



Ecological Assessment

for

vegetation removal

for

the installation of a feeder through

areas of natural vegetation at

Georges River National Park,

Revesby.

Prepared for:

AUSGRID

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Pre-clearance Ecological Survey for Vegetation Removal for the replacement of an obsolete feeder through a section of natural bushland at Georges River National Park, Revesby

Date surveyed: 11.05.2018

Project Name: Ecological Assessment for vegetation removal for subterranean trenching of new feeder at Georges River National Park, Revesby Heights, and associated works

Ausgrid representative: Mr Matthew Gencur

ACS Environmental representative: Mr P Stricker

1 Required works and potential impacts to vegetation:

Ausgrid is planning to upgrade key parts of the current electricity network through an area of Georges River National Park to ensure the continuation of a safe and reliable power supply to residences serviced by the substation that occurs in combination with the Transgrid Sydney South Substation in Georges River National Park.

A new feeder is proposed to be trenched from Kennedy Street, Revesby Heights, to the substation through the National Park to replace an old line that has become obsolete but will require the necessary clearance from existing underground feeders. The new feeder will mostly be trenched through exotic grassland and degraded bushland but will also traverse through about 140m of natural bushland, some 1,000m² of which will require clearing to accommodate the trench which is about 1m deep and 1m in width.

Figure 1 is an aerial image that indicates the direction of the feeder from Kennedy Street, Revesby Heights, to the Sydney South Substation located in the Georges River National Park in a local context

Figure 2 indicates the extent of the required works that will include the removal of natural bushland vegetation

Figures 3 & 4 indicates the nature of the open woodland/scrub vegetation through which the trench will traverse,

