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Dear Daniel,

Flora and Fauna Assessment at Lot 46 and 47 DP 30508, Liverpool Road, Strathfield NSW.

Eco Logical Australia (ELA) understands that on the 27 September 2013, DeAngelis Taylor and Associates submitted a planning proposal to rezone a section of the Strathfield Golf Course, 84 Centenary Drive (Lot 1// DP 8542298 and Lot 1// DP 130917), Strathfield.

The Gateway Determination provided by the former Department of Planning and Infrastructure (now Planning and Infrastructure (P&I)) dated 12 December 2013, stated that '*A FFA (flora and fauna assessment) for the adjacent site at 589 Liverpool Road, Strathfield (Lot 47 // DP 30508), which may form an internal access road to the subject site is to be exhibited as part of the planning process*'.

ELA has been commissioned by DeAngelis Taylor and Associates to prepare this flora and fauna assessment report. It is noted that the construction drawings show the proposed access road also passing through Lot 46 as well as Lot 47 // DP 30508. Therefore, due to the small size of the two plots and fact that they adjoin each other, it is convenient for this report to provide the results of a field assessment that was undertaken across both Lots.

For the purposes of this report the following terminology has been used:

- **Subject site:** is the access road which passes through Lot 46 and 47 // DP 30508 where it is expected that all impacts will be confined to (**Figure 1** and **Figure 2**).
- **Study area:** is the remaining area within Lot 46 and 47 DP 30508. This includes a disused basketball court, planted trees and mown grass that are not directly impacted upon by the development of the access road.
- **Locality:** includes the area within a 5 km radius of the subject site. .

The key objectives of this FFA are to:

- Survey for and identify any threatened species, populations, ecological communities, migratory species and their habitats that may be present within the subject site.
- Assess the impact of the proposed access road on any threatened species, populations, ecological communities, migratory species or their habitats that may be occur within the study area and be affected either directly or indirectly by the proposed access road.
- Evaluate the conservation significance of the subject site.

- Provide recommendations on measures that are aimed at minimising potential impacts that may result from the development of the access road on native flora and fauna species and their habitats.

Methods

Literature and data review

The following databases and reports were reviewed prior to site survey:

- Office of Environment and Heritage's (OEH) Bionet Atlas of NSW Wildlife
- EPBC Protected Matters Search Tool (on 4 January 2014 using the coordinates -33.8855 and 151.07253 (Datum GDA94))
- The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area (SMCMA) (DECC 2009)
- Native vegetation of Southeast NSW (Tozer et al 2006).
- The Green Golden Bell Frog Key Population at Greenacre Management Plan (DECC 2007)

The results of literature and data review were used to produce a list of threatened fauna and flora species that may occur within the locality (**Appendix A**). A likelihood of occurrence and impact assessment was then performed by reviewing threatened species records from the locality, the amount of available habitat present in the study area and using expert knowledge of each species ecology and biology. Five terms for the likelihood of occurrence of species are used in this report, as defined below:

- "known" = the species was or has been observed on the site.
- "likely" = a medium to high probability that a species uses the site.
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely, or unlikely to occur.
- "unlikely" = a very low to low probability that a species uses the site.
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Flora and fauna survey

A site visit was conducted on the 19 February 2014 by ELA ecologist Rodney Armistead. A Random Meander Method was conducted across the study area searching for fauna species, fauna habitats whilst recording all visible vascular flora species (Cropper 1993). A total of two hours was spent within the subject site and study area.

Limitations of survey

The result of this flora and fauna survey does not represent a comprehensive and definitive list of species that may occur or have previously occurred in the area. The reduced survey effort is mainly due to the small size of the study area, time and budget constraints that often do not allow for intensive and long term surveys. For a definitive species list to be collected a more intensive survey effort that is conducted across different seasons would be required.

Impact assessment – Assessment of Significance

An Assessment of Significant (AOS) or 7 part test required under Section 5A of the EP&A Act must be applied to each threatened species, population or ecological community that is known or is likely to occur in the study area and may be affected either directly or indirectly by the proposal. The AOS provides a standardised method to evaluate whether an action will have a significant impact upon a threatened species, populations or ecological communities and therefore, whether a more detailed assessment is required.

Similarly, the EPBC Act requires that Matters of National Environmental Significance (MNES) are assessed using the Significant Impact Criteria to determine the potential for matters to be significantly impacted by a proposed action.

