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REVIEW OF BIODIVERSITY ASPECTS OF NORTHERN BEACHES HOSPITAL ENVIRONMENTAL IMPACT STATEMENT

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Summary

We have been engaged by the community group HEAL (Hospital Environment Access Location) to review the biodiversity aspects of the Environmental Impact Statement for the proposed Northern Beaches Hospital at Frenchs Forest. We are consultant ecologists with many years of experience in the Sydney region. Previous studies of ours are quoted and relied on in the Environmental Impact Statement.

The site of the proposed hospital has high biodiversity conservation values, including a large area of the endangered and highly restricted Duffys Forest Ecological Community; foraging and roosting habitat for a threatened fauna species, the Powerful Owl; and because it forms part of a major north-south wildlife corridor.

The impact of the proposal would be severe, involving clearing variously reported in the Environmental Impact Statement as 4.95 ha or 5.11 ha of the Duffys Forest Ecological Community, and 4 ha or 4.2 ha of Powerful Owl habitat. The clearing would also reduce the efficacy of the wildlife corridor.

The proposed offset is grossly inadequate. The offset site contains no Duffys Forest Ecological Community (contrary to claims in the Environmental Impact Statement), nor any other endangered ecological community; it contains no Powerful Owl habitat (although it does contain habitat for two other threatened species); and it falls well short of the offsetting requirements calculated using the BioBanking Assessment Methodology credit calculator, which is the standard method in NSW for objectively assessing biodiversity impacts and offsetting requirements. No offset is proposed for the impact of the proposed hospital on the important wildlife corridor value of the site.

The Office of Environment and Heritage allows for lower offsetting standards to be applied for State Significant Infrastructure projects such as this one. However, contrary to claims in the Environmental Impact Statement, the proposed offset does not even meet the very low requirements of the Office of Environment and Heritage's Tier 3 (mitigated net loss) standard, which is the weakest offsetting option available.

Contents

1. Introduction

We have been engaged by the community group HEAL (Hospital Environment Access Location) to review the biodiversity aspects of the Environmental Impact Statement for the proposed Northern Beaches Hospital at Frenchs Forest (SMEC 2013a). We are consultant ecologists and have carried out many flora and fauna studies in the Sydney region since 1985. These include major studies of the Duffys Forest Ecological Community (Smith and Smith 2000, 2005a) and of wildlife corridors in the Warringah Local Government Area (Smith and Smith 2005b, 2009a, 2009b). Our studies of both issues are quoted and relied on by SMEC (2013b, 2013c) and James (2013) in their biodiversity studies for the Environmental Impact Statement. Our work was also relied on by the NSW Scientific Committee (2002) in their final determination to list the Duffys Forest Ecological Community as an Endangered Ecological Community.

We inspected the site of the proposed hospital on 13th November 2013 with Dr Conny Harris. In only a couple of hours we recorded an additional 25 native flora species (Appendix 1) and eight native fauna species (Appendix 2) not recorded in the surveys for the Environmental Impact Statement by SMEC (2013c) and James (2013). Considering that the site has supposedly been comprehensively surveyed, these are surprisingly high numbers of additional species and further emphasise the high biodiversity value of the site. None of the additional species is a threatened species listed under either NSW or Commonwealth legislation.

On the same day we also inspected the site of the proposed 10 ha offset at Belrose to verify the claim by SMEC (2013b) that it includes an area of Duffys Forest Ecological Community. We tested the species composition of this vegetation by two methods, both of which clearly showed that the vegetation is not the Duffys Forest Ecological Community but a more common type (Appendix 3). The proposed offset site does not contain any Duffys Forest Ecological Community vegetation, nor any other threatened community.

2. Ecological Significance of the Development Site

- The vegetation at the site of the proposed hospital is the Duffys Forest Ecological Community (DFEC), which is listed as an endangered ecological community under NSW legislation.

- DFEC is a community of very restricted occurrence, known only from the Warringah, Pittwater, Ku-ring-gai, Hornsby and Manly Local Government Areas (NSW Scientific Community 2002).

- DFEC has been extensively cleared and fragmented by urban development and only about 15% of the original area of the community remained in 2002 (NSW Scientific Community 2002).

