIX 3 Fauna species known from the site and locality.

KEY	
Status	
*	Introduced species
M	Migratory species listed under the Commonwealth EPBC Act
E (TSC)	Endangered species listed on the NSW TSC Act
V (TSC)	Vulnerable species listed on the NSW TSC Act
E (EPBC)	Endangered species listed on the Commonwealth EPBC Act
V (EPBC)	Vulnerable species listed on the Commonwealth EPBC Act
Record	
A	Species recorded on the subject site (CPE Tree Services, 2003)
B	Species listed as occurring within 5km of the subject site on the DECC Atlas.

Status	COMMON NAME	SCIENTIFIC NAME	A	B
	BIRDS			
	Phasianidae			
	Brown Quail	<i>Coturnix ypsilophora</i>		✓
	Anatidae			
M	Pacific Black Duck	<i>Anas superciliosa</i>	✓	✓
M	Grey Teal	<i>Anas gracilis</i>		✓
*	Mallard	<i>Anas platythynchos</i>		✓
M	Hardhead	<i>Aythya australis</i>		✓
M	Australian Wood Duck	<i>Chenonetta jubata</i>		✓
M	Black Swan	<i>Cygnus atratus</i>		✓
	Podicipedidae			
	Australasian Grebe	<i>Tachybaptus novaehollandiae</i>		✓
	Columbidae			
	Bar-shouldered Dove	<i>Geopelia humeralis</i>		✓
	Peaceful Dove	<i>Geopelia placida</i>		✓
	Wonga Pigeon	<i>Leucosarcia melanoleuca</i>		✓
	Brown Cuckoo-dove	<i>Macropygia amboinensis</i>		✓
	Crested Pigeon	<i>Ocyphaps lophotes</i>		✓
	Brush Bronzewing	<i>Phaps elegans</i>		✓
	Common Bronzewing	<i>Phaps chalcoptera</i>		✓
*	Spotted Turtledove	<i>Streptopelia chinensis</i>	✓	✓
	Podargidae			
	Tawny Frogmouth	<i>Podargus strigoides</i>		✓
	Aegotheidae			
	Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	✓	✓
	Apodidae			
	Fork-tailed Swift	<i>Apus pacificus</i>		✓
M	White-throated Needletail	<i>Hirundapus caudacutus</i>		✓
	Anhingidae			
	Darter	<i>Anhinga melanogaster</i>		✓
	Phalacrocoracidae			
	Great Cormorant	<i>Phalacrocorax carbo</i>		✓
	Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>		✓
	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>		✓
	Pied Cormorant	<i>Phalacrocorax varius</i>		✓
	Pelecanidae			
	Australian Pelican	<i>Pelecanus conspicillatus</i>		✓

