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Flora assessment:

Lot 1 & 2 DP 706628 Yamba Road, Yamba

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The geology of the Site and surrounding areas (Figure 4) was mapped at 1: 250 000 scale by Rose (1968) as Quaternary sediments (map unit Qa). This map unit is described as 'Alluvium, gravel, sand, silt, clay' and includes areas of beach and dune sand concealed by riverine deposits.

From the Site inspection, the soils of the Site appeared to be Quaternary silica sands.

2.2.2 Soil landscape

The soil landscape of the Site and the surrounding developed areas (Figure 5) was mapped at 1:100 000 scale by Morand (2001) as Disturbed Terrain (map unit xx).

The soil landscape of the Clarence Estuary Nature Reserve to the north-west is mapped as Iluka (map unit il).

Iluka soil landscape is described by Morand (2001) as:

Landscape – Extremely low level to gently undulating Quaternary (Holocene and Pleistocene) sand sheets. Low beach ridges are common on Holocene sand. Slopes 0 - 2%, relief 1 - 3 m, elevation 1 - 5 m. Mix of uncleared and cleared areas of open-forest and closed-forest (littoral rainforest).

2.3 Land use

The Yamba Bay Foreshore Reserve was reserved for public recreation in 1910 and included the Blue Dolphin Holiday Resort. The majority of the land was converted to freehold in 1972 with exception of a 20 m wide Crown road along the foreshore. This road was closed in 1995 and was added to Reserve 1003009 for Public Recreation and Coastal Environment Protection on 11 October 2002 (Purcell 2003 in Appendix 2).

The approximately 131 ha Clarence Estuary Nature Reserve to the north-west of the Site was created in 1999 (website: www.nationalparks.nsw.gov.au accessed 28 October 2006). Purcell (2003) states that:

The Estuary Nature Reserve situated adjacent to Yamba Bay Foreshore Reserve was used for a sanitary depot, pre-dating septic tanks for effluent disposal.

A review of the historical aerial photographs (October 1958, 20 June 1971, 3 August 1980, 31 March 1993, 16 July 2004), showed that the eastern half of the Site was cleared prior to 1971, with further clearing and development of the Holiday Resort over each decade (Table 1, Appendix 3). Figure 6 shows the progressive clearing and development of the Site.

3.0 Vegetation surveys

3.1 Previous surveys

No vegetation survey nor mapping appears to have been undertaken for the Clarence Estuary Nature Reserve to the north-west of the Site. From inspection at the time of survey of the Site, the Nature Reserve supports a complex of *Melaleuca quinquenervia* dominated swamp forest intergrading to Littoral Rainforest.

Purcell (2003) describes the vegetation of the approximately 20 m wide strip of foreshore vegetation as:

1.0 Introduction

The vegetation on approximately 5.7 ha on Lot 1 & 2 DP 706628 Yamba Road, Yamba and the adjoining approximately 0.61 ha on Crown Land Yamba Bay Foreshore Reserve, Lot 740 DP 1023318 (the Site, Figures 1 and 2) was assessed at the request of Sonja Lyneham of Planning Workshop Australia on behalf of Mike Shaw of Blue Dolphin Development Joint Venture.

At the time of survey on 26 and 27 October 2006, the Site was the Blue Dolphin Holiday Resort with numerous occupied holiday units, cabins, tent and caravan sites, swimming pools, children's playgrounds, petrol station, tennis court, extensive networks of concrete vehicle and pedestrian access ways, mown lawns, landscaped garden beds, and clusters of and individual shade trees.

The Site is located in Clarence Valley Local Government Area.

2.0 Environmental setting

The Site is on the southern shore of Yamba Bay which is separated from the main Clarence River by the estuarine sand flats of Hickey and Dart Islands (Figure 1). These islands are part of the Clarence Estuary Wetlands (website: www.dlwc.nsw.gov.au accessed 28 October 2006).

