

Mr Stewart Johnson  
Director  
Project Strategy  
PO Box 271  
Sutherland NSW 1499



4 December 2018

Dear Stewart,

**Biodiversity consideration – proposed stormwater storage area, 62 Ferndell Street, South Granville, NSW**

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**1. Introduction and background**

At the request of Project Strategy, on behalf of Dexu Wholesale Management Limited, Lesryk Environmental Pty Ltd has been engaged to undertake a biodiversity investigation of a portion of 62 Ferndell Street, South Granville, New South Wales (Figure 1).

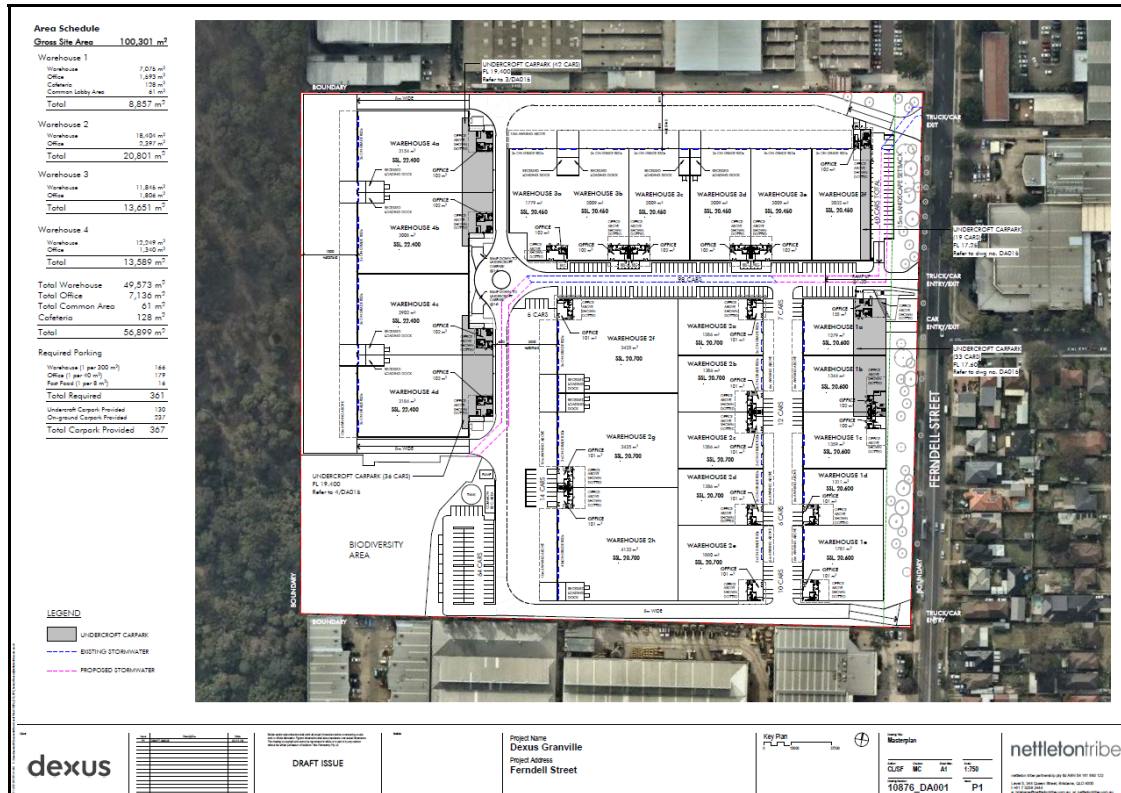
As part of a development proposal for the entire site, the unnamed drainage channel that occurs in the south-eastern corner requires excavation. This excavation is required to accommodate the expected increase in stormwater runoff that would occur due to the undertaking of the proposed development (Figure 2).



**Figure 1.** Subject site (red polygon) and locality

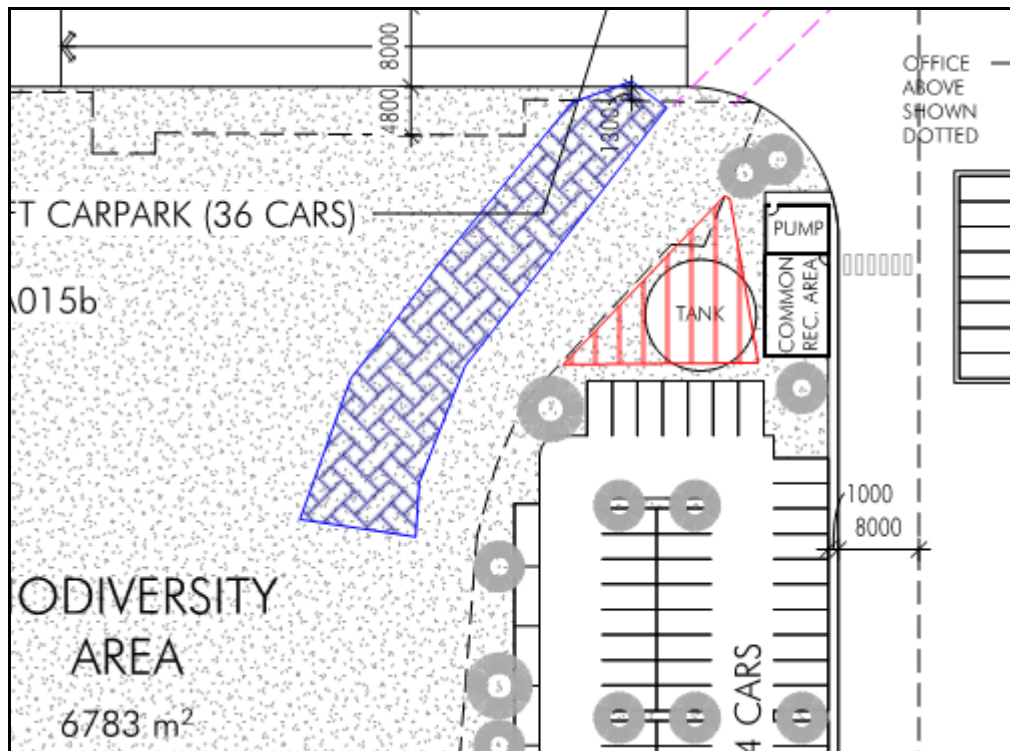
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Lesryk Environmental Pty Ltd  
PO Box 3001  
Bundeena NSW 2230