APPENDIX 3 cont Fauna species known from the site and locality

Status	COMMON NAME	SCIENTIFIC NAME	A	B
E (TSC)	Ciconiidae Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>		✓
	Ardeidae Great Egret	<i>Ardea alba</i>		✓
	Cattle Egret	<i>Ardea ibis</i>		✓
	Intermediate Egret	<i>Ardea intermedia</i>		✓
	White-faced Heron	<i>Egretta novaehollandiae</i>		✓
V (TSC)	Black Bittern	<i>Ixobrychus flavicollis</i>		✓
	Nankeen Night Heron	<i>Nycticorax caledonicus</i>		✓
	Threskiornithidae Yellow-billed Spoonbill	<i>Platalea flavipes</i>		✓
	Royal Spoonbill	<i>Platalea regia</i>		✓
	Straw-necked Ibis	<i>Threskiornis spinicollis</i>		✓
	Accipitridae Brown Goshawk	<i>Accipiter fasciatus</i>		✓
M	Grey Goshawk	<i>Accipiter novaehollandiae</i>		✓
M	Wedge-tailed Eagle	<i>Aquila audax</i>		✓
M	Swamp Harrier	<i>Circus approximans</i>		✓
M	Black-shouldered Kite	<i>Elanus axillaris</i>		✓
M	White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>		✓
M	Whistling Kite	<i>Haliastur sphenurus</i>	✓	✓
V (TSC)	Square-tailed Kite	<i>Lophoictinia isura</i>		✓
M	Black Kite	<i>Milvus migrans</i>		✓
	Falconidae Nankeen Kestrel	<i>Falco cenchroides</i>		✓
M	Australian Hobby	<i>Falco longipennis</i>		✓
M	Peregrine Falcon	<i>Falco peregrinus</i>		✓
M	Brown Falcon	<i>Falco berigora</i>		✓
	Rallidae Eurasian Coot	<i>Fulica atra</i>		✓
	Dusky Moorhen	<i>Gallinula tenebrosa</i>		✓
	Buff-banded Rail	<i>Gallirallus philippensis</i>		✓
	Purple Swampphen	<i>Porphyrio porphyrio</i>		✓
	Charadriidae Black-fronted Dotterel	<i>Euseyonis melanops</i>		✓
M	Masked Lapwing	<i>Vanellus miles</i>		✓
M	Banded Lapwing	<i>Vanellus tricolor</i>		✓
	Scolopacidae Black-tailed Godwit	<i>Limosa limosa</i>		✓
	Turnicidae Painted Button-quail	<i>Turnix varius</i>		✓
	Laridae Silver Gull	<i>Larus novaehollandiae</i>		✓
	Cacatuidae Cockatiel	<i>Nymphicus hollandicus</i>		✓
	Galah	<i>Cacatua roseicapilla</i>	✓	✓
	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>		✓
	Little Corella	<i>Cacatua sanguinea</i>		✓
	Long-billed Corella	<i>Cacatua tenuirostris</i>	✓	✓
V (TSC)	Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>		✓
V (TSC)	Gang Gang Cockatoo	<i>Callocephalon fimbriatum</i>		✓
E (TSC)	Gang Gang Cockatoo population in the Hornsby & Ku-ring-gai LGA's	<i>Callocephalon fimbriatum</i>		
	Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>		✓
	Psittacidae Australian King Parrot	<i>Alisterus scapularis</i>		✓
	Musk Lorikeet	<i>Glossopsitta concinna</i>		✓
V (TSC)	Little Lorikeet	<i>Glossopsitta pusilla</i>		✓

APPENDIX 3 cont Fauna species known from the site and locality

Status	COMMON NAME	SCIENTIFIC NAME	A	B
E (TSC)	Psittacidae cont			
	Swift Parrot	<i>Lathamus discolor</i>		✓
	Eastern Rosella	<i>Platycercus eximius</i>		✓
	Crimson Rosella	<i>Platycercus elegans</i>		✓
	Red-rumped Parrot	<i>Psephotus haematonotus</i>	✓	✓
	Rainbow Lorikeet	<i>Trichoglossus haematodus</i>		✓
	Cuculidae			
	Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>		✓
	Brush Cuckoo	<i>Cacomantis variolosus</i>	✓	✓
	Pheasant Coucal	<i>Centropus phasianinus</i>		✓
V (TSC)	Horsfield's Bronze-cuckoo	<i>Chalcites basalis</i>		✓
	Shining Bronze-Cuckoo	<i>Chalcites lucidus</i>		✓
V (TSC)	Pallid Cuckoo	<i>Cuculus pallidus</i>		✓
	Oriental Cuckoo	<i>Cuculus saturatus</i>		✓
	Pacific Koel	<i>Eudynamys orientalis</i>		✓
	Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>		✓
	Strigidae			
	Southern Boobook	<i>Ninox boobook</i>	✓	✓
	Powerful Owl	<i>Ninox strenua</i>		✓
	Tytonidae			
	Masked Owl	<i>Tyto novaehollandiae</i>		✓
	Barn Owl	<i>Tyto alba</i>		✓
V (TSC)	Alcedinidae			
	Azure Kingfisher	<i>Alcedo azurea</i>		✓
	Laughing Kookaburra	<i>Dacelo novaeguineae</i>	✓	✓
	Sacred Kingfisher	<i>Todiramphus sanctus</i>		✓
	Halcyonidae			
	Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>		✓
	Meropidae			
	Rainbow Bee-eater	<i>Merops ornatus</i>		✓
	Coraciidae			
	Dollarbird	<i>Eurystomus orientalis</i>		✓
V (TSC)	Menuridae			
	Superb Lyrebird	<i>Menura novaehollandiae</i>		✓
	Climacteridae			
	Red-browed Treecreeper	<i>Climacteris erythrops</i>		✓
	White-throated Treecreeper	<i>Cormobates leucophaeus</i>		✓
	Ptilonorhynchidae			
	Satin Bowerbird	<i>Ptilonorhynchus violaceus</i>		✓
	Maluridae			
	Superb Fairy-wren	<i>Malurus cyaneus</i>	✓	✓
	Variegated Fairy-wren	<i>Malurus lamberti</i>		✓
V (TSC)	Acanthizidae			
	Brown Thornbill	<i>Acanthiza pusilla</i>		✓
	Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>		✓
	Yellow Thornbill	<i>Acanthiza nana</i>		✓
	Buff-rumped Thornbill	<i>Acanthiza reguloides</i>		✓
	Striated Fieldwren	<i>Calamanthus fuliginosus</i>		✓
	Western Gerygone	<i>Gerygone fusca</i>		✓
	Brown Gerygone	<i>Gerygone mouki</i>		✓
	White-throated Gerygone	<i>Gerygone olivacea</i>		✓
	Rockwarbler	<i>Origma solitaria</i>		✓
V (TSC)	Pilotbird	<i>Pycnoptilus floccosus</i>		✓
	Speckled Warbler	<i>Pyrrholaemus sagittatus</i>		✓
	White-browed Scrubwren	<i>Sericornis frontalis</i>		✓
	Weebill	<i>Smicrornis brevirostris</i>		✓