- The community is typically found on ridgetops, plateaus and upper slopes, making it highly susceptible to land clearing for urban development. Substantial clearing of DFEC has occurred since 2002, most notably at Austlink Business Park at Belrose. Further clearing is likely in the future, not only at the proposed Northern Beaches Hospital site, but also at other sites, such as widening of Mona Vale Road between Terrey Hills and Ingleside.

- DFEC is poorly represented in National Parks and Wildlife Service estate. It is a community at high risk of extinction as a functioning ecological community.

- The Powerful Owl (*Ninox strenua*), a threatened (vulnerable) fauna species listed under NSW legislation, was recorded repeatedly at the proposed hospital site by SMEC (2013c). The site contains foraging habitat and suitable roost trees close to a known nest site in the adjacent school grounds (James 2013).

- The native vegetation at the proposed hospital site and the wider Northern Beaches Hospital Precinct forms part of a north-south wildlife corridor of high conservation significance, linking Manly Dam Reserve with bushland at Oxford Falls and thence with the eastern section of Garigal National Park (Smith and Smith 2009b).

3. Impact of the Proposed Development

- All DFEC vegetation at the site of the proposed hospital will be cleared, together with a strip of DFEC in the adjacent road reserve that will be impacted by relocation of an overhead transmission line. The total area of DFEC to be developed was stated as 4.95 ha by SMEC (2013b), but James (2013), who prepared the BioBanking Assessment Report, calculated the area as 5.11 ha.

- Using the BioBanking Assessment Methodology, which is now the standard approach in NSW for objectively assessing biodiversity impacts and offsetting requirements, James (2013) calculated that a total of 328 BioBanking ecosystem credits would need to be retired to offset the impact of the proposed hospital on DFEC. She converted this requirement into an area value of 35 ha, but her calculation did not include the 5 credits for the transmission line relocation. If these are included, the area of suitable vegetation required to fully offset the impact would be 35.3 ha.

- James (2013) also calculated that 4.2 ha of Powerful Owl habitat would be developed for the proposed hospital, and that a total of 127 BioBanking species credits would need to be retired to offset this impact. SMEC (2013b) stated that 4 ha of Powerful Owl habitat would be developed. James converted the credits requirement into an area value of 19 ha, but her calculation did not include the 6 credits for the transmission line relocation. If these are included, the area of suitable species habitat required to fully offset the impact would be 20 ha.

- Clearing of native vegetation at the proposed hospital site would weaken the important wildlife corridor between Manly Dam Reserve and Oxford Falls. As can be seen from Figure 1 of James (2013), the Northern Beaches Hospital Precinct, incorporating the proposed hospital site plus adjacent lands that appear to have been identified for future expansion of the hospital and related facilities, covers the entire wildlife corridor and extends both north and south of the proposed hospital site for a total distance of about 800 m. The Northern Beaches Hospital Precinct has been formally identified under the Environmental Planning and Assessment Act as a State Significant Infrastructure Site, so that environmental impacts are deemed of lesser importance in this area compared with the social and economic benefits of development. If, as seems likely, the entire precinct is eventually developed, it would effectively sever the wildlife corridor completely.

4. Adequacy of the Proposed Offset

- The biodiversity impacts of the proposed development will be offset by purchase and retirement of 77 ecosystem credits and 46 species credits at a 10 ha registered BioBank Site adjacent to Belrose Waste Management and Recycling Centre. The offset site will then be added to the adjoining Garigal National Park. The offset site contains no Duffys Forest Ecological Community, nor any other endangered ecological community; it contains no Powerful Owl habitat (although it does contain habitat for two other threatened species); and it falls well short of the offsetting requirements calculated using the BioBanking Assessment Methodology credit calculator. No offset is proposed for the impact of the proposed hospital on the important wildlife corridor value of the site.

- As detailed in Appendix 3, our analysis showed that the offset site does not contain any Duffys Forest Ecological Community, contrary to the claims made by SMEC (2013b). The vegetation in the offset area consists of common communities that are well represented in local national parks (Smith and Smith 2005a).

- The purchase and retirement of 77 ecosystem credits at the offset site is well short of the 328 ecosystem credits required to fully offset the impact of the proposed hospital. It represents less than a quarter of the number of credits required, and the credits are for non-threatened communities of far less conservation significance than the Duffys Forest Ecological Community at the proposed hospital site.