**Figure 2.** The proposed masterplan for 62 Ferndell Street

As part of the works, Dexus Wholesale Management Limited are also proposing to clear a small portion of the western bank of the drainage line (Figure 3) to increase the aesthetical value of the area.



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**Figure 3.** The proposed clearance area on the west bank (blue hashed area)

With reference to the Parramatta Local Environmental Plan (LEP) 2011, the majority of the vegetation present within the south-eastern corner has been mapped as Biodiversity. Whilst the proposed works are not expected to directly disturb this area, there is the potential for indirect impacts to arise. As such, any adverse impacts (direct or indirect) on this area as a result of the proposed works have also been considered.

The area surveyed included all the land proposed to be disturbed by the works as well as a distance of 10 metres (m) beyond these limits. The area investigated will hereafter be referred to as the subject site (Figure 1).

Located approximately 19 kilometres (km) west of the Sydney Central Business District, the subject site is situated within an industrial and highly urbanised and modified portion of the Cumberland Local Government Area (LGA). In addition, extensive areas of residential and commercial developments are present, with very little natural environment remaining. Whilst no conservation areas are present within, or close to, the subject site, the proximate native vegetation does link up with other stands of woodland to the west of the property. A drainage line is also present within the south-east corner of the property, this flowing in a north-easterly direction.

For reference, a photographic record has been provided (Attachment 1).

The investigation has been undertaken as the subject site had not been assessed as part of the initial submission for development approval to Cumberland (then Parramatta City) Council (PCC) nor had clause 6.4 '*Biodiversity protection*' of the Parramatta LEP been considered. The purpose of the current investigation was to consider any potential biodiversity impacts that may occur and, if necessary, mitigate against these.

The assessment of possible impacts associated with the proposed works is based on a field investigation of the subject site, a review of aerial photography that covers the locality, the consultation of standard databases and a consideration of the objectives of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), NSW *Environmental Planning and Assessment Act 1979* (EPA Act), NSW *Biodiversity Conservation Act 2016* (BC Act), Parramatta LEP and any relevant State Environmental Planning Policy (SEPP).

## **2. Desktop review**

Prior to undertaking the site inspection known databases were consulted to identify the diversity of ecological communities, flora and fauna species known for, or potentially occurring in, the study region<sup>1</sup>. The identification of those known or potentially occurring native species and communities within this portion of the Cumberland LGA, particularly those listed under the Schedules to the EPBC and/or BC Acts, thereby permits the tailoring of the field survey strategies to the detection of these plants, animals and communities, or their necessary vegetation associations/habitat requirements.

The desktop review involved the consultation of:

- Biodiversity Values Map and Threshold Tool (BVMTT) (NSW Government 2018)
- the Commonwealth Department of the Environment and Energy's Protected Matters Search Tool (Department of the Environment and Energy [DEE] 2018a)
- the NSW Office of Environment and Heritage's (OEH) Atlas of NSW Wildlife (OEH 2018a)
- the OEH threatened species profile database (OEH 2018b)
- the OEH vegetation types database
- the Parramatta LEP 2011

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<sup>1</sup> The study region is considered to 'include the lands that surround the subject site for a distance of 10 km' (Department of Environment and Climate Change 2007).

- 
- any additional relevant Council publications.

Based on a review of the BVMTT (NSW Government 2018), no areas of high biodiversity value, as defined by the Biodiversity Conservation Regulation 2017, were recorded within the subject site (Attachment 2). Whilst this is the case, it is noted that the wooded area to the west of the property has been included on this map (Attachment 2). The proposed area of clearing does not exceed the thresholds provided under Section 6 of the Biodiversity Conservation Regulation 2017. As such, the proposed action does not need to be assessed in accordance with the Biodiversity Offsets Scheme (Part 6) of the BC Act. In addition, with reference to the BVMTT, application of the Biodiversity Assessment Method (BAM) (Division 2, Part 6 of the BC Act) is not required (Attachment 2). Therefore, a Biodiversity Development Assessment Report (BDAR) does not need to be prepared as part of the proposal.

With reference to the vegetation mapping prepared for the Sydney Metropolitan Area (OEH 2013), the subject site and vegetation that occurs in close proximity has been mapped as containing the following vegetation communities:

- Castlereagh Ironbark Forest
- Cumberland Riverflat Eucalypt Forest
- Urban Exotic/Native.

For reference, the distribution of these communities has been illustrated on Figure 4.

### **3. Site inspection and methodology**

The subject site was inspected by Stephen Bloomfield (B.App.Sc.) on 21 March 2018. The weather conditions experienced during this investigation were predominantly overcast skies, strong winds, mild temperatures (23 °C) and light showers. It is noted that the area had received heavier rain falls leading up to the site inspection.

