

**MOLINO STEWART**  
ENVIRONMENT & NATURAL HAZARDS

**Assyrian Schools Ltd,  
C/- PMDL**

**Saints Peter and Paul Assyrian  
Primary School - Biodiversity  
Assessment**

*Final Report*





# **Saints Peter and Paul Assyrian Primary School - Biodiversity Assessment**

FINAL REPORT

for

Assyrian Schools Ltd

by

Molino Stewart Pty Ltd  
ACN 067 774 332

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# DOCUMENT APPROVAL

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# 1 INTRODUCTION

## 1.1 LOCATION

The subject site is located at Kosovich Place off Wallgrove Road, Cecil Park, NSW (**Appendix A - Figure 1**). The proposed school development includes the following properties: Lot 2320 DP 1201268 and Lot 2321 DP 1201268.

The property is within the Fairfield Local Government Area (LGA).

## 1.2 PROPOSED DEVELOPMENT

It is proposed to develop a new co-education primary school with library, administration and amenities buildings.

The Assyrian Schools Ltd has appointed PMDL Architects as Architectural Head Design Consultant Services to coordinate delivery of design works for the School. PMDL is undertaking a master planning process for the site to provide the new school facilities.

The proposed development consists of:

- A new co-education primary school with associated library, administration and amenities in a combination of both one storey and two storey buildings. The school will ultimately be a 3-stream school from Kindergarten to Year 6 of approximately 630 pupils and 35 staff.
- A multi-use central court and various forecourts and play areas
- An entrance, on-grade car parking and drop-off / pick-up area.

The Masterplan is shown in **Appendix A - Figure 2**.

The proposal will be staged, with stage one of the Masterplan consisting of a two-storey building which will include nine GLAs, staff and administration areas all contained within Lot 2320 only.

This biodiversity assessment includes all impacts associated with development of the school in accordance with the Masterplan,

inclusive of those impacts associated with the Stage 1 development.

## 1.3 LEGISLATIVE AND POLICY CONTEXT

### 1.3.1 Fairfield Biodiversity Strategy

The *Fairfield Biodiversity Strategy 2010* (Fairfield City Council, 2012) seeks to ensure that vegetation with ecological value and resultant legislative obligations can be identified early in the development process.

The Strategy outlines a Conservation Significance Assessment (CSA) process that was undertaken by Council for remnant vegetation in Fairfield City. A series of maps was produced that identified areas of the city based upon a classification system using three levels of conservation significance; High, Moderate and Low. These maps are no longer available as an updated CSA process has recently been undertaken by Council (Tim Johnson, Natural Resources Team Leader Fairfield City Council, *pers comm*). A copy of the updated mapping for the subject site is shown in **Appendix A - Figure 3**. There is no vegetation of high, medium or low significance mapped on the site.

Areas classified as medium and high conservation significance in the previous (2012) mapping were incorporated into the Terrestrial Biodiversity layer of the LEP. As outlined in Section 1.3.2 below, areas of the site are mapped in the LEP as terrestrial biodiversity, however the more recent CSA mapping does not show any areas of conservation significance on the site.

### 1.3.2 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) provides the framework for the assessment of development proposals. The *Threatened Species Conservation Act 1995* (TSC Act), is integrated with the EP&A Act and identifies the species, populations and ecological communities requiring consideration under the EP&A Act.

Section 5A of the EP&A Act requires that the assessment of all developments include consideration of whether the proposal is likely to impact on threatened species, populations or ecological communities. It establishes seven factors on which this assessment of significance must be based (the 'Five Part Test'). Where a significant impact is considered likely, a Species Impact Statement (SIS) must be prepared.

Consideration of threatened species is presented in this report in Section 4.4.

#### **a) Fairfield Local Environmental Plan (Fairfield LEP) 2013**

The majority of the site, including the location of the proposed buildings, is zoned RU4 - Primary Production Small Lots. Smaller areas along the creek lines on the edges of the property are zoned E2 Environmental Conservation.

An area of the site along the waterways is included in the LEP Terrestrial Biodiversity Map (**Appendix A - Figure 4**). Clause 6.2 of the LEP requires Council to take into account the impact of development of areas that support important biodiversity (flora and fauna) and are considered to have special conservation significance. This includes Cumberland Plain Woodland and fish habitat areas along creeks.

An area of the site along the waterways is mapped on the Fairfield LEP Riparian Lands and Waterways map (**Appendix A - Figure 5 and Figure 6**). Clause 6.1 of the LEP requires Council to take into account the impact of development on creeks, land and associated vegetation immediately adjoining creeklines (referred to as riparian land) and natural water bodies (e.g. wetlands). The width of riparian lands in the City ranges from approximately 10 m to 50 m wide on each side of a creek depending on the classification of the creek.

#### **b) Fairfield City Wide Development Control Plan (DCP) (2013)**

The sections of the Fairfield City Wide DCP that are most relevant to this biodiversity assessment are sections 3.3 - *Biodiversity Corridors* and 3.4 - *Riparian Land and Waterways*, as discussed below.

#### DCP Section 3.3 - Biodiversity Corridors

Section 3.3 of the DCP outlines requirements for areas included in the LEP Terrestrial Biodiversity Map. It states that ecological reports should reference the impact of development in relation to the *Fairfield Biodiversity Strategy*.

The principal aim for development in areas that benefit from the presence of biodiversity issues is to consider steps in the early stage of the design process to minimise the impact on the area with biodiversity significance. Recommended measures include:

*a) Seek advice from an environmental consultant with expertise in biodiversity issues. This can include consultants with qualifications in ecology, environmental science or related (relevant) fields.*

This is covered by this report.

*b) Seek advice from Council about information Council has that identify areas that have some conservation significance. These areas have been identified using a Conservation Significance Assessment (CSA). The effect of the CSA areas is to highlight the existence of native vegetation so that the ecological value of the vegetation can be considered as an early part of the development process.*

This advice has been received from Council, see Section 1.3.1 above.

*c) The development should be designed to minimise impacts on the area with biodiversity significance. This can be achieved for example by not removing or disturbing areas containing indigenous vegetation, maximising the setback distance or buffer area from the development to the area with biodiversity significance.*

Addressed in Section 4 and 5 of this report.

*d) Provide new planting or 'undisturbed' areas which maximise connection to adjoining areas of remnant indigenous vegetation retained on-site or on neighbouring sites.*

Addressed in Section 4 and 5 of this report, and will be specified in the Riparian Vegetation Management Plan to be implemented in a future stage of the development.

*e) Try to maximise not only the length but width of corridor supporting indigenous*

*vegetation and movement on native fauna. Narrowing or bottlenecks within the biodiversity corridor should be avoided.*

Riparian corridor vegetation will be retained and enhanced as part of the staged development. Addressed in Section 4 and 5 of this report, it has been specified in a Vegetation Management Plan to be implemented in a future stage of the development.

*f) Ensure any new access roads or provision of services (including stormwater drainage or sewerage systems) avoids indigenous vegetation. Where this is not possible, minimise the level of intrusion (including the length and width of the services) and consider providing for wildlife under/overpasses.*

No native vegetation will be cleared.

For development affected by clause 6.2 of the Fairfield LEP, a Biodiversity report will need to be submitted with development applications, prepared by a suitably qualified environmental consultant. The report will need to address the following matters:

*a) Description of the plant and potential animal species located on the site. Areas of the City identified with Biodiversity significance comprise the Cumberland Plain Woodland Critically Endangered Ecological Community.*

See Section 3 of this report.

*b) Development impacting on native vegetation will generally be required to submit a report prepared by a qualified consultant. The report will need to address criteria contained in the '7 Part Test' (see c.3.2.7). In the event the '7 Part Test' indicates there is potential for a significant impact, then a species impact statement will need to be prepared.*

See Section 4.4 and Appendix E.

*c) Where applicable, consideration must be given to the local Conservation Significance Assessment prepared by Council as part of the Fairfield Biodiversity Strategy 2010. Conservation significance has been assessed as either, High, Moderate or Low. The Biodiversity Strategy provides an important basis for the assessment. Any "7 part Test" shall reference the impact of development in relation to the Biodiversity Strategy.*

See Section 1.3.1.

*d) Information on measures to mitigate potential impacts of development on the area with biodiversity significance.*

See Section 5

*e) Provision of a landscape plan detailing new vegetation to be provided on the site. Note this should include locally occurring indigenous vegetation.*

See Section 5.1, to be provided prior to release of Construction Certificate.

*f) Consideration of the potential impacts of the proposal on movement of native fauna through the site.*

See Section 4.2 and 4.3.

*g) A number of areas of the City with Biodiversity significance have also been zoned E2 Environmental Protection, E3 Environmental Management or W2 Waterways Recreation. Where applicable, the report will also need to address the objectives of these zones.*

Small areas along the creek lines on the edges of the property are zoned E2 Environmental Conservation. See Environmental Impact Statement (EIS) for discussion of zone objectives.

#### DCP Section 3.4 - Riparian and Waterway areas

Detailed requirements in relation for LEP mapped Riparian and Waterway areas are set out in Section 3.4. The DCP outlines that the principal aim for development affected by Riparian Land and Waterways issues is to consider steps in the early stage of design to minimise the impact on the area with biodiversity significance. Recommended measures in the DCP include:

*a) Seek advice from an environmental consultant with expertise in riparian land and waterway issues. This can include consultants with qualifications in ecology, environmental science or related (relevant) fields.*

This is covered by this report.

*b) Seek advice from Council about information Council has that helps identify areas that have some conservation significance. These areas*

have been identified using a Conservation Significance Assessment (CSA). The effect of the CSA areas is to highlight the existence of native vegetation so that the ecological value of the vegetation can be considered as an early part of the development process.

This advice has been received from Council, see Section 1.3.1 above.

*c) As far as possible, retain the natural contours of the land. The degree of cut and fill on a site should be minimised and ensure there are not detrimental impacts on the natural water flow characteristics of the site and surrounding area.*

Earthworks will be required to construct the school buildings. Fill will only be required in the upper section of the site where the buildings will be constructed. All the buildings will be above the 1:100 flood line, but the area of filling will encroach slightly over the 1:100 flood line as in small areas, as shown in **Appendix A - Figure 2**. This area of encroachment will consist of a grassed embankment along the western edge of the school building areas. The only other earthworks required below the 1:100 flood line would be minor levelling out of some areas, such as for the multi-purpose court. The majority of the floodplain will remain at the current levels. No filling is required in the lower section of the site. No earthworks are proposed within the 20 metre Vegetated Riparian Zone, which includes the waterway and dam.

Earthworks will be kept to the minimum necessary. Management of stormwater has been addressed in a Stormwater Management Plan. A Floodplain Management Assessment has been conducted by a separate consultant.

*d) Minimise stormwater runoff into creeks or bushland.*

Has been addressed in a Stormwater Management Plan.

*e) Maximise the amount of soft landscaped area and planting with local native species on a site.*

Has been addressed in the Landscape Plan and the Vegetation Management Plan. Local native species would be used in landscaping and revegetation.

*f) Protect, maintain and promote natural vegetated riparian buffer areas for land shown on the Riparian Land and waterways Map. Plant species established in the riparian area should consist of local native plant species that are representative of the local vegetation community.*

Riparian corridor vegetation will be retained and enhanced. A 20 metre VRZ is proposed, as outlined in Section 3.3. Planting of this zone has been addressed in a Landscape Plan and a Vegetation Management Plan to be implemented in a future of the development.

*g) Plant local (native) vegetation and tree species, other plants should be non-invasive species.*

The DCP also states that for development affected by clause 6.2 Riparian Land and Waterways consideration of the following matters will be required when documenting the development application, together with appropriate mitigation strategies:

*a) Measures that maintain or enhance water quality within the watercourse. This can be achieved by minimising the amount of stormwater discharged from a site into a creek.*

See Section 4.3 and 5 of this report. This has been addressed in detail by a Stormwater Management Plan.

*b) Development in proximity of a watercourse should include appropriate setbacks and be designed not to compromise the stability of the creek bed, shore and bank of the watercourse.*

See Section 3.3.

*c) Where relevant, create measures to ensure the free passage of fish and other aquatic organisms within and along the watercourse.*

Not applicable – no works proposed within waterways.

*d) Development impacting on native vegetation will generally be required to submit a report prepared by a qualified consultant, the report will need to address criteria contained in the '7 Part Test' (see c.3.2.7 above). In the event the '7 Part Test' indicates there is potential for a significant impact then a species impact statement will need to be prepared.*

See Section 4.4 and Appendix E.

e) Where applicable, consideration must be given to the local Conservation Significance Assessment prepared by Council as part of the Fairfield Biodiversity Strategy 2010. Conservation significance has been assessed as either, High, Moderate or Low. The Biodiversity Strategy provides the basis for the assessment. Any “7 part Test” shall reference the impact of development in relation to the Biodiversity Strategy.

See Section 1.3.1.

f) Details of any proposed water extraction from, or discharge into the watercourse.

No water extraction is proposed. Discharge of water is detailed in Section 4.3.

### 1.3.3 Biodiversity Conservation Act 2016 (BC Act)

The *Biodiversity Conservation (BC) Act 2016* and *Regulation 2017* came into operation on 27 February 2018. In relation to ecological assessment of development, the BC legislation replaces the *Threatened Species Conservation Act 1995*.

The BC Act states that a Biodiversity Assessment for State Significant Development requires that an application is to be accompanied by a Biodiversity Development Assessment Report (BDAR) unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values (Section 7.9).

As set out in the accompanying letter, it is advised that PDML formally request a waiver to preparing a BDAR from the Department of Planning and Environment due to the lack of native vegetation or other biodiversity values on the site.

The application is instead required to be accompanied by a Biodiversity Assessment.

Appendix E of this report includes Tests of Significance (5 Part Tests) for impacts on NSW listed threatened species, populations and communities in accordance with s.7.3 of the BC Act.

No areas within the site are mapped as having ‘high biodiversity value’ as identified on the NSW Biodiversity Values Map **Appendix A - Figure 7** (as of 22<sup>nd</sup> June 2018). The development is not being carried out in a declared Area of Outstanding Biodiversity Value (AOBV).

### 1.3.4 Water Management Act 2000

The *Water Management Act 2000* (WMA) controls the carrying out of activities in or near water sources in New South Wales. If a “controlled activity” is proposed on “waterfront land”, an approval is required under the Water Management Act (s91). Waterfront land is that land within 40 m of a waterway and is measured from the top of the bank. The proposal may require minor earthworks within 40 m of a prescribed stream for minor levelling out of some playground areas (**Appendix A - Figure 2**), although no filling within the 40 m buffer will be undertaken. No earthworks are proposed within the 20 m Vegetated Riparian Zone, which includes the waterway and dam. The only vegetation clearing within the 40 m will be weed removal and revegetation.

The NSW DPI Water (formerly the Office of Water) “*Guidelines for Riparian corridors on waterfront land (2012)*” establish recommended buffer widths for watercourses depending on their Strahler classification.

Section 3.3 of this report assesses the riparian land to consider requirements for a Controlled Activity Approval (CAA) from the NSW DPI Water under the WMA. The watercourses present are classified in accordance with the Strahler System in order to define the width of the required Vegetated Riparian Zone (VRZ).

### 1.3.5 Fisheries Management Act 1994 (FM Act)

The FM Act aims to conserve fish stocks and key fish habitats; and conserve threatened species, populations and ecological communities of fish and marine vegetation.

When assessing the environmental impacts of development or activities (under Part 4 or 5 of the EP&A Act) an assessment is required to be made whether that activity will have an impact

on such species, populations or endangered communities.

### **1.3.6 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)**

Under the EPBC Act, Commonwealth approval is required for certain actions that have, or are likely to have, a significant impact on a matter of National Environmental Significance (NES). Matters of NES include nationally threatened species or endangered ecological communities.

An assessment of the impact of a proposal on matters of NES must be undertaken to determine whether there is likely to be a significant impact. If the assessment concludes there is a significant impact then it will become a controlled action under the EPBC Act and the proposal must be referred to the Commonwealth.