- In terms of area, the 10 ha offset site represents only 28% of the 35.3 ha required to fully offset the ecosystem impact of the proposed hospital.

- The offset site does not include any Powerful Owl habitat, although it does include habitat for two other threatened fauna species, the Red-crowned Toadlet *Pseudophryne australis* (17 credits) and Rosenberg's Goanna *Varanus rosenbergi* (29 credits).

- The purchase and retirement of 46 species credits at the offset site represents only 36% of the 127 species credits required to fully offset the impact of the proposed hospital, and the credits are not for the species impacted, the Powerful Owl.

- The offset area contains only 4.8 ha of Rosenberg's Goanna habitat and 2.9 ha of Red-crowned Toadlet habitat. Combined, these represent only 39% of the 20 ha of threatened species habitat required to fully offset the impact of the proposed hospital.

And these two habitat areas overlap almost entirely, so that the actual land area at the offset site that constitutes threatened species habitat is only about 5 ha.

- The biodiversity offset strategy for the proposed hospital has been determined using the Office of Environment and Heritage's interim policy on assessing and offsetting biodiversity impacts of State Significant Projects. This policy sets out three alternative standards to be applied, which, in decreasing order of preference, are termed Tier 1 (improve or maintain), Tier 2 (no net loss) and Tier 3 (mitigated net loss). Determining which standard to apply depends on the availability and cost of suitable offsets. From a biodiversity conservation viewpoint, this has a highly questionable and undesirable effect in that the more restricted the biodiversity assets impacted, and the more severe the impact, the lower the offsetting standard applied, which is what has happened in this case.

- The Tier 1 'improve or maintain' standard is the normal standard applied under the BioBanking Assessment Methodology (BBAM), where 'red flag' assets (endangered ecological communities) are protected and clearing only occurs within the variation rules set out in the BBAM, and the offsetting requirements determined by the BBAM credit calculator are fully met. The proposed development does not meet the Tier 1 standard because a red flag asset is to be cleared outside the rules allowed by the BBAM.

- The Tier 2 'no net loss' standard is applied to State Significant Projects when red flag assets are not protected, or only partially protected, and clearing is allowed that is inconsistent with the BBAM, but all impacts are fully offset in accordance with the offsetting requirements determined by the BBAM credit calculator. The proposed development does not meet the Tier 2 standard because the amount and type of offsetting proposed is far short of satisfying the requirements of the BBAM credit calculator.

- The Tier 3 'mitigated net loss' standard is applied to State Significant Projects where the amount and type of offsetting proposed is inconsistent with the BBAM requirements. Offsetting is allowed under a series of variation criteria that are set out in the policy. SMEC (2013b) claim that the proposed offset satisfies these variation criteria. However, that is not the case. The proposed offset does not even meet the very low Tier 3 standard.

- The variation criteria for Tier 3 allow ecosystem credits for one vegetation type (in this case the Duffys Forest Ecological Community) to be converted to any other vegetation type within the same vegetation formation and the same bioregion (in this case Dry Sclerophyll Forests (shrubby subformation) in the Sydney Basin). The minimum area standard is an offset to clearing ratio of 2:1. James (2013), who prepared the BioBanking Assessment Report, calculated that 5.11 ha of Duffys Forest Ecological Community would be cleared. The proposed offset does not include any Duffys Forest Ecological Community and the area of Dry Sclerophyll Forests (shrubby subformation) is only 7.52 ha, i.e. an offset to clearing ratio of only 1.5:1 (the remainder of the 10.0 ha offset area is a different formation, Heathlands in the Sydney Basin).

- The variation criteria also allow the requirement for species credits to be waived when all ecosystem credits have been obtained in accordance with the policy. SMEC (2013b) claim that in this case it is possible for the shortfall in species credits to be waived since the minimum ecosystem offset to clearing ratio of 2:1 has been

achieved. But the offset to clearing ratio in terms of the variation criteria is only 1.5:1. There is no justification for the shortfall in species credits to be waived.