The following guidelines were considered while these assessments were undertaken:

- Threatened species assessment guidelines: The assessment of significance (DECC 2007)
- Matters of National Environmental Significance. Significant Impact Guidelines 1.1 (DEWHA 2008)
- Environmental Impact Assessment Guidelines - Green and Golden Bell Frog. (NPWS 2003).
- Significant impact guidelines for the vulnerable Green and Golden Bell Frog (*Litoria aurea*). National threatened species and ecological communities - EPBC Act policy statement 3.19 (DEWHA 2009).

Results

Literature review

The database searches and literature review identified 25 threatened flora species, 23 threatened fauna species (four frogs, one reptile, 11 birds, seven mammals) and 42 migratory fauna species (nine terrestrial and 33 marine) that have either previously been recorded or may occur within a 5 km radius of the subject site (**Appendix A**). Marine species are not considered further in this report. The locations of the threatened flora and fauna species records listed in the OEH's Wildlife Atlas are shown in **Figure 3** and **Figure 4**.

Field assessment

Vegetation

The presence of a 'Planted/Urban' vegetation community (SMCMA 2013) was validated during the field assessment (**Figure 5**). The subject site was also found to be occupied by a disused basketball court and two sub communities (**Figure 6**). These two sub communities include:

- Mown exotic grass (**Figure 7**).
- Planted native and exotic trees (**Figure 8 – Figure 11**).

Fifteen flora species were identified within the study area during field investigations (**Appendix B**) of which one was native, eight were exotic and five were planted native species. All of the vegetation appears to have been planted and there were no tree hollows present. No threatened flora species or suitable habitat was the study area.

Fauna

Two common urban bird species were recorded during the site visit, including the *Manorina melanocephala* (Noisy Miner) and *Trichoglossus haematodus* (Rainbow Lorikeet).

Fauna Habitat Assessment

Overall, the fauna habitat features present within the study area were regarded as being of very low quality. The habitats that were present at the subject site include a dense leafy tree canopy, thick leaf litter and a small pile of short pieces of cut timber. No hollow bearing trees, structurally rich understorey vegetation, large logs of piles or fine woody debris that would support critical life histories of threatened species such as the Green and Golden Bell Frog (GGBF) were located within the subject site. Despite this, it is possible that the site could

provide habitat for occasional short term foraging activities by a number of highly mobile threatened fauna species such as *Pteropus poliocephalus* (Grey-headed Flying-fox (GHFF)).

Impact assessment

The proposed access road will impact on an area of mown grass, a disused basketball court and will result in the removal of planted native trees that includes three mature *Eucalyptus fibrosa* (Broad-leaved Ironbark), four mature and two juvenile *Corymbia maculata* (Spotted Gum) will require removal. The only perceived impacts to threatened fauna resulting from the proposal include a minor reduction in potential GHFF foraging habitat through the removal of the *C. maculata* trees.

Two fauna species, the GGBF and (Grey-headed Flying-foxes [GHFF]) have either been previously recorded nearby or were regarded as having the 'potential' to occur within the study area based on the initial literature and database review and may be either directly or indirectly affected by the proposal (**Appendix A**). This is based upon:

- Acknowledging that the study area is located within a locality occupied by the GGBF Key Population (KP) at Greenacre (DECC 2007). The Management Plan (MP) for this KP identifies the locations of three key sub-populations. Despite the fact that the three sub-populations are located approximately 2 km away, DECC (2007) states that individuals could occur throughout the locality in areas where suitable habitat may occur.
- The possible removal of four mature and two juvenile *C. maculata.* This species is regarded as an important winter foraging species to GHFFs (Eby and Law 2008).

However, it is very unlikely that either species will occur, occupy or depend on the habitats within study site. This conclusion is based upon:

- The lack of any suitable habitat within the study area for the GGBF and the last two GGBF records within the immediate area being from 1965 and 1966 at the Strathfield Golf Course (OEH 2014) (**Figure 3**). The next closest contemporary records of the species are located approximately 500 m and 2 km from the study area (**Figure 3**).
- The GHFF were recently observed flying in the locality by ELA ecologists during a nocturnal survey that was conducted on the 19 February 2014. However, considering that the species is highly mobile, the small number of *C. maculata* trees being removed is unlikely to represent critical foraging habitat to the species. Further, foraging habitat unaffected by the proposed works does occur throughout the adjoining locality. However , as potential foraging habitat will be impacted by the proposal, an AoS has been prepared for this species.

