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Andrew Harvey
Urbis
Level 21, 321 Kent St
Sydney NSW 2000

Our Ref: 11SUTECO-0002

14th February 2011

Dear Andrew,

RE: Royal Far West Flora and Fauna Assessment.

Thank you for the opportunity to provide a flora and fauna assessment for the proposed Royal Far West Expansion. The information provided in this report is required to support an Environmental Assessment (EA) of the Concept Plan to be assessed under Part 3A of the EP&A Act. Director General's Requirements (DGRs) have been issued by NSW Department of Planning indicating the EA must "*address impacts on flora and fauna, including threatened species, populations and endangered ecological communities and their habitats and steps taken to mitigate any identified impacts to protect the environment (DGR #14)*".

Given the currently highly developed nature of the site, ELA has undertaken a desktop approach for the flora and fauna assessment. This assessment provides Urbis with an assessment of the threatened species/populations/communities known or likely to occur on site; potential impacts to such species and measures to manage/mitigate impacts to both threatened species populations/communities and the environment more generally.

The findings in the following report indicate there will be no significant impact on threatened flora or fauna species or threatened communities due to the proposed expansion of Royal Far West, Manly.

If you have questions about any aspect of this report, please contact me on (02) 8536 8621 or at ailsak@ecoaus.com.au. I look forward to working with you in the future.

Regards,

Ailsa Kerswell

Dr Ailsa Kerswell

Manager, Aquatic Ecology

Methods

The following steps were taken to prepare the flora and fauna assessment:

1. Reviewed *Preliminary Environmental Assessment Report for the Proposed Expansion of Royal Far West, Manly* (Urbis 2010) and *Arboricultural Impact Report - Royal Far West Site at Manly* (Landscape Matrix 2011) for background to the project and local context.

2. Performed database searches of the NSW Wildlife Atlas and EPBC Act Protected Matters Search Tool to indentify threatened species/populations/communities known to occur within the region. A search of the Manly LGA was performed for NSW listed threatened species. A 2.5 km search was performed around the project site (coordinates -33.79818, 151.28845) for federally listed threatened species.

3. Evaluated the likelihood of species from database searches occurring on site. This assessment was based on database records, presence or absence of suitable habitat, features of the proposal site and professional judgement.

4. For all species known or with the potential to occur on site, undertook an assessment of the potential impacts from the proposed development (7-part tests).

5. Recommended management and mitigation measures to be employed for both threatened species/populations/communities and the environment more generally.

Results

1) Literature review

The study site is a heavily urbanised town centre with minimal habitat values (Figure 1). Potential habitat features of the study sites are four street trees and two other trees surrounded by development. The busy streets and abundant lighting would currently deter most native fauna from inhabiting this area for lengthy periods.

The Concept Plan by Urbis (2010) does not specify the impact to the trees on site. However, the concept illustration in Figure 2 suggests that new buildings may interfere with the root system, and overall stability and health of the trees. For the purposes of this flora and fauna assessment, we have assumed the “worst case scenario” that all six trees will be removed and have assessed the potential impacts of this action. In the case that fewer trees are removed, the impacts discussed below are likely to be less. In the case that no trees are removed, impacts would be from noise and construction work close to the tree canopy.

Six mature trees have been assessed by Landscape Matrix (2011). The trees assessed for this report are located on the Wentworth Street nature strip frontage of the site and on the adjoining property to the southwest:

- 4 x *Araucaria heterophylla* (Norfolk Island Pine). 13-22 m height;
- 1 x *Ficus sp* (appears to be *F. benjimina* - Benjamin's Weeping Fig). 8 m tall; and
- 1 x *Schefflera actinophylla* (Umbrella Tree). 8.5 m tall. An environmental weed species.

The trees are planted exotic specimens. All of the trees were in good health at the time of inspection. Two trees exhibited evidence of decay in their basal trunks following past wounding (most probably arising from mechanical damage caused by vehicular impacts).

None of the trees on site are listed as a threatened species under the *NSW Threatened Species Conservation Act 1995* or the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999.* These trees do not form part of an endangered ecological community.

Figure 1: Study Area for Royal Far West, Manly NSW.