- SMEC (2013c) recognised the importance of the vegetation at the proposed hospital site as part of a major wildlife corridor, and that maintaining habitat connectivity should be a high priority. However, the proposed biodiversity offset strategy (SMEC 2013b) does not include any offset for the impact of the proposed hospital on the wildlife corridor value of the site.

5. Conclusions

- The site of the proposed hospital has high biodiversity conservation values, including a large area of the endangered and highly restricted Duffys Forest Ecological Community; foraging and roosting habitat for a threatened fauna species, the Powerful Owl; and because it forms part of a major north-south wildlife corridor.

- The impact of the proposal would be severe, involving clearing variously reported in the Environmental Impact Statement as 4.95 ha or 5.11 ha of the Duffys Forest Ecological Community, and 4 ha or 4.2 ha of Powerful Owl habitat. The clearing would also reduce the efficacy of the wildlife corridor.

- The proposed offset is grossly inadequate. The offset site contains no Duffys Forest Ecological Community (contrary to claims in the Environmental Impact Statement), nor any other endangered ecological community; it contains no Powerful Owl habitat (although it does contain habitat for two other threatened species); and it falls well short of the offsetting requirements calculated using the BioBanking Assessment Methodology credit calculator, which is the standard method in NSW for objectively assessing biodiversity impacts and offsetting requirements. No offset is proposed for the impact of the proposed hospital on the important wildlife corridor value of the site.

- The Office of Environment and Heritage allows for lower offsetting standards to be applied for State Significant Infrastructure projects such as this one. However, contrary to claims in the Environmental Impact Statement, the proposed offset does not even meet the very low requirements of the Office of Environment and Heritage's Tier 3 (mitigated net loss) standard, which is the weakest offsetting option available.

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Appendix 1. Additional native plant species recorded at proposed hospital site

Species recorded by us on 13th November 2013 that were not recorded in the surveys by SMEC (2013c) and James (2013) for the Environmental Impact Statement.

Scientific name	**Common name**
Aristida vagans	Threeawn Speargrass
Austrodanthonia tenuior	
Billardiera scandens	Appleberry
Brunoniella pumilio	Dwarf Blue Trumpet
Calochlaena dubia	Common Ground Fern
Cassytha pubescens	Common Devil's Twine
Cryptostylis erecta	Tartan Tongue Orchid
Cryptostylis subulata	Large Tongue Orchid
Cyathea australis	Rough Treefern
Ficus rubiginosa	Port Jackson Fig
Hakea salicifolia	Willow-leaved Hakea
Hibbertia bracteata	Blue Mountains Guinea Flower
Homalanthus populifolius	Bleeding Hearts
Hovea linearis s.lat.	Narrow-leaf Hovea
Hybanthus monopetalus	Slender Violet-bush
Juncus subsecundus	Finger Rush
Kunzea ambigua	Tick Bush
Leptomeria acida	Sour Currant Bush
Marsdenia suaveolens	Scented Marsdenia
Notelaea ovata	
Pandorea pandorana	Wonga Wonga Vine
Pittosporum multiflorum	Orange Thorn
Platylobium formosum formosum	Handsome Flat-pea
Pultenaea polifolia	
Thelymitra species	A Sun Orchid

Appendix 2. Additional native fauna species recorded at proposed hospital site

Species recorded by us on 13th November 2013 that were not recorded in the surveys by SMEC (2013c) for the Environmental Impact Statement.

Scientific name	**Common name**	**Type of record**
Limnodynastes peronii	Brown-striped Frog	Calls
Eulamprus quoyii	Eastern Water Skink	Sighting
Lampropholis guichenoti	Garden Skink	Sighting
Cracticus torquatus	Grey Butcherbird	Calls
Malurus lamberti	Variegated Fairy-wren	Sighting
Pachycephala pectoralis	Golden Whistler	Calls
Petaurus breviceps	Sugar Glider	Feeding scars
Wallabia bicolor	Swamp Wallaby	Droppings

Appendix 3. Identity of the vegetation at the offset site

SMEC (2013b) claim that the proposed 10 ha offset site at Belrose contains 4.18 ha of Duffys Forest Ecological Community (DFEC), which they equate to the BioBanking vegetation type ME039, Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateaux, Sydney Basin. We visited the offset site on 13th November 2013 and compiled native plant species lists from three sites within the areas mapped as vegetation type ME039 in the BioBanking Agreement for the site. At each site, we recorded all native plant species growing within or overhanging a standard 20 m by 20 m quadrat, and also noted any additional species growing nearby in the same vegetation type. Quadrat 1 (centre point 334396E, 6268381S) was located in the smaller southern area mapped as ME039. Quadrat 2 (centre point 334381E, 6268506S) and Quadrat 3 (centre point 334305E, 6268504S) were located in the larger northern area mapped as ME039. The species recorded at each site are listed below in Table 3.

