

WILDTHING

Environmental Consultants

31 July 2013

Job No: 12111

Tattersall – Lander Pty Ltd
PO Box 580
RAYMOND TERRACE NSW 2324

Attention: Mr Bob Lander

**RE: LOT 254 DP 753204, LOT 10 DP 1071458 & LOT 51 DP 1015671 NELSON BAY
ROAD BOBS FARM**

This letter gives an update on the finding of ecological studies undertaken for a proposed sand mine within Lot 254 DP 753204, Lot 10 DP 1071458 and Part Lot 51 DP 1015671 Nelson Bay Road, Bobs Farm NSW.

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under the following NPWS Scientific Investigation Licence SL100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Director General of NSW Agriculture (File No. TRIM 13/351) for the Fauna Survey for Biodiversity and Impact Assessment.

The study area (Lot 254 DP 753204, Lot 10 DP 1071458 and Part Lot 51 DP 1015671) is an irregularly shaped area of approximately 46ha occurring to the north of Nelson Bay Road. The study area occurs on stable, often steep sided Aeolian Holocene transgressive dunes composed of quartz sands. Soils consisted of deep very well drained weakly developed Podzols (Murphy, 1995). Vegetation largely consisted of uncleared tall open forest dominated by the canopy species *Eucalyptus pilularis* (Blackbutt) and *Angophora costata* (Smooth-barked Apple). Two smaller areas of wetter forest were also present within lower areas of ground.

The flora and fauna within the study area and adjacent land has been subject to a number of previous ecological investigations (Table 1).

Table 1: Previous Environmental Studies undertaken within study area and adjacent lands.

Environmental Consultant	Area Surveyed	Survey/Study Type
Wildthing Environmental Consultants, (2009).	Lot 10 DP 1071458 Nelson Bay Road, Bobs Farm NSW.	Statement of Effect on Threatened Flora and Fauna for a proposed depot site
ERM (2003)	Electrical easement running through Lot 254 DP 753204.	Environmental Impact Statement – Electricity Supply Upgrade from Tomago to Tomaree.

The following threatened species listed in Table 2 have been recorded on the Atlas of NSW Wildlife (OEH, 2013) and SEWPaC Databases within 10km of the study area.

Table 2: Threatened species, endangered populations and ecological communities considered.

Scientific Name	Common Name	TSC Act 1995	EPBC Act 1999
Flora			
<i>Corybas dowlingii</i>	Red Helmet Orchid	E	
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V
<i>Diuris arenaria</i>	Sand Doubletail	V	
<i>Diuris praecox</i>	Newcastle Doubletail	V	V
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	V	
<i>Phaius australis</i>	Lesser Swamp Orchid	E	E
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	E	E
<i>Grevillea parviflora</i> ssp. <i>parviflora</i>	Small-flowered Grevillea	V	V
<i>Allocasuarina defungens</i>	Dwarf Heath Casuarina	E	E
<i>Angophora inopina</i>	Charmhaven Apple	V	V
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V	
<i>Eucalyptus parramattensis</i> ssp. <i>decadens</i>	Drooping Red Gum	V	V
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	
<i>Melaleuca groveana</i>	Grove's Paperbark	V	
<i>Syzygium paniculatum</i>	Magenta Lillypilly	E	V
<i>Tetratheca juncea</i>	Black-eyed Susan	V	V
<i>Prostanthera densa</i>	Villous Mintbush	V	
<i>Asperula asthenes</i>	Trailing Woodruff	V	
<i>Galium australe</i>	Tangled Bedstraw	E	
<i>Lindernia alsinoides</i>	Noah's False Chickweed	E	
<i>Chamaesyce psammogeton</i>	Sand Spurge	E	
<i>Senecio spathulatus</i>	Coastal Fireweed	E	
<i>Streblus pendulinus</i>	Siah's Backbone		E
<i>Maundia triglochinos</i>		V	
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	E
<i>Persicaria elatior</i>	Tall Knot-weed	V	V
Invertebrates			
<i>Petalura gigantea</i>	Giant Dragonfly	E	
Amphibians			
<i>Crinia tinnula</i>	Wallum Froglet	V	
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V
<i>Litoria brevipalmata</i>	Green-thighed Frog	V	
<i>Mixophyes balbus</i>	Stuttering Frog	V	V
<i>Mixophyes iteratus</i>	Giant Barred Frog	E	E
Reptiles			
<i>Caretta caretta</i>	Loggerhead Turtle	V	M
<i>Chelonia mydas</i>	Green Turtle	V	M
<i>Dermochelys coriacea</i>	Leatherback Turtle	E	E
<i>Eretmochelys imbricata</i>	Hawksbill Turtle		V