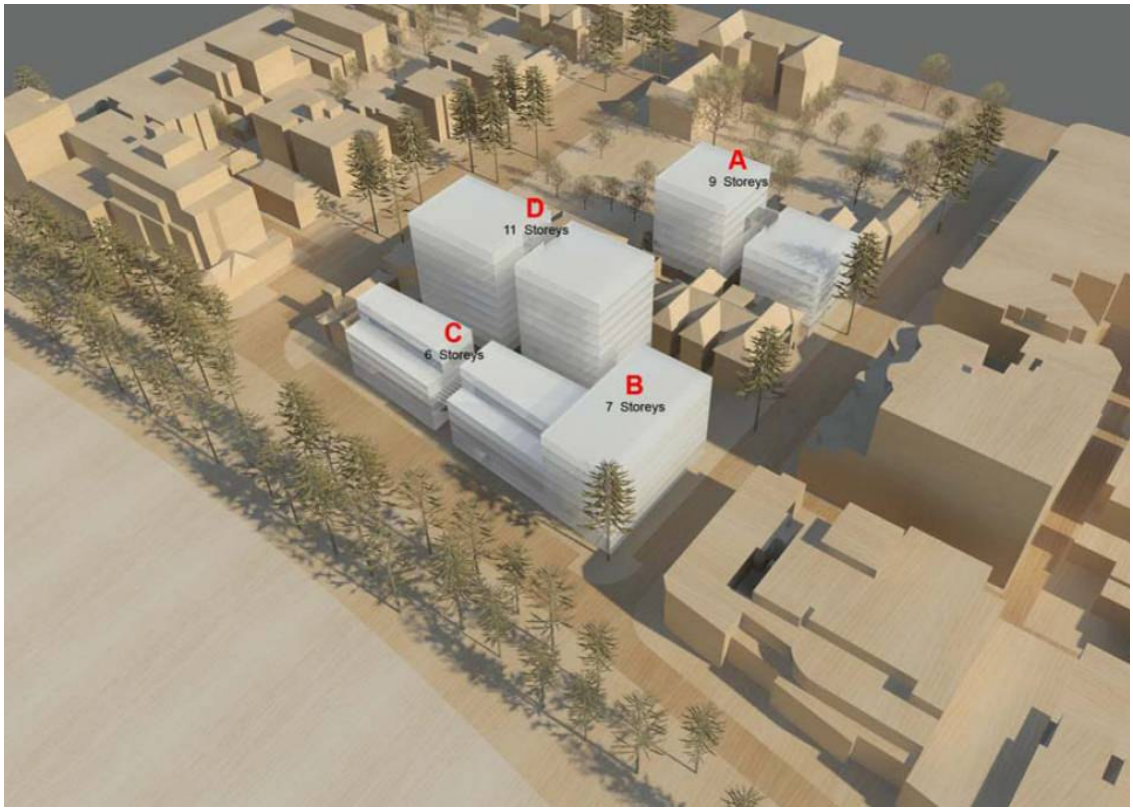

Figure 2: Indicative Concept Plan by Architectus (Urbis 2010).

2) Database search

Full results of database searches are provided in Appendix 1. In summary, 14 fauna and 12 flora threatened species (TSC Act) occur in the Manly LGA. The study site does not lie near critical or potential habitat of Little Penguin. The site does not lie within areas identified as requiring an "8-part test[1]" under section 5A of the EP&A Act for Long-nosed Bandicoots or Little Penguin (Manly Council Penguin and Bandicoot Residential DCP, 2001) (Figure 3).

EPBC Matters of National Environmental Significance identified in the database search include:

- World Heritage Properties: None
- National Heritage Places: 1
- Wetlands of International Significance (Ramsar Wetlands): None
- Great Barrier Reef Marine Park: None
- Commonwealth Marine Areas: None
- Threatened Ecological Communities: 2
- Threatened Species: 40
- Migratory Species: 37

[1] Since the time of DCP development, the 8-part test has been amended. It now requires consideration of seven key questions and is referred to as a 7-part test.

Figure 3: Site location relative to critical or potential habitat of Little Penguin and Long-nosed Bandicoot.

3) Likelihood of occurrence

The likelihood of occurrence on site for the threatened species identified from the database searches is itemised in Appendix 1. In summary, only two species were considered to potentially occur in the habitat on site. These were both birds of prey that roost and/or nest in tall trees near water bodies: White-bellied Sea Eagle and Osprey. Other mobile species such as birds and bats may fly over the study area, but are unlikely to utilise the site due to inappropriate habitat and on-going disturbance from light and noise i.e. associated with the urban setting.