APPENDIX 3 cont Fauna species known from the site and locality

Status	COMMON NAME	SCIENTIFIC NAME	A	B
V (TSC)	Pardalotidae			
	Spotted Pardalote	<i>Pardalotus punctatus</i>		✓
	Striated Pardalote	<i>Pardalotus striatus</i>		✓
	Meliphagidae			
	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>		✓
	Red Wattlebird	<i>Anthochaera carunculata</i>		✓
	Little Wattlebird	<i>Anthochaera chrysoptera</i>		✓
	Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>		✓
	Fuscous Honeyeater	<i>Lichenostomus fuscus</i>		✓
	White-eared Honeyeater	<i>Lichenostomus leucotis</i>		✓
	Yellow-tufted Honeyeater	<i>Lichenostomus melanops</i>		✓
	White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>		✓
	Noisy Miner	<i>Manorina melanocephala</i>	✓	✓
	Bell Miner	<i>Manorina melanophrys</i>	✓	✓
	Lewin's Honeyeater	<i>Meliphaga lewinii</i>		✓
	Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>		✓
	Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>		
	White-naped Honeyeater	<i>Melithreptus lunatus</i>		✓
	Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>		✓
	Noisy Friarbird	<i>Philemon corniculatus</i>		✓
	New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>		✓
	Regent Honeyeater	<i>Xanthomyza phrygia</i>		✓
	Psophodidae			
	Spotted Quail-thrush	<i>Cinclosoma punctatum</i>		✓
	Eastern Whipbird	<i>Psophodes olivaceus</i>		✓
	Neosittidae			
	Varied Sittella	<i>Daphoenositta chrysoptera</i>		✓
	Campephagidae			
	Cicadabird	<i>Coracina tenuirostris</i>		✓
	White-winged Triller	<i>Lalage tricolor</i>		✓
	White-bellied Cuckoo-shrike	<i>Coracina papuensis</i>		✓
	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	✓	✓
	Pachycephalidae			
	Grey Shrike-thrush	<i>Colluricincla harmonica</i>		✓
	Eastern Shrike-tit	<i>Falcunculus frontatus</i>		✓
	Golden Whistler	<i>Pachycephala pectoralis</i>		✓
	Rufous Whistler	<i>Pachycephala rufiventris</i>		✓
	Oriolidae			
	Olive-backed Oriole	<i>Oriolus sagittatus</i>		✓
	Artamidae			
	Dusky Woodswallow	<i>Artamus cyanopterus</i>		✓
	Masked Woodswallow	<i>Artamus personatus</i>		✓
	Pied Butcherbird	<i>Cracticus nigrogularis</i>		✓
	Grey Butcherbird	<i>Cracticus torquatus</i>	✓	✓
	Australian Magpie	<i>Gymnorhina tibicen</i>	✓	✓
	Pied Currawong	<i>Strepera graculina</i>	✓	✓
M	Rhipiduridae			
	Grey Fantail	<i>Rhipidura albiscapa</i>		✓
	Rufous Fantail	<i>Rhipidura rufifrons</i>		✓
	Willie Wagtail	<i>Rhipidura leucophrys</i>	✓	✓
	Corvidae			
	Australian Raven	<i>Corvus coronoides</i>		✓
M	Monarchidae			
	Magpie-lark	<i>Grallina cyanoleuca</i>	✓	✓
	Satin Flycatcher	<i>Myiagra cyanoleuca</i>		✓
	Restless Flycatcher	<i>Myiagra inquieta</i>		✓
	Leaden Flycatcher	<i>Myiagra rubecula</i>		✓