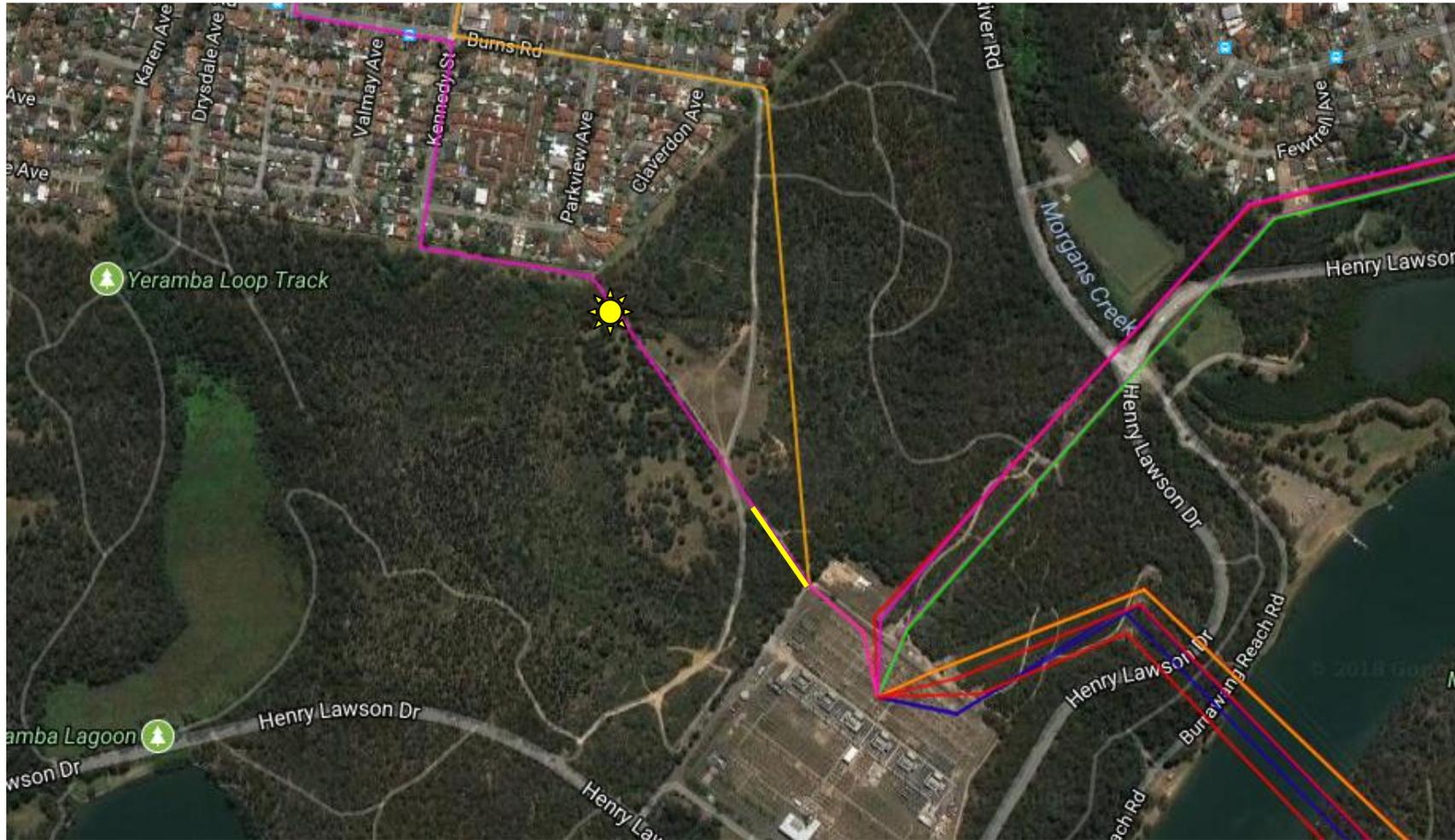


Figure 1 - Aerial image of subject area indicating the proposed route of the feeder from Kennedy Street, Revesby Heights, to the Sydney South Substation (marked in purple outline) requiring some trenching through bushland (bold yellow outline) for the works to occur



Figure 2 – Proposed area of bushland required to be removed/trimmed for trenching works at Georges River National Park, Revesby Heights, to install the new 132kV line to the substation shown at the south-east section of the image (sourced from SIXmaps OEH 2018).



Figure 3 - Indicates the natural low open woodland/scrub vegetation that occurs alongside the access track to the substation, the pink flagged stakes (to centre RHS in image) indicate the centre-line of the Ausgrid easement, the vegetation occurring 5m to the LHS of these stakes is proposed for clearing to allow the trenching works to occur.



Figure 4 - Indicates the distance of 5m into the bushland from the pink flagged stake that the vegetation will require removing for the works to occur

2 Methodology

All trees and other vegetation occurring along the proposed 132kV feeder route (Figures 1, 2 & 3) will require complete removal to allow for the trenching footprint (1m deep by 1m in width), with vegetation to a further distance of 4m into the bushland required to be trimmed to ground level to allow vehicular and machinery access to construct the trench.

All requirements of the document 'Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft)' (DEC, 2004) were undertaken for the survey and observations or potential of occurrence of any threatened species of flora and/or fauna was noted.

3 Environmental context:

The geology of the substrates that the subject feeder line traverses appears to occur near the boundary of the Ashfield Shale of the Wianamatta Group of shales and the upper sediments of the Hawkesbury Sandstone (Herbert 1983).

The Soil Landscape of the subject land occurs at the boundary of the residual Blacktown Soil Landscape and the colluvial Hawkesbury Soil Landscape Group (Chapman & Murphy 1989).

Soils are generally shallow sandy loams on broad ridges associated with Mittagong Sandstones (upper layers of Hawkesbury Sandstone) or rocky exposed Hawkesbury Sandstone (OEH 2013).

4 Plant community type and status:

The local plant community along which the new feeder traverses is 'Sydney Hinterland Exposed Sandstone Woodland' (Figure 5) (S_DSF15; OEH 2013). This community is an exposed sandstone vegetation distributed across the central and north-western Woronora Plateau. It comprises a low-growing woodland with dense shrub layer and open ground layer of forbs, sedges and grasses (OEH 2013).

This community is dominated by low trees to 10m tall of Red Bloodwood (*Corymbia gummifera*) with Broad-leaved Scribbly Gum (*Eucalyptus haemastoma*) occurring less frequently.