4) Assessment of significance

Assessments of significance were conducted for the White-bellied Sea Eagle and Osprey (Appendix 2). These birds use similar habitats, by favouring tall trees near open water for roosting and nesting. In summary, no significant impact to these species are likely due to the:

- Limited suitable habitat (only four tall trees);
- Small number of potentially impacted trees in locality; and
- Highly mobile nature of these fauna species.

5) Mitigation measures

The following mitigation measures are recommended for the proposed re-development:

- Minimise tree removal as far as possible;
- Landscape with species that are indigenous to the Manly area, including tall growing species; and
- Ensure a construction environmental management plan (CEMP) is prepared prior to construction that addresses the following issues: flora and fauna management, weed control, air quality/dust, noise, vibration, soil, water and waste (as required).

Appendix 1

Summary of initial assessment to determine the likelihood of occurrence of threatened species, populations and ecological communities on the 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.

Report generated on 07/02/2011 for Manly LGA (TSC Act) and a 2.5km radius around coordinates -33.79818, 151.28845 (EPBC Act)

Threatened Flora

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Acacia bynoeana	Bynoe's Wattle	E1	V	The species is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. It has recently been found in the Colymea and Parma Creek areas west of Nowra (DECC 2007). It is found in heath and dry sclerophyll forest, typically on a sand or sandy clay substrate, often with ironstone gravels (DECC 2007). The species seems to prefer open and sometimes slightly disturbed sites (DECC 2007). Characteristic overstorey species include: Corymbia gummifera, Eucalyptus haemastoma, E. gummifera, E. parramattensis, E. sclerophylla, Banksia serrata and Angophora bakeri. Shrubs often associated with the species include B. spinulosa, B. serrata, A. oxycedrus, A. myrtifolia and Kunzea spp. (Winning 1992; James 1997). It flowers from September to March and fruits mature in November.	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Acacia terminalis subsp. terminalis	Sunshine Wattle	E1	E	Very limited distribution between Botany Bay to the northern foreshore of Port Jackson. Recent collections have only been made from the Quarantine Station, Clifton Gardens, Dover Heights, Parsely Bay, Nielson Park, Cooper Park, Chifley and Watsons Bays.	No
Caladenia tessellata	Thick-lipped Spider-orchid, Daddy Long-legs		V	Occurs in grassy sclerophyll woodland, often growing in well-structured clay loams or sandy soils south from Swansea (DECC 2007). Usually in sheltered moist places, in areas of increased sunlight. It flowers from September to November (DECC 2007).	No
Chamaesyce psammogeton	Sand Spurge	E1		*C. psammogeton* is a prostrate perennial herb, which grows on foredunes and exposed sites on headlands often with Spinifex (DECC 2007). Flowers in Summer.	No
Cryptostylis hunteriana	Leafless Tongue-orchid		V	It is known from a range of vegetation communities including swamp-heath and woodland (DECC 2007). The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); where it appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*) (DECC 2007). Bell (2001) has identified Coastal Plains Scribbly Gum Woodland and Coastal Plains Smoothed-barked Apple Woodland as potential habitat on the Central Coast. Flowers between November and February, although may not flower regularly (DECC 2007; Bell 2001).	No