Scientific Name	Common Name	TSC Act 1995	EPBC Act 1999
<i>Natator depressus</i>	Flatback Turtle		V
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	V	
<i>Hoplocephalus stephensii</i>	Stephen's Banded Snake	V	
Birds			
<i>Macronectes giganteus</i>	Southern Giant Petrel	E	E & M
<i>Macronectes halli</i>	Northern Giant Petrel	E	M
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	E	
<i>Pterodroma neglecta</i>	Kermadec Petrel	V	
<i>Fregetta grallaria grallaria</i>	White-bellied Storm Petrel	V	V
<i>Pterodroma nigripennis</i>	Black-winged Petrel	V	
<i>Pterodroma solandri</i>	Providence Petrel	V	
<i>Calonectris leucomelas</i>	Streaked Shearwater		M
<i>Puffinus carneipes</i>	Flesh-footed Shearwater	V	
<i>Puffinus tenuirostris</i>	Short-tailed Shearwater		M
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V	
<i>Limosa lapponica</i>	Bar-tailed Godwit		M
<i>Limosa limosa</i>	Black-tailed Godwit	V	M
<i>Arenaria interpres</i>	Ruddy Turnstone		M
<i>Xenus cinereus</i>	Terek Sandpiper	V	M
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler		M
<i>Sterna albifrons</i>	Little Tern	E	M
<i>Onychoprion fuscata</i>	Sooty Tern	V	
<i>Actitis hypoleucos</i>	Common Sandpiper		M
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper		M
<i>Calidris canutus</i>	Red Knot		M
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	M
<i>Calidris ruficollis</i>	Red-necked Stint		M
<i>Calidris tenuirostris</i>	Great Knot	V	M
<i>Tringa stagnatilis</i>	Marsh Sandpiper		M
<i>Numenius madagascariensis</i>	Eastern Curlew		M
<i>Numenius minutus</i>	Little Curlew		M
<i>Numenius phaeopus</i>	Whimbrel		M
<i>Charadrius bicinctus</i>	Double-banded Plover		M
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	
<i>Charadrius mongolus</i>	Lesser Sand-plover	V	M
<i>Pluvialis fulva</i>	Pacific Golden Plover		M
<i>Pluvialis squatarola</i>	Grey Plover		M
<i>Diomedea antipodensis</i>	Antipodean Albatross	V	V & M
<i>Diomedea gibsoni</i>	Gibson's Albatross	V	V & M
<i>Thalassarche bulleri</i>	Buller's Albatross		V & M
<i>Thalassarche cauta cauta</i>	Shy Albatross	V	V & M
<i>Thalassarche cauta salvinii</i>	Salvin's Albatross		V & M
<i>Thalassarche cauta steadi</i>	White-capped Albatross	V	V & M
<i>Thalassarche melanophris impavida</i>	Campbell Albatross		V & M
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	
<i>Haematopus longirostris</i>	Pied Oystercatcher	E	
<i>Esacus neglectus</i>	Beach Stone-curlew	E4A	
<i>Gallinago hardwickii</i>	Latham's Snipe		M
<i>Rostratula benghalensis australis</i>	Australian Painted Snipe	E	V & M
<i>Botaurus poiciloptilus</i>	Australian Bittern	E	E
<i>Ixobrychus flavicollis</i>	Black Bittern	V	
<i>Ardea alba</i>	Great Egret		M
<i>Ardea ibis</i>	Cattle Egret		M
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	
<i>Turnix maculosa</i>	Red-backed Button-quail	V	