APPENDIX 3 cont Fauna species known from the site and locality.

Status	COMMON NAME	SCIENTIFIC NAME	A	B
	Corcoracidae White-winged Chough	<i>Corcorax melanoramphos</i>		✓
	Petroicidae Eastern Yellow Robin	<i>Eopsaltria australis</i>		✓
	Jacky Winter	<i>Microeca fascians</i>		✓
	Scarlet Robin	<i>Petroica boodang</i>		✓
	Rose Robin	<i>Petroica rosea</i>		✓
V (TSC)	Hooded Robin	<i>Melanodryas cucullata</i>		✓
M	Cisticolidae Golden-headed Cisticola	<i>Cisticola exilis</i>		✓
M	Megaluridae Brown Songlark	<i>Cinchoramphos cruralis</i>		✓
M	Little Grassbird	<i>Megalurus gramineus</i>		✓
	Timaliidae Silvereye	<i>Zosterops lateralis</i>		✓
	Hirundinidae Welcome Swallow	<i>Hirundo neoxena</i>		✓
	Tree Martin	<i>Petrochelidon nigricans</i>		✓
	Fairy Martin	<i>Petrochelidon ariel</i>		✓
*	Pycnonotidae Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>		✓
	Turdidae Bassian Thrush	<i>Zoothera lunulata</i>		✓
*	Eurasian Blackbird/Common Blackbird	<i>Turdus merula</i>		✓
*	Sturnidae Common Starling	<i>Sturnus vulgaris</i>	✓	✓
*	Common Myna	<i>Acridotheres tristis</i>		✓
	Nectariniidae Mistletoebird	<i>Dicaeum hirundinaceum</i>		✓
*	Estrildidae Nutmeg Mannikin	<i>Lonchura punctulata</i>		✓
	Plum-headed Finch	<i>Neochmia modesta</i>		✓
	Red-browed Finch	<i>Neochmia temporalis</i>	✓	✓
	Double-barred Finch	<i>Taeniopygia bichenovii</i>		✓
	Zebra Finch	<i>Taeniopygia guttata</i>		✓
V (TSC)	Diamond Firetail	<i>Stagonopleura guttata</i>		✓
*	Passeridae House Sparrow	<i>Passer domesticus</i>	✓	✓
	Motacillidae Australian Pipit	<i>Anthus australis</i>		✓
	REPTILES			
	Chelidae Eastern Snake-necked Turtle	<i>Chelodina longicollis</i>		✓
	Varanidae Lace Monitor	<i>Varanus varius</i>	✓	✓
	Gekkonidae Eastern Stone Gecko/Wood Gecko	<i>Diplodactylus vittatus</i>		✓
	Lesueur's Velvet Gecko	<i>Oedura lesueuri</i>		✓
	Broad-tailed Gecko	<i>Phyllurus platurus</i>		✓
	Agamidae Jacky Lashtail/Lizard	<i>Amphibolurus muricatus</i>		✓
	Eastern Bearded Dragon	<i>Pogona barbata</i>		✓
	Mountain Dragon	<i>Rankinia diemensis</i>		✓

APPENDIX 3 cont Fauna species known from the site and locality.