Epacris purpurascens var. purpurascens		V		Sydney Sandstone Gully Forest and wet heath with strong clay influences (NPWS 1997). Recorded between Gosford in the north to Avon Dam in the south. Found in a range of habitats, but most have a strong shale soil influence. Killed by fire and re-establishes from soil stored seed (DECC 2007).	No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	Associated with shallow sandy soils bordering coastal heath with other stunted or mallee eucalypts, often in areas with restricted drainage and in areas with laterite influenced soils, thought to be associated with proximity to shale (DECC 2007). Flowering is irregular and has been recorded throughout the year (DECC 2007).	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V		Grows in dry grassy woodland, on shallow and infertile soils, mainly on granite (DECC 2007). This species is widely planted as an urban street tree and in gardens but is quite rare in the wild (DECC 2007). It is confined to the New England Tablelands of NSW, where it occurs from Nundle to north of Tenterfield (DECC 2007).	No
Melaleuca biconvexa	Biconvex Paperbark		V	Associated with damp habitats, such as Coastal Narrabeen Moist Forest, Riparian Melaleuca Swamp Woodland (LMCC 2001). This species may occur in dense stands forming a narrow strip adjacent to watercourses, in association with other *Melaleuca* species or as an understorey species in wet forest (NSW Scientific Committee 1998). Flowering occurs over just 3-4 weeks in September and October (DECC 2007).	No
Microtis angusii	Angus's Onion Orchid	E1		Currently only known from one site at Ingleside in the north of Sydney (DECC 2007). The dominant species occurring on the highly disturbed Ingleside site are introduced weeds Hyparrhenia hirta (Coolatai grass) and Acacia saligna (ibid.). Most likely associated with the Duffys Forest vegetation community (ibid.). Exists as subterranean tubers during most of the year, producing leaves and then flowering stems in late winter and spring and flowers from May to October (ibid.). By summer, the above ground parts have withered leaving no parts above ground (ibid.).	No
Persoonia hirsuta	Hairy Geebung	E1		This species occurs in dry sclerophyll eucalypt woodland/forest (Weston & Johnson 1991; Weston 1995), and in shrub-woodland (Harden 1991). It grows in sandy to stony soils derived from sandstone (Weston & Johnson 1991; Weston 1995b) or very rarely on shale (Harden 1991), from near sea level to 600 m altitude (Weston & Johnson 1991; Weston 1995).	No
Pimelea curviflora var. curviflora		V	V	Associated with the Duffys Forest Community, shale lenses on ridges in Hawkesbury sandstone geology (Pittwater Council 2000).	No
Prostanthera junonis	Somersby Mintbush	E1		Likely to be restricted to the Somersby plateau, found on the Somersby and Sydney Town soil landscapes (NPWS 2000). Occurs predominantly in the low woodland component of the Hawkesbury Sandstone Complex dominated by Eucalyptus haemostoma with Banksia ericifolia or B. serrata in the understorey (ibid.). Has been found in the ecotone between low woodland and open forest or the open scrub\heath components (ibid.). Not found in sedgelands or Allocasuarina distyla open heath (ibid.).	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Syzygium paniculatum	Magenta Lilly Pilly	E1		This species occupies a narrow coastal area between Bulahdelah and Conjola State Forests in NSW. On the Central Coast, it occurs on Quaternary gravels, sands, silts and clays, in riparian gallery rainforests and remnant littoral rainforest communities (Payne 1997). In the Ourimbah Creek valley, S. paniculatum occurs within gallery rainforest with Alphitonia excelsa, Acmena smithii, Cryptocarya glaucescens, Toona ciliata, Syzygium oleosum with emergent Eucalyptus saligna. At Wyrrabalong NP, S. paniculatum occurs in littoral rainforest as a co-dominant with Ficus fraseri, Syzygium oleosum, Acmena smithii, Cassine australe, and Endiandra sieberi. Payne (1991) reports that the species appears absent from Terrigal formation shales, on which the gully rainforests occur. S. paniculatum is summer flowering (November-February), with the fruits maturing in May (DECC 2007).	No
Tetratheca glandulosa	Glandular Pink-bell	V	V	Associated with ridgetop woodland habits on yellow earths also in sandy or rocky heath and scrub (NPWS 1997). Often associated with sandstone / shale interface where soils have a stronger clay influence (NPWS 1997). Flowers July to November.	No

Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory.

E = Endangered; E2 = Endangered Population; V = Vulnerable

Threatened Fauna

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Birds					
Anthochaera phrygia (Xanthomyza phrygia)	Regent Honeyeater	E1	E & M	Associated with temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts, and riparian forests of River Oak (*Casuarina cunninghamiana*) (Garnett 1993). Areas containing Swamp Mahogany (*Eucalyptus robusta*) in coastal areas have been observed to be utilised (NPWS 1997). The Regent Honeyeater primarily feeds on nectar from box and ironbark eucalypts and occasionally from banksias and mistletoes (NPWS 1995). As such it is reliant on locally abundant nectar sources with different flowering times to provide reliable supply of nectar (Environment Australia 2000).	Unlikely
Apus pacificus	Fork-tailed Swift		M	Sometimes travels with Needletails. Varied habitat with a possible tendency to more arid areas but also over coasts and urban areas (Simpson & Day 1999).	Unlikely
Ardea alba	Great Egret, White Egret		M	The Great Egret is common and widespread in Australia (McKilligan, 2005). It forages in a wide range of wet and dry habitats including permanent and ephemeral freshwaters, wet pasture and estuarine mangroves and mudflats (McKilligan, 2005).	Unlikely
Ardea ibis	Cattle Egret		M	Cattle Egrets forage on pasture, marsh, grassy road verges, rain puddles and croplands, but not usually in the open water of streams or lakes and they avoid marine environments (McKilligan, 2005). Some individuals stay close to the natal heronry from one nesting season to the next, but the majority leave the district in autumn and return the next spring. Cattle Egrets are likely to spend the winter dispersed along the coastal plain and only a small number have been recovered west of the Great Dividing Range (McKilligan, 2005).	Unlikely
Diomedea exulans antipodensis	Antipodean Albatross		V	Marine	No
Diomedea exulans gibsoni	Gibson's Albatross		V	Marine	No
Eudyptula minor	Little Penguin, Manly Point	E2		Little Penguin in the Manly Point Area (being the area on and near the shoreline from Cannae Point generally northward to the point near the intersection of Stuart Street and Oyama Cove Avenue, and extending 100 metres offshore from that shoreline)	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Gallinago hardwickii	Latham's Snipe, Japanese Snipe			A variety of permanent and ephemeral wetlands, preferring open fresh water wetlands with nearby cover (Marchant and Higgins 1999). Occupies a variety of vegetation around wetlands (Marchant and Higgins 1999) including wetland grasses and open wooded swamps (Simpson and Day 1999).	Unlikely
Haliaeetus leucogaster	White-bellied Sea-Eagle		M	Forages over large open fresh or saline waterbodies, coastal seas and open terrestrial areas (Marchant & Higgins 1993, Simpson & Day 1999). Breeding habitat consists of tall trees, mangroves, cliffs, rocky outcrops, silts, caves and crevices and is located along the coast or major rivers. Breeding habitat is usually in or close to water, but may occur up to a kilometre away (Marchant & Higgins 1993).	Possible
Hieraaetus morphnoides	Little Eagle	V		The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. She-oak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Unlikely
Hirundapus caudacutus	White-throated Needletail		M	Forages aerially over a variety of habitats usually over coastal and mountain areas, most likely with a preference for wooded areas (Marchant & Higgins 1993; Simpson & Day 1999). Has been observed roosting in dense foliage of canopy trees, and may seek refuge in tree hollows in inclement weather (Marchant & Higgins 1993).	Unlikely
Lathamus discolor	Swift Parrot	E	E	Breeds in Tasmania between September and January. Migrates to mainland in autumn, where it forages on profuse flowering Eucalypts (Blakers et al. 1984; Schodde and Tidemann 1986). Hence, in this region, autumn and winter flowering eucalypts are important for this species. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*) (DECC 2007).	Unlikely
Macronectes giganteus	Southern Giant Petrel	E1	E	The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20° S and is a common visitor off the coast of NSW. Over summer, the species nests in small colonies amongst open vegetation on Antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory.	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Macronectes halli	Northern Giant-Petrel	V	V	The Northern Giant Petrel breeds in the sub-Antarctic, and visits areas off the Australian mainland mainly during the winter months (May-October). Immature and some adult birds are commonly seen during this period in offshore and inshore waters from around Fremantle (WA) to around Sydney (NSW) (Pizzey & Knight 1999).	No
Merops ornatus	Rainbow Bee-eater		M	Resident in coastal and subcoastal northern Australia; regular breeding migrant in southern Australia, arriving September to October, departing February to March, some occasionally present April to May. Occurs in open country, chiefly at suitable breeding places in areas of sandy or loamy soil: sand-ridges, riverbanks, road-cuttings, sand-pits, occasionally coastal cliffs. Nest is a chamber a the end of a burrow, up to 1.6 m long, tunnelled in flat or sloping ground, sandy back or cutting.	Unlikely
Monarcha melanopsis	Black-faced Monarch		M	Rainforest and eucalypt forests, feeding in tangled understorey (Blakers et al. 1984).	Unlikely
Myiagra cyanoleuca	Satin Flycatcher		M	Wetter, denser forest, often at high elevations (Simpson & Day 2004).	Unlikely
Ninox strenua	Powerful Owl	V		Powerful Owls are associated with a wide range of wet and dry forest types with a high density of prey, such as arboreal mammals, large birds and flying foxes (Environment Australia 2000, Debus & Chafer 1994). Large trees with hollows at least 0.5m deep are required for shelter and breeding (Environment Australia 2000).	Unlikely
Pandion haliaetus	Osprey	V		Associated with waterbodies including coastal waters, inlets, lakes, estuaries, beaches, offshore islands and sometimes along inland rivers (Schodde and Tidemann 1986; Clancy 1991; Olsen 1995). Osprey may nest on the ground, on sea cliffs or in trees (Olsen 1995). Osprey generally prefer emergent trees, often dead or partly dead with a broken off crown (Olsen 1995).	Possible
Pterodroma neglecta neglecta	Kermadec Petrel (western)		V	Marine	Unlikely