Approval from the relevant Federal Minister is also required for any actions that may have a significant impact on matters of NES, except in circumstances which are set out in the EPBC Act.

## **1.4 PURPOSE OF THIS BIODIVERSITY ASSESSMENT REPORT**

This Biodiversity Assessment Report addresses the proposed development of the school in accordance with the Masterplan, including the proposed earthworks.

This assessment will investigate the native flora and fauna present on the site, describe the direct and indirect impacts of the proposal and methods to avoid, minimise and mitigate impacts, in accordance with the NSW Office of Environment and Heritage (OEH) guidelines and Fairfield LEP and City Wide DCP.

This report will also address the legislative requirements to assess the impacts of the proposed development on threatened species, populations or communities listed under the BC Act, FMA Act and the EPBC Act.

## 2 METHODOLOGY

### 2.1 PERSONNEL

The survey and assessment was conducted by the following personnel in accordance with the Office of Environment and Heritage (OEH) Scientific Licence and Department of Primary Industries (DPI) Animal Research Authority.

#### 2.1.1 Diane Campbell

Diane undertook site ecological survey and analysis of camera results.

##### a) Qualifications:

Bachelor of Science (University of Sydney)

Certificate IV (Contract Management)

Accredited Assessor under the *Biodiversity Conservation Act* and Biodiversity Offsets Scheme (BAAS 17069)

Accredited Biobanking Assessor (No. 240)

##### b) Licences / Approvals:

Scientific Licence Number SL100527 (associate - s132c, NPW Act, 1974)

##### c) Experience:

Diane is a Senior Ecologist with more than 25 years in state and local government undertaking senior ecological and environmental assessment and management. She is an experienced, Accredited NSW Government Assessor under the new Biodiversity Conservation Act and Biodiversity Offsets Scheme (BAAS 17069). She is also Government Certified, Biobank Assessor under the former scheme (still in transition in parts of NSW) who has created a number of Biobank sites for local government.

Diane has extensive experience in planning, undertaking, reviewing and supervising flora and fauna surveys for local and state government, for private clients and preparing plans of management for natural areas, biodiversity and vegetation restoration.

In her previous roles as Manager of Natural Resources at both Hornsby Shire Council and Pittwater Council, she was responsible for numerous flora and fauna surveys. She also established and prepared Biobank Agreements, requiring detailed vegetation expertise.

#### 2.1.2 Danielle Allen

Danielle assisted Diane with ecological survey and report preparation.

##### a) Qualifications:

Honours Degree in Science (University of Newcastle)

Bachelor of Science (Advanced Biology Program) (Macquarie University)

##### b) Licences / Approvals:

Scientific Licence Number SL100527 (associate - s132c, NPW Act, 1974)

##### c) Experience:

Danielle is a Senior Environmental Scientist with over 10 years' experience in ecological and environmental impact assessment, both as a consultant and in local government.

Danielle has a working knowledge of Sydney Basin flora and fauna, and has experience assisting undertaking flora and fauna surveys and preparing threatened species assessments. She has recently completed the OEH Biodiversity Offsets Scheme Accredited Assessor Training (June 2018).

### 2.2 BACKGROUND RESEARCH AND DESKTOP SEARCHES

In completing this biodiversity assessment, the following background searches and desktop searches were undertaken:

- Review of previous studies completed in the area;
- Review of Fairfield Council LEP biodiversity and riparian mapping;

- Review of NPWS (2002) vegetation mapping for western Sydney;
- A search of the NSW Bionet Wildlife Atlas (OEH 2014a) was made to list any threatened species and populations that have been previously detected within the defined locality for the project area: being within an approximate 10 km radius of the subject site;
- A search of records of species listed under the schedules of the Commonwealth EPBC Act was obtained from the protected matters search tool using a 5 km search area (<http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/protected>);
- Review of relevant planning documents including the “Fairfield Biodiversity Strategy” (Fairfield City Council, 2012).

## 2.3 HABITAT ASSESSMENT

Based on the results of the background research and desktop searches, an analysis of the potential for the site to provide habitat for locally recorded threatened species, populations and communities was undertaken. The table in **Appendix B** shows the likelihood of occurrence of each species or community based on known habitat requirements. This table was used to determine the need to undertake targeted searches for specific species during field survey. After the field survey was undertaken, the likelihood of occurrence table was updated to include the survey results.

## 2.4 FIELD SURVEY

### 2.4.1 Flora

Flora survey was conducted on 15<sup>th</sup> February 2017.

A thorough walk through of areas of vegetation in the development area and adjacent site to the north was conducted to assess vegetation communities and record flora species present.

A repeat walk over of the proposed development site was conducted on 15 June

2018 to assess the presence and abundance of any native flora species within the proposed development area.

### 2.4.2 Fauna

Fauna survey was conducted between 15<sup>th</sup> February and 20<sup>th</sup> February 2017.

Two motion detecting cameras were deployed on the site for five nights at the locations shown in **Appendix A - Figure 8**.

An Anabat echo-locational detector was positioned within a potential flyway (location shown in **Appendix A - Figure 8**) and remained operating for five nights to record micro-bat activity. Data obtained was processed using the AnaLook W software. The method followed the draft recommended standards for assessing insectivorous bats using bat detectors (Australasian Bat Society, n.d.).

The diurnal on site searches, spotlighting and frog survey was conducted on 15<sup>th</sup> February 2017 and consisted of:

- Evening spotlighting including frog survey from 8:00 pm to 9:15 pm;
- Searches for Cumberland Plain Land Snail in potential suitable habitat including under trees and logs;
- Diurnal bird survey;
- Searches for scats, tracks or other signs of fauna activity;
- The presence of mature trees with hollows, fissures and/or other suitable roosting/nesting places;
- The presence of Koala food trees;
- The condition, flow and water quality of drainage lines and bodies of water;
- Areas of dense vegetation;
- The presence of hollow logs/debris and areas of dense leaf litter;
- The presence of fruiting flora species;
- The presence of blossoming flora species, particularly winter-flowering species;
- Vegetation connectivity and proximity to neighbouring areas of intact vegetation;

- The presence of caves and man-made structures that may be suitable for bat roost sites; and
- The presence of bulky nests which may belong to raptors.

## 2.5 LIMITATIONS

### 2.5.1 Limitations of the Flora Survey

The flora survey was completed on one day in February 2017 and one further one day inspection in June 2018. This limits detection for species that may grow or flower seasonally. A limitation of this survey is a lack of assessment of non-vascular plants and non-flowering species of Cyperaceae, Poaceae and Orchidaceae. This survey has conducted an appraisal of the vascular flora species evident above ground and no assessment of the physiological condition of communities present was undertaken. No study has been undertaken: in relation to those parts of the vascular plants below ground level; of the soil stored seed bank or other forms of dormant propagules; or of information gathered on species present that may have been planted on the site.

It was not deemed necessary to undertake further investigation given the modified nature of the property. Whilst all reasonable attempts have been made to discern the vascular flora present, there is no assurance that other threatened species will not be encountered on the site.

### 2.5.2 Limitations of the fauna survey

The fauna survey was conducted in summer and focussed on the area of impact of the proposed development. The species diversity observed is a reflection of the condition of the disturbed nature of the site and surrounds. It was not deemed necessary to undertake further investigation given the modified nature of the property.

As many faunal species are cryptic and/or nocturnal and/or wide-ranging and mobile, they are unlikely to be detected even during seasonal surveys. The fauna assessment is,

accordingly, largely an assessment of the potential of the subject site as habitat for various fauna species. With the exception of species definitely recorded from the site, there is no certainty as to the presence or absence of the species discussed. Therefore it is important to adopt the precautionary principle such that it is assumed that any threatened species is likely to occur at the site if suitable habitat exists.

## 3 EXISTING ENVIRONMENT

### 3.1 LANDSCAPE CONTEXT

The site is located on the Cumberland Plain within the Sydney Basin Bioregion. It is immediately outside the highly urbanised area of Western Sydney.

### 3.2 GEOLOGY, SOILS AND TOPOGRAPHY

The topography of the site is undulating hills and flats with red podzolic soils. The ground is very hummocky with furrows running down the hill (opposite to contour ploughing) but on the flat the furrows were along the contour.

The mapped soil landscape on site is Luddenham (lu). This is an erosional soil landscape with undulating to rolling low hills on Wianamatta Group shales, and is often associated with Minchinbury Sandstone. Steeper slopes in local area are mapped as Picton (pn) soil landscape.

### 3.3 DRAINAGE AND RIPARIAN AREAS

The site is located within the Ropes Creek catchment. Ropes Creek is located to the north of Kosovitch Place as shown on **Appendix A – Figure 6**. Ropes Creek flows north-west to South Creek, and then into the Hawkesbury River. The area of the site that is included in the Fairfield LEP Riparian Lands and Waterways map is shown in **Appendix A - Figure 6**.

The waterway on the site that joins Ropes Creek is highly modified and cleared, consisting of a dam connected to upstream and downstream by small drainage channels. Ropes Creek would be classified as a second order stream under the Strahler System of ordering watercourses. The DPI “*Guidelines for riparian corridors on waterfront land*” require that for a second order stream, a

Vegetated Riparian Zone (VRZ) of 20 m width (on each side of waterway) is required. This VRZ will be provided on the site as shown in **Appendix A - Figure 9** and **Appendix A - Figure 10**, and management of this zone will be subject to a Vegetation Management Plan as discussed in further detail in Section 5.1.

The LEP mapping covers a larger area of the site than would be required as a VRZ under the requirements of the WMA. The area mapped on the site as riparian land by the LEP is mostly cleared and highly modified.

Potential impacts on these riparian areas as a result of the development are discussed in more detail in Section 4.3.

### 3.4 LAND USE

The majority of the site comprises cleared land, which was previously utilised as market gardens. A church and associated community hall is located at the cul-de-sac adjacent to the proposed project site.

### 3.5 VEGETATION COMMUNITIES

Native vegetation mapping for the Cumberland (NPWS 2002), shown in **Appendix A – Figure 11**, did not map any native vegetation communities as occurring on the subject site.

Field survey found that the vegetation on the majority of the site consists of exotic grassland with pasture grass and weeds and very few native species. There are no mature native trees within the proposed development area.

The creek along the western boundary of the site has been dammed and is dominated by *Typha latifolia* Bullrush, *Eichhornia crassipes* Water Hyacinth and *Salvinia molesta* Salvinia.

The vegetation along Ropes Creek on other properties to the north of Kosovitch Place is regrowth River-flat Eucalypt Forest (RFEF).

In the paddock there are large tree logs from previous clearing.

### 3.5.1 Endangered Ecological Communities

The Critically Endangered Ecological Community (CEEC) Cumberland Plain Woodland is not present on the site.

The vegetation along Ropes Creek to the north of Kosovitch Place is regrowth RFEF that would meet the below criteria specified in the NSW Scientific Committee Determination (NSW Scientific Committee, 2011) for the Endangered Ecological Community (EEC) "River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions". The criteria include:

- The canopy vegetation is usually dominated by Forest Red Gum, Cabbage Gum and Rough-barked Apple or Broad-leaved Apple;
- The understorey comprises an open stratum of juveniles of any of the canopy trees, as well as *Acacia* sp. and *Melaleuca* sp. and may include *Bursaria spinosa* (Blackthorn), *Daviesia ulicifolia* (Gorse bitter-pea) and *Dillwynia sieberi*;
- A ground cover of native or exotic grasses and herbs depending on the level of disturbance affecting the community.
- The RFEF EEC occurs on river flat or terrace in an upper part of the Coastal Floodplain on silty, clayey or sandy loam soil with a lack of deep humic layers and has little or no saline (salt) influence

The extent of RFEF EEC to the north of the site is shown in **Appendix A - Figure 11**. There is no RFEF on the subject site. The creek line to the west of the proposed school site has been dammed and there is an absence of the tree and understorey species that would indicate the presence of RFEF EEC.

No clearing of remnant trees or understorey within riparian areas that would qualify as RFEF EEC is proposed. The proposed development does require earthworks to be undertaken upslope of the riparian areas to construct the school buildings. The potential for this to indirectly impact downstream environments through hydrological changes has been minimised by restricting filling to the upper section of the site where the buildings

will be constructed as shown on **Appendix A - Figure 2**. Potential direct and indirect impacts of the proposed development are discussed in Section 4 of this report and in the Assessment of Significance for RFEF on Coastal Floodplains that is attached at **Appendix E**.

## 3.6 FLORA SURVEY RESULTS

A list of flora species recorded on the site is provided at Appendix C. The majority are exotic species. The site is heavily disturbed and no flora species of conservation value were noted.

### 3.6.1 Threatened Flora

Seven (7) NSW listed threatened flora species have been previously recorded within 10km of the site. Two endangered flora populations have also been recorded within 10km of the site (see Appendix B).

No threatened flora species or populations were recorded on the site during survey. An analysis of the potential for the site to provide habitat for the locally recorded threatened species is shown in Appendix B. No threatened flora species or populations are expected to occur on the site.

## 3.7 FAUNA SURVEY RESULTS

A list of fauna species recorded on the site is provided at Appendix D. The list consists of common bird species, the introduced Black Rat and a number of microbat species. The bird species observed are typical of the disturbed vegetation and urban location.

The immediate local area consists mainly of cleared land with the exception of the narrow strips of riparian vegetation. The bushland area of Western Sydney Parklands is located less than one kilometre to the east, as well as a small area to the south of the site.

Within the proposed development area, the site is heavily disturbed and as a result provides limited potential fauna habitats. The remnant riparian vegetation on the site and surrounds may provide some habitat for highly-

mobile urban tolerant animals such as bats and birds. There are no hollow bearing trees present, although there are some hollow logs on the ground in the cleared areas of the site.

The dams and waterways may provide some potential habitat for amphibians.

The best quality habitat consists of the remnant riparian vegetation along Ropes Creek on the adjacent site to the north. No clearing of trees or understorey is proposed in these areas. Potential direct and indirect impacts of the proposed development are further discussed in Section 4 of this report.

### 3.7.1 Threatened Fauna

Thirty-four (34) NSW listed threatened fauna species have been previously recorded within 10km of the site. An analysis of the potential for the site to provide habitat for these species is shown in Appendix B.

The only threatened fauna species recorded on the site during survey were the following microbat species recorded via Anabat detection:

- *Mormopterus norfolkensis*, East Coast Freetail-bat (Vulnerable) Positive identification via Anabat. Abundant records across all survey nights.
- *Falsistrelle tasmaniensis*, Eastern False Pipistrelle (Vulnerable). Probable identification via Anabat.
- *Scoteanax ruepellii*, Greater Broad-nosed Bat (Vulnerable). Probable identification via Anabat.

Targeted searches were conducted for the Cumberland Plain Land Snail. This species prefers environments with areas of deep litter, often associated with riparian areas, to obtain its food resources. The development area is devoid of preferred habitat and no evidence of this species was found. Riparian areas located nearby may provide suitable habitat.

Assessments of Significance for microbat species and the Cumberland Plain Land Snail are included at Appendix E and the results discussed in Section 4.4 of this report.

Due to the lack of habitats present within the proposed development area, it is considered unlikely that any other threatened fauna will be

impacted by the works. Potential direct and indirect impacts of the proposed development are further discussed in Section 4 of this report.

## 3.8 FISH HABITAT

Ropes Creek at the subject site is a small second-order stream. The tributary of Ropes Creek located to the west of the development area has been dammed. Only sections of Ropes Creek well downstream of the site are mapped as Key Fish Habitat by NSW DPI (undated b). The Fairfield Biodiversity Strategy (2012) states that there are no records of species listed as threatened under the FMA from the Fairfield LGA. Given the above factors, the site is not expected to provide habitat for any threatened aquatic species listed under the FM Act.