Recommendations

ELA recommends that the following safeguards be incorporated into the proposed construction plans for the access road. These safeguards are designed to avoid unnecessary impacts, and where impacts are unavoidable to minimise the level of disturbance.

- Where practicable minimise the removal of planted native vegetation to what is required to construct the internal access road and replace this loss through landscape plantings elsewhere in the study area; and
- Consider the potential negative and indirect impacts on the health of the adjacent school garden. The erection of a temporary sediment fence that separates the works from school should be considered. The fence should be constructed from UV stabilised polypropylene filter fabric that is either secured to the existing cyclone fence or to timber/metal pegs.

Conclusions

The only species that was considered to possibly use the habitat with the study area was the GHFF. An AOS was completed for this species and it was deemed that any impacts that may result from the construction of the access road are unlikely to constitute a significant impact upon the Grey-headed Flying-fox (**Appendix C**).

Please feel free to contact me if you have any questions or comments.

Yours sincerely,

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References

Churchill, S. 2008. *Australian Bats.* Reed New Holland, Sydney.

Cropper, S. 1993. Management of Endangered Plants. CSIRO, Canberra.

Department of Environment and Climate Change 2009. The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area. Department of Environment and Climate Change NSW, Hurstville.

Department of Environment Climate Change (DECC) (currently the Office of Environment and Heritage (OEH)) 2007. Threatened species assessment guidelines: The assessment of significance.

Department of Environment, Climate Change and Water NSW. 2009. Draft National Recovery Plan for the Grey-headed Flying-fox *Pteropus poliocephalus*. Prepared by Dr Peggy Eby. Department of Environment, Climate Change and Water NSW, Sydney.

Department of Environment, Water, Heritage and the Arts (DEWHA) (currently DoE) 2009. Significant impact guidelines for the vulnerable Green and Golden Bell Frog (*Litoria aurea*). National threatened species and ecological communities - EPBC Act policy statement 3.19.

Department of the Environment (DoE) 2013. Matters of National Environmental Significance. Significant Impact Guidelines 1.1.

Eby, P., and Law, Bradley. 2008. Ranking the feeding habitats of Grey-headed Flying-foxes for conservation management. A report for The Department of Environment and Climate Change (NSW) and The Department of Environment, Water, heritage and the Arts.

Eby, P., and Lunney. D. 2002. Managing the Grey-headed Flying-fox *Pteropus poliocephalus* as a threatened species: a context for the debate. in Managing the Grey-headed Flying-fox as a Threatened Species in New South Wales, pp. 176-195. eds. P Eby and D Lunney. Royal Zoological Society of New South Wales, Mosman NSW.

National Parks and Wildlife Service (NPWS) 2003. Environmental Impact Assessment Guidelines - Green and Golden Bell Frog.

OEH 2014 Bionet – Atlas of NSW Wildlife. http://www.bionet.nsw.gov.au

Tozer, M. G., Turner, K., Simpson, C. C., Keith, D. A., Beukers, P., Mackenzie, B., Tindall, D., and Pennay , C. 2006. Native Vegetation of Southeast NSW: A Revised Classification and Map for the Coast and Eastern Tablelands. Version 1.0. Department of Environment and Conservation and Department of Natural Resources, Sydney.