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Ptilinopus superbus	Superb Fruit-Dove	V		Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms (DECC 2007). It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees (ibid.). Part of the population is migratory or nomadic (ibid.). At least some of the population, particularly young birds, moves south through Sydney, especially in autumn (ibid.). Breeding takes place from September to January (ibid.). Will feed in adjacent mangroves or eucalypt forests (Blakers et al. 1984).	Unlikely
Rhipidura rufifrons	Rufous Fantail		M	The Rufous Fantail is a summer breeding migrant to southeastern Australia (Morcombe, 2004). The Rufous Fantail is found in rainforest, dense wet eucalypt and monsoon forests, paperbark and mangrove swamps and riverside vegetation (Morcombe, 2004). Open country may be used by the Rufous Fantail during migration (Morcombe, 2004).	Unlikely
Rostratula australis	Australian Painted Snipe	E	V	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber (DECC 2007). Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (ibid.). Breeding is often in response to local conditions; generally occurs from September to December (DECC 2007). Roosts during the day in dense vegetation (NSW Scientific Committee 2004). Forages nocturnally on mud-flats and in shallow water (DECC 2007). Feeds on worms, molluscs, insects and some plant-matter (ibid.).	Unlikely
Rostratula benghalensis s. lat.	Painted Snipe		M	See: *Rostratula australis*	Unlikely
Sterna albifrons	Little Tern			Almost exclusively coastal, preferring sheltered areas (DECC 2007), however may occur several kilometres inland in harbours, inlets and rivers (Smith 1990). Australian birds breed on sandy beaches and sand spits (Simpson & Day 1999).	Unlikely
Thalassarche bulleri	Buller's Albatross		V	Marine	No
Thalassarche cauta cauta	Shy Albatross, Tasmanian Shy Albatross		V	Marine	No
Thalassarche cauta salvini	Salvin's Albatross		V	Marine	No
Thalassarche cauta steadi	White-capped Albatross		V	Marine	No
Thalassarche melanophris impavida	Campbell Albatross		V	Marine	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Thalassarche steadi	White-capped Albatross		V	Marine	No
Frogs					
Heleioporus australiacus	Giant Burrowing Frog	V	V	Forages in woodlands, wet heath, dry and wet sclerophyll forest (Ehmann 1997). Associated with semi-permanent to ephemeral sand or rock based streams (Ehmann 1997), where the soil is soft and sandy so that burrows can be constructed (Environment Australia 2000).	No
Litoria aurea	Green and Golden Bell Frog	E	V	This species has been observed utilising a variety of natural and man-made waterbodies (Pyke & White 1996) such as coastal swamps, marshes, dune swales, lagoons, lakes, other estuary wetlands, riverine floodplain wetlands and billabongs, stormwater detention basins, farm dams, bunded areas, drains, ditches and any other structure capable of storing water (DECC 2007). Fast flowing streams are not utilised for breeding purposes by this species (Mahony 1999). Preferable habitat for this species includes attributes such as shallow, still or slow flowing, permanent and/or widely fluctuating water bodies that are unpolluted and without heavy shading (DECC 2007). Large permanent swamps and ponds exhibiting well-established fringing vegetation (especially bulrushes–Typha sp. and spikerushes–Eleocharis sp.) adjacent to open grassland areas for foraging are preferable (Ehmann 1997; Robinson 1993). Ponds that are typically inhabited tend to be free from predatory fish such as Mosquito Fish (Gambusia holbrooki) (DECC 2007).	No
Pseudophryne australis	Red-crowned Toadlet	V		Red-crowned Toadlets are found in steep escarpment areas and plateaus, as well as low undulating ranges with benched outcroppings on Triassic sandstones of the Sydney Basin (DECC 2007). Within these geological formations, this species mainly occupies the upper parts of ridges, usually being restricted to within about 100 metres of the ridgetop. However they may also occur on plateaus or more level rock platforms along the ridgetop (DECC 2007). Associated with open forest to coastal heath (Ehmann 1997). Utilises small ephemeral drainage lines which feed water from the top of the ridge to the perennial creeks below for breeding, and are not usually found in the vicinity of permanent water (Ehmann 1997). Breeding sites are often characterised by clay-derived soils and generally found below the first sandstone escarpment in the talus slope (NPWS 1997).	No
Mammals					