Tick Bush (*Kunzea ambigua*) and Silky Needle Bush (*Hakea sericea*) are the most common species occurring in the shrub layer to 70% cover with other shrubs occurring in less frequency including Rock Banksia (*Banksia oblongoifolia*), Bossiaea heterophylla, Prickly Conesticks (*Petrophile sessilis*), Common Phyllota (*Phyllota phyllicoides*), Red Spider Flower (*Grevillea oleioides*), Pink Spider Flower (*Grevillea sericea*), Flax Wattle (*Acacia linifolia*), Sweet-scented Wattle (*Acacia suaveolens*), Dwarf Apple (*Angophora hirsuta*), Prickly Beard-heath (*Leucopogon juniperinus*). A diverse array of native grasses and sedges occur in the ground layer (Table 1).

Table 1 is a list of all flora species recorded within the area of bushland proposed for removal or trimming to ground level.

The community is not listed on registers of the BC Act (2016) or the EPBC Act (1999) and is well conserved in Dharawal, Heathcote and Georges River National Parks (OEH 2013).

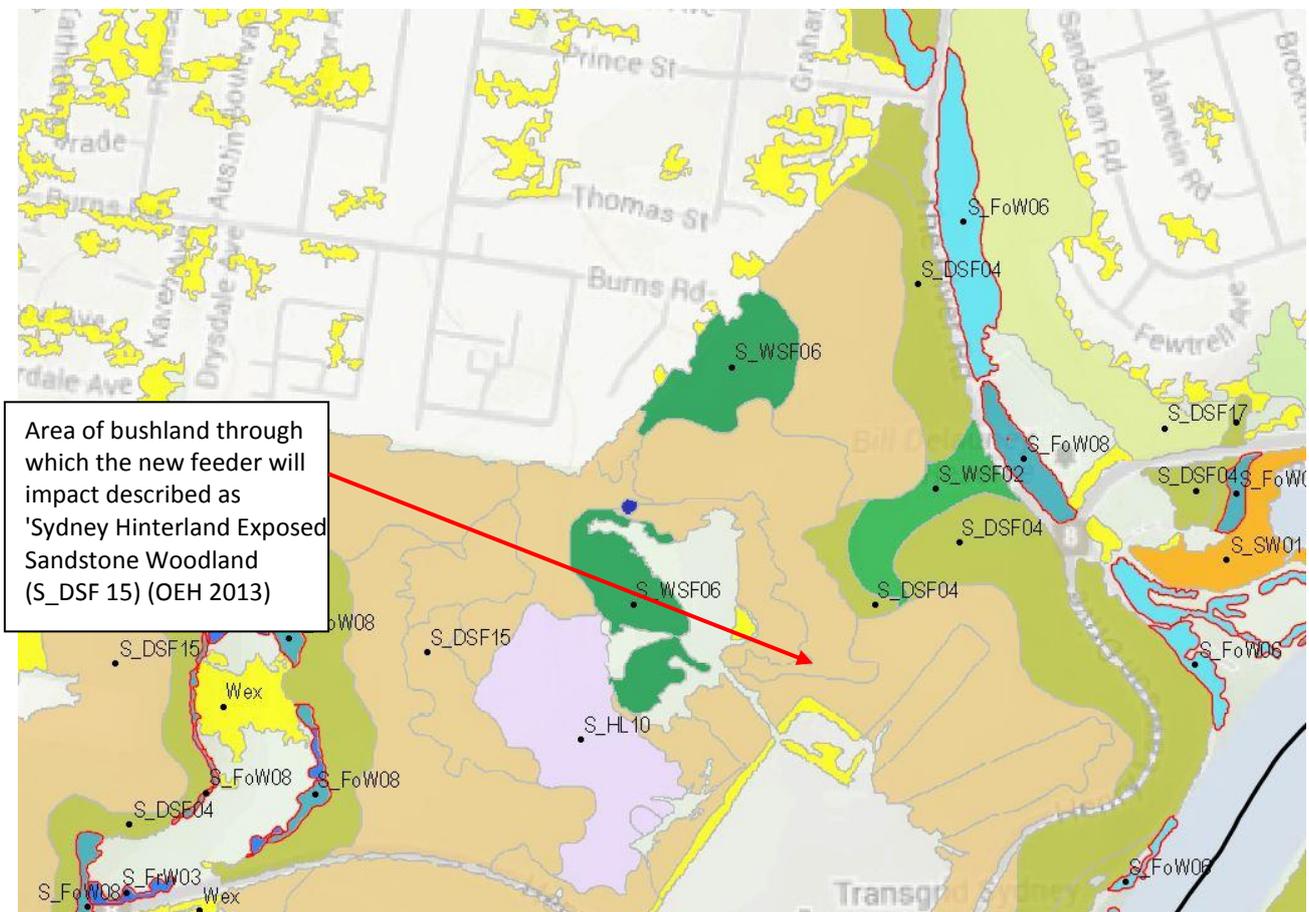


Figure 5 - OEH (2013) vegetation mapping of areas through which the new feeder will be trenced.

KEY

Vegetation: The ecological community is defined as 'Sydney Hinterland Exposed Sandstone Woodland' (S_DSF15) (OEH 2013). Species marked with an asterisk (*) are positively diagnostic for the community.

Estimated canopy cover in subject land (%)

Note that most species occur with a cover percentage of 1 - 5% except where indicated otherwise

STATUS	SCIENTIFIC NAME	COMMON NAME	SUBJECT LAND (~ 1000m ² in area)
	MAGNOLIOPSIDA: MAGNOLIDAE		
	Apiaceae		
	<i>Actinotus minor</i>	Lesser Flannel Flower	*
	Ericaceae		
	<i>Astroloma humifusum</i>	Cranberry Heath	
	<i>Leucopogon juniperinus</i>	Prickly Beard-heath	
	Fabaceae: Faboideae		