The site inspection commenced at 10:45 am and lasted for approximately one-and-a-half hours. Given the physical condition and size of the subject site this length of time is considered more than adequate when endeavouring to determine the diversity of native species present, their associated habitats and vegetation associations, and the conservation status of each of these. Whilst the majority of the site was able to be accessed, given the presence of a fence and the amount of water flowing within the drainage line, a portion of the site was unable to be traversed. However, to overcome this limitation this area was observed from the other side of the fence. No significant limitations to the success of the field survey were encountered.

As application of the BAM was not required, no floristic or vegetation integrity plots were prepared. Similarly, given the disturbed nature of the habitat present within the subject site no specific fauna survey methods (i.e. spotlighting, echolocation detection) were employed.

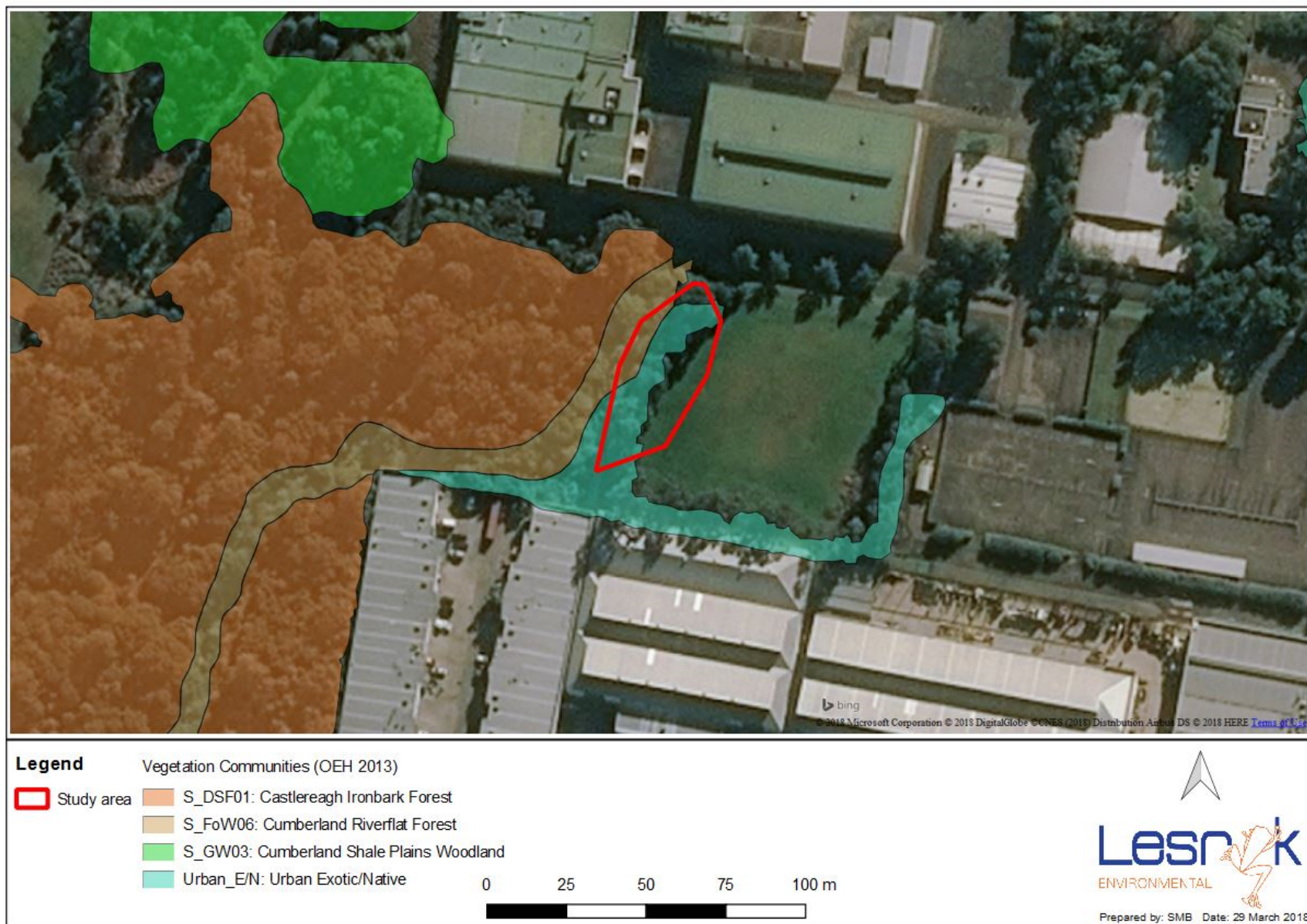
### **4. Results**

#### **4.1. Flora and fauna species recorded**

By the completion of the field survey a number of plants, the majority of which are native species, had been recorded (Attachment 3). It is noted that Attachment 3 is not intended to be a comprehensive list of all of the species present within the subject site, and only represents those plants that were recorded while undertaking searches for:

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





**Figure 4.** Vegetation communities mapped within the subject site

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Given the modified, cleared and urban character of the subject site few animal species were recorded. Those observed or heard calling were the:

- Rainbow Lorikeet (*Trichoglossus haematodus*)
- Noisy Miner (*Manorina melanocephala*)
- Superb Fairy-wren (*Malurus cyaneus*)
- Corella (*Cacatua sp.*)<sup>2</sup>
- Grey Fantail (*Rhipidura albiscapa*)
- Australian Raven (*Corvus coronoides*)
- Spotted Dove (*Streptopelia chinensis*)<sup>3</sup>.