## 3.9 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the EPBC Act, a person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on a matter of National Environmental Significance (NES). These matters are listed as:

- The world heritage values of a declared World Heritage property;
- The ecological character of a declared Ramsar wetland;
- A threatened species or endangered community listed under the Act;
- A migratory species listed under the Act; or
- The environment in a Commonwealth marine area or on Commonwealth land.

The EPBC Protected Matters (Appendix F) report generated for the site lists five threatened ecological communities, 36 nationally listed threatened species and 15 migratory species that may occur within 5km of the site. No EPBC listed ecological communities, flora, fauna or migratory species were detected on the site or considered likely

to be impacted by the development based on habitat assessment, as outlined in Appendix B. No CAMBA, JAMBA or ROKAMBA migratory species were found at the site. The proposal is unlikely to have a significant impact on any CAMBA, JAMBA or ROKAMBA species.

No other NES matters occur on the site and no further assessment under the EPBC Act is required.

### **3.10 GROUNDWATER DEPENDANT ECOSYSTEMS**

A search of the GDE Atlas database (<http://www.bom.gov.au/water/groundwater/gde/map.shtml>) indicated that there are no groundwater dependent ecosystems mapped for the study site.

### **3.11 WILDLIFE CONNECTIVITY AND CORRIDORS**

The immediate local area consists mainly of cleared land with the exception of the narrow strips of riparian vegetation which provide fragmented connectivity for wildlife, mainly for mobile species such as birds and bats.

The bushland area of Western Sydney Parklands is located less than one kilometre east of the site, as well as a small area to the south of the site.

## 4 IMPACT ASSESSMENT

### 4.1 AVOID AND MINIMISE IMPACTS

The proposal will avoid and minimise direct biodiversity impacts by using a cleared and highly modified parcel of land to build the school.

There is some potential for indirect impacts on areas with biodiversity value, such as the riparian corridor to the north. These impacts are discussed in detail in Section 4.4. These indirect impacts will be avoided and minimised through application of the control and mitigation measures specified in Section 5.1 below.

### 4.2 IMPACT OF RELEVANT KEY THREATENING PROCESSES

The action proposed does not constitute any key threatening process.

In relation to riparian areas, development of the site has potential to increase key threatening processes related to weed and pathogen spread. However, the paddock area of the site as it exists at the moment suffers from heavy weed infestation. These weeds would be removed as part of earthworks and construction of the school. Potential for further weed and pathogen spread into riparian areas would be controlled through application of mitigation measures including implementation of a Vegetation Management Plan and specific weed and pathogen control measures during construction.

### 4.3 DIRECT IMPACTS

Potential for direct impacts is very limited as there will not be any clearing of native trees or native understorey. The school and associated amenities will be located in previously cleared paddocks dominated by exotic groundcover species.

No Arborist Report is required for the proposal, as there are no mature trees within the development area.

No vegetation clearing or earthworks will be undertaken along the watercourses.

#### 4.3.1 Loss of fauna habitat

The best quality habitat near the site consists of remnant riparian vegetation, the dam and creeklines and soaks. None of the riparian vegetation will be cleared and the waterways will be retained.

There is an area of logs located from felled trees within the development area. These can be moved to riparian areas to provide on-ground habitat.

#### 4.3.2 Injury and mortality

Due to the lack of fauna habitats within the development area, injury of fauna during construction is considered unlikely.

## 4.4 INDIRECT IMPACTS

### 4.4.1 Changed hydrology

Earthworks and changes to drainage are proposed to construct the school. Filling will only be required in the upper section of the site where the buildings will be constructed. All the buildings will be above the 1:100 flood line, but the area of filling will encroach slightly over the 1:100 flood line as in small areas, as shown in **Appendix A - Figure 2**. This area of encroachment will consist of a grassed embankment along the western edge of the school building areas. The only other earthworks required below the 1:100 flood line would be minor levelling out of some areas, such as for the multi-purpose court. The majority of the floodplain will remain at the current levels. No filling is required in the lower section of the site along the waterway, which will minimise potential for hydrological impacts. No earthworks are proposed within the 20 metre Vegetated Riparian Zone, which includes the waterway and dam.

The site will still drain to the dam area, which is already highly modified and cleared.

Any potential hydrological impacts downstream of the dam are expected to be minor and will be controlled through mitigation measures including implementation of a Soil and Water Management Plan during construction and a Stormwater Management Plan and Wastewater Management Plan for long term operational water management.

#### **4.4.2 Sediment, pollution or nutrient run-off**

There is the potential for sedimentation during earthworks and construction. This will be controlled through mitigation measures including implementation of an Erosion and Sediment Control Plan and Soil and Water Management Plan during construction.

During construction, loss of potentially hazardous substances such as fuels and lubricants into the adjacent environment is also a potential indirect impact. This potential will be controlled through mitigation measures.

In terms of operational water quality, a wastewater assessment has been prepared to develop a system that meets relevant legislation and guidelines. Wastewater from the school when operational will be managed to minimise the risk of effluent run-off and possible downslope environmental impacts (Martens Consulting Engineers, Wastewater Assessment, September 2018). The OSSM will be subject to an operational monitoring and inspection schedule.

#### **4.4.3 Habitat fragmentation or isolation**

The site and immediate local area consists mainly of cleared land. Within the local area there are narrow strips of riparian vegetation such as that along Ropes Creek which provide fragmented connectivity for wildlife, mainly for mobile species such as birds and bats. The riparian corridor on the site is currently cleared and will be revegetated. The proposal does not require any clearing of native vegetation and no area of potential habitat will become

fragmented or isolated as a result of the proposal.

#### **4.4.4 Weed spread**

Development of the site has potential to increase weed spread into riparian areas. However, the paddock area of the site currently suffers from heavy weed infestation. These weeds would be removed as part of earthworks and construction of the school. The works for the Stage 1 facilities will not disturb or alter the potential for further weed spread into riparian areas. Regular slashing of the remainder of the site for safety would assist and control the spread of weeds. Additional control would be provided through application of mitigation measures including implementation of a Vegetation Management Plan, wash down procedures for vehicles and equipment to control weed spread and specific weed control measures during construction.

#### **4.4.5 Pathogens**

The movement of machinery and personnel can facilitate the spread of fungal pathogens such as *Chytrid* and *Phytophthora*. Chytrid fungus has been implicated in the decline of many amphibian species. Construction work on the site has potential to introduce plant and animal pathogens into adjacent riparian area if contaminated machinery was used on site. To control this, hygiene control measures would be implemented during construction for vehicles and equipment.

#### **4.4.6 Disturbance to fauna**

During construction, the project will involve movement of workers, vehicles and machinery and as such will generate noise and movement at and adjacent to the work area. Construction will be undertaken during daylight hours. This may cause some disturbance to day active fauna. This would be temporary for the period of the construction.

During operation of the school, placement of artificial light sources close to fauna habitats can disturb animal activity. The school

buildings and access roads will be located away from the riparian areas.

The development of a school on the site would increase levels of human activity on the site. However, the site is within a highly developed area of Sydney and is not located adjacent to any high quality conservation habitats. Disturbance is more likely to impact less mobile and/or territorial species. Due to the disturbed and isolated nature of the site, these type species are less likely to occur.

## 4.5 THREATENED SPECIES, POPULATIONS AND COMMUNITIES

Potential habitat for threatened species, populations and communities on the site is discussed above in Sections 2.3, 3.5.1, 3.6.1 and 3.7.1. Three threatened microbat species were recorded on site.

Assessments of Significance in accordance with Section 7.3 of the BC Act for impacts on threatened microbat species, the Cumberland Plain Land Snail and the RFEF EEC are included at Appendix E. It is concluded that the development will not have a significant impact on any species listed under the NSW BC Act.

The EPBC Act does not require Commonwealth approval for the proposal as the matter is not a controlled action because it will not have a significant effect on a Matter of National Environmental Significance.

## 4.6 PRESCRIBED IMPACTS

The development does not comprise impacts prescribed as additional biodiversity impacts to which the BOS applies as outlined in Section 6.1 of the *BC Regulation*. This is due to the small scale and nature of the proposed school development, lack of threatened species or ecological community habitat on the development site, and the control measures proposed for potential indirect impacts. The impacts outlined in Section 6.1 of the *BC Regulation* are:

(a) *the impacts of development on the following habitat of threatened species or ecological communities:*

(i) *karst, caves, crevices, cliffs and other geological features of significance,*

(ii) *rocks,*

(iii) *human made structures,*

(iv) *non-native vegetation,*

(b) *the impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range,*

(c) *the impacts of development on movement of threatened species that maintains their lifecycle,*

(d) *the impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development),*

(e) *the impacts of wind turbine strikes on protected animals,*

(f) *the impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.*

## 4.7 CUMULATIVE IMPACTS

The site is highly modified and within a developed and urbanised area of Sydney. There is very limited potential for cumulative biodiversity impacts as no clearing of native vegetation or riparian habitat is proposed. The proposal will not increase fragmentation or isolation of habitat, with riparian corridors to be retained. Implementation of the VMP (Section 5) will improve the vegetation condition and habitat quality in the riparian areas.

## 5 MITIGATION MEASURES

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### 5.1 PRE-CONSTRUCTION PHASE

#### 5.1.1 Development of Plans

Plans to be implemented to support the development proposal:

##### **a) Vegetation Management Plan (VMP)**

A VMP that meets the requirements of the NSW Office of Water “*Guidelines for vegetation management plans on waterfront land*” has been prepared for the full extent of the riparian area. The VMP includes the required Vegetated Riparian Zone (VRZ) of 20 m width (on the eastern side of waterway).

The VMP also includes the following specific “site based” habitat enhancement measures for the Cumberland Plain Land Snail in the riparian area (from the OEH “Action Toolbox” for The Cumberland Plain Land Snail (OEH undated c)):

- *Retain large woody debris and other material (stones) on the ground that provides habitat. Ensure it is dispersed across occupied sites to allow movement of individuals.*
- *Manage presence of stock (or exclude) in occupied sites to reduce, minimise or eliminate trampling and eating of habitat.*
- *Manage weed presence, density and diversity at occupied sites, maintaining low density of weeds that are identified as habitat engineers (e.g. dense shrubs) or otherwise strongly affect structure and composition of the grassy woodland habitat. Where possible, also manage adjacent source areas for weed seeds and propagules.*
- *Reduce or exclude slashing from areas that are or may be occupied by snails such as around woody debris*

*and near the trunks of trees to ensure habitat and cover are retained.*

The VMP has specific measures for controlling weed spread during construction as outlined in Section 5.2.

The VMP sets out a weed control program for the riparian area for a minimum three year maintenance period.

The VMP details planting required to be undertaken in riparian areas. This includes all tree, mid-storey or groundcover planting required. All species are to be locally occurring indigenous species. Preference is to be given to locally sourced seed stock. Plantings are to be monitored and maintained for a minimum three year maintenance period.

The VMP also incorporates the specific measures outlined in Section 5.2 below to protect vegetation and ecological communities during construction works, such as fencing, inductions of personnel and pathogen controls.

No Arborist Report is required for the proposal, as there are no mature trees within the development area.

##### **b) Landscape Plan**

A Landscape Master Plan detailing areas where vegetation would be planted within the development has been prepared (Arterra Design, 02/07/18). The Landscape Master Plan integrates with the VMP which details planting to be undertaken in riparian areas, including specifications for revegetation with locally occurring indigenous species.

##### **c) Soil and Water Management Plan including Erosion and Sediment Control Plan**

An Erosion and Sediment Control Plan and Soil and Water Management Plan that meets the requirements of the “*Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)*” are to be developed for the proposal. This is to include a monitoring and maintenance program for controls.

##### **d) Stormwater Management Plan**

A Stormwater Management Plan has been developed to manage volumes and quality of

water discharge to the waterways and riparian area. Volumes and quality of discharge are to match pre-development conditions as closely as possible (Martens Consulting Engineers, September 2018).

### 5.1.2 On site actions prior to commencement of earthworks, clearing and construction

The following actions will be undertaken on site prior to any earthworks, clearing or construction:

- Protective Fencing of No-Go zones, including all areas of vegetation to be retained, individual trees (if required) and waterways.
- Induction of personnel working on the site into the required mitigation measures and environmentally sensitive No-Go areas.
- Environmental personnel or a consultant Ecologist is to check puddles, logs and groundcover vegetation within the development area for fauna prior to works, and relocate to retained areas of vegetation where suitable.
- Carefully move logs from development area to edges of riparian areas to provide habitat, taking care not to damage any native vegetation.
- Installation of erosion and sediment controls, as detailed in Erosion and Sediment Control Plan and/or Soil and Water Management Plan.

## 5.2 CONSTRUCTION PHASE

Implement the relevant sections of the VMP, including the below specific measures.

Weed control:

Vegetation to be cleared on the paddock areas of the site is highly weed infested. Care must be taken when clearing vegetation and undertaking earthworks not to spread weed propagules and to dispose of vegetation and soils appropriately. The following soil

management and weed control and disposal measures are to be implemented:

- All weed plant material and topsoil containing weed plant material will be disposed of to an appropriate waste management facility.
- Weeds will be removed immediately onto suitable trucks and disposed of without stockpiling.
- Loads of weed-contaminated material will be securely covered to prevent weed plant material falling or blowing off vehicles.
- Topsoil recovered from areas of low weed infestation can be re-used onsite but is to be stockpiled separately to any topsoil from weed infested areas.
- Weeds are to be separated from native vegetation if vegetation is to be used for mulch. Weeds are not to be used for mulch.

Pathogen controls:

- Plant and equipment is to be washed down prior to mobilising to site.
- Pathogen and weed spread will be controlled via the adoption of hygiene and disinfection controls. Construction contractors will be required to ensure that all machinery, materials and personnel are clean of any weed seed and tyres, boots, cutting blades etc. are disinfected using a benzalkonium chloride solution prior to entering or leaving the worksite. This is in accordance with the following Guidelines; *NSW Frog Hygiene Protocol* (DECC 2008a), *Keeping it Clean – A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens* (Allan and Gartenstein 2010) and *Myrtle Rust: Everyday Management* (Department of Primary Industries 2011b) (<http://www.dpi.nsw.gov.au/biosecurity/plant/myrtle-rust>).

Pollution controls:

- Implement the site specific Erosion and Sediment Control Plan and/or Soil

and Water Management Plan. This is to include installation of erosion and sediment controls prior to commencement of any clearing or earthworks on the site.

- The contractor to ensure that appropriate spill kits are located with machinery and plant.
- Refuelling of plant and equipment is only to be carried out in a bunded area at least 30 m distance from any watercourse/wetland and all appropriate control measures and emergency spill kits in place.

### **5.3 POST-CONSTRUCTION PHASE**

Implement relevant sections of the VMP, including the replanting and maintenance program for the riparian area, the weed control program for the riparian area, and specific habitat enhancement measures for the Cumberland Plain Land Snail.

Placement of artificial light sources close to bat roosting or foraging areas can disturb bat activity. Any lighting required near the riparian areas is to be low spill type lighting.

## 6 CONCLUSION

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It is proposed to develop a new co-education primary school with library, administration and amenities buildings. The project will be staged as part of an overall Masterplan for the anticipated future population of the primary school and staff of around 665. This biodiversity assessment has considered impacts associated with development of the site as a primary school as detailed in the Masterplan.

The site comprises cleared land, which was previously utilised as market gardens. A church and community hall is located on the property to the north. This northern property includes remnant native vegetation along Ropes Creek, however the dam located on the subject site has been highly modified and cleared.

The proposal has been designed to avoid and minimise biodiversity impacts by using a cleared and highly modified parcel of land to build the school. The proposed development does not require any clearing of native vegetation. The school would be built in the cleared paddock areas where there is limited habitat for native flora and fauna. The local area has been heavily cleared and modified, with only fragmented connectivity remaining along waterways to any area of remnant vegetation. No development is proposed within the waterways or associated corridor and the riparian vegetation will be rehabilitated.