	<i>Bossiaea heterophylla</i>		*
	<i>Daviesia ulicifolia</i>	Gorse Bitter Bush	
	<i>Phyllota phyllicoides</i>	Heath Phyllota	*
	Mimosaceae		
	<i>Acacia linifolia</i>	Flax-leaf Wattle	*
	<i>Acacia myrtifolia</i>	Myrtle Wattle	*
	<i>Acacia parramattensis</i>	Parramatta Green Wattle	
	<i>Acacia suaveolens</i>	Sweet Wattle	*
	Myrtaceae		
	<i>Angophora hispida</i>	Dwarf Apple	*
	<i>Corymbia gummifera</i>	Red Bloodwood	30% cover (*)
	<i>Eucalyptus haemastoma</i>	Broad-leaved Scribbly Gum	*
	<i>Kunzea ambigua</i>	Tick Bush	40% cover
	<i>Leptospermum trinervium</i>	Paperbark Teatree	*

STATUS	SCIENTIFIC NAME	COMMON NAME	SUBJECT LAND (~ 1000m ² in area)
	Proteaceae		
	<i>Banksia oblongifolia</i>	Rock Banksia	
	<i>Grevillea buxifolia</i> subsp. <i>buxifolia</i>	Grey Spider Flower	*
	<i>Grevillea oleoides</i>	Red Spider Flower	
	<i>Grevillea sericea</i>	Pink Spider Flower	*
	<i>Hakea sericea</i>	Silky Needle-bush	10% cover (*)
	<i>Petrophile sessilis</i>	Conesticks	*
	MAGNOLOPSIDA: LILIDAE		
	Cyperaceae		
	<i>Cyathochaeta diandra</i>	Sheath Rush	*
	<i>Lepidosperma laterale</i>	Variable Sword-sedge	*
	Iridaceae		
	<i>Patersonia sericea</i>	Silky Purple Flag	
	Lomandraceae		
	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush	*
	Phormiaceae		
	<i>Dianella caerulea</i> var. <i>producta</i>	Blue Flax Lily	
	Poaceae		
	<i>Aristida ramosa</i> var. <i>ramosa</i>	Threeawn Speargrass	
	<i>Aristida vagans</i>	Threeawn Speargrass	
	<i>Cymbopogon refractus</i>	Barb-wire Grass	
	<i>Entolasia marginata</i>	Bordered Panic	
	<i>Entolasia stricta</i>	Wiry Panic	*
	<i>Eragrostis brownii</i>	Browns Lovegrass	
	<i>Rytidosperma bipartitum</i>	Wallaby Grass	
	<i>Themeda australis</i>	Kangaroo Grass	
	Xanthorrhoeaceae		
	<i>Xanthorrhoea media</i>	Forest Grass-tree	*