The Site is relatively flat with recorded survey levels between 1.25 and 2.54 m AHD (see surveyor's data in Appendix 1).

It is bounded (Figures 1, 2 and 3) by:

- sandy beach and the estuarine waters of Yamba Bay to the north-east;
- Clarence Estuary Nature Reserve to the north-west;
- Moby Dick Waterfront Motel to the south-east; and
- Yamba Road to the south.

2.1 Climate

The nearest meteorological station is at Yamba Pilot Station (station 058012, operated since 1877), located about 2 km to the east of the Site.

The recorded mean annual daily maximum temperature at Yamba Pilot Station is 23.3°C with a mean annual daily minimum temperature of 15.4°C. The highest mean monthly maximum temperature was recorded for February (26.7°C) and the lowest mean monthly minimum temperature for July (9.7°C) (Bureau of Meteorology website www.bom.gov.au/climate accessed 28 October 2006).

The mean annual rainfall recorded at Yamba Pilot Station is 1457 mm, with the highest mean monthly rainfall of 185.4 mm recorded in March and the lowest mean monthly rainfall of 59.6 mm recorded in September. The mean number of raindays per annum is 133.6 days (Bureau of Meteorology website www.bom.gov.au/climate accessed 28 October 2006).

2.2 Geology and soil landscape

2.2.1 Geology

Yamba Bay Foreshore Reserve supports a variety of grasses including salt couch, Banksia integrifolia (Coast Banksia), Callitris, Tetragonia tetragonoides (Warrigal Green), Cupaniopsis anacardoides (Tuckeroo), Sesuvium portulacastrum.

Purcell (2005) assessed the flora of the Blue Dolphin Holiday Park site, the foreshore Crown reserve (Yamba Bay Foreshore Reserve) and adjoining boundary of the Clarence Estuary Nature Reserve. The area was surveyed on 10 to 12 September 2005.

The random meander survey recorded 40 native Australian plant species, included planted non-local natives (Appendix 4 (from Appendix 1 in Purcell 2005)). No exotic species were recorded in the assessment.

Purcell (2005) recorded native Australian trees at ten locations and 87 individual recordings (Appendix 4 (from Appendix 3 in Purcell 2005), Figure 7).

David Kay (2006) identified 1712 shrubs and trees on the Site and the surveyor recorded the tree locations (Figure 8) as eastings and northings, surface level (m AHD), tree height, spread and trunk diameter (Appendix 1). There were:

Height	Number of individuals	Native	Exotic
10 to 15 m	145	127	18
>5 m and <10 m	488	124	364 with 352 palms)
≤ 5 m	1079	1043	36
Total	1712		

The individuals recorded in the 10 to 15 m height range were:

Status	Species	Common name	Number of individuals	Trunk diameter	Species recorded by Purcell (2005)
Local native	<i>Acacia aulacocarpa</i>	Brush Ironbark Wattle	6	0.3 to 0.5 m	yes
Local native	<i>Angophora costata</i>	Smooth Barked Apple	1	0.3 m	yes
Non-local native	<i>Araucaria heterophylla</i>	Norfolk Island Pine	4	0.3 to 0.6 m	no
Exotic	<i>Arecastrum romanzoffianum</i>	Queen Palm	1	0.3 m	no
Local native	<i>Banksia integrifolia</i>	Coast Banksia	17	0.3 to 0.9 m	yes
Local native	<i>Callitris columellaris</i>	Sand Cypress Pine	29	0.3 to 0.9 m	yes
Local native	<i>Casuarina glauca</i>	Swamp Oak	2	0.2 to 0.5 m	yes
Local native	<i>Corymbia intermedia</i>	Pink Bloodwood	12	0.3 to 0.7 m	yes
Non-local native	<i>Corymbia maculata</i>	Spotted Gum	6	0.4 to 0.7 m	no
Non-	<i>Corymbia torelliana</i>	Cadagi	5	0.3 to 0.7	no