In the updated Conservation Significance Assessment process undertaken by Fairfield City Council, there is no vegetation of high, medium or low significance mapped on the site. Areas of the site along the waterways are included in the Fairfield LEP “Terrestrial Biodiversity” map and “Riparian Lands and Waterways” map. This biodiversity assessment has taken into consideration the impact of the development and it is concluded that the development will have minimal impacts on the biodiversity value of these areas subject to implementation of the recommended mitigation measures and controls.

The vegetation along Ropes Creek to the north of Kosovich Place is regrowth River-flat

Eucalypt Forest which would qualify as a disturbed example of the Endangered Ecological Community River-flat Eucalypt Forest on Coastal Floodplains. The only threatened fauna species recorded on the site during survey were three microbat species recorded via Anabat. The riparian vegetation, waterways and dam on and adjoining the site that are more likely to provide habitat for microbat species will be retained and rehabilitated. These areas likely provide a flyway linking areas of habitat within the local area. A threatened species assessment has been undertaken and it is considered unlikely that the proposed development will have a significant impact on any threatened species, populations or ecological communities listed under the BC Act, FM Act or EPBC Act.

Potential indirect impacts on riparian habitats such as hydrological changes caused by earthworks and drainage, operational light impacts on fauna and weed or pathogen spread will be controlled through application of protection and mitigation measures including implementation of appropriate management plans including a VMP to revegetate native vegetation in the riparian corridor on the western section of the site.

The development proposed will have minimal biodiversity impacts, subject to the implementation of the controls and mitigation measures recommended in this report.

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## **APPENDIX A – SITE PLANS AND MAPS**

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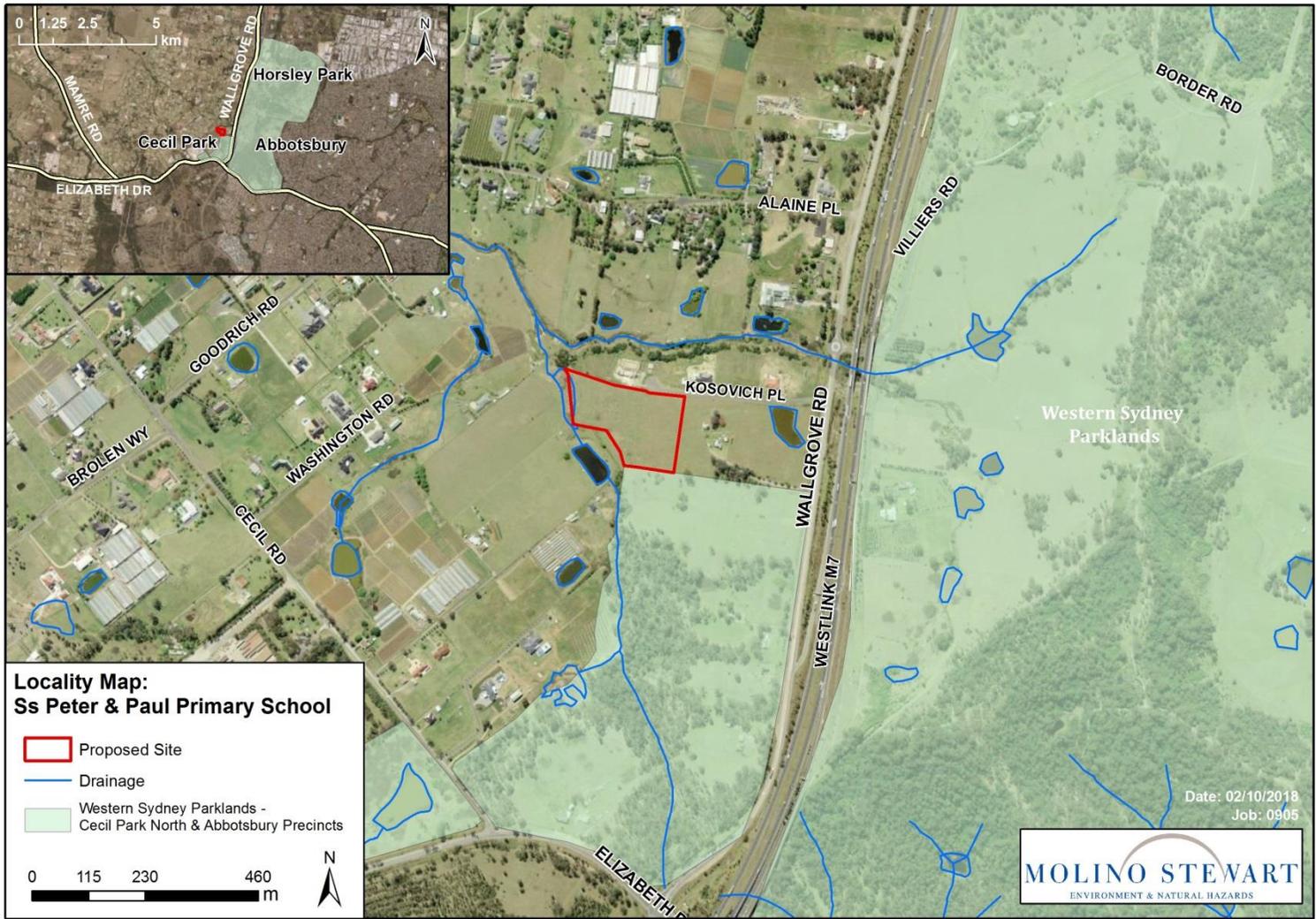


Figure 1 Locality

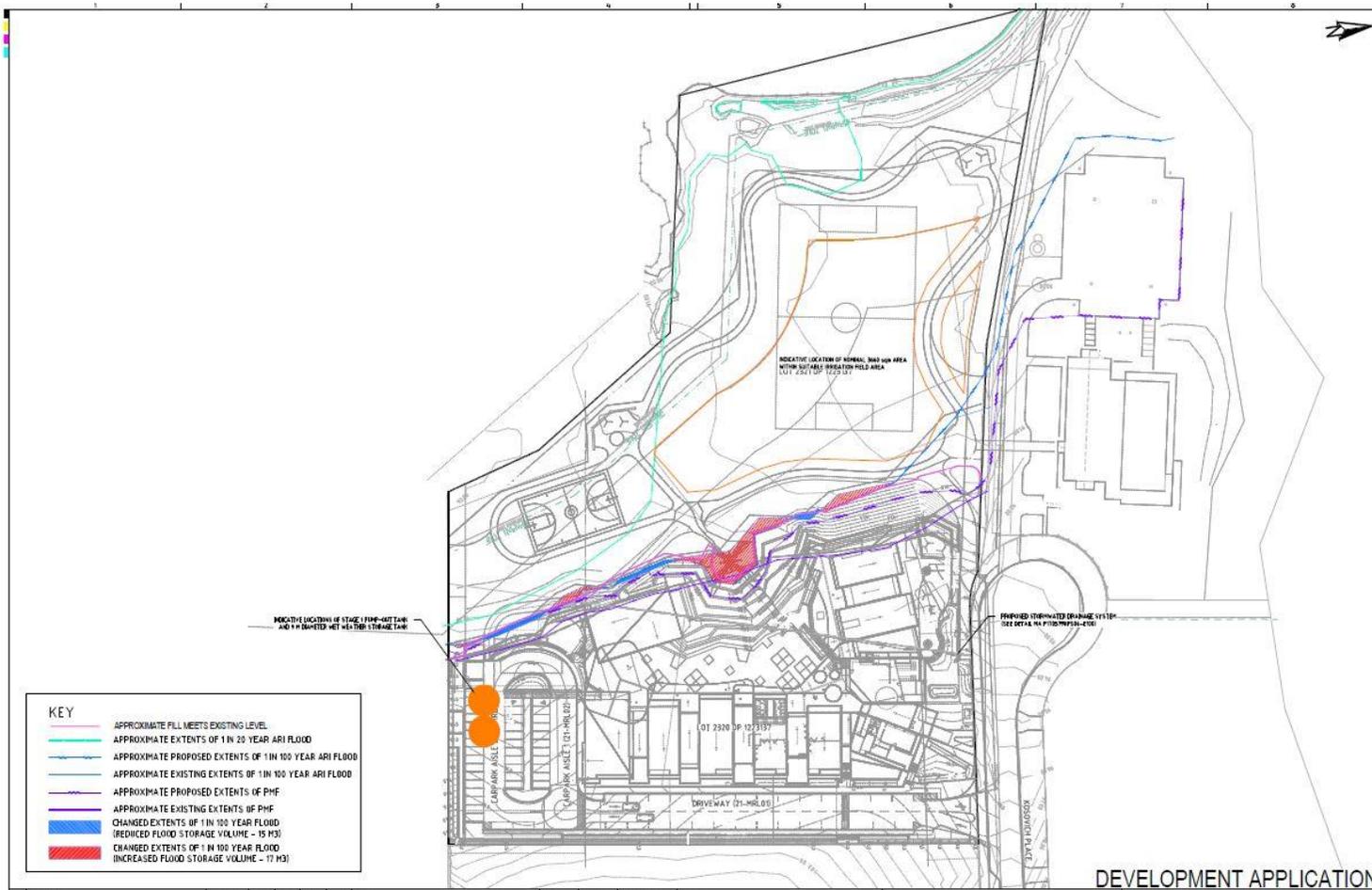


Figure 2 Site Masterplan , including flood levels and extent of fill

(Refer Martens Consulting Engineers, 'Flood Management Assessment', September 2018)

# Enlighten Map

Wednesday, 15 March 2017 5:11 PM



Figure 3 Conservation Significance Assessment (CSA) mapping supplied by Council for the subject site





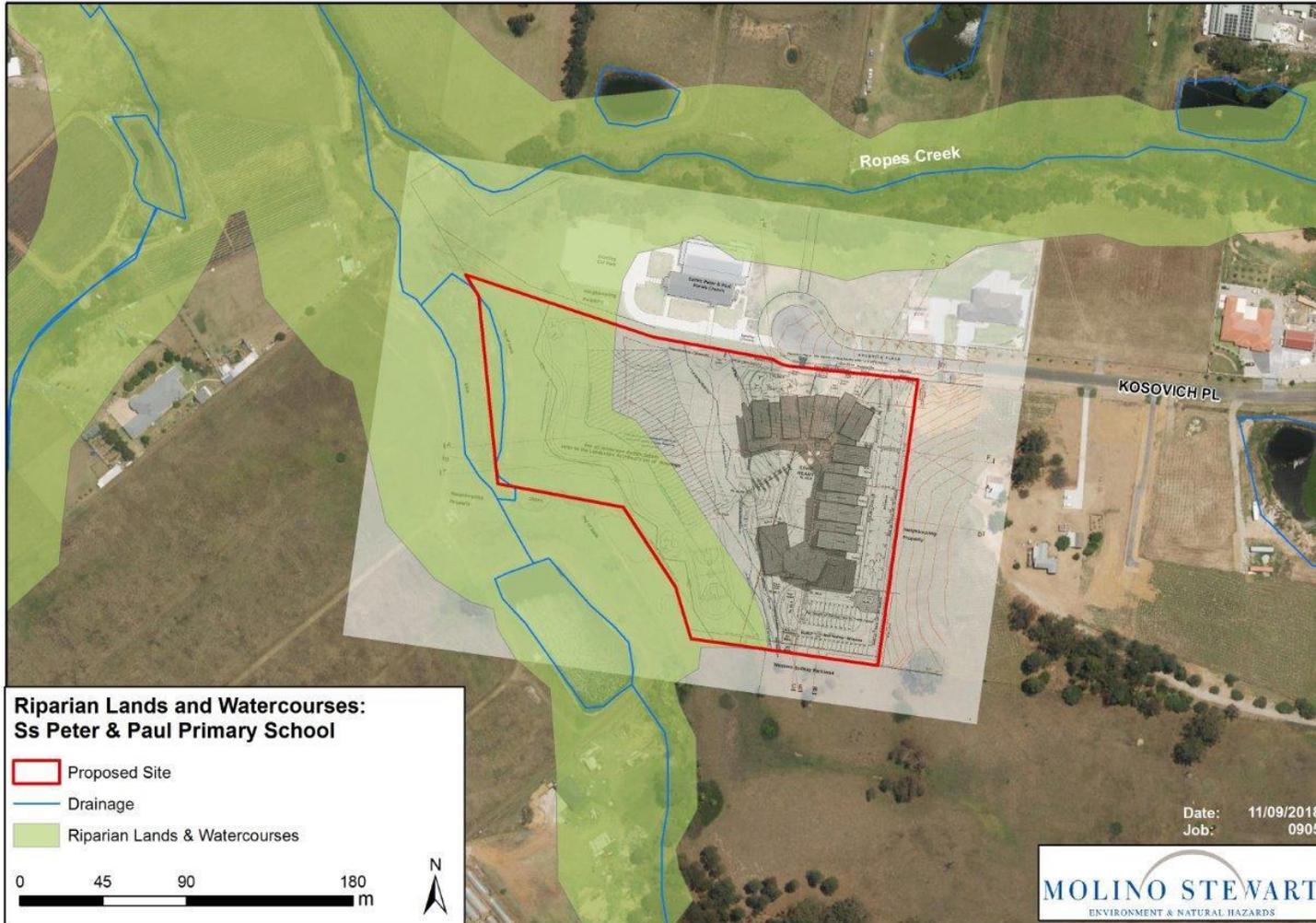


Figure 6 Fairfield LEP Riparian Lands and Waterways map in relation to subject site and proposed school development

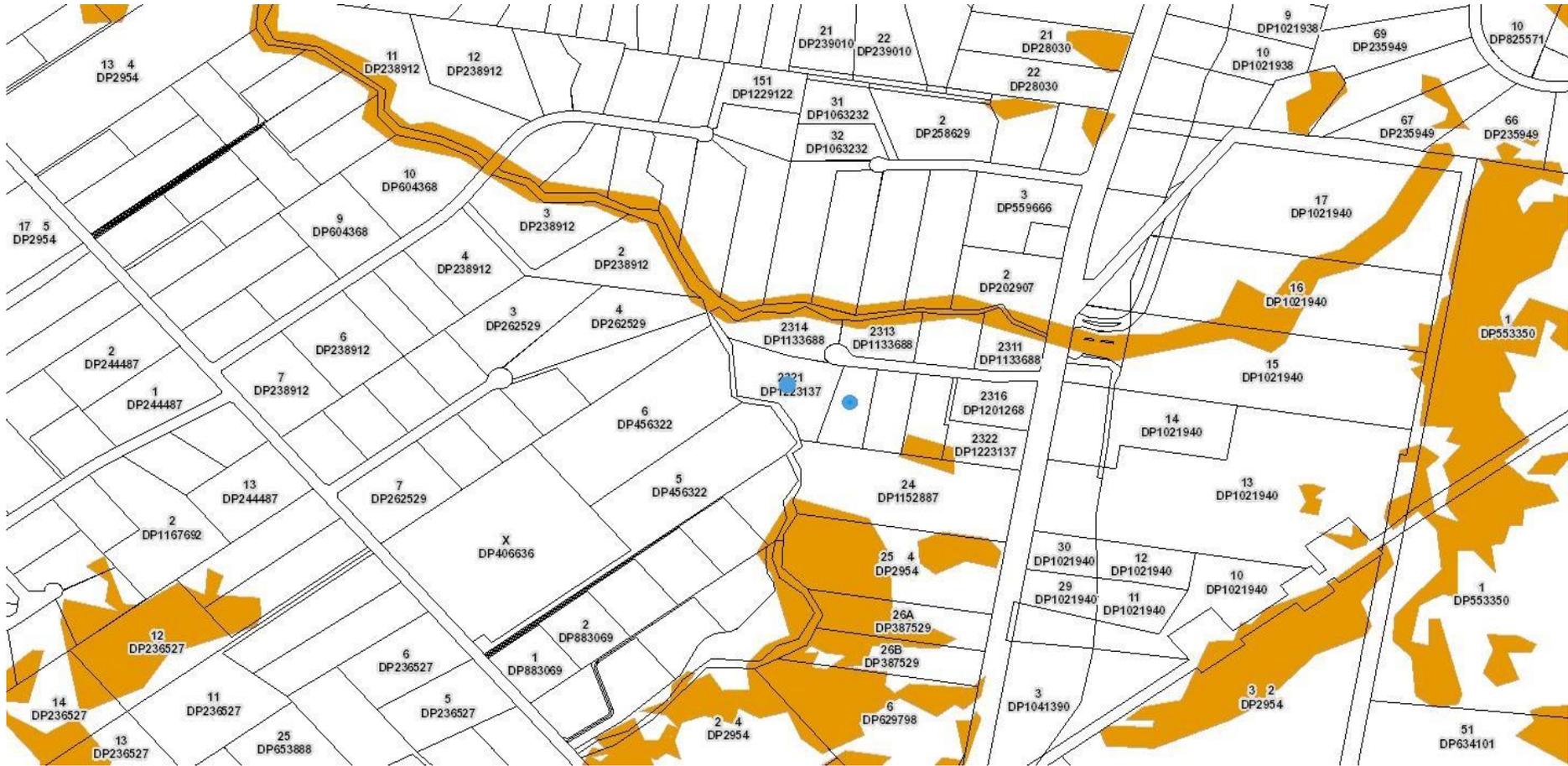


Figure 7 NSW Biodiversity Values Map extract, with subject site highlighted with blue dot