In regards to those plants and animals identified, it is noted that none are listed, or currently being considered for listing, on the Schedules to the EPBC or BC Acts. Similarly, none are considered to be of regional conservation significance.

With regard to the plants recorded none are identified as a Rare or Threatened Australian Plant (ROTAP) (Briggs and Leigh 1996).

The native animals recorded during the site inspection are all protected under Schedule 5 of the BC Act, but considered to be common to abundant throughout, and well conserved within, the surrounding region. These species would not be solely reliant upon those habitats present within, or close to, the subject site, such that the proposed works would threaten the local occurrence of these animals. The animals recorded are all expected to be present within the areas investigated and surrounding locality post-development.

#### **4.1.1. Weeds**

Under the *Biosecurity Act 2015*, which came into effect on 1 July 2017, 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.'

Of those introduced plant species recorded, three are listed under Schedule 3 of the NSW Biosecurity Regulation 2017. With reference to DPI (2018), these three weeds and one other are listed as 'priority weeds' in the Greater Sydney region (which includes the Cumberland LGA). For reference, these species, their status and relevant duty are provided in Table 1.

Three of the weeds listed in Table 1, Lantana, Bridal Creeper and Asparagus Fern are all included on the list of Weeds of National Significance (WONS) (DEE 2018), which is part of a combined State and Commonwealth initiative to combat invasive species.

Where any of the weeds listed in Table 1 occur on site, they must be controlled to result in their suppression. This should be done prior to the work occurring to avoid any further spread of these plants.

#### **4.2. Vegetation communities and fauna habitats recorded**

The subject site consists of:

- exotic grassland with mature native trees
- tall shrubland
- drainage line.

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<sup>2</sup> Species could not be identified as only the call was heard.

<sup>3</sup> This bird is introduced.

**Table 1.** Weeds of significance recorded on site

Species	Listed	Duty
Green Cestrum <i>Cestrum parqui</i>	DPI (2018)	<b>Regional Recommended Measure</b> Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.
Lantana <i>Lantana camara</i>	Biosecurity Regulation 2017 DPI (2018) WONS	<b>Prohibition on dealings</b> Must not be imported into the State or sold.
Bridal Creeper <i>Asparagus asparagoides</i>	Biosecurity Regulation 2017 DPI (2018) WONS	<b>Prohibition on dealings</b> Must not be imported into the State or sold.
Asparagus Fern <i>Asparagus aethiopicus</i>	Biosecurity Regulation 2017 DPI (2018) WONS	<b>Prohibition on dealings</b> Must not be imported into the State or sold.

#### 4.2.1. Exotic grassland with mature native trees

The exotic grassland consists of a high density layer of exotic grasses, forbs, sub-shrubs and herbs, these reaching 0.3 m in height. Common species include Kikuyu Grass (*Cenchrus clandestinus*), Paspalum (*Paspalum dilatatum*), Purpletop (*Verbena bonariensis*), Lamb's Tongue (*Plantago lanceolata*), Paddy's Lucerne (*Sida rhombifolia*), Carolina Mallow (*Modiola caroliniana*) and Farmers Friend (*Bidens pilosa*). The native Couch (*Cynodon dactylon*) and *Einadia* sp. is also present.

The native trees occur as a linear strip above the exotic grassland and reach a height of around 15 m to 20 m. The species present include Cabbage Gum (*Eucalyptus amplifolia*), Grey Box (*Eucalyptus moluccana*), Swamp She-Oak (*Casuarina glauca*), Illawarra Flame Tree (*Brachychiton acerifolius*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*). It is considered that the latter two species have been planted.

Some smaller Sydney Green Wattle (*Acacia decurrens*) are present, these reaching a height of 5 m.

It is noted that none of the mature trees present contain any noticeable hollows suitable for the life-cycle requirements of animals.

#### Conservation significance and habitat importance

The exotic grassland component is of no conservation significance. However, with reference to OEH (2013), the trees present are considered to conform to a degraded example of Cumberland Riverflat Forest. Cumberland Riverflat Forest is a component of River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (hereafter referred to as River-flat Eucalypt Forest), this being listed as an Endangered ecological community under the BC Act.

To further consider the potential impact of the proposed works on River-flat Eucalypt Forest an assessment referring to the criteria provided in association with Section 7.3 of the BC Act has been undertaken (Attachment 4).

This habitat type is of no importance to native fauna, particularly those animals of conservation concern previously recorded in the study region.

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#### 4.2.2. Tall shrubland

The tall shrubland is around 5 m tall and occurs on the eastern bank of the drainage line. It consists of a mixture of shrubs and small trees such as the native Ball Honeymyrtle (*Melaleuca nodosa*) and the exotics Lantana (*Lantana camara*), Privet (*Ligustrum spp.*) and Cockspur Coral Tree (*Erythrina crista-galli*). Isolated emergent Prickly-leaved Tea Tree (*Melaleuca styphelioides*) that reach 12 m tall are also present.

An understorey is absent whilst the groundcover consists of a sparse cover of predominantly exotic species, including Wandering Jew (*Tradescantia fluminensis*).

##### *Conservation significance and habitat importance*

Whilst impacted by weeds, with reference to OEH (2013), the tall shrubland present is considered to conform to a degraded example of Castlereagh Ironbark Forest. Castlereagh Ironbark Forest is a component of Cooks River/Castlereagh Ironbark Forest in the Sydney Basin (hereafter referred to as Cooks River/Castlereagh Ironbark Forest), this being listed as a critically endangered ecological community under the EPBC Act and an endangered ecological community under the BC Act.