Status	Species	Common name	Number of individuals	Trunk diameter	Species recorded by Purcell (2005)
local native				m	
Local native	<i>Elaeocarpus obovatus</i>	Hard Quandong	1	0.3 m	yes
Possibly local native	<i>Eucalyptus grandis</i>	Flooded Gum	6	0.5 to 0.8 m	given as hybrid
Possibly local native	<i>Eucalyptus tereticornis</i>	Forest Red Gum	1	1.2 m	yes
Non-local native	<i>Ficus macrophylla</i>	Moreton Bay Fig	1	0.7 m	given Ficus rubiginosa
Non-local native	<i>Ficus microcarpa</i> var. <i>hillii</i>	Hill's Weeping Fig	1	1 m	given as Ficus superba
Local native	<i>Lophostemon confertus</i>	Brush Box	1	0.4 m	yes
Local native	<i>Lophostemon suaveolens</i> (given as <i>Angophara</i> spp.)	Swamp Turpentine	11	0.3 to 0.5 m	yes
Local native	<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	40	0.2 to 1.3 m	yes

The most abundant native tree ≥ 10 m height was *Melaleuca quinquenervia*. Of the 40 *Melaleuca quinquenervia* recorded, there were two individuals (Tree 105 and 1364) with trunk diameter ≥ 1 m and 19 individuals (Trees 398, 757, 1412, 1417, 309, 759, 1419, 1425, 1426, 1291, 1411, 1422, 107, 123, 110, 109, 1414, 1495, 106) with trunk diameter ≥ 0.5 m (Figure 8).

More than 70% (352) of the 488 individuals recorded in the > 5 m and < 10 m height range were planted palms. In the > 5 m and < 10 m height range, there were:

Status	Species	Common name	Number of individuals	Trunk	Species recorded by Purcell (2005)
Local native	<i>Acacia aulacocarpa</i>	Brush Ironbark Wattle	14	0.3 to 0.6 m	yes
Local native	<i>Acacia melanoxylon</i>	Blackwood	5	0.3 to 0.4 m	yes
Non-local native	<i>Archontophoenix cunninghamiana</i>	Bangalow Palm	41	0.1 to 0.4 m	no
Exotic	<i>Arecastrum romanzoffianum</i>	Queen Palm	295	0.3 m	no
Local native	<i>Avicennia marina</i>	Grey Mangrove	3	0.2 to 0.4 m	yes
Local native	<i>Banksia integrifolia</i>	Coast Banksia	25	0.2 to 0.9 m	yes
Local native	<i>Callitris columellaris</i>	Sand Cypress Pine	8	0.2 to 0.7 m	yes
Exotic	<i>Caryota mitis</i>	Fishtail Palm	3	0.1 to 0.2 m	no