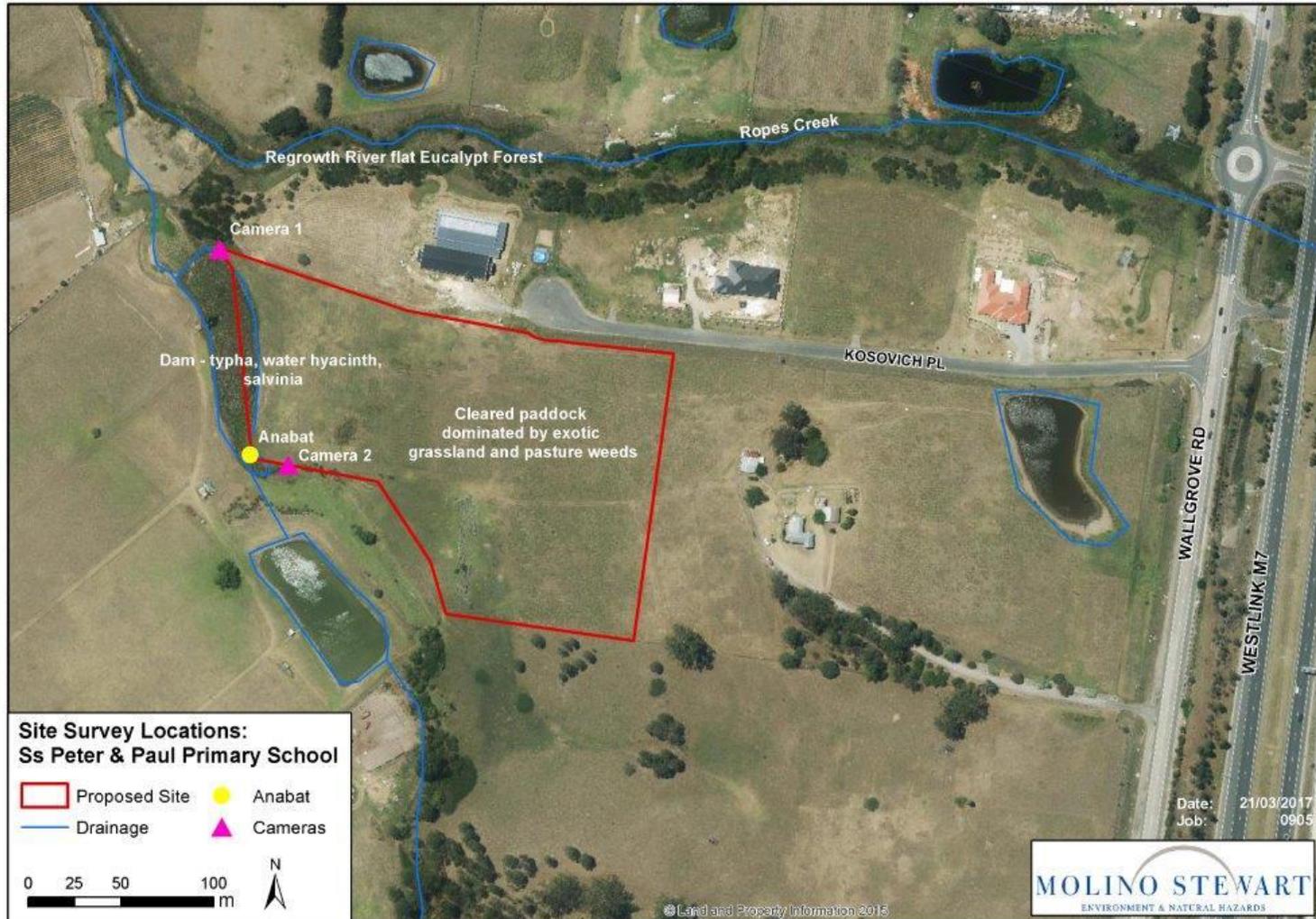


Figure 8 Ecological field survey locations

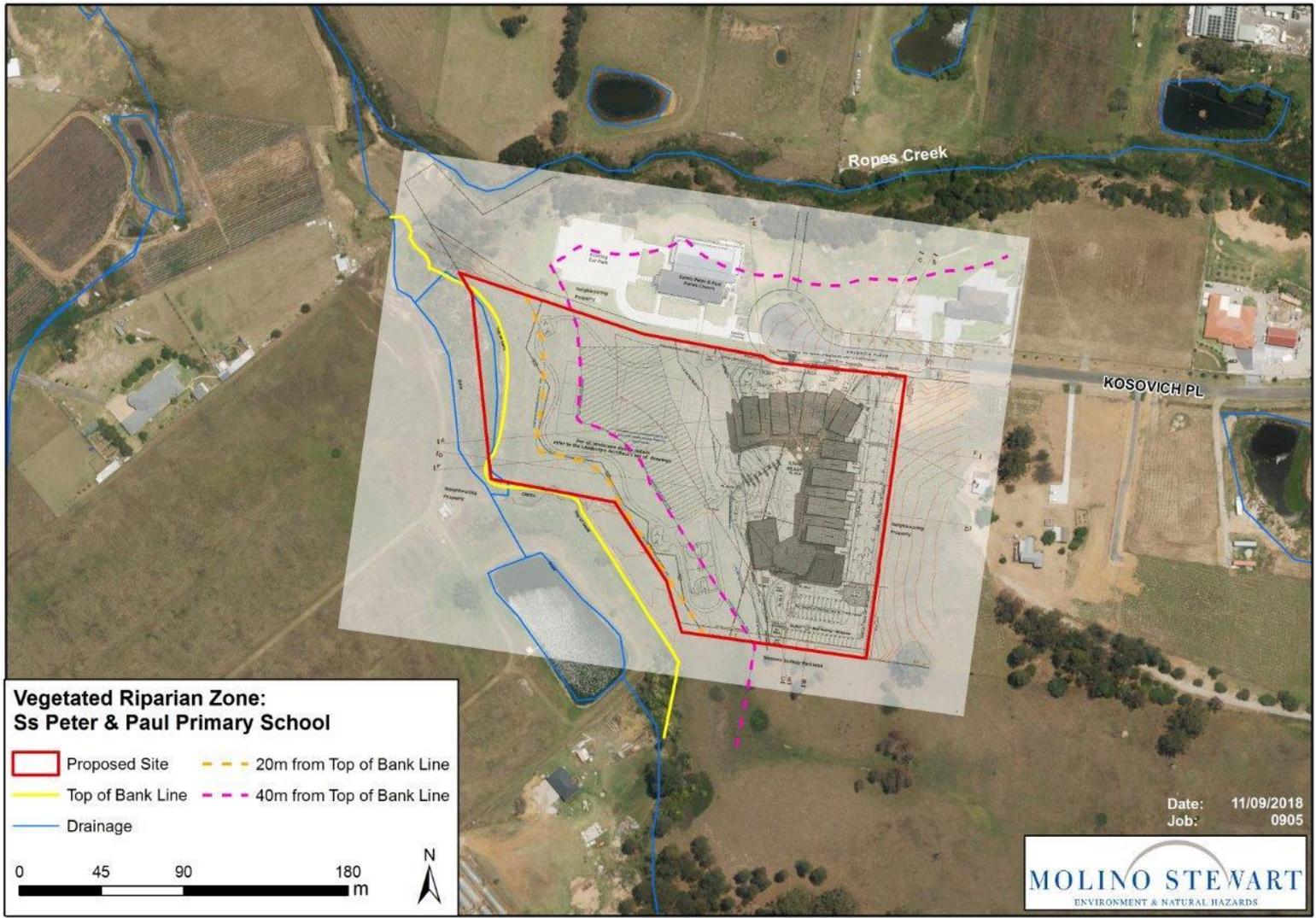


Figure 9 Proposed Vegetated Riparian Zone (VRZ)

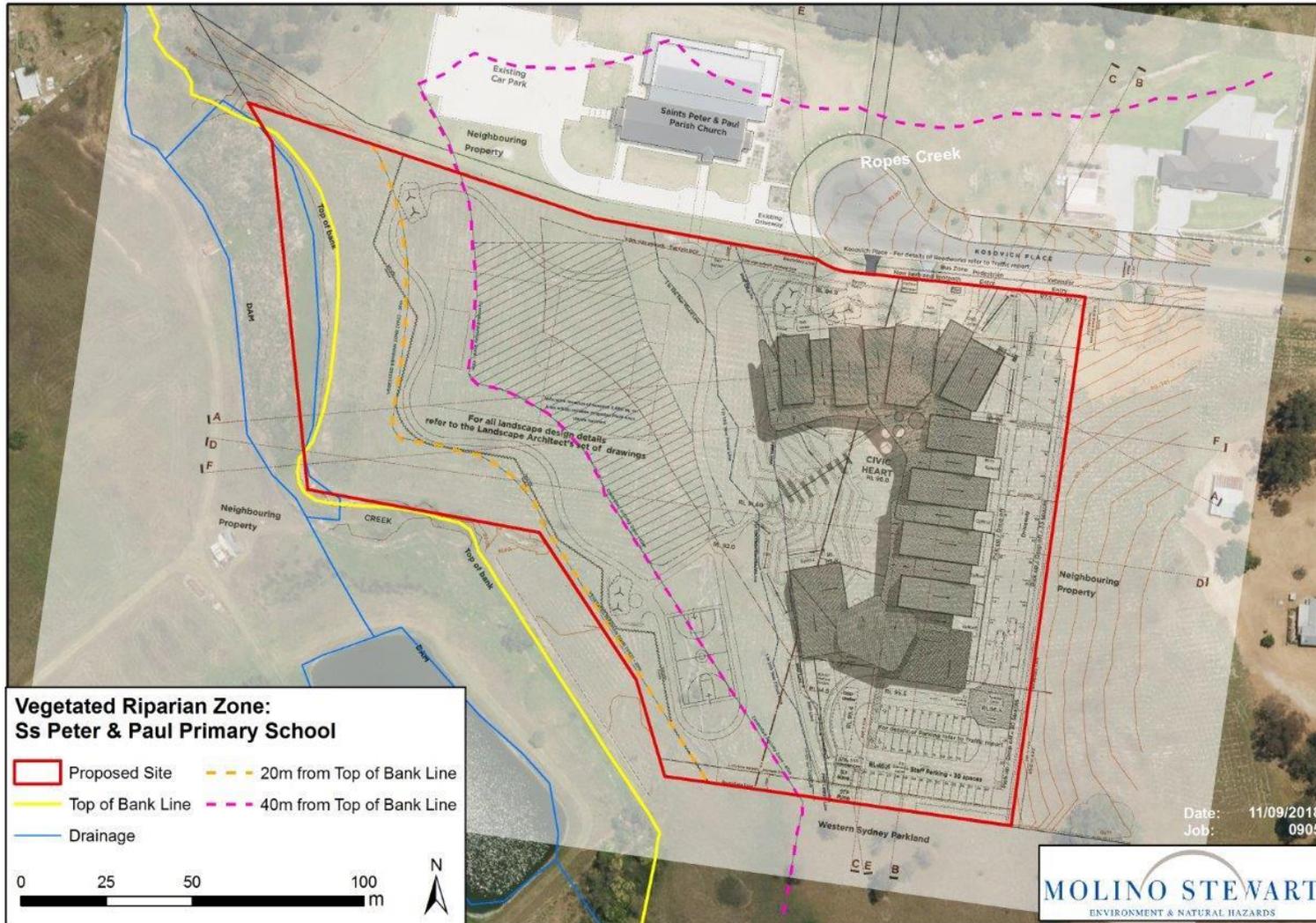


Figure 10 Proposed Vegetated Riparian Zone (VRZ) in relation to development footprint

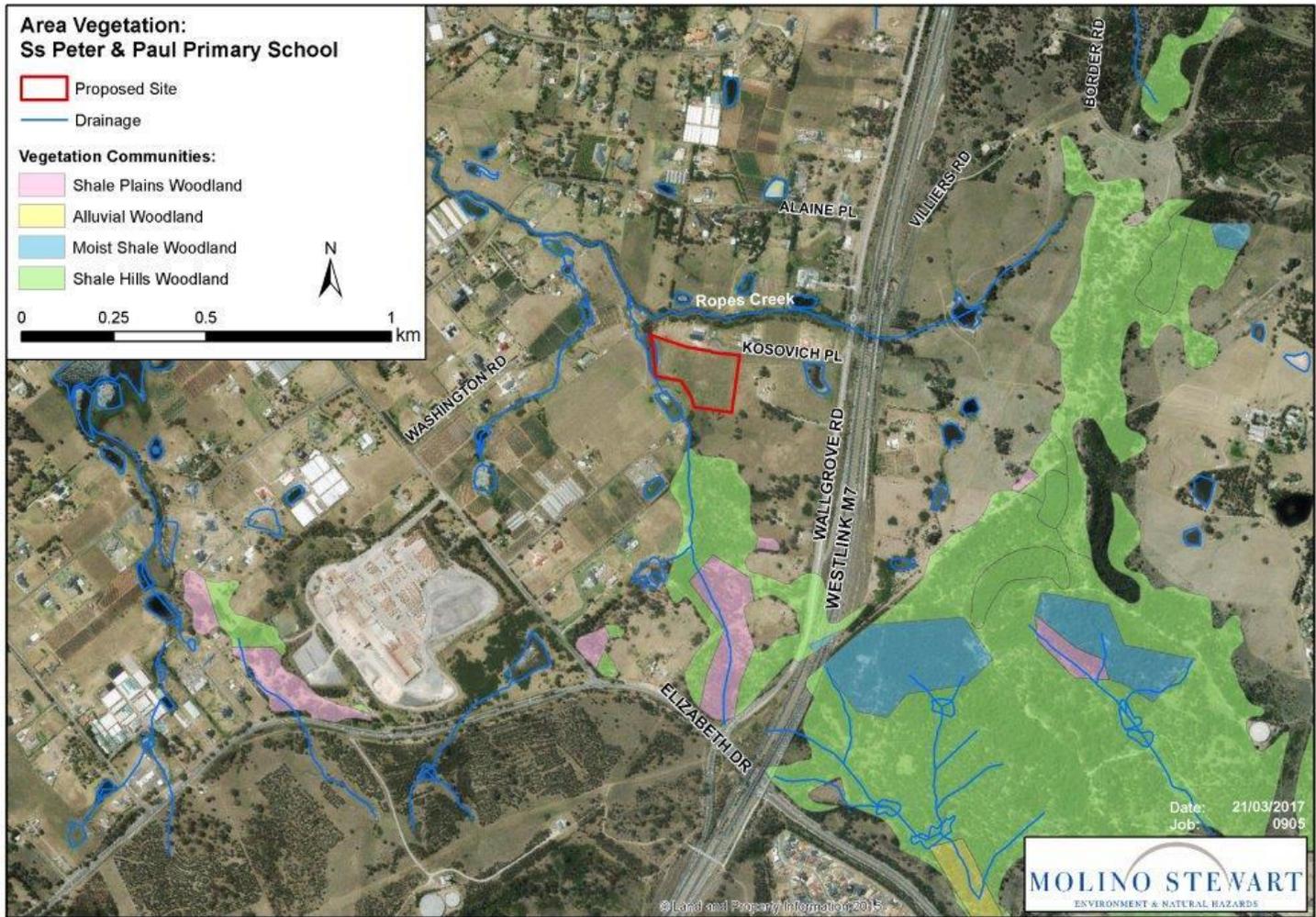


Figure 11 Vegetation Mapping for local area (from NPWS 2002)