To further consider the potential impact of the proposed works on Cooks River/Castlereagh Ironbark Forest assessments referring to the criteria provided under the EPBC Act (i.e. Significant Impact Guidelines) and Section 7.3 of the BC Act have been undertaken (Attachment 4).

A number of small birds are considered to utilise this habitat type for shelter and foraging purposes. However, this habitat type is not of high importance to native fauna, particularly those animals of conservation concern previously recorded in the study region.

#### 4.2.3. Drainage line

The drainage line, which was flowing at the time of the field survey, is around 3 m wide and consists of an earthen bed and banks. The depth was unable to be determined due to the volume of water experienced at the time of the site inspection and its turbidity. A small concreted headwall (around 0.5 m) is present, this creating a small fall. Some small pool and riffle areas are also present.

The drainage channel flows in a north-easterly direction where it enters twin pipe culverts (around 1 m diameter) at the northern limits of the subject site and flows underneath the industrial area of the property. The bank at this area has been concreted to, presumably, prevent scouring and erosion when the drainage channel swells with water in times of heavy flow.

Where the drainage line does not occur within the tall shrubland environment, some emergent aquatic vegetation is present, this being a small patch of Cumbungi (*Typha orientalis*) that reaches 1.5 m in height. The native Knotweed (*Persicaria sp.*) and the exotic Large-leaved Pennywort (*Hydrocotyle bonariensis*) also occur.

The drainage line does not appear on topographic mapping that encompasses the subject site nor is it identified as a 'watercourse' by DPI (email correspondence between Mr Benjamin Barrett [Sparks and Partners and Mr Jarrod Grimston [DPI] - 07/09/18).

##### *Conservation significance and habitat importance*

The drainage line is of no conservation significance.

Common fish species, such as Eels (*Anguilla spp.*), and frogs (i.e. Common Eastern Froglet [*Crinia signifera*]) are considered to utilise this water body. However, this habitat type is not of high importance to native fauna, particularly those animals of conservation concern previously recorded in the study region.



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No further consideration of the NSW *Fisheries Management Act 1994* is considered necessary.

## **5. Consideration of impact**

The proposed works are expected to result in the removal of 1300 m<sup>2</sup> of degraded vegetation. A portion of this vegetation conforms to:

- River-flat Eucalypt Forest (1100 m<sup>2</sup>)
- Cooks River/Castlereagh Ironbark Forest (200 m<sup>2</sup>)

Based on the outcomes of those assessments undertaken on River-flat Eucalypt Forest and Cooks River/Castlereagh Ironbark Forest (Attachment 4), no significant impact is considered likely to occur.

No habitat important to the occurrence of those plants and animals listed under the EPBC and BC Acts that have been previously recorded in the study region was identified. No threatened flora species are likely to occur and no threatened fauna would utilise or be reliant upon any portion of the subject site for their lifecycle requirements. As such, no threatened flora or fauna species, or their populations, are expected to be adversely affected by the proposed works.

Whilst a small stand of shrubland/woodland is to be removed, this occurs at the edge of a larger stand of taller intact woodland; the undertaking of the proposed work would not fragment or isolate any areas of habitat, nor present any barriers to the breeding or dispersal requirements of native species.

Currently 21 Key Threatening Processes (KTP[s]) are listed under the EPBC Act, whilst 35 for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the following would be applicable to the proposed works:

- land clearance (EPBC Act)
- alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands (as described in the final determination of the Scientific Committee to list the threatening process) (BC Act)
- clearing of native vegetation (BC Act)
- invasion, establishment and spread of Lantana (BC Act)
- invasion of native plant communities by exotic perennial grasses (BC Act).

The proposed work is not considered to significantly contribute to these KTP's.

In regard to the biodiversity area mapped under the Parramatta LEP as occurring in proximity to the subject site, it is noted that the proposed works have been designed and sited to avoid the majority of this area. Whilst this is the case, the works are expected to have a minor adverse impact on the eastern edge of this biodiversity area. The impact will be restricted to a small amount of clearing of shrubland that is degraded and suffering from weed invasion as a result of urban stormwater runoff and edge effects.

It is noted that this area of 'biodiversity' contains Cooks River/Castlereagh Ironbark Forest, this being listed as a critically endangered ecological community under the EPBC Act and an endangered ecological community under the BC Act. With reference to the outcome of those assessments undertaken on Cooks River/Castlereagh Ironbark Forest (Attachment 4), no significant impact is considered likely to occur.

With reference to clause 6.4 '*Biodiversity protection*' of the Parramatta LEP, the proposed works are not considered to have an adverse impact on:

- regionally significant species of fauna and flora or habitat
- habitat elements providing connectivity.

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## 6. Conclusions

By the completion of the field inspection two ecological communities listed under either the EPBC and/or BC Acts had been recorded, these being:

- Cooks River/Castlereagh Ironbark Forest (listed as critically endangered under the EPBC Act and endangered under the BC Act)
- River-flat Eucalypt Forest (listed as endangered under the BC Act).

Assessments referring to the criteria provided under the EPBC Act (i.e. Significant Impact Guidelines) and Section 7.3 of the BC Act were undertaken to further consider the potential impact of the proposed works on these ecological communities. These assessments determined that the proposed works would not have a significant impact on either community.

No flora or fauna species listed under the Schedules of the EPBC or BC Acts were recorded within, or in close proximity to, the subject site. Similarly, none would be reliant upon the subject site for any of their necessary lifecycle requirements. As such, no assessments using the criteria provided under the EPBC Act (i.e. Significant Impact Guidelines) or Part 7 of the BC Act were carried out.