The full species lists for each site (including additional species outside the quadrat), and the combined species list for all three sites, were tested for DFEC using a method originally devised by us (Smith and Smith 2000) and applied by SMEC (2013c) to determine whether DFEC was present at the proposed hospital site. The method uses positive and negative diagnostic species to calculate indices for DFEC and for the two other Warringah vegetation types with which it is likely to be confused: Sydney Sandstone Ridgetop Woodland and Sydney Sandstone Gully Forest. The vegetation type is identified by which of the three types has the highest index value. The analysis showed that the vegetation at all three sites is Sydney Sandstone Ridgetop Woodland, not DFEC (Table 1).

The identity of the vegetation was also tested using the method of Tozer *et al*. (2010) based on the number of positive diagnostic species for each vegetation type present in a 400 m^2 quadrat. The Tozer *et al.* (2010) vegetation types are equivalent to the BioBanking vegetation types. The analysis showed that the vegetation in each quadrat most closely resembled vegetation type ME014, not ME039 (Table 2). Type ME014, Red Bloodwood – Scribbly Gum heathy woodland on sandstone plateaux, Sydney Basin, is a common community in Warringah, well represented in Ku-ring-gai Chase and Garigal National Parks (Smith and Smith 2005a).

We conclude that the vegetation in the offset site claimed by SMEC (2013b) to be the threatened Duffys Forest Ecological Community is not that community and is not a threatened community.

Table 1. Analysis for Duffys Forest Ecological Community using the method of Smith and Smith (2000). The species list for each site, and the combined list for all three sites, include additional species recorded outside the quadrats, since the more comprehensive the species list the stronger the analysis. Underlining indicates the vegetation type that the species list most closely resembles.

Vegetation type	Index values			
	Site 1	Site 2	Site 3	Combined
Duffys Forest Ecological Community	42.5	35	35	27.5
Sydney Sandstone Ridgetop Woodland	55	60	57.5	67.5
Sydney Sandstone Gully Forest	45	45	40	37.5

Table 2. Vegetation type analysis using the method of Tozer *et al*. (2010), which is based on species lists from 400 m^2 quadrats. Underlining indicates the vegetation type that the quadrat most closely resembles.

Tozer *et al*. (2010) vegetation type	Equivalent BioBanking vegetation type	Number of positive diagnostic species		
		Quadrat 1	Quadrat 2	Quadrat 3
DSF p140	ME012	33	39	41
DSF p131	ME014	<u>44</u>	<u>56</u>	<u>56</u>
DSF p142	ME029	31	30	36
DSF p146	ME038	31	35	34
DSF p143	ME039	38	36	33

Table 3. Native plant species recorded at the three sample sites in the proposed Belrose offset area. Q = species recorded growing in or overhanging the 20 m by 20 m quadrat; A = additional species recorded outside the quadrat but in the same vegetation type.

Plant species	Site 1	Site 2	Site 3
Acacia linifolia		Q	Q
Acacia longifolia	Q		
Acacia suaveolens	A		Q
Acacia ulicifolia			Q
Actinotus minor	Q	Q	Q
Allocasuarina distyla	A	Q	Q
Allocasuarina littoralis	Q		
Amyema pendulum	Q		
Angophora costata		Q	Q
Angophora crassifolia	Q		
Angophora hispida	Q		
Anisopogon avenaceus	Q	Q	
Banksia ericifolia	Q	Q	Q
Banksia oblongifolia	Q	Q	A
Banksia serrata	Q	Q	Q
Banksia spinulosa spinulosa	Q	Q	Q
Bauera rubioides	Q		Q
Billardiera scandens	Q		Q
Blandfordia nobilis			A
Boronia ledifolia		Q	Q
Boronia pinnata		Q	A
Bossiaea heterophylla			Q
Bossiaea scolopendria		Q	A
Caesia parviflora parviflora		Q	Q
Calochilus species	Q		
Cassytha glabella	Q		
Cassytha pubescens	Q	Q	
Caustis flexuosa		Q	Q
Centella asiatica	Q		
Ceratopetalum gummiferum		A	Q
Comesperma ericinum			Q
Conospermum longifolium longifolium			Q
Corymbia gummifera	Q	Q	Q
Cryptostylis erecta		Q	
Cryptostylis subulata	Q		
Cyathochaeta diandra	Q	Q	