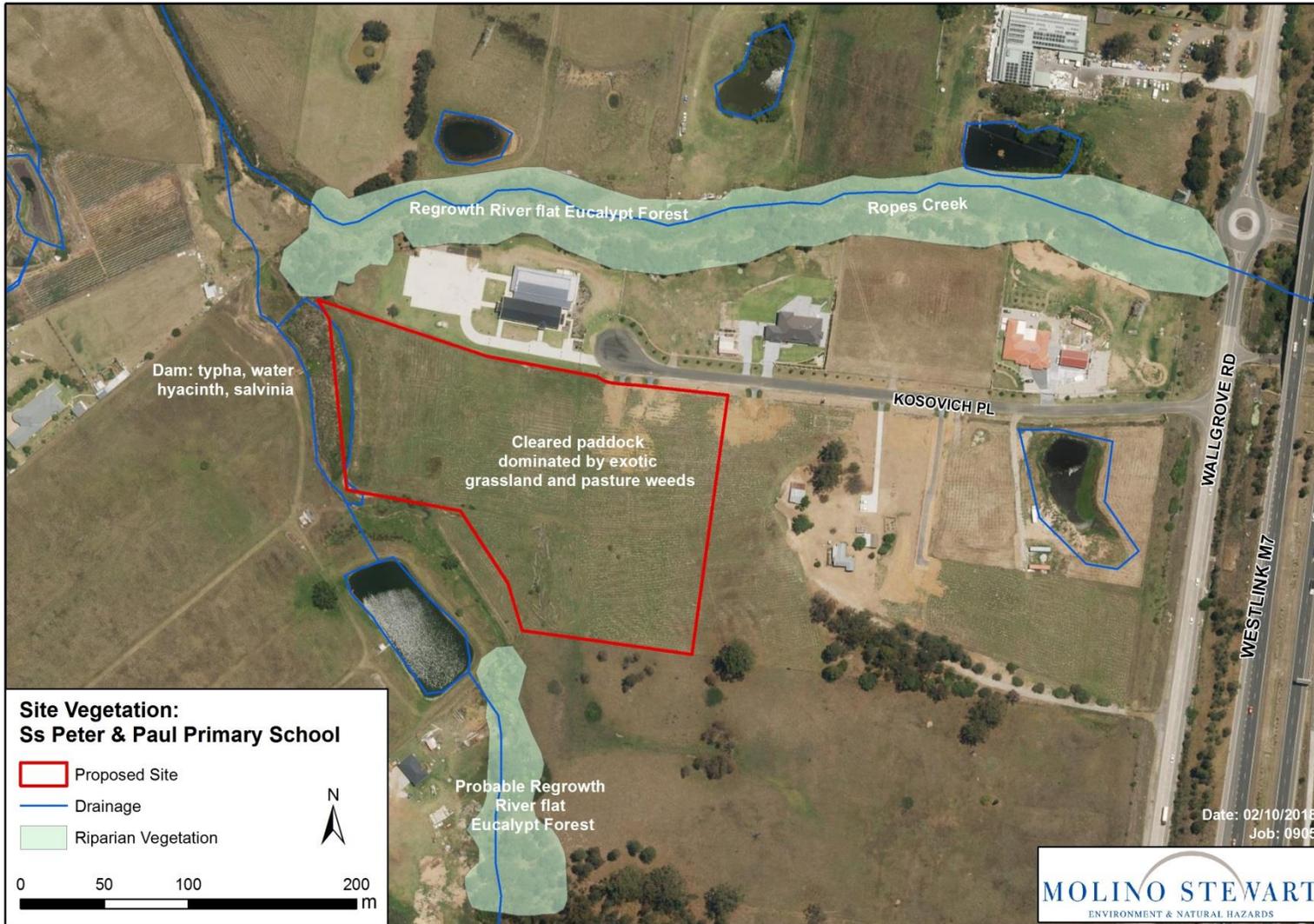


Figure 12 Site vegetation

**APPENDIX B – LIKELIHOOD OF OCCURRENCE  
ASSESSMENT TABLE**

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### Likelihood of occurrence criteria

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey
High	It is highly likely that a species inhabits the study area and is dependant on identified suitable habitat (i.e. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10 km) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the study area and has not been recorded recently in the locality (10 km). It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (i.e. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded.
None	Suitable habitat is absent from the study area.

### Habitat assessment table

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
<b>Endangered Ecological Communities</b>					
Cumberland Plain Woodland (CPW)	CEEC	CEEC	Typically occurs on heavy clay soils derived from Wianamatta Shale.  Includes a sub-form known as 'derived native grassland' where trees and shrubs have been cleared leaving a predominance of native grasses.	-	Not detected on site.
River-flat Eucalypt Forest on Coastal Floodplains	EEC	-	Found on the river flats of the coastal floodplains. It has a tall open tree layer of eucalypts, which may exceed 40 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality.	-	Recorded on adjacent site. Present on northern creek outside development area and likely present to the south of the site.
<b>Endangered Populations</b>					
Dillwynia tenuifolia, Kemps Creek <i>Dillwynia tenuifolia</i>	EP, V	-	The endangered population occurs in the area bounded by Western Road, Elizabeth Drive, Devonshire Road and Cross Street, Kemps Creek in the Liverpool Local Government Area.  The endangered population occurs on a small outlier of the Berkshire Park Soil Landscape. The site supports a transition from Castlereagh Ironbark Forest to Castlereagh Scribbly Gum Woodland. Portions of the site contain a form of	4	None. The site is not within the boundary of the Kemps Creek EP. Habitat not present on site.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			Shale Gravel Transition Forest.		
<i>Marsdenia viridiflora</i> R. <i>Br. subsp. viridiflora</i> population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas  <i>Marsdenia viridiflora</i> <i>subsp. viridiflora</i>	EP	-	Grows in vine thickets and open shale woodland.  Recent records are from Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Previously known north from Razorback Range.  The EP occurs as very scattered plants in areas of remnant vegetation.	19	None. Habitat not present on site.
<b>Flora Species</b>					
Downy Wattle <i>Acacia pubescens</i>	V	V	Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravely soils, often with ironstone.  Occurs in open woodland and forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland.  Concentrated around the Bankstown-Fairfield- Rookwood area and the Pitt Town area	45	Low. Not detected on site. Not a cryptic species.
<i>Dillwynia tenuifolia</i>	V, EP	-	In western Sydney, may be locally abundant	34	None. Endangered population known

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. <i>Eucalyptus fibrosa</i> is usually the dominant canopy species.</p> <p>The core distribution is the Cumberland Plain from Windsor and Penrith east to Dean Park near Colebee.</p> <p>Flowering occurs sporadically through the year with a peak from August to March depending on environmental conditions.</p>		from Kemps Creek nearby. Not detected on site.
Juniper-leaved Grevillea <i>Grevillea juniperina</i> <i>subsp. juniperina</i>	V	-	<p>Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels.</p> <p>Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest.</p> <p>Flowering may occur sporadically throughout the year, but particularly between July and October.</p>	78	None. Site very disturbed. Not detected on site.
Small-flower Grevillea <i>Grevillea parviflora</i>	V	V	Grows in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and	1	None. Habitat not present on site. Not detected on site.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
<i>subsp. parviflora</i>			<p>nodules. Sydney region occurrences are usually on Tertiary sands and alluvium, and soils derived from the Mittagong Formation. Soil landscapes include Lucas Heights or Berkshire Park.</p> <p>Occurs in a range of vegetation types from heath and shrubby woodland to open forest. In Sydney it has been recorded from Shale Sandstone Transition Forest and in Sydney Sandstone Ridgetop Woodland at Wedderburn and in Cooks River / Castlereagh Ironbark Forest at Kemps Creek.</p> <p><i>G. parviflora subsp. parviflora</i> has been recorded growing with several other threatened species including <i>Dillwynia tenuifolia</i> at Kemps Creek.</p> <p>Often occurs in open, slightly disturbed sites such as along tracks.</p> <p>Flowering has been recorded between July to December as well as April-May.</p>		
Nodding Geebung <i>Persoonia nutans</i>	E	E	Restricted to the Cumberland Plain between Richmond in the north and Macquarie Fields in the south. The species has a disjunct distribution, with the majority of populations (and 99% of individuals) occurring in the north of the species range in the Agnes Banks, Londonderry, Castlereagh, Berkshire Park and Windsor Downs	4	None. Habitat not present on site. Not detected on site.

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>areas. Core distribution occurs within the Penrith, and to a lesser extent Hawkesbury, local government areas, with isolated and relatively small populations also occurring in the Liverpool, Campbelltown, Bankstown and Blacktown local government areas. The southern and northern populations have distinct habitat differences.</p> <p>Northern populations are confined to aeolian and alluvial sediments and occur in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland and some in Cooks River / Castlereagh Ironbark Forests. Southern populations also occupy tertiary alluvium, but extend onto shale sandstone transition communities and into Cooks River / Castlereagh Ironbark Forest.</p> <p>Peak flowering is from November to March with sporadic flowering all year round.</p> <p>Abundance at a site appears to be related to disturbance history. Sites with higher abundance also appear to be more disturbed.</p>		
Spiked Rice-flower <i>Pimelea spicata</i>	E	E	On the Cumberland Plain known from Marayong and Prospect Reservoir south to Narellan and	20	None. Not detected on site.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>Douglas Park.</p> <p>Found on well-structured clay soils.</p> <p>On the Cumberland Plain sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark.</p> <p>The co-occurring species in the Cumberland Plain sites are grey box (<i>Eucalyptus moluccana</i>), forest red gum (<i>E. tereticornis</i>) and narrow-leaved ironbark (<i>E. crebra</i>). Blackthorn (<i>Bursaria spinosa</i>) is often present at sites (and may be important in protection from grazing) and kangaroo grass (<i>Themeda australis</i>) is usually present in the groundcover (also indicative of a less intense grazing history).</p> <p>Flowering can occur at any time of the year, but mostly occurs in summer as is probably related to rainfall.</p>		
<i>Pultenaea parviflora</i>	E	V	<p>Core distribution is from Windsor to Penrith and east to Dean Park. Outlier populations are recorded from Kemps Creek and Wilberforce.</p> <p>May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May</p>	16	None. Habitat not present on site. Not detected on site.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.</p> <p><i>Eucalyptus fibrosa</i> is usually the dominant canopy species. <i>Eucalyptus globoidea</i>, <i>E. longifolia</i>, <i>E. parramattensis</i>, <i>E. sclerophylla</i> and <i>E. sideroxylon</i> may also be present or co-dominant, with <i>Melaleuca decora</i> frequently forming a secondary canopy layer.</p> <p>Flowering may occur between August and November depending on environmental conditions.</p> <p>Populations range in number between 10 and more than 5000 individuals, with disturbance history often important in numbers at a site. This also influences the population structure, with fire-induced recruitment producing a more evenly-aged population than soil disturbances. Dominance at a site largely depends on competition from other shrubby plants.</p>		
<b>Fauna</b>					
Dusky Woodswallow <i>Artamus cyanopterus cyanopterus</i>	V	-	This species has been observed in a variety of habitats, most often in open forests and woodlands, and may be seen along roadsides and on golf courses.	9	Low. Habitat not present on site.

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>Despite records showing a wide distribution and occurrence in a variety of habitats, the Dusky Woodswallow is considered to be a woodland dependent bird. The majority of breeding records for this species, as well as presence records within the breeding period, occur on the western slopes of the Great Dividing Range, a region dominated by woodland and open dry forest.</p> <p>Nomadic. Nests colonially.</p>		
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>	V	-	<p>In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests.</p> <p>In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.</p> <p>Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.</p>	1	None. Habitat not present on site.
Varied Sittella <i>Daphoenositta chrysoptera</i>	V	-	<p>The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands.</p>	7	Low. Habitat not present on site.

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.</p> <p>Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.</p>		
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>	V	-	<p>Prefers moist habitats, with trees taller than 20 m.</p> <p>Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.</p> <p>Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.</p> <p>Hibernates in winter.</p>	5	Recorded. Probable identification via Anabat.
Little Lorikeet <i>Glossopsitta pusilla</i>	V	-	<p>Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.</p> <p>Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the</p>	2	Low. Habitat not present on site, riparian areas to north or nearby urban areas might represent suitable habitat.

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>species.</p> <p>Gregarious, travelling and feeding in small flocks (&lt;10), though often with other lorikeets.</p> <p>Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like <i>Allocasuarina</i>.</p> <p>Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs.</p>		
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>	V	Ma	<p>This species is widespread in eastern New South Wales, including coastal and near-coastal areas and along major inland rivers.</p> <p>Birds form permanent pairs that inhabit territories throughout the year.</p> <p>Breeding habitat for the White-bellied Sea-eagle consists of large trees, usually living or less often dead, within mature open forest, gallery forest or woodland. Nest trees are usually emergent,</p>	2	Low. Dependant on large trees. Habitat not present on site. No stick nests observed.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			typically eucalypts and often have emergent dead branches.		
Little Eagle <i>Hieraaetus morphnoides</i>	V	-	Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.  Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	9	Low. Dependant on large trees. Habitat not present on site. No stick nests observed.
Swift Parrot <i>Lathamus discolor</i>	E	CE	Breeds in Tasmania during spring and summer. Migrates to the Australian south-east mainland between March and October.  On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations.  Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i> , Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Mugga Ironbark <i>E. sideroxylon</i> , and White Box <i>E. albens</i> . Commonly used lerp infested trees include Inland Grey Box <i>E. microcarpa</i> , Grey Box <i>E. moluccana</i> and Blackbutt <i>E. pilularis</i> .	1	Low. Habitat not present on site, riparian areas to north or nearby urban areas might represent suitable habitat.
Square-tailed Kite <i>Lophoictinia isura</i>	V	-	In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along	1	Low. Habitat not present on site. Potential to occur on adjoining land.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>the major west-flowing river systems. It is a summer breeding migrant to the south-east arriving in September and leaving by March.</p> <p>Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.</p> <p>Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.</p>		
Cumberland Plain Land Snail <i>Meridolum corneovirens</i>	E	-	<p>Primarily inhabits Cumberland Plain Woodland. This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.</p> <p>Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish.</p>	192	High to Medium. Targeted searches were undertaken on site. Not detected.
Eastern Bentwing-bat <i>Miniopterus schreibersii oceanensis</i>	V	-	<p>Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.</p> <p>Hunt in forested areas, catching moths and other flying insects above the tree tops.</p>	20	Low to Medium. Not detected on site via Anabat. No preferred forested areas on site for foraging, although may also forage in open areas. No roosting habitats present.