Figure 1. The study site

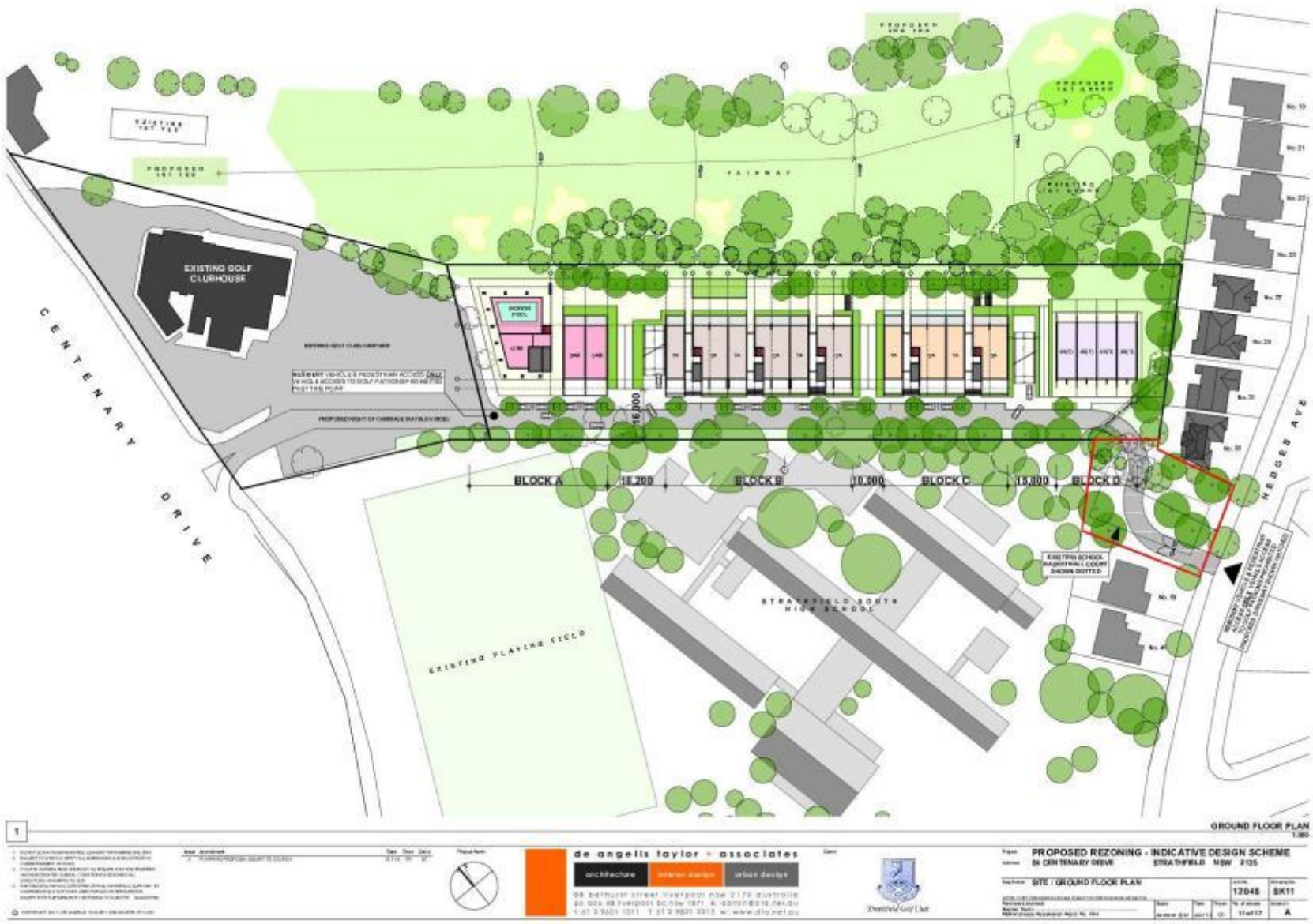

Figure 2. Proposed construction footprint including access road