Status	COMMON NAME	SCIENTIFIC NAME	A	B
	Agamidae cont			
	Eastern Water Dragon	<i>Physignathus lesueurii</i>	✓	✓
	Pygopodidae			
	Common Scaly-foot	<i>Pygopus lepidopodus</i>		✓
	Scincidae			
	Red-throated Cool-skink	<i>Acritoscincus platynota</i>		✓
	Cream-striped Shinning-skink	<i>Cryptoblepharus virgatus</i>	✓	✓
	Robust Ctenotus	<i>Ctenotus robustus</i>	✓	✓
	Copper-tailed Ctenotus/Skink	<i>Ctenotus taeniolatus</i>	✓	✓
	Cunningham's Spiny-tailed Skink	<i>Egernia cunninghamii</i>		✓
	White's Rock-skink	<i>Egernia whitii</i>		✓
	Eastern Water Skink	<i>Eulamprus quoyii</i>	✓	✓
	Barred-sided Forest Skink	<i>Eulamprus tenuis</i>		✓
	Dark-flecked Garden Sun-skink	<i>Lampropholis delicata</i>		✓
	Pale-flecked Garden Sun-skink	<i>Lampropholis guichenoti</i>		✓
	Unidentified grass skink	<i>Lampropholis sp.</i>		✓
	Tree-base Litter-skink	<i>Lygisaurus foliorum</i>		✓
	Yellow-bellied Three-toed Skink	<i>Saiphos equalis</i>		✓
	Weasel Skink	<i>Saproscincus mustelinus</i>		✓
	Eastern Blue-tongue Lizard	<i>Tiliqua scincoides</i>	✓	✓
	Boidae			
	Carpet & Diamond Python	<i>Morelia spilota spilota</i>		✓
	Diamond Python	<i>Morelia spilota</i>		✓
	Typhlopidae			
	Blackish Blind Snake	<i>Ramphotyphlops nigrescens</i>		✓
	Colubridae			
	Common Tree Snake	<i>Dendrelaphis punctulatusq</i>		✓
	Elapidae			
	Eastern Small-eyed Snake	<i>Cyrtophis nigrescens</i>		✓
	Yellow-faced Whip Snake	<i>Demansia psammophis</i>		✓
	Red-naped Snake	<i>Furina diadema</i>		✓
	Marsh Snake/ Black-bellied Swamp Snake	<i>Hemiaspis signata</i>		
	Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>	✓	
	Eastern Brown Snake	<i>Pseudonaja textilis</i>		✓
	AMPHIBIANS			
	Myobatrachidae			
	Common Eastern Froglet	<i>Crinia signifera</i>	✓	✓
	Bullfrog/Eastern Banjo Frog	<i>Limnodynastes dumerillii</i>		✓
	Long-thumbed Frog	<i>Limnodynastes fletcheri</i>		✓
	Striped Marsh Frog/Brown-striped Frog	<i>Limnodynastes peronii</i>	✓	✓
	Spotted Marsh Frog/Spotted Grass Frog	<i>Limnodynastes tasmaniensis</i>		
V (TSC)	Red-crowned Toadlet	<i>Pseudophryne australis</i>		✓
	Bibron's Toadlet	<i>Pseudophryne bibroni</i>		✓
	Smooth Toadlet	<i>Uperoleia laevigata</i>		✓
		<i>Uperoleia sp.</i>		✓
E (TSC)	Hylidae			
	Green & Golden Bell Frog	<i>Litoria aurea</i>		✓
	Green Tree Frog	<i>Litoria caerulea</i>		✓
	Blue Mountains Tree Frog	<i>Litoria citropa</i>		✓
	Brown Tree Frog	<i>Litoria ewingii</i>		✓
	Eastern Dwarf Tree Frog	<i>Litoria fallax</i>		✓
	Broad-palmed Frog	<i>Litoria latopalmata</i>		✓
	Lesueur's Tree Frog	<i>Litoria lesueurii</i>	✓	✓
	Peron's Tree Frog	<i>Litoria peronii</i>		✓

APPENDIX 3 cont Fauna species known from the site and locality.