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
Eastern Freetail-bat <i>Mormopterus norfolkensis</i>	V	-	<p>Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.</p> <p>Roost mainly in tree hollows but will also roost under bark or in man-made structures.</p> <p>Usually solitary but also recorded roosting communally, probably insectivorous.</p>	9	Recorded. Positive identification via Anabat. Abundant records across all survey nights.
Southern Myotis <i>Myotis macropus</i>	V	-	<p>Generally roost 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.</p> <p>Forage over streams and pools catching insects and small fish by raking their feet across the water surface.</p> <p>In NSW females have one young each year usually in November or December.</p>	7	Medium. Dam provides potential foraging habitat, although no nearby roosting habitat. Not detected via Anabat.
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	V	V	<p>Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.</p> <p>Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Site fidelity to camps is high; some camps have been used for over a century.</p>	32	Low, no suitable foraging resources are available on site. Riparian areas to north or nearby urban areas might represent suitable habitat.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			<p>Can travel up to 50 km from the camp to forage; commuting distances are more often &lt;20 km.</p> <p>There is a known long term breeding colony at Cabramatta Creek at Warwick Farm in the Fairfield LGA. This is approximately 10 km from the subject site.</p> <p>Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines.</p> <p>Also forage in cultivated gardens and fruit crops.</p>		
<p>Yellow-bellied Sheathtail-bat <i>Saccolaimus flaviventris</i></p>	V	-	<p>A wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn.</p> <p>Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.</p> <p>When foraging for insects, flies high and fast over the forest canopy, but lower in more open country.</p> <p>Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.</p> <p>Breeding has been recorded from December to</p>	1	Medium to Low. Not detected on site via Anabat.

Common Name ( <i>Scientific Name</i> )	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
			mid-March, when a single young is born.		
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>	V	-	<p>This species is found mainly in the gullies and river systems that drain the Great Dividing Range. It extends to the coast over much of its range.</p> <p>Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.</p> <p>Although this species usually roosts in tree hollows, it has also been found in buildings.</p> <p>Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m.</p> <p>Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.</p> <p>Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.</p>	2	Recorded. Probable identification via Anabat.
Masked Owl	V	-	Extends from the coast where it is most abundant	1	Low. Habitat not present on site.

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records within 10km (NSW Wildlife Atlas)	Likelihood of occurrence
<i>Tyto novaehollandiae</i>			<p>to the western plains.</p> <p>Lives in dry eucalypt forests and woodlands from sea level to 1100 m.</p> <p>A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats.</p> <p>Pairs have a large home-range of 500 to 1000 ha.</p> <p>Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Masked Owls are territorial, and pairs remain in or near the territory all year round.</p> <p>The main requirements are tall trees with suitable hollows for nesting and roosting and adjacent areas for foraging.</p>		

## **APPENDIX C – FLORA SPECIES DETECTED ON SITE**

*Flora Recorded During the Site Survey*

<b>Family</b>	<b>Botanical name</b>	<b>Common Name</b>
<i>Apiaceae</i>	<i>Anethum graveolens*</i>	Dill Weed
<i>Asteraceae</i>	<i>Ageratina adenophora*</i>	Crofton Weed
	<i>Conyza bonariensis*</i>	Fleabane
	<i>Euchiton sphaericus*</i>	Cudweed
	<i>Hypochoeris radicata*</i>	Cats Ear
	<i>Onopordum acanthium*</i>	Scotch Thistle
	<i>Senecio madagascariensis*</i>	Fireweed
	<i>Sonchus oleraceus*</i>	Sow Thistle
	<i>Taraxacum sp*</i>	Dandelion
<i>Chenopodiaceae</i>	<i>Einardia polygonoides</i>	
<i>Convolvulaceae</i>	<i>Dichondra repens</i>	Kidney Weed
<i>Cyperaceae</i>	<i>Cyperus congestus*</i>	
	<i>Cyperus eragrostis*</i>	Umbrella Sedge
<i>Fabaceae</i>	<i>Glycine tabacina</i>	Glycine
<i>Goodeniaceae</i>	<i>Scaevola albida</i>	Pale Fan-flower
<i>Juncaceae</i>	<i>Juncus usitatus</i>	Common Rush
<i>Malvaceae</i>	<i>Sida rhombifolia*</i>	Paddy's Lucerne
<i>Myrtaceae</i>	<i>Eucalyptus amplifolia</i>	Cabbage Gum
	<i>Eucalyptus tereticornis</i>	Forest Red Gum
<i>Myrsinaceae</i>	<i>Anagallis arvensis*</i>	Scarlet Pimpernel
<i>Oleaceae</i>	<i>Ligustrum lucidum*</i>	Large-leaved Privet

	<i>Ligustrum sinense</i> *	Small-leaved Privet
	<i>Olea erupaea</i> subsp. <i>cuspidata</i>	African Olive
<i>Onagraceae</i>	<i>Ludwigia peploides</i> subsp. <i>montevidensis</i>	Water Primrose
<i>Plantaginaceae</i>	<i>Plantago lanceolata</i> *	Ribwort
<i>Poaceae</i>	<i>Bromus catharticus</i> *	Prairie Grass
	<i>Chloris gayana</i> *	Rhodes Grass
	<i>Cynodon dactylon</i> *	Couch
	<i>Paspalum dilatatum</i> *	Paspalum
	<i>Pennisetum clandestinum</i> *	Kikuyu
	<i>Setaria gracillis</i> *	Slender Pigeon Grass
<i>Polygonaceae</i>	<i>Persicaria decipiens</i>	Slender Knotweed
	<i>Rumex crispis</i> *	Curled Dock
<i>Pontederiaceae</i>	<i>Eichhornia crassipes</i> *	Water Hyacinth
<i>Rosaceae</i>	<i>Rubus fruticosus</i> *	Blackberry
<i>Salviniaceae</i>	<i>Salvinia molesta</i>	Salvinia
<i>Solanaceae</i>	<i>Datura inoxia</i>	Downy Thornapple
	<i>Solanum cinereum</i>	Narrawa Burr
<i>Typhaceae</i>	<i>Typha latifolia</i> *	Bulrush
<i>Verbenaceae</i>	<i>Verbena bonariensis</i> *	Purpletop

\*Introduced or cultivated species

## **APPENDIX D – FAUNA SPECIES DETECTED ON SITE**

*Fauna Recorded During the Site Survey*

<b>Family</b>	<b>Scientific name</b>	<b>Common Name</b>	<b>Sighting Notes</b>
<i>Acrocephalidae</i>	<i>Acrocephalus australis</i>	Australian Reed-warbler	
<i>Artamidae</i>	<i>Strepera graculina</i>	Pied Currawong	
<i>Cacatuidae</i>	<i>Cacutua sanguinea</i>	Little Corella	
<i>Corvidae</i>	<i>Corvus ottu</i>	Torresian Crow	
<i>Maluridae</i>	<i>Malurus cyaneus</i>	Superb Fairy-wren	
<i>Monarchidae</i>	<i>Grallina cyanoleuca</i>	Magpie-lark	
<i>Rhipiduridae</i>	<i>Rhipudura leucophrys</i>	Willie Wagtail	Camera
<i>Sturnidae</i>	<i>Acridotheres tristis*</i>	Common Myna	
CLASS MAMMALIA			
<i>Muridae</i>	<i>Rattus rattus*</i>	Black Rat	Camera
<i>Vespertilionidae</i>	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	Positive identification via Anabat
<i>Vespertilionidae</i>	<i>Mormopterus norfolkensis#</i>	East Coast Freetail-bat	Positive identification via Anabat. Abundant records across all survey nights.
<i>Vespertilionidae</i>	<i>Falsistrelle tasmaniensis#</i>	False Pipistrelle	Probable identification via Anabat.
<i>Vespertilionidae</i>	<i>Vespadelus vulturnus</i>	Little Forest Bat	Possible identification via Anabat
<i>Vespertilionidae</i>	<i>Vespadelus regulus</i>	Southern Forest Bat	Positive identification via

<b>Family</b>	<b>Scientific name</b>	<b>Common Name</b>	<b>Sighting Notes</b>
			Anabat
<i>Vespertilionidae</i>	<i>Tadarida australis</i>	White-striped Freetail-bat	Probable identification via Anabat
<i>Vespertilionidae</i>	<i>Mormopterus species 2</i> (possible <i>M. ridei</i> – Eastern Freetail Bat)		Probable Identification via Anabat
<i>Vespertilionidae</i>	<i>Scoteanax ruepellii</i> #	Greater Broad-nosed Bat	Probable identification via Anabat

# Vulnerable species (NSW TSC Act)

### **Listed migratory species** - CAMBA, JAMBA, ROKAMBA (Commonwealth EPBC Act)

\*Introduced species

## **APPENDIX E – NSW THREATENED SPECIES ASSESSMENTS OF SIGNIFICANCE**

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## CUMBERLAND PLAIN LAND SNAIL *MERIDOLUM CORNEOVIRENS*

This species is listed as Endangered under the NSW BC Act.

The Cumberland Plain Land Snail *Meridolum corneovirens* occurs in western Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. It is known from over 100 different locations within woodland vegetation. Not all areas are occupied and the distribution is fragmented as a result of land use patterns. This species:

- Primarily inhabits grassy open woodland with occasional dense patches of shrubs of the Cumberland Plain Woodland (a CEEC); but also occurs within other EECs in western Sydney including Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.
- Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps; occasionally shelters under rubbish.
- Can dig several centimetres into soil to escape drought.
- Is a fungus specialist. Unlike the common garden snail, this species does not eat green plants and is generally active at night.
- Little is known of its biology, including breeding biology. It is known to be hermaphroditic, laying clutches of 20-25 small, round, white eggs in moist, dark areas (such as under logs), with the eggs taking 2-3 weeks to hatch. There is a suggestion that the species breeds throughout the year when conditions are suitable (OEH, undated).

There are 192 NSW Wildlife Atlas records of this species within 10km of the site.

Targeted searches were conducted on the site for the Cumberland Plain Land Snail. This species prefers environments with areas of deep litter, often associated with riparian areas, to obtain its food resources. The development area is devoid of preferred habitat and no evidence of this species was found. There is no Cumberland Plain Woodland on the site or surrounds. Riparian areas located nearby may provide suitable habitat, including the regrowth River-Flat Eucalypt Forest located along Ropes Creek to the north of the existing church. The local area has been heavily cleared and urbanised, with only fragmented connectivity remaining along waterways to any larger areas of remnant vegetation.

- a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,**

The proposed development does not require any clearing of native vegetation. The school would be built in the cleared paddock areas where there is a lack of suitable habitat for this species. There are riparian habitats to the north and south of the site which are more likely to provide habitat for this species. The area to the south forms part of Western Sydney Parklands. The western part of the site within the riparian corridor would be revegetated. The OEH "Action Toolbox" for this species (OEH undated c) lists the following "site based" recovery actions for this species that will be implemented as part of the Vegetation Management Plan (VMP) for the riparian areas on this site:

- *Retain large woody debris and other material (stones) on the ground that provides habitat. Ensure it is dispersed across occupied sites to allow movement of individuals.*
- *Manage presence of stock (or exclude) in occupied sites to reduce, minimise or eliminate trampling and eating of habitat.*
- *Manage weed presence, density and diversity at occupied sites, maintaining low density of weeds that are identified as habitat engineers (e.g. dense shrubs) or otherwise strongly affect*

*structure and composition of the grassy woodland habitat. Where possible, also manage adjacent source areas for weed seeds and propagules.*

- *Reduce or exclude slashing from areas that are or may be occupied by snails such as around woody debris and near the trunks of trees to ensure habitat and cover are retained.*

Considering the above factors, the proposal is unlikely to have an adverse effect on the life cycle of this species such that a viable local population of the species is likely to be placed at risk of extinction.

**b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:**

- Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction**
- Is likely to substantially and adversely modify the composition such that its local occurrence is likely to be placed at risk of extinction**

Not applicable to Cumberland Plain Land Snail

**c) In relation to the habitat of threatened species or ecological community:**

- The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**

The proposed development does not require any clearing of native vegetation. The school would be built in the cleared paddock areas where there is a lack of suitable habitat for this species.

The riparian habitats which are more likely to provide habitat for this species to the north of the site will be retained. Potential indirect impacts on habitat such as hydrological changes caused by earthworks and drainage changes and weed spread will be controlled through application of protection and mitigation measures including implementation of a Vegetation Management Plan (VMP), Erosion and Sediment Control Plan (ESC Plan), and water management plans for the site. The western part of the site within the riparian corridor would be revegetated.

- Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity**

The local area has been heavily cleared and urbanised, with only fragmented connectivity remaining along waterways to any area of remnant vegetation. The riparian vegetation present along the waterways will be retained, thus retaining any existing connectivity. The proposal does not require any clearing of native vegetation and no area of potential habitat will become fragmented or isolated as a result of the proposal.

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

Based on the survey of the subject site and assessment of the habitat features present, the paddock area where the school would be built is unlikely to provide important habitat for this species. The riparian corridors to the north will be retained.

- whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)**

There are no AOBV in the locality.

- Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

The proposed development does not constitute any key threatening process.

In relation to riparian areas, development of the site has potential to increase key threatening processes related to weed and pathogen spread. However, the paddock area of the site as it exists at the moment suffers from heavy weed infestation. These weeds would be removed as part of earthworks and construction of the school. Potential for further weed and pathogen spread into riparian areas would be controlled through application of mitigation measures including implementation of a VMP and specific weed and pathogen control measures during construction.

### **Conclusion**

It is unlikely that the proposed development will have a significant impact on the Cumberland Plain Land Snail.

## MICROCHIROPTERAN BATS

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### **Falsistrelle tasmaniensis, Eastern False Pipistrelle**

This species is listed as Vulnerable under the NSW BC Act.

The Eastern False Pipistrelle prefers moist habitats, with trees taller than 20 m. It generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. They hunt beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter (OEH, undated).

There are 5 NSW Wildlife Atlas records of this species within 10km of the site.

There was a probable detection of this species on the site via Anabat.

### **Miniopterus schreibersii oceanensis, Eastern Bentwing-bat**

This species is listed as Vulnerable under the NSW BC Act.

Preferred habitats for this species include rainforest, wet and dry sclerophyll forest, open woodland, Melaleuca forests and open grassland. The Eastern Bentwing-bat forages high in forested areas from just above canopy height to many times canopy height. In more open areas such as grasslands, flight may be within a few metres of the ground.

Eastern Bentwing-bats are primarily cave dwellers, but will also roost in man-made structures such as road culverts and mines (Churchill 1998).

There are 20 NSW Wildlife Atlas records of this species within 10km of the site.

This species was not detected on site via Anabat. No preferred forested habitat or caves are present on site. No roosting habitats present in development area.

- **Mormopterus norfolkensis, East Coast Freetail-bat**

This species is listed as Vulnerable under the NSW BC Act.

The Eastern Freetail-bat utilises dry eucalypt forest and woodland on the coastal side of the Great Dividing Range. They show a preference for open spaces in woodland or forest, and are more active in the upper slopes of forest areas rather than in riparian zones. They also forage over large waterways. This species roosts in hollow trees (usually in hollow spouts), under exfoliating bark and in various man-made structures (Churchill 1998). Usually solitary but also recorded roosting communally, probably insectivorous (OEH, Undated).

There are nine NSW Wildlife Atlas records of this species within 10km of the site.

This species was recorded via Anabat on the site, with abundant records over all survey nights. This may indicate that important habitat is present in the locality.

- **Myotis macropus Southern Myotis**

This species is listed as Vulnerable under the NSW BC Act.

The Southern Myotis forages over streams and watercourses feeding on fish and insects taken at the waters' surface. They generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, stormwater channels, buildings, under bridges and in dense foliage. In NSW females have one young each year usually in November or December.

There are seven NSW Wildlife Atlas records of this species within 10km of the site.

The dam on site may represent potential foraging habitat, although there is no nearby roosting habitat. This species was not recorded on the site via Anabat detection.

- **Saccolaimus flaviventris, Yellow-bellied Sheathtail-bat**

This species is listed as Vulnerable under the NSW BC Act.

Yellow-bellied Sheath-tail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. It roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Breeding has been recorded from December to mid-March, when a single young is born.

When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.

There is one NSW Wildlife Atlas records of this species within 10km of the site.

This species was not recorded on site by Anabat detection.

- **Scoteanax ruepellii, Greater Broad-nosed Bat**

This species is listed as Vulnerable under the NSW BC Act.

This species is found mainly in the gullies and river systems that drain the Great Dividing Range. It extends to the coast over much of its range. It utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings.

Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.

Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.

There are two NSW Wildlife Atlas records of this species within 10km of the site.

There was a probable identification of this species on the site via Anabat.

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

The proposed development does not require any clearing of native vegetation. The school would be built in the cleared paddock areas. There are no roosting structures or trees within the proposed development area that would be disturbed.

The riparian vegetation, waterways and dam on and adjoining the site that are more likely to provide habitat for microbat species will be retained. These areas likely provide a flyway linking areas of habitat within the local area.

Within the school there will also be large areas of open space retained that could be used as foraging habitat, including the oval and playground area adjoining the creek and dam. The western part of the site within the riparian corridor would be revegetated.

Filling will only be required in the upper section of the site where the buildings will be constructed. All the buildings will be above the 1:100 flood line, but the area of filling will encroach slightly over the 1:100 flood line as in small areas, as shown in Figure 2. This area of encroachment will consist of a grassed embankment along the western edge of the school building areas. The only other earthworks required below the 1:100 flood line would be minor levelling out of some areas, such as for the multi purpose court. No filling is required in the lower section of the site. Potential for hydrological impacts on downstream environments will be minimised as the majority of the floodplain will remain at the current levels. No earthworks are proposed within the 20 metre Vegetated Riparian Zone, which includes the waterway and dam.

Placement of artificial light sources close to bat roosting or foraging areas can disturb bat activity. The school buildings and access roads will be located away from the riparian areas. Any lighting required on the oval or otherwise near the riparian areas is to be low spill type lighting.

It is therefore considered that the action proposed is not likely to have an adverse effect on the life cycle of these species such that a viable local population of the species is likely to be placed at risk of extinction.

**b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:**

- i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- ii. Is likely to substantially and adversely modify the composition such that its local occurrence is likely to be placed at risk of extinction,**

Not applicable to threatened species.

**c) In relation to the habitat of threatened species, populations or ecological community:**

- i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**

The proposed development does not require any clearing of native vegetation. The school would be built in the cleared paddock areas. The western part of the site within the riparian corridor would be revegetated.

There are riparian habitats in the local area which are more likely to provide habitat for this species. Potential indirect impacts on habitat such as hydrological changes caused by earthworks and drainage changes, operational light impacts and weed spread will be controlled through application of mitigation measures including implementation of a VMP.

- ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity**

The local area has been heavily cleared and modified, with only fragmented connectivity remaining along waterways to any area of remnant vegetation. The riparian vegetation present along the waterways will be retained, thus retaining any existing connectivity. The proposal does not require any clearing of native vegetation. An increase in fragmentation or isolation is unlikely for these highly mobile bat species as a result of the proposal.

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

There are riparian habitats which are likely to provide habitat and flyways for bats in the local area and the riparian habitat within this site will be rehabilitated. The dam will be retained and the 20 m wide VRZ along the waterway will be revegetated. The school would be built in the cleared paddock areas.

There were multiple records of *Mormopterus norfolkensis*, East Coast Freetail-bat on all survey nights. This may indicate that important habitat is present in the locality for this species. As outlined above, the riparian vegetation on site that would provide habitat for this species would be retained. Within the school there will also be large areas of open space retained that could be used as foraging habitat, including the oval and playground area adjoining the creek and dam. No native trees or hollow bearing trees would be removed.

It is therefore considered that the habitat to be removed, modified, fragmented or isolated is not of critical importance to the long-term survival of these species in the locality.

- d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)**

There are no AOBV in the locality.

- e) Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

The action proposed does not constitute any key threatening process.

In relation to riparian areas, development of the site has potential to increase key threatening processes related to weed and pathogen spread. However, the paddock area of the site as it exists at the moment suffers from heavy weed infestation. These weeds would be removed as part of earthworks and construction of the school. Potential for further weed and pathogen spread into riparian areas would be controlled through application of mitigation measures including implementation of a VMP and specific weed and pathogen control measures during construction.

### **Conclusion**

It is unlikely that the proposed development will have a significant impact on any of the tested microbat species.

# RIVER FLAT EUCALYPT FOREST ENDANGERED ECOLOGICAL COMMUNITY (EEC)

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“River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions” is listed as an EEC in NSW under the BC Act. It is not listed under the federal EPBC Act.

This community is found on the river flats of the coastal floodplains. The RFEF EEC it occurs in upper part of the Coastal Floodplain on silty, clayey or sandy loam soil with a lack of deep humic layers and has little or no saline (salt) influence.

It is characterized by an open tree layer of eucalypts, which may exceed 40 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality (OEH undated a). The canopy vegetation is usually dominated by Forest Red Gum *Eucalyptus tereticornis*, Cabbage Gum *Eucalyptus amplifolia* and Rough-barked Apple *Angophora floribunda* or Broad-leaved Apple *Angophora subvelutina*. The understorey comprises an open stratum of juveniles of any of the canopy trees, as well as Acacia and Melaleuca and may include Blackthorn *Bursaria spinosa*, Gorse bitter-pea *Daviesia ulicifolia* and *Dillwynia sieberi*. A ground cover of native or exotic grasses and herbs depending on the level of disturbance affecting the community.

The community has an important role in maintaining river ecosystems and riverbank stability.

As discussed in the Section 3.5 of the Ecological Report, the vegetation along the creek to the north of Kosovitch Place is regrowth River-Flat Eucalypt Forest that would meet the criteria specified in the NSW Scientific Committee Determination (NSW Scientific Committee, 2011) for the EEC. The extent of River-Flat Eucalypt Forest on this adjacent site is shown in **Appendix A - Figure 11** of the Ecological Report. The creek-line to the west of the proposed school site has been dammed and there is an absence of the tree and understorey species that would indicate the presence of River-Flat Eucalypt Forest on Coastal Floodplains EEC at that location. There is however vegetation with trees downstream (north) of the dam that may qualify as the EEC. The extent of this potential EEC is outside the subject site.

*An action is considered likely to have a significant impact on an EEC if:*

- a) **In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,**

Not applicable to EECs

- b) **in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:**
  - i. **is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
  - ii. **is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction**

The proposed development does not require any clearing of native vegetation. The school would be built in the cleared and elevated paddock areas where there is a lack of suitable habitat for this community. Filling will only be required in the upper section of the site where the buildings will be constructed. All the buildings will be above the 1:100 flood line, but the area of filling will encroach slightly over the 1:100 flood line in small areas, as shown in Figure 2. This area of encroachment will consist of a grassed embankment along the western edge of the school building areas. The only other earthworks required below the 1:100 flood line would be minor levelling out of some areas, such as for

the multi-purpose court. No filling is required in the lower section of the site. Potential for hydrological impacts on downstream environments will be minimised as the majority of the floodplain will remain at the current levels. No earthworks are proposed within the 20 metre Vegetated Riparian Zone, which includes the waterway and dam.

The riparian area on the site that provides potential future rehabilitation potential will be retained and revegetated in accordance with the VMP.

Development of the site has potential to increase weed and pathogen spread in the riparian areas, however the paddock area of the site as it exists at the moment suffers from heavy weed infestation. These weeds would be removed as part of the proposed development and construction of the school. Potential for further weed and pathogen spread into riparian areas would be controlled through application of mitigation measures including implementation of a VMP. The occurrence of this EEC adjoining the site is highly disturbed. The western part of the site within the riparian corridor would be revegetated with species found in River Flat Eucalypt Forest.

The site will drain to the dam area, which is already highly modified and cleared and does not include River-flat Eucalypt Forest. Any potential hydrological impacts to River-Flat Eucalypt Forest downstream of the dam are expected to be minor and will be controlled through mitigation measures including implementation of a VMP, ESC Plan, S&WMP and water management plans for the site for long term water management.

In summary, all areas of River Flat Eucalypt Forest along the riparian corridor on the adjacent site will be retained and indirect impacts will be mitigated. Therefore:

- it is not “likely” that the “local occurrence” of the ecological community will be “placed at risk of extinction” as a consequence of the proposed development; and
- it is not considered “likely” that the proposed development would “substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction”.

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

**i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**

The proposed development does not require any clearing of native vegetation that would comprise the EEC. The school would be built in the cleared and elevated paddock areas where there is no suitable habitat.

The riparian habitats to the north of the development site that have regrowth River-Flat Eucalypt Forest. The riparian habitat to the south is also probable regrowth River-Flat Eucalypt Forest and forms part of the Western Sydney Parklands. Potential indirect impacts such as hydrological changes such as weed spread will be controlled through application of protection and mitigation measures including implementation of a VMP.

The site will drain to the dam area, which is already highly modified and cleared and does not include River-flat Eucalypt Forest. Any potential hydrological impacts to River-Flat Eucalypt Forest downstream of the dam are expected to be minor and will be controlled through mitigation measures including implementation of a VMP, ESC Plan, and water management plans for the site for long term water management. The western part of the site within the riparian corridor would be revegetated.

**i. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity**

The local area has been heavily cleared and urbanised, with only fragmented connectivity remaining along waterways to any area of remnant vegetation. The riparian vegetation present along the waterways will be retained and rehabilitated, thus retaining any existing connectivity. The proposal

does not require any clearing of native vegetation and no area of potential habitat will become fragmented or isolated as a result of the proposal.

**ii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality**

The EEC located to the north of the site is regrowth vegetation, and is highly disturbed. Based on the survey of the subject site and assessment of the habitat features present, the elevated paddock area where the school would be built does not provide actual or potential habitat for this EEC. The riparian corridors on the site will be retained. Potential indirect impacts can be controlled and mitigated. The proposed development will not affect the long term survival of the community in the locality.

**d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)**

There are no AOBV in the locality.

**e) Whether proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

The proposed development does not constitute any key threatening process.

In relation to riparian areas, development of the site has potential to increase key threatening processes related to weed and pathogen spread. However, the paddock area of the site as it exists at the moment suffers from heavy weed infestation. These weeds would be removed as part of earthworks and construction of the school. Potential for further weed and pathogen spread into riparian areas would be controlled through application of mitigation measures including implementation of a VMP and specific weed and pathogen control measures during construction.

**Conclusion**

It is unlikely that the proposed development will have a significant impact on River-flat Eucalypt Forest Endangered Ecological Community.

## **APPENDIX F – EPBC ACT PROTECTED MATTERS REPORT**

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# EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/06/18 16:33:38

[Summary](#)

[Details](#)

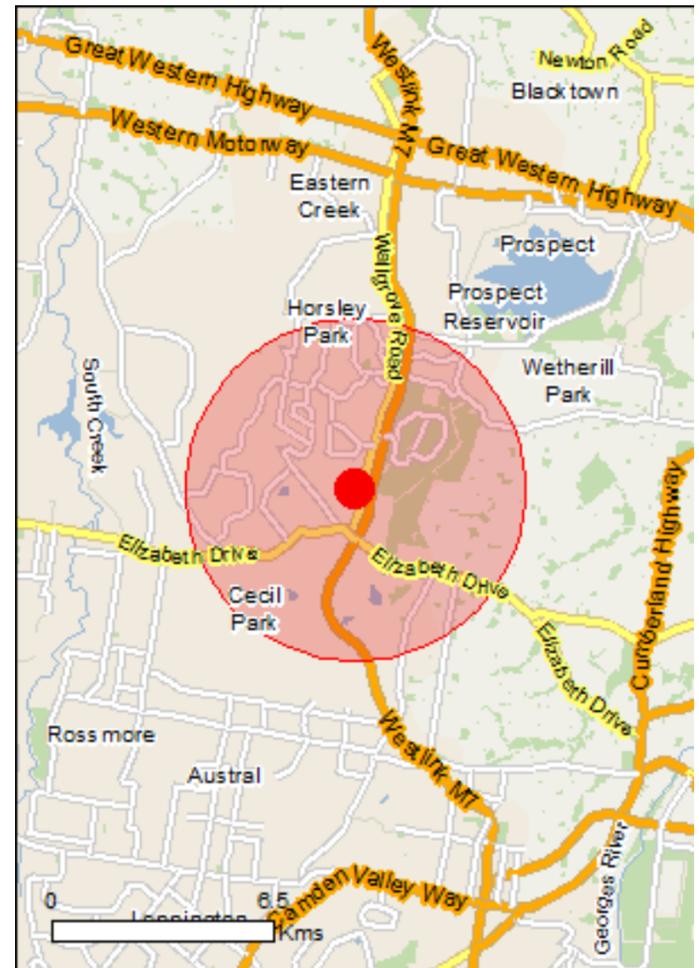
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

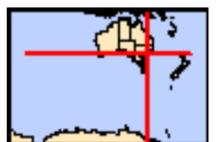
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[Coordinates](#)

Buffer: 5.0Km



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	5
<a href="#">Listed Threatened Species:</a>	36
<a href="#">Listed Migratory Species:</a>	15

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	3
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	21
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	50
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

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

Name	Status	Type of Presence
<a href="#">Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion</a>	Endangered	Community may occur within area
<a href="#">Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community</a>	Endangered	Community likely to occur within area
<a href="#">Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion</a>	Critically Endangered	Community may occur within area
<a href="#">Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</a>	Critically Endangered	Community likely to occur within area
<a href="#">Western Sydney Dry Rainforest and Moist Woodland on Shale</a>	Critically Endangered	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Anthochaera phrygia</a> Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Dasyornis brachypterus</a> Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
<a href="#">Grantiella picta</a> Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

### Fish

Name	Status	Type of Presence
<a href="#">Macquaria australasica</a> Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
<a href="#">Prototroctes maraena</a> Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
<b>Frogs</b>		
<a href="#">Heleioporus australiacus</a> Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
<a href="#">Litoria aurea</a> Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Litoria raniformis</a> Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Chalinolobus dwyeri</a> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Dasyurus maculatus maculatus (SE mainland population)</a> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
<a href="#">Petauroides volans</a> Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
<a href="#">Petrogale penicillata</a> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pseudomys novaehollandiae</a> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pteropus poliocephalus</a> Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<b>Plants</b>		
<a href="#">Acacia bynoeana</a> Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
<a href="#">Acacia pubescens</a> Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Allocasuarina glareicola</a> [21932]	Endangered	Species or species habitat may occur within area
<a href="#">Cynanchum elegans</a> White-flowered Wax Plant [12533]	Endangered	Species or species habitat known to occur within area
<a href="#">Genoplesium baueri</a> Yellow Gnat-orchid [7528]	Endangered	Species or species habitat may occur within area
<a href="#">Grevillea parviflora subsp. parviflora</a> Small-flower Grevillea [64910]	Vulnerable	Species or species

Name	Status	Type of Presence
<a href="#">Haloragis exalata subsp. exalata</a> Wingless Raspwort, Square Raspwort [24636]	Vulnerable	habitat likely to occur within area Species or species habitat may occur within area
<a href="#">Persoonia nutans</a> Nodding Geebung [18119]	Endangered	Species or species habitat likely to occur within area
<a href="#">Pimelea curviflora var. curviflora</a> [4182]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pimelea spicata</a> Spiked Rice-flower [20834]	Endangered	Species or species habitat known to occur within area
<a href="#">Pomaderris brunnea</a> Rufous Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pterostylis gibbosa</a> Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
<a href="#">Pterostylis saxicola</a> Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur within area
<a href="#">Pultenaea parviflora</a> [19380]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Syzygium paniculatum</a> Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thesium australe</a> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area

## Listed Migratory Species

[ [Resource Information](#) ]

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

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

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

## Other Matters Protected by the EPBC Act

### Commonwealth Land [\[ Resource Information \]](#)

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

Name
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Telstra Corporation Limited

### Listed Marine Species [\[ Resource Information \]](#)

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

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Cuculus saturatus</a> Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]		Species or species habitat known to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat likely to occur within area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Name	State
Kemps Creek	NSW

### Invasive Species [\[ Resource Information \]](#)

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

Name	Status	Type of Presence
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Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
<b>Frogs</b>		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
<b>Mammals</b>		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area

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

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

# Coordinates

-33.866633 150.842466

# Acknowledgements

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

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

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.