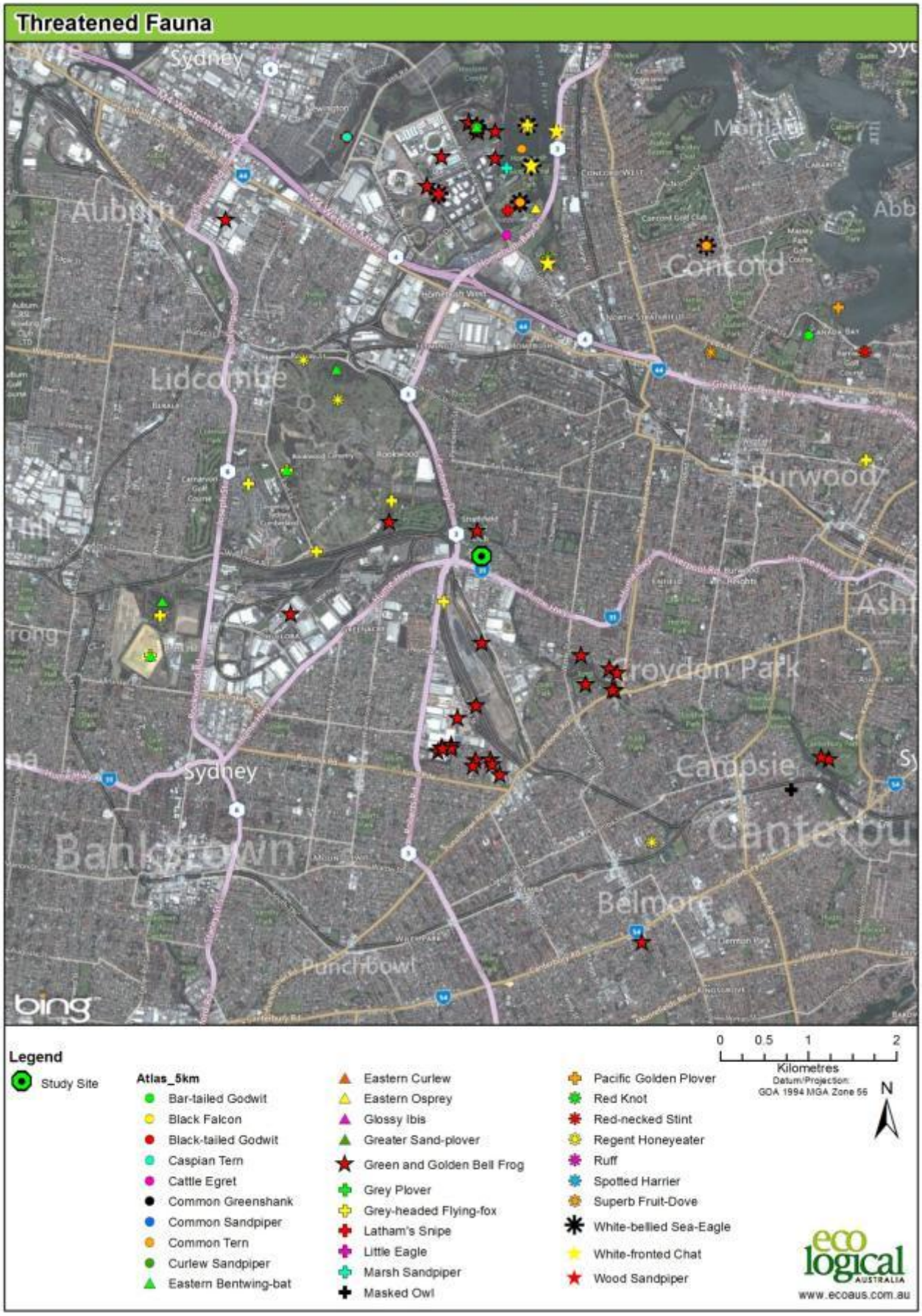

Figure 3. Locations of threatened fauna species records in the locality (source OEH 2014)