Status	COMMON NAME	SCIENTIFIC NAME	A	B
	Hylidae cont			
	Green Stream Frog/Leaf-green Tree Frog	<i>Litoria phyllochroa</i>		✓
	Tyler's Tree Frog	<i>Litoria tyleri</i>		✓
	Verreaux's Tree Frog	<i>Litoria verreauxii</i>		✓
	MAMMALS			
	Ornithorhynchidae			
	Platypus	<i>Ornithorhynchus anatinus</i>		✓
	Tachyglossidae			
	Short-beaked Echidna	<i>Tachyglossus aculeatus</i>		✓
	Vombatidae			
	Wombat	<i>Vombatus ursinus</i>	✓	✓
	Dasyuridae			
	Brown Antechinus	<i>Antechinus stuartii</i>	✓	✓
	Unidentified Antechinus	<i>Antechinus sp.</i>		✓
	Unidentified dasyurid	<i>Dasyuridae sp.</i>		✓
V (TSC)	Spotted-tailed Quoll	<i>Dasyurus maculatus</i>		✓
	Petauridae			
V (TSC)	Yellow-bellied Glider	<i>Petaurus australis</i>		✓
	Sugar Glider	<i>Petaurus breviceps</i>	✓	✓
	Pseudocheiridae			
	Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	✓	✓
	Greater Glider	<i>Petauroides volans</i>		✓
	Phalangeridae			
	Brushtail Possum	<i>Trichosurus sp</i>		✓
	Common Brushtail Possum	<i>Trichosurus vulpecula</i>	✓	✓
	Macropodidae			
	Unidentified macropod	<i>Macropod sp.</i>		✓
	Eastern Grey Kangaroo	<i>Macropus giganteus</i>		✓
	Common Wallaroo	<i>Macropus robustus</i>		✓
	Red-necked Wallaby	<i>Macropus rufogriseus</i>	✓	✓
	Kangaroo	<i>Macropus sp.</i>		✓
E (TSC)	Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>		✓
	Swamp Wallaby	<i>Wallabia bicolor</i>	✓	✓
	Muridae			
	Rat	<i>Rattus</i>		✓
	Bush Rat	<i>Rattus fuscipes</i>	✓	✓
	Pteropodidae			
V (TSC)	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>		✓
	Rhinolophidae			
	Eastern Horseshoe-bat	<i>Rhinolophus megaphyllus</i>		✓
	Molossidae			
V (TSC)	Eastern Freetail-bat	<i>Mormopterus norfolkensis</i>		✓
	Little Mastiff-bat	<i>Mormopterus planiceps</i>		✓
	Undescribed Freetail-bat	<i>Mormopterus sp 2</i>		✓
	White-striped Freetail-bat	<i>Tadarida australis</i>		✓
	Vespertilionidae			
V (TSC)	Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>		✓
	Gould's Wattled Bat	<i>Chalinolobus gouldii</i>		✓
	Chocolate Wattled Bat	<i>Chalinolobus morio</i>		✓
V (TSC)	Eastern Bent-wing Bat	<i>Miniopterus schreibersii oceanis</i>		✓
V (TSC)	Large-footed Myotis	<i>Myotis adversus</i>		✓
	Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>		✓
	Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>		✓
V (TSC)	Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>		✓
	Eastern Broad-nosed Bat	<i>Scotorepens orion</i>		✓

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V (TSC)	Vespertilionidae cont			
	Large Forest Bat	<i>Vespadelus darlingtoni</i>		✓
	Southern Forest Bat	<i>Vespadelus regulus</i>		✓
	Unidentified Eptesicus	<i>Vespadelus sp.</i>		✓
	Little Forest Bat	<i>Vespadelus vulturinus</i>		✓
	Otariidae			
	Australian Fur-seal	<i>Arctocephalus pusillus doriferus</i>		✓
	Introduced Mammals			
	* Goat	<i>Capra hircus</i>		✓
	* European Cattle	<i>Bos taurus</i>		✓
	* Horse	<i>Equus caballus</i>		✓
	* Dingo	<i>Canis lupus</i>		✓
	* Dog	<i>Canis lupus familiaris</i>		✓
	* Unidentified deer	<i>Cervus sp.</i>		✓
	* Cat	<i>Felis catus</i>		✓
	* Fox	<i>Vulpes vulpes</i>		✓
	* Brown Hare	<i>Lepus capensis</i>	✓	✓
	* Rabbit	<i>Oryctolagus cuniculus</i>	✓	✓
	* House Mouse	<i>Mus musculus</i>		✓
	* Black Rat	<i>Rattus rattus</i>		✓
E (TSC)	INVERTEBRATES			
	Camaenidae			
	Cumberland Plain Land Snail	<i>Meridolum corneovirens</i>		✓

LOT 5 DP 261728
WARADALE ROAD, SILVERDALE

PROPOSED REZONING

FLORA AND FAUNA
PRELIMINARY INVESTIGATION

March 2010