Scientific Name	Common Name	TSC Act 1995	EPBC Act 1999
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V	
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	
<i>Lathamus discolor</i>	Swift Parrot	E	E
<i>Neophema pulchella</i>	Turquoise Parrot	V	
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	
<i>Callocephalon fimbriatum</i>	Gang Gang Cockatoo	V	
<i>Apus pacificus</i>	Fork-tailed Swift		M
<i>Hirundapus caudacutus</i>	White-throated Needletail		M
<i>Monarcha melanopsis</i>	Black-faced Monarch		M
<i>Monarcha trivirgatus</i>	Spectacled Monarch		M
<i>Merops ornatus</i>	Rainbow Bee-eater		M
<i>Rhipidura rufifrons</i>	Rufous Fantail		M
<i>Epthianura albifrons</i>	White-fronted Chat	V	
<i>Petroica boodang</i>	Scarlet Robin	V	
<i>Petroica phoenicea</i>	Flame Robin	V	
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	V	
<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A	E & M
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater	V	
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler	V	
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E1	E
<i>Circus assimilis</i>	Spotted Harrier	V	
<i>Pandion cristatus</i>	Eastern Osprey	V	
<i>Lophoictinia isura</i>	Square-tailed Kite	V	
<i>Erythrorhynchus radiatus</i>	Red Goshawk	E4A	V
<i>Hieraaetus morphnoides</i>	Little Eagle	V	
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle		M
<i>Ninox connivens</i>	Barking Owl	V	
<i>Ninox strenua</i>	Powerful Owl	V	
<i>Tyto longimembris</i>	Eastern Grass Owl	V	
<i>Tyto novaehollandiae</i>	Masked Owl	V	
<i>Tyto tenebricosa</i>	Sooty Owl	V	
Mammals			
<i>Planigale maculata</i>	Common Planigale	V	
<i>Dasyurus maculatus maculatus</i>	Tiger Quoll	V	V
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	
<i>Phascolarctos cinereus</i>	Koala	V	
<i>Macropus parma</i>	Parma Wallaby	V	
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E1	V
<i>Potorous tridactylus tridactylus</i> SE Mainland	Long-nosed Potoroo	V	V
<i>Aepyprymnus rufescens</i>	Rufous Bettong	E1	
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	
<i>Petaurus australis</i>	Yellow-bellied Glider	V	
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	V	
<i>Psuedomys novaehollandiae</i>	New Holland Mouse		V
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
<i>Syconycteris australis</i>	Common Blossom-bat	V	
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	
<i>Miniopterus australis</i>	Little Bentwing-bat	V	
<i>Miniopterus schreibersii oceanensis</i>	Large Bentwing-bat	V	

Scientific Name	Common Name	TSC Act 1995	EPBC Act 1999
<i>Kerivoula papuensis</i>	Golden-tipped Bat	V	
<i>Myotis macropus</i>	Southern Myotis	V	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	
<i>Chalinolobus dwyeri</i>	Large Pied Bat	V	V
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V	
Endangered Populations			
<i>Dromaius novaehollandiae</i> (Emu) – population in the NSW North Coast Bioregion and Port Stephens LGA.			
Hawks Nest and Tea Gardens Endangered Koala (<i>Phascolarctos cinereus</i>) Population			
Endangered Ecological Communities			
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions.			
Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions.			
River Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions.			
Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions.			
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions.			
E=Endangered Species V=Vulnerable Species E4A=Critically Endangered M=Migratory Species			

Vegetation communities present within Study Area (Figure 1):

- Coastal Sand Apple Blackbutt (35.2ha).
- Swamp Mahogany Paperbark Forest (0.53ha).
- Tall Alluvial Moist Forest (0.75ha).
- Orchard and associated residences (8.78ha).
- Cleared Maintained Easement (0.65ha).