Table 1 - Native flora species recorded within subject site in Georges River National Park along bushland route of proposed new feeder (Figures 1, 2, 3 & 4).

5 Threatened species:

Flora

A total of 11 threatened flora species have been recorded within a 10 x 10km area centred around the subject site. These species are listed in Table 2. Figure 5 indicates the location of some of these threatened species in relation to the subject area.

Family	Common name	Scientific name	NSW status	Comm. status	No. of records
Dilleniaceae		<i>Hibbertia sp. Bankstown</i>	E4A,P	CE	1
Ericaceae	Woronora Beard-heath	<i>Leucopogon exolasius</i>	V,P	V	1
Fabaceae (Faboideae)	Prickly Bush-pea	<i>Pultenaea aristata</i>	V,P	V	1
Fabaceae (Mimosoideae)	Bynoe's Wattle	<i>Acacia bynoeana</i>	E1,P	V	1
	Downy Wattle	<i>Acacia pubescens</i>	V,P	V	536
	Deane's Paperbark	<i>Melaleuca deanei</i>	V,P	V	3
Orchidaceae	Sydney Plains Greenhood	<i>Pterostylis saxicola</i>	E1,P,2	E	1
Proteaceae	Small-flower Grevillea	<i>Grevillea parviflora subsp. parviflora</i>	V,P	V	4
	Hairy Geebung	<i>Persoonia hirsuta</i>	E1,P,3	E	2
	Nodding Geebung	<i>Persoonia nutans</i>	E1,P	E	13
Thymelaeaceae	Spiked Rice-flower	<i>Pimelea spicata</i>	E1,P	E	1

Table 2 - Eleven (11) threatened flora species (BC Act; EPBC Act) that have been recorded within a 10 x 10km area centred around the subject site within the last 20 years (OEH 2018).