Status	Species	Common name	Number of individuals	Trunk	Species recorded by Purcell (2005)
Local native	<i>Casuarina glauca</i>	Swamp Oak	9	0.1 to 0.3 m	yes
Exotic	<i>Cocos nucifera</i>	Coconut Palm	1	0.4 m	no
Local native	<i>Corymbia intermedia</i>	Pink Bloodwood	16	0.2 to 0.6 m	yes
Non-local native	<i>Corymbia maculata</i>	Spotted Gum	4	0.2 to 0.3 m	no
Local native	<i>Cupaniopsis anacardioides</i>	Tuckeroo	3	0.2 to 0.5 m	yes
Exotic	<i>Delonix regia</i>	Poinciana	1	0.5	no
Exotic	<i>Dyopsis decaryi</i>	Triangle Palm	3	0.4 m	no
Exotic	<i>Dyopsis lutescens</i>	Golden Cane Palm	1	0.1 m	no
Local native	<i>Elaeocarpus obovatus</i>	Hard Quandong	2	0.5 m	yes
Exotic	<i>Erythrina crista-galli</i>	Coral Flame Tree	1	0.3 m	no
Non-local native	<i>Ficus microcarpa</i> var. <i>hillii</i>	Hills Weeping Fig	2	0.5 to 0.7 m	given as <i>Ficus superba</i>
Non-local native	<i>Grevillea robusta</i>	Silky Oak	1	0.3 m	no
Possibly local native	<i>Hymenosporum flavum</i>	Native Frangipani	1	0.2 m	no
Local native	<i>Livistona australis</i>	Cabbage Tree Palm	3	0.3 to 0.6 m	**
Local native	<i>Lophostemon confertus</i>	Brush Box	3	0.4 to 0.5 m	yes
Local native	<i>Lophostemon suaveolens</i> (given as <i>Angophara</i> spp.)	Swamp Turpentine	12	0.3 to 0.5 m	yes
Local native	<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	13	0.2 to 0.6 m	yes
Local native	<i>Melia azedarach</i>	White Cedar	3	0.1 m	yes
Exotic	<i>Phoenix roebelenii</i>	Date Palm (dwarf)	3	0.1 to 0.5 m	no
Exotic	<i>Platanus x acerifolia</i>	London Plane Tree	1	0.4 m	no
Exotic	<i>Ravenala madagascariensis</i>	Traveller's Palm	2	0.2 to 0.4 m	no
Non-local native	<i>Schefflera actinophylla</i>	Umbrella Tree	3	0.3 to 0.5 m	no
Exotic	<i>Spathodea campanulata</i>	African Tulip Tree	1	0.7 m	no
Local native	<i>Syzygium luehmannii</i>	Small-leaved Lilly-pilly	4	0.1 to 0.3 m	no
?	Unknown		1	0.3 m	no

Of the 1079 individuals recorded between 1 m and 5 m, all were planted except 36 native individuals recorded, namely:

Species	Number of individuals	Trunk diameter	Species recorded by Purcell (2005)
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<i>Acacia aulocaocarpa</i>	1	0.4 m	yes
<i>Acacia melanoxylon</i>	8	0.1 to 0.3 m	yes
<i>Alphitonia excelsa</i>	4	0.1 to 0.4 m	yes
<i>Banksia integrifolia</i>	8	0.1 to 0.6 m	yes
<i>Callistemon citrinus</i>	1	0.1 m	no
<i>Callitris columellaris</i>	1	0.3 m	yes
<i>Casuarina glauca</i>	3	0.1 to 0.3 m	yes
<i>Corymbia intermedia</i>	3	0.1 to 0.5 m	yes
<i>Cupaniopsis anacardioides</i>	4	0.2 to 0.3 m	yes
<i>Eucalyptus robusta</i>	1	0.5 m	no
<i>Lophostemon suaveolens</i> (given as <i>Angophora</i> spp.)	2	0.1 to 0.4 m	yes

3.2 Current assessment

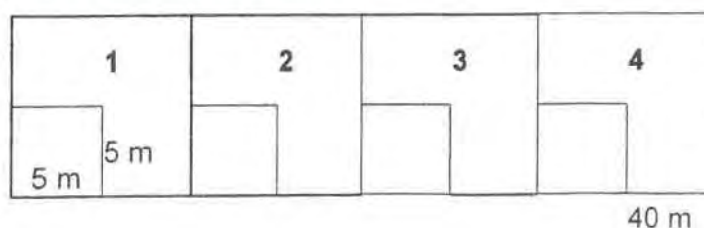
A total of 103 species (57 native, 2 non-local native and 44 exotic) were recorded (Table 2) from three 40 m x 10 m transects and two 20 m x 20 m quadrats (all 400 m² in area) and one Spot location on the Site and one 40 m x 10 m transect and one Spot location in the adjoining Clarence Estuary Nature Reserve by Dr AnneMarie Clements and Polly Simmonds on 26 and 27 October 2006.