The undertaking of the proposed works would not remove or significantly affect any habitats of local, regional, state or national conservation concern. As such, the proposed works would not have a significant impact on any ecological communities, plants or animals of national, state or regional significance.

The undertaking of the proposal can proceed as planned without requiring the referral of the matter to the Federal Minister for the Environment and Energy or the preparation of a BDAR.

## 7. Recommendations

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

- Those woodland patches that are to be retained should be fenced prior to and during construction, and marked up on a plan and provided to the works contractor. No personnel or machinery should enter or disturb in any way any of these areas.
- Sediment and erosion control features should:
  - be erected prior to any clearing of vegetation or construction works
  - not be removed until the completion of construction works and all exposed surfaces have been stabilised
  - be monitored to ensure compliance to an effective standard.
- In accordance with the NSW *Biosecurity Act 2015*, those weeds of significance identified on site must be controlled to result in their suppression.
- Any exposed areas should be mulched and revegetated as soon as possible to prevent soil erosion.

If you require any further information on this matter, please do not hesitate to contact the undersigned on either (02) 9523 2016 or 0404 803 409.

Yours sincerely,



Stephen Bloomfield  
Senior Ecologist  
Lesryk Environmental Pty Ltd

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## 8. Bibliography

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- Simpson, K and Day, N 2008, *Field guide to the birds of Australia*, 7<sup>th</sup> Edition, Penguin Books Australia, Victoria



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## **ATTACHMENT 1. Photographic record of the subject site**



**Plate 1.** The exotic grassland with a line of eucalypts and other plantings. Photograph taken looking north-west



**Plate 2.** The modified character of the subject site. The tall shrubland is shown on the left and the row of trees on the right. Photo taken looking north.





**Plate 3.** The character of the tall shrubland. the fence is presumably the boundary of the 'biodiversity' area mapped by Council in the LEP.



**Plate 4.** The weed infested character of the riparian vegetation and drainage line at its inlet. Photo taken looking south/south-west.





**Plate 5.** The modified character of the drainage line inlet. Photo taken looking east.



**Plate 6.** The character of the drainage line and riparian vegetation. Heavy flow is evident.



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## **ATTACHMENT 2. Biodiversity Values Map and Threshold Tool**

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(subject site indicated by blue polygon)

## Biodiversity Offset Scheme (BOS) Entry Threshold Map



0.7 0 0.36 0.7 Kilometers

GCS\_GDA\_1994

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

### Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

### Notes

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## Biodiversity Values Map and Threshold Report

### Results Summary

<b>Date of Calculation</b>	26/11/2018 9:46 AM	<b>BDAR Required*</b>
<b>Total Digitised Area</b>	0.4 ha	
<b>Minimum Lot Size Method</b>	Lot size	
<b>Minimum Lot Size</b>	10.03 ha	
<b>Area Clearing Threshold</b>	0.5 ha	
<b>Area clearing trigger</b> Area of native vegetation cleared	Unknown #	Unknown #
<b>Biodiversity values map trigger</b> Impact on biodiversity values map(not including values added within the last 90 days)?	no	no

\*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor> to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species" as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

# Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.


## Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies with all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

## Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature  Date: 26/11/2018 09:46 AM

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### **ATTACHMENT 3. Flora species recorded**