Coastal Sand Blackbutt Open Forest

This community occupied approximately 35.2ha of the study area and was located on the well-drained Holocene sand dunes (Figures 11 & 12). This community was characterised by large specimens of *Eucalyptus pilularis* (Blackbutt). Other species present included *Angophora costata* (Smooth-barked Apple).

Similar Vegetation Types

HU509 - Blackbutt - Smooth-barked Apple shrubby open forest on coastal sands of the southern North Coast.

NPWS, (2000)

Biometric ID & Type

Map Unit 33 – Coastal Sand Apple – Blackbutt Forest

(402) Blackbutt – Smooth-barked Apple shrubby open forest on coastal sands of the southern North Coast.

Structure

Stratum

Height Range

Canopy Cover

Canopy

20 - 35m

20-45%

Small Tree

10 - 20m

5-40%

Shrub

1.5 – 4m

10-30%

Ground

<1m

5 – 60%

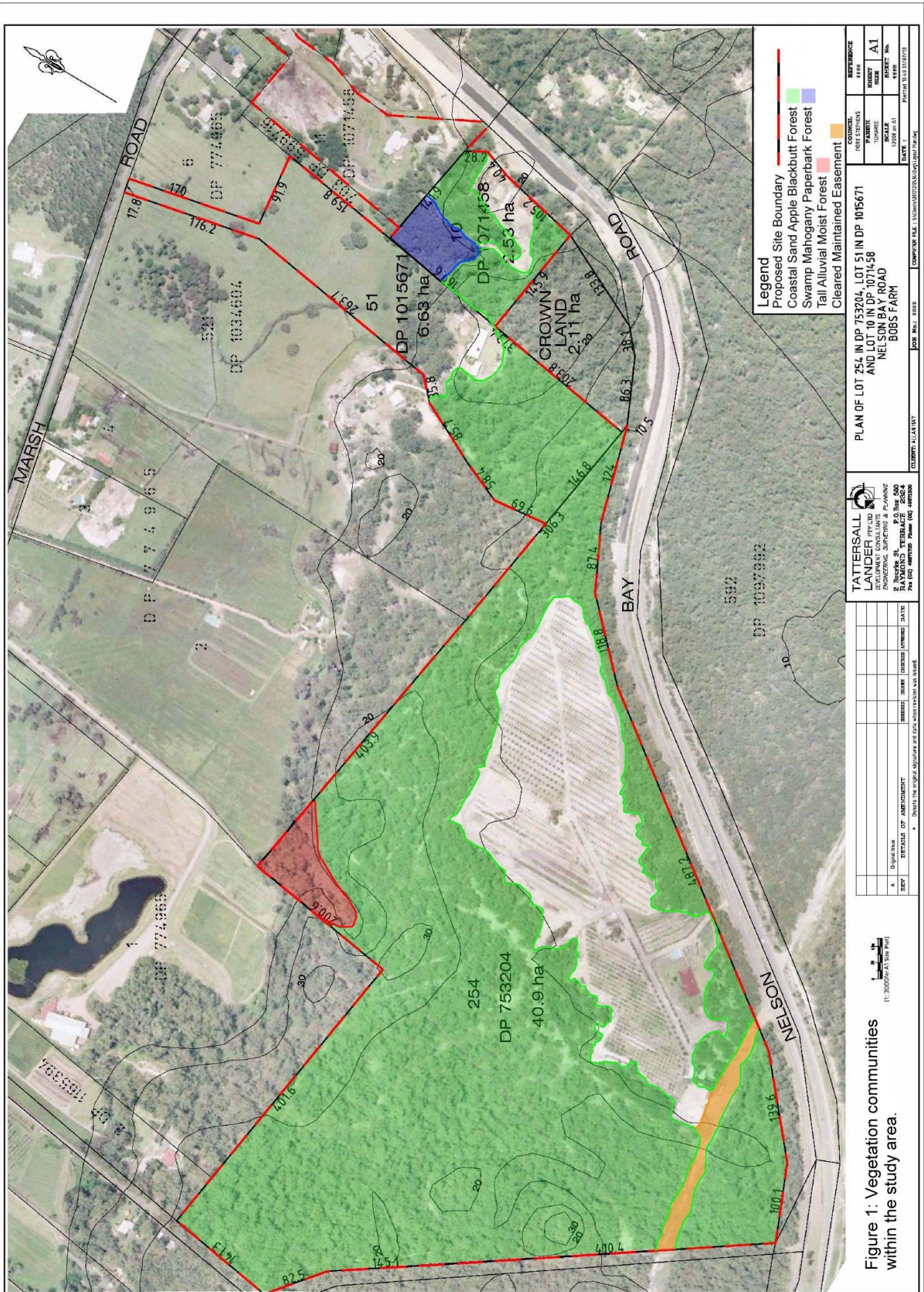
Species Composition

Canopy

Eucalyptus pilularis (Blackbutt), *Angophora costata* (Smooth-barked Apple).

Small Tree Layer

Banksia serrata (Old Man Banksia), *Endiandra sieberi* (Corkwood), *Monotoca elliptica* (Tree Broom-heath).



Shrub Layer

Leucopogon margarodes, *Acacia longifolia* (Sydney Golden Wattle), *Breynia oblongifolia* (Breynia), *Dodonaea triquetra* (Common Hop Bush), *Monotoca elliptica* (Tree Broom-heath).

Ground Layer

Pteridium esculentum (Bracken Fern), *Themeda triandra* (Kangaroo Grass), *Imperata cylindrica* var. *major* (Blady Grass), *Themeda triandra* (Kangaroo Grass), *Lomandra longifolia* (Spiny Mat Rush), *Calochlaena dubia* (Soft Bracken Fern).

Climbers

Parsonsia straminea (Common Silkpod), *Kennedia rubicunda* (Kennedia).