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	V	V	The Large-eared Pied Bat has been recorded in a variety of habitats, including dry sclerophyll forests, woodland, sub-alpine woodland, edges of rainforests and wet sclerophyll forests (Churchill 1998; DECC 2007). This species roosts in caves, rock overhangs and disused mine shafts and as such is usually associated with rock outcrops and cliff faces (Churchill 1998; DECC 2007).	No
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)		E	The Spotted-tailed Quoll inhabits a range of forest communities including wet and dry sclerophyll forests, coastal heathlands and rainforests (Mansergh 1984; DECC 2007j), more frequently recorded near the ecotones of closed and open forest. This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage in (DECC 2007). Maternal den sites are logs with cryptic entrances; rock outcrops; windrows; burrows (Environment Australia 2000).	No
Isoodon obesulus obesulus	Southern Brown Bandicoot	E	E	This species is associated with heath, coastal scrub, heathy forests (Menkhorst & Knight 2004), shrubland and woodland on well drained soils. This species is thought to display a preference for newly regenerating heathland and other areas prone to fire (Menkhorst & Seebeck 1990).	No
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V		Associated with a range of habitats such as rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland (Churchill 1998). It forages above and below the tree canopy on small insects (AMBS 1995, Dwyer 1995, Dwyer 1981). Will utilise caves, old mines, and stormwater channels, under bridges and occasionally buildings for shelter (Environment Australia 2000, Dwyer 1995).	Unlikely
Perameles nasuta	Long-nosed Bandicoot, North Head	E2		The exact area occupied by the population is not clearly defined. For the purpose of this determination, the population includes the local government areas (LGA) of Marrickville and Canada Bay, with the likelihood that it also includes Canterbury, Ashfield and Leichhardt LGAs.	No
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE mainland)		V	Associated with dry coastal heath and dry and wet sclerophyll forests (Strahan 1998) with dense cover for shelter and adjacent more open areas for foraging (Menkhorst & Knight 2004).	No
Pseudomys novaehollandiae	New Holland Mouse		V	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes. The New Holland Mouse is a social animal, living predominantly in burrows shared with other individuals.	No

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Inhabits a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and cultivated areas (Churchill 1998, Eby 1998). Camps are often located in gullies, typically close to water, in vegetation with a dense canopy (Churchill 1998).	Unlikely

Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Protected Matters Report are only indicative and cannot be considered a comprehensive inventory. 'Migratory marine species' and 'listed marine species' listed on the EPBC Act (and listed on the DEW protected matters report) have not been included in this table, since they are considered unlikely to occur within the study area due to the absence of marine habitat.

E = Endangered; E2 = Endangered Population; V = Vulnerable; M = Migratory.

Threatened Ecological Communities

Threatened Ecological Communities	EPBC Status	Regional Occurrence	Likelihood of Occurrence
Eastern Suburbs Banksia Scrub of the Sydney Region	Endangered	Community known to occur within area	No
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	No

Disclaimer: Data extracted from the EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory.

Appendix 2

EPBC Act Assessments

Undertaken according to the *EPBC Act Significant Impact Guidelines* (Commonwealth of Australia 2009).

White-bellied Sea Eagle (*Haliaeetus leucogaster*)

The White-bellied Sea Eagle is listed as a marine and migratory species under the EPBC Act.

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

Criterion a: substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;

The White-bellied sea eagle is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. (DEWHA 2010). It is found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitat occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea) (DEWHA 2010).

The White-bellied sea eagle generally forages over large expanses of open water and will also forage over open terrestrial habitats (such as grasslands) which it hunts its prey from a perch or whilst in flight feeding opportunistically on a variety of fish, birds, reptiles, mammals, crustaceans and on carrion and offal (DEWHA 2010).

The White-bellied Sea Eagle is not known to nest on site. This species prefers taller trees to provide good vantage over the surroundings. The larger street trees (Norfolk Island Pines) may provide adequate height for future nesting sites. However, the branching structure of these trees may not be suitable for nest placement. The shorter trees on site are not suitable nesting habitats.

The White-bellied Sea Eagle perches on high branches to observe for prey in nearby water. The trees on site are considered too far from the ocean to provide such benefits.

Therefore, the action is unlikely to significant impact on habitat for this species.