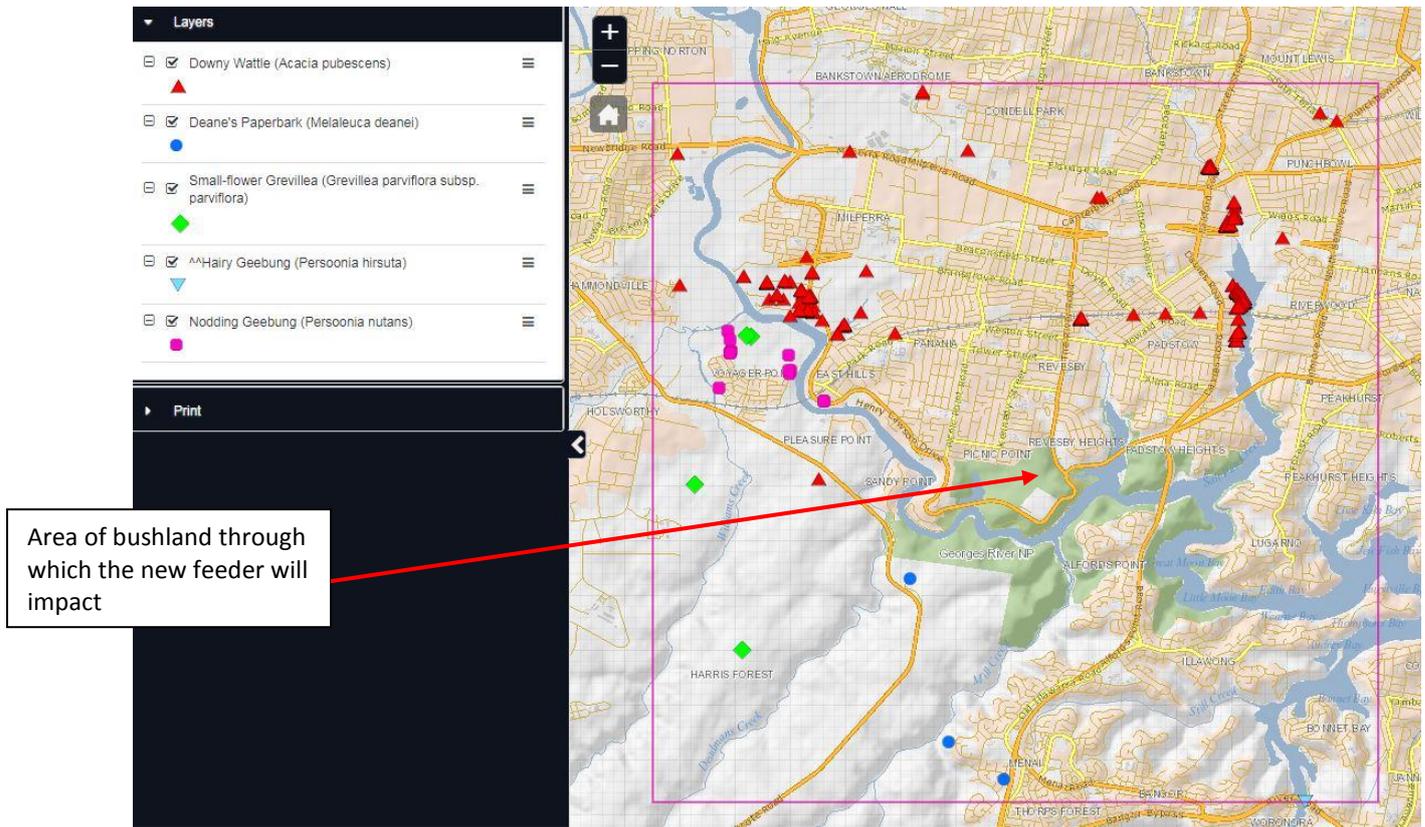


Figure 6 - Location of recorded sightings of 5 of the most recorded threatened flora species in the locality

Comment:

None of the threatened species listed in Table 2 were located within the area of bushland proposed to be cleared or trimmed. Most of the threatened species have been recorded further to the north-west at Milperra and Hammondville (Figure 6) and habitat is not considered suitable for most of these species.

Fauna

A total of 6 threatened fauna species have been recorded within a 10 x 10km area centred around the subject site. These species are listed in Table 3. Figure 7 indicates the location of some of these threatened fauna species in relation to the subject area.

Class and Family	Common name	Scientific name	NSW status	Comm. status	No. of records
Amphibia Hylidae	Green and Golden Bell Frog	<i>Litoria aurea</i>	E1,P	V	2
Aves Scolopacidae	Eastern Curlew	<i>Numenius madagascariensis</i>	P	CE,C,J,K	4
Psittacidae	Swift Parrot	<i>Lathamus discolor</i>	E1,P,3	CE	5
Mammalia Phascolarctidae	Koala	<i>Phascolarctos cinereus</i>	V,P	V	26
Pteropodidae	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V,P	V	46
Vespertilionidae	Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V,P	V	4

Table 3 - Six (6) threatened fauna species (BC Act; EPBC Act) that have been recorded within a 10 x 10km area centred around the subject site within the last 20 years (OEH 2018).