3.2.1 Methods

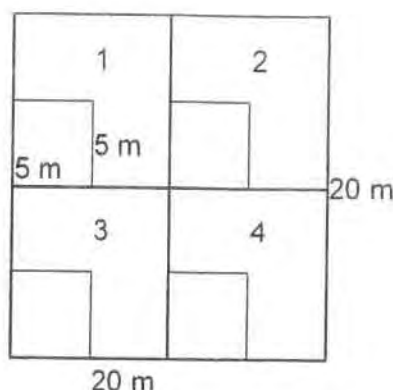
Sampling locations were selected in areas with trees present. The sampling locations (Figure 9) were:

Transect	Location	Sampling location in Purcell (2005)
1 (10 m x 40 m)	North-east corner in Yamba Bay Foreshore Reserve	Native tree recorded
2 (10 m x 40 m)	North-east corner of the adjoining Clarence Estuary Nature Reserve	
3 (10 m x 40 m)	South-south of the Site	includes location 10
4 (20 m x 20 m)	North-west of the Site	includes location 1
5 (10 m x 40 m)	Centre of the Site	includes location 4 and 5
6 (20 m x 20 m)	Centre in Yamba Bay Foreshore Reserve	includes location 6
Spot location		
A	Northern section camping location E28	SM label
B	North-west along drainage line	

The transects and quadrats (T1 to T6) (Figure 9) were 400 m² in area and consisted of four contiguous 10 m x 10 m quadrats. The shape of the sampling areas depended on the width of relatively homogeneous vegetation. The layout of the quadrats and sub-quadrats was as follows for the transects:



And for Quadrats T4 and T6:



The relative frequency of plant species was assessed by recording the presence/absence of each species in each of the 10 m x 10 m quadrats with the presence/absence of herb and shrub species recorded in 5 m x 5 m sub-quadrats in each of the 10 m x 10 m quadrats (Table 2). In each 10 m x 10 m quadrat, the number of individuals and heights of all tree species were recorded (Table 3).

The relative frequency of plant species was assessed by recording the presence/absence of each species in each of the sub-quadrats, with:

- Herb and shrub (< 2 m) species scored for a smaller 5 m x 5 m sub-quadrat in each of the 10 m x 10 m sub-quadrats (Table 2). Frequency of a species is expressed (Table 2) by the number of sub-quadrats, in which it was scored (i.e. 1, 2, 3, 4 or 5).
- Numbers and maximum canopy heights of all tree species recorded in each of the 10 m x 10 m sub-quadrats (Table 3).

Supplementary data from Spot locations A and B (Figure 9, Table 2) consisted of recording species present in an approximately 10 m radius.

Sampling locations were photographed at the time of inspection (Appendix 5).

Nomenclature is consistent with Harden (1990-1993, 2002), Harden and Murray (2000) and subsequent taxonomic changes as published in *Telopea*, the Sydney Royal Botanic Gardens' journal of systematic botany, and in other Australian taxonomic literature.

3.2.2 Observations

The species composition recorded in the sampling locations was as follows:

Transect	Total species recorded	Native species recorded	Exotic species recorded	% Exotic species
1 (Foreshore Reserve)	17	5	12	71%
2 (Nature Reserve)	39	31	8	21%
3 (Holiday Park)	24	9	15	63%
4 (Holiday Park)	21	7	14	62%
5 (Holiday Park)	42	25	17	40%
6 (Foreshore Reserve)	19	9	10	53%

Transect	Total species recorded	Native species recorded	Exotic species recorded	% Exotic species
Spot locations				
A (Holiday Park)	4	3	1	25%
B (Drainage line)	9	9	0	0%
TOTAL	103	59	44	43%

Yamba Bay Foreshore Reserve

The vegetation of the foreshore reserve adjoining Yamba Bay (sampled in Transects 1 and 6) consisted predominantly of open grassed areas, concrete paths and scattered trees (see photographs in Appendix 5). In the central area with denser trees, 47% of the species recorded were native compared with 29% in the more open lawn area with scattered trees.