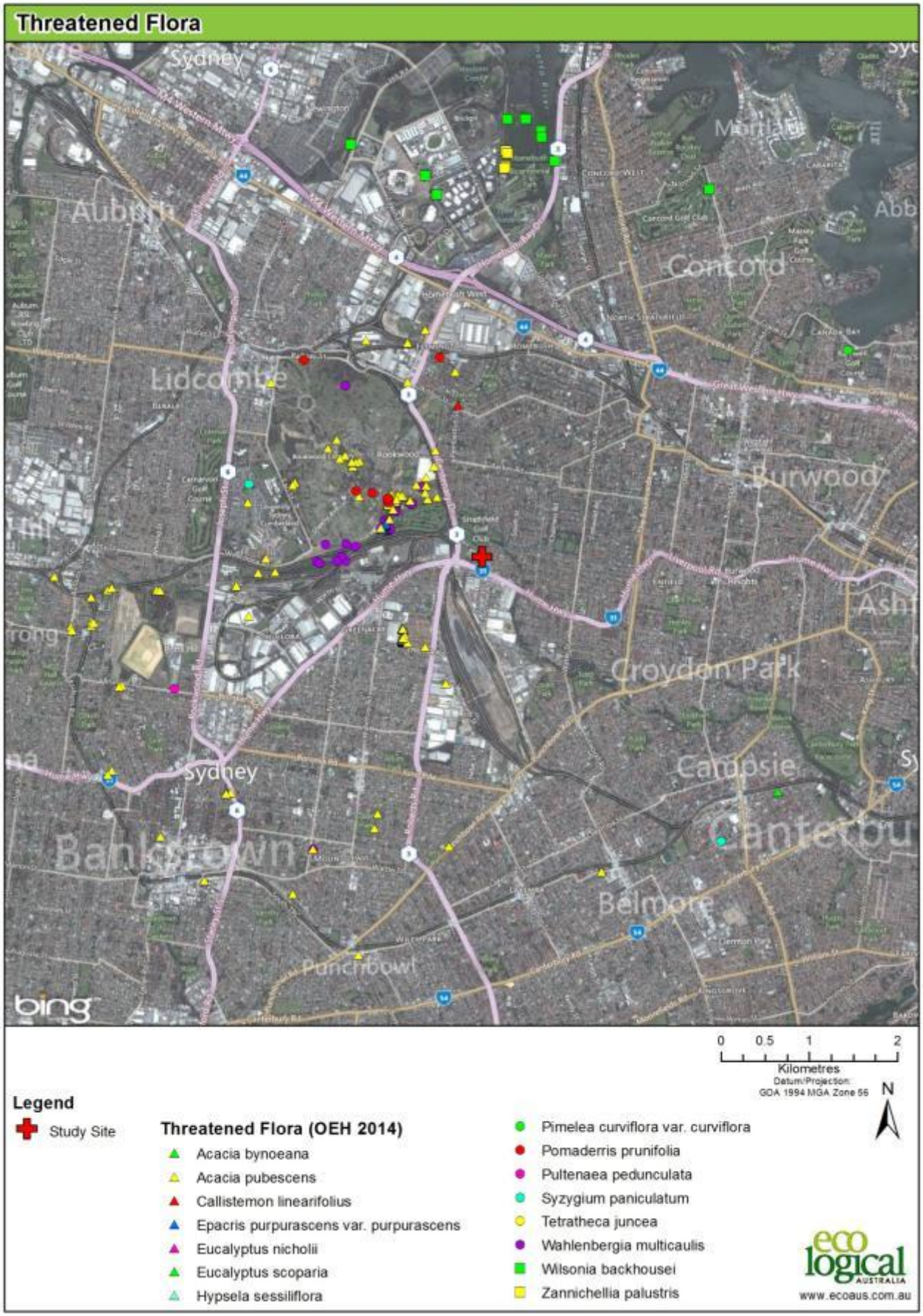

Figure 4. Locations of threatened flora species records in the locality (source OEH 2014)

Figure 5. The vegetation communities present within and adjoining the study site

Figure 6. Vegetation communities mapped on site during the site assessment

Figure 7. A view of the location for the proposed access road (facing east towards Hedges Avenue).

Figure 8. Planted *Corymbia maculata*

Figure 9. A view of the location for the proposed access road (facing north towards the Strathfield Golf Course).

Figure 10. View of vegetation in the north-western corner of the site that will be cleared

Figure 11. The planted native trees (four adult and two juvenile *C. maculata*, *three* E. fibrosa and one diseased *E. tereticornis*) that will be removed to make way for the proposed internal access road

Appendix A: Likelihood of Occurrence

Summary of initial assessment to determine the likelihood of occurrence of threatened species and populations in the proposal site.

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "yes" = the species was or has been observed on the site.
- "likely" = a medium to high probability that a species uses the site.
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur.
- "unlikely" = a very low to low probability that a species uses the site.
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Species Name	Common Name	TSC Act	EPBC Act	Likelihood of occurrence according to desktop review	Likelihood of occurrence post site assessment	Likelihood of impact from works
Flora						
Acacia bynoeana	Bynoe's Wattle	E1		No	No	No impacts
Acacia pubescens	Downy Wattle	V	V	Unlikely	No	No impacts
Allocasuarina glareicola		E1		No	No	No impacts
Bothriochloa biloba	Lobed Blue-grass		V	No	No	No impacts
Callistemon linearifolius	Netted Bottle Brush	V		No	No	No impacts
Cryptostylis hunteriana	Leafless Tongue-orchid		V	No	No	No impacts
Deyeuxia appressa		E1	E	No	No	No impacts
Epacris purpurascens var. purpurascens		V	-	No	No	No impacts
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V		No	No	No impacts
Eucalyptus scoparia	Wallangarra White Gum	E1		No	No	No impacts
Hypsela sessiliflora		E1	-	No	No	No impacts
Melaleuca biconvexa	Biconvex Paperbark		V	No	No	No impacts
Pelargonium sp. *Striatellum* (G.W.Carr 10345)	Omeo Stork's-bill [84065]	E		No	No	No impacts
Pimelea curviflora var. *curviflora*		V	V	No	No	No impacts
Pimelea spicata	Spiked Rice-flower	E	E	No	No	No impacts
Pomaderris prunifolia				No	No	No impacts