Criterion b: result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or

The project will not result in the establishment of an invasive species that is harmful to the White-bellied Sea Eagle. Manly is a highly developed area with an established population of urban invasive species. The proposed development will not exacerbate this problem or introduce new invasive species to the area. Landscaping with plant species indigenous to Manly has been recommended.

Criterion c: seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

The White-bellied Sea Eagle may potentially use the large street trees (Norfolk Island Pines) as a resting area between foraging activity, or as a feeding perch. Even if all of these trees are removed as

part of the development, it is unlikely that this would seriously disrupt the lifecycle of an ecologically significant portion of the population. Four trees are unlikely to support more than one bird (or breeding pair) and given the presence of other similar sized Norfolk Island Pines in the Manly area, there are many other suitable options for nearby resting areas.

Therefore, the proposed works should not disrupt the lifecycle of the White-bellied Sea Eagle.

Conclusion

The proposal is considered unlikely to have a significant impact on the Osprey for the following reasons:

- Habitat removal is minimal compared to that within the locality;
- Areas of known and potential habitat are also present elsewhere within the LGA;
- The proposal would not isolate or fragment any currently connecting areas of habitat particularly given this species is highly mobile; and
- Disturbance to foraging is likely to be temporary and only during construction.

NSW Assessment of Significance (7-part test)

The Assessment of Significance (7-part test) is applied to species, populations and ecological communities listed on Schedules 1, 1A and 2 of the TSC Act and Schedules 4, 4A and 5 of the Fisheries Management Act. The assessment sets out 7 factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether further assessment is required via a Species Impact Statement (SIS). All factors must be considered and an overall conclusion made based on all factors in combination. An SIS is required if, through application of the 7-part test, an action is considered likely to have a significant impact on a threatened species, population or ecological community.

Osprey (*Pandion haliaetus*)

The Osprey is found around coastal waters, estuaries, beaches, reefs, islands and they have been recorded following major rivers inland. They are common around the north coast but become uncommon in closely settled areas in south east Australia. Ospreys nest high up in tall dead trees or the dead crowns of trees, usually within one kilometre of the coast. Ospreys fish in clear waters, often using tall foreshore vegetation as hunting and feeding perches (SEWPaC 2010).

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 the risk of extinction.

Ospreys commonly hunt along coastal streams and estuaries, utilising tall foreshore vegetation as hunting and feeding perches. The species is highly mobile covering large areas in daily foraging excursions. Ospreys may use the tall street trees (Norfolk Island Pines) for foraging, and resting.

The proposal may cause some limited disruption of potential habitat for this species should it be present within the study area during the time of construction. Any disturbance would be short in duration and it is likely that birds would relocate to other nearby areas habitat should they be disturbed.

Worst case scenario is that four Norfolk Island Pines will be removed as part of the development. Given the highly mobile nature of the species, and suitable other trees in the immediate area, it is considered unlikely that the proposal would place a viable local population at risk of extinction and would likely have minimal impact.

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 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 four street trees (Norfolk Island Pines) may provide suitable nesting or resting habitat for Osprey. It is unknown whether all of these trees will be removed as part of the proposal. However if removed, other areas of potential habitat for this species are present throughout the Manly area.

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,

While the construction process may cause minor disturbance, and the trees may or may not be removed, the proposal will not result in any isolation or fragmentation of roosting, foraging or overfly areas.

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 to be removed represents a very small amount of the potential roosting habitat present within the locality and LGA. Other suitable habitat is present in the immediate vicinity. As such it is unlikely that the proposal would interfere with the long term survival of the species.

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

No critical habitat has been declared for this species.

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

No recovery plan has yet been developed for this species. No relevant threat abatement plans have been prepared for this species. However, the Department of Environment and Conservation has identified nine priority actions to help recover the Osprey in New South Wales.

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.

No key threatening processes are relevant to this proposal with respect to the Osprey. However, a threat to the Osprey is the *removal of large trees near the coast that could be used as nest* sites. The development may involve the removal of up to four tall trees throughout the study area. Given the small number of trees and suitability of other tall species in the vicinity, it is unlikely that the proposal with threaten the Osprey.

Conclusion

The proposal is considered unlikely to have a significant impact on the Osprey for the following reasons:

- Habitat removal is minimal compared to that within the locality;
- Areas of known and potential habitat are also present elsewhere within the LGA;
- The proposal would not isolate or fragment any currently connecting areas of habitat particularly given this species is highly mobile; and
- Disturbance to foraging is likely to be temporary and only during construction.

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