Swamp Forest

This community occupied approximately 0.53ha of low ground in the eastern side of the study area.

Similar Vegetation Types

Biometric ID and Vegetation Type	(405) Swamp Mahogany swamp forest on coastal Lowlands of the North Coast and Northern Sydney Basin.
NPWS, (2000)	Map Unit 37 Swamp Mahogany – Paperbark Forest

Structure

Stratum	Height Range	Canopy Cover
Canopy	15 - 25m	15-45%
Small Tree	10 - 15m	40-85%
Shrub	1.5 – 4m	5-20%
Ground	<1m	5 – 40%

Species CompositionCanopy

Melaleuca quinquenervia (Broad-leaved Paperbark), *Eucalyptus robusta* (Swamp Mahogany), *Livistona australis* (Cabbage Tree Palm), *Casuarina glauca* (Swamp Oak).

Small Tree Layer

Glochidion ferdinandi (Cheese Tree), *Livistona australis* (Cabbage Tree Palm).

Shrub Layer

Acacia longifolia (Sydney Golden Wattle). *Leptospermum polygalifolium* (Tea Tree),

Ground Layer

Gahnia clarkei (Sword Grass), *Enhydra fluctuans*, *Persicaria strigosa* (Knotweed), *Phragmites australis* (Australian Reed), *Histiopteris incisa* (Batswing Fern).

Climbers

Parsonsia straminea (Common Silkpod),

Tall Alluvial Moist Forest

This community occupied approximately 0.53ha of low ground in the eastern side of the study area.

Similar Vegetation Types

NPWS, (2000)	Map Unit 5 Alluvial Tall Moist Forest
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Structure

Stratum	Height Range	Canopy Cover
Canopy	15 - 25m	15-45%
Small Tree	10 - 15m	40-85%
Shrub	1.5 – 4m	5-20%
Ground	<1m	5 – 40%

Species CompositionCanopy

Eucalyptus grandis (Flooded Gum), *Melaleuca quinquenervia* (Broad-leaved Paperbark).