Species Name	Common Name	TSC Act	EPBC Act	Likelihood of occurrence according to desktop review	Likelihood of occurrence post site assessment	Likelihood of impact from works
Pterostylis saxicola	Sydney Plains Greenhood	E	E	No	No	No impacts
Pultenaea pedunculata	Matted Bush-pea	E		No	No	No impacts
Streblus pendulinus	Siah's Backbone		E	No	No	No impacts
Syzygium paniculatum	Magenta Lilly Pilly	E1		No	No	No impacts
Tetratheca glandulosa		V,P		No	No	No impacts
Tetratheca juncea	Black-eyed Susan	V		No	No	No impacts
Wilsonia backhousei	Narrow-leafed Wilsonia	V	-	No	No	No impacts
Wilsonia backhousei	Narrow-leafed Wilsonia	V		No	No	No impacts
Zannichellis palustris		E		No	No	No impacts
Fauna						
Amphibians						
Heleioporus australiacus	Giant Burrowing Frog	V	V	No	No	No impacts
Litoria aurea	Green and Golden Bell Frog	E1	V	Potential – known occurrence in locality	No	No impacts
Litoria raniformis	Growling Grass Frog	E1	V	No	No	No impacts
Mixophyes balbus	Stuttering Frog		V	No	No	No impacts
Reptiles						
Hoplocephalus bungaroides	Broad-headed Snake	E	V	No	No	No impacts
Birds						

Species Name	Common Name	TSC Act	EPBC Act	Likelihood of occurrence according to desktop review	Likelihood of occurrence post site assessment	Likelihood of impact from works
Anthochaera phrygia (*Xanthomyza phrygia*)	Regent Honeyeater	E	E & M	Unlikely	No	No impacts
Botaurus poiciloptilus	Australasian Bittern	V	-	No	No	No impacts
Falco subniger	Black Falcon			Unlikely	No	No impacts
Circus assimilis	Spotted Harrier	V, P		Unlikely	No	No impacts
Dasyornis brachypterus	Eastern Bristlebird	E	E	No	No	No impacts
Epthianura albifrons	White-fronted Chat	V		Unlikely	No	No impacts
Hieraaetus morphnoides	Little Eagle	V	-	No	No	No impacts
Lathamus discolor	Swift Parrot	E	E	No	No	No impacts
Ptilinopus superbus	Superb Fruit Dove	V, P		No	No	No impacts
*Rostratula australis (*a.k.a. *R. benghalensis)*	Painted Snipe (Australian subspecies)	E	V	No	No	No impacts
Tyto novaehollandiae	Masked Owl			No	No	No impacts
Mammals						
Dasyurus maculatus *Dasyurus maculatus maculatus*	Spotted-tailed Quoll Spotted-tailed Quoll (SE Mainland Population)	V -	- E	No	No	No impacts
Isoodon obesulus obesulus	Southern Brown Bandicoot	E	E	No	No	No impacts
Phascolarctos cinereus	Koala	V-E2	-	No	No	No impacts

Species Name	Common Name	TSC Act	EPBC Act	Likelihood of occurrence according to desktop review	Likelihood of occurrence post site assessment	Likelihood of impact from works
Potorous tridactylus *Potorous tridactylus tridactylus*	Long-nosed Potoroo Long-nosed Potoroo (SE Mainland Population)	V -	- V	No	No	No impacts
Pseudomys novaehollandiae	New Holland Mouse	-	V	No	No	No impacts
Chalinolobus dwyeri	Large-eared Pied bat	V	V	No	No	No impacts
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	V	-	Potential	Unlikely	No impacts
Pteropus poliocephalus	Grey-headed Flying-Fox	V	V	Potential foraging habitat	Potential foraging habitat	Affected species – requires 7 part test
Migratory Species						
Apus pacificus	Fork-tailed Swift	P	M	No	No	No impacts
Haliaeetus leucogaster	White-bellied Sea-Eagle	-	M	No	No	No impacts
Hirundapus caudacutus	White-throated Needletail	-	M	No	No	No impacts
Merops ornatus	Rainbow Bee-eater	-	M	No	No	No impacts
Monarcha melanopsis	Black-faced Monarch	-	M	No	No	No impacts
Monarcha trivirgatus	Spectacled Monarch		M	No	No	No impacts
Myiagra cyanoleuca	Satin Flycatcher	-	M	No	No	No impacts
Pandion haliaetus	Osprey		M	No	No	No impacts
Rhipidura rufifrons	Rufous Fantail	-	M	No	No	No impacts