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#### **Key**

\* - introduced species

<sup>s</sup> - significant weed



FAMILY	Scientific Name	Common Name
<b>PINOPSIDA</b>		
Cupressaceae	<i>Cupressus sp. *</i>	A Cypress
<b>MAGNOLIOPSIDA - DICOTYLEDONS</b>		
Apiaceae	<i>Hydrocotyle bonariensis *</i>	Large-leaved Pennywort
Asclepiadaceae	<i>Araujia hortorum *</i>	Moth Plant
Asteraceae	<i>Bidens pilosa *</i>	Farmers Friend
	<i>Conyza bonariensis *</i>	Fleabane
	<i>Ozothamnus diosmifolius</i>	White Dogwood
	<i>Taraxacum officinale *</i>	Dandelion
Casuarinaceae	<i>Casuarina glauca</i>	Swamp She-Oak
Chenopodiaceae	<i>Einadia sp.</i>	
Commelinaceae	<i>Tradescantia fluminensis *</i>	Wandering Jew
Crassulaceae	<i>Crassula multicava</i> subsp. <i>multicava *</i>	Shade Crassula
Fabaceae: Caesalpinieae	<i>Senna pendula</i> var. <i>glabrata *</i>	Cassia
Fabaceae: Faboideae	<i>Daviesia ulicifolia</i> subsp. <i>ulicifolia</i>	Gorse Bitter-pea
	<i>Erythrina crista-galli *</i>	Cockspur Coral Tree
Fabaceae: Mimosoideae	<i>Acacia decurrens</i>	Sydney Green Wattle
	<i>Acacia longiflora</i> var. <i>longifolia</i>	Sydney Golden Wattle
Lobeliaceae	<i>Pratia purpurascens</i>	
Malvaceae	<i>Brachychiton acerifolius</i>	Illawarra Flame Tree
	<i>Modiola caroliniana *</i>	Carolina Mallow
	<i>Sida rhombifolia *</i>	Paddy's Lucerne
Myrtaceae	<i>Callistemon sp.</i>	Bottlebrush
	<i>Eucalyptus amplifolia</i>	Cabbage Gum
	<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark
	<i>Eucalyptus moluccana</i>	Grey Box
	<i>Eucalyptus tereticornis</i>	Forest Red Gum
	<i>Melaleuca nodosa</i>	Ball Honey Myrtle
	<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark
	<i>Melaleuca styphelioides</i>	Prickly-leaved Tea Tree
Ochnaceae	<i>Ochna serrulata *</i>	Ochna
Oleaceae	<i>Ligustrum lucidum *</i>	Large-leaved Privet
	<i>Ligustrum sinense *</i>	Small-leaved Privet
Pittosporaceae	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Blackthorn
Plantaginaceae	<i>Plantago lanceolata *</i>	Lamb's Tongue
Polygonaceae	<i>Persicaria sp.</i>	Knotweed
Proteaceae	<i>Grevillea robusta *</i>	Silky Oak
Ranunculaceae	<i>Clematis aristata</i>	Traveller's Joy
Salicaceae	<i>Salix sp. *</i>	A Willow
Solanaceae	<i>Cestrum parqui *<sup>S</sup></i>	Green Cestrum
	<i>Solanum pseudocapsicum *</i>	Jerusalem Cherry
Verbenaceae	<i>Lantana camara *<sup>S</sup></i>	Lantana
	<i>Verbena bonariensis *</i>	Purpletop
	<i>Verbena sp. *</i>	
<b>MAGNOLIOPSIDA - MONOCOTYLEDONS</b>		
Asparagaceae	<i>Asparagus asparagoides *<sup>S</sup></i>	Bridal Creeper
	<i>Asparagus aethiopicus *<sup>S</sup></i>	Asparagus Fern
Cyperaceae	<i>Cyperus eragrostis *</i>	
Iridaceae	<i>Dietes sp. *</i>	
Lomandraceae	<i>Lomandra longifolia</i>	Mat Rush
Phormiaceae	<i>Dianella caerulea</i> var. <i>caerulea</i>	Blue Flax Lily
Poaceae	<i>Aristida vagans</i>	Three-awn Speargrass
	<i>Bromus catharticus *</i>	Prairie Grass
	<i>Cenchrus clandestinus *</i>	Kikuyu Grass
	<i>Cynodon dactylon</i>	Couch
	<i>Ehrharta erecta *</i>	Panic Veldt Grass
	<i>Eragrostis curvula *</i>	African Love Grass
	<i>Microlaena stipoides</i>	Weeping Grass
	<i>Paspalum dilatatum *</i>	Paspalum
Typhaceae	<i>Typha orientalis</i>	Cumbungi

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## **ATTACHMENT 4. Ecological assessments**

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**1 Commonwealth - Environment Protection and Biodiversity Conservation Act 1999**

By the completion of the field investigation, Cooks River/Castlereagh Ironbark Forest, listed as a critically endangered ecological community under this Act, had been recorded.

The Significant Impact Guidelines prepared under the EPBC Act (DE 2013) are used to determine whether the action (i.e. the proposed works) has, will have, or is likely to have a significant impact on this MNES and, as such, whether the undertaking of the proposal would require referral of the matter to the Federal Minister for the Environment and Energy for further consideration or approval.

**1. (a) Cooks River/Castlereagh Ironbark Forest – critically endangered ecological community**

*An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:*

- *reduce the extent of an ecological community*

The proposed works will result in the potential disturbance of around 200 m<sup>2</sup> of degraded Cooks River/Castlereagh Ironbark Forest. No characteristic canopy trees within this community are expected to be removed. As such, the proposal will have a minor impact on this critically endangered ecological community reducing its extent very marginally. This minor impact will not affect the long term survival of the community within the locality, with a larger better and well intact stand of Cooks River/Castlereagh Ironbark Forest present to the west of the subject site.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

While the stand of this ecological community may be minimally impacted upon, the works proposed are not considered to fragment or increase fragmentation of the critically endangered ecological community that is present.

- *adversely affect habitat critical to the survival of an ecological community*

Given the condition of the vegetation within the area that would be affected, it is considered that the proposal would not adversely affect habitat critical to the survival of Cooks River/Castlereagh Ironbark Forest.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The proposal is not considered to modify or destroy any abiotic factors necessary for the Cooks River/Castlereagh Ironbark Forest's survival.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting*

As some vegetation would be removed and leave a new edge of woodland exposed, there is the potential for weed encroachment. However, given the extent of current weed invasion, the site locality and current land use, the proposed works are not considered to contribute any further to what is the current state of the community.

The proposed work would not cause a substantial change in the species composition within the Cooks River/Castlereagh Ironbark Forest such that it would cause the decline or loss of functionally important species.

- 
- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
    - *assisting invasive species, that are harmful to the listed ecological community, to become established*

As some vegetation would be removed and leave a new edge of woodland exposed, there is the potential for weed encroachment. However, given the extent of current weed invasion, the site locality and current land use, the proposed works are not considered to contribute any further to what is the current state of the community.

Given that invasive species already occur in and around the Cooks River/Castlereagh Ironbark Forest stand it is unlikely that further establishment beyond the disturbance zone would be significant.

- *or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community*

The proposed work would not cause the regular mobilisation of fertilisers, herbicides or other chemicals or pollutants that would be harmful to the Cooks River/Castlereagh Ironbark Forest.

- *or interfere with the recovery of an ecological community.*

It is considered that the level of disturbance represented by the proposed action would not significantly interfere with the recovery of this community.

## **Conclusion**

The proposal is not considered to have a significant impact on the Cooks River/Castlereagh Ironbark Forest critically endangered ecological community, As such, it is not considered necessary that the matter be referred to the Federal Minister for the Environment and Energy for further consideration or approval.