Small Tree Layer

Livistona australis (Cabbage Tree Palm).

Shrub Layer

Myrsine howittiana (Brush Muttonwood).

Ground Layer

Calochlaena dubia (False Bracken), *Blechnum indicum* (Swamp Water Fern).

Climbers

Parsonsia straminea (Common Silkpod), *Cissus hypoglauca* (Water Vine).

Cleared Maintained Easement

The electrical easement in the south-west of the site consisted largely of low maintained native ground covers. Common ground covers found in this area included *Imperata cylindrica* (Blady Grass) and *Pteridium esculentum* (Bracken Fern).

Orchard and residences

The orchard and residences occupied 8.78ha of the study area. This area had been previously cleared and consisted of Olive and Fig Orchards, two residences with associated structures and gardens.

Endangered and significant Ecological Communities

Swamp Mahogany Paperbark Forest occurring in the east of the site was found to be consistent with the Endangered Ecological Community – Swamp Sclerophyll Forest.

Although not likely to be an Endangered Ecological Community the occurrence of Alluvial Moist Forest on site is likely to be regarded as a significant community on the Tilligerry Peninsula.

Threatened Flora

To date no threatened flora species have been recorded within the study area during fieldwork. The threatened orchid species *Diuris arenaria* and *Diuris praecox* were the most likely threatened flora species to be present within the study area. *Diuris arenaria* has been previously found occurring within the electrical easement within the west of the study area (ERM, 2003). Targeted surveys to be

undertaken within the known flowering season in (August & September) will likely confirm the presence of this orchid within the study area.

Threatened fauna

To date one threatened fauna species *Miniopterus australis* (Little Bentwing-bat) has been recorded within the study area. According to database searches and *Petaurus norfolcensis* (Squirrel Glider), *Scoteanax rueppellii* (Greater Broad-nosed Bat) and *M. australis* have also been previously recorded on site. Other threatened fauna species which are known to occur in the locality within similar habitat to that on site include *Phascolarctos cinereus* (Koala), *Phascogale tapoatafa* (Brushtail Phascogale), *Dasyurus maculata* (Tiger Quoll), *Ninox strenua* (Powerful Owl) and *Daphoenositta chrysoptera* (Varied Sittella).

Other fauna species present within the study area

To date native species recorded within the study area includes Frogs; *Crinia signifera* (Common Eastern Froglet), Reptiles; *Dendrolaphis punctulata* (Green Tree Snake), *Varanus varius* (Lace Monitor), *Lampropholis delicata* (Grass Skink), *Ctenotus taeniolatus* (Copper-tailed Skink) and *Ctenotus robustus* (Striped Skink), Birds; *Rhipidura fuliginosa* (Grey Fantail), *Cormobates leucophaea* (White-throated Treecreeper), *Lichenostomus chrysops* (Yellow-faced Honeyeater), *Philemon corniculatus* (Noisy Miner), *Philemon corniculatus* (Noisy Friarbird), *Meliphaga lewinii* (Lewin's Honeyeater), *Platycercus eximius* (Eastern Rosella) and *Acanthiza pusilla* (Brown Thornbill), Mammals; *Wallabia bicolor* (Swamp Wallaby), *Trichosurus vulpecula* (Common Brushtail Possum) and *Antechinus stuartii* (Brown Antechinus).

Conclusion

Additional flora and fauna surveys including fauna trapping and targeted orchid searches are yet to be undertaken within the site which may find additional threatened species.

If you require any further information please contact our office.

Yours faithfully,



Daryl Harman
Senior Ecologist
Wildthing Environmental Consultants

BIBLIOGRAPHY

- ERM (2003). *Environmental Impact Statement for an Electrical Supply Upgrade from Tomago to Tomaree*. Energy Australia, September 2003.
- Murphy, C. L. (1995). *Soil Landscapes of the Port Stephens 1:100 000 Sheet Map*. Department of Land and Water Conservation, Sydney.
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