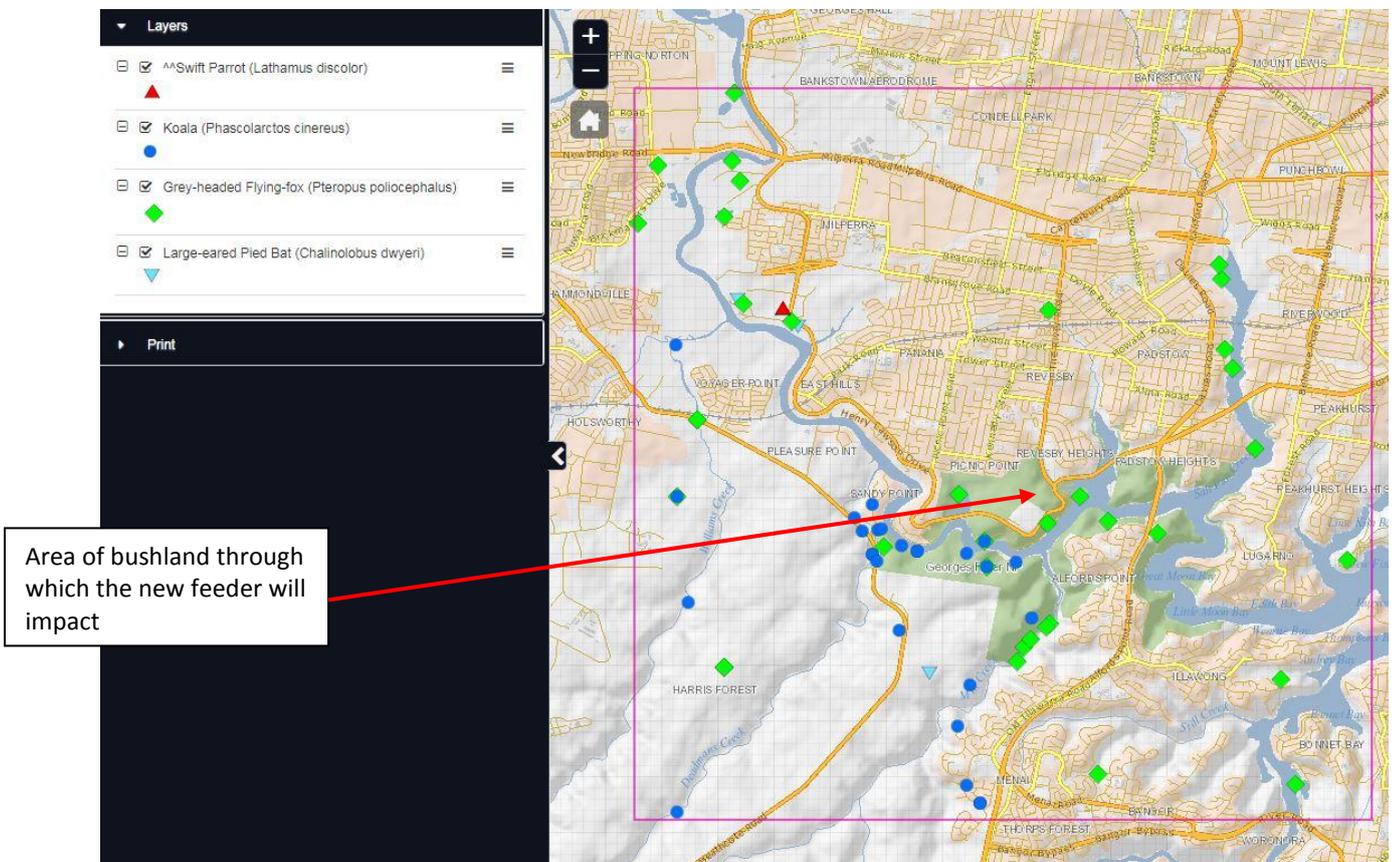


Figure 7 - Location of recorded sightings of 5 of the most recorded threatened fauna species in the locality

Comment:

The only threatened fauna species listed in Table 3 located close to the area of bushland proposed to be cleared or trimmed is the Grey-headed Flying Fox which feeds on the nectar of flowering eucalypts over wide range. This species will not be impacted by the proposal and nor would any of the other threatened fauna species.