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## 2. State - *Biodiversity Conservation Act 2016*

By the completion of the field investigation, two ecological communities listed as endangered under this Act had been recorded, these being:

- River-flat Eucalypt Forest
- Cooks River/Castlereagh Ironbark Forest.

The potential impacts associated with the proposed work on these two endangered ecological communities is considered with reference to the assessment criteria provided under Section 7.3 of the BC Act. These criteria consider factors that trigger the likelihood of a development to have a significant effect on threatened ecological communities, species or their habitats, and consequently whether a BDAR is required.

### 2. (a) Five-part test – River-flat Eucalypt Forest

*(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,*

River-flat Eucalypt Forest is an endangered ecological community not a threatened species.

*(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*

The proposed works will result in the potential disturbance of around 1100 m<sup>2</sup> of degraded River-flat Eucalypt Forest. As such, the proposal will have a minor impact on this endangered ecological community reducing its extent very marginally. This minor impact will not affect the long term survival of the community within the locality.

The minor disturbance associated with the work is unlikely to place the local occurrence of the River-flat Eucalypt Forest community at risk of extinction.

- (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 work is not considered to adversely modify the composition of the River-flat Eucalypt Forest present such that its local occurrence would 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 work will result in the removal of around 1100 m<sup>2</sup> of degraded River-flat Eucalypt Forest.

- (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 stand of River-flat Eucalypt Forest in this locality is already heavily fragmented and isolated by the previous and current land use practices. Given the scale of the proposal, the scope of works are not considered to result in the further fragmentation or isolation of this endangered ecological community.

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*(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,*

Given the limited structure and value of this ecological community in its current state and the pressures placed on it from previous and current land use practices, it is not considered that the habitat to be removed is vital to the long-term survival of the River-flat Eucalypt Forest in this 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),*

No declared areas of outstanding biodiversity value would be directly or indirectly affected by the proposal. The subject site is not listed as a declared area of outstanding biodiversity value under Part 3 of the Biodiversity Conservation Regulation 2017.

*(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process*

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the 'clearing of native vegetation', 'invasion, establishment and spread of Lantana' and 'invasion of native plant communities by exotic perennial grasses' would be applicable to the proposal in regard to River-flat Eucalypt Forest. While this is the case, given the amount of clearing proposed as well as the pressures placed on the site from previous and current land use practices, it is not considered that the proposal would significantly contribute to a KTP such that the local or regional presence of the River-flat Eucalypt Forest endangered ecological community would be compromised.

### **Expected impact on the River-flat Eucalypt Forest**

Given its size, location and condition, the subject site's River-flat Eucalypt Forest is not considered significant for the conservation and preservation of this community in the locality. Therefore, no significant areas of local or regional habitat would be removed or affected by the proposal. The expected impacts associated with the proposal on the River-flat Eucalypt Forest are considered to be minimal and therefore the preparation of a BDAR is not considered necessary.

## **2. (b) Five-part test – Cooks River/Castlereagh Ironbark Forest**

*(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,*

Cooks River/Castlereagh Ironbark Forest is an endangered ecological community not a threatened species.

*(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*

The proposed works will result in the potential disturbance of around 200 m<sup>2</sup> of degraded Cooks River/Castlereagh Ironbark Forest. As such, the proposal will have a minor impact on this endangered ecological community reducing its extent very marginally. This minor impact will not affect the long term survival of the community within the locality.



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The minor disturbance associated with the work is unlikely to place the local occurrence of the Cooks River/Castlereagh Ironbark Forest community at risk of extinction.

*(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 work is not considered to adversely modify the composition of the Cooks River/Castlereagh Ironbark Forest present such that its local occurrence would 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 work will result in the removal of around 200 m<sup>2</sup> of degraded Cooks River/Castlereagh Ironbark Forest.

*(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 stand of Cooks River/Castlereagh Ironbark Forest in this locality is already heavily fragmented and isolated by the previous and current land use practices. Given the scale of the proposal, the scope of work is not considered to result in the further fragmentation or isolation of this endangered ecological community.

*(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,*

Given the limited structure and value of this ecological community in its current state and the pressures placed on it from previous and current land use practices, it is not considered that the habitat to be removed is vital to the long-term survival of the Cooks River/Castlereagh Ironbark Forest in this 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),*

No declared areas of outstanding biodiversity value would be directly or indirectly affected by the proposal. The subject site is not listed as a declared area of outstanding biodiversity value under Part 3 of the Biodiversity Conservation Regulation 2017.

*(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process*

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the 'clearing of native vegetation', 'invasion, establishment and spread of Lantana' and 'invasion of native plant communities by exotic perennial grasses' would be applicable to the proposal in regard to Cooks River/Castlereagh Ironbark Forest. While this is the case, given the amount of clearing proposed as well as the pressures placed on the site from previous and current land use practices, it is not considered that these actions would significantly contribute to a KTP such that the local or regional presence of the Cooks River/Castlereagh Ironbark Forest endangered ecological community would be compromised.

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**Expected impact on the Cooks River/Castlereagh Ironbark Forest**

Given its size, location and condition, the subject site's Cooks River/Castlereagh Ironbark Forest is not considered significant for the conservation and preservation of this community in the locality. Therefore, no significant areas of local or regional habitat would be removed or affected by the proposed work. The expected impacts associated with the proposal on the Cooks River/Castlereagh Ironbark Forest are considered to be minimal and therefore the preparation of a BDAR is not considered necessary.