In the north-east corner with scattered trees (sampled in Transect 1), the trees consisted of one *Angophora costata* (Sydney Red Gum), one *Araucaria heterophylla* (Norfolk Island Pine), four *Melaleuca quinquenervia* (Broadleaved Paperbark) and on the shoreline one *Avicennia marina* var. *australasica* (Grey Mangrove). The ground layer was a mown lawn of *Cynodon dactylon* (Couch) with exotic grasses *Bromus catharticus* (Prairie Grass), *Eragrostis mexicana* (Mexican Lovegrass), *Pennisetum clandestinum* (Kikuyu), *Poa annua* (Winter Grass) and other exotic species including *Soliva sessilis* (Bindi-eye). Only one native groundcover species, *Oxalis rubens* (Oxalis), was recorded.

A dense stand of trees was present in the central area of the foreshore reserve (sampled in Quadrat 6). The trees recorded were the native species *Banksia integrifolia* (Coast Banksia), *Callitris columellaris* (Sand Cypress-Pine), *Casuarina glauca* (Swamp Oak) with shrub layer up to 2-3 m of *Acacia melanoxylon* (Blackwood), *Cupaniopsis anacardioides* (Tuckeroo), *Acacia longifolia* (Sydney Golden Wattle). The ground layer was sparse with scattered natives recorded including *Cyperus* sp., *Desmodium rhytidophyllum* (Tick-trefoil) and *Dichelachne crinita* (Long-haired Plume Grass) and the exotic grasses *Cynodon dactylon*, *Bromus catharticus*, *Poa annua*, *Setaria* sp., *Sporobolus africanus* (Parramatta Grass) and exotic herbs *Guilleminea densa* (Small Matweed), *Medicago* sp. (Medic), *Polycarpon tetraphyllum* (Four-leaf Allseed), *Soliva sessilis* (Bindi-eye), and *Trifolium repens* (White Clover).

Blue Dolphin Holiday Park

The vegetation in the Holiday Park consisted of scattered trees and clumps of shade trees with mown lawn (sampled in Transect 3, Quadrat 4 and Spot location A) and some garden beds (sampled in Transect 5).

The management of the groundcover in the camp sites appears to include the rolling out of commercial Couch turf in barer areas, as observed at Spot location A, resulting in a dominance of *Cynodon dactylon* ground cover.

The trees in the south-west (Transect 3) were planted and/or younger remnant trees retained in rows. The tree species recorded were *Banksia integrifolia*, *Lophostemon suaveolens*, *Melaleuca quinquenervia* and the native shrub *Acacia aulacocarpa*.

The sampling area of Quadrat 4 included a tent occupying the tent site. The trees recorded were *Banksia integrifolia*, *Callitris columellaris*, *Corymbia intermedia* and *Syzygium oleosum*.

In the camping area (Spot location A), of four species recorded, three were the tree species *Callitris columellaris*, *Corymbia intermedia* and *Syzygium moorei* (Rose Apple). *Callitris columellaris* and *Corymbia intermedia* occur in Yamba as local native species. The threatened species *Syzygium moorei* is not a local native species.

From the distribution on Plantnet (website of the Royal Botanic Garden (Sydney) www.plantnet.rbgsyd.nsw.gov.au, accessed 24 October 2006), *Syzygium moorei* is known to occur:

Distribution and occurrence: Grows in lowland subtropical rainforest, north from the Richmond R., now rare.

NSW subdivisions: NC

Other Australian states: Qld

Threatened species: NSW TSCA: Vulnerable ROTAP: 2VCI



In Transect 3 and Quadrat 4, the groundcover was a mown lawn with a dominance of *Cynodon dactylon* and a high frequency of *Soliva sessilis* with *Axonopus affinis* (Narrow-leaved Carpet Grass) and other exotic herbs and grasses also present.