Plant species	Site 1	Site 2	Site 3
Dampiera stricta	Q	Q	Q
Dianella caerulea	Q		
Dianella prunina		Q	Q
Dichelachne micrantha	Q		
Dillwynia retorta		A	Q
Entolasia stricta	Q	Q	Q
Epacris pulchella	Q	Q	Q
Eucalyptus capitellata			Q
Eucalyptus haemostoma	Q	Q	Q
Eucalyptus oblonga	Q	Q	
Eucalyptus punctata		Q	Q
Eucalyptus sieberi		Q	Q
Eucalyptus umbra			Q
Eustrephus latifolia	Q		
Gahnia erythrocarpa		Q	Q
Glochidion ferdinandi pubens	Q		
Gompholobium grandiflorum		A	Q
Gonocarpus teucrioides	Q		
Grevillea buxifolia		Q	Q
Grevillea linearifolia		Q	
Grevillea speciosa	Q	Q	Q
Hakea dactyloides s.str.	Q		
Hakea laevipes		Q	Q
Hakea teretifolia	Q	Q	Q
Hibbertia linearis		Q	Q
Hypolepis muelleri	A		
Imperata cylindrica	Q		
Kunzea ambigua	Q		
Lambertia formosa	Q	Q	Q
Lepidosperma filiforme			Q
Lepidosperma laterale		Q	Q
Leptocarpus tenax	Q		
Leptospermum arachnoides	Q		
Leptospermum polygalifolium	Q		
Leptospermum squarrosum	Q		Q
Leptospermum trinervium	A	Q	Q
Lepyrodia scariosa	Q	Q	Q
Leucopogon microphyllus		Q	
Lindsaea linearis	Q	Q	
Lindsaea microphylla		Q	
Lomandra brevis	Q	Q	
Lomandra cylindrica	Q	Q	Q
Lomandra filiformis filiformis		Q	
Lomandra glauca	Q	Q	Q
Lomandra gracilis	Q		
Lomandra longifolia	Q		
Lomandra obliqua	Q	Q	Q
Lomatia silaifolia	Q		Q
Micrantheum ericoides		Q	
Microlaena stipoides	Q		
Micromyrtus ciliata	Q		

Plant species	Site 1	Site 2	Site 3
Mitrasacme polymorpha		Q	
Monotoca scoparia		Q	Q
Patersonia glabrata		Q	Q
Patersonia sericea	Q	Q	Q
Persoonia lanceolata	A		
Persoonia levis	Q	Q	Q
Persoonia pinifolia	A	Q	Q
Petrophile pulchella	Q		
Phyllanthus hirtellus	Q		Q
Phyllota grandiflora			Q
Phyllota phylicoides		Q	Q
Pittosporum undulatum	Q		
Platysace linearifolia	Q	Q	Q
Pteridium esculentum	Q		
Ptilothrix deusta		Q	
Pultenaea stipularis			Q
Pultenaea tuberculata	Q	Q	
Scaevola ramosissima		Q	Q
Schizaea asperula	Q		
Schizaea dichotoma		Q	Q
Schoenus ericetorum	Q		
Schoenus imberbis		Q	Q
Smilax glyciphylla	Q		
Stephania japonica	Q		
Styphelia tubiflora	Q	Q	
Tetrarrhena juncea		Q	Q
Tetratheca ericifolia	Q	Q	Q
Xanthorrhoea media	Q	Q	Q
Xanthorrhoea resinifera	A		
Xanthosia tridentata	Q		
Xyris gracilis	Q		