Marine species were excluded from likelihood analysis

Appendix B: Flora species recorded on site

Species names	Common names	Native/exotic
Asparagus aethiopicus	Asparagus Fern	Exotic
Bidens pilosa	Cobblers Pegs	Exotic
Callistemon sp.	Callistemon	Native/planted
Cinnamomum camphora	Camphor Laurel	Exotic
Corymbia maculata	Spotted Gum	Native/planted
Eucalyptus eugenioides	Thin-leaved Stringybark	Native/planted
Eucalyptus fibrosa	Red Ironbark	Native/planted
Eucalyptus tereticornis	Forest Red Gum	Native/damaged/diseased
Lolium perenne	Perennial Rye-grass	Exotic
Microlaena stipoides	Weeping Rice Grass	Native
Paspalum distichum	Water Couch	Exotic
Pennisetum clandestinum	Kikuyu	Exotic
Setaria parviflora	Slender Pigeon Grass	Exotic
Taraxacum sp.	Dandelion	Exotic
Wahlenbergia sp.	Blue Bells	Native

Appendix C: Assessments of Significance

***Pteropus poliocephalus* (Grey-headed Flying-fox)**

Grey-headed Flying-foxes (GHFF) utilise a wide variety of habitats (including disturbed areas) for foraging, and have been recorded travelling long distances on feeding forays (Churchill 2008). Fruits and flowering plants of a wide variety of native forests tree species form the main food source for this species. The species roosts in large 'camps or colonies' of up to 200,000 individuals that are usually formed close to water or in gullies and are increasingly being formed in urban areas (Churchill 2008).

This species was recently recorded flying in proximity to the subject site. It is unlikely that this species would use this site for roosting, but it does represent potential foraging habitat, as such the significance of impacts from the proposal are assessed here.

a) in the case of a threatened species, whether the action proposed 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.

Threats to GHFF include losses and the degradation of foraging habitat, disturbance of roosting sites, unregulated shooting, and electrocution on powerlines (Eby and Lunney 2002). The proposed development would involve the removal of three *E. fibrosa* trees, four semi-mature and two juvenile *C. maculata.* This vegetation does not represent roosting habitat and there are no camps that are used by this species known from the locality. Therefore, the proposal will result in the loss of a small amount of foraging habitat for the species. However, considerable areas of foraging habitat exist within the locality. The loss of this planted vegetation will not have an adverse effect on the life cycle of this species such that a viable local population of the species is placed at risk of extinction.

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

This is not an endangered population.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

This is not an endangered or critically endangered ecological community.

d) 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 action proposed, and

The habitat that will be removed during the proposed development includes six planted *C. maculata* trees and three *E. fibrosa* trees.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The proposed development is unlikely to impact upon or change the level of fragmentation that already exists in the locality for this species.

(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,

The habitat being removed does not represent critical foraging habitat to the species in accordance with condition threshold outlined in DECCW (2009). Therefore the trees that will be removed are not likely to be important to the long term survival of this species.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical GHFF roosting or foraging habitat as described in DECCW (2009) will be directly or indirectly affected by the proposed development.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is currently a draft National Recovery Plan for the Grey-headed Flying-fox (DECCW 2009). The proposal is unlikely to conflict with any of its proposed objectives.

g) whether the action proposed 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 is unlikely to constitute or to contribute to any part of key threatening process.

Conclusions

The proposal is unlikely to constitute a significant impact on GHFFs given that:

- The impacts will be confined to extremely small area.
- The removal of nine planted trees constitutes a minor disturbance to an area of marginal foraging habitat.
- Larger areas of suitable foraging habitat for GHFFs will remain intact throughout the surrounding locality.
- Due to the mobility of the species, the removal of nine planted trees will not isolate or fragment any currently connected areas of habitat in terms of use by this highly mobile species.

On the basis of the above considerations, the proposed access road will not constitute a significant impact on the Grey-headed Flying-fox.