There was minor occurrence of native species:

- in the south-western corner (Transect 3) *Cerastium glomeratum*, *Oxalis rubens*, *Pratia purpurascens* (Whiteroot), *Themeda australis* (Kangaroo Grass) and *Wahlenbergia gracilis* (Sprawling Bluebell) were recorded, which may be the result of close proximity to the nature reserve, as well as less intensive use of this area by campers; and
- in the camp site (Quadrat 4), *Centella asiatica* (Pennywort), *Cotula australis* (Common Cotula) and *Notothixos cornifolius* were recorded.

The garden bed (Transect 5) had a total of 42 species (25 native and 17 exotic) recorded. Many of the natives are likely to have been planted. The native trees recorded included *Callitris collumellaris*, *Corymbia intermedia*, *Cupaniopsis anacardioides*, *Glochidion ferdinardi*, *Lophostemon suaveolens* and *Melaleuca quinquenervia*. Palms were commonly planted in the area, notably *Archontophoenix cunninghamiana* (Bangalow Palm).

Clarence Estuary Nature Reserve

The vegetation of the Nature Reserve was a mosaic of tidal creeks with mangroves, *Melaleuca quinquenervia* dominated swamp forest and Littoral Rainforest. The

vegetation was sampled in the north-eastern corner (Transect 2) and in the drainage line west of the Holiday Park (Spot location B).

In Transect 2, there had been recent bush regeneration work with the cutting and painting with herbicide of *Asparagus asparagoides* (Bridal Creeper), *Chrysanthemoides monilifera* subsp. *monilifera* (Boneseed) and *Lantana camara* (Lantana) evident. Of the 39 species, there were eight exotic species recorded: *Asparagus asparagoides*, *Bidens pilosa* (Farmer's Friend), *Carica papaya* (Papaya), *Chrysanthemoides monilifera* subsp. *monilifera* (Boneseed), *Lantana camara*, *Ochna serrulata* (Mickey Mouse Plant), *Solanum nigrum* (Blackberry Nightshade) and *Solanum seaforthianum* (Brazilian Nightshade).

The native component was diverse with trees of *Acacia aulacarpa*, *Angophora costata*, *Angophora floribunda*, *Alphonia excelsa*, *Banksia integrifolia*, *Callistris columellaris*, and *Melaleuca quinquenervia* with *Avicennia marina* on the shoreline. The midstorey and understorey supported a wide range of regenerating native species.

The drainage line and immediately adjoining vegetation was relative weed-free with nine native species recorded with *Avicennia marina* var. *australasica* in the tidally inundated areas and upslope *Acacia melanoxylon* (Blackwood), *Melia azedarach* (White Cedar), *Syzygium luehmannii* (Small-leaved Lillypilly) and *Syzygium oleosum* (Blue Cherry), with ground cover including *Acronychia imperforata* (Beach Acronychia), *Eustrephus latifolius* (Wombat Berry), *Tetragonia tetragonioides* (New Zealand Spinach), and in the wetter less saline areas *Phragmites australis* (Common Reed).

4.0 Conservation significance

The conservation significance of the communities and species recorded in the Site were assessed at a:

- National level against the schedules of the Commonwealth Environment Protection and Biodiversity Conservation Act (1999) (EP&BC Act). The EP&BC Act lists threatened ecological communities and species, and is a Commonwealth assessment and approval system for:
 - Actions that have a significant impact on matters of national environmental significance;
 - Actions that have a significant impact on the environment of Commonwealth land and;
 - Actions carried out by the Commonwealth Government.
- State level against the schedules of the Threatened Species Conservation Act 1995 (TSC Act).

4.1 Communities

4.1.1 National

A search of the Environment Protection and Biodiversity Conservation Act 1999 (EP&BC Act) online database (www.deh.gov.au/epbc, accessed on 29 October 2006) revealed that there are no endangered ecological communities listed in the EP&BC Act within 10 km radius from the Site.

4.1.2 State