6 Mitigation measures to be undertaken in relation to the construction of the new feeder route:

The following mitigation measures are recommended in relation to the proposal to clear vegetation and undertake trenching within Georges River National Park:

1. An ecologist should induct all contractors & supervise the clearing works to ensure that impacts on potential habitat are minimised and to mitigate any animal welfare issues.
2. Only those vehicles, machinery and small plant in good working order and with recent service history should be allowed on site. All fuel, lubricant and hydraulic lines and connectors to be inspected prior to entering site and ensure in good working order.
3. Refuelling of small plant (chainsaws, trimmers etc) onsite is allowed provided it is carried out in a bunded area at least 30 metres distant from any watercourse and all appropriate control measures and emergency spill kits in place. No refuelling of larger plant or vehicles is allowed on site.
4. Pathogen and weed spread will be controlled via the adoption of hygiene and disinfection controls in accordance with the:
 - NSW Frog Hygiene Protocol (DECC 2008)
 - Keeping it Clean – A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens (Allan and Gartenstein 2010). – Specifically the pages 20-25 “Hygiene protocols for vehicles and heavy machinery”
 - Myrtle Rust: Everyday Management (Department of Primary Industries 2011) (<http://www.dpi.nsw.gov.au/biosecurity/plant/myrtle-rust>).
5. Vegetation trimmed or cleared should be mulched and used on site.
6. Areas where vegetation has been trimmed to allow access to vehicles and machinery to undertake the trenching will most likely recover and not require augmented planting.

7. Soil that is excavated to install the new feeder will contain much soil-stored seed and should be stockpiled on site and used to infill the trench. As such, native revegetation through seeding and vegetative regeneration will be enhanced.
8. Augmented planting may have to be undertaken along the areas where trenching has removed all native vegetation. Species listed in Table 1 can be used for replanting or species listed in the characteristic assemblage for the community coded S_DS15 (OEH 2013) can ideally be used for augmented replanting.
9. Weed control that may be required post-construction and vegetative rehabilitation work should be undertaken by an appropriately qualified bush regenerator. Such supervisors must have a relevant Certificate IV or Diploma level qualification in bush regeneration.
10. At the area denoted by the yellow shaded star in Figure 1 (☀) there is an individual of Broad-leaved Scribbly Gum which appears to be a suitable habitat tree (Figure 8) and which is proximal to the line of proposed trenching. This individual should not be impacted and should be retained in good condition. Hand-digging around roots to restrict damage to the structural root zone (SRZ) is recommended to preserve this individual.



Figure 8 - Individual of Scribbly Gum which it is recommended to conserve by hand-digging around roots where practical.

7 Conclusions of ecological survey and assessment of new feeder route:

No threatened flora or fauna species, or threatened ecological communities, were noted to occur, or have the potential to occur, along the route of the new trenched 132kV feeder.

Vegetation trimmed or cleared for the construction should be mulched and used on site. The vegetation occurring in areas where it is required to be trimmed to allow access to vehicles and machinery to undertake the trenching, will most likely recover vegetatively or by seed regeneration and these areas not require augmented planting. Weed incursion into these areas requires periodic monitoring (every 3 months for up to 3 years) and weed removal and control must be implemented in these areas.

Soil that is excavated to install the new feeder will contain much soil-stored seed and should be stockpiled on site and used to infill the trench. As such, native revegetation through seeding and vegetative regeneration will be enhanced. Similarly, weed incursion into these areas requires periodic monitoring (every 3 months for up to 3 years) and weed removal and control must be implemented in these areas.

Augmented planting may have to be undertaken along the areas where trenching has removed all native vegetation. Species listed in Table 1 can be used for replanting or species listed in the characteristic assemblage for the community coded S_DS15 (OEH 2013) can ideally be used for augmented replanting.

8 References and literature reviewed:

DEC (2004) Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities

Fairley, A. (2004) *Seldom Seen – Rare Plants of Greater Sydney*. New Holland Publ Sydney, Aust.

Fairley, A. & Moore, P. (2010) *Native Plants of the Sydney District – An Identification Guide*. Kangaroo Press, Kenthurst, Sydney.

Harden, G. J. (ed.) (1990 – 2002; 2018 online) *Flora of New South Wales*, Royal Botanic Gardens, Sydney NSW.

OEH Atlas of NSW Wildlife (2018). NPWS Geographic Information Systems Division, Hurstville NSW, 2220.

OEH (2013). OEH (2013) 'The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area'.